

Intermec

**User's
Manual**

JANUS 2020
Hand-Held Computer

P/N 059951-003

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Manual Change Record

This page records the changes to this manual, which was originally released as version 001.

Version	Date	Description of Change
002	12/95	<p>This manual was substantially updated to reflect changes made to the firmware, to support technical changes, and to make it easier to use. The new information includes:</p> <ul style="list-style-type: none">• Binary file transfer (BFT)• JANUS software versions 1.23, 1.24, 1.3x, 2.1x, and 3.0• Long-range scanner option• New Auto-Loader software with changes to the LOADADD batch file• New PC card software to support PCMCIA Standard 2.1 <p>Also, this addendum is no longer available because it has been incorporated into this manual:</p> <p><i>Addendum to the JANUS User's Manual (P/N 060298-002)</i></p> <p>All of the functionality described in this manual applies to JANUS readers with software versions 2.xx and higher. If you have an earlier version of JANUS software, some of the features described in this manual may not be available on your reader, such as BFT and the new LOADADD batch file.</p>
003	10/96	<p>This manual was updated to reflect minor corrections and changes throughout the manual. Two specific changes are:</p> <ul style="list-style-type: none">• Page size change from 7½ x 9 to 8½ x 11• Corrected problem with space character in Code 39 bar code labels.

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Glossary

I

Index

Before You Begin

This section introduces you to standard warranty provisions, safety precautions, dangers, warnings, and cautions, formatting conventions used in this manual, and sources of additional product information.

Warranty Information

To receive a copy of the standard warranty provision for this product, contact your local Intermec sales organization. In the U.S. call 1-800-755-5505, and in Canada call 1-800-688-7043. Otherwise, refer to the Worldwide Sales & Service list shipped with this manual for the address and telephone number of your Intermec sales organization.

Safety Summary

Your safety is extremely important. Read and follow all warnings and cautions in this manual before handling and operating Intermec equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings and cautions.

Do Not Repair or Adjust Alone Do not repair or adjust energized equipment alone under any circumstances. Someone capable of providing first aid must always be present for your safety.

First Aid Always obtain first aid or medical attention immediately after an injury. Never neglect an injury, no matter how slight it seems.

Resuscitation Begin resuscitation immediately if someone is injured and stops breathing. Any delay could result in death. To work on or near high voltage, you should be familiar with approved industrial first aid methods.

Energized Equipment Never work on energized equipment unless authorized by a responsible authority. Energized electrical equipment is dangerous. Electrical shock from energized equipment can cause death. If you must perform authorized emergency work on energized equipment, be sure that you comply strictly with approved safety regulations.

Note: For laser compliance and safety information, refer to the JANUS 2020 Manual Supplement that is shipped your JANUS reader.

Dangers, Warnings, and Cautions

The dangers, warnings, and cautions in this manual use this format.



Danger

A danger warns you of possible eye damage caused by use of a Class IIIa laser product. Use of this symbol is mandated by CFR21 1040.

Danger

Un signe de danger vous avertit d'un risque d'endommagement de l'œil causé par l'utilisation d'un produit au laser de classe IIIa. CFR21 1040 oblige l'utilisation de ce symbole.



Warning

A warning warns you of an operating procedure, practice, condition, or statement that must be strictly observed to avoid death or serious injury to the persons working on the equipment.

Avertissement

Un avertissement vous alerte d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour éviter l'occurrence de mort ou de blessures graves aux personnes manipulant l'équipement.



Caution

A caution alerts you to an operating procedure, practice, condition, or statement that must be strictly observed to prevent equipment damage or destruction, or corruption or loss of data.

Conseil

Une précaution vous alerte d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour empêcher l'endommagement ou la destruction de l'équipement, ou l'altération ou la perte de données.

About This Manual

The *JANUS 2020 User's Manual* describes the reader's features and explains how you can operate, configure, network, and create programs for the JANUS reader.

This manual describes the features that are available on JANUS readers with software versions 2.xx and higher. If you have an earlier version of JANUS software, you can still use this manual; however, some features may not be available on your reader, such as binary file transfer (BFT), PC card software that complies with PCMCIA Standard 2.1, and the new LOADADD batch file.

This manual was written for two audiences:

- Users can read Chapters 1 through 4 for help operating the reader.
- Analysts and programmers can use the entire manual to manage the JANUS reader, its applications, and its connection to the data collection system. You should understand data collection programming, data communications, and DOS (commands, file structure, startup files, device drivers).

What You Will Find in This Manual

This table summarizes the information in each chapter and appendix.

Chapter	What You Will Find
1	Summarizes the reader's features, functions, and accessories. Describes how to unpack your new reader and get it started for the first time.
2	Explains how to use the reader's keypad, display, batteries, drives, and scanner.
3	Explains how to use, manage, and program the software that comes with the reader.
4	Explains how to use PC cards with the reader.
5	Explains how to change the reader's configuration.
6	Introduces networking concepts and explains how to use your reader to communicate with other devices.
7	Explains how to create, run, and transmit IRL programs.
8	Explains how to configure the reader to operate in any DOS NLS language and use the matching keypad.
9	Explains how to warm boot, cold boot, and reset the reader. Also describes how to enable/disable a password, enter Storage mode, dump conventional memory, and load flash memory.

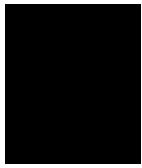
What You Will Find in This Manual (continued)

Chapter	What You Will Find
10	Lists solutions for the problems you may encounter while operating the reader.
11	Describes the commands that change the reader's operation.
12	Describes the commands that change the reader's configuration.
A	Presents the reader's specifications, lists the configuration command names and syntax, and describes the reader's default configuration settings.
B	Lists all of the keystroke combinations you can enter on the reader's keypad.
C	Contains reference tables for configuring communications protocols, using key codes, and using the full ASCII chart.
D	Describes the syntax for Interlnk, POWER.EXE, and the Auto-Loader batch files.

Terminology











You should be aware of how these terms are being used in this manual. For definitions of the technical terms used in this manual, see the glossary.

Term	Description
Reader	The generic term "reader" indicates any JANUS 2020 reader. More specific terms, such as "JR2020," indicate a specific type of JANUS 2020 reader.
JR2020	The term "JR2020" indicates any JANUS 2020 reader with a radio frequency (RF) interface for RF communications.
IC.EXE	The Interactive Configuration application (IC.EXE) was called "the configuration application" in previous versions of this manual.
PC cards	"PC cards" were referred to as "PCMCIA cards" in previous versions of this manual, its addendums, and README.DOC. Intermec no longer uses the name of the Personal Computer Memory Card International Organization (PCMCIA) to refer to this type of PC card.
"For help, see your JANUS PSK reference manual."	This manual does not refer to a specific PSK manual because you may have one or more PSK manuals, depending on the programming language(s) you use.



Format Conventions for Input From a Keyboard or Keypad

This table describes the formatting conventions for input from PC or host computer keyboards and reader keypads:

Convention	Description
Special text	Shows the command as you should enter it into the reader. See “Format Conventions for Commands” later in this chapter.
<i>Italic text</i>	Indicates that you must replace the parameter with a value. See “Format Conventions for Commands” later in this chapter.
Bold text	Indicates the keys you must press on a PC or host computer keyboard. For example, “press Enter ” means you press the key labeled “Enter” on the PC or host computer keyboard.
	Shows the key you must press on the reader. For example, “press  ” directs you to press the key labeled “Enter” on the reader keypad.
	Shows a series of reader keys you must press and release in the order shown. For example, “Press     to boot the reader.”
	Shows a series of reader keys you must press simultaneously. Also, you must press and hold the keys in the order shown. For example, “Press  -  to enter Control mode.”

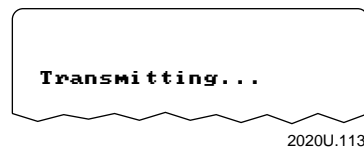
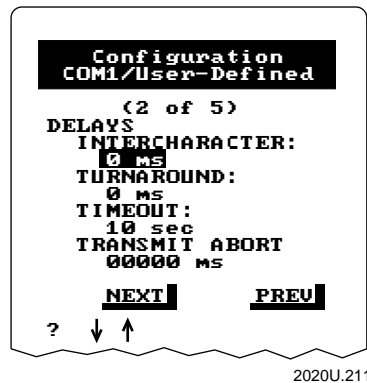
Format Conventions for Bar Codes

You can scan the bar codes listed in this manual to enter data or perform a command. Each bar code includes the name and human-readable interpretation. For example:



Format Conventions for Software Screens and Messages

This manual includes illustrations that represent how the JANUS displays software screens and messages. Here are two examples:



Format Conventions for Commands

This manual includes sample commands that are shown exactly as you should type them on your reader. The manual also describes the syntax for many commands, defining each parameter in the command. This example illustrates the format conventions used for commands:


When you use the LOADADD command, follow this syntax:

```
loadadd [path\]filename [path\filename path\filename...]
```

where:

path is the drive and directory of the file(s) to include in the image file. If you do not include a *path*, the current directory is used.

filename is the name of the file or files to include in the image file and load to the reader.

You can include multiple *path**filename* and *path**. * parameters in the command. The *path**. * parameter loads all the files in a directory. For example, type this command at the DOS prompt and press :

```
loadadd c:\janus\config.sys c:\atadr\*. * c:\data\*. *
```

This table defines the conventions used in the example:

Convention	Description
Special font	Commands appear in this font. You enter the command exactly as it is shown.
<i>Italic text</i>	Italics indicate a variable, which you must replace with a real value, such as a number, filename, or keyword.
[]	Brackets enclose a parameter that you may omit from the command. Do not include the brackets in the command.
Required parameters	If a parameter is not enclosed in brackets [], the parameter is required. You must include the parameter in the command; otherwise, the command will not execute correctly. <i>Note: In previous versions of this manual, required parameters were enclosed in braces { }.</i>
where	This word introduces a list of the command's parameters and explains the values you can specify for them.

Suggested Reading

You may need to refer to the manuals listed below. To order additional manuals, contact your local Intermec representative or distributor.

Manual	Intermec Part No.
<i>0100 Access Point User's Manual</i>	062367
<i>The Bar Code Book</i>	051241
<i>Data Communications Reference Manual</i>	044737
DOS user's manual	
<i>IRL Programming Reference Manual</i>	048609
<i>JANUS 2.4 GHz Installation Utility User's Manual</i>	062368
<i>JANUS 2.4 GHz Terminal Emulation Quick Reference Guide</i>	063682
<i>JANUS 900 MHz Radio Frequency Quick Reference Guide</i>	060207
<i>JANUS 2010 and 2020 Optical Link Adapter Quick Reference Guide</i>	058431
<i>JANUS 2020 Battery Charger Quick Reference Guide</i>	059955
<i>JANUS 2020 Communications Dock Quick Reference Guide</i>	059954
<i>JANUS Application Simulator User's Manual</i>	062778
<i>JANUS Hand-Held Computer Software Upgrade Instruction Sheet</i>	062910
<i>JANUS PSK for Ada Reference Manual</i>	062038
<i>JANUS PSK for Basic Reference Manual</i>	063191
<i>JANUS PSK for C++ Reference Manual</i>	062133
<i>JANUS Terminal Emulation Quick Reference Guide</i>	062178
<i>PC-IRL Reference Manual</i>	049212
<i>RF System/9180 User's Manual</i>	054292

If you are using the JANUS PSK, you may have one or more of the JANUS PSK manuals listed above, depending on the programming language you use. Refer to your PSK manual when you see these instructions:

“For help, see your JANUS PSK reference manual.”

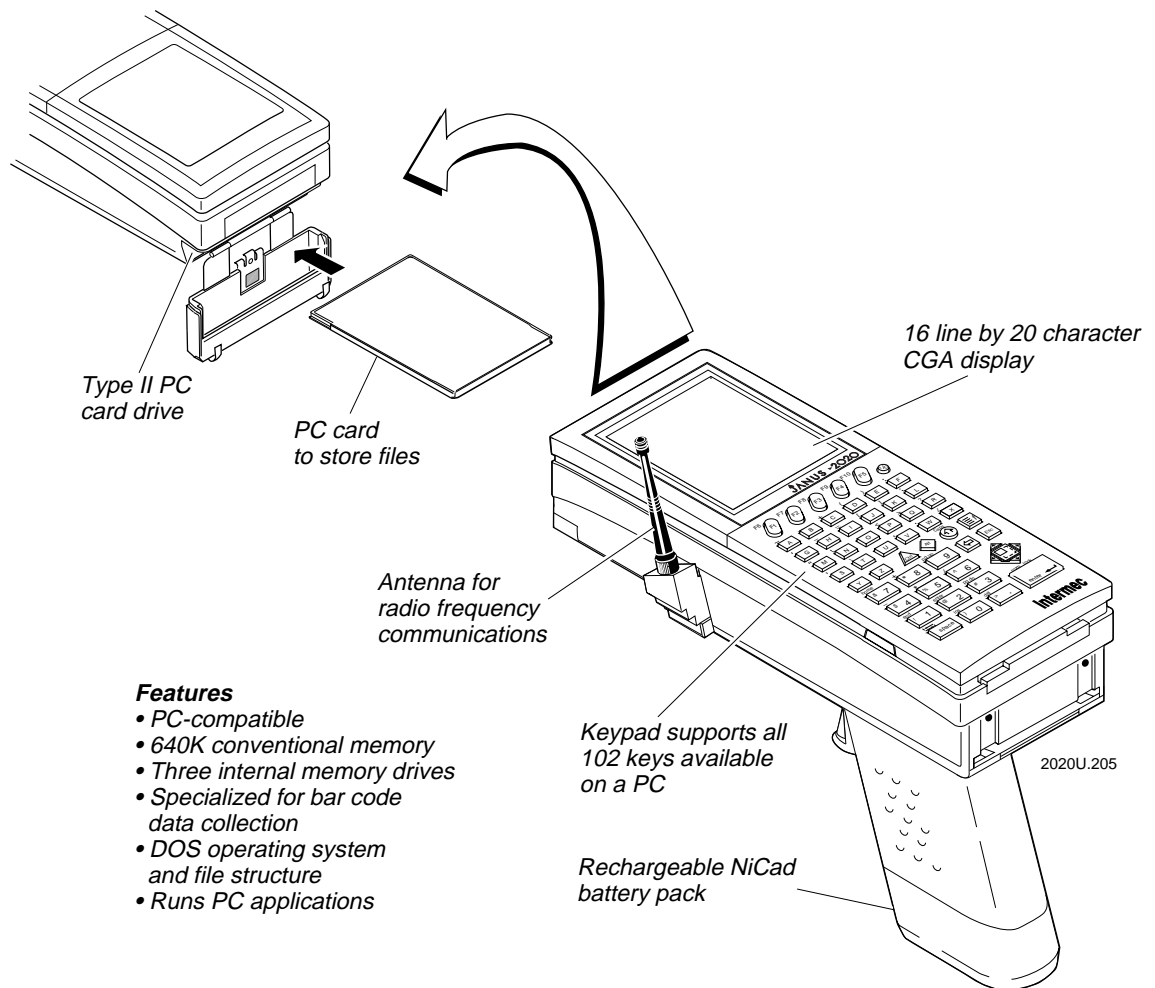


Getting Started

This chapter introduces the JANUS 2020 reader and explains how to get your new reader up and running.

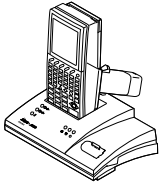
What Is the JANUS 2020 Reader?

The JANUS 2020 is a combination hand-held bar code reader and computer. It has a 386 microprocessor, contains Microsoft ROM DOS, and is PC-compatible.

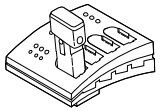


Accessories for the Reader

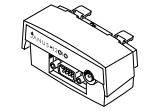
You can use these accessories with the JANUS 2020 reader:



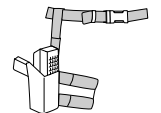
JD2020 Communications Dock The dock allows the reader to communicate with a host computer and other devices through two serial ports, while simultaneously charging the NiCad battery pack in the reader. The dock also has a slot to charge a spare NiCad battery pack.



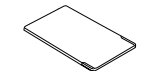
JZ2020 Battery Charger The charger lets you charge up to four NiCad battery packs at one time. The battery charger senses when a battery pack is fully charged and will not overcharge it, ensuring long and consistent battery pack life.



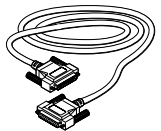
JL2010 Optical Link Adapter The optical link adapter allows the reader to communicate with a host computer or other device by means of an RS-232 serial port. You can also connect a power supply to the optical link adapter to operate the reader and charge the NiCad battery pack.



JH2020 Leg Holster The holster is a convenient way to carry the reader. The holster attaches to a belt with an adjustable Velcro tether, and two adjustable leg straps hold the reader firmly and comfortably in place.



PC Cards Intermec has certified third-party Type I and Type II PC cards, including memory, modem, and network cards. Memory cards you use in the JANUS reader provide additional disk storage space, not executable conventional memory. Contact your local Intermec sales representative for ordering information.



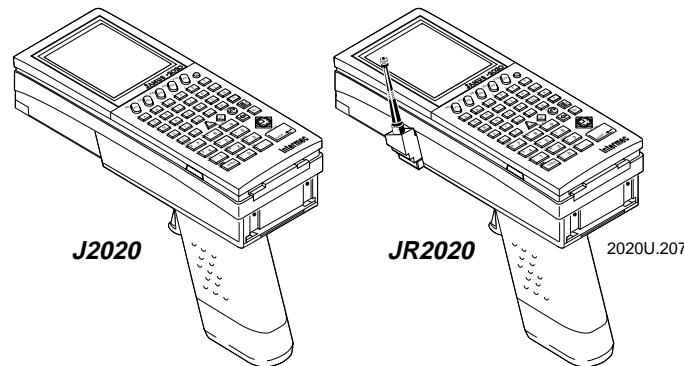
Cables You may need to purchase cables for serial data communications between the reader and peripheral devices. For help, see “Physical and Environmental Specifications” in Appendix A.

JANUS 2020 Models and Options

The JANUS family of 2020 readers includes these models:

J2020 The basic reader is a combination hand-held programmable data collection computer. The reader has a Type II PC card drive for Type I or Type II memory and expansion cards and uses a serial port for data communications.

JR2020 The JR2020 complements the functionality of the basic reader with an RF interface, which allows the reader to communicate with a host computer over a radio frequency (RF) network.



These options are available for the JANUS 2020 reader:

- Alphanumeric keypad that is available in English, French, German, Italian, and Spanish.
- Large numeric keypad that is available in English.
- Standard or long-range laser scanner.
- Terminal emulation (TE) software and keypads that let the reader emulate IBM 3270, IBM 5250, or VT100/220/320 and ANSI terminals.
- Radio frequency communications available for 900 MHz and 2.4 GHz networks.

This manual tells you how to use the basic features in all models of the JANUS reader. Special information about TE and RF is included in the quick reference guides that are shipped with this manual or with your 2.4 GHz installation kit.

Using the Reader for the First Time

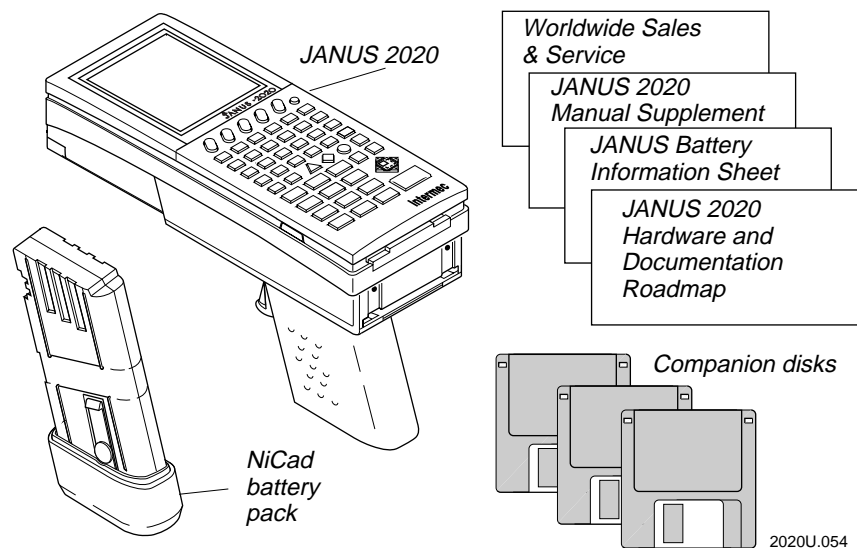
Follow these steps to get your new JANUS 2020 reader up and running:

1. Unpack the reader, NiCad battery pack, companion disks, and documentation.
2. Charge the NiCad battery pack.
3. Install the charged NiCad battery pack.
4. Turn on the reader for the first time.
5. Set the time and date.
6. Verify that the reader is operating correctly.

These steps are described in detail in the next sections.

Unpacking the Reader

When you remove the reader from its box, save the box and shipping material in case you need to ship or store the reader. Check the contents of the box against the invoice for completeness and contact your Intermec representative if there is a problem.

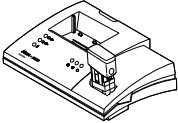
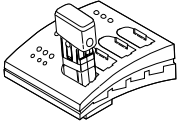
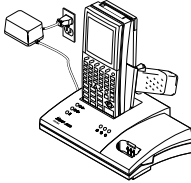
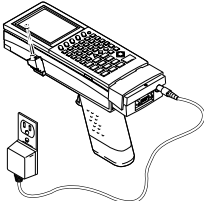


A set of companion disks are included in the box with the reader. These disks contain software you can use on the reader. Look on the Boot Utilities companion disk 1 for a README.DOC file. This file may contain information about the reader that was not available when this manual was published. You can view or print this file with any text editor.

Charging the NiCad Battery Pack

The reader's nickel-cadmium (NiCad) battery pack is shipped to you completely discharged of power, so you must charge the battery pack before you can use the reader. There are four ways to charge the battery pack. For help, see the JANUS accessory quick reference guides.

Note: To learn about using and maximizing the reader's battery power, see "Managing Your Battery Power" in Chapter 2.

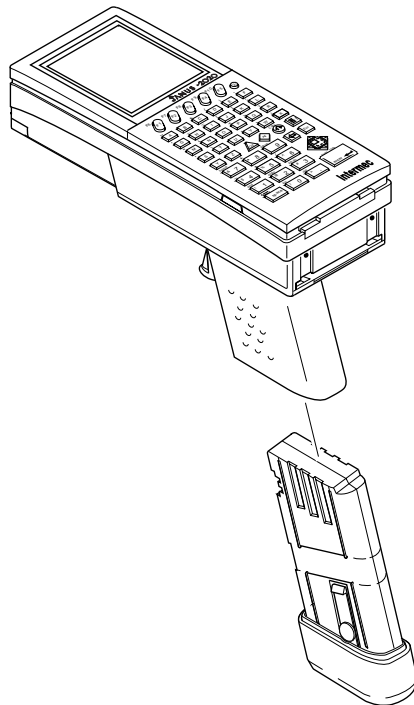
Method	Description	Time to Charge
	Place the battery pack in the battery slot of the communications dock.	About 2.5 hours
	Place the battery pack in the battery charger.	About 2.5 hours
	Install the battery pack in the reader, place the reader in the communications dock reader slot, and connect an external power supply to the dock.	About 15 hours (with the reader turned off)
	Install the battery pack in the reader, attach the optical link adapter to the reader, and connect an external power supply to the optical link adapter.	About 15 hours (with the reader turned off)

Installing the NiCad Battery Pack

Next, you install the newly charged battery pack into the reader.

To install the battery pack

1. Hold the reader with the handle pointing down.
2. Position the battery pack underneath the empty reader handle with the molded rubber end of the pack on the bottom.
3. Slide the battery pack up into the reader handle. Push very firmly on the bottom of the pack until it locks into the handle. You will hear two clicks as the battery pack latches into the reader handle.




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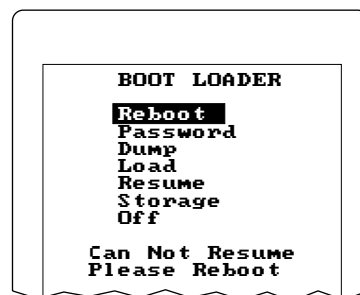
Turning On the Reader for the First Time

When you turn on the reader for the first time, you need to perform an initialization sequence to prepare the reader for operation.


To turn on the reader for the first time

1. After you install the charged battery pack, turn on the reader by pressing the yellow  key on the top right of the keypad.

The Boot Loader menu appears, and the Reboot command is selected.

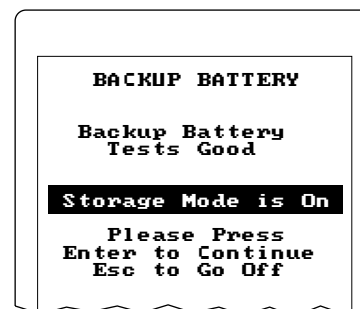


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
2. Press  to reboot the reader. The reader performs a cold boot, which is described in Chapter 9, “Booting and Resetting the Reader.”

Note: If you do not press a key within 60 seconds after the reader displays a screen, the reader shuts off and you have to start over at Step 1.

The BACKUP BATTERY screen appears, describing the status of the lithium backup battery.



2020U.039

3. Press  to continue booting the reader.

The reader continues booting and displays the DOS prompt when it finishes.

Setting the Time and Date


Next, you set the current time and date.


To set the time and date

1. Scan this bar code at the DOS prompt:



TIME


2. Type the current time in the format HH:MM:SS and then press .

To type a colon on an alphanumeric keypad, press  . To type a colon on a large numeric keypad, press  .

3. Scan this bar code at the DOS prompt:




DATE

4. Type the current date in the format MM-DD-YY and then press .

To type a dash on an alphanumeric keypad, press  . To type a dash on a large numeric keypad, press    .

Verifying That the Reader Is Operating Correctly

Once you have turned on the reader, your JANUS reader is ready for operation. You can enter data by typing on the keypad or by scanning bar code labels.

For example, to view the contents of the reader's current drive, type this command at the DOS prompt and press :

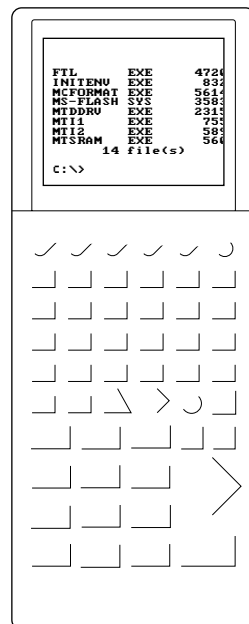
```
dir
```

Or scan this bar code:



DIR

The directory of the current drive appears on the reader display.



2020U.217


If you cannot see the cursor after you enter the DIR command, scan this bar code to move to the cursor's position in the reader's display area:




/-


To learn more about the reader's display and the position of the cursor, see "How to Use the Reader's Display" in Chapter 2.

Turning the Reader On and Off

The reader's Suspend/Resume key is the yellow  key in the upper right corner of the keypad, as shown in this illustration:

When you press  to turn the reader off, the reader does not shut off but goes into a Suspend mode. This mode is referred to as "off" in the rest of this manual.

In Suspend mode, the reader saves all memory and turns off the power to most hardware, including the CPU.

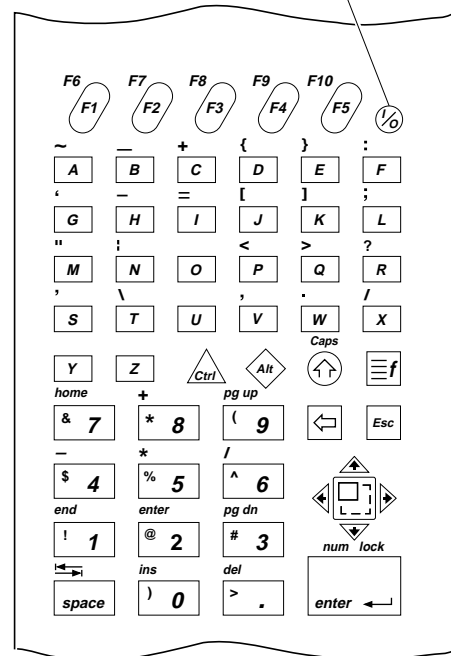
When you press  to turn the reader back on, the reader resumes exactly where it was when you turned it off.

If a program was running when you turned off the reader, the program continues running from the same point when you turn the reader back on.

If you change the battery pack while the reader is turned off, the reader resumes exactly where it was the next time the reader is turned on.

Note: You do not boot the reader by turning it off and on. To learn how and when to boot the reader, see "Booting the JANUS Reader" in Chapter 9.

Suspend/Resume key turns the reader on and off



2020U.143

Where Do You Go From Here?

Now that your new JANUS reader is up and running, you can use this manual to learn how to perform these tasks:

For Help With This Task

To learn to use the reader's keypad, display, audio signals, batteries, COM ports, drives, and scanner

To learn to use the reader's software and manage its disk space and memory

To learn to use PC cards in the reader's PC card drive or drives

To learn about configuration files and ways to change the reader's configuration

To add the reader to your data collection system and learn how to communicate with other devices

To run IRL programs on the reader

To configure the reader for an international language and learn to use the matching keypad

To learn to boot the reader, solve problems, and respond to error messages

See This Chapter

Chapter 2, "Learning How to Use the Reader"

Chapter 3, "Learning About the Software"

Chapter 4, "Using PC Cards in the Reader"

Chapter 5, "Configuring the Reader"

Chapter 6, "Networking the Reader"

Chapter 7, "Working With IRL"

Chapter 8, "Preparing the Reader for International Use"

Chapter 9, "Booting and Resetting the Reader," and Chapter 10, "Troubleshooting"

2

Learning How to Use the Reader

This chapter describes and explains how to use the reader's keypad, display, audio signals, communications port, batteries, drives, and laser scanner.

JANUS 2020 Features

This chapter tells you about these features on the JANUS 2020 reader:

Laser scanner

The reader has a built-in laser scanner to scan bar code data. There are two scanner options: the standard laser scanner scans bar code labels up to 25 inches away, or the long-range laser scanner scans bar code labels up to 60 inches away.

Display

The reader display is 16 lines by 20 characters. You can use the viewport feature to move around a virtual PC-size screen.

Antenna

You can use radio frequency (RF) on the JR2020 reader to communicate with the RF controller.

Keypad

There are three keypad options: an alphanumeric keypad that is available in five languages, a large numeric keypad, and terminal emulation keypads.

Drives

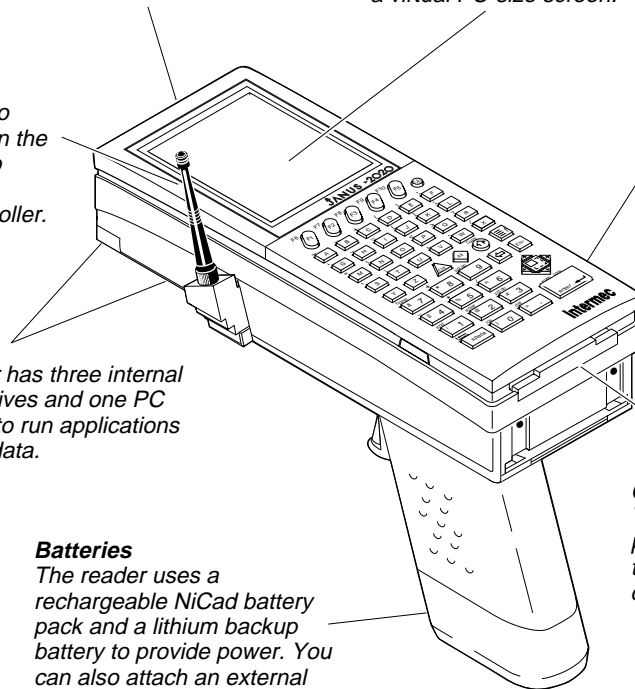
The reader has three internal memory drives and one PC card drive to run applications and store data.

Batteries

The reader uses a rechargeable NiCad battery pack and a lithium backup battery to provide power. You can also attach an external power supply.

Communications port

You can use the optical port on the reader to communicate with other devices.



2020U.004

Using the Alphanumeric Keypad

The JANUS 2020 reader has three keypad options:

- Alphanumeric keypad
- Large numeric keypad
- Terminal emulation keypads

The alphanumeric keypad is an all-purpose keypad with 52 keys. Although the keypad is smaller than a regular PC keyboard, you use special keys on the reader's keypad and press key combinations to access all 102 keys that are available on a PC keyboard.

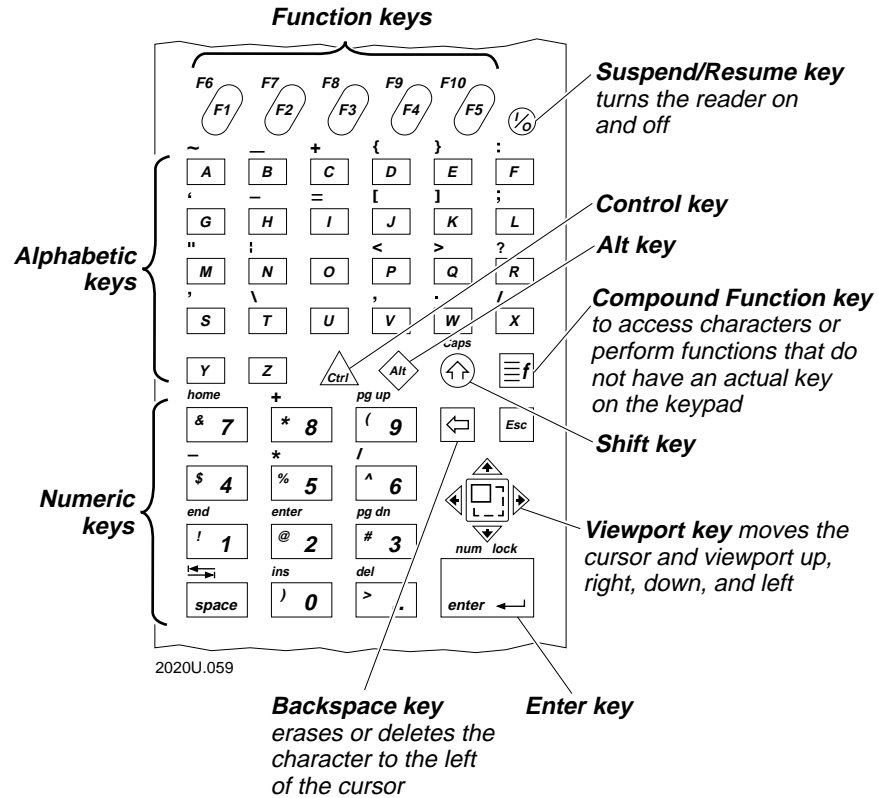
The alphanumeric keypad is available in English, French, German, Italian, and Spanish. For help with an international keypad, see Chapter 8, "Preparing the Reader for International Use."

The large numeric keypad has 34 keys and is available in English. The number keys are larger to make it easier to enter a lot of numeric data. For help using the large numeric keypad, see "Using the Large Numeric Keypad" later in this chapter.

Optional terminal emulation (TE) keypads come with the JANUS 2020 TE reader. The TE keypads are similar to the alphanumeric keypad, but contain additional keys available on an IBM 3270 or 5250 keyboard. For help using your TE keypad, see your JANUS TE documentation.

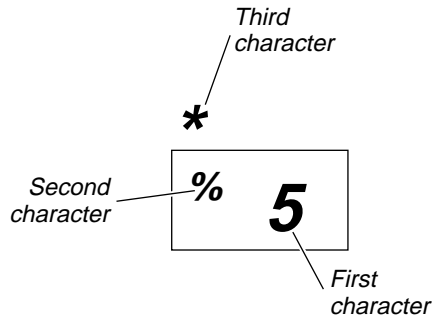
Finding the Special Keys

Before you use the reader's alphanumeric keypad, make sure you can find all of the different types of keys on the keypad.



How to Type the Characters Printed on the Keypad

There are three types of characters and symbols printed on the alphanumeric keypad:








Character	Description	To Type the Character
First	The first character is the one in the middle or lower right corner of the key. If there are two characters printed on the key, it is the larger character. Every key on the keypad has a first character.	<ol style="list-style-type: none"> 1. Press the key the character appears on.
Second	The second character is the one in the upper left corner of the key. Some keys do not have a second key. The alphabetic keys (A through Z) do not show the second key, but it is the uppercase version of the letter.	<ol style="list-style-type: none"> 1. Press \uparrow. 2. Press the key the character appears on.
Third	The third character is the one that appears just above the key, printed on the top cover of the JANUS reader. Some keys (such as Y and Z) do not have a third character.	<ol style="list-style-type: none"> 1. Press \equiv. 2. Press the key the character appears above.

To practice using an alphanumeric keypad, type these characters






:

F

- To type a lowercase f, press .
- To type an uppercase F, press . Press .
- To type a colon (:), press . Press .

*




% 5

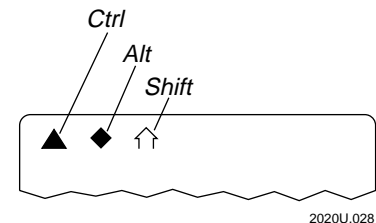
- To type the number 5, press .
- To type the percent sign (%), press . Press .
- To type the asterisk (*), press . Press .

How the Ctrl, Alt, and Shift Keys Work




The JANUS keypad does not have an actual key for every character and function available. You use the Ctrl, Alt, and Shift keys to access characters or perform functions that do not have an actual key on the keypad. You also use the Shift key to type uppercase alphabetic characters.




The Ctrl, Alt, and Shift keys work differently on the JANUS keypad than on a regular PC keyboard. On a PC keyboard, you press and hold key combinations that require the Ctrl, Alt, or Shift keys. On the reader's keypad, you do not hold down these keys.

When you press , , or , the key is held in a buffer until you press another key. The icon appears on the reader's display to remind you that the key is being held in the buffer. When you press another key, the key combination is entered into the reader and the icon disappears.






2020U.028

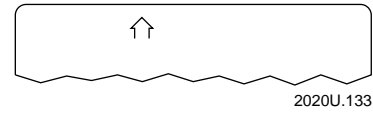
To flush the , , or  key from the buffer without performing any action, just press the key again. The icon disappears from the display.


If you are programming or using applications that require a right and left Ctrl, Alt, or Shift key, you can access these keys on the reader's keypad. To enter a right Ctrl, Alt, or Shift key, press , , or  on the keypad. To enter a left Ctrl, Alt, or Shift key, use the key combination from the Reader Keypad Charts in Appendix B.




To use the Ctrl, Alt, and Shift keys

1. Press , , or . The Ctrl, Alt, or Shift icon appears on the reader's display.

For example, press . The Shift icon appears on the reader's display.












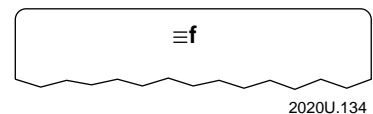
2. Press the second key. For example, press  to type the uppercase letter A. The Shift icon disappears from the reader's display.



Or, to flush the key from the keypad buffer without performing any action, press , , or  again. The icon disappears from the reader's display.

How the Compound Function Key Works

The Compound Function key is a special key on the JANUS keypad. You use the  key to access characters or perform functions that do not have an actual key on the keypad.

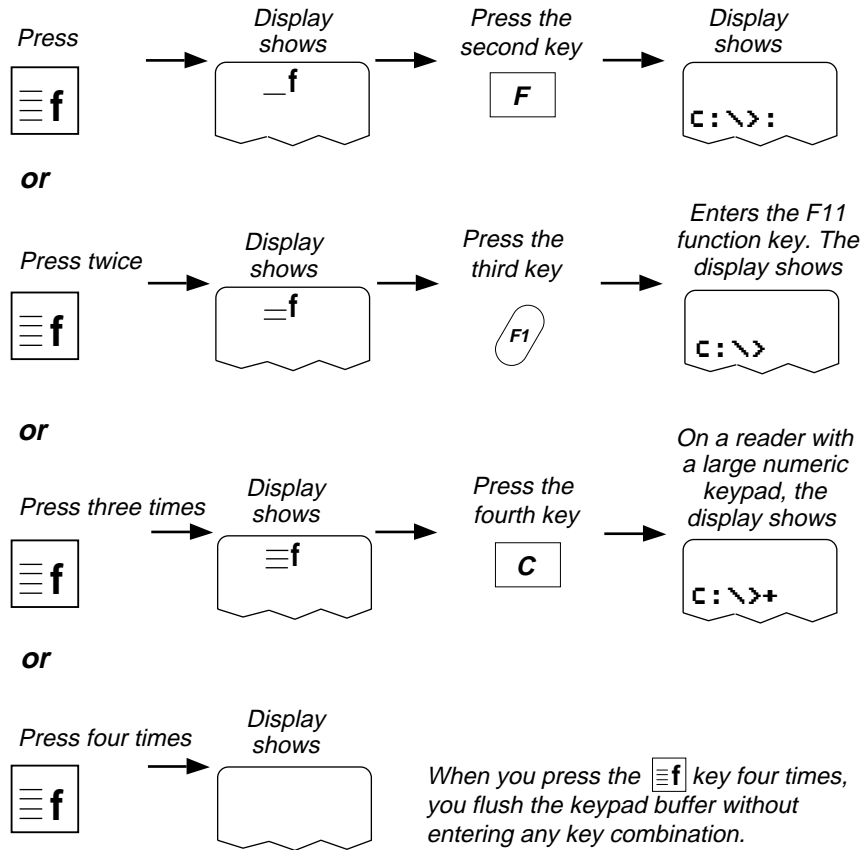
The  key works like the , , and  keys. When you press , the key is held in a buffer and the Compound Function key icon appears on the reader's display. Once you press a key other than , the key combination is entered into the reader and the icon disappears from the display. For example, you press   to type the colon (:) character printed above the  key.



The  key has three levels to access additional key combinations that are not displayed on the keypad. You can press  up to three times and then press one more key to access a wide range of key combinations. For example, you can access the F11 key, F12 key, or the Ctrl-Break function.

For a complete list of key combinations, see Appendix B, "Reader Keypad Charts."


To use the Compound Function key






2020U.032

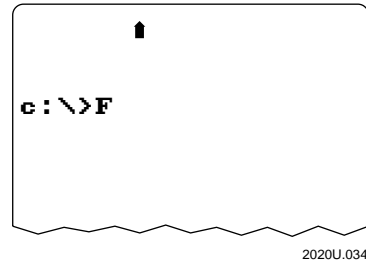
Note: To enter the third key combination shown above, , you must use a large numeric keypad.

Capitalizing All Characters



To type all alphabetic characters as uppercase letters, you can press  before every letter you type, or you can enable the Caps Lock feature.

To enable Caps Lock

1. Press .
2. Press . The Caps Lock icon appears on the reader's display.
3. Type an alphabetic character. The letter appears as an uppercase letter on the reader's display. For example, press  to type an uppercase letter F.



To disable Caps Lock

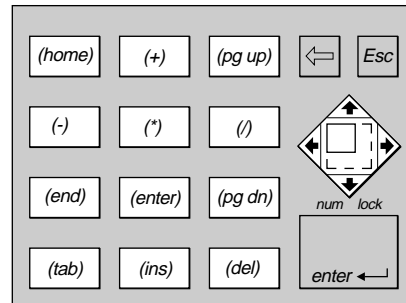
1. Press .
2. Press . The Caps Lock icon disappears from the reader's display.
3. Type an alphabetic character. The letter appears as a lowercase letter on the reader's display.

Note: You can also use the Keypad Caps Lock configuration command to enable or disable Caps Lock on the reader. For help, see “Keypad Caps Lock” in Chapter 12.

Learning How to Use the Cursor Keys

You can press keys to move the cursor around the reader's display screen. The reader's cursor keys work the same as the cursor keys on a regular PC keyboard. You can use the cursor keys to move around the reader's screen if you are running a program, entering data in a screen, editing a file, or editing a command at the DOS prompt.

Cursor keys on
JANUS 2020



Cursor keypads on
PC keyboard





















2020U.048

There are two ways to use cursor keys on the keypad:

- Use the cursor keys and the viewport keys with the reader's number pad disabled.
- Use the cursor keys with the reader's number pad enabled and the Num Lock turned off. For help, see "Using the Number Pad" later in this chapter.

The next table explains how to use each cursor key with the number pad disabled.

Using the Cursor Keys

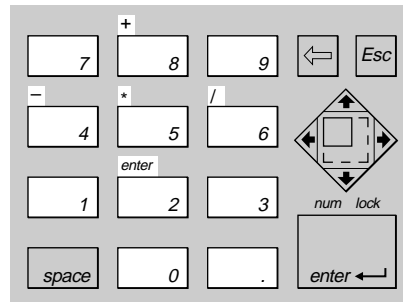
Cursor Key	To Use the Key	Description
Home	Press  	Moves the cursor to the top left corner of the display. If you are at the DOS prompt, moves the cursor to the beginning of the line.
End	Press  	Moves the cursor to the end of the last line displayed on the screen.
Page up	Press  	Moves the cursor up one screen. If you are at the DOS prompt and the DOSKEY command is enabled, scrolls up one page of DOS commands.
Page down	Press  	Moves the cursor down one screen. If you are at the DOS prompt and the DOSKEY command is enabled, scrolls down one page of DOS commands.
Insert	Press  	Each character you type is inserted after the cursor until you exit Insert mode by pressing   again. Normally, you type text in Overwrite mode. Characters are typed over the existing characters on the screen.
Delete	Press  	Deletes or erases the character displayed above the cursor.
Arrow up	Press 	Moves the cursor up one row or line. If you are at the DOS prompt and the DOSKEY command is enabled, scrolls up to the previous DOS command.
Arrow down	Press 	Moves the cursor down one row or line. If you are at the DOS prompt and the DOSKEY command is enabled, scrolls down to the next DOS command.
Arrow right	Press 	Moves the cursor one character to the right.
Arrow left	Press 	Moves the cursor one character to the left.

Using the Number Pad

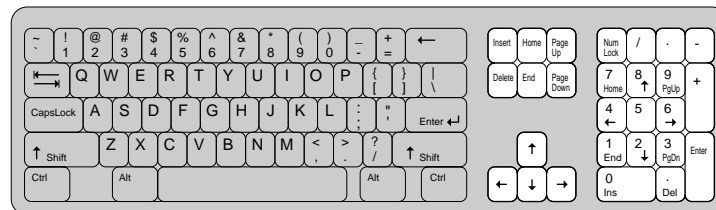
You can use the number pad to move the cursor around the screen and to type numbers and mathematical symbols. The reader's number pad is designed to work like the number pad on a regular PC keyboard. If you are programming or using an application that requires the scan code for a character from the PC's number pad, you need to use the reader's number pad.

For example, you must use the PC's number pad to type a character from the extended ASCII character set. You cannot use the number keys above the alphabetic characters. You must also use the reader's number pad to type characters from the extended ASCII character set.

Number pad
on JANUS 2020



Number pad on
PC keyboard



2020U.119

A PC keypad has a key labeled Num Lock. When you press the Num Lock key on a PC, a light turns on to tell you that the Num Lock is turned on and you can type numbers and mathematical symbols. When you press the Num Lock key again, the light turns off and the number pad becomes a cursor keypad. The reader's number pad works the same way. You can turn the Num Lock on and off with the number pad.

There are two ways to type numbers and mathematical symbols:

- Use the number keys 0 through 9 with the number pad disabled.
- Use the number keys 0 through 9 with the number pad enabled and the Num Lock turned on.

To enable the number pad

Press   .

To turn Num Lock on



Press  .

To turn Num Lock off


Press  .

To disable the number pad

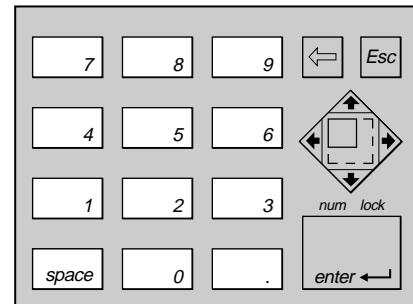
Press   .

With the number pad enabled, you press   to toggle back and forth between Num Lock on and off.




To type these keys with the number pad enabled and Num Lock turned on

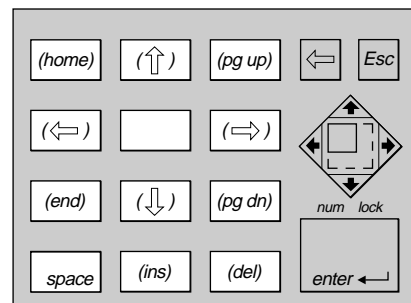
To type the characters in this figure, press a key on the number pad. For example, to type the number 2, press .

You can also type any ASCII character in the extended character set. For help, see “How to Enter ASCII Characters” later in this chapter.




2020U.126

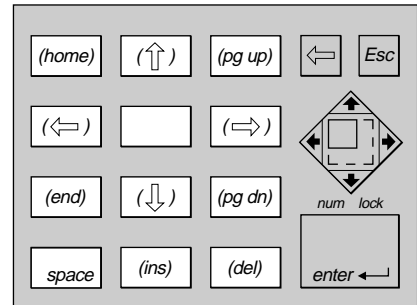
To use the cursor keys in this figure, press  and then press a key on the number pad. For example, to page up (pg up), press  .






2020U.127

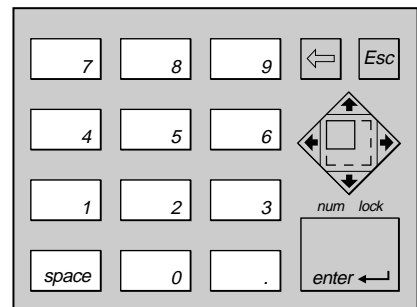
To type these keys with the number pad enabled and Num Lock turned off

To use the cursor keys in this figure, press a key on the number pad. For example, to move to the home position on the display, press .






2020U.127

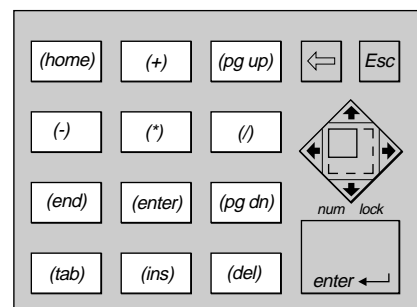
To type the characters in this figure, press  and then press a key on the number pad. For example, to type the number 6, press  .



2020U.126

To type these keys with the number pad enabled and Num Lock turned on or off

To type the characters or use the cursor keys in this figure, press  and then press a key on the number pad. For example, to type the plus (+) sign, press  .





2020U.125

Note: You cannot type the secondary character printed on each numeric key (0-9) with the number pad enabled. You must disable the number pad to type these characters: & * (\$ % ^ ! @ #) >

Finding Out If the Number Pad Is Enabled or Disabled

You can turn the Num Lock on and off on the number pad. On the reader, it may be difficult to tell when the number pad and Num Lock are enabled. You can type a character to find out if the number pad is enabled or disabled.

To find out if the number pad is enabled or disabled



1. Press  and release it.
2. Press .
3. Use this table to find out if the number pad is enabled or disabled, and if Num Lock is turned on or off.










Displays	Status of the Number Pad
%	Number pad is disabled.
5	Number pad is enabled with Num Lock turned off.
Nothing happens	Number pad is enabled with Num Lock turned on.









How to Enter ASCII Characters

You can type any ASCII character in the ASCII extended character set. For help, see any DOS book for a chart with the values you can enter.

To enter an ASCII character

1. Press   to find out the status of the number pad.

Displays	What Do You Do Next?
%	Press  to erase the character. Press    to enable the number pad. Press   to turn the Num Lock on.
5	Press  to erase the character. Press   to turn the Num Lock on.
Nothing happens	Go to Step 2.

2. Press and hold .
3. Type the three-digit decimal ASCII value for the character. The value cannot be larger than 255. For example, type    for the @ symbol.
4. Release the  key. The ASCII character appears on the reader's display.
5. To exit and disable the number pad, press   .

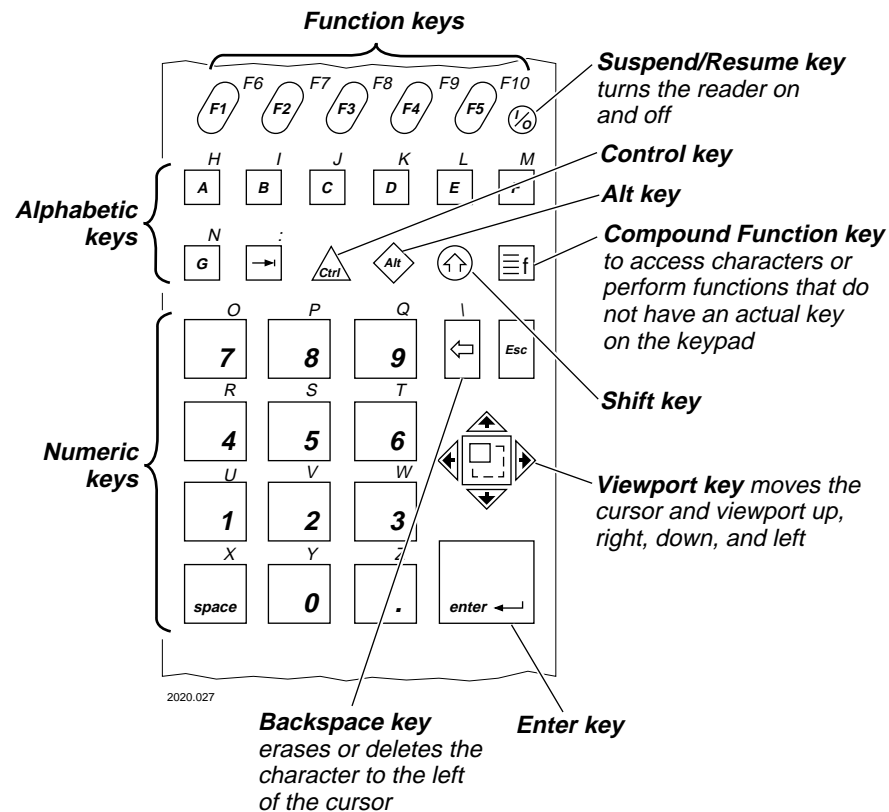
Using the Large Numeric Keypad

The number keys on the large numeric keypad are larger to make it easy for you to type a lot of numeric data. The large numeric keypad is available only in an English version.

The large numeric keypad has 34 keys, and you can access all 102 keys that are available on a PC keyboard by pressing combinations of keys. For a list of key combinations, see Appendix B, "Reader Keypad Charts." This section describes how to use the large numeric keypad.

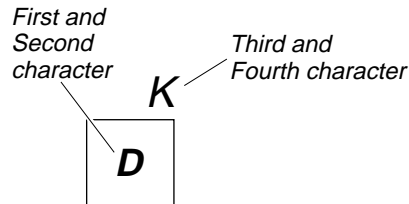
Finding the Special Keys

Make sure you can find these special keys on the large numeric keypad.



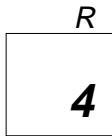
How to Type the Characters Printed on the Keypad







There are four types of characters and symbols printed on the large numeric keypad:











Character	Description	To Type the Character
First	The first character is the one in the middle of the key. Every key on the keypad has a first character.	1. Press the key the character appears on.
Second	The second character is not shown on the key, but it is the uppercase version of the alphabetic key (A through G). The other keys do not have a second key.	1. Press \uparrow . 2. Press the key the character appears on.
Third	The third character is the one that appears just above the key, printed on the top cover of the JANUS reader. Some keys, such as Esc, do not have a third character.	1. Press $\square f$. 2. Press the key the character appears above.
Fourth	The fourth character is not shown above the key, but it is the uppercase version of the alphabetic key (H through Z). The other keys do not have a fourth key.	1. Press \uparrow . 2. Press $\square f$. 3. Press the key the character appears above.

To practice using a large numeric keypad, type these characters







- To type the number 4, press .
- To type the lowercase r, press . Press .
- To type the uppercase R, press . Press . Press .



- To type a lowercase d, press .
- To type an uppercase D, press . Press .
- To type a lowercase k, press . Press .
- To type an uppercase K, press . Press . Press .

How to Type Other Characters

The large numeric keypad does not have an actual key for every character and function available. You use the , , , and  keys to access characters or perform functions that do not have an actual key on the keypad. This table tells you where to find more information about using the keys on the large numeric keypad.

Key







Where to Find More Information

See “How the Ctrl, Alt, and Shift Keys Work” earlier in this chapter.



See “How the Compound Function Key Works” earlier in this chapter.

home, pg up, pg dn,
end, , , , 

See “Learning How to Use the Cursor Keys” earlier in this chapter. This section explains how to use the cursor keypad on an alphanumeric or large numeric keypad.

For the key combinations to access the cursor keys on a large numeric keypad, see Appendix B, “Reader Keypad Charts.”

 through 

See “Using the Number Pad” earlier in this chapter. This section explains how to enable and disable the number pad on an alphanumeric or large numeric keypad.

For the key combinations to access the number pad keys and cursor keys on a large numeric keypad, see Appendix B, “Reader Keypad Charts.”

For a list of the keystrokes you use to access every character or function on the large numeric keypad, see Appendix B, “Reader Keypad Charts.”

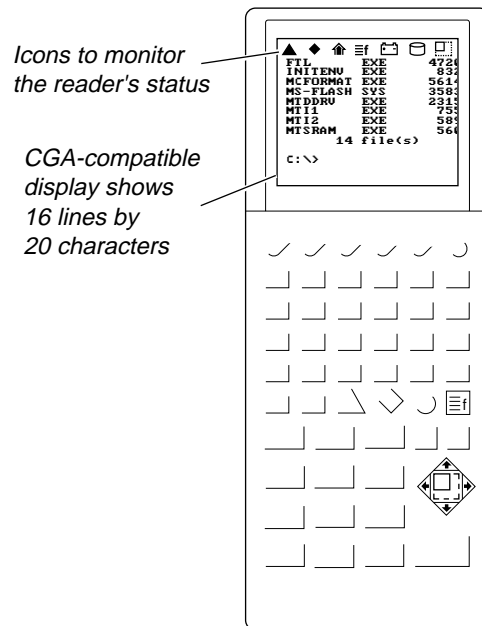
How to Use the Reader's Display

You can use the JANUS reader's display to enter data, view or list files, run programs, monitor the reader's status, and for many other functions. The reader's display is 16 lines by 20 characters and is CGA compatible.

You can use these features of the display:

- Choose different display sizes and video modes.
- Use Text mode or Graphics mode to support different types of applications.
- Use the reader's screen as a viewport to see a full PC-size screen of 25 lines by 80 characters.
- Adjust the display's contrast, backlight, screen scrolling, character height, or character width.
- Use the reader's icons to monitor the status of special keys, battery power, PC card drive, RF communications, and viewport movement.

Each display feature is explained in the next sections.



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Choosing the Display Sizes and Parameters

By default, the reader's display is configured with these values:

- 25 lines by 80 characters (full-sized virtual screen)
- Normal width characters
- Scroll at line 16
- Normal height characters

You can configure the reader's display to the sizes and parameters listed in the next table. If you select the 25 x 80 display size, you can customize the character width, character height, and the line at which the display scrolls; otherwise, those parameters are preset to match the display size.

One reason you may want to configure the display is to support the applications you run on the reader. For example, if you are running a JANUS PSK application designed to fit the reader's 16 x 20 screen, you may choose the 16 x 20 display size.

For help changing the configuration, see Chapter 5, "Configuring the Reader," or "Display Setup" in Chapter 12.

Note: *If you are working at the DOS prompt, Intermec recommends that you set the display size to 25 x 80 or you may see inconsistent display results.*

List of Display Sizes and Parameters

Display Size	Parameters
<p>25 x 80 (25 lines by 80 characters)</p>	<p>You can set these parameters:</p> <p>Video Mode: Set normal- or double-width characters. If you use double-width characters, the display size is 25 x 40. For each character width, you can also choose either Monochrome or Color mode. For help, see "Display Setup" in Chapter 12.</p> <p>Scroll Line: Set the line at which the display scrolls to 8, 16, or 25. <i>Note: If you run an application that uses a 25 line by 80 character display, the reader display will scroll at line 25.</i></p> <p>Character Height: Set normal- or double-height characters.</p>
<p>16 x 20 (16 lines by 20 characters)</p>	<p>These parameters are automatically set.</p> <p>Video Mode: Normal-width characters</p> <p>Scroll Line: Line 16</p> <p>Character Height: Normal-height characters</p>
<p>8 x 20 (8 lines by 20 characters)</p>	<p>These parameters are automatically set:</p> <p>Video Mode: Normal-width characters</p> <p>Scroll Line: Line 8</p> <p>Character Height: Double-height characters</p>
<p>16 x 10 (16 lines by 10 characters)</p>	<p>These parameters are automatically set:</p> <p>Video Mode: Double-width characters</p> <p>Scroll Line: Line 16</p> <p>Character Height: Normal-height characters</p>
<p>8 x 10 (8 lines by 10 characters)</p>	<p>These parameters are automatically set:</p> <p>Video Mode: Double-width characters</p> <p>Scroll Line: Line 8</p> <p>Character Height: Double-height characters</p>

Using Text or Graphics Mode

You can use Text mode or Graphics mode on the reader. By default, the reader uses Text mode and you can set the display size to 25 x 80, 16 x 20, 8 x 20, 16 x 10, and 8 x 10. If your application only recognizes DOS mode, you must use a display size of 25 x 80 or 25 x 40. The other display sizes are not DOS standard and are for use with custom applications. You can program applications to use blinking and reverse video characters in Text mode.

To use Graphics mode, your application needs to set Graphics mode when you start the application on the reader. As you exit the application, set Text mode again before returning to the DOS prompt. When the reader is set to use Graphics mode, you see a 128 x 160 pixel display size. You can use the reader's CGA display as a viewport to move around and see a 200 x 640 pixel virtual display. In Graphics mode, you automatically use the reader's virtual display (PC-size screen).

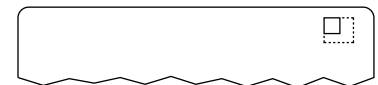
For help on programming the reader or setting Graphics mode, see your JANUS PSK reference manual.

Using the Display As a Viewport

You can see one section of a PC-size screen on the reader's smaller display for applications that need to be PC compatible. You will only see 16 lines and 20 characters of data at one time. However, you can use the reader's display as a viewport to move around and see the entire screen. By moving the viewport, you use the reader's virtual display of 25 lines by 80 characters—the same size as a PC screen.

In the reader's default configuration, the display size is configured for 25 x 80. The first time you turn the reader on, it displays the upper left corner of the virtual display. This is the viewport's home position. Any line of data that is longer than 20 characters is in the unseen area of the virtual display. You move the viewport to see each part of the virtual display.

When you move the viewport out of the home position (upper left corner), the Viewport icon displays until the viewport is returned to its home position.

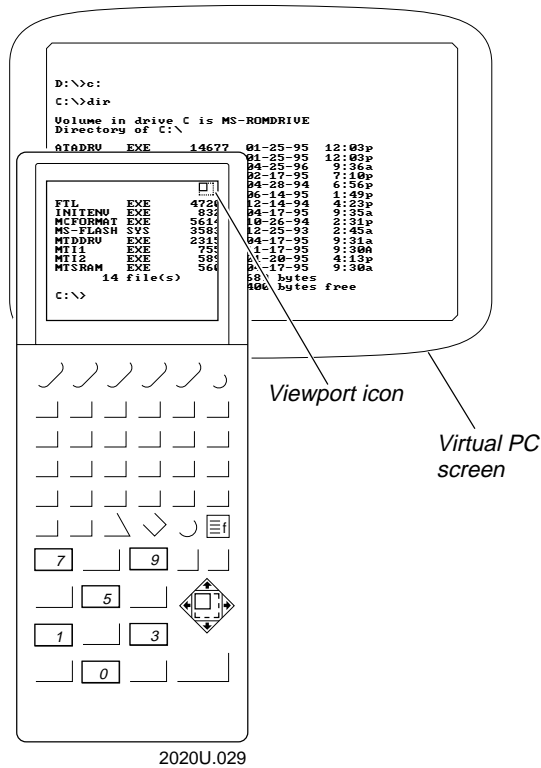


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Note: To use the display as a viewport, you must configure the reader display size to 25 x 80. For help, see “Display Setup” in Chapter 12.

Trying Out the Viewport

When you display a directory list, you need to use the viewport to see all of the information in the list.




To try using the viewport

1. Change to drive C. Type this command and press `enter ↵`.

```
c:
```
2. To see a directory list, type this command and press `enter ↵`.

```
dir
```
3. Press `⇨`. The viewport moves one "step" to the right to see the next part of the directory list. The Viewport icon appears on the reader's display.
4. Repeat Step 3 to move the viewport to the right again if you still cannot see all of the directory information.
5. Press `⇨ ⇨ 0`. The viewport moves to the cursor and you see the C:> prompt. The Viewport icon disappears from the reader's display.

What Are Viewport Movement Steps?

When you press  followed by an arrow key or scan the equivalent bar code label, the viewport moves one “step” in that direction. You can set the number of characters and lines the viewport moves in a single move or step. You can configure the reader to:

- Move the viewport right or left from 1 to 20 characters (or columns) in a single step. The default horizontal step is 10 characters.
- Move the viewport up or down from 1 to 9 lines (or rows) in a single step. The default vertical step is 9 lines.

For help, see “Viewport Movement Steps” in Chapter 12.

Moving the Viewport

You can configure the reader to have:



















- the viewport automatically follow the cursor.
- the operator manually move the viewport.

For help, see “Viewport Movement Mode” in Chapter 12.

Even if you configure the reader to automatically follow the cursor, you may want to move around the 25 x 80 screen to see other information. You can manually move the viewport by pressing the key combinations or scanning the bar code labels listed in the next table.

To Move the Viewport	Press These Keys	Or Scan This Bar Code
One step to the right	 →	Viewport Right  *_**
One step to the left	 ←	Viewport Left  *%_*
Up one step	 ↑	Viewport Up  *%/*
Down one step	 ↓	Viewport Down  *%+*

Moving the Viewport (continued)

To Move the Viewport	Press These Keys	Or Scan This Bar Code
To the lower right corner of the virtual display	  1	Viewport End  *..%.*
To the upper left corner of the virtual display	  7	Viewport Home  *..%/.*
Up one page	  9	Viewport Page Up  *..%+.*
Down one page	  3	Viewport Page Down  *..%-.*
Moves the viewport to the cursor. This command may not work if you are using the reader in Graphics mode.	  0	Viewport to Cursor  */-.*
Moves the cursor to the viewport. This command does not work on applications that have different definitions for cursor movement and you may erase unentered data if you move the cursor backward.	  5	Cursor to Viewport  *..%%.*

Note: *If you are using a large numeric keypad, see Appendix B, "Reader Keypad Charts," for the viewport movement keystrokes.*

If You Cannot See the Cursor

If you have moved the viewport and cannot see the cursor, try entering one of these two options:

To See the Cursor

Move the viewport to the cursor's position. This command may not work if you are using the reader in Graphics mode.

Press These Keys**Or Scan This Bar Code**

Viewport to Cursor



* /-*

Bring the cursor to the viewport. This command does not work on applications that have different definitions for cursor movement and you may erase unentered data if you move the cursor backward.



Cursor to Viewport



..%%

Adjusting the Display From the DOS Prompt

You can change several parameters to adjust the display:





- Make the screen contrast lighter or darker.
- Turn the display backlight on or off.
- Change the line at which the display scrolls.
- Change the height of the characters.
- Select automatic or manual viewport movement.
- Make the beep volume quieter or louder.













There are three ways to change these parameters:

- Use the reader's Control mode as described next.
- Use the Interactive Configuration application (IC.EXE). For help, see Chapter 5, "Configuring the Reader."
- Use the configuration commands to change each parameter. For help, see Chapter 12, "Configuration Command Reference."

You can use Control mode to change the display parameters at the DOS prompt or when you are running an application. You should only change the scroll line at the DOS prompt.

To use Control mode

1. To enter Control mode, press and hold , press , and then release both keys. The  and  icons appear on the reader's display.
2. Press any of these key sequences to adjust the display.

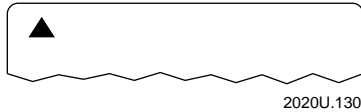
Press	To Adjust the Display
	Make the display contrast darker.
	Make the display contrast lighter.
	Turns the display backlight on or off.
	Change the scroll line to line 8.
	Change the scroll line to line 16.
	Change the scroll line to line 25.
	Change the characters to normal height.
	Change the characters to double height.
	Change the viewport to automatically follow the cursor.
	Change the viewport so that you must manually move it.
	Make the beep volume quieter.
	Make the beep volume louder.

3. Press  to exit Control mode. The  and  icons disappear from the reader's display.

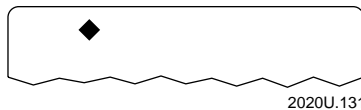
Note: The display parameters you set in Control mode are reset to the default configuration value when you warm boot the reader. Display Contrast is reset only when you cold boot the reader.

Understanding the Icons

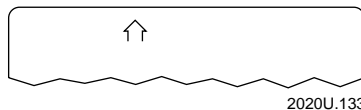
You can use the reader's icons to monitor the status of special keys, battery power, PC card drive, viewport movement, and RF communications. As you use the reader, the icons are turned on and off in the top line of the reader display to indicate the current status.



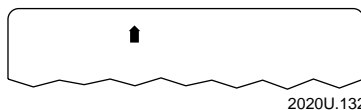
Ctrl This icon appears when you press \triangle_{Ctrl} . The key is stored in the keypad buffer until you press another key. When you press a second key, the key combination is entered into the reader and the icon disappears.



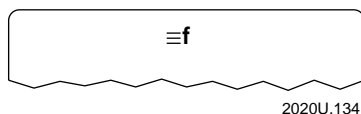
Alt This icon appears when you press \diamond_{Alt} . The key is stored in the keypad buffer until you press another key. When you press a second key, the key combination is entered into the reader and the icon disappears.



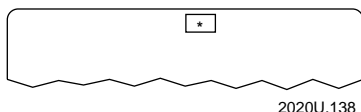
Shift This icon appears when you press \uparrow_{Shift} . The key is stored in the keypad buffer until you press another key. When you press a second key, the key combination is entered into the reader and the icon disappears.



Caps Lock This icon appears when you press $\square_{Caps} \uparrow_{Shift}$ to enable the Caps Lock feature and type all alphabetic characters as uppercase letters. When you press $\square_{Caps} \uparrow_{Shift}$ to disable Caps Lock, the icon disappears.

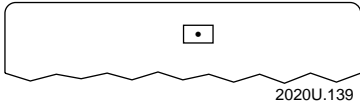


Compound Function This icon appears when you press \equiv_{CF} . You can press \equiv_{CF} up to three times plus one more key to access a wide range of key combinations. Each time you press \equiv_{CF} , an additional line appears on the Compound Function key icon to indicate the number of times you pressed the key. Once you press a key other than \equiv_{CF} , the key combination is entered into the reader and the icon disappears.

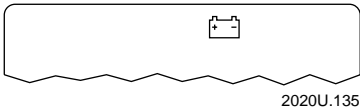


Connected This icon contains an asterisk. It blinks on a JR2020 display when the RF interface is either actively channel searching or trying to reestablish RF communications with the network controller. When the Connect icon stays on, the RF interface is connected to a network controller. When RF communications are not enabled or are not possible, the Connect icon is turned off. For help, see your JANUS RF documentation.

Understanding the Icons (continued)



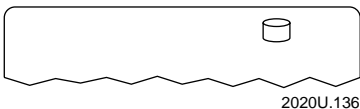
Data This icon contains a period. It appears on a JR2020 display when data is buffered in the RF interface. The data is either being transmitted to the network controller, or received data has not been accepted by the reader's application. When no data is being buffered in the RF interface, the Data icon is turned off. For help, see your JANUS RF documentation.



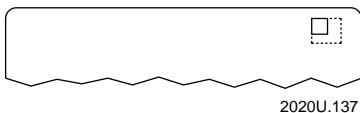
Battery This icon turns on and stays on when the NiCad battery pack has approximately 15 to 45 minutes of power left. If you are using a JR2020, you should replace or recharge the battery pack immediately because you will soon lose RF communications. For help, see your JANUS RF documentation.

If you continue to operate the reader without replacing or recharging the battery pack, the battery pack charge becomes very low. The Battery icon stays on, the reader chirps every 5 seconds, and then turns off after 1 minute. The laser scanner and RF communications are turned off 15 seconds after the first low battery chirp.

You cannot turn the reader back on until you replace the battery pack. The Battery icon disappears when you replace or recharge the NiCad battery pack.



Disk Write This icon appears when you read from and write to a PC card in the PC card drive. The icon disappears once the reader is finished reading from or writing to the PC card. If you are using an SRAM card and the card's lithium battery is low, the icon turns on and off every 2 seconds. For help on changing the card's lithium battery, see "Replacing Lithium Batteries in an SRAM Card" in Chapter 4.



Viewport This icon appears when you move the viewport out of the upper left corner of the virtual display, which is the viewport's home position. When you move the viewport back to the home position, the icon disappears.

Understanding the Reader's Audio Signals



The JANUS reader has a beeper and internal speakers to sound audio signals or beep sequences as you use the reader. For example, you will hear a low beep tone each time you enter or scan a valid command. The next table explains the purpose of each beep sequence you may hear.

You can change the beep volume, frequency, and duration to meet the needs of your working environment. For example, use a quiet beep in a library, a loud beep in a manufacturing plant, or a unique beep to distinguish the reader from other devices. For help, see the beeper commands in Chapter 12, “Configuration Command Reference.”


Beep Sequence	Description
Low beep	You entered a valid command or the data you entered was stored. If the reader sounds a low beep after you insert a PC card, the reader recognized the card, but cannot read it. You need to configure the reader or format the card. For help, see Chapter 4, “Using PC Cards in the Reader.”
High beep	You entered valid data, the reader decoded a label, or the reader decoded the last row of a two-dimensional symbology. When you cold boot the reader, you hear a high beep once the power-on self test (POST) has executed successfully.
Three low beeps	You entered an invalid command or data, or the reader detected an IRL syntax error while compiling. For help, see “Running IRL Programs” in Chapter 10.
Low beep, high beep, low beep	The reader detected an IRL runtime error (a nonfatal error). For help, see “Running IRL Programs” in Chapter 10.
High beep, low beep, high beep	There is an input or output (I/O) error. For help, see “Networking or Communicating With the Reader” in Chapter 10.
Three high beeps	There is a configuration error or a fatal IRL error. For help, see “Running IRL Programs” in Chapter 10.
Two low beeps, two high beeps	The reader sounds this beep sequence whenever you update the reader's configuration.
Medium beep, high beep	The reader recognized the PC card that you inserted. You can begin using the card.

Understanding the Reader's Audio Signals (continued)

Beep Sequence	Description
High beep, medium beep	You hear this beep sequence when you remove a PC card.
Click	The reader sounds a click each time you press a key. You can disable the keyclick. For help, see "Keypad Clicker" in Chapter 12. The reader also clicks while you are scanning a two-dimensional symbology (Code 16K or Code 49) bar code label.
Chirp (every 5 or 15 seconds)	The reader sounds a chirp every 5 seconds when the NiCad battery pack is low, or every 15 seconds when the lithium backup battery is low. For help, see "Recognizing a Low or Discharged Battery" later in this chapter.
Double (shadow) beep or click	The reader sounds a double-beep when you enter a valid command or data and the NiCad battery pack or lithium backup battery is low. You also hear a double-click when you press a key. The second beep or click is a lower tone that shadows the first. For help, see "Learning About the Reader's Batteries" later in this chapter.

You can use the IMBEEP.EXE program on Application companion disk 3 to make the reader sound each signal listed in the table above.

To demonstrate the reader's audio signals




1. Copy the IMBEEP.EXE file from companion disk 3 to a drive on the reader. For help, see Chapter 3, "Learning About the Software."
2. Change to the drive where IMBEEP.EXE is stored.
3. Type this command and press :

imbeep

Or scan this bar code:



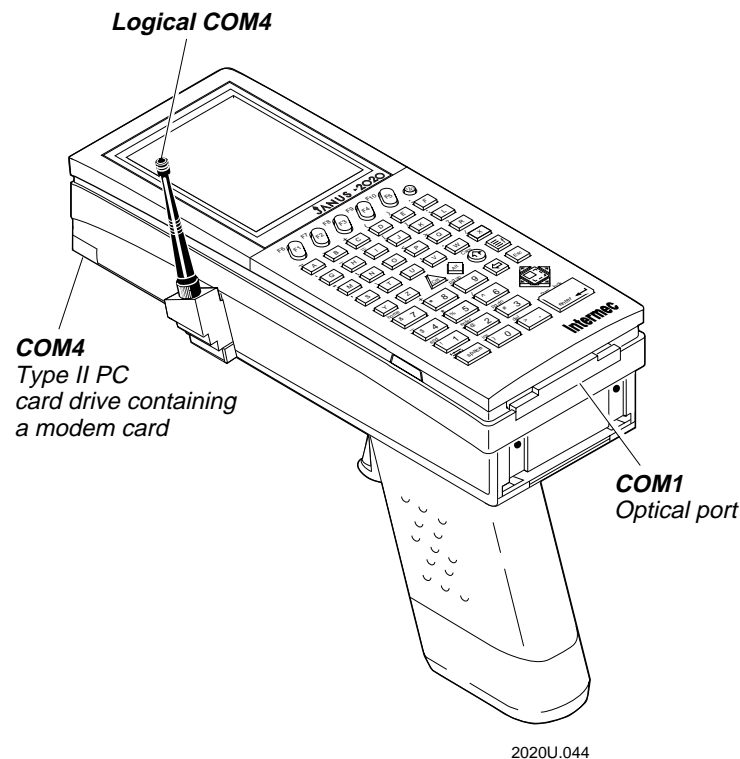
IMBEEP

4. Follow the instructions on the screen. Press a letter from  to  to listen to each audio signal the reader sounds.
5. Press  to exit the program.

Locating the Communications Ports

Communications ports, also called COM ports, are locations from which data can be passed into and out of the JANUS reader. You use serial communications through a COM port, which means that data is transmitted one bit at a time over a single line from one computer to another.

You can use the reader's COM ports to communicate with other devices.



You can communicate with other RS-232 devices, such as modems and terminals, through COM1 by:

- using a JD2020 Communications Dock.
- using a JL2010 Optical Link Adapter.
- lining up the optical ports of two JANUS readers.

You can communicate with other devices in an RF network through the logical COM4. You can also communicate over telephone lines through COM4 when you have a modem card inserted in the PC card drive. For help, see Chapter 6, "Networking the Reader."

Learning About the Reader's Batteries

There are two batteries in the JANUS 2020 reader:

Lithium Backup Battery This battery backs up the RAM and clock when the NiCad battery pack is discharged or removed from the reader.

NiCad (Nickel-Cadmium) Battery Pack This battery provides the main power source to operate the reader.

Lithium Backup Battery

The lithium battery is designed to back up the RAM and clock while you remove a discharged NiCad battery pack and insert a charged battery pack. Your lithium battery will provide backup battery power for 3 to 4 years if you follow these guidelines:

- Keep a charged NiCad battery pack in the reader. If you leave the reader without at least a partially charged battery pack installed, you will prematurely discharge the lithium battery. For help, see "NiCad Battery Pack" later in this chapter.
- When the NiCad battery pack charge is low or you are not using the reader for a while, use an external power supply. Place the reader in the JD2020 Communications Dock or connect the JL2010 Optical Link Adapter and attach an external power supply. For help, see "Using an External Power Supply" later in this chapter.
- If you are not going to use the reader for **1 week or longer**, it is very important that you put the reader into Storage mode and remove the NiCad battery pack. For help, see "Using Storage Mode to Preserve the Backup Battery" in Chapter 9.



Caution

The lithium battery can only be replaced by a trained Intermec service technician. Opening the unit will void the warranty and may cause damage to the internal components.

Conseil

La pile au lithium ne peut être remplacée que par un technicien de service Intermec. Le fait d'ouvrir l'unité annule la garantie et peut endommager les pièces internes.

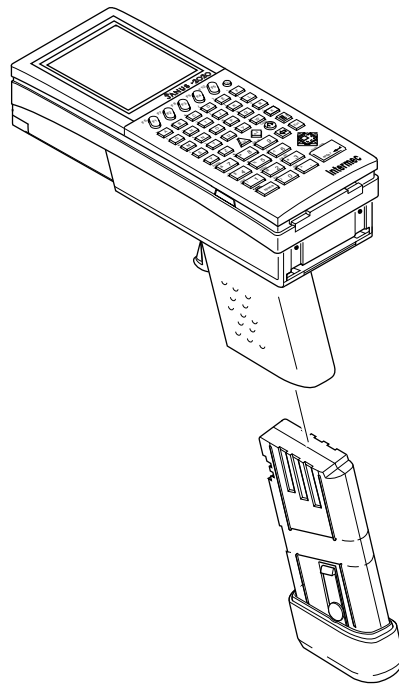
NiCad Battery Pack

The NiCad battery pack is the main power source for the reader. Always keep a charged battery pack in the reader to preserve the life of the lithium battery. When you remove a battery pack, insert another charged battery pack in the reader. If you leave the reader without at least a partially charged battery pack installed, you will prematurely discharge the lithium battery. For help, see “Managing Your Battery Power” later in this chapter.

Installing the Battery Pack

1. Hold the reader with the handle pointing down.
2. Position the battery pack underneath the empty reader handle with the molded rubber end of the pack on the bottom.
3. Slide the battery pack up into the reader handle. Push very firmly on the bottom of the pack until it locks into the handle.

You will hear two clicks as the battery pack latches into the reader handle.



2020U.002

Removing the Battery Pack

The battery pack is encased in the reader handle.




Caution

Removing the battery pack while the reader is on may cause loss of data.

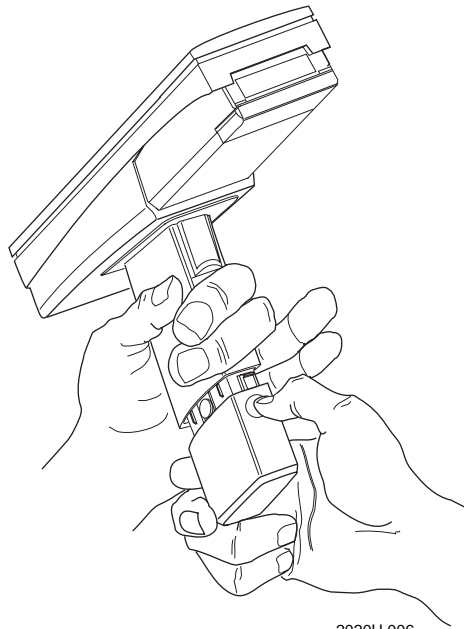
Conseil

Ne détachez pas le jeu de piles pendant que le lecteur est actif car cela pourrait entraîner la perte de données.

To remove the battery pack

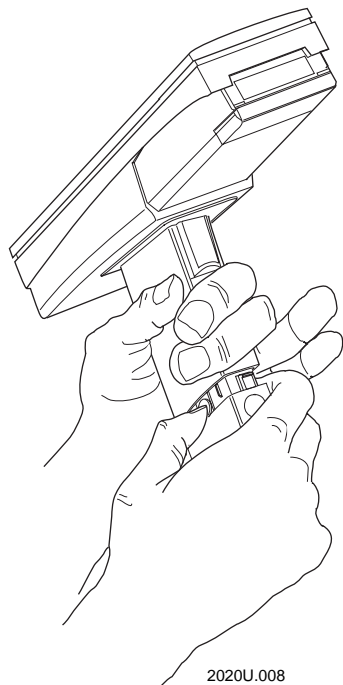
1. Switch off the reader by pressing .
2. Hold the reader with the handle pointing down. Press firmly on the top part of the raised circular button and, at the same time, push the battery pack up until you hear a click. Pull down gently. The pack will release from the handle and slide down approximately 0.5 inch (1.27 cm) before stopping.

Note: Do not hold the reader with the handle up to remove the battery pack. Hold it with the handle pointing toward the floor.




2020U.006

3. With your thumb and forefinger, firmly squeeze the two yellow buttons and push the pack up a little to release the latches inside the handle. Pull down gently and the battery pack will slide out of the handle.



Checking the Power Remaining in the NiCad Battery Pack

You can use the POWER.EXE utility to check the power remaining in the reader's NiCad battery pack. To display the current power status, type this command at the DOS prompt and press :

```
power
```

Or scan this bar code:



POWER

The Power Management Status screen appears similar to this example:

```
Power Management Status
-----
Setting = ADV: MIN
CPU: idle 36% of time
AC Line Status : OFFLINE
Battery Status : High
Battery life (%) :
80
```

2020U.037

These fields help you estimate the power left in the NiCad battery pack:

AC Line Status Tells you if external power is attached to the reader. ONLINE means the reader is using an external power supply. OFFLINE means the reader is using the NiCad battery pack for power.

Battery Status Tells you if the NiCad battery pack is high, low, or charging. High power means the battery pack has more than 50% power remaining. Low power means there is less than 50% power remaining.

Battery Life (%) Gives you an estimate of the amount of power remaining in the NiCad battery pack. This estimate is accurate to $\pm 10\%$. For example, if the battery life is at 20%, the battery pack is getting low and you need to replace it soon. The accuracy of the estimate depends upon variables such as the temperature, use, and age of the battery pack. When the AC Line Status is ONLINE, the Battery Life (%) is always 100%, even if the battery pack is not fully charged.

You may find that POWER.EXE performs differently for each battery pack. For example, you may find that one battery pack uses power at a faster rate and reaches 20% battery life sooner than a new battery pack. For a detailed description of POWER.EXE, see Appendix D, "Software Utility Reference."

Note: You can also use the IRL FP command to determine the power remaining in the reader's NiCad battery pack. For help, see the IRL Programming Reference Manual.

Charging the Battery Pack

You can recharge the NiCad battery pack using any of these JANUS 2020 accessories:

- Communications dock
- Battery charger
- Optical link adapter connected to a power supply

You do not need to discharge the battery pack every time before recharging the battery pack. Only discharge the battery pack if you notice problems with the battery pack's ability to hold a charge. The communications dock and battery charger use a charging method that maximizes battery life and prevents the loss of battery capacity due to the memory effect associated with NiCad batteries. For help about charging battery packs, see the accessory quick reference guides.

***Note:** Battery packs charged in a room temperature of 68°F (20°C) have a higher charge capacity and more charging cycles than battery packs charged at a higher temperature.*

Disposing of the NiCad Battery Pack

The materials used in the construction of the JANUS 2020 battery pack are recyclable. Intermec strongly urges that you recycle the battery packs when they reach the end of their useful lives. Additionally, the Environmental Protection Agency has classified worn out or damaged NiCad batteries or battery packs to be hazardous waste. Several states have passed legislation that prohibits discarding these batteries into the municipal waste stream.

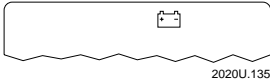
If you have any question on how to recycle or dispose of the NiCad battery packs, contact your local, county, or state hazardous waste management office.

Recognizing a Low or Discharged Battery

If you see the Battery icon or hear a chirping sound, the reader is indicating that the NiCad battery pack or the lithium backup battery are almost discharged. Use this table to find out which battery is low or discharged.

Low NiCad or Lithium Battery Warning

What You Need to Do



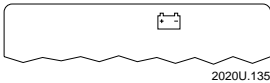
2020U.135

NiCad battery pack is low (15 to 45 minutes left).

- The Battery icon turns on and stays on.

If you are using a J2020, replace the battery pack soon.

If you are using a JR2020, replace the battery pack immediately because you will soon lose RF communications.



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NiCad battery pack is critically low (1 minute left).

- The Battery icon remains on.
- The reader chirps every 5 seconds for 1 minute and then turns off.
- The reader double-beeps when you enter valid data, and double-clicks when you press any key.

Replace the battery pack immediately, or attach an external power supply.

The laser scanner and RF communications are turned off 15 seconds after the first chirp.



Lithium battery is critically low (1 minute left).

- The Battery icon is not displayed.
- The reader chirps every 15 seconds for 1 minute and then turns off.
- The reader double-beeps when you enter valid data, and double-clicks when you press any key.
- The Backup Battery screen appears each time you turn the reader on.

You must keep a charged NiCad battery pack installed in the reader. You can also attach an external power supply. Save all your data and back up all your files from drive E.

Contact your Intermec service representative to replace the lithium battery.



Caution


When the Battery icon appears, save your data and replace the battery pack as soon as possible, or you may lose your data.

Conseil

Quand l'icône de la pile apparaît, enregistrez vos données et remplacez le jeu de piles aussitôt que possible, sinon vous pourriez perdre des données.

Managing Your Battery Power

To maximize the life of the reader's lithium backup battery and NiCad battery pack, use these power management features.

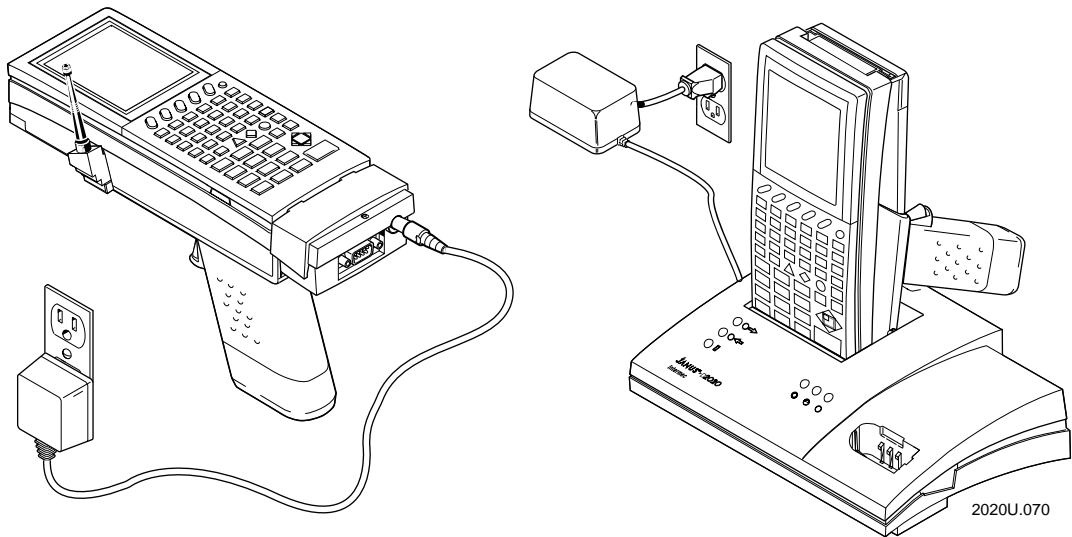
Situation	Ways to Save Battery Power	Description
You will not use the reader again for 5 minutes, a few hours, or up to a week.	<ul style="list-style-type: none"> Put the reader in Suspend mode. Use the Automatic Shutoff feature. 	<p>Suspend mode saves the NiCad battery pack's power. Press  to put the reader in Suspend mode. For help, see "Turning the Reader On and Off" in Chapter 1. Make sure the battery pack is charged (not in a low battery state).</p> <p>Automatic Shutoff puts the reader in Suspend mode when there is no activity on the reader for the length of time you set. For help, see "Automatic Shutoff" in Chapter 12.</p>
You will not use the reader again for 1 week or longer.	<ul style="list-style-type: none"> Put the reader in Storage mode and remove the NiCad battery pack. 	<p>Storage mode saves the lithium backup battery's power. When you put the reader into Storage mode, you must remove the NiCad battery pack. For help, see "Using Storage Mode to Preserve the Backup Battery" in Chapter 9.</p>
You are operating the reader and the NiCad battery pack charge becomes low.	<ul style="list-style-type: none"> Remove the battery pack and insert another charged battery pack. Attach an external power supply to charge the battery pack installed in the reader. Put the reader in Storage mode. 	<p>Unless the reader is in Storage mode, you need to keep a charged battery pack installed in the reader to save the lithium backup battery's power. For help, see "NiCad Battery Pack" earlier in this chapter.</p>
You are using RF communications on a JR2020.	<ul style="list-style-type: none"> Use the Duty Cycle parameters. 	<p>Duty Cycle automatically alternates RF communications between Receiving and Standby mode. In Standby mode, the JR2020 uses less NiCad battery pack power. For help, see the <i>JANUS 900 MHz Radio Frequency Quick Reference Guide</i>.</p>

Using an External Power Supply

You can operate the reader using an external power supply with the following JANUS 2020 accessories:

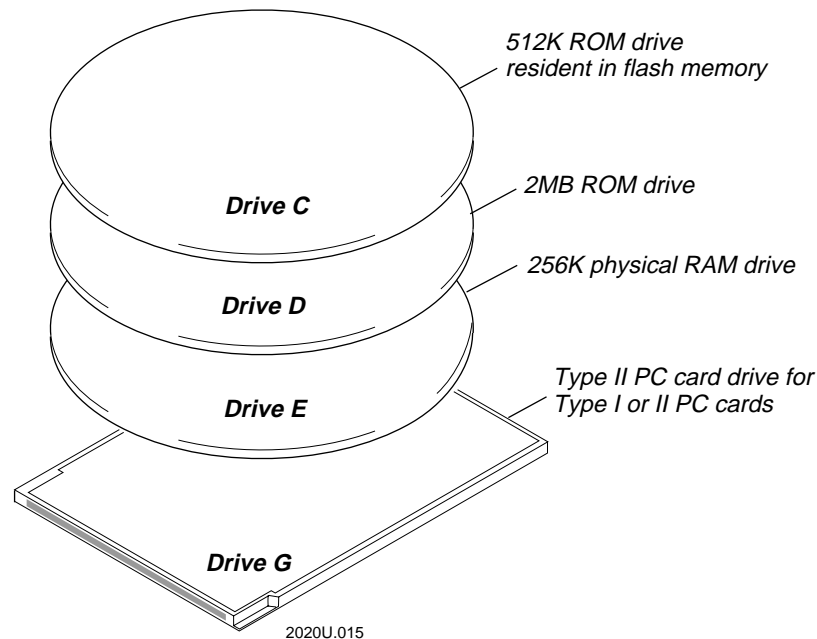
- Communications dock
- Optical link adapter connected to a power supply

You can use the external power supply and charge the reader's NiCad battery pack at the same time. For help, see the accessory quick reference guides.



Defining the Reader's Drives

The reader has three standard memory drives and one PC card drive to run applications and store data.



Drive C is a 512K ROM drive that resides in flash memory. This drive is upgradeable, but has limited write capability. Drive C uses a file allocation table (FAT) type format. The startup files, AUTOEXEC.BAT and CONFIG.SYS files, are stored on drive C. You can also use the drive to store applications and files. You use special utilities to add, change, or delete files on drive C. For help, see “Learning How to Change the Contents of Drive C” in Chapter 3.

Drive D is a 2MB ROM drive that uses a FAT-type format. The reader's applications and DOS system files are stored on drive D. You cannot modify drive D.

Drive E is a physical RAM drive and uses a FAT-based file format. You can use this drive to store data files and user applications. Drive E can also be reduced or eliminated to free extended memory and use it for an application. For help, see “Creating and Using a Physical RAM Drive” in Chapter 3.

Drive G is a Type II PC card drive that is similar to a disk drive on a PC. You can use memory or input/output (I/O) cards that comply with PCMCIA (Personal Computer Memory Card International Association) Standard 2.1. You use memory cards to store applications or data files. You use I/O cards (such as a modem card) to connect the reader to another device for communications. For help, see Chapter 4, "Using PC Cards in the Reader."

Note: Drive F is a placeholder since there is only one PC card drive on the JANUS 2020 reader.

Managing the Reader's Memory and Disk Space

You can store applications and data on the reader's drives. The memory you need for an application usually depends on the application and the types of memory available on the reader. Use these guidelines to store and run applications on the reader.

Data Storage Use drive E to store data if the files are less than 256K. If you need to store data files larger than 256K, use a PC card in drive G. For help on selecting a PC card, see Chapter 4, "Using PC Cards in the Reader."

Applications and Look-Up Tables Use drive C or E to store all applications and look-up tables. You can use drive C to store applications that do not write to the same drive and read-only tables. Use drive C to store files that do not need to be changed often. If you need more memory or disk space, use a PC card in drive G. For help on selecting a PC card, see Chapter 4, "Using PC Cards in the Reader."

Large Applications You may develop a large application that requires more conventional memory than you have available on the reader. You can remove any device drivers and TSRs that you do not need on the reader. For help, see "Making More Memory Available on the Reader" in Chapter 3. You can also purchase a DOS extender and develop your application so it can run using both conventional and extended memory.

Using the Laser Scanner

You use the built-in laser scanner on the JANUS 2020 reader to scan and enter bar code data. The laser scanner emits a beam of laser light that is visible on a bar code label as you scan it. The reader decodes the bar code label and enters the data or command you scanned.



Warning

Do not look directly into the window area or at a reflection of the laser beam while the laser is scanning. Long-term exposure to the laser beam can damage your vision.

Avertissement


Ne regardez pas directement la réflexion d'un rayon laser ou dans la fenêtre du laser lorsque celui-ci est en opération. Si vous regardez trop longtemps un rayon laser, cela peut endommager votre vue.

Scanning a Label With the Reader

There are two types of scanners available:

- Standard laser scanners can scan bar code labels up to 25 inches away, depending on the bar code height and density.
- Long-range laser scanners can scan bar code labels up to 60 inches away, depending on the bar code height and density.

To scan a bar code label with a standard scanner

1. Press  to turn the reader on.
2. Hold the reader at a slight angle a few inches from the bar code label. The laser scanner window must be pointing toward the label.
3. Pull and hold the yellow trigger on the reader to activate the scanner. Direct the beam so that it falls across all bars in the bar code label. After reading the label, the reader beeps and the scanner turns off.
4. Release the scanner trigger.

To scan bar code labels with a long-range scanner

1. Press I/O to turn the reader on.
2. Point the laser scanner toward the bar code label.
3. Pull and hold the yellow trigger on the reader to activate the scanner. The spotting beam (a small red dot) lights for about half a second to help you aim the scanner. The spotting beam automatically spreads into a normal sweeping laser line.
4. Direct the beam so that it falls across all bars in the bar code label. The reader beeps when it reads the label.

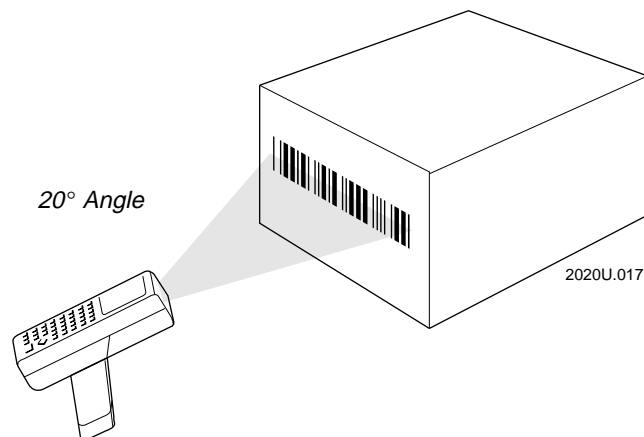


Danger

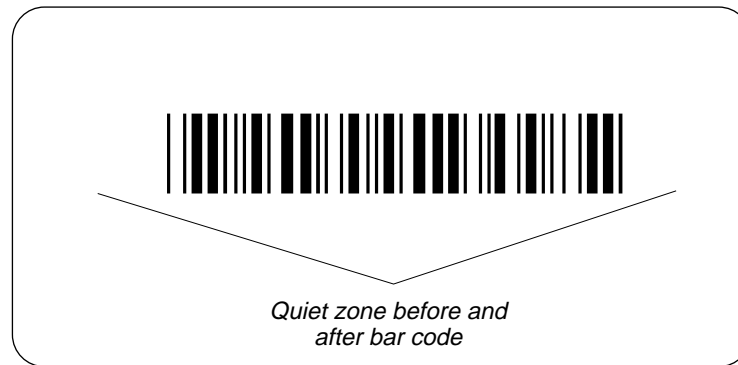
Avoid direct beam exposure. Do not look directly into the window area or at a reflection of the laser beam while the laser is on. Exposure to the laser beam can damage you vision.

Danger

Évitez l'exposition de l'œil directe. Ne regardez pas directement la réflexion d'un rayon laser ou dans la fenêtre du laser lorsque celui-ci est en opération. Si vous regardez un rayon laser, cela peut endommager votre vue.



To successfully read a bar code label, the laser beam must see all the bars in a label and a “quiet zone” at each end of the label. A quiet zone is a clean, non-printed space.



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With either the standard or long-range scanner, you will have the best success if you hold the reader so that the horizontal reading angle is near zero and the vertical reading angle is near 20 degrees. Optimum angles vary with the type and printing quality of the bar code label, the distance of the reader from the label, and the lighting of the work area.

Note: You should not scan the bar code label “straight on.” In a 2-degree conical “dead zone” directly above the label, the laser beam may reflect back into the scanner window and prevent the reader from reading the label.

Laser Scanner Options

You can set several configuration command parameters to configure the laser scanner to meet your needs. The parameters available are:

Decode Security Defines the security level to use when decoding bar codes. When you select a lower decode security level, the reader can decode bar codes with poorer print quality.

Scan Ahead Allows you to scan a number of bar code labels at one time. The labels are held in a stack until the reader can process the data.

Scanner Mode Defines how the scanner operates when the trigger is pulled. In One-Shot mode, the laser turns on and stays on until you release the trigger or a label is decoded. In Automatic mode, you can continuously scan bar code labels without having to release the trigger between labels.

Scanner Redundancy Defines the number of scans (voting) the scanner takes of the same label. When set, voting allows the reader to decode the same bar code label multiple times during a single-trigger event, and compare the decoded information before signaling a good read. The scanner redundancy parameter is important when you are scanning poor quality bar code labels.

Scanner Timeout Defines the maximum length of time the scanner stays on each time you pull the scanner trigger.

Scanner Trigger Allows you to set the triggering to level or edge triggering. With level triggering, you pull the trigger and the laser turns on and stays on until you release the trigger. In edge triggering, you pull the trigger and the laser turns on and stays on until you pull the trigger a second time, or the scanner timeout turns the laser off.

There are several ways to set the laser scanner commands on the reader. For help configuring the reader, see Chapter 5, "Configuring the Reader." For help using the scanner configuration commands, see Chapter 12, "Configuration Command Reference."

3

Learning About the Software

This chapter describes how to use and manage the software that comes with the JANUS reader, how to change files on drive C, how to create programs for the reader, how to make more conventional memory available for the software you run on the reader, and how to upgrade the reader.

What Software Is Provided With the Reader?

The JANUS reader comes with this software:

Auto-Loader Use this utility to change the contents of drive C. You can also use it to configure the reader to operate in any language supported by DOS National Language Support (NLS). For help, see “Learning How to Change the Contents of Drive C” later in this chapter and Chapter 8, “Preparing the Reader for International Use.”

Binary file transfer (BFT) Use BFT over a CrossBar or RF network to connect a host computer to one or more readers in order to transfer binary files or change the contents of the reader’s drive C. For help, see “Downloading Applications Across the Network” in Chapter 6.

Boot Loader menu Use this menu to reboot the reader, dump the reader’s conventional memory, reload or upgrade the reader’s software, or use Storage mode. For help, see Chapter 9, “Booting and Resetting the Reader.”

Communications Manager Use the Communications Manager to transmit and receive files, and to see the status of the reader’s COM port. For help, see “Running Communications Manager” in Chapter 6.

Configuration Manager Use Configuration Manager to configure the reader. Configuration Manager consists of several programs that let you change the reader’s configuration by running the Interactive Configuration application (IC.EXE), using Control mode, scanning bar code labels, typing commands at the DOS prompt, and receiving commands over an RF link. For help, see Chapter 5, “Configuring the Reader.”

DOS Use DOS commands and utilities to transfer files, create and run programs, create a RAM drive, and access files on PC cards. The reader supports many standard DOS 5.0 commands. For help using DOS, see any DOS manual.

Interactive Configuration application (IC.EXE) Use IC.EXE to configure the reader. With menus and dialog boxes, this application simplifies the configuration process. For help, see Chapter 5, “Configuring the Reader.”

Interlnk Use this DOS communications program to access the drives on a host computer as if they were on the reader, and vice versa. For help, see “Running Interlnk to Transfer Files” in Chapter 6.

IRL Desktop Use the IRL Desktop to transmit, receive, and clear data files, and to download and run IRL programs. For help, see Chapter 7, "Working With IRL."

MkImage and PutImage Use these two programs to change the contents of drive C. MkImage creates an image file containing the files you want on drive C, and PutImage places the new image on the reader. For help, see "Using MkImage and PutImage to Change Drive C" later in this chapter.

PC card utilities and drivers Use these drivers and utilities to access the reader's PC card drive, customize the reader to use the PC card software, and provide you with helpful tools. For help, see Chapter 4, "Using PC Cards in the Reader."

Reader Services Reader Services are programs that are part of the reader's system software. These programs decode bar codes, process data input and output, configure the reader, and handle power management. You can create applications that use Reader Services. For help, see "Using Reader Services in Applications" later in this chapter.



Caution

Do not run any Intermec-provided JANUS 2020 application programs (such as IC.EXE) on your PC. Also, do not run any .EXE programs that use Intermec interrupt extensions or libraries on your PC. These programs will lock up your PC and may corrupt the PC BIOS.

Conseil

N'exécutez pas sur votre PC de programmes d'application JANUS 2020 fournis par Intermec (tels que IC.EXE). N'exécutez pas non plus sur votre PC de programmes .EXE qui utilisent des bibliothèques ou des extensions d'interruption car ces programmes bloqueront votre PC et pourraient corrompre le BIOS du PC.

What Software Is Provided on the Companion Disks?

You receive a set of companion disks with your JANUS reader. The disks contain files that may help you use the reader more efficiently. You can use Interlnk to copy files from the companion disks to the reader. For help, see “Running Interlnk to Transfer Files” in Chapter 6.

You can use a PC and the DOS DIR command to learn exactly what files are stored on the companion disks. Here are general descriptions of each disk:


Companion disk 1 The Boot Utilities companion disk contains the files you need to load or upgrade the reader’s system software. This disk also contains the README.DOC, a text file that describes important information about the reader that was unavailable when this manual was published. This disk also contains a batch file, INSTALL.BAT, that you can use to install Auto-Loader onto a host computer. Auto-Loader lets you change the contents of drive C.

Companion disk 2 The MS-DOS Programs companion disk contains commands and device drivers. Some of these commands and drivers are already installed on the reader. This disk also contains applications, such as INTERLNK.EXE, MkImage, and PutImage.

Companion disk 3 The Application companion disk contains applications such as Communications Manager and IRLXDESK.EXE. This disk also contains PC card drivers and utilities that control the reader’s operation, prepare the reader to use the different types of PC cards, customize the reader to use the PC card software, and provide you with helpful tools.

Note: *Companion disk 3 also contains LDKEYTAB.EXE and a .KTB file. Only an authorized Intermec service technician should use these files to load the keypad scan code table.*

Using DOS Commands

The JANUS reader uses the DOS operating system, and you can use DOS commands on the reader just as you do on a PC. From the DOS prompt, you type a DOS command and press  to execute the command. For example:

```
c:\> dir
```

Or you can create and scan bar code labels that contain DOS commands:

DIR Command



DIR

For help using DOS commands, see any DOS manual.

All DOS commands provided with the reader are available on the MS-DOS Programs companion disk 2. The most commonly used commands are also stored on the reader's drive D. See the README.DOC for a list of the files on drive D.

These DOS commands are not supported by the reader:

DOSSHELL.*	GORILLA.BAS	REMLINE.BAS
DOSSWAP.EXE	HERC.*	UNFORMAT.COM
DRIVER.SYS	MONEY.BAS	VGA.*
EGA.*	MONO.*	VGAMONO.GRB
EGAMONO.GRB	MSHER.COM	
FDISK.EXE	NIBBLE.BAS	

These commands are supported by the reader, but you cannot use them on drive C or drive D because they are ROM (read only memory) drives:

CHKDSK (You can analyze, but not fix, drives C and D with CHKDSK)

DISKCOMP

DISKCOPY

MIRROR

SYS

Defining the Startup Files

JANUS readers use the AUTOEXEC.BAT and CONFIG.SYS startup files to control how DOS uses hardware, memory, and files. AUTOEXEC.BAT loads programs and defines paths. CONFIG.SYS loads device drivers and reserves memory for processing information. The commands in the startup files execute when you warm boot or cold boot the reader.

You may modify the startup files for a variety of reasons:

- To support applications you will run on the reader
- To load drivers for your PC cards
- To create physical RAM drives
- To configure the reader to operate in another language

Because AUTOEXEC.BAT and CONFIG.SYS are stored on drive C, you must use Auto-Loader, binary file transfer (BFT), or MkImage and PutImage to replace them. For help, see “Learning How to Change the Contents of Drive C” later in this chapter.

The next sections illustrate what the two startup files may contain when your reader arrives from the factory.

AUTOEXEC.BAT File

Your reader’s AUTOEXEC.BAT should look like this one:

Command Line	Definition
echo off	The AUTOEXEC.BAT commands are not displayed as they are executed.
cls	Clears the screen.
if not exist autoinst.bat goto T2 call autoinst goto T3 :T2	These commands call the AUTOINST.BAT file, enabling you to update drive C with Auto-Loader.
if exist d:\autoinst.bat call d:\autoinst :T3	Do not remove these commands.
set prompt=\$p\$g	Do not delete AUTOINST.BAT from drive C.
set path=c:\;d:\;e:\;	Sets the DOS prompt to display the current drive and directory, followed by the > symbol.
	Directs DOS to look for commands and programs in the root directories of drives C, D, and E. Do not add drive G to the path, or else errors will occur when no PC card is installed.

AUTOEXEC.BAT (continued)

Command Line	Definition
set temp=e:\	A temp directory is required for MORE.COM to work correctly on ROM drives.
set im_errpath=e:\	Tells the reader to write the configuration error file JANUS.ERR to drive E. This command must be executed before RDG.BAT is called.
d: if exist d:\rdg.bat call d:\rdg.bat	Loads Reader Services, Configuration Manager TSR, and the decode and scanner utilities that let the JANUS reader operate as a bar code reader. <i>Note: If you customize RDG.BAT, you may have problems using the JANUS reader as a bar code reader.</i>
rfph 4	Loads the RF protocol handler for COM4 only if you are using an RF reader.
set dircmd=/a/o:gn	Directs the DIR command to list all files, include hidden files (/a), group directories first (/o:g), and sort by filename (n).
d:\im_disp.exe	Loads software required for the display.
if exist d:\auxhdr.com auxhdr	Loads an update to the DOS AUX device.
d:\ic e:\janus.ini	Loads the JANUS.INI configuration file if it exists.
d:\cs_ipm.exe REM d:\cs_apm.exe	CS_IPM and CS_APM work with card services to manage the power on the PC card drive when you suspend and resume the reader. Do not load both at the same time: <ul style="list-style-type: none">• Load CS_IPM if you use ATA, flash, or SRAM cards.• Load CS_APM if you use I/O cards.
if not exist c:\fta.exe goto DOS_PROMPT e: fta.exe checkhost; exit	Runs the FTSERVER batch file if it is on drive C. FTSERVER runs FTA.EXE, which provides binary file transfer (BFT) on the reader. If a host is trying to initiate a BFT session, FTA continues running; if not, FTA stops running.
%IM_APPLICATION% :DOS_PROMPT	After FTA terminates, %IM_APPLICATION% runs any application identified by the DOS environment variable IM_APPLICATION.
c:	Resets the reader to drive C.
cls	Clears the screen.

CONFIG.SYS

Your reader's CONFIG.SYS should look like this one:

Command Line	Definition
shell=command.com /e:2000 /p	Increases the size of the environment space to 2000 bytes. This line is required for Auto-Loader.
device=d:\cs.exe /poll 1	Loads the software required for PC cards.
device=d:\csalloc.exe d:\csalloc.ini	Loads the software required for PC cards. CSALLOC is a DOS program that scans the system for available memory, I/O port, and interrupt request queue (IRQ) resources.
device=d:\himem.sys	Loads the DOS extended memory manager, HIMEM.SYS. HIMEM must be loaded after device drivers are loaded.
device=d:\sramdisk.sys 256 512	Creates the 256K RAM drive E.
REM device=mti1.exe REM device=mti2p.exe	Loads software required for Intel flash PC Series1 and Series2 cards. ¹
device=mtsram.exe	Loads software required for SRAM cards.
REM device=c:\atadriv.exe /S:2	Loads software required for ATA cards. ¹
device=mtddrv.exe	Loads software required for ATA, flash, and SRAM cards.
REM device=c:\ftl.exe	Loads software required for flash cards. ¹
REM device=d:\cardid.exe d:\cardid.ini	Loads software required for ATA and I/O cards. ¹
install=d:\card_sr.exe	Loads software required for the PC card drive.
device=d:\interlnk.exe /drives:7 /noprinter /com:1 /auto	Loads Interlnk as a resident device driver only if Intersvr is executing on a host computer that is connected to the reader. This line is used by Auto-Loader. Do not remove it.
buffers=10	Sets the amount of memory that DOS reserves for data transferred to and from a disk.
stacks=9,256	Sets the amount of memory that DOS reserves to process hardware interrupts.
files=50	Sets the number of files that can be open at one time. This command is used for IRL support.
lastdrive=z	Sets the letter designation for the reader's last drive.

¹ These commands are remarked out because they apply to ATA, flash, or I/O PC cards. By default, the reader is configured for an SRAM PC card.

Learning How to Change the Contents of Drive C

Drive C contains the reader's AUTOEXEC.BAT and CONFIG.SYS startup files, as well as software for the PC card drive. You can use the remaining space on drive C to store applications and data files. In general, drive C should contain files that you often read or execute, but do not often write to or replace.

Drive C is a 512K ROM drive implemented in flash memory. It is upgradeable, but has limited write capability. You can use DOS commands to read from drive C, but you cannot use DOS commands to write to drive C.

To write to drive C, you must use one of these special utilities:

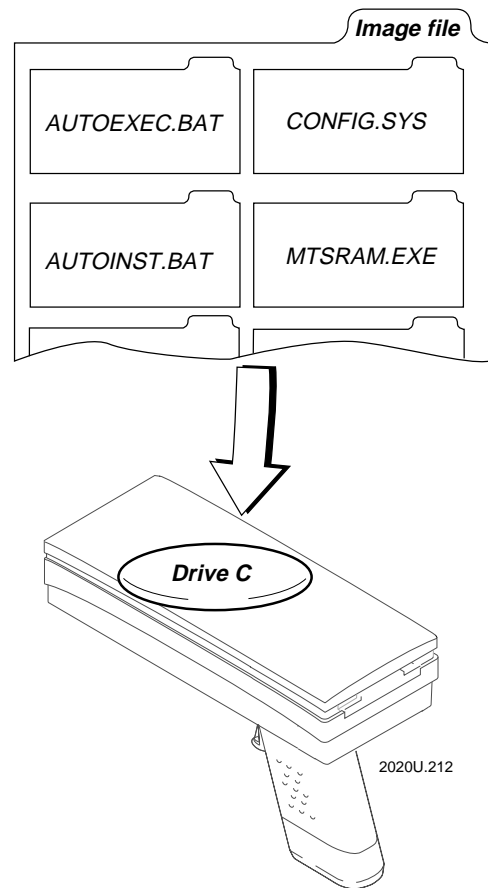
- Auto-Loader
- MkImage and PutImage
- Binary file transfer (BFT)

These utilities let you create an image file that contains an "image" or "snapshot" of all the files you want on drive C.

Then you use the utilities to load the image file to drive C.

Once you load the image file to drive C, the image file becomes transparent. For example, when you use the DOS DIR command for a directory listing on drive C, all you see are the individual files that were contained in the image file.

You cannot directly add, edit, or delete individual files on drive C. Instead, you must replace the entire image.



You can use these utilities to create an image file and copy it to drive C:

Auto-Loader Auto-Loader creates an image file that contains the files you want placed on the reader's drive C, and then replaces the reader's old drive C image file with the new one. You run Auto-Loader on a host computer connected to the reader's COM1 port.

Binary File Transfer (BFT) BFT lets you load an image file to drive C from the reader itself. For help, see "Downloading Applications Across the Network" in Chapter 6.

MkImage and PutImage MkImage lets you create an image file containing the files you want placed on the reader's drive C. PutImage replaces the reader's old drive C image file with the new one. You can run MkImage on a host computer, on the reader's PC card drive, or on the reader's RAM drive. You must run PutImage on the reader.

When deciding which utility to use, you should consider these facts:

- Auto-Loader and BFT require you to use a host computer. MkImage and PutImage do not require you to use a host computer.
- You must install Auto-Loader onto the host computer. MkImage and PutImage are already on the reader's drive D.
- You must create a BFT application for the host computer using Data Collection Manager (DCM) or Interface Software (IS). Also, you must create BFT-ready applications for the reader using BFT functions provided in the PSK. For help, see your DCM, IS, or PSK documentation.
- If you run MkImage on the reader's RAM drive, the image file must be less than 256K.

The next table shows the tasks you can perform with Auto-Loader, BFT, and MkImage and PutImage.

Summary of Methods for Changing the Contents of Drive C

Task You Want to Do	Use These Utilities	For Complete Instructions
Configure the reader to use a language.	Auto-Loader	See "Configuring the Reader for a Language" in Chapter 8.
Add or edit files on drive C without deleting all existing files.	Auto-Loader	See "Adding or Editing Files on Drive C" later in this chapter.
	or MkImage/PutImage	See "Using MkImage and PutImage to Change Drive C" later in this chapter.
Replace some files on drive C without deleting all existing files.	Auto-Loader	See "Adding or Editing Files on Drive C" later in this chapter.
	or MkImage/PutImage	See "Using MkImage and PutImage to Change Drive C" later in this chapter.
Replace all of the files on drive C.	Auto-Loader	See "Replacing All Files on Drive C" later in this chapter.
	or MkImage/PutImage	See "Using MkImage and PutImage to Change Drive C" later in this chapter.
Deleting some files from drive C without deleting all existing files.	Auto-Loader	See "Deleting Files From Drive C" later in this chapter.
	or MkImage/PutImage	See "Using MkImage and PutImage to Change Drive C" later in this chapter.
Copy one image file to multiple readers.	Auto-Loader	See "Copying One Image File to More Than One Reader" later in this chapter.
	or BFT	See "Downloading Applications Across the Network" in Chapter 6.
	or MkImage/PutImage	See "Using MkImage and PutImage to Change Drive C" later in this chapter.

Using Auto-Loader to Change Drive C

You can use Auto-Loader to perform these tasks:

- Adding or editing files on drive C
- Replacing some files on drive C
- Replacing all of the files on drive C
- Deleting files from drive C

First you must install Auto-Loader onto the host computer.

Installing Auto-Loader on Your Host Computer

If you want to use Auto-Loader, you must install Auto-Loader from the Boot Utilities companion disk 1 onto your host computer. Before you start installing Auto-Loader, make sure you have:

- A copy of companion disk 1, which contains the Auto-Loader software.
- DOS 3.3 or higher running on the host computer.
- COM1 or COM2 serial port available on the host computer.
- The host computer environment space, which is reserved by the SHELL command in CONFIG.SYS, should be at least four times the length of the pathname where the installation will copy the required files.

Note: *If you want the reader to operate in another language, you must install Auto-Loader according to the instructions in Chapter 8, "Preparing the Reader for International Use."*

To install Auto-Loader on your host computer

1. Insert companion disk 1 into a disk drive on your host computer.
2. Create the directory where you want to install Auto-Loader. Make that directory your current working directory.

Note: *Do not use the drive C root directory or install Auto-Loader on a pseudo-drive created with a third-party file compression software utility.*

3. At the DOS prompt on the host computer, type this command:

```
source:install [-port]
```

where:

source is the disk drive where you inserted companion disk 1.

port is the number of the host computer's COM port that the reader is connected to. This parameter is optional; the default is COM1.

Here are two examples:

- If companion disk 1 is in drive A, the reader is connected to the host computer's COM1, and you want the reader to operate in English, type this command on the host computer:

```
a:install
```

- If companion disk 1 is in drive B, the reader is connected to the host computer's COM2, and you want the reader to operate in English, type this command on the host computer:

```
b:install -com2
```

4. Wait for the installation procedure to finish and follow any instructions on the host computer's display.

The installation creates the C_FILES\COMMON directory that contains the reader's default AUTOEXEC.BAT, CONFIG.SYS, and AUTOINST.BAT startup files. You can edit these startup files before loading them onto the reader. Do not remove or alter clearly commented statements required for Auto-Loader.

The installation also copies eight batch files into the directory you created for Auto-Loader. The next sections describe how to use five of the batch files: LOADADD, LOADNEW, MAKENEW, LOADIMG, and LOADXIMG. To learn how to use the other batch files, see "Auto-Loader Batch Files" in Appendix D.

Because the batch files are customized for the drive and directory where they are installed, you must reinstall Auto-Loader to move the files. Also, these batch files are customized for English because you did not specify a country when you installed Auto-Loader. If you want the reader to operate in another language, you must install Auto-Loader according to the instructions in Chapter 8, "Preparing the Reader for International Use."

Using an External Power Supply

When you use Auto-Loader, you must connect an external power supply to the communications dock or optical link adapter.

Auto-Loader uses MkiImage and PutImage software. Because PutImage requires an external power supply, Auto-Loader also requires an external power supply.



Caution

The reader should be powered by an AC power source when you use the PutImage command in case the battery pack goes low while the flash memory is being erased. If the power goes down when using PutImage, the reader locks up and the system flash must be reloaded from the Boot Loader menu and you will lose data.

Conseil

Il faut alimenter le lecteur par une source de courant AC lors de l'exécution de la commande PutImage dans le cas où le jeu de piles s'affaiblit pendant l'effacement du flash. Si le courant est coupé lors de l'exécution de PutImage, le lecteur se verrouille, le flash système doit être rechargé du menu d'amorçage (Boot Loader) et vous perdez des données.

In the next procedures, Step 2 directs you to connect the power supply to the communications dock or the optical link adapter. You **MUST** perform this step.

Adding or Editing Files on Drive C

You can add or edit some files on your reader's drive C without overwriting all the files on drive C.

To add or edit files on drive C

Note: All files on drive C remain intact unless they are replaced by new files with the same name.

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.
2. Connect the power supply to the communications dock or the optical link adapter.
3. Create a working directory on the host computer.

4. Copy all the files you want to add or edit to your working directory.

If you want to edit files that are on drive C including the startup files, you can use Interlnk to copy files to your working directory on the host computer. Then you can edit the files and include them in the new image file for drive C. You can also copy files from the companion disks that are shipped with the reader.

5. Make sure your current directory is the one where you installed the Auto-Loader batch files, or make sure that directory is listed in the path statement of your host computer's AUTOEXEC.BAT file.
6. Type this command:

```
loadadd [path\]filename [path\filename path\filename...]
```

where:





path is the drive and directory of the file or files to include in the image file and load to the reader. If you do not include a *path*, the current directory is used.

filename is the name of the file or files to include in the image file and load to the reader.

You can include multiple *path\filename* and *path*.** parameters in the command. The *path*.** parameter loads all the files in a directory.





For example:

```
loadadd c:\janus\config.sys c:\atadriv\*. * c:\data\*. *
```

7. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press     to warm boot the reader and load Interlnk into memory. Auto-Loader begins updating drive C.

8. When the update is complete, the reader reboots automatically. Exit Intersvr on the host computer by pressing **Alt-F4**. This message appears:

```
Drive C: Installation process completed.
```

9. Interlnk is still loaded in the reader's memory. If you need the conventional memory to run other applications, press     to warm boot the reader. Because Intersvr is no longer running on the host computer, a warm boot does not cause Interlnk to load itself into the reader's memory.

Auto-Loader saves all the files contained in the image file to the NEWDRV_C\C_FINAL directory and saves the image file in the NEWDRV_C\IMAGE directory. Auto-Loader overwrites these directories each time you use a LOAD or MAKE command, with the exception that LOADIMG.BAT and LOADXIMG.BAT preserves the image file for successive use.

Replacing All Files on Drive C

You can replace all the files on your reader's drive C by creating a new image file that contains all the files you want on drive C.

To replace all the files on drive C

Note: All the files on drive C will be overwritten.

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.
2. Connect the power supply to the communications dock or the optical link adapter.
3. Create a working directory on the host computer.
4. Copy all the files you want on drive C to the working directory except for the startup files, which must remain in C_FILES\COMMON.

If you want to copy files from drive C, you may need to start Interlnk first to copy files. For example, if you have PC card drivers installed on drive C, you should copy them off the reader to your working directory.

You can also copy files from the companion disks.

5. The command you type in Step 7 will copy the startup files from C_FILES\COMMON to drive C, overwriting the startup files on your reader.

If you need to customize the default AUTOEXEC.BAT or CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.

6. Make sure your current directory is the one where you installed the Auto-Loader batch files, or make sure that directory is listed in the path statement of your host computer's AUTOEXEC.BAT file.
7. Type this command:

```
loadnew [path\]filename [path\filename path\filename...]
```





where:





path is the drive and directory of the file or files to include in the image file and load to the reader. If you do not include a *path*, the current directory is used.

filename is the name of the file or files to include in the image file and load to the reader.

You can include multiple *path\filename* and *path*.** parameters in the command. The *path*.** parameter loads all the files in a directory. For example:

```
loadnew c:\janus\data.txt c:\atadriv\*. * c:\data\*. *
```

8. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press     to warm boot the reader and load Interlnk into memory. Auto-Loader begins updating drive C.
9. When the update is complete, the reader reboots automatically. Exit Intersvr on the host computer by pressing **Alt-F4**. This message appears:

```
Drive C: Installation process completed.
```
10. Interlnk is still loaded in the reader's memory. If you need the conventional memory to run other applications, press     to warm boot the reader. Because Intersvr is no longer running on the host computer, a warm boot does not cause Interlnk to load itself into the reader's memory.

Auto-Loader saves all the files contained in the image file to the NEWDRV_C\C_FINAL directory and saves the image file in the NEWDRV_C\IMAGE directory. Auto-Loader overwrites these directories each time you use a LOAD or MAKE command, with the exception that LOADIMG.BAT and LOADXIMG.BAT preserves the image file for successive use.

Deleting Files From Drive C

You can delete files from your reader's drive C by creating a new image file that contains all the files on drive C except for the files you want to delete.

To delete files from drive C

Note: *All the files on drive C will be overwritten.*

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.
2. Connect the power supply to the communications dock or the optical link adapter.
3. Create a working directory on the host computer.

4. Copy all the files you want on drive C to the working directory except for the startup files, which must remain in C_FILES\COMMON.

If you want to copy files from drive C, you may need to use Interlnk. For example, if you have PC card drivers installed on drive C, you should copy them from the reader to the working directory on the host. You can also copy files from the companion disks.

5. The command you type in Step 7 will copy the startup files from C_FILES\COMMON to drive C, overwriting the startup files on your reader.

If you need to customize the default AUTOEXEC.BAT or CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.

6. Make sure your current directory is the one where you installed the Auto-Loader batch files, or make sure that directory is listed in the path statement of your host computer's AUTOEXEC.BAT file.
7. Type this command:

```
loadnew [path\]filename [path\filename path\filename...]
```




where:




path is the drive and directory of the file or files to include in the image file and load to the reader. If you do not include a *path*, the current directory is used.

filename is the name of the file or files to include in the image file and load to the reader.

You can include multiple *path\filename* and *path*.** parameters in the command. The *path*.** parameter loads all the files in a directory. For example:

```
loadnew c:\janus\data.txt c:\atadr\*. * c:\data\*. *
```

8. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press    to warm boot the reader and load Interlnk into memory. Auto-Loader begins updating drive C.
9. When the update is complete, the reader reboots automatically. Exit Intersvr on the host computer by pressing **Alt-F4**. This message appears:


```
Drive C: Installation process completed.
```
10. Interlnk is still loaded in the reader's memory. If you need the conventional memory to run other applications, press    to warm boot the reader. Because Intersvr is no longer running on the host computer, a warm boot does not cause Interlnk to load itself into the reader's memory.

Auto-Loader saves all the files contained in the image file to the NEWDRV_C\C_FINAL directory and saves the image file in the NEWDRV_C\IMAGE directory. Auto-Loader overwrites these directories each time you use a LOAD or MAKE command, with the exception that LOADIMG.BAT and LOADXIMG.BAT preserve the image file for successive use.

Copying One Image File to More Than One Reader

You can copy an image file to more than one JANUS reader so drive C is the same on every reader. Follow these steps, described in detail in the next procedures:

1. Create the image file.
2. Rename the image file.
3. Load the image file onto more than one reader.

To create the image file with MAKENEW

Note: This procedure describes how to create an image file with MAKENEW, but you can use any LOAD or MAKE command to create the image file. For help with another command, see "Auto-Loader Batch Files" in Appendix D.

1. Connect the reader to the host computer through a communications dock or optical link adapter.

Note: If you use the communications dock and plan to use Interlnk during this procedure (as described in Step 3), you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Connect the power supply to the communications dock or the optical link adapter.
3. Create a working directory on the host computer. Copy all the files you want on drive C to the working directory except for the startup files, which must remain in C_FILES\COMMON.
4. The command you type in Step 5 will create an image file that contains the default startup files in C_FILES\COMMON. If you must customize AUTOEXEC.BAT or CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.
5. To create an image file that contains the startup files in C_FILES\COMMON plus any additional files you specify, type this command on the host computer:

```
makenew [path\]filename [path\filename path\filename...]
```

where:

path is the drive and directory of the file or files to include in the image file. If you do not include a *path*, the current directory is used.

filename is the name of the file or files to include in the image file.

You can include multiple *path\filename* and *path*.** parameters in the command. The *path*.** parameter loads all the files in a directory. For example:

```
loadnew c:\janus\data.txt c:\atadriv\*. * c:\data\*. *
```

6. The image file is saved as NEWDRV_C\IMAGE\DRIVEC.IMG on the host computer. The next time you execute the MAKENEW command, this image file will be overwritten. To protect the image file, you can rename it.

To rename the image file

When you execute a LOAD or MAKE command, Auto-Loader saves a copy of the drive C image file as NEWDRV_C\IMAGE\DRIVEC.IMG. You can copy that file to multiple readers.

Auto-Loader overwrites DRIVEC.IMG each time you create a new image file. If you rename DRIVEC.IMG, it will not be overwritten.

You can also create multiple image files and rename each with a unique name. For example, you can create an image file for each type of PC card you use in the reader. Each image file contains a CONFIG.SYS that loads the drivers for the PC card. When you need to switch PC cards in the reader, you can load the appropriate image file to the reader:

- NEWDRV_C\IMAGE\C-ATA.IMG
- NEWDRV_C\IMAGE\C-FLASH.IMG

To copy the image file to more than one reader

Note: *All the files on each reader's drive C will be overwritten.*

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.
2. Connect the power supply to the communications dock or the optical link adapter.

3. Type the LOADXIMG or LOADIMG command:

- If the image file has the NEWDRV_C\IMAGE\DRIVEC.IMG default name, type this command on the host computer:

```
loadximg
```

- If the image file has any other name, type this command on the host computer:

```
loading path\filename
```





where:





path is the drive and directory of the image file to load.

filename is the name of the image file to load.

For example, to load the FLASH\C-ATA.IMG image file, type this command on the host computer:

```
loading c:\flash\c-ata.img
```

4. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press     to warm boot the reader and load Interlnk into memory. Auto-Loader begins updating drive C.
5. When the update is complete, the reader reboots automatically.
6. To load the image file on another reader, disconnect the reader from the host computer, connect another reader to the host computer, and repeat Steps 3 through 5.

Note: *Interlnk is still loaded in memory on the reader you disconnected from the host computer. You can press     to warm boot the reader and remove Interlnk from memory.*

7. When you finish updating your JANUS readers, you can exit Intersvr on the host computer by pressing **Alt-F4**. You will see this message:

```
Drive C: Installation process completed.
```


Using MkImage and PutImage to Change Drive C

As noted in the table on page 3-12, you can use MkImage and PutImage to perform these tasks:

- Adding or editing files on drive C
- Replacing some files on drive C
- Replacing all of the files on drive C
- Deleting files from drive C

Follow these steps, which the next sections describe in detail:

1. Decide if you want to run MkImage on a reader or host computer.
2. Create a working directory and fill it with files for the reader's drive C.
3. Create the new image file with MkImage.
4. Load the new image file onto the reader with PutImage.

Note: *You do not have to install MkImage and PutImage onto the reader because the files are available by default on the reader's drive D.*

Deciding Where to Run MkImage

You can run MkImage:

- on the reader's RAM drive if the image file is less than 256K.
- on a PC card inserted into the reader.
- on a host computer with or without Interlnk:

With Interlnk You can use Interlnk on the host computer to execute the copy of MkImage that is stored on the reader's drive D. Also, you can use Interlnk to copy files from the reader's drive C to the host's working directory. For help, see "Running Interlnk to Transfer Files" in Chapter 6.

Without Interlnk You can run MkImage on the host computer without Interlnk if you copy the MkImage executable file, MKIMAGE.EXE, from the MS-DOS Programs companion disk 2 to the host computer. Also, you can use DOS COPY commands to copy additional files from the companion disks instead of from the reader's drive C.

Creating and Filling the Working Directory

1. Create a working directory where you will store the files you want on the reader's drive C. If the directory contains subdirectories, MkImage ignores them because you cannot create subdirectories on the reader's drive C.
2. Create or copy up to 127 files to the working directory, as follows:
 - If you are adding new files to drive C, copy all files currently on drive C as well as the new files to the working directory.
 - If you are changing or replacing some of the existing files on drive C, copy all files currently on drive C to the working directory. Edit the files you want to change or replace.
 - If you are replacing all files on drive C, copy the files you want on drive C to the working directory.
 - If you are deleting files from drive C, copy all files currently on drive C to the working directory. Delete the files you want to remove from drive C.

You can use the DOS COPY command to copy files from the companion disks, or you can use Interlnk to copy files from the reader's drive C.

Creating the New Image File

Create the image file by typing the command:

```
mkimage path [filename]
```

where:

path specifies the directory that contains the files for the image file. This directory is called the source directory.

The *path* parameter is **required** and must begin with a slash (/) for the root directory. You do not need to include the drive letter. For example, you could enter /JANUS/IMAGE as the path. If you do not specify the path correctly, the command fails.

If you omit the *path* parameter, MkImage uses the current path, which results in a corrupt image file that will not function properly on the reader.

filename specifies the full path and name of the image file to create. If you do not include this parameter, the image file is called DRIVEC.BIN and is placed in the current working directory.

All files in the source directory are placed into the image file, including hidden and read-only files. If subdirectories exist, they are ignored. If an error occurs while creating the image file, see Chapter 10, "Troubleshooting."

Loading the New Image File

Note: When you run PutImage, all files on drive C are overwritten. Be sure to back up any files you want to keep before you continue.

1. Connect the reader to the host computer through a communications dock or optical link adapter.

Note: If you use the communications dock and plan to use Interlnk during this procedure (as described in Step 3), you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Connect a power supply to the communications dock or optical link adapter.



Caution

The reader should be powered by an AC power source when you use the PutImage command in case the battery pack goes low while the flash memory is being erased. If the power goes down when using PutImage, the reader locks up and the system flash must be reloaded from the Boot Loader menu and you will lose data.

Conseil

Il faut alimenter le lecteur par une source de courant AC lors de l'exécution de la commande PutImage dans le cas où le jeu de piles s'affaiblit pendant l'effacement du flash. Si le courant est coupé lors de l'exécution de PutImage, le lecteur se verrouille, le flash système doit être rechargé du menu d'amorçage (Boot Loader) et vous perdez des données.

3. If you created the image file on the host computer and want to load it to the reader from the host, start Interlnk now (with the host as client, and the reader as server). For help, see “Running Interlnk to Transfer Files” in Chapter 6.

You do not have to start Interlnk if you followed one of these strategies:

- You created the image file on the reader.
- You created the image file on the host computer, copied the file to a PC card, and inserted the PC card into the reader.

4. Type this command on the reader:

```
putimage [drive:][\path\[filename]
```

where:

drive is the drive that contains the image file.

path is the name of the directory that contains the image file. If you do not include a *path*, the current directory is used.

filename is the name of the drive C image file created by MkImage. If you do not specify a filename, PutImage looks for DRIVEC.BIN. If that file does not exist, PutImage displays an error message and terminates.

Note: PutImage will overwrite all files on drive C.

For example, to copy the C-ATA.IMG image file from the host computer's C:\FINAL directory to the reader, type this command:

```
putimage c:\final\c-ata.img
```

PutImage tries to determine if there is adequate power before replacing the drive image. If a power problem exists, PutImage displays an error message and terminates.

You see messages as the reader updates drive C. PutImage copies the current DOS image into RAM, erases flash memory, copies the DOS and new drive C image file to drive C, and warm boots the reader.

If an error occurs, see "Using MkImage and PutImage" in Chapter 10.

Examples of Using MkImage and PutImage

Here are three examples of how you can use MkImage and PutImage to change the contents of the reader's drive C:

- In the first example, you run both MkImage and PutImage on the reader.
- In the second example, you run MkImage on the host, transfer the image file to the reader on a PC card, and run PutImage on the reader.
- In the third example, you run MkImage on the host, use Interlnk to make the image file appear as if it were on the reader, and run PutImage on the reader.

Example 1

In this example, the resulting image file will be smaller than 256K, so you can create the image file on the reader's physical RAM drive (drive E) and then load the image from drive E to drive C.

1. Create a working directory on the reader's drive E by typing this command at the reader's DOS prompt:

```
mkdir e:\drivec
```

2. Fill the working directory with all the files you want to include in the new image file:

- a. Copy all the files from the current drive C to the working directory by typing this command at the reader's DOS prompt:

```
copy c:\*.* e:\drivec\*.*
```

- b. Add any other files to the working directory that you want on the reader's drive C. These files may include read-only data files and applications for your JANUS users.

- c. Edit AUTOEXEC.BAT, CONFIG.SYS, and other files as necessary.

3. Create the new image file by typing this command at the reader's DOS prompt:

```
mkimage e:\drivec e:\c-ata.img
```

An image file, C-ATA.IMG, is created in the working directory of drive E.

4. You must provide an external power supply for the reader before you can execute PutImage. Connect a communications dock or optical link adapter to the reader, and then connect a power supply to the dock or adapter.
5. Update drive C by typing this command at the reader's DOS prompt:

```
putimage e:\c-ata.img
```

Example 2

In this example, the resulting image file will be larger than 256K, so you must create the image file on the host computer. Also, this example assumes that the host computer and reader can share a PC card.

1. Create a working directory on the host computer by typing this command at the host computer's DOS prompt:

```
mkdir c:\drivec
```

2. Fill the working directory with all the files you want to include in the new image file:

- a. Copy the files from the current drive C to the working directory. Because the host computer and reader can share a PC card, you can insert the card into the reader's PC card drive and copy all files from drive C to drive G. Then insert the card into the host computer's PC card drive and copy all the files to the working directory.
- b. Add any other files to the working directory that you want on the reader's drive C. These files may include read-only data files and applications for your JANUS users.
- c. Edit AUTOEXEC.BAT, CONFIG.SYS, and other files as necessary.

3. Create the drive image by typing this command at the host computer's DOS prompt:

```
mkimage c:\drivec c:\newdrv.img
```

An image file, NEWDRV.IMG, is created in the working directory of the host computer's drive C.

4. Copy the image file from the host computer to the PC card and then insert the PC card into the reader's PC card drive, drive G.
5. You must provide an external power supply for the reader before you can execute PutImage. Connect a communications dock or optical link adapter to the reader, and then connect a power supply to the dock or adapter.
6. At the reader's DOS prompt, type this command to load the new image file onto drive C:

```
putimage g:\newdrv.img
```

Example 3

In this example, you create the image file on the host computer, use Interlnk to make the image file appear as if it were on the reader, and use PutImage to load the image file to drive C.

1. Connect the reader to a host computer with a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.
2. Connect a power supply to the communications dock or optical link adapter.
3. Create a working directory on the host computer by typing this command at the host computer's DOS prompt:

```
mkdir c:\drivec
```

4. Fill the working directory with all the files you want to include in the new image file:
 - a. Copy the files from the current drive C to the working directory. Use Interlnk with the host computer as the client and the reader as the server. For help, see "Running Interlnk to Transfer Files" in Chapter 6. (You can also copy the files from the companion disks.)
 - b. Add any other files to the working directory that you want on the reader's drive C. These files may include read-only data files and applications for your JANUS users.
 - c. Edit AUTOEXEC.BAT, CONFIG.SYS, and other files as necessary.
5. Type this command at the host computer's DOS prompt:

```
mkimage c:\drivec c:\newdrv.img
```

MkImage creates an image file, NEWDRV.IMG, in the working directory of the host computer's drive C.

6. Restart Interlnk. Make the reader the client, and the host computer the server. For help, see "Running Interlnk to Transfer Files" in Chapter 6. The new image file, NEWDRV.IMG, appears on the reader's drive H.
7. At the reader's DOS prompt, type this command to load the image file to drive C:

```
putimage h:\newdrv.img
```

Creating and Using a Physical RAM Drive

A physical RAM (random access memory) drive is a disk drive that exists only in your reader's extended memory. You create, read, write, and delete files on a RAM drive the same way you can on a hard disk drive. RAM drives are faster than hard disk drives because the contents of a RAM drive are, by definition, always resident in RAM.

By default, your reader's drive E is configured in the CONFIG.SYS file as a 256K RAM drive. You can use the same DOS commands and Norton utilities on a RAM drive that you can on a hard disk drive.

Understanding When Files Are Saved or Lost

Make sure you understand when the files on a RAM drive are saved or lost:

When You Do This	RAM Drive Files Are
You press ⏻ to turn off the reader.	Saved
You warm boot the reader.	Saved
You cold boot the reader.	Lost
You load the reader's flash memory.	Lost
You put the reader in Storage mode.	Lost
You execute CONFIG.SYS after changing the command that creates the RAM drive.	Lost
You turn off the reader (by pressing ⏻ or removing the battery) while the reader is performing a warm boot.	Lost

Copy all important files from the RAM drive to another drive or another computer before you perform any task that causes the files to be lost.

Note: *If you need to cold boot the reader, you may be able to save the contents of the RAM drive. For help, see "Saving the Contents of the RAM Drive" in Chapter 10.*

Deciding How Much Memory to Use for RAM Drives

The size of the RAM drive you create is limited only by the amount of extended memory in the reader. You can create multiple RAM drives as long as the sum of their sizes does not exceed the amount of memory available.

Decide how much memory you will use for the RAM drive or drives:

Up to 256K If you use up to 256K, all applications have enough memory to operate normally. Intermec recommends that you adhere to a 256K limit.

From 256K to 320K If you use more than 256K but less than 320K, the IRL Desktop and IC.EXE run slowly because the RAM drive is using memory these applications use for caching.

More than 320K If you use more than 320K, Reader Services cannot run. For help deciding if you need Reader Services, see “Using Reader Services in Applications” later in this chapter.

Creating a RAM Drive

You create RAM drives with the SRAMDISK.SYS device driver. Because SRAMDISK.SYS works only in extended memory, the reader must be running an XMS extended memory manager, such as HIMEM.SYS. Your CONFIG.SYS must include a command that installs the memory manager **before** the command that creates the RAM drive. For example, the default CONFIG.SYS contains these commands in this order:

```
device=d:\himem.sys
device=d:\sramdisk.sys 256 512
```

When you create a physical RAM drive, DOS gives it the next available drive letter on the reader. For example, if you create three RAM drives, DOS may assign them drives E, F, and G. In this case, the reader’s Type II PC card drive is assigned drive H (instead of G).

To create or change a RAM drive

1. To create or change a RAM drive, you must edit the reader’s CONFIG.SYS file, which is on drive C. For help, see “Learning How to Change the Contents of Drive C” earlier in this chapter.
2. Verify that HIMEM.SYS or another XMS extended memory manager is loaded into memory by a command in the reader’s CONFIG.SYS file.
3. Add a SRAMDISK.SYS command in the CONFIG.SYS file for each RAM drive you want to add. The SRAMDISK.SYS command(s) must appear **after** the command that loads the extended memory manager.

The SRAMDISK.SYS command must follow this syntax:

```
device=d:\sramdisk.sys [disksize sectorsize entries]
```

where:

disksize is the size of the RAM drive in kilobytes; specifies the amount of extended memory allocated for the drive. Type a number from 16 to 256; the default is 64. You can create multiple RAM drives if the sum of their *disksize*s is 256K or less.

Note: *You may be able to use more than 256K of extended memory for the RAM drive. For help, see the previous section, "Deciding How Much Memory to Use for RAM Drives."*

sectorsize is the size of the disk sector in bytes. Type 128, 256, or 512; the default is 512. You can specify *sectorsize* only if you specify *disksize*.

entries is the maximum number of files and directories you can create in the RAM drive. Type a number from 2 to 1024; the default is 64. You can specify *entries* only if you specify *sectorsize* and *disksize*.

Here are sample SRAMDISK.SYS commands:

- To create a 64K RAM drive:





```
device=d:\sramdisk.sys
```

- To create two 128K RAM drives:

```
device=d:\sramdisk.sys 128  
device=d:\sramdisk.sys 128
```

- To create a 256K RAM drive with 128-byte sectors and up to 16 entries in its root directory:

```
device=d:\sramdisk.sys 256 128 16
```

4. Load the reader's CONFIG.SYS file on drive C using Auto-Loader, BFT, or MkImage and PutImage, as described in "Learning How to Change the Contents of Drive C" earlier in this chapter.
5. Press     to warm boot the reader. The changes to the RAM drive are put into effect when CONFIG.SYS executes.



Caution

Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil

N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

Programming for the Reader

The applications you run on your reader control how it operates, interacts with users, and helps you solve your business problems. Intermec supports these programming languages on the JANUS reader:

- Ada
- Borland C/C++
- Clipper
- IRL
- Microsoft C/C++
- Microsoft QuickBasic
- Microsoft's Visual Basic for DOS

Intermec also offers these products that help you create applications for your reader:

- JANUS Programmer's Software Kit (PSK)
- JANUS Application Simulator
- Interactive Reader Language (IRL)
- PC-IRL

Using JANUS PSK and JANUS Application Simulator

The JANUS 2020 fully supports the JANUS Programmer's Software Kit (PSK). Although many applications can be written with standard language functions, you can create applications using C or Basic that incorporate PSK library functions and Intermec-specific system software interrupts. These functions and interrupts give the programmer low-level control over the reader's hardware, such as the backlight, viewport, communications using Intermec protocols, and power management statistics.

The JANUS Application Simulator lets you run JANUS applications that use PSK functions on your PC so you can use DOS development tools and debuggers common in the software industry to debug the applications' logic and syntax. (Without the Simulator, you cannot run these applications on a PC because the PSK functions and interrupts cause a PC to lock up.)

To learn more, see these manuals:

- *JANUS PSK for C++ Reference Manual*
- *JANUS PSK for Basic Reference Manual*
- *JANUS PSK for Ada Reference Manual*
- *JANUS Application Simulator User's Manual*

Using IRL and PC-IRL

The JANUS 2020 fully supports IRL, as described in Chapter 7, "Working With IRL." You can write, compile, and run IRL programs on your reader. You can port existing IRL applications to the JANUS platform and take advantage of special JANUS commands and features.

Intermec recommends you use PC-IRL to create and download IRL programs. PC-IRL provides IRL programmers with an easy-to-use programming and debugging environment on a PC.

To learn more, see these manuals:

- *IRL Programming Reference Manual*
- *PC-IRL Reference Manual*

Making PSK Applications That Work With BFT

You can create PSK applications that can accept and respond to a host computer's request to initiate a binary file transfer (BFT) session.

You need to program your PSK application to accept the Prepare for Reboot command from any host computer. Your application responds by calling a Prepare for Reboot procedure (which may consist of housekeeping tasks such as closing files), and then notifies the PSK library and host computer that the reader is ready to be rebooted. At that point, the host can reboot the reader and open a BFT session.

To learn how to create BFT-ready PSK applications, see your JANUS PSK reference manual. To learn more about BFT, see "Downloading Applications Across the Network" in Chapter 6.

Preparing Applications to Recover From Lockups

If an application becomes locked in an infinite loop, you may not be able to terminate the application. You could warm or cold boot the reader, as described in Chapter 9, "Booting and Resetting the Reader," but the contents of both conventional memory and the RAM drive would be lost.

You can make it easier for a user to recover from a locked-up application. If you create applications in a programming language supported by the JANUS PSK and you follow the instructions in the JANUS PSK reference manual, those applications can check a flag called the application break bit whenever the program calls the appropriate function.

When an application gets into a loop or is waiting for input, the user can turn off the reader, enable the application break bit, and turn the reader back on. As the reader resumes, your application finds the application break bit enabled and takes appropriate action.

For the steps the user should perform when an application locks up, see “Breaking Out of an Application” in Chapter 9.

Note: IRL programs automatically check the application break bit.

Using Reader Services in Applications

Reader Services are programs that decode bar codes, process data input and output (I/O), configure the reader, and handle all power management for the reader. AUTOEXEC.BAT loads Reader Services when you boot the reader. You do not interact directly with Reader Services because they operate as part of the reader’s system software. You can create applications that use Reader Services. For help, see your JANUS PSK reference manual.

Reader Services include these programs:

Communications Utilities Communications Utilities are transmit and receive functions that you can call with PSK functions or software interrupts. Communications Utilities let the reader transmit and receive buffers or bytes of data regardless of the communications protocol that you use.

Configuration Manager Configuration Manager maintains the reader’s current configuration file (such as JANUS.INI), ensures that the reader operates according to that configuration, and lets you change the reader’s configuration file. Configuration Manager is a terminate and stay resident program (TSR) that loads into the reader’s memory during a warm or cold boot. For help, see “Unloading and Loading Configuration Manager TSR” later in this chapter.

Input Manager Using software interrupts and library functions, your reader applications can use Input Manager as an interface for all data I/O from the reader’s COM ports, wand, scanner, and keypad. Input Manager also handles all power management during data I/O. For help with software interrupts and library functions, see your JANUS PSK reference manual.

You can use Input Manager to customize how the reader handles data from the keypad, wand, or scanner. The reader can display all input, beep when labels are scanned, and parse reader commands. For example, when you scan a bar code label, Input Manager can identify the symbology and if the label includes reader commands.

Virtual Wedge The Virtual Wedge decodes and manages bar code input, making the reader functionally equivalent to a wedge reader connected to a PC. This program facilitates rapid porting of PC applications to the reader. When you scan a bar code label, the Virtual Wedge inserts the data into the keyboard buffer as if it had been typed. The Virtual Wedge sends configuration commands to Configuration Manager. The Virtual Wedge also recognizes and implements reader commands.

Making More Memory Available on the Reader

Your JANUS reader may not have enough conventional memory available for the applications you want to run. If so, you may be able to free some conventional memory by performing these tasks:

- Not installing the PC card drivers to free about 60K of memory
- Unloading the Reader Wedge TSR to free about 80K of memory
- Unloading the Configuration Manager TSR to free about 50K of memory

Not Installing the PC Card Drivers

You do not need to install PC card drivers if you are not using PC cards in your reader. You may be able to save up to 60K in conventional memory by not installing the drivers.

Note: By default, the SRAM PC card drivers are installed when you boot the reader. All other drivers are remarked out in the CONFIG.SYS file, which means they are disabled because they are preceded by the REM characters.





To make sure the PC card drivers are not installed when you boot the reader

1. Edit your AUTOEXEC.BAT file and locate these lines. One line is already remarked out. Remark out the other line so that both are remarked out.

```
d:\cs_ipm.exe  
d:\cs_apm.exe
```

2. Edit your CONFIG.SYS file and remark out all these lines by adding the REM command at the beginning of each line:

```
device=d:\cs.exe /poll 1  
device=d:\csalloc.exe d:\csalloc.ini  
install=d:\card_sr.exe  
device=c:\atadv.exe /s:2  
device=c:\mtrsram.exe  
device=d:\cardid.exe d:\cardid.ini  
device=c:\mti1.exe  
device=c:\mti2p.exe  
device=c:\mtddrv.exe  
device=c:\ftl.exe (or c:\ms-flash.sys)
```

3. Copy the new CONFIG.SYS and AUTOEXEC.BAT files to drive C. For help, see “Learning How to Change the Contents of Drive C” earlier in this chapter.
4. Press     to warm boot the reader.

Unloading and Loading Reader Wedge TSR

The Reader Wedge TSR (RWTSR.EXE) must be loaded in memory before you can execute Reader Wedge PSK functions such as IM_RECEIVE_INPUT. However, you do not need RWTSR.EXE loaded when you are not running a PSK application. You can unload RWTSR.EXE and save about 80K.

Note: If you run a C program that contains PSK Version 2.1 Reader Wedge functions, the program automatically loads and unloads RWTSR.EXE for you.

To load the Reader Wedge TSR

- Type this command at the DOS prompt:

```
rwtsr
```

Or scan this bar code:



RWTSR

To unload the Reader Wedge TSR

- Type this command at the DOS prompt:

```
rwtsr -d
```

Or scan this bar code:



RWTSR -D

Unloading and Loading Configuration Manager TSR

Configuration Manager software performs two functions:

- Maintaining the reader's current configuration file and making sure that the reader operates according to that configuration.
- Letting you change the configuration file through a variety of methods.

These two functions are handled by separate processes running on the reader. Both processes are started when you boot the reader. You cannot unload the process that maintains the configuration, but you can unload the process that lets you change the configuration.

The process that lets you change the configuration is the Configuration Manager TSR (CFGTSR.EXE). After you configure a reader, you can unload the Configuration Manager TSR and free 50K of conventional memory.

Note: *While the Configuration Manager TSR is unloaded, do not run applications that change the reader's configuration.*

To load Configuration Manager TSR

- Type this command at the DOS prompt:

```
cfgmgr
```

Or scan this bar code:



CFGMGR

The reader displays the message, "Configuration Manager TSR X.XX."

To unload Configuration Manager TSR

- Type this command at the DOS prompt:

```
cfgmgr -d
```

Or scan this bar code:



CFGMGR -D

The reader displays the message, "Configuration Manager TSR Unloaded."

When the Configuration Manager TSR is not loaded:

- You have an additional 50K of memory available on the reader for other applications or device drivers.
- You cannot scan bar code labels that contain configuration commands. If you scan a configuration command, the reader sounds an error beep and displays the message, “Bad command or filename.”
- You cannot send configuration commands over an RF link or serial COM port with an RF reader.
- You can run IC.EXE or the IRL Desktop (IRLDESK.EXE). When you start IC.EXE or the IRL Desktop, the reader loads the Configuration Manager TSR for you. When you exit IC.EXE or the IRL Desktop, the reader unloads the Configuration Manager TSR.

If there is not enough memory available for the Configuration Manager TSR when you try to start IC.EXE or the IRL Desktop, the reader displays an error message. To solve this problem, make sure at least 50K of memory is free and try again.

Upgrading to New Software

Intermec periodically releases new versions of the JANUS software that may include new features, improved performance, and enhancements to existing features.

To help you upgrade your reader to the new software, Intermec offers an upgrade kit that contains the software, license, and instructions you need. See your Intermec service representative for information about the upgrade kits that are currently available.

Usually, the upgrade kit requires you to load new flash memory, following the procedure described in the *JANUS Software Upgrade Instruction Sheet*.

4

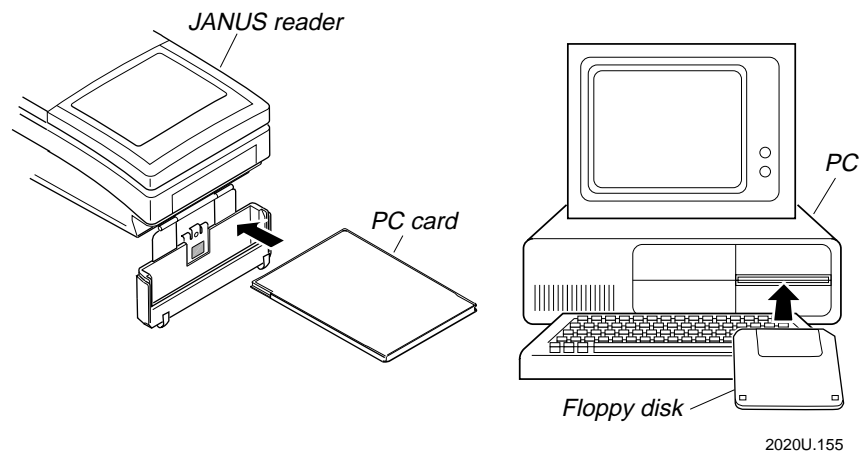
Using PC Cards in the Reader

This chapter describes how to use PC cards and the reader's PC card drive.

Learning About PC Cards

The PC card drive expands both the JANUS reader's disk space and input/output capabilities. With a PC card, you can store and transfer information to other readers and computers that also have PC card drives.

A PC card drive is similar to a disk drive on a PC, and the PC card is similar to a floppy disk.



Note: *PC cards were called PCMCIA cards in previous versions of this manual.*

The next sections introduce PCMCIA and describe how the JANUS readers support PC cards.

What Is PCMCIA?

PCMCIA (Personal Computer Memory Card International Association) defines a set of hardware and software standards for memory and expansion cards that are available for personal computers. With Intermec's version JANUS 2.1 software or later, the JANUS readers can use PC cards that comply with PCMCIA Standard 2.1.

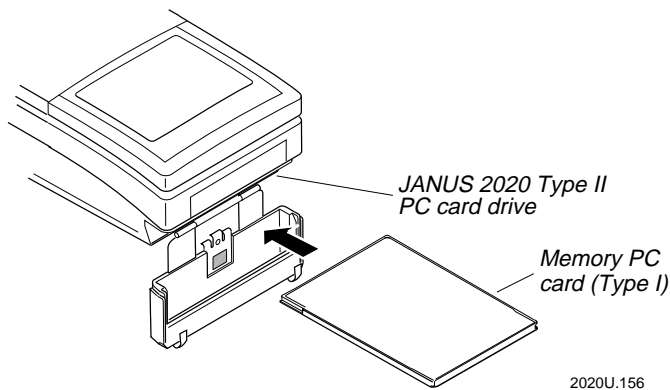
Features of the JANUS PC Card Software

JANUS software supports PC cards by offering these features:

- Compliance with the PCMCIA Standard 2.1
- SystemSoft software that controls the PC card drive
- DOS commands that make it easy to format and use PC cards
- Compatibility in the JANUS family of devices so you can share PC cards between the readers

Locating the PC Card Drive

The standard JANUS 2020 reader has a Type II PC card drive. You can use Type I or II memory PC cards and Type II expansion PC cards.



Which PC Cards Are Supported by JANUS?

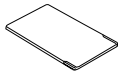
JANUS readers use cards that comply with Intel ExCA or PCMCIA Standards 1.0, 2.0, and 2.1. There are three types of PC cards; you can identify them according to physical size:

- | | |
|----------|-------------------------------|
| Type I | These cards are 3.3mm thick. |
| Type II | These cards are 5mm thick. |
| Type III | These cards are 10.5mm thick. |

You can use Type I or Type II cards in the PC card drive on the JANUS reader. You cannot use Type III cards with the reader.

Type of Card	Purpose of Card
Type I	Adds disk storage
Type II	Adds disk storage or connects the reader to an I/O device

Which Memory PC Cards Are Recommended?



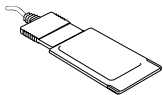
You can use Type I or Type II memory cards that have up to 64MB of memory formatted with a DOS file allocation table (FAT). There are many types of memory PC cards available. The memory cards you use on the JANUS reader provide additional disk storage space, not more executable conventional memory.

Intermec recommends using ATA, flash, or SRAM cards in your reader. Choose the type of memory card that meets your data storage needs:

Memory Card	Type of Data Storage
ATA	Use an ATA flash card to store large amounts of data that change frequently. ATA cards retain their data without the use of a backup battery and are available in larger memory sizes.
Flash	Use a flash card to store data that does not change as frequently. Flash cards retain their data without the use of a backup battery.
SRAM	Use an SRAM card to store data that changes frequently. An SRAM card has a lithium battery to back up data for the life of the battery.

Note: Intermec recommends that you use ATA and SRAM cards for most data storage needs. You should only use a flash card as a low-cost alternative. If you use a flash card, Intermec recommends flash cards that store 1MB or more of data.

Which Expansion Cards Are Recommended?



You can use Type II expansion or input/output (I/O) cards to connect the reader to I/O devices. Modem cards and network cards are examples of I/O cards. For a complete list of Intermec-supported PC cards, see your Intermec sales representative.

Inserting and Removing PC Cards

When you insert and remove PC cards, you must know:

- The types of cards to install (see the previous section).
- The correct orientation of the card as you insert it (see this section).

If you are ready to begin using your PC card, you can skip ahead to “Configuring, Formatting, and Using PC Cards” later in this chapter.

Inserting Cards Into the PC Card Drive

The PC card drive on the JANUS 2020 reader is located on the underside of the reader just below the laser scanner window. You can use a Type I or Type II PC card in the drive.

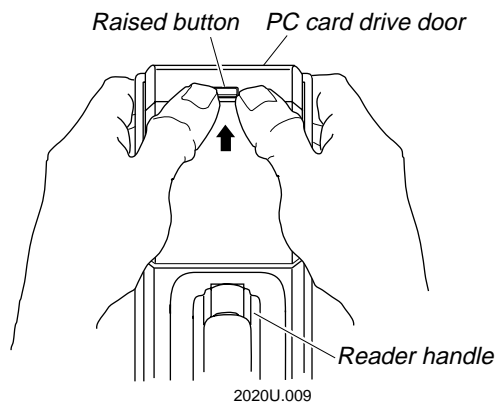
To insert a PC card

1. Make sure the reader is on. Press the  key to turn the reader on.

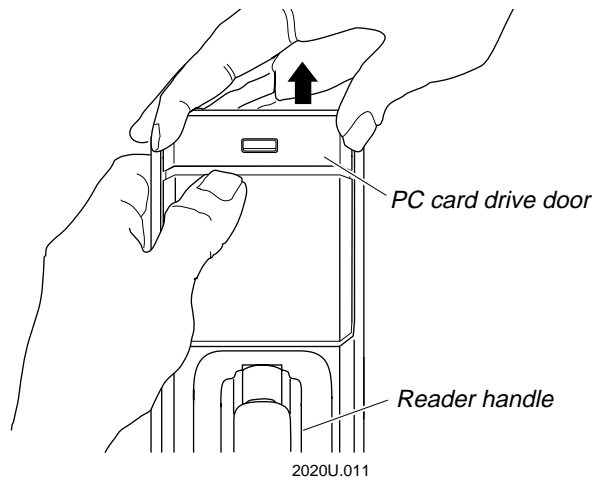
Note: The reader must be turned on when you insert a card into the PC card drive or the reader may not recognize the card.

2. Hold the reader with the keypad pointed toward the floor. Press down on the raised button with one thumb while firmly pushing the door forward with both thumbs until the PC card drive door releases.

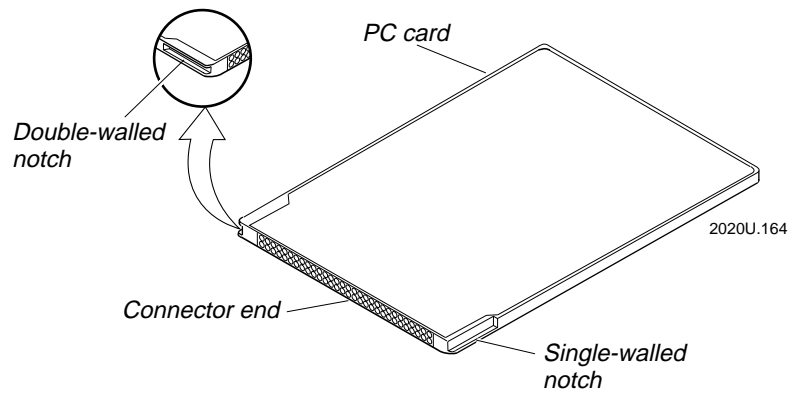
Note: The drive door may seem hard to open until you become accustomed to opening the door.



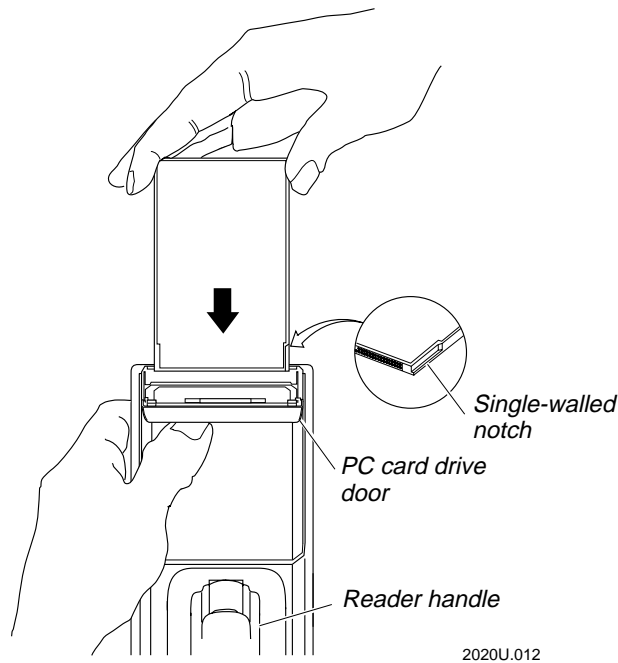
- Slide the PC card drive door away from the front end of the reader as far as it will go. Swing the door up until the drive slot is accessible.



- Identify the two notches on the edges of the PC card. Look at the connector end of the card. There is a single-walled notch on one side, and a double-walled notch on the other side.



5. Insert the card into the drive slot, connector end first with the single-walled notch on the right edge of the card.



6. Push the card into the drive slot until it fits firmly in the connector at the back of the drive slot.

Note: Do not force a PC card into the drive slot. If the card does not fit easily into the connector, remove it and make sure you have the card oriented correctly. Then try again.

Approximately 5 seconds after you insert the card, the reader sounds an audible beep tone to indicate that it recognizes the card. For a description of the beep tones, see "Understanding the Reader's Audio Signals" in Chapter 2.

7. Close the drive door by sliding the door shut until it latches.

Note: If you are using a card with an external cable, do not close the drive door.

To remove a PC card



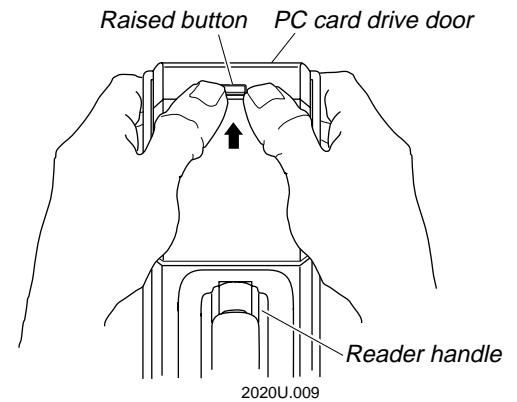
Caution

Do not remove the PC card when the disk write icon is on or you may lose data.

Conseil

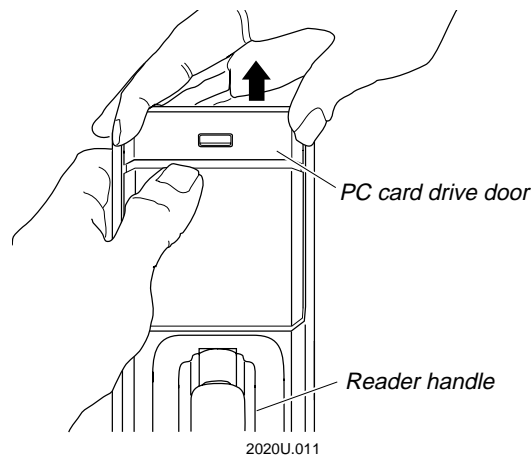
N' enlevez la carte PC quand l'icône d'écriture sur disque est active car vous pourriez perdre des données.

1. Make sure the reader is finished writing to the PC card.
2. You can remove the card with the reader turned on or off.
3. Hold the reader with the keypad pointed toward the floor. Press down on the raised button with one thumb while firmly pushing the door forward with both thumbs until the PC card drive door releases.

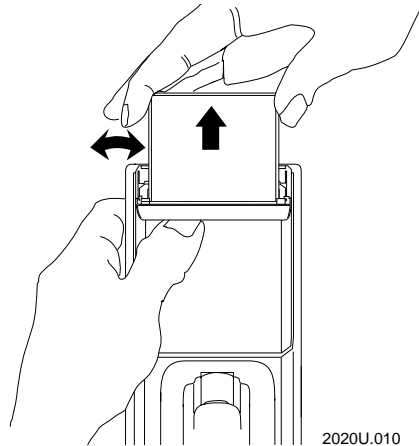


***Note:** The drive door may seem hard to open until you become accustomed to opening the door.*

4. Slide the PC card drive door away from the front end of the reader as far as it will go. Swing the door up until the drive slot is accessible.



5. Loosen the card from the connector by gently wiggling the card from side to side.



6. Slide the card out of the drive slot.
7. Close the drive door by sliding the door shut until it latches.

Reader Beeps for PC Cards


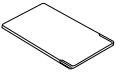
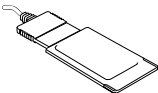
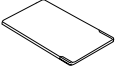


When you insert or remove a PC card, the JANUS reader beeps to indicate whether or not the reader recognizes the card. For a description of the beep tones, see “Understanding the Reader’s Audio Signals” in Chapter 2.

If the reader does not sound a beep sequence, remove the card. Verify that the reader is turned on. Try inserting the card again.

Configuring, Formatting, and Using PC Cards

By default, the JANUS reader is configured for SRAM cards. You need to configure the reader and format any other type of PC card before you can use the card in your reader. The next table shows a brief overview of the process for each type of PC card. After you scan this overview, you may want to read the next sections for more details.


Type of Card	Step 1: Configure the Reader	Step 2: Format the Card	Step 3: Use the Card
ATA 	Edit the CONFIG.SYS file and activate or add card drivers and utilities.	Use ATAINIT.EXE and FORMAT.COM: <pre>atainit {drive:} format {drive:}</pre>	Use DOS commands, for example: <pre>copy delete move</pre>
Flash 	Edit the CONFIG.SYS file and activate or add card drivers and utilities.	Use MCFORMAT.EXE: <pre>mcformat</pre>	Use DOS commands, for example: <pre>copy delete move</pre>
I/O (Modem) 	Edit the AUTOEXEC.BAT and CONFIG.SYS files and activate or add card drivers and utilities.	No formatting is required.	Use a commercially available communications program.
SRAM 	Edit the CONFIG.SYS file and activate or add card drivers and utilities. <p>Note: SRAM card is the default in the reader's CONFIG.SYS file.</p>	Use FORMAT.COM: <pre>format {drive:}</pre>	Use DOS commands, for example: <pre>copy delete move</pre>

The next sections give you detailed instructions to configure, format, and use ATA, flash, I/O, and SRAM PC cards in the reader.

The JANUS reader is already configured to use SRAM cards.

To format your SRAM card, type this command

```
format {drive:}
```

where *drive* is the PC card drive. Press . You can begin using the card.

Preparing to Use ATA Cards

To use an ATA flash card in the PC card drive, you need to:

1. Configure the reader to use an ATA card by adding the ATA card drivers and utilities to the CONFIG.SYS file.
2. Initialize and format the ATA card.
3. Use the ATA card.

Configuring the Reader to Use an ATA Card

Follow these steps to configure the reader for an ATA card:

1. Edit the CONFIG.SYS file on the reader's drive C.

Note: You cannot edit the file directly on the reader's drive C because drive C is a ROM drive resident in flash memory. For help, see "Learning How to Change the Contents of Drive C" in Chapter 3.

2. Search for these lines in the CONFIG.SYS file:

```
device=c:\atadriv.exe /s:2  
device=c:\mtddriv.exe  
device=d:\cardid.exe d:\cardid.ini
```

If the lines are remarked out, delete the REM characters. If you cannot find these lines, add them to the CONFIG.SYS file.

3. To save conventional memory, remark out any lines that load drivers for flash, I/O, or SRAM cards. For a list of card drivers, see "Managing the PC Card Drivers in the Startup Files" later in this chapter.
4. Save your changes to the CONFIG.SYS file.
5. Replace the CONFIG.SYS file on the reader's drive C.

Initializing and Formatting an ATA Card

Follow these steps to initialize and format the ATA card:

1. Insert the ATA card in the PC card drive.
2. Type this command at the DOS prompt:

```
atainit {drive:}
```

where *drive* is the PC card drive.

Note: *ATAINIT only works with ATA cards that are supported by the ATADRV.EXE driver. If you are unable to use your ATA card, it may be an unsupported card. Check the documentation shipped with the ATA card.*



Caution

Make sure you enter the correct drive letter when you initialize the ATA card or you may erase the wrong drive.

Conseil

Assurez-vous de ne pas faire d'erreur en tapant la lettre identifiant le lecteur pour le formatage de la carte ATA. Sinon, vous risquez d'effacer un lecteur incorrect.

The program displays the parameters (Fixed Cylinders, Heads, and Physical Sectors) for your ATA card. The next prompt is:

```
Here are the parameters that were returned, examine them carefully to ensure they match what was expected. Press ENTER to accept and continue or <P> to prompt.
```

Note: You can press Eso at any time to abort and exit the initialization program.

3. Press enter to accept the values that are displayed. The next prompt is:
Do you wish a compact format?
4. If your ATA card is 4MB or less, press Y. If your ATA card is greater than 4MB, press N. ATAINIT begins initializing the card and displays these messages.

```
Partition table successfully written.  
BPB Boot sector successfully wiped.  
Proceed with a DOS "FORMAT /U" command.
```

5. Type this command at the DOS prompt:

```
format /u {drive:}
```

where *drive* is the PC card drive.



Caution

Make sure you enter the correct drive letter when you format the ATA card or you may erase the wrong drive.

Conseil

Assurez-vous de ne pas faire d'erreur en tapant la lettre identifiant le lecteur pour le formatage de la carte ATA. Sinon, vous risquez d'effacer un lecteur incorrect.

The program displays the next message.

```
WARNING: ALL DATA ON NON-REMOVABLE DISK
```

```
DRIVE G: WILL BE LOST!
```

```
Proceed with Format (Y/N)?
```

6. Press Y to continue. When the card is formatted, the next prompt is displayed.

```
Volume label (11 characters, ENTER for none)?
```

7. Press enter if you do not want to enter a label for the card, or type a label name (up to 11 characters long) and press enter . The program displays the card's capacity and other drive statistics. You are ready to use the ATA card.

Using the ATA Card

You can use standard DOS commands to copy, delete, and move files, and to create and remove directories on an ATA card. To learn which DOS commands are available on the reader, see the MS-DOS Programs companion disk 2.

For example, to copy all the files from drive E to drive G (PC card drive), type this command at the DOS prompt:

```
copy e:\*.* g:
```

To delete all the files on the ATA card in drive G, type this command at the DOS prompt:

```
del g:\*.*
```

If you need more information about DOS commands, refer to any book that describes DOS commands.

Preparing to Use Flash Cards

To use a flash card in the PC card drive, you need to:

1. Configure the reader to use a flash card by adding the flash card drivers and utilities to the CONFIG.SYS file.
2. Erase the flash card if it has been formatted already. If you have an unformatted card, proceed to Step 3.
3. Format the flash card using the MCFORMAT utility.

Note: Intermec recommends using flash cards that store 1MB or more of data.

Configuring the Reader to Use a Flash Card

Follow these steps to configure the reader for a flash card:

1. Edit the CONFIG.SYS file on the reader's drive C.

Note: You cannot edit the file directly on the reader's drive C because drive C is a ROM drive resident in flash memory. For help, see "Learning How to Change the Contents of Drive C" in Chapter 3.

2. Search for these lines in the CONFIG.SYS file:

```
device=c:\mti1.exe  
device=c:\mti2p.exe  
device=c:\mtddrv.exe  
device=c:\ftl.exe (or: device=c:\ms-flash.sys)
```

Note: If you want to use the FTL (file translation layer) flash format, install FTL.EXE. If you want to use the MS-Flash format, install MS-FLASH.SYS.

If the lines are remarked out, delete the REM characters. If you cannot find these lines, add them to the CONFIG.SYS file.

3. To save conventional memory, remark out any lines that load drivers for ATA, I/O, or SRAM cards. For a list of card drivers, see "Managing the PC Card Drivers in the Startup Files" later in this chapter.
4. Save your changes to the CONFIG.SYS file.
5. Replace the CONFIG.SYS file on the reader's drive C.

Erasing a Previously Formatted Flash PC Card

If your flash card has already been formatted, you must erase the card and clear its memory before you can format the card again.

Note: *If your flash card has never been formatted, proceed to the next section.*

To erase a previously formatted flash card

1. Insert the flash card in the PC card drive.
2. Type this command at the DOS prompt:

mcformat

Or scan this bar code:



MCFORMAT

The MCFORMAT main menu appears:

```
PC Memory Card Formatter
(C) 1994 INTEL Corporation
Copyright 1994 SystemSoft Corp. All Rights Reserved
Version 1.01 (241 3-05)F
```

MCFORMAT options

Choose one of the following:

1. Create and format a new partition.
2. Format an existing partition.
3. Erase a partition.
4. Display partition information.

Enter your choice. [4]

To quit MCFORMAT, press [ESC].

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3. Press to select option 3. You will see this information.

```

Erase a partition.
Drive Beg address End address Type Status Size
-----
G      0      4194303  FTL  Formatted 4096K
Which drive would you like to select?
Drive =

```

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4. Press the letter of the PC card drive. For example, press to format a flash card in drive G. The program displays the next prompt:

This command will erase drive G: entirely.

Do you want to continue (Y/N)?

5. Press to begin erasing the flash card. The program displays the next messages and the percent complete as it erases the card. Do not remove the flash card while the program is erasing the card.

DO NOT REMOVE CARD WHILE ERASING!

Erasing card.

100% complete

Press return for main menu.

6. Press to return to the MCFORMAT main menu.
7. Press to exit MCFORMAT. You are ready to format the flash card.

Formatting a Flash PC Card

Follow these steps to format a flash card:

1. Insert the flash card in the PC card drive.
2. Type this command at the DOS prompt:

```
mcformat
```

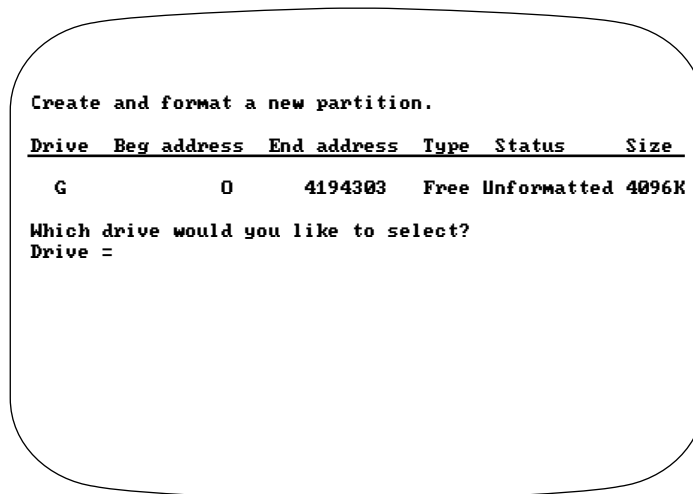
Or scan this bar code:



MCFORMAT

The MCFORMAT main menu appears.

3. Press to select option 1. This information appears:



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4. Press the letter of the PC card drive. For example, press to format a flash card in drive G. The program displays the next prompt:

```
Would you like to format entire card with FLASH(1)or  
FTL(2) (1/2)?
```

5. Press to format the entire card in an MS-Flash format, or press to format the entire card in an FTL flash format. The program displays the next prompt:

```
Are you ready to format drive G: with FTL format (Y/N)?
```

Note: For most applications, Intermec recommends that you format a flash card in FTL (file translation layer) flash format. You should use the MS-Flash format when you are using the flash card in a JANUS reader and also in another PC card slot that supports MS-Flash format, but not FTL flash format.

6. Press Y to begin formatting the card. The program begins formatting the flash card and displays the percent complete as it is working. Do not remove the flash card while the program is formatting the card.

The next prompt is:

```
100% complete
Format Complete
Please input a volume label. (11 Characters, Press
enter for no label)
Label =
```

7. Press enter if you do not want to enter a label for the card, or type a label name (up to 11 characters long) and press enter. The program displays the current card status followed by the next prompt.

```
Press return for main menu.
```

8. Press enter to return to the MCFORMAT main menu.
9. Press Esc to exit MCFORMAT. You are ready to use the flash card.

Note: If you have trouble formatting the flash card or the reader does not recognize the card, you may need to install additional flash card drivers. For help, see “Using PC Cards” in Chapter 10.

Using a Flash PC Card

You can use standard DOS commands to copy, delete, and move files, and to create and remove directories on a flash card. To learn which DOS commands are available on the reader, see the MS-DOS Programs companion disk 2.

For example, to copy all the files from drive E to drive G (PC card drive), type this command at the DOS prompt:

```
copy e:\*.* g:
```

To delete all the files on the flash card in drive G, type this command at the DOS prompt:

```
del g:\*.*
```

If you need more information about DOS commands, refer to any book that describes DOS commands.

You can also use MCFORMAT to format an existing partition on the flash PC card, or display information about the card's partitions. To do so, start MCFORMAT and choose options 2 or 4, respectively.

Preparing to Use I/O Cards

You can use I/O expansion cards in the PC card drive. To use an I/O card in the drive, you need to add the I/O card drivers and utilities to AUTOEXEC.BAT and CONFIG.SYS.

Note: Before you use an I/O card in your JANUS reader, read the documentation shipped with the PC card for any instructions on using your card. Some cards may need to be configured before they can be used in the reader's PC card drive.

Configuring the Reader to Use an I/O Card

Follow these steps to configure the reader for an I/O card:

1. Edit the AUTOEXEC.BAT file, which is stored on the reader's drive C.

Note: You cannot edit the file directly on the reader's drive C because drive C is a ROM drive resident in flash memory. For help, see "Learning How to Change the Contents of Drive C" in Chapter 3.

2. Search for this line in the AUTOEXEC.BAT file:

```
d:\cs_apm.exe
```

If the line is remarked out, delete the REM characters. If you cannot find this line, add it to the AUTOEXEC.BAT file.

3. Remark out this line:

```
d:\cs_ipm.exe
```

Note: Do not load both CS_IPM.EXE or CS_APM.EXE at the same time.

4. Save your changes to the AUTOEXEC.BAT file.
5. Edit the CONFIG.SYS file on the reader's drive C.
6. Search for this line in the CONFIG.SYS file:

```
device=d:\cardid.exe d:\cardid.ini
```

If the line is remarked out, delete the REM characters. If you cannot find this line, add it to the CONFIG.SYS file.

7. To save conventional memory, remark out any lines that load drivers for ATA, flash, or SRAM cards. For a list of card drivers, see "Managing the PC Card Drivers in the Startup Files" later in this chapter.
8. Save your changes to the CONFIG.SYS file.
9. Replace the AUTOEXEC.BAT and CONFIG.SYS files on the reader's drive C.

Using an I/O PC Card

You can use modem, LAN, and radio frequency I/O cards in the PC card drive. When you use a modem I/O card, the drive is designated as COM4.

You can use any commercially available programs with I/O cards. For example, you can use a shareware communications program with a modem card to transmit data through telephone lines.

You need to manage the reader's power when an I/O card is installed in the PC card drive. For example, a modem card draws power even when it is not being used.

These methods help conserve the reader's power:

- Connect an external power supply to the JANUS reader when operating an I/O card. Use an optical link adapter or communications dock to connect an external power supply to the reader.
- Use the CARDINFO.EXE utility to turn off the power to the PC card drive when you are not using the I/O card. For help, see "Managing the Power on the PC Card Drive" later in this chapter.

Note: *If you have problems using a network card, see "Networking or Communicating With the Reader" and "Using PC Cards" in Chapter 10.*

Resetting the PC Card Drive for I/O Cards

By default, the PC card drive is not reset when you suspend or resume the reader. Therefore, you can keep files open when you suspend and resume the reader without losing data.

However, if you have an I/O card in the PC card drive, you must reset the drive when you resume the reader. You can configure the reader to reset the drive after a suspend/resume cycle by running the CS_APM.EXE program.

To load CS_APM.EXE into memory

- Type this command at the DOS prompt:

```
d:\cs_apm
```

Or scan this bar code:



```
*D:\CS_APM*
```

You can add this command to your AUTOEXEC.BAT file to start CS_APM.EXE whenever you boot the reader:

```
d:\cs_apm.exe
```

Note: *CS_APM.EXE is also available on the Application companion disk 3.*

Preparing to Use SRAM Cards

To use an SRAM card in the PC card drive, you need to:

1. Configure the reader to use an SRAM card by adding the SRAM card drivers and utilities to the CONFIG.SYS file.
2. Format the SRAM card.
3. Use the SRAM card.

By default, your JANUS reader is configured to use SRAM cards. You can proceed to the procedure for formatting the SRAM card, unless you configured your reader to use another type of PC card. In that case, you need to configure the reader to use an SRAM card.

Configuring the Reader to Use an SRAM Card

Follow these steps to configure the reader for an SRAM card:

1. Edit the CONFIG.SYS file on the reader's drive C.

Note: You cannot edit the file directly on the reader's drive C because drive C is a ROM drive resident in flash memory. For help, see "Learning How to Change the Contents of Drive C" in Chapter 3.

2. Search for these lines in the CONFIG.SYS file:

```
device=c:\mtramsram.exe
```

```
device=c:\mtddrv.exe
```

If the lines are remarked out, delete the REM characters. If you cannot find these lines, add them to the CONFIG.SYS file.

3. To save conventional memory, remark out any lines that load drivers for ATA, flash, or I/O cards. For a list of card drivers, see "Managing the PC Card Drivers in the Startup Files" later in this chapter.
4. Save your changes to the CONFIG.SYS file.
5. Replace the CONFIG.SYS file on the reader's drive C.

Formatting an SRAM PC Card

Follow these steps to format an SRAM card:

1. Insert the SRAM card in the PC card drive.
2. Type this command at the DOS prompt:

```
format {drive:}
```

where *drive* is the PC card drive. You are ready to use the SRAM card.

Using the SRAM PC Card

You can use standard DOS commands to copy, delete, and move files, and to create and remove directories on an SRAM card. To learn which DOS commands are available on the reader, see the MS-DOS Programs companion disk 2. For help using DOS commands, see any DOS manual.

For example, to copy all the files from drive C to drive G (PC card drive), type this command at the DOS prompt:

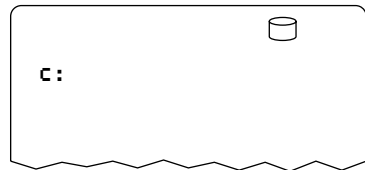
```
copy c:\*.* g:
```

To delete all the files on the SRAM card in drive G, type this command at the DOS prompt:

```
del g:\*.*
```

Replacing Lithium Batteries in an SRAM Card

Each SRAM card has a lithium battery to save data when the card is not in the reader. When an SRAM card's battery is low, the disk write icon flashes every 2 seconds.



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When the disk write icon flashes, you should save the data on the SRAM card and change the lithium battery as soon as possible.



Caution

If the lithium battery in the SRAM card goes low, you need to back up any data on the card before changing the battery. If the lithium battery goes dead, any data on the SRAM card is lost.

Conseil

Si la pile au lithium de la carte SRAM s'affaiblit, il faut faire une copie de sauvegarde de données stockées sur la carte avant de changer la pile. Si la pile lithium perd toute puissance, les données stockées sur la carte sont perdues.

To replace the lithium battery in the SRAM card

1. Copy any files you want to save from the SRAM card to another drive on the reader or to a host computer.
2. Remove the card from the reader. For help, see “Inserting and Removing PC Cards” earlier in this chapter.
3. Use the documentation that came with your SRAM card to replace the lithium battery.
4. Install the card in the reader. For help, see “Inserting and Removing PC Cards” earlier in this chapter.
5. Format the card. For help, see “Formatting an SRAM PC Card” earlier in this chapter.
6. Copy any files you saved in Step 1 back onto the SRAM card.

Managing the Power on the PC Card Drive

You can use a utility called CARDINFO.EXE to manage the power on the PC card drive. You can also use CARDINFO.EXE to get information about the card inserted in your JANUS reader.

You can run CARDINFO at any time to:

- display information about the type of card that is currently inserted in the PC card drive.
- turn on or off the power to the PC card drive when a PC card is installed in the drive.
- display the drive letter designation for your ATA PC card.
- display detailed information about the PC card and drive configuration, including the I/O ports, interrupt request (IRQ) resources, and memory areas that are being used by each card.
- display the latest error that occurred for a PC card that is installed in the drive.

To run CARDINFO on the reader, type one of these commands at the DOS prompt:

Command	Description
<code>cardinfo</code>	Displays information about the card inserted in the PC card drive, including the type of card, size, card manufacturer, and product name.
<code>cardinfo /off {:<i>slot</i>}</code>	Turns off the power to the PC card drive. Use the slot option to turn off the power to a specific PC card drive. The JANUS 2020 PC card drive is slot 1.
<code>cardinfo /on {:<i>slot</i>}</code>	Turns on the power to the PC card drive. Use the slot option to turn on the power to a specific PC card drive. The JANUS 2020 PC card drive is slot 1.
<code>cardinfo /c</code>	Displays information about the card in the PC card drive, including the type of card, size, card manufacturer, product name, and Card Services.
<code>cardinfo /v |more</code>	Displays extensive information about the card in the PC card drive, including the type of card, size, manufacturer, product name, Card Services, client, and card configuration. Use the DOS More switch because the output is usually more than one screen long.
<code>cardinfo /?</code>	Displays information about CARDINFO options.

Use CARDINFO to manage the reader's power when an I/O card is in the PC card drive. For example, a modem card draws power even when it is not in use, so you can conserve the NiCad battery pack by turning off the power to the PC card drive when you are not using the modem card.

To turn off the power to the PC card drive

- When you are not using the modem card, type this command:

```
cardinfo /off:1
```

Or scan this bar code:



CARDINFO /OFF:1

To turn on the power to the PC card drive

- When you are ready to use the modem card, type this command:

```
cardinfo /on:1
```

Or scan this bar code:



CARDINFO /ON:1

Managing the PC Card Drivers in the Startup Files

The PC card drivers and utilities are stored on the JANUS reader and the Application companion disk 3. These files control how the PC card drive operates, customizes the reader to use the PC card software, and provides you with helpful tools.

Note: Your reader is customized to use the PC card drivers and cards as efficiently as possible. For help with advanced card configuration and power management, see the SystemSoft CardSoft 3.1 Software User's Guide, which is stored as the executable zipped file CSUG_DOC.EXE on companion disk 3. The guide is in Microsoft Word 2.0 format.

This section lists the commands you need to support PC cards in the startup files, and includes tips for enabling the PC card drivers.

Drivers in CONFIG.SYS

Your CONFIG.SYS must contain these lines to support the PC card drive:

```
device=d:\cs.exe /poll 1
device=d:\csalloc.exe d:\csalloc.ini
install=d:\card_sr.exe
```

Note: If you delete or remark out these lines, you cannot use the PC card drive.

CONFIG.SYS also contains lines that support specific types of PC cards, such as ATA cards. To save conventional memory, you can comment out all the drivers except for the ones that apply to the type of card (or cards) currently installed in the reader.

Type of Card	Lines You Need to Activate the Device Drivers
ATA	device=c:\atadriv.exe /s:2 device=c:\mtddrv.exe device=d:\cardid.exe d:\cardid.ini
Flash	device=c:\mti1.exe device=c:\mti2p.exe device=c:\mtddrv.exe device=c:\ftl.exe (or: c:\ms-flash.sys)
I/O	device=d:\cardid.exe d:\cardid.ini
SRAM	device=c:\mtrsram.exe device=c:\mtddrv.exe

Drivers in AUTOEXEC.BAT

The AUTOEXEC.BAT file loads one of these drivers:

- CS_IPM.EXE for ATA, flash, and SRAM cards
- CS_APM.EXE for I/O cards

CS_IPM.EXE is loaded into memory when you boot the reader because this command appears in the default AUTOEXEC.BAT file:

```
d:\cs_ipm.exe
```

CS_IPM.EXE and CS_APM.EXE are stored on drive D and companion disk 3. You load one or the other, but not both drivers at the same time. If you need to install both, install CS_APM.EXE because it does everything CS_IPM.EXE does.

Tips for Enabling PC Card Drivers

Consider these guidelines:

- If you use several types of PC cards, you can expect to edit the CONFIG.SYS file often to activate and deactivate these device drivers. You may consider creating several versions of the CONFIG.SYS file, each of which supports a different type of card.
- If you are having trouble or if you want to customize your system, you can use the CONFIG.EXE configuration utility, which is stored on companion disk 3.

For instructions, read the *SystemSoft CardSoft 3.1 Software User's Guide*. The guide is in Microsoft Word 2.0 format and stored as the executable zipped file CSUG_DOC.EXE on companion disk 3.

Note: You must run CONFIG.EXE on a PC, not on a JANUS reader.

5

Configuring the Reader

This chapter discusses the reader's configuration parameters and files, explains how to configure the reader, describes how to restore the default configuration, and concludes by listing the configuration parameters.

About the Configuration Parameters

You can customize many operating characteristics of the JANUS reader, such as the volume of its beeper and the bar code symbologies it decodes. These characteristics are governed by configuration parameters. The values you set for the parameters determine how the reader operates.

By customizing the reader's configuration, you can set up the JANUS 2020 to operate easily and efficiently within your data collection system.

Note: *To learn the purpose and syntax of each configuration command, see Chapter 12, "Configuration Command Reference." The commands are listed alphabetically.*

The configuration parameters can be organized into three groups, which are discussed in the next sections: bar code symbologies, communications, and general operation. Therefore, when you configure the reader, you are performing one or more of these tasks:

- Choosing the Symbologies the Reader Will Decode
- Specifying How the Reader Will Communicate
- Controlling How the Reader Will Operate

Choosing the Symbologies the Reader Will Decode

This list contains all the bar code symbologies the reader can decode:

Codabar	Code 2 of 5	Interleaved 2 of 5 (I 2 of 5)
Code 11	Code 39	MSI
Code 128	Code 49	Plessey
Code 16K	Code 93	UPC/EAN

To ensure that the reader can operate quickly and efficiently, you should enable only the bar code symbologies that you are going to scan. If you enable multiple symbologies, the reader may on rare occasions decode a bar code according to the wrong symbology and produce erroneous results.

When you enable each bar code symbology, you may need to set a check digit, the length of the bar code label, or other options. For help, see Chapter 12, "Configuration Command Reference."

Specifying How the Reader Will Communicate

Before you can use the reader to communicate with another computer device, you must specify how the reader will transmit and receive data.

For an introduction to networking concepts, see “Planning the Network Connection” in Chapter 6. To learn how to configure the reader to fit into your network, see “Configuring the Reader for Communications” in Chapter 6.

Controlling How the Reader Will Operate

The operating parameters let you adjust the way the reader operates. By customizing the operating parameters, you can:

- set the reader to automatically shut off after a specified length of time.
- modify bar coded data using preambles, postambles, and the key code look-up table.
- enable or disable specific reader commands.
- change the duration, frequency, and volume of the beeper.
- control the display contrast, mode, setup, viewport movement, and backlight timeout.
- enable or disable the keypad clicker, Ctrl key functions, numeric keypad, and keypad caps lock.
- customize the way the scanner operates by selecting scan ahead data buffering, type of scanner devices, decode security level, scanner timeout value, and trigger modes.

About the Configuration Files

The parameter settings that are currently enabled on the reader comprise what is called the reader's current configuration or its online configuration. This current configuration may or may not be saved in a configuration file.

A configuration file is an ASCII text file that contains settings for some or all of the reader's configuration parameters. To see a sample configuration file and its format, see "Editing a Configuration File" later in this chapter.

Configuring the Reader With Configuration Files

To configure the reader with a configuration file, you load the file into IC.EXE and let IC.EXE configure the reader to match the parameters in the configuration file. You can use IC commands at the DOS prompt, or you can start the menu-driven IC.EXE application.

This manual uses the phrase "load the configuration file" to indicate this process of configuring the reader with a configuration file, even though technically you do not load the configuration file into the reader's memory.

A configuration file can contain settings for all the configuration parameters, or just a few. When you load a configuration file, only those parameters contained in the file are changed in the reader's current configuration. If the configuration file does not contain a setting for a parameter, the current setting remains in effect on the reader.

Creating Configuration Files

You can use the menu-driven IC.EXE to create configuration files. For help, see "Using the Interactive Configuration Application" later in this chapter.

Or you can type this command at the DOS prompt to create a configuration file that contains the reader's current configuration:

```
ic /s path\filename
```

where:

/s is the IC.EXE switch that saves the current configuration to a file.

path is the drive and directory where you want to store the file.

filename is the name of the configuration file.

For example, type this command:

```
ic /s e:\network\reader\janus.ini
```

The reader checks if the filename already exists. If it does, the reader prompts you to overwrite the existing file. If you choose Yes, the reader saves the current configuration in the file. If you choose No, the reader does not save the current configuration.

Creating Multiple Configuration Files

You can create multiple configuration files as long as each has a unique name and the .INI extension, such as JANUS.INI. Each configuration file can be customized for a specific application, environment, or task.

For example, you can create a file that contains the current configuration and edit the file to delete all parameters except the ones that specify the bar code symbologies the reader decodes. Now you can use this file to change the symbologies enabled on the reader without changing other parameters. You can create several configuration files, each of which enables a different set of symbologies.

You can also create configuration files that contain a subset of parameters: DISPLAY.INI for display parameters, NETWORK.INI for communications parameters, and BEEP.INI for beeper parameters.

Backing Up Your Configuration Files

You should create a backup copy of your configuration files to ensure that you have a record of each reader's configuration. Store the backups on a host computer, disk, or PC card for safekeeping.

You can also use the tables at the end of this chapter to record the options you select for each parameter.

How to Configure the Reader

You can configure the JANUS 2020 by using any of the methods described in detail in the next sections:

Using the Interactive Configuration Application (IC.EXE) With menus and dialog boxes, the Interactive Configuration application (IC.EXE) lets you view the current configuration, modify parameters, create configuration files, and configure the reader with any configuration file.

Configuring the Reader by Scanning Bar Codes You can change the reader's current configuration by scanning Code 39 or Code 93 bar code labels that contain configuration commands. This is a fast, easy way to change the reader's configuration. You can scan the bar code labels in this manual, or you can create your own bar code labels.

Configuring the Reader With IRL Z Commands You can change the reader's current configuration by running IRL programs that contain Z commands that modify the reader's configuration.

Configuring the Reader With PSK Functions You can change the reader's current configuration by running PSK applications that contain IM_COMMAND functions that modify the reader's configuration.


Sending Commands From a Host Computer You can change the reader's current configuration by sending configuration commands from a host computer to the reader. The host computer must be running an application that lets you send commands to the reader. The reader must be running an application that accepts configuration commands, such as the IRL Desktop or an application that uses the Reader Services input manager.

Editing a Configuration File You can manually edit a configuration file with a standard ASCII text editor on a host computer or reader. Then you load the configuration file from the DOS prompt, or use IC.EXE to load the file.

Loading a Configuration File From the DOS Prompt You can change the reader's current configuration by typing an IC.EXE command at the DOS prompt that configures the reader with the configuration file you specify.

Loading a Configuration File Whenever You Boot You can add a command to AUTOEXEC.BAT that configures the reader with the configuration file you specify when you warm or cold boot the reader. If you do not use this feature, the reader returns to its default configuration during a boot.

Using the Interactive Configuration Application

The Interactive Configuration application (IC.EXE) is a menu-driven application that lets you create configuration files, configure the reader, and view system information. To start IC.EXE, type this command at the DOS prompt and press :

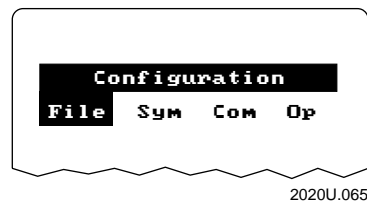
ic

Or scan this bar code:



IC

The main menu appears, displaying four menu options:




File Select the File menu to load or save configuration files, or return to the default configuration. You can also display software versions, equipment information, and available memory. You quit IC.EXE by selecting Exit from this menu.

Sym Select the Sym menu to choose the bar code symbologies that the reader can decode. For some symbologies, you must also configure the check digit and label length.

Com Select the Com menu to choose a communications protocol for each COM port, define the parameters for each protocol, and activate one protocol.

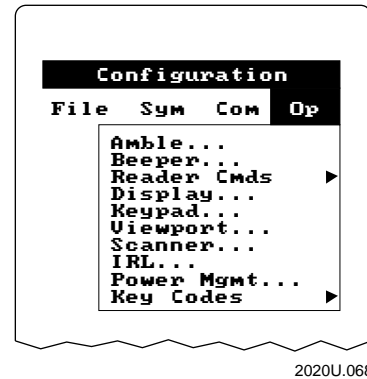
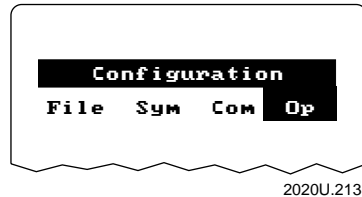
Op Select the Op menu to change the operating parameters for the reader. These parameters include automatically turning the reader on and off, display options, beeper control, keypad options, reader commands, and scanner operation.

Note: After you select a menu, you can press  to display the online help screen.

You can use the keystrokes described next to move around in IC.EXE, or you can scan bar code labels. For help, see “Scanning Bar Codes to Select Menu Options” in Appendix C.

Selecting Menus and Commands

Press **←** or **→** to select a menu name from the IC.EXE main menu. Then press **↵** to display the commands in the selected menu. In this example, you press **→ → ↵** to display the Op menu:



Press **↑** or **↓** to select a command or option from a menu, and then press **↵** to execute the command or option.

Note: The *Sym*, *Com*, and *Op* menus list the configuration parameters you can configure. An asterisk (*) on the *Sym* or *Com* menu indicates that the symbology or protocol is active.

Filling In Fields, Marking Check Boxes, and Saving Changes

Screens list the options for each configuration parameter. Below each option name is either a toggle field or an entry field:

- In a toggle field, you press **←** or **→** to view the options for that field.
- In an entry field, you type a value into the field.

To move to the next field, press **→** or **↵** or **↵**. To move to the previous field, press **←** or **↵** or **↵**.

To learn how to enter ASCII control characters into fields, see “Entering ASCII Control Characters” in Appendix C. You can use ASCII control characters for some communications protocol characters, preambles, and postambles.

Some screens contain check boxes. Check boxes are used when more than one option can be selected at a time. Press **space** to mark or clear check boxes.

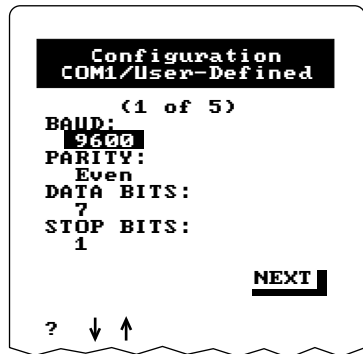
When you exit a screen, you can save or discard your changes:

- To exit a screen and save the changes, press **↵** or choose OK.
- To exit a screen without saving the changes, press **Esc** or choose CANCEL.

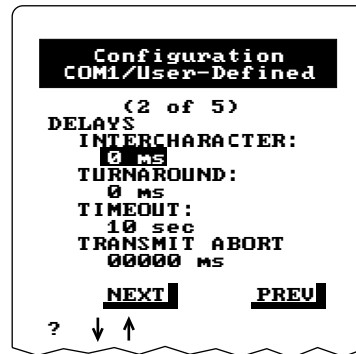
Using a Series of Screens to Configure a Parameter

Sometimes IC.EXE presents a series of screens for one parameter. You must fill in fields or select options on each screen to configure the parameter.

For example, when you configure the User-Defined protocol for COM1, IC.EXE displays five screens of options for the protocol. Here are the first two screens in that series:












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You can tell that a screen is part of a series when you see the Next and Prev commands at the bottom of the screen. Next and Prev let you move forward to the next screen or back to the previous screen.

Pressing  while the cursor is in any field is the same as choosing Next. As described earlier, you press  or   or  to move to the next field in the screen. You press  or   or  to move to the previous field.

Using Multiple Configuration Files

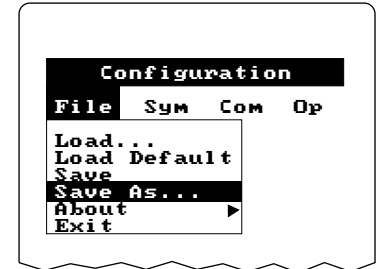
This example illustrates how to create and use multiple configuration files. Your JANUS reader will be used in two settings: in a tool room, where it is very quiet, and on the warehouse floor, where there is a substantial level of noise. You decide to create two INI files, one with the beeper volume set low and one with the beeper volume set high.

To create two INI files with different beeper volumes

1. Start IC.EXE, choose the Beeper command from the Op menu, and set the beeper volume to Quiet.

2. Choose the Save As command from the File menu and press . The Configuration screen appears.
3. Specify a unique DOS filename for the INI file, such as QUIET.INI. Make sure the filename includes a path with a drive that you can write to, such as drive E:

e:\quiet.ini



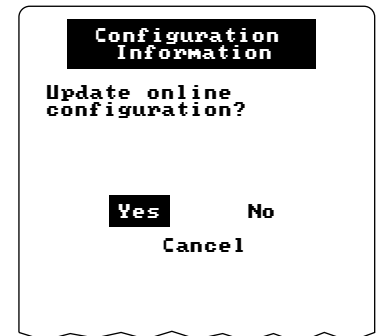
2020U.109

Note: If you store the configuration file on drive E, the file will be erased when you cold boot the reader, load flash memory, put the reader in Storage mode, or execute CONFIG.SYS after changing the command that creates drive E.

4. Choose Exit from the File menu. This screen prompts you to update the online configuration before you exit.

The online configuration (also called the current configuration) is the set of parameters currently enabled on the reader.

5. Press to choose Yes and apply the changes to the reader. The reader now beeps very quietly.
6. Restart IC.EXE, choose Beeper from the Op menu, and change the beeper volume to Very Loud.
7. Choose Save As from the File menu, and specify a unique DOS filename for the INI file, such as VERYLOUD.INI.
8. Choose Exit from the File menu. Again, IC.EXE prompts you to update the online configuration before exiting.
9. Press to select No and press . The reader is still configured to beep quietly.



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To configure the reader with the other INI file

When you are ready to make the reader beep very loudly, you need to configure the reader with the VERYLOUD.INI file. Follow either method:

- You can type this command at the DOS prompt and press :

```
ic /l e:\veryloud.ini
```

For help, see “Loading a Configuration File From the DOS Prompt” later in this chapter.

- You can use IC.EXE, as follows:
 1. Start IC.EXE.
 2. Choose Load from the File menu and press .
 3. Select VERYLOUD.INI from the list of filenames and press .
 4. Choose Exit from the File menu and press .
 5. When the reader prompts you to update the online configuration, press to choose Yes. The reader is now configured to beep loudly.

Configuring the Reader by Scanning Bar Codes

You can configure the reader by scanning bar code labels listed in this manual or by creating your own Code 39 or Code 93 bar code labels. For help, see Chapter 12, “Configuration Command Reference.”

You can create bar code labels that contain more than one configuration command. For example, you can configure a reader for User-Defined protocol (PS0) on COM1 (IS1), with a baud rate of 2400 (IA4), even parity (IB1), 8 data bits (II8), and 2 stop bits (IC2) by scanning three bar codes. Each bar code starts with \$+ (the Change Configuration command) followed by the syntax and option for each parameter.

Configure for COM1, Configure User-Defined Protocol



\$+IS1PS0

Set to 2400 Baud, Even Parity, 8 Data Bits, and 2 Stop Bits



\$+IA4IB1II8IC2

Activate User-Defined Protocol



\$+PA0

The bar code labels change the reader's current configuration, but the changes are not saved to a configuration file.

Note: Quotation marks are required if parameter options conflict with the reader configuration commands. For example, to set a preamble to BV, use `$+AD"BV"`. If you leave out the quotation marks (`$+ADBV`), the reader will mistake the command as setting the preamble (AD) to no characters and changing the beep volume (BV). Type two sets of quotation marks ("") to include one quotation mark in the command.

Configuring the Reader With IRL Z Commands

You can automatically configure the reader each time you run an IRL program by including Z commands in the program. These Z commands change the reader's current configuration, but the changes are not saved to a configuration file.

You should use this configuration method when you want to run an IRL program that requires the reader to have a specific configuration. Include Z commands at the beginning of the IRL program to modify the configuration, and then include more Z commands at the end of the program to restore the configuration to its previous settings.

For example, to change the display mode from buffered to transparent, insert this Z command in your IRL program:

```
Z "$+DM1 "
```

When the IRL program reaches this command statement, it configures the reader and then executes the next command line in the program.

For help using Z commands, see your *IRL Programming Reference Manual*.

Configuring the Reader With PSK Functions

You can automatically configure the reader each time you run a PSK application by including IM_COMMAND functions in the application. These IM_COMMAND functions change the reader's current configuration, but the changes are not saved to a configuration file. For help using IM_COMMAND functions, see your JANUS PSK reference manual.

Sending Commands From a Host Computer

You can create reader applications that use Reader Services to accept configuration command strings from the host computer. These command strings change the reader's current configuration, but the changes are not saved to a configuration file.

For example, to configure the reader to decode Code 93, the host computer sends this command to a reader application:

```
$+CF1
```

The reader application must have been designed to accept command syntax from the host computer. The reader cannot accept commands when it is at the DOS prompt. For help using Reader Services, see your JANUS PSK reference manual.

Editing a Configuration File

A configuration file contains commands that modify the reader's configuration. You can manually edit a configuration file to add, delete, or modify the commands. Choose one of these methods:

- Upload the configuration file to a host computer, edit the file using any standard ASCII text editor, and download the file to the reader.
- Start Interlnk with the host computer as the client and the reader as the server. From the host computer, use any standard ASCII text editor to edit the configuration file on the reader.
- Edit the configuration file on the reader with the EDLIN.EXE editor.

After editing the configuration file, you must configure the reader with the file. For help, see the next section, "Loading a Configuration File From the DOS Prompt."

This table shows the commands in a sample INI file, as well as descriptions of each command:

Command	Description
AD " "	Preamble disabled.
AE "\x0D"	Postamble set to CR.
BD "00050L"BD "00050H"	Beep duration set to 50 ms for low and high beeps.
BF "01200L"BF "02400H"	Beep frequency set to 1200 Hz for low beeps and 2400 Hz for high beeps.
BV "1"	Beep volume set to quiet.
CA "99"	Interleaved 2 of 5 set to variable length with a check digit.

Make sure you follow these conventions when you edit the INI file:

- Type all configuration commands in uppercase, or else the reader cannot recognize them as commands.
- Enclose the command options in quotes (BV"1") when you are editing the configuration file. Quotation marks designate the end of a configuration command.
- Use double quotes to enter a quote in the command line. For example, the reader interprets AD""4 as a command to set the preamble (AD) to the characters " and 4.

For a list of configuration commands in alphabetical order by command syntax, see the “Configuration Commands by Syntax” table in Appendix A. For a complete description of each command, see Chapter 12, “Configuration Command Reference.”

Loading a Configuration File From the DOS Prompt

You can type a command at the DOS prompt that causes IC.EXE to configure the reader with the specified configuration file without opening the menu-driven IC.EXE interface.

To load a configuration file from the DOS prompt

- Type this command at the DOS prompt:

```
ic /l path\filename
```

where:

/l is the IC.EXE switch that loads a configuration file.

path is the drive and directory that contains the configuration file.

filename is the name of the configuration file you want to load.

For example, type this command:

```
ic /l e:\network\reader\janus.ini
```

If there are no errors in the configuration file, the reader displays this message and configures the reader with the configuration file:

```
Loading reader  
Configuration from  
{path\filename}
```

If the configuration file contains errors, the reader displays a message stating that the reader configuration is unchanged. The reader generates an error file with the same filename as the configuration file, but with the extension .ERR. This file lists the line numbers with the incorrect syntax and the reason for the error. The command SET IM_ERRPATH=E:\ in AUTOEXEC.BAT specifies that the error file is written to drive E. You can view the file by typing this command at the DOS prompt on drive E:

```
type filename.err
```

Loading a Configuration File Whenever You Boot

Each time you cold boot the reader, the reader returns to its default configuration. If you do not want the default configuration, you can add a command to AUTOEXEC.BAT that configures the reader with another configuration file every time you warm or cold boot the reader.

The reader's AUTOEXEC.BAT file is stored on drive C. Because drive C is a ROM drive resident in flash memory, you must use special utilities to change its contents. For help, see "Learning How to Change the Contents of Drive C" in Chapter 3.

To load a configuration file when you boot the reader

1. Create the configuration file to load when you boot the reader. For example, to save the current configuration in a file, start IC.EXE and select Save As from the File menu. Type a unique DOS filename for the file, such as JANUS.INI.
2. Add this line to the reader's AUTOEXEC.BAT file:

```
d:\ic /l path\filename
```

where:

`/l` is the IC.EXE switch that loads a configuration file.
`path` is the drive and directory that contains the configuration file.
`filename` is the name of the configuration file you want to load.

For example, type this command:

```
d:\ic /l e:\network\reader\janus.ini
```

3. Copy the configuration file and new AUTOEXEC.BAT onto drive C.


Or copy the configuration file onto a memory card in one of the PC card drives. Because the reader cannot boot from drive F, you should not copy the new AUTOEXEC.BAT file to drive F and expect the reader to boot from drive F.

Note: *If you store the configuration file on drive E, the file will be erased when you cold boot the reader, load flash memory, put the reader in Storage mode, or execute CONFIG.SYS after changing the command that creates drive E.*

Restoring the Reader's Default Configuration

When you configure the reader according to the instructions presented in this chapter, the parameters remain in effect until you reconfigure the parameters or cold boot the reader.

You can return the reader to its default configuration, which is described in Appendix A. Choose one of these methods:


- Type this command at the DOS prompt and press :

```
ic /d
```

Or scan this command at the DOS prompt:



IC /D

- Use IC.EXE to restore the default configuration. At the DOS prompt, type `ic` and press . Choose the Load Default command from the File menu. Then choose Exit from the File menu. When prompted to update the online configuration, choose Yes.
- Cold boot the reader. During a cold boot, the reader returns to its default configuration. For help, see “Cold Booting the Reader” in Chapter 9.

Note: *The reader does not return to its default configuration during a cold boot if you followed the instructions in the previous section, “Loading a Configuration File Whenever You Boot.”*

Recording Your Reader's Configuration

These tables list all of the configuration parameters, their options, and where to find them in IC.EXE. The default setting for each parameter is identified in **bold italics** in these tables.

You should have an accurate record of the reader's configuration settings in case the reader is ever reset and the configuration setup is lost:

- You can back up the reader's configuration files and store the backups on another reader, a host computer, a PC card, or a disk.
- You can record the configuration on the following pages by circling the option you chose for each parameter or writing the value.

Bar Code Symbolologies Table

Parameter	Options	Location in IC.EXE
Codabar	Disabled ABC Standard Concatenated	Sym menu, Codabar option
Start/Stop	Discard Retain ABCD Retain DC1-DC4	Sym menu, Codabar option
Code 11	Disabled One check digit Two check digits	Sym menu, Code 11 option
Code 16K	Disabled Standard With function code 1	Sym menu, Code 16K option
Code 2 of 5	Disabled 3 bar start/stop, label length 2 bar start/stop, label length	Sym menu, 2 of 5, I2 of 5 option
Code 39	Disabled No check digit Check digit HIBC AIAG check digit	Sym menu, Code 39 option
Check digit	Discard Retain	Sym menu, Code 39 option
ASCII	Non-full ASCII Full ASCII Mixed-full ASCII	Sym menu, Code 39 option

Bar Code Symbolologies Table (continued)

Parameter	Options	Location in IC.EXE
Code 49	Disabled Enabled	Sym menu, Code 49 option
Function Code 1	Disabled ASCII character	Sym menu, Code 49 option
Function Code 2	Disabled ASCII character CR LF	Sym menu, Code 49 option
Function Code 3	Disabled ASCII character	Sym menu, Code 49 option
Code 93	Disabled Enabled	Sym menu, Code 93 option
Code 128	Disabled Standard UCC/EAN-128	Sym menu, Code 128 option
Interleaved 2 of 5	Disabled Fixed length # Variable length, no check digit Case Code, check digit Variable length, check digit	Sym menu, 2 of 5, I2 of 5 option
MSI	Disabled No check digit 1 modulus 10 check digits 2 modulus 10 check digits	Sym menu, MSI option
Check digits	Discard Retain	Sym menu, MSI option
Plessey	Disabled Discard check digit Retain check digit	Sym menu, Plessey option
UPC/EAN		Sym menu, UPC/EAN option
Check digit	Discard Retain	Sym menu, UPC/EAN option
EAN-8	Disabled Enabled	Sym menu, UPC/EAN option
Supplementals	Yes No	Sym menu, UPC/EAN option

Bar Code Symbolologies Table (continued)

Parameter	Options	Location in IC.EXE
UPC/EAN (continued) UPC-A/EAN-13	Disabled Enabled UPC-A only	Sym menu, UPC/EAN option
UPC-E	Disabled Enabled	Sym menu, UPC/EAN option
Number system digit	Discard Retain	Sym menu, UPC/EAN option
UPC-A leading zero	Discard Retain	Sym menu, UPC/EAN option

Communications Table

Parameter	Options	Location in IC.EXE
Communications Dock Port	Auxiliary Network	Com menu, COM1 option, Dock Port option
COM Port, Select	COM1 COM4 (RF)	Not available in IC.EXE
COM Port, UART Restore	00 Hex Hex value	Com menu, COM1 option UART Restore option
Communications Protocol Configure	User-Defined Point-to-Point Polling Mode D Multi-Drop PC Standard	Com menu, COM1 option, Configure option
Communications Protocol, Activate	User-Defined Point-to-Point Polling Mode D Multi-Drop PC Standard None	Com menu, COM1 or RF option, Activate option
Communications Protocol, User-Defined Multi-Drop	Disabled Enabled	Com menu, Configure option, User-Defined protocol

Communications Protocol Parameters Table

Parameter	Options	Location in IC.EXE
Address, Multi-Drop	A to Z, 0 to 5 A	Com menu, COM1 option, Multi-Drop protocol
AFF	Disabled Any ASCII character	Com menu, COM1 option, User-Defined protocol
Baud Rate	110 300 600 1200 2400 4800 9600 19200 38400	Com menu, COM1 option, All protocols except Multi-Drop
Data Bits	7 bits 8 bits	Com menu, COM1 option, All protocols except Polling Mode D
EOF	Disabled Any ASCII character	Com menu, COM1 option, User-Defined protocol
EOM Transmit	Disabled Any two ASCII characters CR and LF	Com menu, COM1 option, User-Defined protocol
EOM Receive	Disabled Any two ASCII characters CR and LF	Com menu, COM1 option, User-Defined protocol
EOR	Disabled Any two ASCII characters	Com menu, COM1 option, User-Defined protocol
Flow Control	None XON/XOFF response XON/XOFF control XON/XOFF response and control CTS checking/RTS control	Com menu, COM1 option, User-Defined protocol Point-to-Point protocol Polling Mode D protocol

Communications Protocol Parameters Table (continued)

Parameter	Options	Location in IC.EXE
Intercharacter Delay	0 1 ms 2 ms 5 ms 10 ms 20 ms 50 ms 100 ms	Com menu, COM1 option, User-Defined protocol Point-to-Point protocol
IRL BAK	Disabled Any ASCII character BEL	Com menu, COM1 option, User-Defined protocol
IRL End Program Block	Disabled Any ASCII character SO (shift out)	Com menu, COM1 option, User-Defined protocol
IRL EOP	Disabled Any ASCII character SYN (synchronous idle)	Com menu, COM1 option, User-Defined protocol
IRL PAK	Disabled Any ASCII character RS (record separator)	Com menu, COM1 option, User-Defined protocol
IRL PSS	Disabled Any ASCII character CR (carriage return)	Com menu, COM1 option, User-Defined protocol
IRL RUN	Disabled Any ASCII character DC2 (device control 2)	Com menu, COM1 option, User-Defined protocol
IRL SOP	Disabled Any ASCII character SI (shift in)	Com menu, COM1 option, User-Defined protocol
LRC	Disabled Enabled	Com menu, COM1 option, User-Defined protocol
NEG	Disabled Any ASCII character	Com menu, COM1 option, User-Defined protocol
Parity	None Even Odd Mark Space	Com menu, COM1 option, All protocols except Polling Mode D

Communications Protocol Parameters Table (continued)

Parameter	Options	Location in IC.EXE
POL	Disabled Any ASCII character	Com menu, COM1 option, User-Defined protocol
Records Per Block	All records transmitted in one block 1-99 records transmitted per block	Com menu, COM1 option, User-Defined protocol
REQ	Disabled Any ASCII character	Com menu, COM1 option, User-Defined protocol
RES	Disabled Any ASCII character	Com menu, COM1 option, User-Defined protocol
SEL	Disabled Any ASCII character	Com menu, COM1 option, User-Defined protocol
SOM	Disabled Any ASCII character	Com menu, COM1 option, User-Defined protocol
Stop Bits	1 bit 2 bits	Com menu, COM1 option, User-Defined protocol Polling Mode D protocol PC Standard protocol
Timeout Delay	5 ms 100 ms 500 ms 2 sec 10 sec 20 sec 40 sec 60 sec no timeout	Com menu, COM1 option, User-Defined protocol Point-to-Point protocol
Transmit Abort Timeout	Disabled (0) 1-65000 ms	Com menu, COM1 option, User-Defined protocol Multi-Drop protocol

Communications Protocol Parameters Table (continued)

Parameter	Options	Location in IC.EXE
Turnaround Delay	0 1 ms 2 ms 5 ms 10 ms 20 ms 50 ms 100 ms	Com menu, COM1 option, User-Defined protocol Point-to-Point protocol

Operations Table

Parameter	Options	Location in IC.EXE
Automatic Shutoff	Disabled (0) 15 sec 1 minute 1 - 60 minutes	Op menu, Power Mgmt option
Beep Duration	1 ms to 60,000 ms High beep 50 ms Low beep 50 ms	Op menu, Beeper option
Beep Frequency	20 to 20,000 Hz High beep 2000 Hz Low beep 1000 Hz	Op menu, Beeper option
Beep Volume	Off Quiet Normal Loud Very loud	Op menu, Beeper option
Command Processing	Disable all reader commands Enable all reader commands Enable override Disable override	Op menu, Reader Commands option
Enable/Disable specific commands	Abort program (IRL) Backlight Backspace Change Configuration Clear Clear File (IRL) Cursor to Viewport Download Program (IRL) End Change Configuration	Op menu, Reader Commands option, Enable option

Operations Table (continued)

Parameter	Options	Location in IC.EXE
Enable/Disable specific commands (continued)	Enter Enter Accumulate mode Enter Key Code Exit Accumulate mode IRL Program Resume Laser Off Laser On Multiple-Read Labels Prepare for Reboot Reboot Receive File (IRL) Run Program (IRL) Set Clock Transmit File (IRL) Viewport to Cursor Viewport Down Viewport End Viewport Home Viewport Left Viewport Page Down Viewport Page Up Viewport Right Viewport Up	
Decode Security	Low Moderate High	Op menu, Scanner option
Display Backlight Timeout	Disabled (0) 1 - 60 seconds 10 seconds	Op menu, Display option
Display Contrast	0 - 7 3	Op menu, Display option
Display Mode, IRL	Buffered Transparent	Op menu, IRL option

Operations Table (continued)

Parameter	Options	Location in IC.EXE
Display Setup	25 x 80 16 x 20 8 x 20 16 x 10 8 x 10	Op menu, Display option
Video mode	0 1 2 3	Op menu, Display option
Scroll line	8 16 25	Op menu, Display option
Character height	1x (normal) 2x (double)	Op menu, Display option
Key Code Look-Up Table	Keys changed No modifications	Op menu, Key Codes option
Keypad Caps Lock	Enabled Disabled	Op menu, Keypad option
Keypad Clicker	Disabled Enabled	Op menu, Keypad option
Keypad Ctrl Key Functions	Enabled Disable Ctrl-Alt-Del Disable Ctrl combinations	Op menu, Keypad option
Keypad, Numeric	Disabled Enabled	Op menu, Keypad option
Postamble	<CR> Disabled (no char.) Any 25 ASCII characters	Op menu, Amble option
Preamble	Disabled (no characters) Any 25 ASCII characters	Op menu, Amble option
Scan Ahead	Disabled Enabled	Op menu, Scanner option
Scanner Mode	One-Shot mode Automatic mode	Op menu, Scanner option
Scanner Redundancy	None Normal High	Op menu, Scanner option

Operations Table (continued)

Parameter	Options	Location in IC.EXE
Scanner Timeout	Disabled (0) 1-60 seconds	Op menu, Scanner option
Scanner Trigger	Level Edge	Op menu, Scanner option
Viewport Movement Keys	Enabled Disabled	Op menu, Keypad option
Viewport Movement Mode	Auto Manual	Op menu, Viewport option
Viewport Movement Steps	1 - 20 horizontal 10 horizontal 1 - 9 vertical 9 vertical	Op menu, Viewport option

6

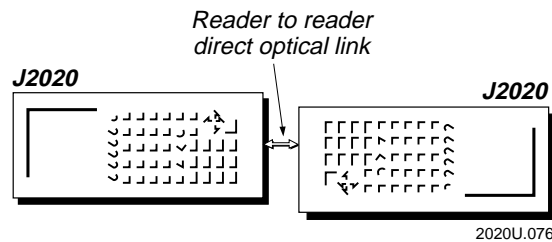
Networking the Reader

This chapter introduces networking concepts and explains how to use COM ports, configure the reader for communications, run Interlnk, use Communications Manager, and download applications with binary file transfer (BFT).

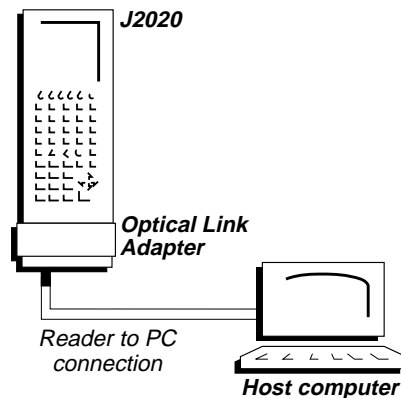
How the JANUS 2020 Fits Into Your Network

The JANUS reader is a versatile hand-held computer that you can easily add to your network or distributed data collection system. For example, you can connect your JANUS 2020 directly to another reader or computer, enabling both computers to share files, data, and programs.

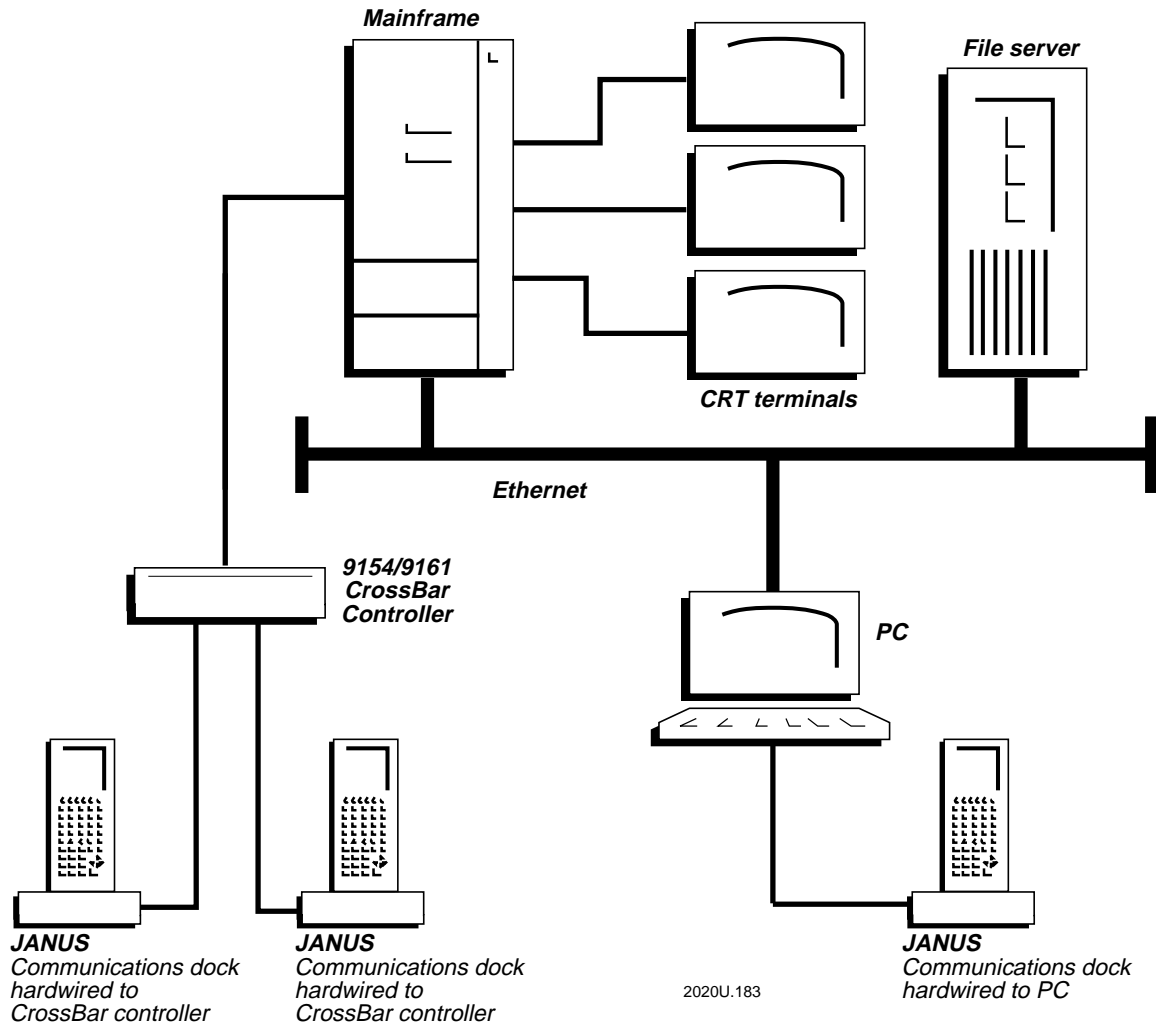
Two Readers Communicating Through Their Optical Ports



Reader and PC Communicating Through Direct Cabling

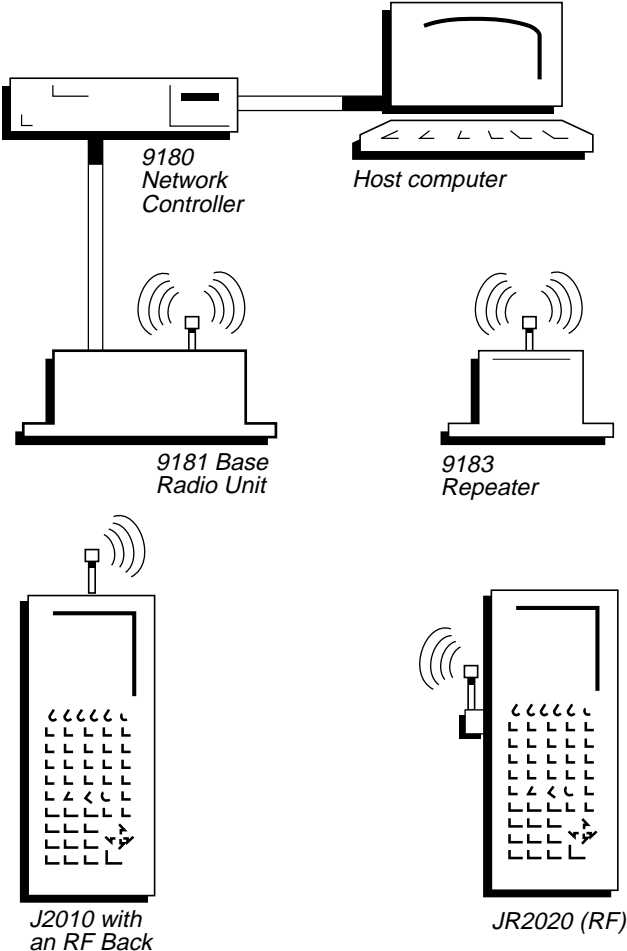


JANUS Readers in an Ethernet and CrossBar Data Collection Network



You can make the JANUS 2020 an end device in your local area network or distributed data collection system. The reader is often used as a downline data collection computer connected to powerful upline systems.

JANUS Readers in a Radio Frequency (RF) Data Collection Network



2020U.184

You can use a JR2020 as an end device in your RF network. For help, see your JANUS RF documentation.

Working With JANUS COM Ports

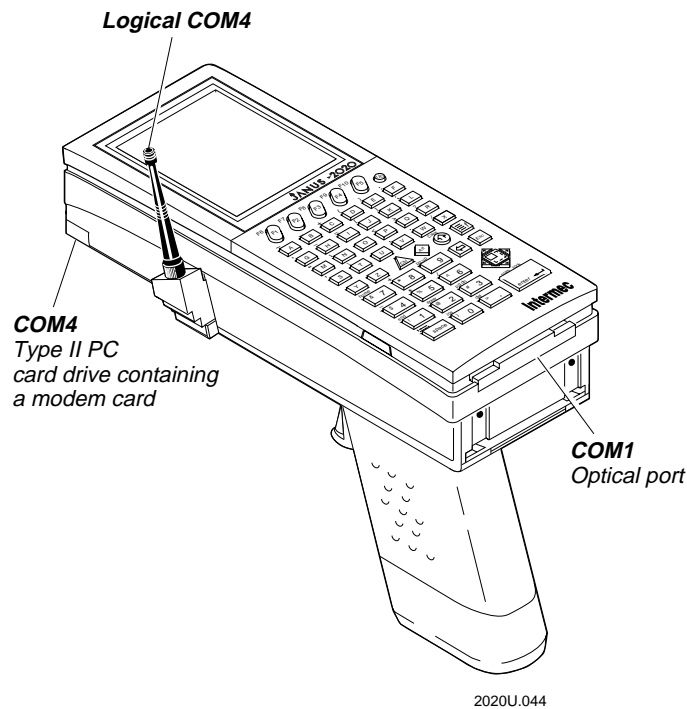
Communications ports, also called COM ports, are locations from which data can be passed into and out of the reader. COM ports offer serial communications, which means that data is transmitted one bit at a time over a single line from one computer to another.

The next sections cover these topics:

- Identifying JANUS COM Ports
- Examining the COM1 Optical Port Signals
- Understanding How IRQs Affect COM Ports

Identifying JANUS COM Ports

This illustration identifies the COM ports on the reader, and the next table explains how each is designated as a COM port.



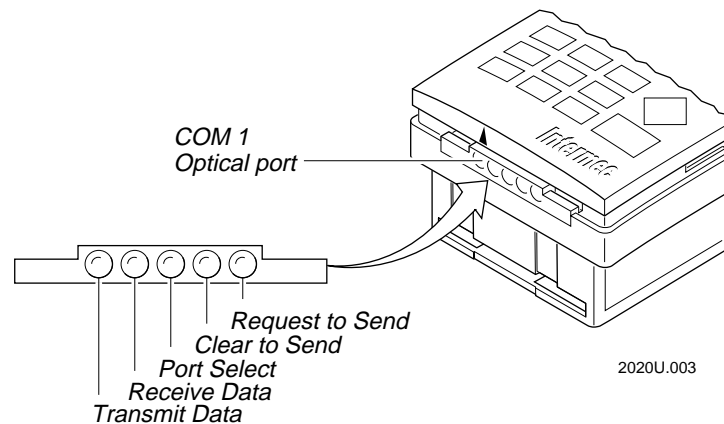
Port	How Is It Designated As a COM Port?
COM1	By default.
COM4	Use the modem card's configuration tool.
Logical COM4	By default in JR2020.

Your reader can have both an RF port designated “logical COM4” and a modem card in the Type II PC card drive designated “COM4.” Accessing the RF network through logical COM4 will not conflict with accessing the serial communications network through COM4.

Note: *Intermec recommends that you do not designate any COM port as COM3. For help, see “Understanding How IRQs Affect COM Ports” later in this chapter.*

Examining the COM1 Optical Port Signals

The reader's COM1 is an optical serial port. You can communicate through COM1 using a communications dock, optical link adapter, or another reader. This illustration shows the optical port's signals:



Understanding How IRQs Affect COM Ports

According to the industry standard architecture (ISA) for PCs, the COM ports on a PC must share hardware interrupt requests (IRQs). Because your JANUS reader is PC compatible, the reader's COM ports also share IRQs:

IRQ3 is assigned to both COM2 and COM4.

IRQ4 is assigned to both COM1 and COM3.

The ISA practice of sharing IRQs causes limitations on the JANUS readers:

- The Intermec protocol handlers, PHIMEC and PHPCSTD, cannot share IRQs. You can load PHIMEC or PHPCSTD only on COM1.
- The Intermec RF protocol handler (RFPH) uses "logical COM ports." RFPH designates the RF port as "logical COM4" but does not use IRQ3. Instead, IRL uses the logical port numbers to direct transmits and receives. For example, X4P transmits using "logical COM4."
- Intermec recommends that you do not designate any JANUS port as COM3. Because COM1 and COM3 share an IRQ, you cannot use COM1 if you use COM3.

Planning the Network Connection

In most networking and data communications situations, the JANUS reader uses a communications application, communications protocol, and protocol handler to communicate with another computer device.

What is a communications application? A communications application is a software program that lets the reader communicate with another computer device. Many specialized communications applications are available because there are many specialized data communications tasks to be performed. For example, a communications application may establish a connection with another computer, transfer files, and perform error checking—or it may make remote directories and files available to the local user.

Communications applications usually require communications protocols and protocol handlers to handle the actual transmission of data. However, you do not need a communications protocol or protocol handler if the application will access the COM port directly.

What is a communications protocol? Communications protocols determine exactly how data is transmitted between the reader and the connected device. Each protocol has parameters you can set, such as baud rate and parity. Both the reader and the connected device must use the same protocol and parameter settings to communicate properly.

What is a protocol handler? Protocol handlers are programs you run only on the JANUS reader. The protocol handler transmits and receives data in the manner specified by the communications protocol. Each protocol handler is used with a specific communications protocol.

The next sections explain how to choose a communications application, communications protocol, and protocol handler for each COM port on the reader.

Choosing a Communications Application

You can use one of the three communications applications provided with your reader, you can create a JANUS PSK communications application, or you can purchase a third-party communications application:

Communications Manager You can use Communications Manager to transmit and receive data files, and to request COM port and protocol status. For help, see "Running Communications Manager" later in this chapter.

Interlnk You can use this DOS utility to access the drives on the host computer as if they are on the reader, and vice versa. For help, see "Running Interlnk to Transfer Files" later in this chapter.

IRL Desktop You can use the IRL Desktop to transfer IRL programs and IRL data files between the reader and a host computer. For help, see Chapter 7, "Working With IRL."

JANUS PSK communications application You can create your own communications application using the software libraries provided with the JANUS Programmer's Software Kit. For help, see your JANUS PSK reference manual.

File transfer application for BFT You can use the file transfer application to transfer binary files. For help, see "Downloading Applications Across the Network" later in this chapter.

Third-party communications application You can use a third-party communications application that conforms to the requirements of the JANUS reader.

Choosing a Communications Protocol

The reader can communicate in any of seven configurable protocols. The protocols are introduced briefly here. For details about their characteristics and parameters, see "Communications Protocol, Configure" in Chapter 12.

Multi-Drop Protocol Multi-Drop follows the same protocol sequences as Polling Mode D with the extension of device addressing, which allows up to 32 devices on one 4-wire RS-485 twisted pair line. Multi-Drop protocol is typically used in CrossBar networks. Due to timeout parameters, the baud rate must be 2400 or higher.

No Protocol No Protocol is for communications applications, such as Interlnk, that directly access the COM port instead of using a protocol handler. When you do not use a protocol, you can switch between direct COM port access and using a protocol handler.

PC Standard Protocol PC Standard handles data transfer on a character-by-character basis or by either filling a receive buffer or transmitting a buffer of data. This protocol is designed to be compatible with the standard PC BIOS functions. The one exception is that the PC Standard protocol can buffer data that is received to avoid losing characters if a program has not checked for data recently.

Point-to-Point Protocol Point-to-Point is an unsolicited protocol in which the reader transmits data whenever it has something to transmit. The data is followed by a CR LF as the EOM characters. The reader is always in a receiving state and does not wait for select commands. This protocol does not perform any error checking or acknowledgment handshaking.

Point-to-Point protocol is typically used to connect the reader to a CRT terminal or host computer. Since Point-to-Point is an unsolicited protocol, you can initiate the transmit command from the reader or the host.

Polling Mode D Protocol Polling Mode D requires the host computer to ask the reader for data it might have (polling) and to request to send data to the reader (selecting). PC-IRL uses this protocol.

RF Protocol RF Protocol is used in radio frequency (RF) networks only. For details, see your JANUS RF documentation.

User-Defined Protocol User-Defined is a powerful protocol because you can configure the protocol to your own requirements. For example, you can configure User-Defined to act like a Point-to-Point protocol, except that it requires an LRC and an acknowledgment from the receiver. You can also define the communications characters such as SOM, POL, or SEL, or disable these characters by setting them to null.

You can also use User-Defined protocol to define User-Defined Multi-Drop protocol. In User-Defined Multi-Drop, you must set the POL and SEL protocol characters in a predetermined combination. For help, see “POL and SEL Combinations for Multi-Drop Protocol” in Appendix C.

Choosing a Protocol Handler

There are three protocol handlers:

PHIMEC The Intermec protocol handler. PHIMEC lets you communicate with other Intermec devices such as concentrators.

PHPCSTD The PC Standard protocol handler. PHPCSTD provides low-level communications abilities and protocol services at the DOS level for non-communications software, including byte-by-byte transfer and status information.

RFPH The RF protocol handler. RFPH lets you communicate with devices in an RF network.

You will use each protocol handler with a specific communications protocol:

Use This Protocol Handler	With This Communications Protocol
PHIMEC	User-Defined Protocol Point-to-Point Protocol Polling Mode D Protocol Multi-Drop Protocol
PHPCSTD	PC Standard Protocol
RFPH	RF Protocol

Note: *You do not load a protocol handler if you choose No Protocol as your communications protocol. For example, if you decide to use the Interlnk communications application, you do not need a communications protocol or protocol handler, so you choose No Protocol and do not load a protocol handler.*

PHIMEC and PHPCSTD are not loaded when you boot your reader because they use a lot of conventional memory. RFPH is loaded when you boot a JR2020.

When you load a protocol handler that corresponds to the active protocol, the active protocol tells the protocol handler how to communicate. For help, see "Loading and Unloading a Protocol Handler" later in this chapter.

Configuring the Reader for Communications

Prepare the reader to communicate with another device by performing these steps for every reader COM port that you want to communicate through:

1. Choose a COM port to configure. Decide which communications application, communications protocol, and protocol handler to use for that COM port. For help, see “Working With JANUS COM Ports” and “Planning the Network Connection” earlier in this chapter.
2. Select the COM port.
3. Configure the communications protocol(s) for the COM port.
4. Activate one communications protocol for the COM port.
5. Load the protocol handler for the COM port.
6. If you do not load a protocol handler, you may need to specify a value to restore the UART FIFO control register for the COM port.
7. Connect the reader to the device it will communicate with.
8. Repeat Steps 1 through 7 for every COM port you want to configure.

Steps 2 through 7 are described in detail in the next sections.

Selecting the COM Port

Begin configuring the reader by selecting a COM port. All changes you make in the reader’s configuration that relate to communications are applied to the selected COM port until you select another COM port.

To select the reader’s COM port

1. Decide which reader COM port to use. For help, see “Identifying JANUS COM Ports” earlier in this chapter.
2. Select the reader’s COM port with the Communications Port, Select COM Port command. The reader will apply all subsequent changes in its communications configuration to the selected port.

For help, see “Communications Port, Select COM Port” in Chapter 12.

Configuring the Communications Protocols

Next, identify and configure one or more communications protocols to use on the selected COM port.

To configure a communications protocol or protocols for a COM port

1. Select the communications protocol with the Communications Protocol, Configure command. The reader applies all subsequent changes in its communications configuration to the selected protocol. For help, see "Communications Protocol, Configure" in Chapter 12.

Note: For a CrossBar network, configure the reader for Multi-Drop protocol.

2. Set the parameters (such as baud rate) for the communications protocol. Make sure the values you set for the reader match the values set for the device it will communicate with.

There are three ways to set communications parameters:

- You can use IC.EXE.
- You can scan the configuration commands listed in Chapter 12.
- You can use DOS commands. For example, you can type the MODE command at the DOS prompt, or an application using the COM port can execute standard DOS commands.

The method you choose depends on the COM port, as follows:

Methods for Setting Communications Parameters

COM Port	Use IC.EXE?	Scan Commands?	Type DOS Commands?
COM1	Yes	Yes	Yes
RF (logical COM4)	Yes	Yes	No
COM4	No	Yes	Yes

3. Repeat Steps 1 and 2 for every communications protocol you want to configure for the selected COM port.

Here are the parameters you can set for each communications protocol:

Multi-Drop Protocol Parameters

- Baud rate, parity, and data bits
- Transmit abort timeout
- Address, multi-drop

PC Standard Protocol Parameters

- Baud rate, parity, data bits, and stop bits

Point-to-Point Protocol Parameters

- Baud rate, parity, data bits, and stop bits
- Flow control
- Intercharacter delay, turnaround delay, and timeout delay
- Transmit abort timeout

Polling Mode D Protocol Parameters

- Baud rate
- Flow control
- Transmit abort timeout

User-Defined Protocol Parameters

- Baud rate, parity, data bits, and stop bits
- Flow control and LRC
- Intercharacter delay, turnaround delay, and timeout delay
- Transmit abort timeout
- SOM and EOM
- AFF, NEG, POL, REQ, RES, and SEL
- EOF, EOR, and records per block
- IRL parameters: BAK, End, EOP, PAK, PSS, Run, and SOP
- User-Defined, Multi-Drop enable

Activating One Communications Protocol

A COM port can only use one communications protocol at a time. You designate the communications protocol that a port will use when you activate the communications protocol. You must activate one communications protocol for the COM port.

To activate one communications protocol for a COM port

- Execute the Communications Protocol, Activate command to activate the communications protocol. For help, see “Communications Protocol, Activate” in Chapter 12.

Loading and Unloading a Protocol Handler

You can load protocol handlers in several ways:

- Manually load them at the DOS prompt.
- Load them from AUTOEXEC.BAT when you boot the reader.
- Include them in a batch file that also executes your program.
- Load them when you start IRL Desktop or Communications Manager.

Note: A protocol handler is active when its corresponding communications protocol is active. For example, if the PC Standard protocol handler is loaded, it will not become active until you use the Communications Protocol, Activate command to activate the PC Standard protocol.

If you are using an off-the-shelf communications application that directly accesses the COM port, do not load a protocol handler. Instead, activate No Protocol in the reader's configuration. You cannot download reader configuration commands from the host computer when using off-the-shelf software.

Loading and Unloading a Protocol Handler at the DOS Prompt

You can load the protocol handlers from the DOS command line. You should unload the protocol handler when you are finished to maximize memory.

To load a protocol handler

- Type this command at the reader's DOS prompt:

```
protocol_handler port
```

where:

protocol_handler is the protocol handler you are loading:

PHIMEC	Intermec protocol handler
PHPCSTD	PC Standard protocol handler
RFPH	RF protocol handler

port is the number of the COM port for which you are loading the protocol handler.

For example, to load the Intermec protocol handler on COM1, type this command at the DOS prompt:

```
phimec 1
```

Or scan this bar code:



PHIMEC 1

To unload a protocol handler

- Type this command at the DOS prompt:

```
unload protocol_handler port
```

For example, to unload the Intermec protocol handler from COM1, type this command at the DOS prompt:

```
unload phimec 1
```

Loading a Protocol Handler When You Boot the Reader

You may want a protocol handler always loaded in the reader's memory. First, make sure you have enough conventional memory to load a protocol handler and operate the reader. Then add a command to AUTOEXEC.BAT to load the protocol handler. When you boot the reader, AUTOEXEC.BAT will load the protocol handler into memory.

The command you add to AUTOEXEC.BAT should match the command you type at the DOS command line. For help, see the previous section.

Loading and Unloading a Protocol Handler With a Batch File

If you create your own application or use software that does not have built-in protocol handlers, you can create a batch file that automatically loads and unloads the protocol handler whenever you enter and exit the application.

Note: Name the batch file carefully. COMMAND.COM executes files in this order: .COM, .EXE, .BAT. If a batch file (.BAT) and an application (.EXE) have the same filename, when you type the filename the reader runs the application instead of the batch file. Therefore, the batch file that loads the protocol handlers for your application should have a different filename than the application itself.

This batch file loads PHIMEC and PHPCSTD, runs Communications Manager, and unloads the protocol handlers when you exit Communications Manager. You can edit this batch file to load only one protocol handler, freeing some conventional memory for the application.

Example Batch File

Command Line

```
set CMPCST=
set CMUSER=

phimec 1

if not errorlevel 1 set CMUSER=1

phpcstd 1

if not errorlevel 1 set CMPCSTD=1

cmanager %1 %2 %3

if not "%CMPCSTD%"=="1" goto :nopcstd
unload phpcstd 1

if errorlevel 1 echo unload
    failure on pcstd
:nopcstd

if not "%CMUSER%"=="1" goto :nouser
unload phimec 1

if errorlevel 1 echo unload
    failure on userdef
:nouser
```

Definition

Clears the environment variables used by this batch file.

Loads the Intermec protocol handler for COM1.

If the Intermec protocol handler is already loaded, an error is returned and the variable is not set.

Loads the PC Standard protocol handler for COM1.

If the PC Standard protocol handler is already loaded, an error is returned and the variable is not set.

Executes the Communications Manager program. You can replace this with your application executable.

If this batch file loaded the PC Standard protocol handler, then the PC Standard protocol handler is unloaded.

Checks for failure to unload the PC Standard protocol handler.

If this batch file loaded the Intermec protocol handler, the Intermec protocol handler is unloaded.

Checks for failure to unload the Intermec protocol handler.

Loading and Unloading a Protocol Handler With an Application

You can load a protocol handler for a designated port when you start the IRL Desktop or Communications Manager. When you exit the program, the protocol handler is automatically unloaded.

To load a protocol handler by starting IRL Desktop or Communications Manager

- Type this command at the DOS prompt:

```
application [-portph]
```

where:

application is the application you are executing:

<i>irl</i>	IRL Desktop
<i>cmgr</i>	Communications Manager

port is the number of the reader's COM port.

ph is the code for the protocol handler:

<i>i</i>	Intermec protocol handler
<i>p</i>	PC standard protocol handler
<i>r</i>	RF protocol handler

For example, to load the Intermec protocol handler on COM1 and execute the IRL Desktop, type this command at the DOS prompt:

```
irl -1i
```

Or scan this bar code:



IRL -1I

Specifying a Value for the FIFO Control Register

If you turn off your JANUS reader while running a non-Intermec communications application, the reader cannot access and save the contents of the First In First Out (FIFO) control register (FCR). The FCR contains a hex value that controls the Universal Asynchronous Receiver/Transmitter (UART) buffer.

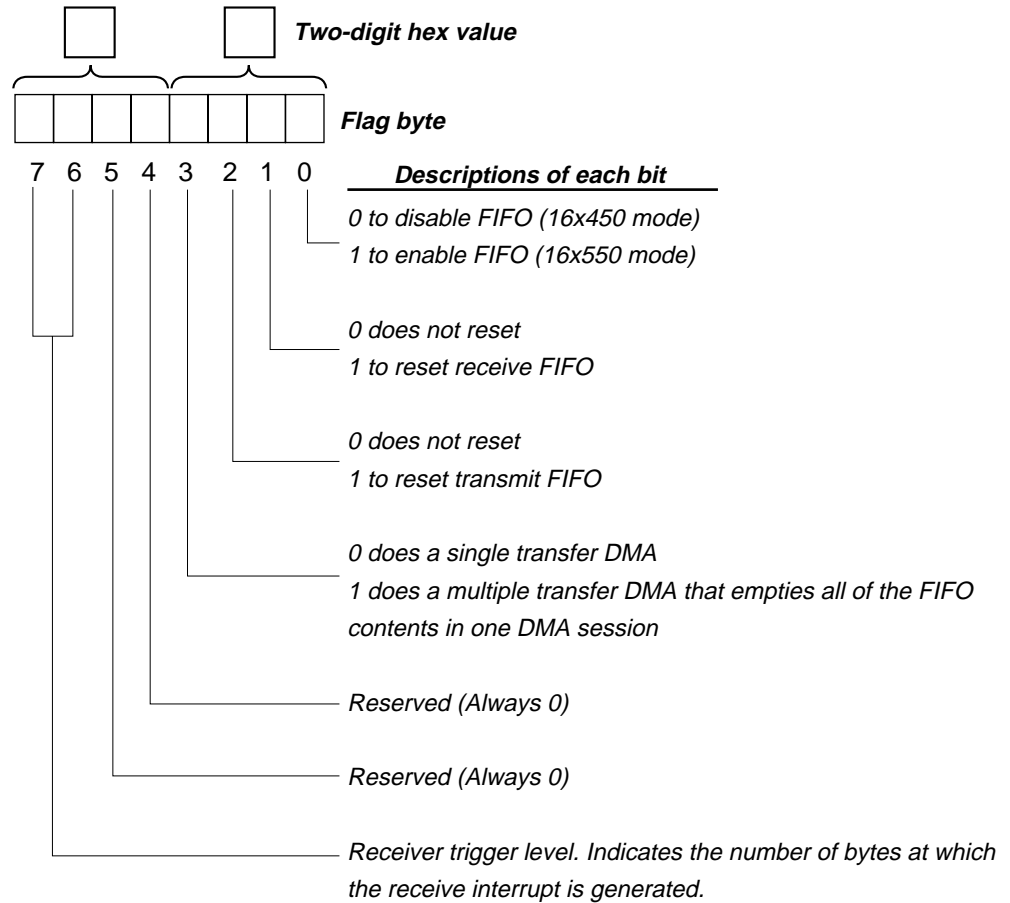
When you turn the reader back on, the reader sets the FCR to its default value, 0 hex, unless you have already specified a value that the reader can use to restore the FCR. You should specify another value if the default is not appropriate for how the communications application configures the FCR.

You need to determine if you should specify a value for the FCR, calculate what the value should be, and then specify the value. The next sections describe how to perform these tasks.

To determine if you should specify a value

- You must specify a value if you plan to run a non-Intermec communications application on COM1 that changes the reader's COM1 UART FCR to use UART 16x550 mode, and you do not load an Intermec protocol handler into memory.

Many communications applications change the reader's COM1 UART FCR to use UART 16x550 mode. To learn if your application uses UART 16x550 mode, see its manual.

Method for Calculating the Two-Digit Hexadecimal Value for the UART FIFO Control Register (FCR)


7	6	Number of bytes that generate a receive interrupt
0	0	1
1	0	4
0	1	8
1	1	14

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To calculate the two-digit hex value

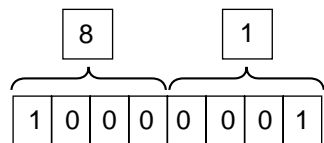
1. Use the illustration on the previous page as a guide for calculating the value for the FCR.

In this illustration, the two-digit hex value is the value you will specify for the FCR. Calculate this value by converting the contents of the FCR byte to two hexadecimal numbers.

The FCR byte contains eight bits. Each bit represents a parameter that controls how the UART buffer operates. You set or clear each parameter by setting each bit to 1 or 0.

2. Choose 1 or 0 for each bit in the FCR byte. Read the descriptions to decide whether to set or clear each bit.
3. Convert the bits to two hexadecimal numbers. The resulting two-digit hex number is the value you will specify for the FCR.

For example, a two-digit hex value of 81 enables UART 16x550 mode, requires the buffer to receive four bytes of data before generating a receive interrupt, and leaves all other parameters disabled:



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To specify the value

- Specify the value for the FCR using one of these methods:

Use IC.EXE Start IC.EXE, choose COM1 from the COM menu, and type the value into the FIFO CONTROL REGISTER parameter. For help using IC.EXE, see Chapter 5, “Configuring the Reader.”

Scan a command Scan the Communications Port, UART Restore command in Chapter 12, “Configuration Command Reference.”

Use software interrupts Use software interrupts in your application. For help, see your JANUS PSK reference manual.

Connecting the Reader to Another Device

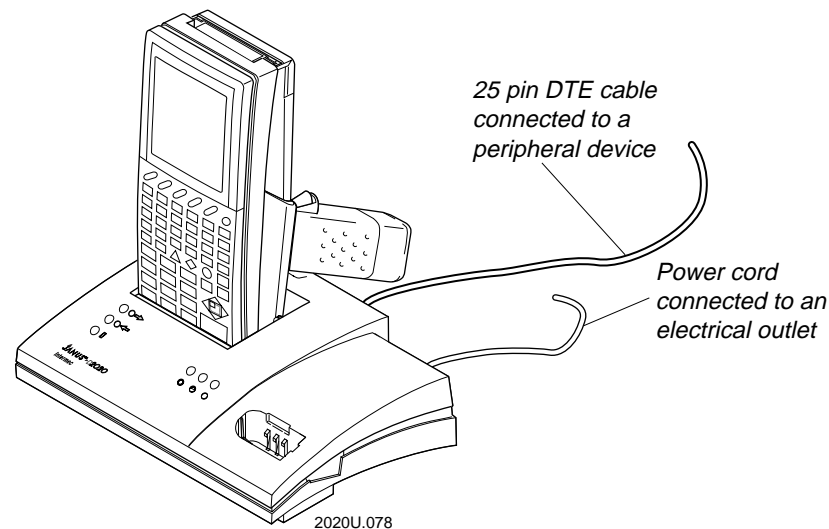
You can physically connect the reader to another device using one of the three methods described next.

Note: *If you have a JR2020, you do not physically connect the reader to another device. The reader communicates through radio signals instead of a physical connection.*

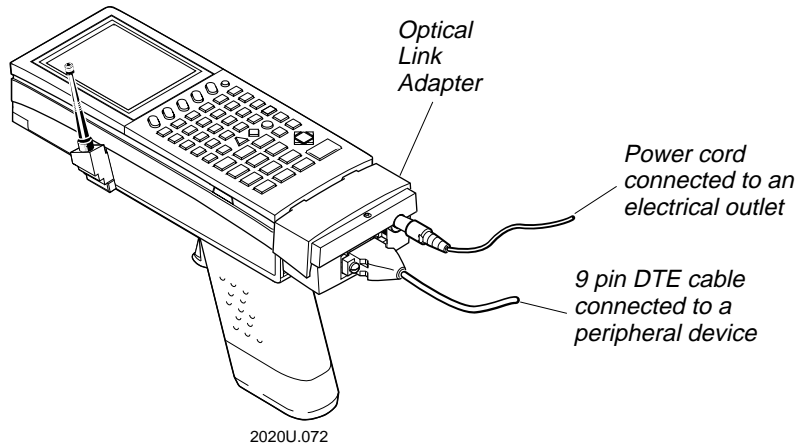
Communications Dock Place the reader in a communications dock and connect one or two devices to the dock's serial ports. The dock's network port is a 25-pin DTE connector and the auxiliary port is a 25-pin DCE connector. Depending on how you set the dock's DIP switches, the reader communicates with both ports or the ports communicate with each other.

If you plan to run Interlnk with the reader connected to a host computer through the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

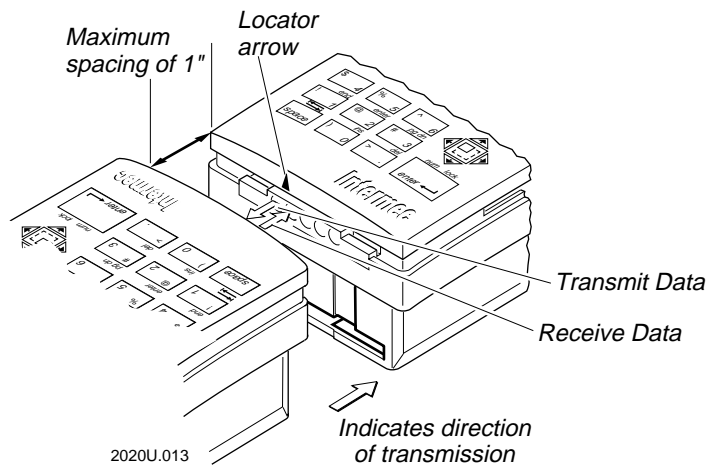
If the reader will communicate through **only one** port (network or auxiliary) on the reader communications dock, you must select that port with the Communications Dock Port command. For help, see "Communications Dock Port" in Chapter 12 or the *JANUS 2020 Communications Dock Quick Reference Guide*.



Optical Link Adapter Connect the optical link adapter to the optical port on the end of the reader. Then connect a device to the optical link adapter's serial port, which is a 9-pin DTE connector. For help, see the *JL2010 Optical Link Adapter Quick Reference Guide*.



Reader-to-reader Align two JANUS readers for direct communications. Line up the receive signal on the first reader with the transmit signal on the second reader. Line up the transmit signal on the first reader with the receive signal on the second reader. An arrow on the bottom of the reader helps you align the readers. The readers can be no more than 1 inch apart.



Running Interlnk to Transfer Files

With Interlnk, you can easily transfer files between your reader and a host computer or another reader. You can also make all the drives on one computer appear as if they are physically located on the other, so that you have unrestricted access to the contents of all the drives. You can run programs over the Interlnk connections.

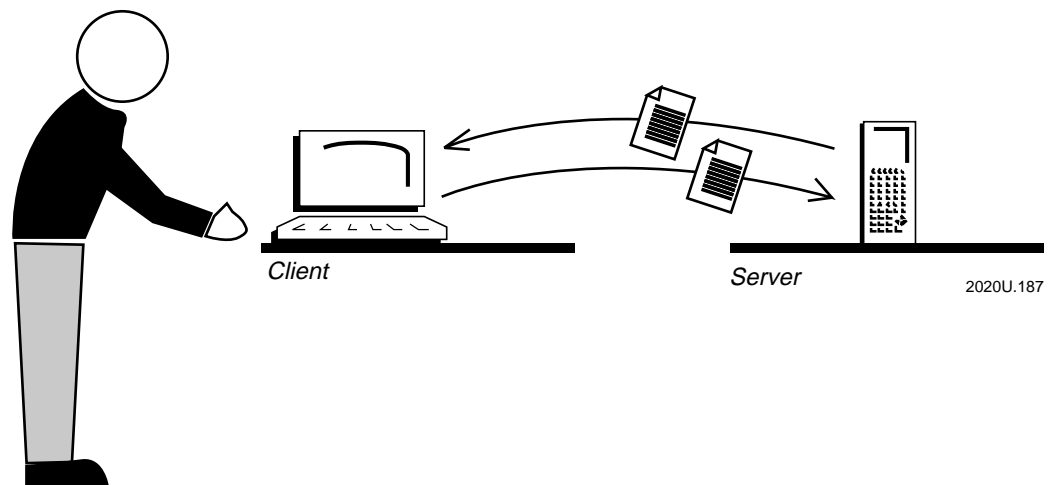
Note: You cannot execute IRL programs over an Interlnk connection. Also, you cannot run Interlnk in an RF network.

Differentiating Between Client and Server

The Interlnk utility consists of two programs: Interlnk and Intersvr. These two programs are designed to be run on separate computers:

- The computer running Interlnk is called the client.
- The computer running Intersvr is called the server.

The difference between client and server is a simple one: the client is the device from which you enter all commands. In this example, the host computer is the client:



Client The client is the computer from which you will access drives, directories, files, and programs that are stored on the server. You will type commands on the client's keyboard or keypad to access those drives.

Server The server is the computer that contains the drives, directories, files, and programs you want to access. The server's drives and printers look as if they are on the client. Intersvr displays the status of the connection between Interlnk and Intersvr on the server's screen.

Sometimes your reader will be the client, and sometimes it will be the server, depending upon the task you are trying to accomplish.

Intermec suggests that you always make the host computer the client because Interlnk requires more conventional memory than Intersvr and your host computer probably has more conventional memory available than your JANUS reader.

Your reader should be the client when:

- you want the drives on the host computer to show up on the reader as if they were physically part of the reader.
- there is an application on the host computer that you want to run on the reader.

Your reader should be the server when:

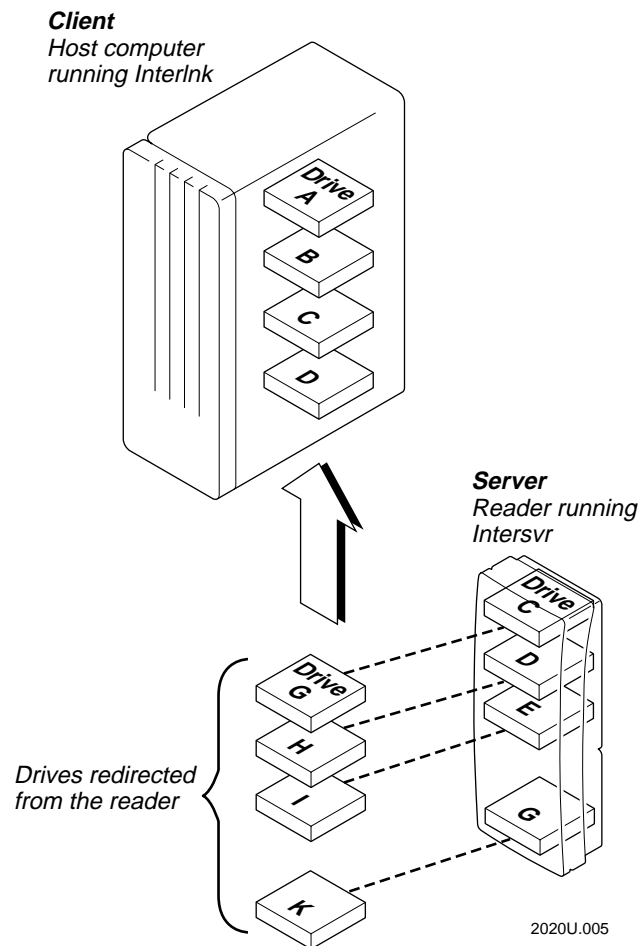
- you want the drives on the reader to show up on the host computer as if they were physically part of the host computer.
- there is an application on the reader that you want to run on the host computer.

Note: *The client cannot access a server's drive that was redirected before Interlnk was started, such as a network drive.*

Example of Using Interlnk

Suppose the host computer has two disk drives (A and B) and two hard drives (C and D). The JANUS 2020 has four drives: three simulated drives (C, D, and E) and one Type II PC card drive (G).

You want access to the drives on the reader while working at the host. Therefore, the host computer must be the client and the reader must be the server. Run Interlnk on the host computer and run Intersvr on the reader. Instructions for these tasks are included later in this chapter.



Note: Interlnk reserves drives E and F for the server's drives A and B, even though the reader does not have drives A and B. Interlnk also reserves drive J for the server's drive F, which is a placeholder on the JANUS 2020 reader.

Now the reader's drives appear on the host computer, as if they were physically located on the host computer. The host computer has its original drives A, B, C, and D, plus drives G, H, I, and K.

Drive I on the host computer is really the physical RAM drive E on the reader. Anything you do to the host computer's drive I affects the reader's drive E.

You can type standard DOS commands on the host computer's keyboard to access the directories and files in the reader's drives. For example, to display a list of files located in the root directory of the reader's drive E, type this command on the host computer:

```
dir i:\
```

To copy a file from a directory on the host computer's drive C to the reader's drive E, type this command on the host computer:

```
copy c:\shared\data\accounts.txt i:\accounts.txt
```

Interlnk System Requirements

Your host computer and reader must meet these requirements to run Interlnk and Intersvr:

- A serial port is available on the host computer and reader.
- The host computer is running DOS 3.0 or higher.
- The client has 16K of free memory.
- The server has 130K of free memory.
- The reader is connected to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

Installing Interlnk on the Host Computer

You need two files to run Interlnk:

INTERLNK.EXE The device driver that you load into the client's memory.

INTERSVR.EXE The program that you run on the server.

You must install those files on the host computer before you can run Interlnk or Intersvr on the host. You can install the files from either the MS-DOS companion disk 2 or the reader's drive D.

To install Interlnk on the host computer from companion disk 2

1. On the host computer, make sure that the current working directory is the directory where you want to install the Interlnk files.
2. Insert companion disk 2 into a disk drive on the host computer.
3. Copy INTERLNK.EXE and INTERSVR.EXE from companion disk 2 to the host computer.

To install Interlnk on the host computer from the reader's drive D

1. Connect the reader to the host computer using a 7-wire, null-modem serial cable and either the communications dock or optical link adapter.
2. Make sure that the MODE command is available on the host computer.
3. On the host computer, make sure that the current working directory is the directory where you want to install the Interlnk files.
4. At the reader's DOS prompt, type this command to copy the Interlnk files from the reader's drive D to the host computer:

```
intersvr /rcopy
```

Or scan this bar code:

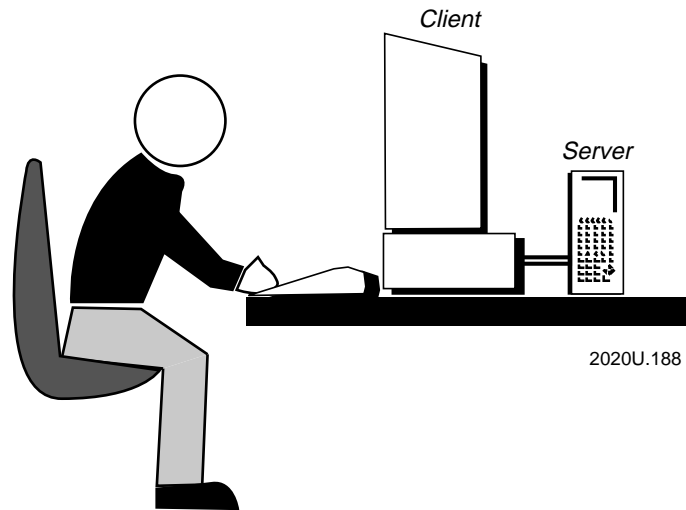


INTERSVR /RCOPY

Follow any instructions displayed on the reader. If the host computer locks up after you copy the files, reboot the host.

Making the Host Computer the Client

Follow these instructions to run Interlnk with the host computer as the client. When the host computer is the client, you can access all the reader's drives by typing commands on the host computer's keyboard.



To run Interlnk with the host computer as the client

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.
2. Edit the host computer's AUTOEXEC.BAT and CONFIG.SYS files:
 - Add a device command to CONFIG.SYS that specifies the location of INTERLNK.EXE and the number of drives to redirect from the server to the client. (If you do not include the /drives: option, Interlnk redirects three drives and you cannot access all the reader's drives.) For example:

```
device=c:\janus\network\interlnk.exe /drives:7
```
 - If you execute the Windows SMARTDRV.EXE on the host computer, remark it out of the AUTOEXEC.BAT or CONFIG.SYS file.
 - If you are not using the host computer's COM1 and you execute the DOS command SHARE.EXE on the host computer, remark out the SHARE command in the AUTOEXEC.BAT or CONFIG.SYS file.

3. At the reader's DOS prompt, type this command to start Intersvr:

```
intersvr
```

Or scan this bar code:



INTERSVR

The Interlnk Server Status screen appears, but no information is displayed because the connection has not been made yet.

4. On the host computer, press **Ctrl-Alt-Del** to reboot and load Interlnk from the CONFIG.SYS file.

Note: After you modify CONFIG.SYS and reboot your host computer once, you no longer need to reboot to establish a connection. Instead, you can type `interlnk` at the host computer's DOS prompt.

5. On the reader, the Interlnk Server Status screen is updated with information about the redirected drives. Use the viewport to view the screen. For help, see "Interpreting the Server's Status Screen" later in this chapter.

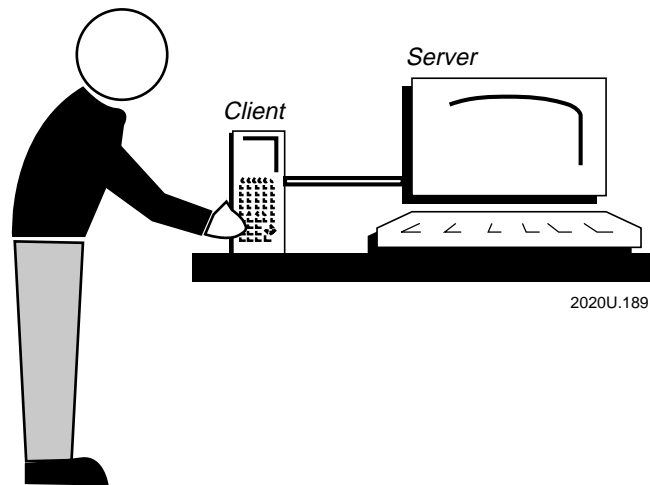
You are ready to start using your Interlnk connection. For example, if the client's drive E is redirected to the server's drive C, type this command at the client's DOS prompt:

```
e:
```

Any command you type at the client's drive E prompt will affect the server's (reader's) drive C.

Making the Reader the Client

Follow these instructions to run Interlnk with the reader as the client. When the reader is the client, you can access all the host computer's drives by typing commands on the reader's keypad.



To run Interlnk with the reader as the client





1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.
2. Start Intersvr by typing this command at the host computer's command prompt:

```
intersvr
```

If you are not using the host computer's COM1 to connect to the reader, specify the correct COM port in the command line. For example:

```
intersvr /com3
```

The Interlnk Server Status screen appears, but no information is displayed because the connection has not been made yet.

3. Press     to warm boot the reader. A command in the reader's CONFIG.SYS file automatically loads Interlnk into the reader's memory.


**Caution**

Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil

N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

On the host computer, the Interlnk Server Status screen is updated with information about the redirected drives. For help, see “Interpreting the Server's Status Screen” later in this chapter.

You are ready to start using your Interlnk connection. For example, if the client's drive H is redirected to the server's floppy disk drive A, type this command at the client's DOS prompt and press :

h:

Or scan this bar code:

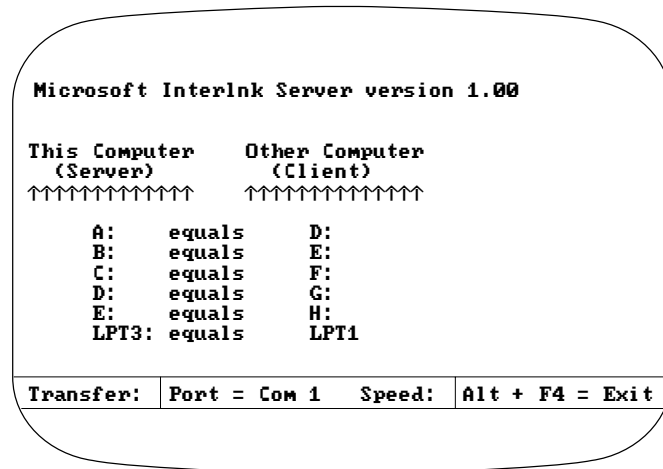


H.

All commands you type at the client's drive H prompt affect the server's drive A.

Interpreting the Server's Status Screen

When you start Intersvr, the server displays a status screen that contains two columns of information:



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This Computer (Server) This column lists all drives and printer ports on the server. The screen also displays the size of hard disk drives on the server.

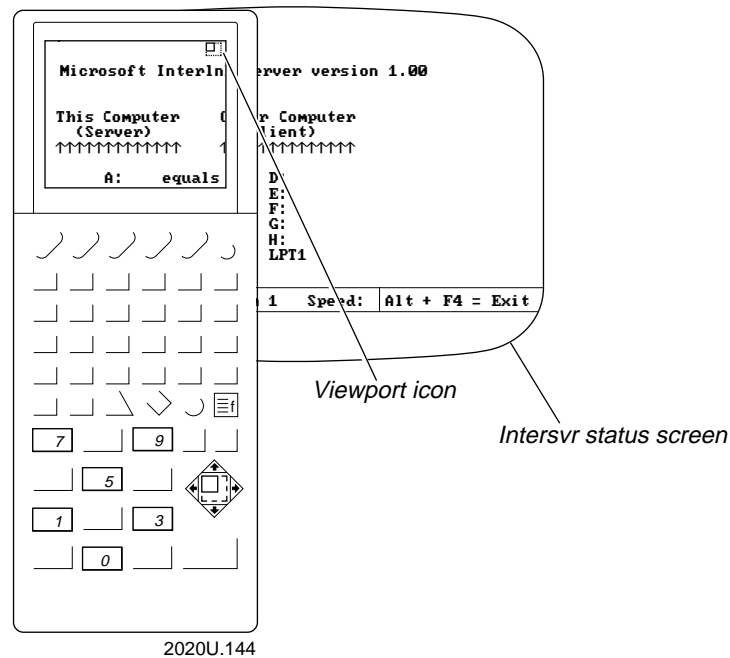
Other Computer (Client) This column lists the drive designation on the client for each drive redirected from the server.

While the client reads from or writes to the server, the word Transfer flashes at the bottom of the screen and an asterisk (*) appears next to the server drive being accessed. The status bar also indicates which server port is connected to the client and the baud rate.

To use the viewport when the reader is the server

When the JANUS reader is the server, the reader displays only the upper left corner of Intersvr's 25 x 80 status screen.

You can use the reader's viewport to see the whole status screen.



For help, see “Moving the Viewport” in Chapter 2 or use the commands on the next page.

Use these viewport movement commands:

To Move the Viewport

Press These Keys

Or Scan This Bar Code

Up

Viewport Up



%/

Down














 

Viewport Down



%+

Viewport Movement Commands (continued)

To Move the Viewport	Press These Keys	Or Scan This Bar Code
Right	 →	Viewport Right  *._*
Left	 ←	Viewport Left  *0%_*
To the cursor	  0	Viewport to Cursor  */_*
To the lower right corner of the display	  1	Viewport End  *..%.*
To the upper left corner of the display	  7	Viewport Home  *..%/*

Redirecting Drives From the DOS Prompt

From the DOS prompt, you can use the Interlnk command to redirect a client drive to a server drive:

```
interlnk client=server [client=server...]
```

where:

client is the letter of the client's drive to which you want to assign another server drive.

server is the letter of the server's drive.

For example, suppose you want to run an application on the host computer that uses data files stored on the reader's drive E. The application explicitly looks on host computer's drive G for the data files. When you start Interlnk, drive G on the client (the host computer) points to drive C on the server (the reader). Therefore, you must redirect the client's drive G to point to the server's drive E. Type this command at the client's DOS prompt:

```
interlnk g=e
```



To cancel the redirection of client drive G, type the command:

```
interlnk g=
```

Note: The client cannot access a server's drive that was redirected before Interlnk was started, such as a network drive.

Exiting Interlnk

You can break the connection between Interlnk and Intersvr at any time by pressing these keys on the server:

- If the server is the host computer, press **Alt-F4** on the host computer.
- If the server is the reader, press   on the reader.

If you remarked out SHARE.EXE or SMARTDRIVE in the host computer's AUTOEXEC.BAT or CONFIG.SYS, you should restore the commands now.

Restarting Interlnk

You can restart the connection between Interlnk and Intersvr by typing this command on the server:

```
intersvr
```

Or scan this bar code:



INTERSVR

If you are not using COM1, specify the COM port you are using.

You are ready to start using your Interlnk connection. If Interlnk will not restart, repeat the steps in “Making the Host Computer the Client” or “Making the Reader the Client” earlier in this chapter.

Running Communications Manager

Communications Manager lets you transmit and receive ASCII files, and request COM port and protocol status. The files for Communications Manager are shipped on the Application companion disk 3:

- CMANAGER.EXE
- CMGR.BAT
- CO001.DAT

Copy the Communications Manager files to the reader's drive C or PC card. For help, see "Running Interlnk to Transfer Files" earlier in this chapter.

You can run Communications Manager by using its menu interface or by typing commands at the DOS prompt. These methods are described next.

Using Communications Manager Menus

To start the Communications Manager application, scan this bar code:



CMGR

Or you can type this command at the DOS prompt:

```
cmgr [-portph]
```

where you have the option of loading a protocol handler:

port is the number of the COM port for which you are loading the protocol handler. This is an optional parameter.

ph is the code for the protocol handler you are loading:

- i Intermec protocol handler
- p PC Standard protocol handler
- r RF protocol handler

For example, to load the PC Standard protocol handler on COM1 and execute Communications Manager, type this command at the DOS prompt and press  :

```
cmgr -1p
```

Note: When you use Communications Manager with the PC Standard protocol handler, it automatically sets EOR to <CR><LF> and EOF to <SUB> for file transfers.

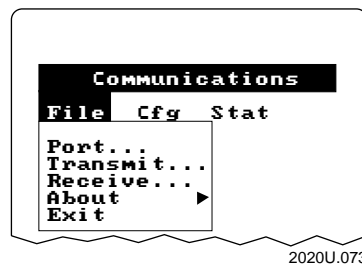
When you start Communications Manager, the main menu appears. The menu bar contains three menus:



File Select the File menu to designate which port to communicate through, and to transmit or receive ASCII files. The File menu also has a command to display the software version. You quit Communications Manager by selecting Exit from this menu.

Cfg Select the Cfg menu to set the communications protocol for each of the reader's COM ports and define the parameters for each selected protocol. See Chapter 12, "Configuration Command Reference," for a list of the protocols and their parameters.

Stat Select the Stat menu to view the status of the selected COM port, such as the protocol and parameters being used and whether the port is active or inactive.



The File menu contains these commands:

Port Lets you select the COM port to communicate through. For help, see "Identifying JANUS COM Ports" earlier in this chapter.

Transmit Transmits the selected file through the designated COM port. A screen displays the status of the transfer.

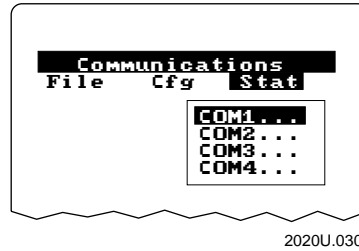
Receive Stores the file it receives from the designated COM port under the selected filename. A screen displays the status of the transfer.

About Displays the software version of Communications Manager.

Exit Exits Communications Manager.

Selecting Menus and Commands

Press **←** or **→** to select a menu name from the Communications Manager main menu. Then press **enter** to display the commands in the selected menu. In this example, you press **→ → enter** to display the Stat menu:



Press **↑** or **↓** to select a command or option from a menu, and then press **enter** to execute the command or option.

You can scan bar code labels listed in “Scanning Bar Codes to Select Menu Options” in Appendix C to move the cursor through the communications menus instead of pressing keys on the keypad.

Filling In Fields and Marking Check Boxes

You must move the cursor through the fields on a screen to the OK, Cancel, Next, or Prev buttons.

Task	Description
To move forward through the screen.	Press ↓ or f space .
To move backward through the screen.	Press ↑ or f f space .

If the screen contains a list of filenames, press **↓**, **↑**, **f** **space**, or **f** **f** **space** until the file is highlighted. Then press **enter** to select the file.

The screens contain two types of fields where you select or view the options for a parameter:

- In a toggle field, you press **←** or **→** to view the options for that field.
- In an entry field, you type a value into the field.

To learn how to enter ASCII control characters into fields, see “Entering ASCII Control Characters” in Appendix C. You can use ASCII control characters for some communications protocol characters.

Exiting Screens and Saving Changes

When you exit a screen, you can save or discard your changes:

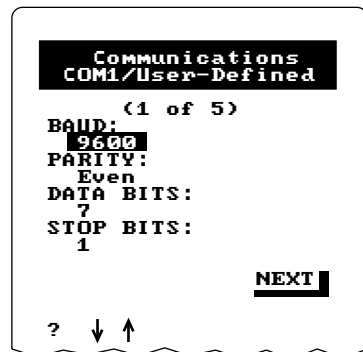
Task	Description
To exit a screen and save the changes.	Select OK and press <input type="button" value="enter ↵"/> .
To exit a screen and discard the changes.	Select Cancel and press <input type="button" value="enter ↵"/> Or press <input type="button" value="Esc"/> in any field.

Press , , , or to select the OK and Cancel buttons.

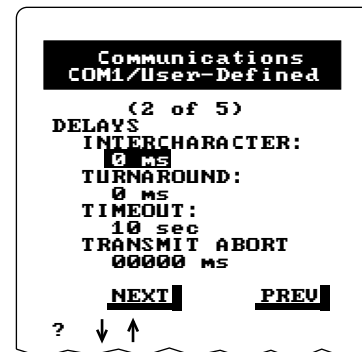
Using a Series of Screens to Configure a Parameter

Sometimes the Communications Manager presents a series of screens for one parameter. You must fill in fields or select options on each screen to configure the parameter.

For example, when you configure the User-Defined protocol for COM1, Communications Manager displays five screens of options for the protocol. Here are the first two screens in that series:



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You can tell that a screen is part of a series when you see the Next and Prev commands at the bottom of the screen. Next and Prev let you move forward to the next screen or back to the previous screen.

Pressing while the cursor is in any field is the same as choosing Next. As described earlier, you press or to move to the next field in the screen. You press or to move to the previous field.

Exiting Communications Manager

To exit Communications Manager, select Exit from the File menu and press .

Typing Commands at the DOS Prompt

You can use a DOS command line instead of the menu interface to transmit and receive files. The syntax for the command is:

```
cmgr [-reader_portph] -phost_port -stype -f[path\]file
```

where:

reader_port is the number of the reader's COM port.

ph is the name of the protocol handler:

- i Intermec protocol handler
- p PC Standard protocol handler
- r RF protocol handler

host_port is the number of the host computer's COM port.

type indicates whether you are transmitting or receiving:

- t to transmit
- r to receive

path is the directory for the file you are transmitting or receiving. If you omit the path, the current working directory is used.

file is the name of the file you are transmitting or receiving.

For example, to load the PC Standard protocol handler on the reader's COM1 and transmit a file called TEST.DAT from the host computer's COM1, type this command at the reader's DOS prompt:

```
cmgr -1p -p1 -st -ftest.dat
```

Downloading Applications Across the Network

You can use binary file transfer (BFT) to download applications to JANUS readers in 900 MHz RF and CrossBar networks. BFT can perform these tasks with or without assistance from the person operating the reader:

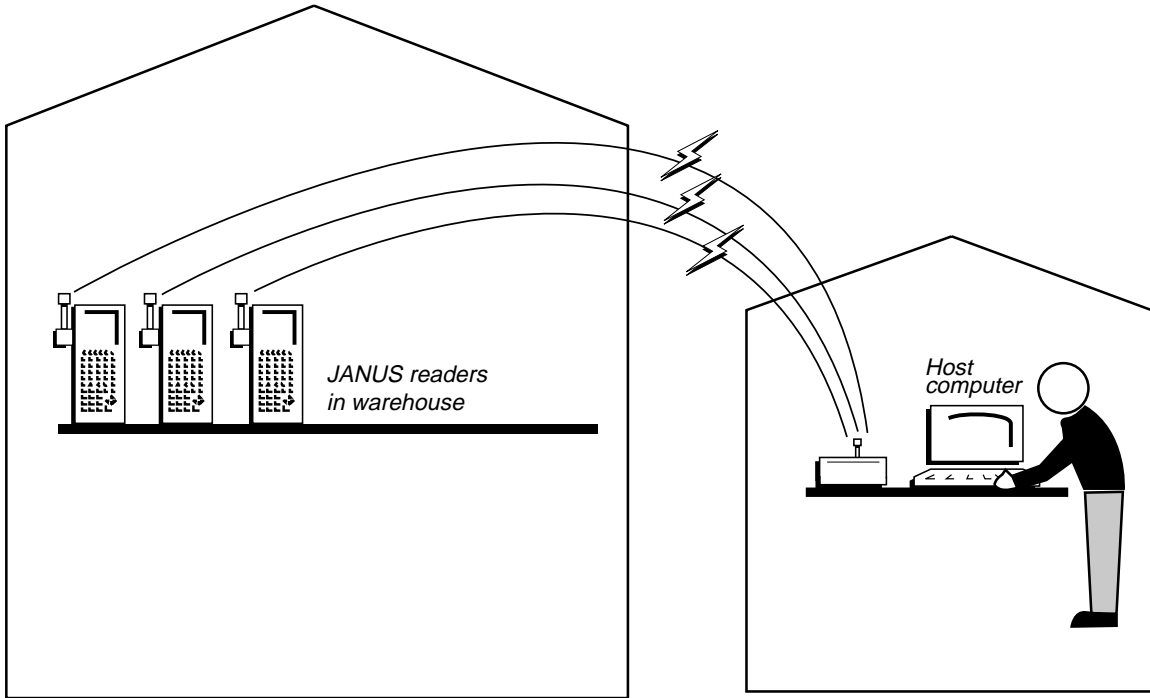
- Interrupt any PSK application, reboot the reader, and start the file transfer application (FTA) on the reader
- Transfer binary files (for example, an application) with error detection
- Change the contents of the reader's drive C by loading a new image file
- Run any program on the reader when the transfer or update is complete

Note: *The BFT functionality is provided by the file transfer application (FTA.EXE), which is stored on the Application companion disk 3.*

Examples of Using BFT

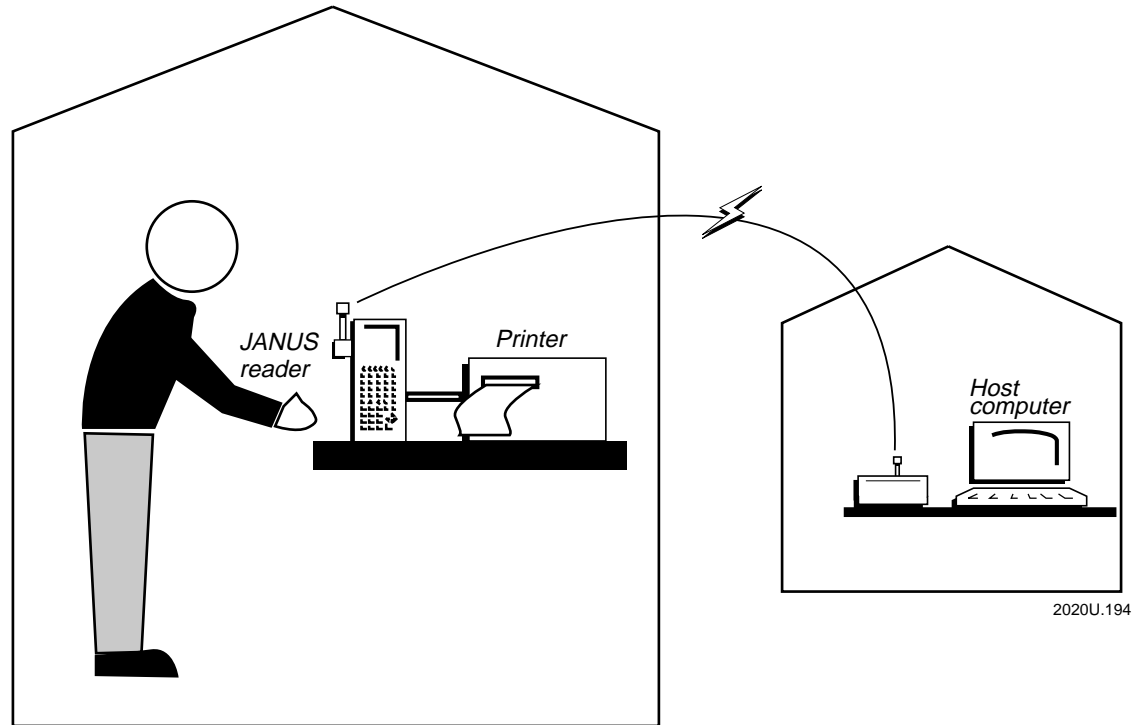
The next two examples illustrate how you can use BFT to update applications on networked JANUS readers by transferring new binary files to the readers.

Example 1: Updating Several JANUS Readers From a Host Computer



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From a single host computer, a system administrator uses BFT to download a new version of a data collection application simultaneously (using group queues) to every reader on the RF network in the warehouse while the operators are on their lunch break.

Example 2: Downloading an Executable File From a Host Computer

A service technician is using a JANUS reader to diagnose problems with a printer in the RF network. The technician may decide to use a test application that is stored on another computer in the RF network. Using BFT, the technician can download the application to the reader—without walking back to the computer, connecting the reader to the host computer, and using Interlnk to transfer the application.

Examining a Typical BFT Session

A typical BFT session, with the host computer acting as the client and the JANUS reader acting as the server, includes these activities:

- The host computer and readers are connected with a CrossBar or 900 MHz RF network.
- The operator starts a BFT-ready PSK application on the reader and either continues working or stops working.

Note: *A BFT-ready PSK application has been programmed to accept the host's Prepare for Reboot command, call a Prepare for Reboot PSK function, and notify the PSK library and host computer when the reader is ready to be rebooted. For help creating BFT-ready PSK applications, see your JANUS PSK reference manual.*

- From the host computer, an administrator starts the Data Collection Manager (DCM) or Interface Software (IS) application that manages the BFT process. This application sends a Prepare for Reboot command to a single reader or a group of readers.
- The PSK application on the reader accepts the Prepare for Reboot command, optionally performs housekeeping tasks (such as closing files), and sends a Ready for Reboot message to the host. This ensures that the host computer has received all data queued in the controllers, as well as indicates that the reader is ready to be rebooted.
- The host computer sends a Reboot command to the reader or readers. The reader reboots, and a command in AUTOEXEC.BAT starts FTSERVER.BAT if there is a copy of FTSERVER.BAT on drive C.

FTSERVER.BAT starts the file transfer application (FTA.EXE). If FTA detects that a host computer rebooted the reader to initiate a BFT session, FTA continues running. Otherwise, it terminates.

- The host computer can begin sending commands to the FTA:
 - The host computer may transfer binary files to and from the reader.
 - The host computer may update the reader's drive C with a 512K image.
 - The host computer may set the IM_APPLICATION DOS environment variable to an application on the reader that will be run when the FTA terminates.
- When the FTA terminates, the reader executes the command identified by the IM_APPLICATION DOS environment variable.

Preparing the Reader and Host Computer for BFT

To take advantage of BFT, you must set up your reader, host computer, and network as described in this checklist:

- Make sure the host computer and readers are connected through a CrossBar or 900 MHz RF network.

To use BFT in a CrossBar network, you must use the Multi-Drop communications protocol. You cannot, for example, use the User-Defined or Polling Mode D communications protocols.

- If you use Multi-Drop with BFT, do not set the baud rate higher than 9600 bps.

BFT transmits packets larger than 30 bytes to the reader. If you set the baud rate to 19.2 kbps, the reader cannot handle large incoming packets at that speed. An error condition develops: the communications application times out or waits indefinitely on a receive request, and the 9154 Multi-Drop Line Controller's fault light turns on.

- If you are using a 9180 Network Controller or 9154 Multi-Drop Line Controller, find out the version of the controller's firmware. You may need to modify the controller's asynchronous host computer parameters if the controller has an older version of firmware:

9180 If the 9180 firmware version is 2.1 or greater, you do not have to adjust the configuration to support BFT. However, if the version is less than 2.1, you must change the asynchronous host computer parameters to 8 data bits, rather than the default 7 data bits.

9154 If the 9154 firmware version is 2.6 or greater, you do not have to adjust the configuration to support BFT. However, if the version is less than 2.5, you must change the asynchronous host computer parameters to 8 data bits, rather than the default 7 data bits.

Note: *Intermec does not recommend using Binary File Transfer (BFT) to transfer large files in a CrossBar network with a 9154 Multi-Drop Line Controller.*

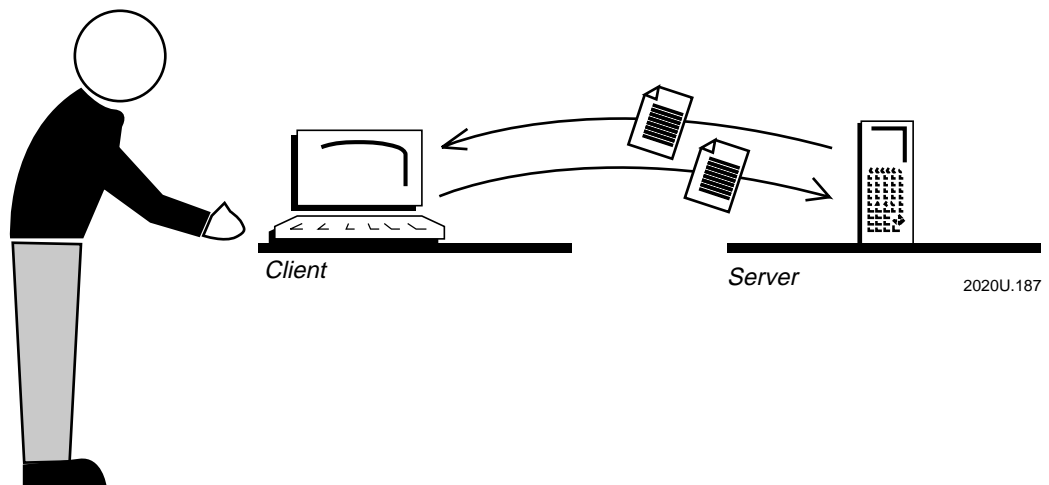
You can contact your Intermec service representative to learn how to order a firmware upgrade for the 9180 and 9154.

- The 9161 Multi-Drop and Port Concentrators do not support BFT.
- Create a DCM or IS application that will run on the host computer and communicate with the FTA on the reader. For help creating this application, read your DCM or IS documentation.
- Enable the Prepare for Reboot and Reboot commands with the Command Processing command (\$+DC) on the reader. These commands allow the reader to respond when the host computer initiates a BFT session. In the reader's default configuration, these commands are enabled. For help, see "Command Processing" in Chapter 12.

- ❑ Copy FTA.EXE and FTA.INI from the Application companion disk 3 to the reader's drive C. For help adding new files to drive C, see "Adding or Editing Files on Drive C" in Chapter 3.
- ❑ Run a BFT-ready PSK application on the reader so that when the host computer requests that the reader prepare for reboot, the reader can respond correctly. The PSK application must be programmed to expect the Prepare for Reboot command. For help, see "Prepare for Reboot" in Chapter 11 and your JANUS PSK reference manual.

Differentiating Between Client and Server

BFT is a client/server application, and you must decide which device (host computer or reader) is to be the client or server. The difference between client and server is a simple one: the client is the device from which you enter all commands. In this example, the host computer is the client:



The way you start the FTA on the reader determines whether the reader will be the client or server.

To make the reader the client

1. Type this command at the reader's DOS prompt to start the FTA:
`fta`
2. Type this command at the FTA prompt to open a BFT session:
`open`
3. From the reader, type the commands to transfer binary files or update the reader's drive C.

To make the reader the server

There are two ways to make the reader the server:

1. Type this command at the reader's DOS prompt to start the FTA:
`fta`
2. Type this command at the FTA prompt to make the reader the server:
`server`
3. From the host computer, type the commands to transfer binary files or update the reader's drive C.

Or,

1. Send the Prepare for Reboot command from the host computer to start the FTA on the reader.
2. When you receive the Ready For Reboot message from the reader, send the Reboot command from the host computer to the reader. This command reboots the reader and opens the BFT session.
3. From the host computer, type the commands to transfer binary files or update the reader's drive C.

Note: Because you cannot display the server's directories from the client, you must already know where each target file is located on the server.

Starting an Application When the FTA Terminates

When the host computer is the client, the host computer can identify an application that will be started automatically on the reader when the FTA is terminated on the reader.

For example, you finish transferring binary files to the reader, close the connection between the host computer and reader, and terminate the FTA on the reader. Next, you may want to restart the PSK application that was running on the reader when the host computer issued the Prepare for Reboot command.

To automatically start an application when the FTA terminates

1. From the host computer, issue a command that sets the reader's DOS environment variable `IM_APPLICATION` to an application on the reader. For help, see your DCM or IS documentation.
2. Terminate the FTA on the reader. The `%IM_APPLICATION%` command in the reader's `AUTOEXEC.BAT` executes, running the specified command on the reader. For help, see "Defining the Startup Files" in Chapter 3.


Using FTA Commands on the Reader

When the reader is the client, you can use these FTA commands:

CHECKHOST	LUPGRADE
CLOSE	OPEN
EXIT	PUT
GET	RUPGRADE
HELP	SERVER

Typing FTA Commands on the Reader

You can use the FTA commands on the reader by:

- typing a command at the FTA prompt. (The FTA prompt appears when you run the FTA by typing `fta` at the reader's DOS prompt.)
- typing one or more commands in a batch file.
- typing one or more commands on the DOS command line. Use a semicolon (;) between each command. For example, type this command and press  to open an FTA session, get a file from the host, and exit the session:

```
e:\> fta o; g filename; e
```

where *filename* is the path and name of the file to be transferred.

Learning the Syntax of FTA Commands

This section describes each FTA command and its syntax. You can abbreviate the command names as shown in the Syntax column of the next table. Also, you do not have to capitalize the commands; the commands are not case sensitive.

FTA Command Descriptions and Syntax

Command	Description	Syntax
CHECKHOST	Checks if the host computer rebooted the reader and is ready to proceed with the reader as the server and the host computer as the client. You can type this command only from the reader's DOS command line.	ch [<i>port</i>] where: <i>port</i> is the COM port for the connection. If you do not specify a port, the application uses the first port with an active protocol handler.
CLOSE	Terminates the connection with the host computer. You can abbreviate this command as CL.	c
EXIT	Terminates the FTA program and returns you to the DOS prompt on the reader.	e
GET	Copies a file from the host computer to the reader.	g <i>hfile</i> [<i>rfile</i>] where: <i>hfile</i> is the path and filename of the file to be transferred from the host computer to the reader. <i>rfile</i> is the destination path and filename on the reader. If you do not specify a <i>rfile</i> name, the <i>hfile</i> name is used.
HELP	Displays a description of the FTA commands, syntax, and parameters.	h
LUPGRADE	Upgrades the reader's drive C from the reader. Stands for "local upgrade."	l <i>file</i> c where: <i>file</i> is the path and filename of the image file on the JANUS reader, and C is the drive to be updated.

FTA Command Descriptions and Syntax (continued)

Command	Description	Syntax
OPEN	Establishes a connection with the host computer.	<p>o [port]</p> <p>where:</p> <p><i>port</i> can be the COM port for the connection. If you do not specify a port, the application uses the first port with an active protocol handler. Once a connection is open, you can type other FTA commands or type <input type="text" value="E"/> to exit.</p>
PUT	Copies a file from the reader to the host computer.	<p>p rfile [hfile]</p> <p>where:</p> <p><i>rfile</i> is the path and filename of the file to be transferred from the reader to the host.</p> <p><i>hfile</i> is the destination path and filename on the host. If you do not specify an <i>hfile</i> name, the <i>rfile</i> name is used.</p>
RUPGRADE	Upgrades the reader's drive C from the host. Stands for "remote upgrade."	<p>r file c</p> <p>where:</p> <p><i>file</i> is the path and filename of the image file on the host computer, and C is the drive to be upgraded.</p>
SERVER	Identifies the reader as the server, not the client. You will type all subsequent FTA commands at the host.	<p>s [port]</p> <p>where:</p> <p><i>port</i> is the COM port for the connection. If you do not specify a port, the application uses the first port with an active protocol handler.</p>

Editing the FTA Initialization File

The FTA initialization file (FTA.INI) controls how the FTA operates. You may need to modify INI parameters to match the timeouts with the speed of your network. You can use a standard ASCII text editor to edit the file. This table describes the parameters in the default FTA.INI file, which is stored on Application companion disk 3:

Parameter in FTA.INI	Description
HostOpenSessionTimeout=10000	Milliseconds FTA waits for the host to respond to an open session request in which the reader is the client.
HostStartServerTimeout=10000	Milliseconds FTA waits for the host to respond to an open session request in which the reader is the server.
ReceiveRecordTimeout=10000	Milliseconds FTA waits for the host to send the next data record while downloading a file to the reader.
StartUploadTimeout=10000	Milliseconds FTA waits for the host to respond to a request to begin uploading a file from the reader.
StartDownloadTimeout=10000	Milliseconds FTA waits for the host to respond to a request to begin downloading a file to the reader.
HostServerReadTimeout=10000	Milliseconds FTA waits for the host to send a command to the reader when the host is the client.
HostClientReadTimeout=65535	Milliseconds FTA waits for the host to send a command to the reader when the host is the server.
SendRecordTimeout=10000	Milliseconds FTA waits for the reader to transmit a record to the host.
JobRecoverAttempts=1	Number of times FTA attempts to recover a session with the host after that session has been lost.
EndTransmitTimeout=65535	Milliseconds FTA waits for the host to acknowledge that a file upload is complete.
TransmitResponseDelay=5000	Milliseconds FTA allows to elapse before it starts to upload a file from the reader to the host after the host sent the command to begin uploading the file.
ClearChannelTimeout=10000	Milliseconds FTA waits for data when the communications channel is being cleared.



Working With IRL

This chapter introduces Intermec's Interactive Reader Language (IRL) and explains how to use the IRL Desktop, specify the path for IRL files, interrupt and resume IRL programs, run IRL programs with limited conventional memory, and use the IRL reader commands covered in Chapter 11.

Learning About IRL

Interactive Reader Language (IRL) is a high-level programming language you can use to develop programs for your JANUS reader. IRL Version 4.1 comes with your JANUS reader. IRL features include:

- advanced bar code input capabilities.
- efficient reader power management.
- efficient memory management.
- ease of use for creating programs quickly.

You can create IRL programs using any DOS-based text editor and save the program as an ASCII text file. You can also write IRL programs on a PC with PC-IRL software and download them to the reader using the Polling Mode D protocol.

For help learning how to program in IRL, or how to take advantage of the IRL features that are available only on JANUS readers, see these manuals:

- *IRL Programming Reference Manual*
- *PC-IRL Reference Manual*

Note: *The default filenames for IRL programs and data files include braces {}. For example, you may see these filenames on the reader: {IRL-1}.IRL and {IRL-A}.IRD.*


Using the IRL Desktop

The IRL operating environment on the reader is called the IRL Desktop. The IRL Desktop is a menu-driven application that helps you run, download, transmit, and receive IRL programs.

This section covers these tasks:

- Opening the IRL Desktop
- Closing the IRL Desktop
- Exploring the IRL Desktop User Interface
- Executing Commands in the IRL Desktop
- Running an IRL Program
- Pausing an IRL Program
- Exiting an IRL Program
- Downloading an IRL Program
- Transmitting IRL Files
- Receiving IRL Files
- Clearing IRL Data Files

Opening the IRL Desktop

To open the IRL Desktop, type this command at the DOS prompt and press :

```
irl
```

Or scan this bar code:



IRL

You can load a protocol handler or run a program when you start the IRL Desktop by including one or both of these parameters in the command:

```
irl -[portph] [filename]
```

where:

port is the number of the COM port for which you are loading the protocol handler.

ph is the code for the protocol handler you want to load:

i	Intermec protocol handler
p	PC Standard protocol handler
r	RF protocol handler

filename is the name of the IRL program to run.

For example, to load the Intermec protocol handler on COM1 and open the IRL Desktop, type this command at the DOS prompt:

```
irl -1i
```

Or scan this bar code:




IRL -1I

To load the PC Standard protocol handler on COM1, open the IRL Desktop, and immediately begin running the STOCK.IRL program, type this command at the DOS prompt:

```
irl -1p stock.irl
```

Note: If you start an IRL program from the DOS prompt, you will return to the DOS prompt when you exit the program.

Closing the IRL Desktop

To close the IRL Desktop, select Exit from the File menu and press .

Exploring the IRL Desktop User Interface

When you start the IRL Desktop, the main menu appears. In the menu bar, there are two menus, File and About. The contents of the File menu appear automatically.

File This menu lets you transfer files, change directories, review file statistics, run an IRL program, and exit the IRL Desktop.

About This menu displays information about the reader and its configuration, including the amount of RAM and disk space available, the current paths for IRL files, the version of IRL, and the communications protocol configured for each COM port.

The File menu contains these commands:

Run Runs the IRL program you select.

Resume Resumes running an IRL program with all the status registers and variables reset to the values from when the program was halted.

Directory Lists all IRL files in the current directory.

Change Dir Changes the path for the data files and programs.

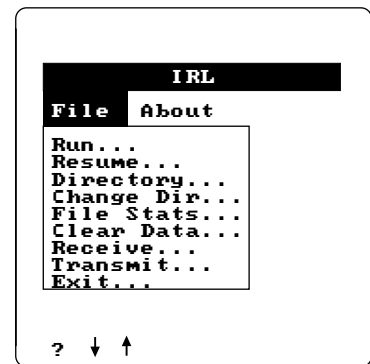
File Stats Indicates if a data file is dimensioned or undimensioned and the number of records entered. If the file is dimensioned, it lists the dimensions.

Clear Data Deletes all IRL data files with the default filename format: {IRL-0}.IRD, {IRL-A}.IRD to {IRL-Z}.IRD. Does not delete IRL data files with customized names (such as NEW.IRD).

Receive Receives a file through the designated COM port and stores the file under the selected filename. This command is equivalent to scanning an IRL File, Receive bar code.

Transmit Transmits the selected file through the designated COM port. This command is equivalent to scanning an IRL File, Transmit bar code.

Exit Exits the IRL Desktop.



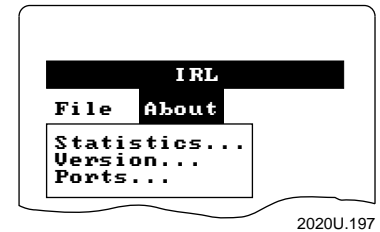
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The About menu contains these commands:

Statistics Displays information about the amount of memory and disk space available, and lists the path for data files and programs.

Version Displays the version of IRL running on the reader.

Ports Displays the communications protocol configured for each port. If you have not configured a protocol for a port or loaded a protocol handler, the port is not listed.



Selecting Menus and Commands

Press **←** or **→** to select a menu name from the IRL Desktop main menu. Then press **enter** to display the commands in the selected menu.

Press **↑** or **↓** to select a command from a menu, and then press **enter** to execute the command.

You can scan the bar code labels to move the cursor through the IRL Desktop menus instead of pressing keys on the keypad. For help, see “Scanning Bar Codes to Select Menu Options” in Appendix C.

Note: You can press **F1** to display the online help screen for a menu or command.

Moving the Cursor Through the Screen




Some screens list the options for each command or list filenames for you to choose. You need to move the cursor through the fields to the OK and Cancel buttons.







Task	Description
To move forward through the screen.	Press ↓ or F2 .
To move backward through the screen.	Press ↑ or F3 .

If the screen contains a list of filenames, press **↓**, **↑**, **F2**, or **F3** until the file is highlighted. Then press **enter** to select the file.

Exiting a Screen

When you exit a screen, you can save or discard your changes.

Task	Description
To exit a screen and save the changes.	Select OK and press  .
To exit a screen and discard the changes.	Select Cancel and press  . Or press  .

Usually, you can press , , , or  to select the OK and Cancel buttons. On some screens, such as the Change Directory screen, you must press  or .

Practicing With the IRL Desktop User Interface

You can follow the step-by-step instructions in “Specifying the Path for Programs and Data Files” later in this chapter to become more familiar with the keystrokes required by the IRL Desktop user interface.

Executing Commands in the IRL Desktop

You can execute commands in the IRL Desktop by:

- selecting the command from the IRL Desktop main menu.
- sending the command from the host computer. You must be running a communications application on the host computer, and the IRL Desktop must be open on your reader.
- scanning a Code 39 or Code 93 bar code label that contains the command. For bar code labels to scan, see the IRL commands in Chapter 11, “Reader Command Reference.”

Running an IRL Program


You can start an IRL program using any of the methods described next.

Note: You cannot execute IRL programs over an Interlnk connection.

- At the DOS prompt, type this command to start the IRL Desktop and immediately start running an IRL program:

```
irl [filename]
```

where *filename* is the name of the IRL program to run.

- From the IRL Desktop, choose the Run command in the File menu. The desktop lists the program files in the current directory. Use \blacktriangle and \blacktriangledown to select the program you want to run and press .
- When you download an IRL program from the host computer to the reader, append the Run command (//) to the end of the program. The program begins running when the download is complete.
- Using a communications application on the host computer, send the Run command to the reader. The command runs {IRL-1}.IRL, the default program.
- Scan this bar code label with the reader to run {IRL-1}.IRL, the default program:

Run IRL Program



//

The IRL Desktop checks the syntax of the program before it runs the program. If the program contains syntax errors, the reader emits three low pitched beeps and the desktop displays the line number(s) of the errors along with a message describing the error(s). Correct the program and run it again. During a syntax check, OK and Cancel buttons are displayed along with any error messages. Choose OK to continue the syntax check. Choose Cancel to terminate it.

If the IRL Desktop finds no syntax errors, it displays the amount of memory the program and symbol table use, and the amount of memory remaining. Then the program begins executing at the first program statement.

Pausing an IRL Program

You can press $\textcircled{I/O}$ to turn the reader off and place it in Suspend mode while an IRL program is running. When you press $\textcircled{I/O}$ again to turn the reader back on, the IRL program resumes running.

You can also exit an IRL program and resume running it later. For help, see “Resuming IRL Programs” later in this chapter.

Exiting an IRL Program

You can exit an IRL program using any of the methods described next.

Note: *If you started the IRL program by typing a command at the DOS prompt, you will return to the DOS prompt when you exit the IRL program. Otherwise, if you started an IRL program from inside the IRL Desktop, you will return to the IRL Desktop when you exit the IRL program.*

- Include the IRL Exit command (E) with a modifier in the program statements. When IRL reaches the command in the program, the program will exit.
- Send the Exit IRL command (/S) from the host computer.
- Scan this bar code label with the reader:

Exit IRL Program



/S

The program completes any housekeeping functions, such as closing files, and returns to either the IRL Desktop or DOS.

- Press the application break sequence from the reader's keypad to break out of an IRL program that is locked in an infinite loop. For help, see "Breaking Out of an Application" in Chapter 9.

Downloading an IRL Program

To download an IRL program, send a Start of Program (SOP) character followed by the program to be downloaded from the host computer. You can set the SOP character in the reader's configuration. The default is <SI>. For help, see "IRL SOP" in Chapter 12.


Note: *When you download a program, the IRL Desktop should be at the main menu, with no commands selected. Also, you must make sure that the appropriate communications protocol has been configured and activated, and that the corresponding protocol handler has been loaded.*

The IRL Program, Download command downloads the program you specify from the host computer to the reader. The command renames the program to {IRL-1}.IRL and copies it to the directory specified by the program path. If the program path is on a nonwritable drive, the program is copied to the data path. If there is an {IRL-1}.IRL program already in the directory, it is overwritten. The command also compiles the program without displaying a "Compiling" message. If an error occurs during the compile, an error message appears and control returns to the IRL Desktop.

You can also use PC-IRL, Collect, DCM, DFM, or Interscan to download IRL programs. For help, see the product's manual.

Transmitting IRL Files

You can transmit an IRL program or data file using any of these methods when the IRL Desktop is open:

- Choose the Transmit command from the File menu. A transmit screen lists the program files in the current directory. Use \blacktriangle and \blacktriangledown to select the program you want to transmit and press .
- Send an IRL Transmit file command from the host computer:

`%%filename`


where *filename* is the number or letter designation of the file: 0, 1, or any character from A to Z.

- Scan this bar code label with the reader:

Transmit IRL File



%%*

A transmit screen lists all of the files. Use \blacktriangle and \blacktriangledown to select the program to transmit and press . For help, see the *IRL Programming Reference Manual*.

Receiving IRL Files

You can receive a file from the host computer and store it under a specified filename using any of these methods when the IRL Desktop is open:

- Choose the Receive command from the File menu.
- Send an IRL Receive file command from the host computer:

`.%filename`

where *filename* is 0, 1, or any character from A to Z.

A receive screen appears. Type the filename to be received and choose OK. For help, see the *IRL Programming Reference Manual*.

- Scan this bar code label with the reader:

Receive IRL File



.%

A receive screen appears. Type the filename to be received and choose OK. For help, see the *IRL Programming Reference Manual*.

Clearing IRL Data Files

You can delete one or all of the IRL data files with default filenames: {IRL-0}.IRD, and {IRL-A}.IRD to {IRL-Z}.IRD. Use any of these methods when the IRL Desktop is open.

- Choose Clear Data from the File menu to delete all IRL data files. A message explains that the default data files will be deleted and shows the directory where the files are located. Choose OK to delete the data files.
- Scan one of these bar code labels with the reader to delete one or all of the IRL data files.

Clear All IRL Data Files



.\$

Clear {IRL-0}.IRD



.S0

Note: You can create bar code labels to delete {IRL-A}.IRD to {IRL-Z}.IRD.

If you choose to clear all data files, a message explains that the default data files will be deleted and shows the directory where the files are located. Choose OK to delete the data files.

If you clear one data file, IRL deletes the file without displaying a message or prompt.

- Send an IRL Clear file command from the host computer:

`.$filename`

where *filename* is 0 or any character from A to Z. If you do not include a filename, all IRL data files (0, A to Z) are deleted.



Caution

When the clear file command is sent from the host without data, all data is cleared and all files are deleted.

Conseil

Lorsque la commande d'effacement de fichier (clear file) est envoyée de l'hôte sans préciser les données à effacer, toutes les données sont effacées et tous les fichiers sont supprimés.

Specifying the Path for Programs and Data Files

The directory that is current when you open the IRL Desktop becomes the path for your IRL programs and data files. However, when the current drive is C or D, the first writable drive on the reader becomes the path.

If you do not want to use the current directory or first writable drive as the path, you can specify a path for programs and data files. There are several ways to specify the path:

How to Specify the Path

You set the IM_IRLPROG and/or IM_IRLDATA environment variables in your AUTOEXEC.BAT file.

You set the IM_IRLPROG and/or IM_IRLDATA environment variables at the DOS prompt.

You include the path for a data file in the OPEN command.

You select the path from the IRL Desktop.

How Long the Path Remains in Effect

This change remains in effect until you reset the path to another value. Each time you boot the reader, AUTOEXEC.BAT sets the path according to the environment variables.

Note: If you do not set the environment variables in AUTOEXEC.BAT, the current directory or first writable drive becomes the path when you boot the reader.

This change remains in effect until you reset the path to another value or boot the reader.

This change remains in effect for the data file until you modify the OPEN command.

This change remains in effect until you reset the path to another value, boot the reader, or exit the IRL Desktop.

The next sections describe these tasks:

- Setting the Path With an Environment Variable
- Including a Data File Path in the OPEN Command
- Selecting the Path From the IRL Desktop

Setting the Path With an Environment Variable

You can use the IM_IRLPROG and IM_IRLDATA environment variables to set the paths for programs and data files. You can include the environment variables in your AUTOEXEC.BAT file or type them at the DOS prompt.

To set the path for IRL programs with an environment variable

- Follow this command format:

```
set IM_IRLPROG=[drive:][\directory]
```

where:

drive is the letter of the drive where you will store programs.

Note: You can set IM_IRLPROG to any drive, even one that you cannot write to.

directory is the directory or directories where you will store programs.

For example:

```
set IM_IRLPROG=e:\sales\programs
```

To set the path for IRL data files with an environment variable

- Follow this command format:

```
set IM_IRLDATA=[drive:][\directory]
```

where:

drive is the letter of the drive where you will store data files.

Note: If you set IM_IRLDATA to a drive you cannot write to, the reader defaults to the drive that was current when you opened the IRL Desktop. If you cannot write to that drive, IRL uses the reader's first writable drive.

directory is the directory or directories where you will store data files.

For example:

```
set IM_IRLDATA=e:\sales\data
```

Including a Data File Path in the OPEN Command

You can specify the path for a data file in an IRL program by declaring the path in the OPEN command for files A through Z. For example:

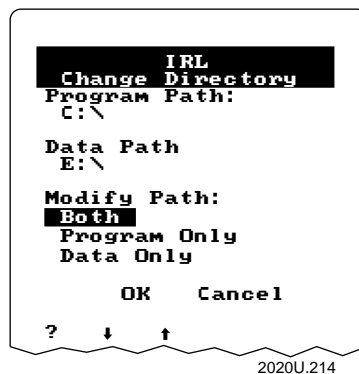
```
OD"e:\sales\accounts\orders.ird"(10,15)
```

This command creates File D, which is stored as ORDERS.IRD in the E:\SALES\ACCOUNTS directory. To learn more about the OPEN command, see the *IRL Programming Reference Manual*.

Note: You cannot specify a path for File 0 in an IRL program.

Selecting the Path From the IRL Desktop

1. Open the IRL Desktop.
2. Choose Change Dir from the File menu. This Change Directory screen appears.



The screen displays the paths currently set for IRL programs and data files. In this example, the program path is the root directory of drive C, and the data files path is the root directory of drive E.

You can use \blacktriangledown or \blacktriangleup to select Both, Programs Only, and Data Only—but you must use F2 or F9 to select the OK and Cancel buttons.

3. Decide if you want to modify one or both of the paths:

For This Task

Press These Keys

Set one path for both programs and data files.

Press \blacktriangledown until you select Both. Press enter .

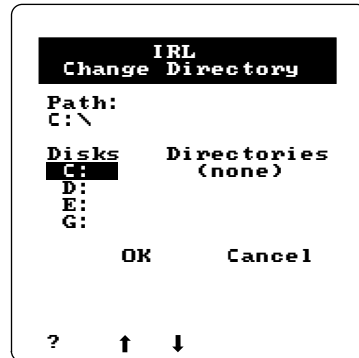
Set a path for programs only.

Press \blacktriangledown until you select Programs Only. Press enter .

Set a path for data files only.

Press \blacktriangledown until you select Data Only. Press enter .

The second Change Directory screen appears.



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4. Press \blacktriangledown or \blacktriangleup to select the disk drive for the path.
5. Press $F2$ to move to the Directories field, and then press \blacktriangledown or \blacktriangleup to select the directory for the path.

If the drive does not contain directories, (none) appears under the Directories heading, as shown in the second Change Directory screen.

6. To exit and save your changes, you must select OK at both Change Directory screens. Press $F2$ until you select the OK button, and then press $\text{enter} \leftarrow$. The first Change Directory screen appears. Again, press $F2$ until you select OK, and then press $\text{enter} \leftarrow$.
7. Use the IRL Desktop to perform another task.

Resuming IRL Programs

You can exit an IRL program, perform other functions (such as execute DOS commands, run other IRL programs, or put the reader in Suspend mode), and then resume the IRL program exactly where you left off.

Exiting a Program So You Can Resume It Later

You can resume an IRL program if you exit it using one of these methods:

- Execute the IRL Program, Exit (/S) command. You can scan a bar code that contains the command, or send the command from a host computer.
- Add to your IRL program an Exit command with a D modifier (ED). When the ED command executes, the program terminates and returns you to the DOS prompt.
- Press the application break sequence, as described in “Breaking Out of an Application” in Chapter 9.

You can exit multiple programs that can all be resumed later. IRL creates a *filename*.RSM file in the data file path for each program, where *filename* is the program name. The .RSM file contains information that lets IRL resume the program exactly where you left off. IRL deletes the .RSM file when you run or resume the program.

IRL also saves the name of the last program that was exited as described previously into the {LATEST}.RSM file. Every time IRL saves the filename to this file, it overwrites the last filename; therefore, the file always identifies the last IRL program that can be resumed. IRL deletes this file when you run or resume the program.

Resuming a Program From the DOS Prompt

To resume an IRL program from the DOS prompt, use this command:

```
irl [-rX] [filename]
```

where:

-r is the command that instructs IRL to resume a program. If you do not include the **-r**, IRL starts the program from the beginning and deletes the .RSM file.

X is an optional value to be placed in the status register (#0). Make sure there is no space between the **-r** and **X** value, or the value will not be placed into the status register (#0).

If you do not specify an **X** value, IRL sets the register to 0. If you supply an invalid value, IRL sets the register to 99999999.

IRL sets the status register only if you exited the program with the ED command. You determine the significance of this value. For example, you can use it to pass to the IRL program a status of some action taken while the user was in DOS.

filename is the name of the IRL program to resume running. If you do not specify a ***filename*** and you do include the **-r**, IRL resumes the last program exited, as identified in {LATEST}.RSM.

Resuming a Program From the IRL Desktop

Choose the Resume command from the File menu and select a program to resume. Or scan this IRL Program, Resume command (\$) from the IRL Desktop to resume the program identified in the {LATEST}.RSM file:

Resume IRL Program



\$.

Freeing Enough Memory to Run an IRL Program

If you see the message “Insufficient memory” when you try to run an IRL program from the IRL Desktop, you do not have enough conventional memory available to run the program and the IRL Desktop.

You may be able to free enough conventional memory to run the program by following the suggestions in “Making More Memory Available on the Reader” in Chapter 3.

You can also use the IRLXDESK utility instead of the IRL Desktop to run the program. IRLXDESK does not provide the IRL Desktop menu environment, so it uses less conventional memory than the IRL Desktop.

To run an IRL program with IRLXDESK

1. Make sure the IRLXDESK.EXE file is on your JANUS reader. You may need to copy the IRLXDESK.EXE file from the Application companion disk 3 to your reader. For help, see “Running Interlnk to Transfer Files” in Chapter 6.
2. If your IRL program requires a protocol handler, you must load it manually. IRLXDESK does not automatically load any protocol handlers. For help, see “Loading and Unloading a Protocol Handler” in Chapter 6.
3. Type this command at the DOS prompt:

```
irlxdesk filename
```

where *filename* is the name of the IRL program you want to run.

IRL Reader Commands

You can use these reader commands only from the IRL Desktop:

- IRL File, Clear
- IRL File, Receive
- IRL File, Transmit
- IRL Program, Download
- IRL Program, Exit
- IRL Program, Run
- IRL Program, Resume

The IRL reader commands are described in Chapter 11, "Reader Command Reference." You can execute these commands by:

- scanning a command from a Code 39 or Code 93 bar code label.
- choosing a command from a menu in the IRL Desktop by pressing keys on the keypad.
- sending a command from a host computer only when the host is running an application that uses Reader Services.
- executing a command in an IRL program only when the IRL Desktop is running.

Preparing the Reader for International Use

This chapter describes how to configure the reader to operate in French, German, Italian, or Spanish. The chapter also explains how to use an international keypad.

Configuring the Reader for a Language

You can configure your JANUS reader to operate in any language that is supported by DOS National Language Support (NLS).

The AUTOEXEC.BAT and CONFIG.SYS startup files on your reader will be changed to support the language you select. Because these files are stored on drive C, a ROM drive resident in flash memory, you must use a special utility, Auto-Loader, to replace them. To learn why drive C requires Auto-Loader, see “Learning How to Change the Contents of Drive C” in Chapter 3.

To configure the reader for a language:

1. Install Auto-Loader on your host computer.
2. Configure the reader for the language with Auto-Loader.

These steps are described in the next sections.

Installing Auto-Loader on Your Host Computer

You must install Auto-Loader from Boot companion disk 1 onto your host computer. Before you start installing Auto-Loader, make sure you have:

- A copy of companion disk 1, which contains the Auto-Loader software.
- DOS 3.3 or higher running on the host computer.
- COM1 or COM2 serial port available on the host computer.
- The host’s environment space, which is reserved by the SHELL command in CONFIG.SYS, should be at least four times the length of the pathname to which the installation will copy the required files.

Note: *If you want the reader to operate in English, you must install Auto-Loader according to the instructions in Chapter 3, “Learning About the Software.”*

To install Auto-Loader on your host computer

1. Insert companion disk 1 into a disk drive on your host computer.
2. Create the directory where you want to install Auto-Loader. Make that directory your current working directory.

Do not use the drive C root directory or install Auto-Loader on a pseudo-drive that was created with a third-party file compression software utility.

3. At the DOS prompt on the host computer, type this command:

```
source:install [country] [-port]
```

where:

- source* is the disk drive where you inserted companion disk 1.
- country* specifies the country that corresponds to the language the reader will operate in. Type a country name supported by DOS NLS: France, Germany, Italy, or Spain. This parameter is optional; the default is USA.
- port* is the number of the host computer's serial COM port that the reader is connected to. This parameter is optional; the default is COM1.

Here are two examples:

- If companion disk 1 is in drive A, the reader is connected to the host computer's COM1, and you want the reader to operate in French, type this command on the host computer:

```
a:install france
```

- If companion disk 1 is in drive B, the reader is connected to the host computer's COM2, and you want the reader to operate in Italian, type this command on the host computer:

```
b:install italy -com2
```

4. Wait for the installation procedure to finish and follow any instructions on the host computer's display.

The installation creates the C_FILES\COMMON directory that contains the default AUTOEXEC.BAT, CONFIG.SYS, and AUTOINST.BAT startup files. You can edit these startup files before loading them onto the reader. Do not remove or alter clearly commented statements that are required for Auto-Loader.

The installation also creates eight batch files in the directory you created for Auto-Loader. You will use LOADADD, LOADNEW, or LOADLANG to configure the reader to operate in a language. To learn about the other batch files, see "Auto-Loader Batch Files" in Appendix D.

Because the batch files are customized for the drive and directory where they are installed, you must reinstall Auto-Loader to move the files. Also, because the batch files are customized for the language you chose when you installed Auto-Loader, you must reinstall Auto-Loader to switch to another language.

Choosing a Method to Configure a Language

To configure the reader to operate in a language, you must change the contents of the reader's drive C. This section describes three procedures you can follow. The procedure you choose depends on what you expect drive C to contain, as shown in this table:

Contents of Drive C	Follow the Instructions in This Section
Three startup files from C_FILES\COMMON, and all files on drive C	"Using the LOADADD Batch File With the NLS Option"
Three startup files from C_FILES\COMMON, and additional files	"Using the LOADNEW Batch File"
Three startup files from C_FILES\COMMON	"Using the LOADLANG Batch File"

Note: *If you are using a JANUS 2020 with 2.4 GHz RF, you must configure the reader for a language before you install 2.4 GHz support.*

Using the LOADADD Batch File With the NLS Option

The LOADADD batch file adds NLS language support to the three startup files in the C_FILES\COMMON directory, creates an image file that contains those three startup files and all the files currently on the reader's drive C, and then loads the image file onto the reader's drive C. (The startup files currently on drive C are overwritten.)

To update drive C with the three startup files and all files currently on drive C





1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.
2. Connect the power supply to the communications dock or the optical link adapter.
3. The command you type in Step 5 will copy the default startup files from C_FILES\COMMON to drive C, overwriting the startup files on your reader. If you need to customize the default AUTOEXEC.BAT or CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.

When Auto-Loader copies the startup files, it adds commands at the end of the startup files to configure the reader to operate in the language you chose when you installed Auto-Loader on your host computer.

4. Make sure your current directory is the one where you installed the Auto-Loader batch files, or make sure that directory is listed in the path statement of your host computer's AUTOEXEC.BAT file.





5. Type this command on the host computer:

```
loadadd nls
```

6. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press     to warm boot the reader and start Interlnk. Auto-Loader begins updating drive C.

7. When the update is complete, the reader reboots automatically. Now you can exit Intersvr on the host computer by pressing **Alt-F4**. You see this message on the host computer:

```
Drive C: Installation process completed
```

8. Interlnk is still loaded in the reader's memory. If you need the conventional memory to run other applications, press     to warm boot the reader. Because Intersvr is no longer running on the host computer, a warm boot does not cause Interlnk to load itself into the reader's memory.

Using the LOADNEW Batch File

The LOADNEW batch file adds NLS language support to the three startup files in the C_FILES\COMMON directory to the reader's drive C. LOADNEW next copies the three files to the reader's drive C, plus any additional files you specify. All files currently on drive C are erased during this process.

To update drive C with the three startup files plus any additional files

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.
2. Connect the power supply to the communications dock or the optical link adapter.
3. Create a working directory on the host computer.
4. Copy all the files you want on drive C to the working directory except for the startup files, which must remain in C_FILES\COMMON.

If you want to copy files from drive C, you may need to start Interlnk to copy files. For example, if you have PC card drivers installed on drive C, you can copy them off the reader to your working directory. For help, see Chapter 6, "Networking the Reader."

You can also copy files from the companion disks that are shipped with the reader.

5. The command you type in Step 7 will copy the default startup files from C_FILES\COMMON to drive C, overwriting the startup files on your reader. If you need to customize the default AUTOEXEC.BAT or CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.

When Auto-Loader copies the startup files, it adds commands at the end of the startup files to configure the reader to operate in the language you chose when you installed Auto-Loader on your host computer.

6. Make sure your current directory is the one where you installed the Auto-Loader batch files, or make sure that directory is listed in the path statement of your host computer's AUTOEXEC.BAT file.
7. Type this command on the host computer:

```
loadnew [path\]filename [path\filename path\filename...]
```





where:





path is the drive and directory of the file or files to add to the image file and load to the reader.

filename is the name of the file or files to add to the image file and load to the reader.

You can include multiple *path\filename* and *path*.** parameters in the command. The *path*.** parameter loads all the files in a directory. For example:

```
loadnew c:\janus\data.txt c:\atadr\*. * c:\data\*. *
```

8. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press     to warm boot the reader and start Interlnk. Auto-Loader begins updating drive C.
9. When the update is complete, the reader reboots automatically. Now you can exit Intersvr on the host computer by pressing **Alt-F4**. You see this message on the host computer:


```
Drive C: Installation process completed
```
10. Interlnk is still loaded in the reader's memory. If you need the conventional memory to run other applications, press     to warm boot the reader. Because Intersvr is no longer running on the host computer, a warm boot does not cause Interlnk to load itself into the reader's memory.

Using the LOADLANG Batch File

The LOADLANG batch file adds NLS language support to the three files in the C_FILES\COMMON directory to the reader's drive C. LOADNEW next copies the three files to the reader's drive C. You cannot specify any additional files for drive C. All files currently on drive C will be erased during this process.


To update drive C with only the three startup files


1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.
2. Connect the power supply to the communications dock or the optical link adapter.
3. The command you type in Step 5 will copy the default startup files from C_FILES\COMMON to drive C, overwriting the startup files on your reader. If you need to customize the default AUTOEXEC.BAT or CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.

When Auto-Loader copies the startup files, it will add commands at the end of the files to configure the reader to operate in the language you chose when you installed Auto-Loader on your host computer.

4. Make sure your current directory is the one where you installed the Auto-Loader batch files, or make sure that directory is listed in the path statement of your host computer's AUTOEXEC.BAT file.
5. Type this command on the host computer:

```
loadlang
```

6. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press  to warm boot the reader and start Interlnk. Auto-Loader begins updating drive C.
7. When the update is complete, the reader reboots automatically. You see this message:

```
DOS NLS SUPPORT  
INSTALLED FOR  
country
```
8. You can exit Intersvr on the host computer by pressing **Alt-F4**.
9. Interlnk is still loaded in the reader's memory. If you need the conventional memory to run other applications, press  to warm boot the reader. Because Intersvr is no longer running on the host computer, a warm boot does not cause Interlnk to load itself into the reader's memory.

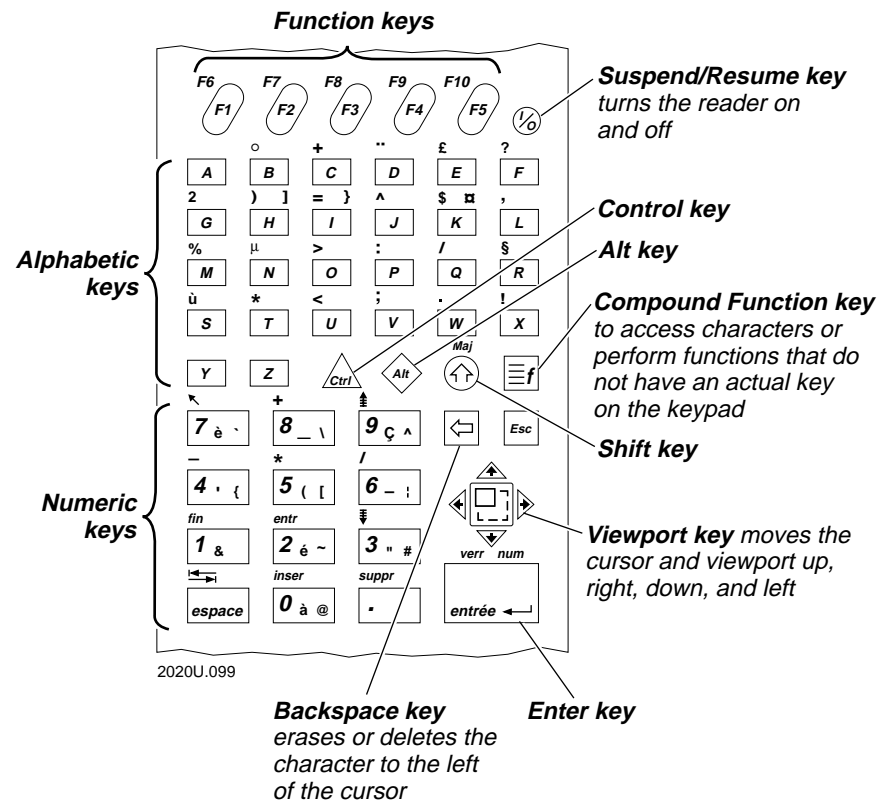
Using an International Keypad

You may use one of four international keypads with your JANUS reader: French, German, Italian, and Spanish.

Each international keypad is an alphanumeric keypad with 52 keys. You use special keys on the reader's keypad and press key combinations to access all 102 keys that are available on a PC keyboard.

Finding the Special Keys

Make sure you can find these special keys on your international keypad. This example shows the French keypad.



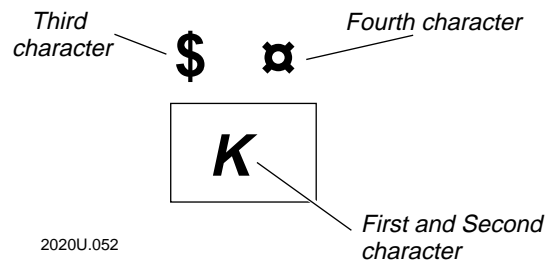
How to Type the Characters Printed on the Keypad







The reader's keypad contains characters that are printed both on the keys and above the keys (on the reader's top cover). This section describes how to type all the characters. For additional help, see "Using the Alphanumeric Keypad" in Chapter 2.

Typing the Characters On and Above the Alphabetic Keys

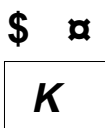
There are four types of characters and symbols printed on and above the alphabetic keys on an international keypad.

Example from the French keypad



Character	Description	To Type the Character
First	The first character is printed on the key. It is the lowercase version of each alphabetic key.	1. Press the key the character appears on.
Second	The second character is printed on the key. It is the uppercase version of each alphabetic key.	1. Press  . 2. Press the key the character appears on.
Third	The third character is the one that appears just above the key on the left side, printed on the top cover of the reader. Some keys, such as  , do not have a third character.	1. Press  . 2. Press the key the character appears above.
Fourth	The fourth character is the one that appears just above the key on the right side, printed on the top cover of the reader. Some keys, such as  , do not have a fourth character.	1. Press  . 2. Press  . 3. Press the key the character appears above.

To practice using an international keypad, type these characters

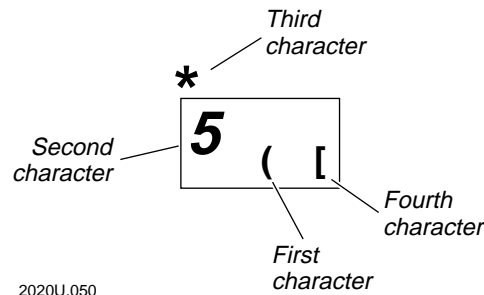


- To type the lowercase k, press .
- To type the uppercase K, press . Press .
- To type a dollar sign (\$) on a French keypad, press . Press .
- To type a  character on a French keypad, press . Press . Press .

Typing the Characters On and Above the Numeric Keys

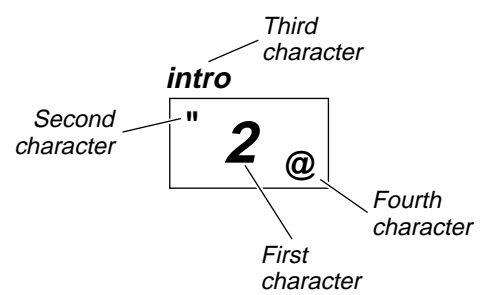
There are four types of characters and symbols printed on and above the numeric keys on an international keypad.






Example from the French keypad



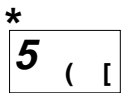
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Example from the Spanish keypad

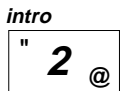


Character	Description	To Type the Character
First	The first character is printed in the middle of the key. Every numeric key on the keypad has a first character.	<ol style="list-style-type: none"> 1. Press the key the character appears on.
Second	The second character is printed in the upper left corner of the key. Some keys, such as  , do not have a second character.	<ol style="list-style-type: none"> 1. Press . 2. Press the key the character appears on.
Third	The third character is the one that appears just above the key, printed on the top cover of the reader. Every numeric key on the keypad has a third character.	<ol style="list-style-type: none"> 1. Press . 2. Press the key the character appears above.
Fourth	The fourth character is printed in the lower right corner of the key. Some keys, such as  on a German keypad, do not have a fourth character. The Italian keypad does not have a fourth character on the numeric keys.	<ol style="list-style-type: none"> 1. Press . 2. Press the key the character appears on.

To practice using an international keypad, type these characters



- To type a left parenthesis on a French keypad, press
- To type the number 5 on a French keypad, press . Press .
- To type an asterisk (*) on a French keypad, press . Press .
- To type a left bracket on a French keypad, press . Press .



- To type the number 2 on a Spanish keypad, press .
- To type double quotes (") on a Spanish keypad, press . Press .
- To use the intro function on a Spanish keypad, press . Press .
- To type the @ character on a Spanish keypad, press . Press .

Typing Diacritical or Accent Marks

You may need to type a special character with a diacritical or accent mark, such as Â, Ã, Ä. You use the key to type a diacritical mark and access characters that do not have an actual key on the keypad.

To type a diacritical or accent mark

1. Press .
2. Press the key the diacritical mark appears above. For example, press on the French keypad to type the " diacritical mark.
3. Press the key or key combination for the character you are modifying. For example, press on the French keypad to add the " diacritical mark to the uppercase letter A and type the character Ä.

Or, to type the diacritical mark only, press .

If you try to modify a character to which the diacritical mark does not apply, the reader sounds an error beep and displays the diacritical mark and the incorrect character.


Note: The characters above O and U constitute the 102nd key on a 101/102 enhanced PC keyboard. Both characters produce scan code 56H.

Using the Alt Key

On all versions of the reader's international keypads, the right Alt key is identical to the Alt Gr key on international PC keyboards.

- To enter a right Alt key, press .
- To enter a left Alt key, press .

Capitalizing All Characters




To type all alphabetic characters as uppercase letters, you can press  before every letter you type, or you can enable the Caps Lock feature.

To enable Caps Lock

Press  .

To disable Caps Lock

Press  .

Note: For many DOS NLS languages, you may press  to disable Caps Lock if it is active. For other DOS NLS languages, pressing   does not disable Caps Lock even if it is already active.

Using the Number Pad

You can use the number pad to move the cursor around the screen and to type numbers and mathematical symbols. The reader's number pad is designed to work like the number pad on a regular PC keyboard. If you are programming or using an application that requires the scan code for a character from the PC's number pad, you use the reader's number pad.

For example, you must use the PC's number pad to type a character from the extended ASCII character set. You cannot use the number keys above the alphabetic characters. You must also use the reader's number pad to type characters from the extended ASCII character set.

There are two ways to type numbers and mathematical symbols:

- Use the number keys 0 through 9 with the number pad disabled.
- Use the number keys 0 through 9 with the number pad enabled and the Num Lock turned on.



When you enable the number keypad, only the numbers shown on the keys are available. You cannot access the other characters printed **on** the numeric keys. However, you can always access the third character printed **above** the keys, whether the number keypad is enabled or disabled.

To enable the number pad

Press   .

To turn Num Lock on and off

Press  .

With the number pad enabled, you press   to toggle back and forth between Num Lock on and off.

To disable the number pad







Press   .

Using DOS Code Pages

All international keypads are translated using an installed DOS code page. DOS code pages contain both the standard ASCII character set and a set of national language characters specific to the language supported by the code page. You can find more information on DOS code pages in any DOS 5.0 manual.

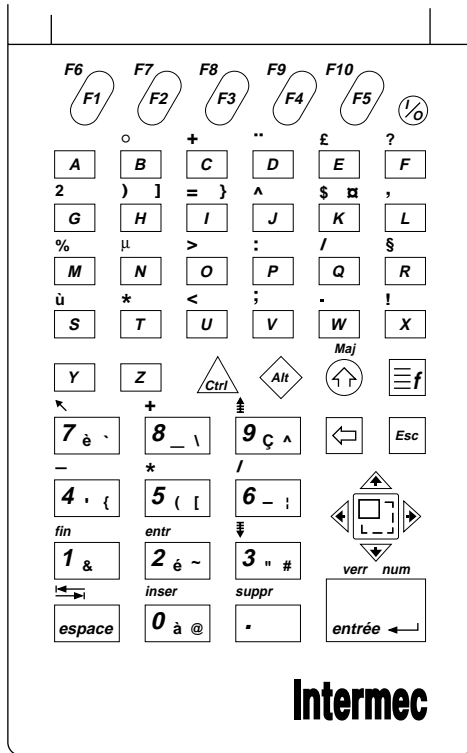
If you installed DOS NLS support for French, German, Italian, or Spanish, you can switch DOS code pages at any time from your DOS NLS language to English, and vice versa.

To switch the DOS code pages on the reader

- Press    to change to English key translations. This is the default DOS configuration.
- Press    to change to the key translations based on the code page installed for the reader (French, German, Italian, or Spanish).

Using the French Keypad

Use this illustration and example keypad chart to enter any character on the French keypad.



2020U.019

To Enter Press the Key(s)

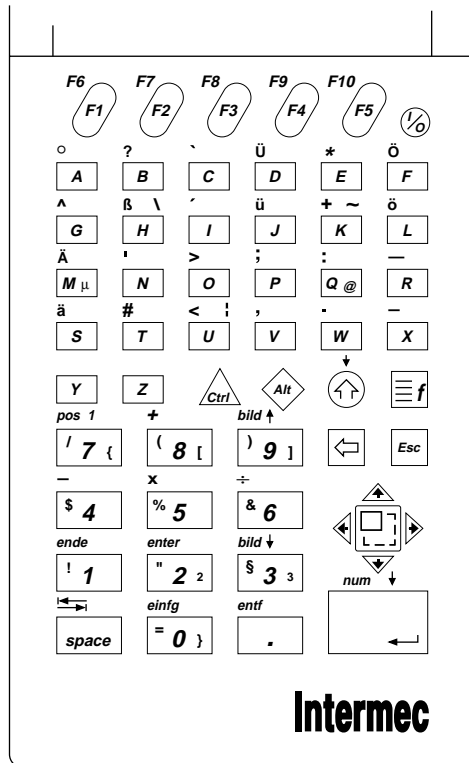
- h H
- H ⬆ H
-) ⌘ H
-] ⌘ ⌘ H
- p P
- P ⬆ P
- :
- (5
- 5 ⬆ 5
- * (asterisk) ⌘ 5
- [⌘ 5
- ¨ (accent mark) ⌘ D ⌘ space
- Ä ⌘ D ⬆ A
- Maj ⌘ ⬆

With Caps Lock (Maj) Enabled

- 0 to 9 0 to 9

Using the German Keypad

Use this illustration and example keypad chart to enter any character on the German keypad.

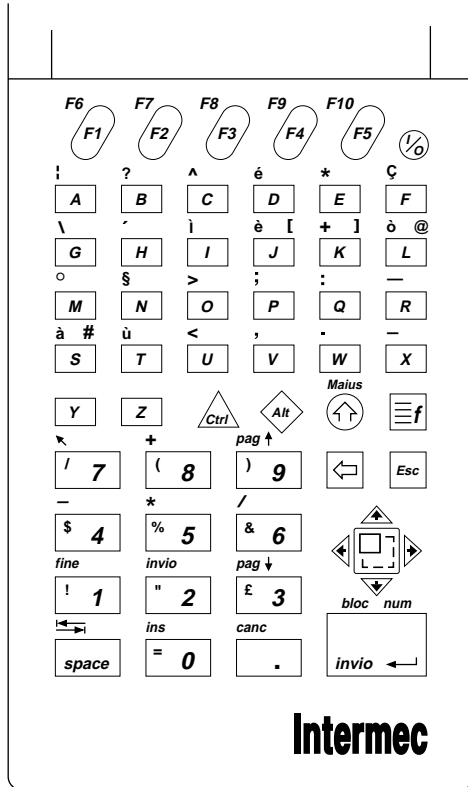


2020U.021

To Enter	Press the Key(s)
k	
K	
+	
~ (tilde)	
u	
U	
<	
| (pipe)	
8	
(
+	
[
` (accent mark)	
È	
Caps Lock (↓)	

Using the Italian Keypad

Use this illustration and example keypad chart to enter any character on the Italian keypad.



2020U.025

To Enter

Press the Key(s)

k



K



+



]



s



S



à



#



5



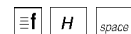
%



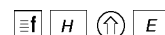
* (asterisk)



' (accent mark)



Ê

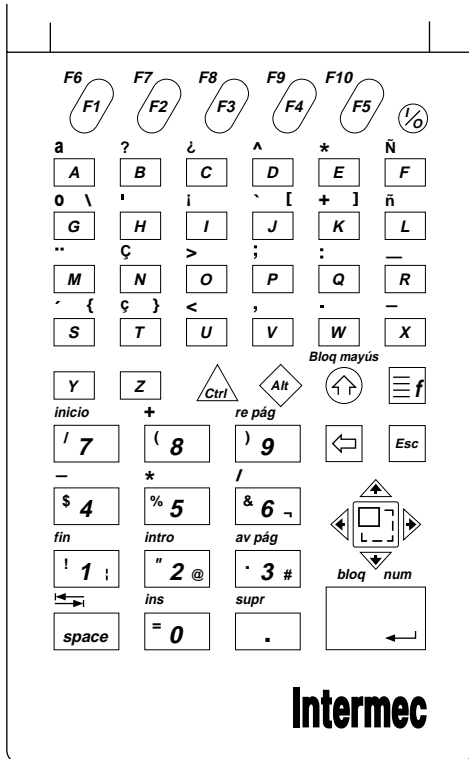


Maius



Using the Spanish Keypad

Use this illustration and example keypad chart to enter any character on the Spanish keypad.



2020U.023

To Enter

k
 K
 +
]
 t
 T
 Ç
 }
 2
 " (quotation marks)
 intro
 @
 ^ (accent mark)
 Û
 Bloq mayús

Press the Key(s)

K
 K
 K
 K
 T
 T
 T
 T
 2
 2
 2
 2
 space
 U

9

Booting and Resetting the Reader

This chapter describes how to boot and reset the reader, set a password for advanced reader commands, put the reader in Storage mode, dump the contents of conventional memory to a host computer, and load the reader's flash memory.

Booting the JANUS Reader

The bootstrap process for the JANUS reader is similar to the bootstrap process for a PC. However, while you often boot a PC, you seldom boot the reader. The next sections explain how and why you perform these tasks:

- Warm Booting the Reader
- Cold Booting the Reader
- Executing or Skipping the Startup Files

Warm Booting the Reader

You may warm boot the reader to run a startup file that has changed. You may also warm boot to start Interlnk.

A warm boot performs a power-on self test (POST) to ensure that the hardware and peripherals are operational, runs CONFIG.SYS and AUTOEXEC.BAT, and displays the DOS prompt. The contents of the physical RAM drive (drive E) remain intact.



Caution

Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil

N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

To warm boot the reader

- Press and release these keys in order:



Cold Booting the Reader

You may cold boot the reader to clear conventional memory, break out of an application locked in an infinite loop, or recover from an error condition.

A cold boot invokes the BIOS boot sequence, which verifies that the 256K flash system image is not corrupt, clears all memory, and performs a POST to ensure that the hardware and peripherals are operational. The cold boot initializes system hardware for use by system software, loads the default configuration, runs AUTOEXEC.BAT and CONFIG.SYS, and loads DOS. Because the physical RAM drive is initialized, all files on drive E are lost.

Note: If you need to cold boot the reader, you may be able to save the contents of the RAM drive. For help, see "Saving the Contents of the RAM Drive" in Chapter 10.



Caution

When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil

Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

To cold boot the reader

1. Press I/O to turn off the reader.
2. Press F9 - 2 - \leftarrow .
3. Press 2 .
4. Press I/O to turn the reader on.
5. Type the password if the reader prompts you to do so. If you fail to enter the correct password after three attempts, the reader resumes normal operation.
6. The Boot Loader menu appears.

The Reboot command is already selected.
Press enter to execute the Reboot command, which cold boots the reader.



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Executing or Skipping the Startup Files

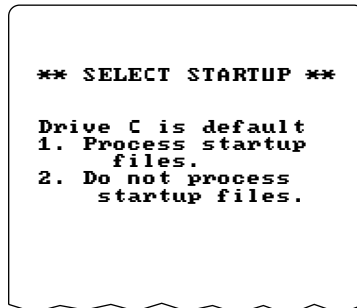
You can control whether AUTOEXEC.BAT and CONFIG.SYS are executed during warm and cold boots by choosing an option at the DOS setup screen.

You may use this feature if changes you made to AUTOEXEC.BAT or CONFIG.SYS cause the reader to lock up during the boot process. If you reboot without executing the startup files, you can correct the problem.

To specify if the startup files execute when the reader boots

1. Press **Ctrl** **Alt** **F1** to warm boot the reader, or cold boot the reader as described earlier in this chapter.
2. Press **B** when the reader displays the “Loading MS-DOS 5.0 ROM Ver” message.

The DOS setup screen appears.



2020U.198

3. Decide if you want option 1 or 2:
 - Option 1** The reader will execute the CONFIG.SYS and AUTOEXEC.BAT files on drive C when you boot the reader. If there are no startup files on drive C, the reader will not execute any startup files.
 - Option 2** The reader will not execute any startup files when you boot the reader. The reader will prompt you for the current date and time every time you perform a warm or cold boot.
4. Press **1** to choose option 1 or press **2** to choose option 2. The reader continues booting. Your choice is saved in the reader’s CMOS and used in future warm and cold boots.

Resetting the Reader

Resetting the reader can involve forcing the reader to turn off, or stopping applications and clearing the reader's conventional memory.

Note: Turning off the reader by pressing (⏻) does not clear the reader's conventional memory. When you turn the reader back on, it resumes operating just as it was before you put it in Suspend mode.

Forcing the Reader to Turn Off

If the reader will not turn off when you press (⏻), you can force the reader to turn off by pressing (⏻) - [5] - ⏴. It may take a few seconds before the reader turns off.

Later, when you press (⏻) to turn the reader on, the Boot Loader menu appears. From the menu, you can dump the contents of conventional memory to another computer and/or you can cold boot the reader.

For help, see "Dumping the Reader's 640K Conventional Memory" later in this chapter, and then see "Cold Booting the Reader" earlier in this chapter.

Breaking Out of an Application







If the application you are running becomes locked in an infinite loop, you can break out of that application without cold booting.

The procedure involves setting a flag, called the application break bit, in the reader. Applications check the application break bit when you turn on the reader to determine if they should resume running. If the bit is set to 1, the programs will not resume.

IRL applications automatically check the application break bit. If you are creating your own applications in C or Basic, you should make each application check this bit every time the reader is turned on. See your JANUS PSK reference manual to learn how to check the application bit.

Note: If your C or Basic application is locked in an infinite loop and does not check the application bit, you can cold boot the reader to break out of the application.

To break out of an application

1. Press  to turn off the reader. If you must force the reader to turn off, see the previous section.
2. Press  -  - .
3. Press  to set the application break bit in the reader.
4. Press  to turn on the reader.

If the application checks the application break bit, it should take appropriate action when it detects that the bit has been set.

If the application does not check the application break bit, it will resume running. You may have to cold boot the reader to break out of this application. For help, see “Cold Booting the Reader” earlier in this chapter.

Displaying the Boot Loader Menu

The Boot Loader menu appears when you enter a designated key combination, the system flash is corrupt, the BIOS checksums fail, or the reader cannot resume. From the Boot Loader menu, you can perform advanced reader commands, as described later in this section.

To display the Boot Loader menu

1. Press I/O to turn off the reader.
2. Press F9 - 2 - \leftarrow .
3. Press 2 .
4. Press I/O to turn on the reader.

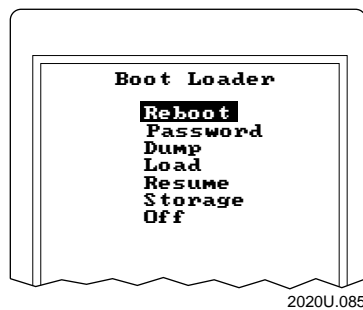
If you do not press a key within 60 seconds after a screen is displayed, the reader automatically shuts off and you have to start over at Step 1.

5. The reader may prompt you for a password. If so, you must enter the password before you can display the Boot Loader menu.

Type the password. You are allowed three attempts to type the password correctly. If you fail, the reader does not display the Boot Loader menu. Instead, the reader resumes normal operation.

Note: The reader comes from the factory with the password disabled.

6. The Boot Loader menu appears.



The Boot Loader menu lists seven commands and displays status messages or checksum messages at the bottom of the screen. The commands are:

Reboot This command lets you cold boot the reader. A cold boot clears conventional memory and destroys all buffered data. For help, see “Cold Booting the Reader” earlier in this chapter.


Password This command lets you enable or disable a password that all users must enter to display the Boot Loader menu. For help, see “Limiting Access to Advanced Reader Commands” later in this chapter.

Dump This command lets you transmit the lower 640K of memory out through COM1. You might use this feature when the reader is not functioning and you need to save the contents of conventional memory. For help, see “Dumping the Reader’s 640K Conventional Memory” later in this chapter.

Load This command lets you load the reader’s flash memory from a host computer connected to a serial port. You may reload the default flash memory to correct an error condition or you may upgrade the reader’s software. For help, see “Loading Flash Memory” later in this chapter.

Resume This command lets you exit the Boot Loader menu and resume operating as you were before you displayed the Boot Loader menu. For example, if the reader was executing an application, the application continues. If there is a bad checksum or the flash is corrupt, the reader cannot resume. For help, see “Powering Up or Booting the Reader” in Chapter 10.

Storage This command lets you put the reader in Storage mode, which helps preserve the life of the backup battery. All data stored in RAM is lost when you enter Storage mode. You should place the reader in Storage mode if you are not going to use it for one week or more. For help, see “Using Storage Mode to Preserve the Backup Battery” later in this chapter.

Off This command lets you exit the Boot Loader menu and put the reader into Suspend mode. When you press  to turn the reader back on, the reader resumes normal operation. For help, see “Turning the Reader On and Off” in Chapter 1.

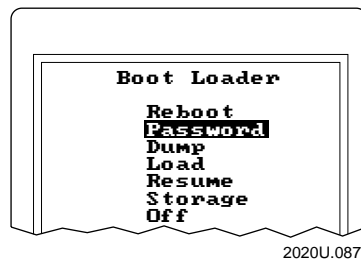
Limiting Access to Advanced Reader Commands

You can set a password on the reader to limit access to advanced reader commands. Only users who correctly type the password can display the Boot Loader menu and exit from Storage mode.

If you lose or forget the password, call your Intermecc service representative.

To set the password

1. Display the Boot Loader menu:
 - a. Press I/O to turn off the reader.
 - b. Press F9 - 2 - \leftarrow .
 - c. Press 2 .
 - d. Press I/O to turn on the reader.
 - e. Type the password if the reader prompts you to do so. If you fail to enter the correct password after three attempts, the reader resumes normal operation.
2. The Boot Loader menu appears. Press \downarrow until you highlight Password.



3. Press enter . The PASSWORD screen appears.



4. Type the new password and press .
Your password can contain up to seven characters.
5. Type the new password again for verification and press .
- If you type the password incorrectly, you receive an error message and you need to repeat Steps 4 and 5.
6. Select Resume from the Boot Loader menu.
The reader resumes operating. You will be prompted for this password when you display the Boot Loader menu or exit Storage mode.

To disable the password

1. Display the Boot Loader menu. For help, see the previous set of steps.
2. At the Boot Loader menu, press ▼ until you highlight Password.
3. Press . The PASSWORD screen appears.
4. Press twice without typing any other characters. This action disables the password by creating a null password.
5. Select Resume from the Boot Loader menu.

Using Storage Mode to Preserve the Backup Battery

If you are not going to use the reader for 1 week or more, you must put it in Storage mode to preserve the life of the lithium backup battery. While the reader is in Storage mode, the NiCad battery pack must be removed; otherwise, the reader slowly drains the battery pack and backup battery.



Caution

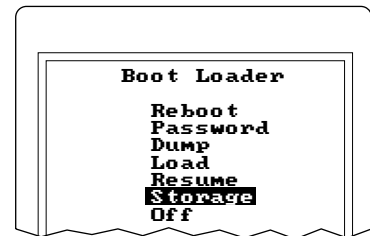
All data in conventional memory will be lost when you put the reader in Storage mode.

Conseil

Toutes les données dans la mémoire conventionnelle perdront lorsque vous mettez le lecteur en mode de stockage.

To put the reader in Storage mode

1. Display the Boot Loader menu:
 - a. Press I/O to turn off the reader.
 - b. Press F8 - 2 - \leftarrow .
 - c. Press 2 .
 - d. Press I/O to turn on the reader.
 - e. Type the password if the reader prompts you to do so. If you fail to enter the correct password after three attempts, the reader resumes normal operation. You will be prompted for this password again when you exit Storage mode.
2. The Boot Loader menu appears. Press \blacktriangledown until you highlight Storage.
3. Press $\text{enter} \leftrightarrow$. The reader goes into Storage mode and shuts off.
4. Remove the NiCad battery pack. For help, see “Removing the Battery Pack” in Chapter 2.



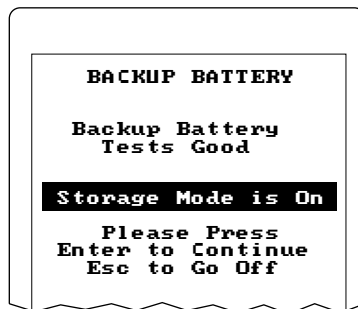
2020U.089

Note: *The reader does not enter Storage mode until you remove the battery pack.*

To exit Storage mode

1. Install the reader's NiCad battery pack. For help, see "Installing the Battery Pack" in Chapter 2.
2. Press I/O to turn on the reader.
3. Type the password if the reader prompts you to do so. The Boot Loader menu appears.
4. From the Boot Loader menu, select Reboot.

The reader begins rebooting, displays the BACKUP BATTERY screen, and asks if you want to exit Storage mode.



2020U.039

5. Press Enter to exit Storage mode, continue booting the reader, and return to the DOS prompt.

Note: If you press Esc the reader remains in Storage mode. Immediately remove the battery pack, as described in Chapter 2.

Dumping the Reader's 640K Conventional Memory

If you cannot resume the reader, you may need to cold boot the reader or load flash memory to resolve the error condition. However, all data in conventional memory will be lost when you perform either of these tasks.

You can save the contents of the reader's 640K conventional memory by dumping it to a host computer. The host computer must be running a communications program that can receive and store the data from the reader's memory.


To dump the reader's 640K conventional memory to a host computer

1. Connect the reader to a host computer using the optical link adapter or the communications dock. The reader transmits and receives data at 4800 baud, no parity, 8 data bits, and 1 stop bit.
2. Run a communications program, such as Crosstalk, that saves data on the host computer. This program is not provided with the reader.
3. Display the Boot Loader menu:
 - a. Press I/O to turn off the reader.
 - b. Press $\text{FS} - \boxed{2} - \blacktriangleleft$.
 - c. Press $\boxed{2}$.
 - d. Press I/O to turn on the reader.
 - e. Type the password if the reader prompts you to do so. If you fail to enter the correct password after three attempts, the reader resumes normal operation.
4. The Boot Loader menu appears. Press \blacktriangledown until you select Dump, and then press $\boxed{\text{enter} \leftarrow}$.



2020U.091

The reader dumps data from low memory (640K and below) through COM1 to the host computer. The data is transmitted in Intel hexadecimal object file format.

5. A record counter on the reader display counts the data as it is transmitted to the host computer. The record counter stops updating when the reader is finished downloading the data.
6. Choose your next step. You can cold boot the reader by choosing the Reboot command and pressing . Then you can use the reader.

If you dumped the 640K because the Boot Loader menu displayed the “Bad BIOS Checksum” error message or because the flash memory was corrupted, you must load the flash memory now. For help, see the next section, “Loading Flash Memory.”

Loading Flash Memory

You can download all of the reader's flash memory from a host computer if the Boot Loader menu displays the "Bad BIOS Checksum" error, if flash memory is corrupted, or if you need to upgrade the reader's software.

Loading flash memory replaces:

- drive C, the 512K ROM drive resident in flash memory.
- drive D, the 2MB ROM drive.
- the 256K flash system image.

Also, because you will reboot the reader near the end of this process, the contents of the physical RAM drive (drive E) will be destroyed.



Caution

When you load the reader's flash memory, all data in conventional memory will be lost.

Conseil

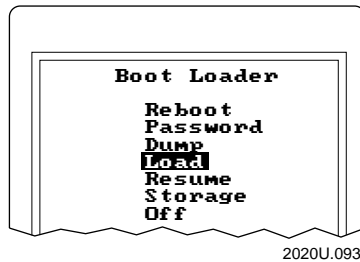
Lorsque vous chargez la mémoire flash du lecteur, vous perdez toutes les données de la mémoire conventionnelle.

If you are upgrading the reader's software, follow the instructions in the *JANUS Software Upgrade Instruction Sheet*.

To load the reader's flash memory

1. Decide if you want to save the contents of conventional memory. If so, you must perform the steps in the previous section, "Dumping the Reader's 640K Conventional Memory," now.
2. Decide if you want to save any files on drives C and E, such as customized startup files, applications, or configuration files. If so, you must copy the files to a PC card, another reader, or a host computer now. For help, see "Running Interlnk to Transfer Files" in Chapter 6.
3. Connect the reader to a host computer using an optical link adapter or the communications dock. Use a null modem RS-232 cable to attach the accessory to the host computer. This cable is the same one you would use for Interlnk.
4. Connect a power supply to the communications dock or optical link adapter.
5. Press Ⓜ to turn on the reader.

6. If the Boot Loader menu does not appear, follow these steps to display it:
 - a. Press I/O to turn off the reader.
 - b. Press F8 - 2 - \leftarrow .
 - c. Press 2 .
 - d. Press I/O to turn on the reader.
 - e. Type the password if the reader prompts you to do so. If you fail to enter the correct password after three attempts, the reader resumes normal operation.
7. At the Boot Loader menu, press \downarrow until you select Load.



8. Press enter to execute the Load command.
9. Insert the Boot Utilities companion disk 1 into a disk drive on the host computer.
10. On your host computer, type the Upgrade command.

Follow this syntax:

```
source:\upgrade /com_port source: destination:
```


where:

- source* is the disk drive on the host computer where you inserted companion disk 1.
- com_port* is the number of the serial COM port on the host computer that the reader is connected to.
- destination* is the drive on the host computer that you are using as a temporary work space while installing the loader and flash files. The drive must have at least 3.5MB of free disk space.

For example, if the disk is inserted in the host's drive A, the host's drive C is your temporary work space, and the reader is connected to the host's COM1, type this command on the host computer and press enter :

```
a:\upgrade /com1 a: c:
```

The upgrade program begins executing. It takes a little over 10 minutes to update or upgrade all of the reader's flash memory.

11. Press any key to skip the online instructions about checking connections to the reader and putting the reader in Load mode. You already performed those tasks. The online instructions are provided for users who do not have these printed instructions.
12. When the upgrade program finishes, it indicates the upgrade was successful. Press any key to return to the DOS prompt on your host computer. The files are deleted from the temporary work space on the host computer.
13. After you return to the DOS prompt on your PC, the reader displays the message, "System Has Reset, Please Reboot." Choose Reboot from the Boot Loader menu and press  to cold boot the reader.



Caution

When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil

Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

14. Reload any files or programs you had on drives C and E. For help, see "Learning How to Change the Contents of Drive C" in Chapter 3.

Note: If you are upgrading to a new version of software, do not reload the startup files and drivers you used for the previous release.

15. If the reader operates in a language other than English, you must configure the reader to use that language. Use Auto-Loader as described in Chapter 8, "Preparing the Reader for International Use."

10

Troubleshooting

This chapter describes how to solve problems that may arise when you operate the reader.

How to Use This Chapter

If you have a problem operating the reader, read this chapter for a solution. For easy reference, problems are grouped into these topics:

- Powering Up or Booting the Reader
- Operating the Reader
- Saving the Contents of the RAM Drive
- Networking or Communicating With the Reader
- Running IRL Programs
- Using PC Cards
- Using DOS Commands and Applications
- Using MkImage and PutImage
- Scanning Bar Code Labels
- Problems With the NiCad Battery Pack
- If Your Applications Refer to Specific Drive Letters
- Upgrading Flash Cards for JANUS 2.1 Software



Caution

There are no user-serviceable parts inside the reader. Opening the unit will void the warranty and may cause damage to the internal components.

Conseil


La reader ne contient pas de pièces révisibles par l'utilisateur. Le fait d'ouvrir l'unité annule la garantie et peut endommager les pièces internes.

If you send the reader in for service, it is your responsibility to save the reader applications, data, and configuration. Intermec is responsible only for ensuring that the keypad and other hardware features match when replacing your unit.

Powering Up or Booting the Reader

This table lists problems that may occur when you turn on, turn off, or boot the reader.

Problem





When you press  to turn on the reader, nothing happens or the reader immediately turns itself off.

Solution

Make sure the NiCad battery pack is installed correctly. Push firmly on the bottom of the battery pack to lock it into the reader handle.

The NiCad battery pack may be discharged. Replace the battery pack with a spare charged battery pack, or charge the battery pack and try again.

During a warm boot, the reader cannot finish booting and displays an error message.

If you press a key (especially , ,  or ) while the reader is booting, you may see the message, "XX Keyboard Error, Press F1 or F2," where XX is an error code such as FA. Press  to exit the error screen and the reader continues booting.



Caution

Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil

N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

When you turn on the reader, the power management software displays an error message.

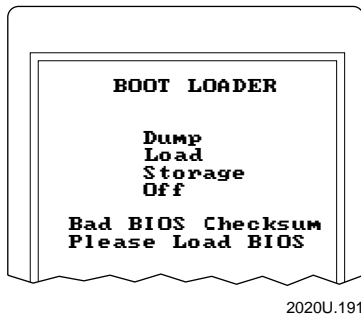
An error occurred and the reader cannot resume operating. You can turn the reader off without losing data, provided there is sufficient battery power. The next time you turn on the reader, the error sequence repeats and the Boot Loader menu appears.

If you reboot the reader, you will lose all the data in the reader's 640K conventional memory. You can save the contents of conventional memory and reload the system flash. For help, see "Dumping the Reader's 640K Conventional Memory" and "Loading Flash Memory" in Chapter 9.

Powering Up or Booting the Reader (continued)

Problem

When you turn on or cold boot the reader, the Boot Loader menu appears. The menu may not list all the Boot Loader commands, and the screen may include a status message. For example:



Solution

The bootstrap checks the system flash when doing a resume or cold boot. If the system flash is corrupt or there are bad checksum error messages, it brings up the Boot Loader menu. Read the status messages at the bottom of the menu:

- If you see “Bad BIOS Checksum” or a message that indicates the system flash is corrupt, save the contents of conventional memory and reload the system flash. For help, see “Dumping the Reader’s 640K Conventional Memory” and “Loading Flash Memory” in Chapter 9.
- If you see “Bad Saved State,” the reader may have been in Storage mode. Press to reboot. If you are prompted to exit Storage mode, press again.

You may also see the “Bad Saved State” message if you press to suspend the reader while it is booting. Press to reboot the reader. You may be able to save the contents of the physical RAM drive. For help, see “Saving the Contents of the RAM Drive” later in this chapter.



Caution

When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil

Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

When the reader finishes booting, an icon remains on at the top of its display.

Contact your Intermec service representative.

When the reader boots, the CPU starts all power cycles and turns all icons (except for Battery) on and off. The icons turn off very quickly as the reader passes a series of bootstrap code checks. Any icon that remains on indicates where the bootstrap code failed.

Operating the Reader

This table lists problems that may occur when you operate the reader. For example, if you have problems entering or scanning data, some solutions are listed in the table.

Problem	Solution
You cannot remember the password to access the Boot Loader menu.	Contact your Intermec service representative.
When you try to start IC.EXE, the reader displays an error message indicating that there is not enough memory available to run the Configuration Manager.	If the Configuration Manager TSR is unloaded when you start IC.EXE, the reader automatically loads the TSR for you. If there is not enough conventional memory available for the TSR, the reader displays an error message. Make sure at least 50K of memory is available. For help, see "Making More Memory Available on the Reader" in Chapter 3.
You scan a valid configuration command, but the reader beeps and displays an error message such as "Bad command or filename."	Make sure the Configuration Manager TSR is loaded in memory. You can scan configuration commands only if the TSR is loaded. For help, see "Unloading and Loading Configuration Manager TSR" in Chapter 3.
You want to return to the default configuration.	Follow the instructions in "Restoring the Reader's Default Configuration" in Chapter 5.
You see one of these error messages when you try to run an application: <ul style="list-style-type: none">• "File not found"• "Not ready reading drive X. Abort, Retry, Fail?"	If you developed an application that refers to a specific drive letter, make sure the drive letter is correct. If the drive is not correct, you can change the application to refer to the new drive letters or to use a relative path instead of an absolute path. You can also use the DOS SUBSTITUTE command, as described in "If Your Applications Refer to Specific Drive Letters" later in this chapter. <i>Note: Some drive letters on the JANUS reader were changed with software version 2.10.</i>
While writing to a PC card in the PC card drive, you turn off the reader, pull out the card, modify the card, insert it back in the reader, and turn on the reader.	The reader will continue to write to the PC card when you turn it back on. The file you were writing to is out of sequence. Your PC card may be corrupted. If you cannot access the data on the card, you may need to format it.
While writing to a PC card in the PC card drive, you turn off the reader, pull out the card, and turn on the reader without a card.	You have interrupted the write process. You will lose the data you were writing to the PC card.

Operating the Reader (continued)

Problem

You cannot tell if the numeric keypad is enabled or disabled.

Solution

You can check if the numeric keypad is enabled or disabled by pressing \uparrow and a number. For example, press \uparrow $\boxed{5}$ and see what appears on the reader's display:

Display	Indicates This State
%	The number pad is disabled.
5	The number pad is enabled with Num Lock on.
blank	The number pad is enabled with Num Lock off.

You scan a reader command, such as Backlight On, and nothing happens.

The reader commands are disabled. Scan the Enable Override command shown below to temporarily enable all of the reader commands. You can also enable or disable reader commands with IC.EXE. For help, see "Command Processing" in Chapter 12.

Enable Override



\$+DC3

When you run an application, the reader scrolls at line 25 and uses Automatic Viewport Movement mode regardless of the way you configured these parameters.

If you want the reader to scroll at another line or use Manual Viewport Movement mode while running an application, you must explicitly set those parameters in the application. You can use, for example, PSK functions.

The reader decodes a bar code label in a symbology other than the label's actual symbology.

Try scanning the bar code label again. Make sure you scan the entire label.

To ensure that the reader can operate quickly and efficiently, you should enable only the bar code symbologies that you are going to scan. If you enable multiple symbologies, the reader may on rare occasions decode a bar code according to the wrong symbology and produce erroneous results.

You cannot scan bar code labels.

See "Scanning Bar Code Labels" later in this chapter.

You see this message, "Configuration Manager TSR is not loaded."

You typed `cfgmgr -d` to unload the Configuration Manager TSR from memory, but it has already been unloaded. No action is required.

You see this message, "Configuration Manager TSR already loaded."

You typed `cfgmgr` to load the Configuration Manager TSR into memory, but it has already been loaded. No action is required.

Operating the Reader (continued)

Problem

The user application is not receiving the bar code input properly.

Solution

Reader Services may have been unloaded. The reader cannot decode bar code labels unless Reader Services are loaded.

Verify that the IF EXIST D:\RDG.BAT CALL D:\RDG.BAT command is in AUTOEXEC.BAT, and then warm boot the reader to reload Reader Services.

If you cannot load Reader Services, you may have assigned too much conventional memory to the physical RAM drives. For help, see "Deciding How Much Memory to Use for RAM Drives" in Chapter 3.



Caution

Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil

N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

The Battery icon appears at the top of the reader display.

The reader displays the Battery icon when the NiCad battery pack has approximately 15 to 45 minutes of power left. If you are using a J2020, replace the battery pack soon.

If you are using a JR2020, you should immediately replace or recharge the battery pack because you will soon lose RF communications.



Caution

When the Battery icon appears, save your data and replace the battery pack as soon as possible.

Conseil

Quand l'icône de la pile apparaît, enregistrez vos données et remplacez le jeu de piles aussitôt que possible, sinon vous pourriez perdre des données.

*Operating the Reader (continued)***Problem**

You see all these symptoms:

- The Battery icon remains on.
- The reader chirps every 5 seconds for 1 minute and then turns off.
- The reader sounds a double-beep when you enter or scan data, and sounds a double-click when you press any key.

You see all these symptoms:

- The Battery icon is not displayed.
- The reader chirps every 15 seconds for 1 minute and then turns off.
- The reader sounds a double-beep when you enter or scan data, and sounds a double-click when you press any key.
- The Backup Battery screen appears each time you turn the reader on.

The reader appears to be locked up and you cannot enter data.

Solution

The NiCad battery pack charge is critically low.




Save your data. Replace the battery pack with a spare charged battery pack, charge the battery pack, or attach an external power supply.

The laser scanner and RF communications are turned off 15 seconds after the first chirp.

The lithium backup battery is critically low.

Keep a charged NiCad battery pack installed in the reader. You can also attach an external power supply. Save all your data and back up all the files that are on drive E.

Contact your Intermec service representative to replace the lithium backup battery.

Press  to turn off the reader. If the reader will not turn off, see the next problem in this table for help. Press  to turn on the reader. If the reader displays the Boot Loader menu with the message “Bad Saved State,” press  to cold boot the reader. You may be able to save the contents of the physical RAM drive. For help, see “Saving the Contents of the RAM Drive” later in this chapter.

**Caution**


When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil





Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

Operating the Reader (continued)

Problem

The reader appears to be locked up or is beeping every 10 seconds. When you press  to turn off the reader, it does not turn off.

Solution

Press  -  -  to turn off the reader. It may take a few seconds before the reader turns off. When you press  to turn on the reader, it displays the Boot Loader menu.

Read the status messages at the bottom of the menu. If the messages tell you to resume, choose Resume from the Boot Loader menu. If the messages tell you to reboot, choose Reboot from the Boot Loader menu to cold boot the reader. You may be able to save the contents of the physical RAM drive. For help, see "Saving the Contents of the RAM Drive" later in this chapter.



Caution


When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil

Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

All the files on drive E have been erased.

The contents of drive E, the physical RAM drive, are destroyed when you perform these tasks:

- You cold boot the reader.
- You load the reader's flash memory.
- You put the reader in Storage mode.
- You execute CONFIG.SYS after changing the command that creates the RAM drive.
- You turn off the reader (by pressing  or removing the NiCad battery pack) while the reader is performing a warm boot.
- You removed and replaced a discharged NiCad battery pack, instead of inserting a fully charged battery pack.
- You run an application on the reader that masks the non-maskable interrupt (NMI). While this is acceptable on a PC, it is not acceptable on a reader.

You must restore or copy your files to the RAM drive E.


Operating the Reader (continued)

Problem

The reader displays the Boot Loader menu.

Solution

The reader displays the Boot Loader menu in response to several error conditions:

- You turned off the reader (by pressing  or removing the NiCad battery pack) while the reader was performing a warm boot.
- You removed and replaced a discharged NiCad battery pack, instead of inserting a charged battery pack.
- You ran an application on the reader that masks the non-maskable interrupt (NMI). While this is acceptable on a PC, it is not acceptable on a reader.
- There may be another problem with the reader.

Read the status messages at the bottom of the menu. If the messages tell you to resume, choose Resume from the Boot Loader menu. If the messages tell you to reboot, choose Reboot from the Boot Loader menu to cold boot the reader. You may be able to save the contents of the physical RAM drive. For help, see “Saving the Contents of the RAM Drive” later in this chapter.



Caution

When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil

Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

You need to cold boot the reader and you want to save the contents of drive E, the physical RAM drive.

For help, see “Saving the Contents of the RAM Drive” later in this chapter.

Saving the Contents of the RAM Drive

When you cold boot the reader, the contents of drive E, the physical RAM drive, are normally destroyed. You may be able to save the contents of the RAM drive by using this procedure.

To save the contents of the physical RAM drive

1. From the Boot Loader menu, choose Reboot.



Caution

When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil

Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

2. Press `Esc` as soon as you see the RAM memory test message:

```
BIOS Ver x.xxx  
Copyright 1992-199x  
All Rights Reserved  
00120K RAM Passed
```

Note: You must press `Esc` before the memory counter reaches 00640K RAM Passed.

3. The reader continues booting. At the DOS prompt, enter this command:

```
dir e:
```

If the contents of drive E are displayed, you can continue using the reader.
If the contents of drive E are destroyed, you must restore or copy your files to drive E.

Networking or Communicating With the Reader

This table lists problems that may occur when the reader is communicating with another device.

Note: If you have problems with your RF network, see your JANUS RF documentation.

Problem	Solution
Communications problems occur only when you connect the optical link adapter to a reader and no external power source is attached.	The reader may not be in good contact with the optical link adapter. Inspect the spring contacts and contact surfaces on the optical link adapter for signs of corrosion or contamination. If necessary, clean the contacts with a cotton swab and an alcohol-based solvent. Other solvents may damage the plastic housing.
The communications application cannot communicate.	<p>Verify that the reader and the other device are using the same communications protocol and parameter settings. If they do not match, change them and restart the communications application.</p> <p>Make sure the reader's optical port, communications dock, and optical link adapter are clear of foreign material. Wipe the optical port window with a damp cloth to remove any material that may be blocking the light from the LEDs.</p> <p>You may need to reset the UART FIFO control register. For help, see "Specifying a Value for the FIFO Control Register" in Chapter 6.</p>
You attempt to load PHIMEC, and the reader displays the message, "Comm port not available."	<p>The PHIMEC protocol handler has not been loaded into memory. You attempted to load PHIMEC to a COM port other than COM1.</p> <p>Load the protocol handler again. For help, see "Loading and Unloading a Protocol Handler" in Chapter 6.</p>
When you use the Multi-Drop protocol and 19.2 bps baud rate, the communications application times out or waits indefinitely on a receive request, and the 9154 Multi-Drop Line Controller's fault light turns on.	The packets are too large (over 30 bytes) for the JANUS reader to handle at the 19.2 bps baud rate. Lower the baud rate to 9600 bps.
You experience problems with the reader display when you run terminal emulation (TE) on the reader. For example, the prompt disappears after you run a program.	<p>When you run TE on the reader, the CONFIG.SYS file loads ANSI.SYS. ANSI.SYS interacts with IM_DISP.EXE, causing unpredictable effects on the reader's display.</p> <p>Remark out IM_DISP.EXE in the AUTOEXEC.BAT file while you use TE. For help editing AUTOEXEC.BAT, see "Learning How to Change the Contents of Drive C" in Chapter 3.</p>

Networking the Reader (continued)

Problem

The communications application appears to stop executing or locks up.

Solution

The reader may have lost its connection with the communications dock, optical link adapter, or other device.

Verify that the reader is still connected to the other device. Make sure all the cables are firmly connected to each device. If you are using a communications dock, make sure the reader is placed correctly in the reader slot.

If the reader was disconnected, restart the communications application. If it is still locked up, warm boot the reader. Check the communications protocol configuration and make sure you have set timeout values.



Caution

Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil


N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

You may experience problems with your RF network, such as:

- The RF option is not listed in the Com menu of IC.EXE.
- The RF protocol handler (RFPH) did not load correctly.
- The Connect icon turns off.

If you have any problems with your RF network, see your JANUS RF documentation.

Running IRL Programs

When an IRL error occurs, the reader beeps and displays an error message. Press  to clear the message and continue. The types of error messages are:

Receive error This error occurs when the reader is receiving a message or protocol characters from the host.

Transmit error This error occurs when the reader is transmitting a message or protocol characters to the host.

Syntax error This error occurs when the reader is performing a syntax check on a program before running the program. If a program statement is invalid, the error message lists the program statement and the problem. Edit the program for syntax errors and run it again.


Runtime error This error occurs when the reader is executing a program. The program ignores nonfatal errors. If it is a fatal error, the reader exits the program and returns to the IRL Desktop or DOS prompt.

This table lists the error beep sequences and their meanings:

Sequence	Meaning
Three low beeps	Syntax or compile error
Low beep, high beep, low beep	Nonfatal runtime error
Three high beeps	Fatal runtime error

Note: The JANUS reader does not beep to indicate transmit or receive errors.

The next table lists problems that may occur when you run IRL programs on the reader.

Problem	Solution
The reader displays "Executing..." on power up or prompts you for data on power up.	An IRL Program is running. Type or scan this Exit IRL Program command: Exit IRL Program  */\$*
There is not enough memory to run your IRL program.	You need to free more conventional memory or run the program without running the IRL Desktop. For help, see "Freeing Enough Memory to Run an IRL Program" in Chapter 7.

Running IRL Programs (continued)

Problem

When you try to start the IRL Desktop, the reader displays an error message indicating that there is not enough memory available to run the Configuration Manager.

The reader is locked up in an IRL program.

You are having problems trying to download an IRL program.

You have trouble running an IRL program with Interlnk.

Solution

If the Configuration Manager TSR is unloaded when you start the IRL Desktop, the reader automatically loads the TSR for you. If there is not enough conventional memory available for the Configuration Manager TSR, the reader displays an error message. Make sure at least 50K of memory is available.

Perform the application break sequence, as described in "Breaking Out of an Application" in Chapter 9.

Make sure you have performed all these steps:

- You configured the communications protocol correctly on the reader and host. For help, see "Configuring the Communications Protocols" in Chapter 6.
- You activated the communications protocol. For help, see "Activating One Communications Protocol" in Chapter 6.
- You loaded the protocol handler. For help, see "Loading and Unloading a Protocol Handler" in Chapter 6.
- You are in the IRL Desktop, at the main menu, with no commands selected.

You cannot run an IRL program over an Interlnk connection.

Using PC Cards

This table lists problems that may occur when you use PC cards in the JANUS reader. For help, see Chapter 4, “Using PC Cards in the Reader.”

Problem

You are trying to access the reader's PC card drive and you see the message, “Invalid media type reading drive X. Abort, Retry, Fail?”

You are trying to access the reader's PC card drive and you see the message, “Not ready reading drive X. Abort, Retry, Fail?”

You try to access the reader's PC card drive and you see the message, “Bad command or file.”

You access the PC card in the PC card drive and the reader locks up frequently.

You try to load CS_APM.EXE or CS_IPM.EXE and you see the message, “CS PM already loaded.”

Solution

Press **A** to abort. The reader cannot read the PC card in the drive. Use the CARDINFO utility to verify the type of card you are using (ATA, flash, I/O, or SRAM).

Check the reader's CONFIG.SYS file. Make sure you have the correct drivers installed for the type of card you are using. Format the PC card.

Press **R** to try again. If you see the message again, press **A** to abort. The reader cannot read the PC card in the drive. Use the CARDINFO utility to verify the type of card you are using (ATA, flash, I/O, or SRAM).

Check the reader's CONFIG.SYS file. Make sure you have the correct drivers installed for the type of card you are using. Format the PC card.

You may also see this message if you are using the Substitute command and you do not have a PC card in each PC card drive. Insert a PC card in each drive and try using the Substitute command again.

Check the command you entered and make sure it is a valid command. Try entering the command again.

The PC card may not be formatted correctly. If you formatted the PC card on your PC or host computer, try formatting the card in the reader's PC card drive. You can also use the CARDINFO utility to verify the current format and status of the card.

You cannot load CS_APM and CS_IPM at the same time. If you see this message, one of the utilities is already loaded. Load CS_APM only for I/O cards; otherwise use CS_IPM.

Check the AUTOEXEC.BAT file to see which utility is loaded. If you are loading the wrong one, edit the AUTOEXEC.BAT file or load the utility from the DOS prompt. For help, see “Drivers in AUTOEXEC.BAT” in Chapter 4.

Using PC Cards (continued)

Problem

You hear the reader sound a single low tone beep when you insert a PC card in the PC card drive.

Solution

The reader cannot read the card in the PC card drive. You need to format the card. For help, see "Configuring, Formatting, and Using PC Cards" in Chapter 4.

If you followed all the instructions to format a flash PC card and the reader still does not recognize the card, you may need to install two other flash card drivers. You need to install the MTAA.EXE and MTAB.EXE drivers to use AMD Type A or B flash cards.

Copy the two drivers from the Application companion disk 3 to drive C on the reader (using Auto-Loader or MkImage and PutImage). Edit the CONFIG.SYS file and add these lines after the line that installs the MTI2P.EXE driver:

```
device=c:\mtaa.exe  
device=c:\mtab.exe
```

After you place the revised CONFIG.SYS file on the reader's drive C, boot the reader and try to format the flash card again.

You delete files from a 512K flash card and it does not appear that there is any additional space available on the card.

If you are using a 512K flash card with an MS-Flash file format, the card is formatted as a WORM (Write Once Read Many) drive. A 512K flash card does not have room for more than one separately erasable block of memory. You can delete individual files using the DOS delete command, but the memory the files were using is not available to be used again. To reclaim the memory from deleted files, you need to erase the entire card and then reformat the card.

Note: *Intermec recommends using flash cards that store 1MB or more of data.*

You try to format a flash PC card with the MCFORMAT utility and you see the message, "You must erase X: before creating a new partition."

If a flash card has been formatted before, you must erase the card before you can format it. Use the MCFORMAT utility and select option 3 from the MCFORMAT main menu to erase a flash card.

If you erase the flash card and still see this message when you try to format the card or the card will not format, check CONFIG.SYS. Make sure the flash card drivers are installed. Once the flash card drivers are active in CONFIG.SYS, try erasing the flash card. Then format the card.

Using PC Cards (continued)

Problem

After you load your Novell network software, you use a network PC card and run an application that does not work properly after making a system call.

Solution

Your Novell network software may have modified the COMSPEC environment variable to add a drive specifier to the path. However, DOS needs COMSPEC to find the COMMAND.COM file, which must be loaded for DOS to execute system commands. The reader uses ROM DOS, which expects COMSPEC to be set to:

```
comspec=command
```

To eliminate this problem, run the INITENV utility before you log onto a NetWare server. INITENV.EXE is on the reader's drive C and Application companion disk 3. Create a login batch file similar to this one:




```
@echo off
c:\initenv
e:\login %1 %2
set comspec=command
```

Use the new login file instead of your Novell login file when you log the reader onto the server. If you do not run INITENV.EXE before logging in, your DOS environment table will be corrupted and cause your JANUS application to fail. You can set COMSPEC correctly to fix part of the problem, but you must boot the reader to clear embedded garbage characters from the environment table.

To check COMSPEC, type `set` and press . All environment variables are displayed. If COMSPEC was set to anything other than COMMAND, it has been changed by the login process.

Using DOS Commands and Applications

This table lists problems that may occur when you run DOS-based applications on the reader.

Problem	Solution
The reader displays a "Write Fault Error Writing Device PRN" message.	A <DLE> or Ctrl-P was entered into the reader. There may be a conflict because <DLE> is both the Intermec command override command and the DOS printer redirection command. Press   to turn off console echo to the printer and then press  to abort. For help, see "Command Override" in Chapter 11.
The reader is locked up in an application.	Perform the application break sequence, as described in "Breaking Out of an Application" in Chapter 9.
There is not enough memory to load a program.	You need to free conventional memory. For help, see "Making More Memory Available on the Reader" in Chapter 3.
The reader locks up when running Auto-Loader and you cannot reboot the reader.	Use the Boot Loader menu to reload the system flash memory. For help, see "Loading Flash Memory" in Chapter 9.
You have trouble running an IRL program over an Interlnk connection.	You cannot run an IRL program over an Interlnk connection.
You do not have MS-DOS Programs companion disk 2 and need to use Interlnk.	<p>If you do not have companion disk 2, which contains the Interlnk files, you can install Interlnk to the host from the reader.</p> <p>Connect the reader and host computer with a 7-wire RS-232 cable when installing Interlnk. The MODE command must be available on the host where you are installing Interlnk.</p> <p>Type this command on the reader:</p> <pre>intersvr /rcopy</pre> <p>The command copies the Interlnk files to the host computer.</p>
The host computer locks up after you type this command on the reader: <pre>intersvr /rcopy</pre>	When the Interlnk files are downloaded to the host computer, the host computer may lock up. Reboot the host computer.
The reader locks up when you are using Interlnk and try to get a directory listing (DIR) on one of the reader's ROM drives.	Edit the host computer's AUTOEXEC.BAT or CONFIG.SYS file and remove or remark out Windows SMARTDRV.EXE.

Using DOS Commands and Applications (continued)

Problem

The reader locks up just after the DOS boot banner message appears when you finish updating drive C with Auto-Loader.

Solution

Press **Alt-F4** on the host computer and then warm boot the reader. A lockup occurs when both these conditions are true:

- An active Intersvr connection to the JANUS reader exists when the reader reboots. The reader's default CONFIG.SYS file installs Interlnk automatically when the reader is connected to COM1 of the host computer and the host is running Intersvr.
- The reader's CONFIG.SYS and AUTOEXEC.BAT install a combination of device drivers, DOS options, TSRs, and applications that absorb the majority of available conventional memory.

When both conditions exist, there is not enough space for your software configuration to coexist with the Interlnk device driver. The reader attempts to allocate memory that is not available, and a lockup may occur.

To prevent the lockup, press **Alt-F4** on the host computer or break the serial connection between the reader and host computer before the reader reaches the DOS initialization step of the warm boot.

When you exit Intersvr on the host computer or break the serial connection, the Interlnk device driver will not detect INTERSVR.EXE, and Interlnk will not be loaded into the reader's memory.

A DOS command does not work.

These DOS commands are not supported on the reader:

- | | |
|-------------|--------------|
| DOSSHELL.* | MONEY.BAS |
| DOSSWAP.EXE | MONO.* |
| DRIVER.SYS | MSHER.COM |
| EGA.* | NIBBLE.BAS |
| EGAMONO.GRB | REMLINE.BAS |
| FDISK.EXE | UNFORMAT.COM |
| GORILLA.BAS | VGA.* |
| HERC.* | VGAMONO.GRB |

You cannot access a drive while using Interlnk.

Interlnk does not redirect network drives, CD-ROM drives, or any other device that uses a redirection interface. These commands do not work with Interlnk:

- | | |
|----------|----------|
| CHKDSK | MIRROR |
| DISKCOMP | SYS |
| DISKCOPY | UNDELETE |
| FORMAT | UNFORMAT |

Using DOS Commands and Applications (continued)

Problem

The reader does not boot after you modified the CONFIG.SYS file.

You see this message when you use Interlnk/Intersrv to copy files between the reader and the host computer:

Not ready writing drive X
Abort, Fail, Retry

Solution

Boot the reader and press **B** when you see this message, "Loading MS-DOS 5.0 ROM Version." The DOS setup screen appears. Press **2** to make the reader reboot without executing the startup files.

Correct the error in CONFIG.SYS. Use Auto-Loader, BFT, or MkImage and PutImage to load the new CONFIG.SYS onto the reader.

Boot the reader. When you see the DOS message, press **B**. When the DOS setup screen appears, press **1**. The reader should boot with the corrected CONFIG.SYS file.

Press **R** to Retry and continue copying the files. You may have a problem copying files if you use the DOS version (utilities from your PC) of INTERLNK.EXE and INTERSVR.EXE on the JANUS reader. Intermec modified the INTERLNK.EXE and INTERSVR.EXE utilities to work with the JANUS reader. The Intermec version of these utilities is provided on the reader's Drive D and on the MS-DOS Programs Companion Disk 2. Use the INTERLNK.EXE and INTERSVR.EXE utilities provided with your reader to transfer and copy files.

If you files were not copied correctly, try the procedure again using the INTERLNK.EXE and INTERSVR.EXE utilities provided with your reader.

Using MkImage and PutImage

This table lists problems that may occur when you use MkImage to create a new image file for drive C or use PutImage to load the image file onto drive C.

Problem

```

Error, incorrect
number of parameters
    
```

2020U.201

```

Error, invalid
path
    
```

2020U.216

```

Error, no files
found in directory
    
```

2020U.035

```

Error, files in
selected dir require
too much space
to create the
disk image
    
```

2020U.037

```

Error, too many
files exist in
directory
    
```

2020U.041

```

Error, could not
open output file
    
```

2020U.202

Solution

Verify that you have the correct path and filename in the MkImage or PutImage command and then try again.

Verify the path you entered with the MkImage command and then try again. You must enter the full path for the source directory, beginning with the root directory of the source drive.

If you do not supply a full path, the current working directory is used, which results in a corrupt image file that will not function properly on the reader.

Verify the directory where the files are located for the MkImage command and then try again.

The total combined size of the files in the source directory exceed the capacity of the reader's drive C, which is 512 bytes. Reduce the size or number of files and then try again.

The number of individual files exceed the number of files allowed. You can have a maximum of 127 files in the directory for drive C. Reduce the number of files and then try again.

The MkImage command syntax for the filename is invalid, or there is not enough space on the disk. Verify the command and filename and then try again. If that does not solve the problem, free some disk space.

Using MkImage and PutImage (continued)

Problem

```
Error, not enough
free conventional
memory to create
disk image
```

2020U.043

```
Error, not enough
free disk memory to
create output file
```

2020U.045

```
Error, could not
open image file
```

2020U.047

```
Error, image file
not found
```

2020U.049

```
Error, invalid image
file, recreate using
the MkImage command.
```

2020U.051

```
Error, not enough
free conventional
memory to run this
program.
```

2020U.053

Solution

Free some conventional memory and then try to run MkImage again. For help, see “Making More Memory Available on the Reader” in Chapter 3.

There is not enough memory on your disk to create the MkImage output file. Remove one or more files and free some disk space.

Verify that the image file exists and you have the correct path and filename in the PutImage command and then try again.

Verify that the image file exists and you have the correct path and filename in the PutImage command and then try again.

The image was created by a method other than MkImage, or you entered the wrong filename in the PutImage command. Create the image file with MkImage, and then try running PutImage again.

Free some conventional memory and try to run PutImage again. For help, see “Making More Memory Available on the Reader” in Chapter 3.

Using MklImage and PutImage (continued)

Problem

```

Error, EMM Manager
is installed,
reboot without EMM
Support before using
PutImage
    
```

2020U.055

```

Error, unable to
turn on flash
programming voltage
    
```

2020U.057

```

Error, cannot
program flash due
to low battery
    
```

2020U.061

When you start PutImage, one of these messages appears:

- Critical error, invalid checksums have occurred.
- Critical error, invalid image file.
- Critical error, a write fault has occurred.
- Critical error, erase was bad.

Solution

Unload the EMM manager (EMM386.EXE) and try running PutImage again.

Three things could have happened:

- You do not have an external power supply attached to the reader. You must provide an external power supply for the reader before you execute PutImage. Connect a communications dock or optical link adapter to the reader, and then connect a power supply to the dock or adapter.
- There is a hardware problem.
- Some other subsystem (such as a PC card) is presently using the 12V. Wait, and try using PutImage again later.

You must provide an external power supply for the reader before you execute PutImage. Connect a communications dock or optical link adapter to the reader, and then connect a power supply to the dock or adapter.

A critical error occurred. You cannot reboot the reader, but you can save the data held in conventional memory and reload the reader's flash memory. For help, see "Dumping the Reader's 640K Conventional Memory" and "Loading Flash Memory" in Chapter 9.



Scanning Bar Code Labels

If you cannot scan bar codes with the reader, locate your problem in the list and follow the instructions:

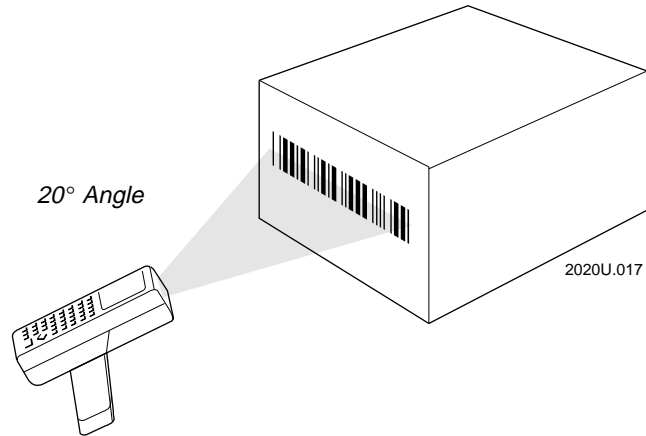
You cannot see a red light when aiming at a wall. You may be too far from the wall. Move within 2 feet of the wall and test the scanner again. Or test the scanner by pointing it at the floor.

The scanner will not register the bar code label you are trying to scan. Make sure you aim the beam so it crosses the entire label in one pass. If your scanner still will not register the scan, it may mean that you did not enable the symbology of the bar code. For help, see "Choosing the Symbologies the Reader Will Decode" in Chapter 5.

If you still have trouble with the scanner, perform these checks:

- Inspect the print quality of the bar code. Try scanning a bar code label that you know scans. Compare the two bar code labels. You may need to replace the label that cannot be scanned.
- Make sure the reader is turned on. Press  to turn the reader on.
- You try to scan a bar code label and the scanner turns off or will not turn on. If the reader is chirping every 5 seconds and the Battery icon is displayed, you have a low NiCad battery pack. You must turn off the reader and replace the battery pack.
- You scan a bar code label that contains a valid configuration command, but the reader beeps and displays an error message such as, "Bad command or filename." Make sure the Configuration Manager TSR is loaded into memory. If it is not loaded, you cannot scan configuration commands. Type `cfgmgr` and press  to load Configuration Manager and rescan the bar code label.
- You scan a bar code label to enter data at the DOS prompt, but the reader beeps and displays an error message such as, "Bad command or filename." Make sure the application that is expecting the data is running. If necessary, start the application and scan the bar code again.
- Clean the scanning window of the laser scanner with a solution of ammonia and water. Wipe dry. Do not allow abrasive material to touch the window.
- Use IC.EXE to verify that the reader is configured to read the bar code symbology you are scanning.

- Scan the bar code again, but vary the scanning angle and distance.

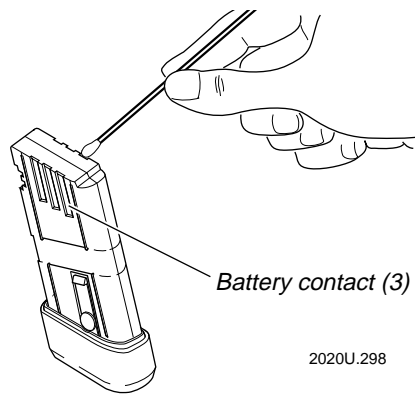


- Verify that the command `IF EXIST D:\RDG.BAT CALL D:\RDG.BAT` is executed from the `AUTOEXEC.BAT` file. If the command is not executed, the reader cannot decode bar code labels.
- The `SCANNER.INI` file contains configuration information for each type of scanner device. The `SCANNER.INI` file must remain on drive D.

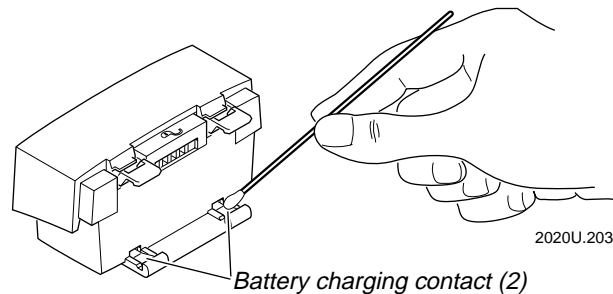
Problems With the NiCad Battery Pack

Follow these guidelines to avoid problems with the NiCad battery pack and the reader:

- Always turn the reader off **BEFORE** you remove the NiCad battery pack.
- Periodically clean the NiCad battery pack contacts to maintain good contact with the reader. Use a cotton swab and some rubbing alcohol to clean the gold contacts on the sides of the battery pack.




- If the battery pack appears to lose its charge capacity, discharge the battery pack using the communications dock or battery charger before charging it. It is not necessary to discharge the battery pack every time you charge it, only when you notice problems. If the battery pack still will not hold a charge, try using a new battery pack. For help, see the accessory quick reference guides.
- If the JL2010 optical link adapter fails to charge the battery pack when connected to a power supply, inspect the spring contacts and contact surfaces on the optical link adapter for signs of corrosion or contamination. If necessary, clean the battery charging contacts with a cotton swab and some rubbing alcohol. Other solvents may damage the plastic housing on the optical link adapter.



Problems With the NiCad Battery Pack (continued)

The next table lists problems you may have with the NiCad battery pack while operating the reader.

Problem

When you press  to turn on the reader, nothing happens or the reader immediately turns itself off.

Solution

Make sure the NiCad battery pack is installed correctly. Push firmly on the bottom of the pack to lock it into the handle.

The NiCad battery pack may be discharged. Replace the battery pack with a spare charged battery pack, or charge the battery pack and try again.

The Battery icon appears at the top of the reader display.

The reader displays the Battery icon when the NiCad battery pack has approximately 15 to 45 minutes of power left. If you are using a J2020, replace the battery pack soon.

If you are using a JR2020, you should immediately replace or recharge the battery pack because you will soon lose RF communications.



Caution

When the Battery icon appears, save your data and replace the battery pack as soon as possible.

Conseil

Quand l'icône de la pile apparaît, enregistrez vos données et remplacez le jeu de piles aussitôt que possible, sinon vous pourriez perdre des données.

You see all these symptoms:

- The Battery icon remains on.
- The reader chirps every 5 seconds for 1 minute and then turns off.
- The reader sounds a double-beep when you enter or scan data, and sounds a double-click when you press any key.

The NiCad battery pack charge is critically low.

Save your data. Replace the battery pack with a spare charged battery pack, charge the battery pack, or attach an external power supply.

The laser scanner and RF communications are turned off 15 seconds after the first chirp.

Problems With the NiCad Battery Pack (continued)

Problem

You see all these symptoms:

- The Battery icon is not displayed.
- The reader chirps every 15 seconds for 1 minute and then turns off.
- The reader sounds a double-beep when you enter or scan data, and sounds a double-click when you press any key.
- The Backup Battery screen appears each time you turn the reader on.

Solution

The lithium backup battery is critically low.

Keep a charged NiCad battery pack installed in the reader. You can also attach an external power supply. Save all your data and back up all the files that are on drive E.

Contact your Intermec service representative to replace the lithium backup battery.

If Your Applications Refer to Specific Drive Letters

In JANUS software version 2.10, some drive letters were changed. If you are using an application that refers to a specific drive letter on a JANUS reader with software version 2.10 or later, you may see messages like “File Not Found” or “Not ready reading drive X. Abort, Retry, Fail?”

You may need to change your applications if you have developed them for a JANUS reader that has an earlier software version. The drive letter change in software version 2.10 will only affect your applications if the application is coded to use specific drive letters (uses an absolute path).

Note: If your applications do not use specific drive letters, you can use the applications on a reader with software version 2.10 without making changes.

If you have JANUS readers with software version 1.31 or earlier, you may need to change your applications if you:

- Use readers with different software versions and one of the versions is 2.10 or later. For example, a J2020 reader with 2.10 software and a J2020 reader with 1.30A software.
- Upgrade all your JANUS readers to software version 2.1 or later.

If your application uses specific drive letters, you have these options:

- Change your application to query the reader for its drive letters (use a logical or relative path). You can use the revised application on any reader with any software version.
- You can use the DOS Substitute command on readers with software version 2.10 or later to change the drive letter assignments to match readers with earlier software versions. For help, see “To use the Substitute command” on the next page.
- If you are upgrading all of your readers to software version 2.1 or later, you can continue to use specific drive letters. Change your application to use the new drive letters for the new software version, and use the revised application on any reader with software version 2.10 or later.
- If you want to continue to use specific drive letters and you have a mix of software versions, you need to create two versions of the application. One version is coded to use the drive letters for software versions 1.31 or earlier. The second version is coded to use the drive letters for software version 2.10 or later.

You can use the DOS Substitute command to substitute a drive letter for another drive letter on the reader. With the Substitute command, you can change the drive letters on a reader with software version 2.10 or later to match the drive letters on a reader with an earlier software version.

When using the Substitute command on the reader, you can:

- add the Substitute command to the AUTOEXEC.BAT file so that the drive letter assignments are changed each time the reader is booted.
- execute the Substitute command at the DOS prompt to temporarily change the drive letter assignments.
- execute the Substitute command in a batch file.

These commands do not work on drives used in the Substitute command:

CHKDSK	LABEL
DISKCOMP	MIRROR
DISKCOPY	RECOVER
FORMAT	SYS

For a complete description of the Substitute command, see any DOS 5.0 user's manual or guide.

To use the Substitute command

1. Insert a PC card in the PC card drive. For example, insert a PC card in the JANUS 2020 PC card drive.




Caution

You must insert a PC card in each PC card drive or you will get a critical error message when the reader executes the Substitute command.

Conseil

Vous devez insérer une carte PC dans chaque lecteur PC. Sinon, un message d'erreur critique s'affiche lorsque le lecteur exécute la commande Substitute.

Note: DOS requires that a drive is present when you execute the Substitute command.

2. Type the Substitute command and press .

`subst drive: substitute_drive:`

where *substitute_drive* is the letter you are assigning to the *drive*. Include a colon after each drive letter in the command.

For example, on a J2020 with software version 2.1, use this command to substitute drive G with drive E:

`subst g: e:`

To remove the substitution

- Use the /d switch to delete a virtual drive. For example:

```
subst g: /d
```

Upgrading Flash Cards for JANUS 2.1 Software

A flash PC card must be formatted to match the version of the JANUS software installed on your reader. Flash cards that you use in readers with older versions of JANUS software will not work on readers with JANUS 2.1 software or later, because the new software supports the PCMCIA Standard 2.1 and the old software does not.

If you have a mix of readers in your work environment, some with new software and others with older software, you cannot interchange flash cards between readers with different software versions. You should format some cards for the new JANUS 2.1 software, and leave other cards formatted for the older software. You may find it helpful to label the cards and readers with their software version.

To format a flash card for the new JANUS 2.1 software

1. If you want to save any files on the flash card, you must copy them before you format the card. Insert the card into a reader with an older version of the software and copy the files to a PC or another reader.
2. Insert the card into a reader with the new JANUS 2.1 software and use the MCFORMAT.EXE utility to format the card. For help, see “Preparing to Use Flash Cards” in Chapter 4.
3. Copy the files from Step 1 back onto the flash card.
4. You are ready to use the reformatted flash card in a reader with the new JANUS 2.1 software.

Reader Command Reference

This chapter is an alphabetical listing of the reader commands that you can use while operating the reader. Reader commands, such as Backlight On, allow you to perform a task on the reader.

Using Reader Commands

A reader command causes the reader to perform a task. For example, you can turn the backlight on to easily view the reader's display when you are working in a dimly lit environment. You can execute reader commands by:

- scanning a command from a Code 39 or Code 93 bar code label.
- pressing keys on the keypad and choosing a command from an IC.EXE or IRL Desktop menu.
- sending a command from a host computer.
- executing a command in an IRL program.

You will find the purpose and syntax for each reader command in this chapter.

Note: *You can send reader commands from a host computer only when the reader is running an application that uses Reader Wedge TSR. You can also execute reader commands in IRL programs and applications using Reader Services.*

You can group reader commands together (concatenate) into one string. For example, the command to turn the backlight on is `%.1`, and the command to raise the beep volume is `$+BV9`. Use this next command to group the two reader commands together and download them from a host computer:

```
%.1$+BV9
```

To create a bar code label, you can add start and stop codes:

Backlight On / Raise Beep Volume



```
*%.1$+BV9*
```





The reader executes concatenated commands in the order in which they appear in the command string. If one of the commands is incorrect, the reader sounds three low beeps and processes any valid commands up to the invalid command. All other data in the remainder of the string is ignored.

Backlight On and Off

Purpose: Turns the backlight on to easily view the reader display in dimly lit environments.

From Host: Not supported

Keypad:

1. Press  - , and then release both keys to enter Control mode.
2. Press  to turn the backlight on or off.
3. Press  to exit Control mode.

IRL Command: Z"%1"





Scan: Backlight On

%1

Purpose: Turns the backlight off.

From Host: Not supported

Keypad:

1. Press  - , and then release both keys to enter Control mode.
2. Press  to turn the backlight on or off.
3. Press  to exit Control mode.




IRL Command: Z"%0"

Scan: Backlight Off


%0

Note: You can use the command % . to toggle the backlight on and off.


Backspace

Purpose:	Deletes the last character from the current data record. If there is no data in the buffer, the reader sounds three low beeps.
From Host:	Not supported
Keypad:	 or 
IRL Command:	Not supported
Scan:	Backspace  *-* [*]



Change Configuration

Purpose:	This command must precede any configuration command parameter. If you enter a valid string, the reader configuration parameters are modified and the reader sounds a high beep. For help on the configuration parameters, see Chapter 12, "Configuration Command Reference."
	<i>Note: You no longer need to use the Exit Configuration command (\$-) after a Change Configuration command, but it is allowed for backward compatibility.</i>
From Host:	$\$+command$
Keypad:	Not supported
IRL Command:	Z"\$+command"
Scan:	Change Configuration  *\$+*
	Enter a configuration command or scan a bar code label containing a configuration command. For example, enter the command BV0 to turn the beep volume off.

Clear

Purpose:	Deletes the entire data record you are accumulating.
From Host:	Not supported
Keypad:	Not supported
IRL Command:	Not supported
Scan:	Clear  *_ _*

Command Override




Purpose:	Causes the character that follows it to be treated as data. Command override allows you to use control characters in preambles, postambles, data strings, and configuration command strings.
From Host:	<DLE>
Keypad:	 <p>The key sequence ^P (Ctrl P) is also the ASCII Data Link Exception character (DLE). ^P causes the character that follows it to be received as data, even if it is a protocol character. To interpret a Command Override command from the host, the command must be preceded by DLE.</p> <p>For example, when ^P^P^M is sent from the host, it is interpreted as ^P^M, where ^P is acknowledged allowing the next command (^M) to be interpreted as data and passed on to the application. When ^P^M is sent from the host, it is interpreted as ^M, the display is not affected and the Carriage Return command is executed.</p>
IRL Command:	Z"^P"
Scan:	Command Override  *<DLE>*

The JANUS 2020 reader uses Ctrl-P as the Command Override command; however, the DOS printer redirection command (Ctrl-P) is also supported on the reader. This dual purpose may cause some conflicts.



If you have Reader Services loaded and scan the bar code label <DLE>, the first scan is interpreted as a reader command. The next <DLE> entered causes a Ctrl-P to be entered into the expanded key buffer. DOS takes this Ctrl-P and enables printer redirection.

If no printer is connected, all subsequent entries cause an error and the next message is displayed:

```
Write fault error writing device PRN
Abort, Retry?
```

DOS shuts off the printer echo for the duration of the error, which allows it to display the error. As long as the printer echo has been requested (by entering a Ctrl-P), DOS turns the printer echo back on after the critical error is corrected. To exit the critical error, press   to turn off the console echo to the printer, and then press  to abort.

Enter

Purpose:	Enters the current data record or completes the entry of a command. If no data exists, a null string is entered.
From Host:	Not supported
Keypad:	
IRL Command:	Not supported
Scan:	Enter  **

Enter and Exit Accumulate Mode

Accumulate mode is used to accumulate all scanned data in the reader's data buffer. When you exit Accumulate mode, the accumulated data is "entered" as a data record. The buffer is cleared by one of these commands:

- Exit accumulate command
- Enter command
- Clear command
- Any type of reset

Up to 250 characters can be held in the buffer. If the data record count exceeds 250 characters, the last bar code read is rejected and the reader sounds an error beep.

Purpose: Enters Accumulate mode. If you press any keys when using the Enter Accumulate command, the keystrokes are accumulated as data.

From Host: Not supported

Keypad: Not supported

IRL Command: Not supported

Scan: Enter Accumulate Mode



+/

Purpose: Exits Accumulate mode and transmits the current data record. If no data has been accumulated, an empty data record is entered.

From Host: Not supported

Keypad: Not supported

IRL Command: Not supported

Scan: Exit Accumulate Mode



-/

IRL File, Clear

Purpose: Deletes one or all of the IRL data files that have default filenames: {IRL-0}.IRD, and {IRL-A}.IRD through {IRL-Z}.IRD. For help, see “Clearing IRL Data Files” in Chapter 7.

Note: You can use this command only from the IRL Desktop.

From Host: `.$filename`

where *filename* is 0 or any character from A to Z. If you do not include a filename, all IRL data files (0, A to Z) are deleted.



Caution

When the clear file command is sent from the host without data, all data is cleared and all files are deleted.

Conseil

Lorsque la commande d'effacement de fichier (clear file) est envoyée de l'hôte sans préciser les données à effacer, toutes les données sont effacées et tous les fichiers sont supprimés.

Keypad: In the IRL Desktop, choose File and then choose Clear Data.

IRL Command: Not supported

Scan: Scan one of these bar codes:

Clear All IRL Data Files



.\$

Clear {IRL-0}.IRD



.\$0

Note: You can create bar code labels to delete {IRL-A}.IRD through {IRL-Z}.IRD.

If you choose to clear all data files, a message explains that the default data files will be deleted and shows the directory where the files are located. Choose OK to delete the data files. If you clear one data file, IRL deletes the file without displaying a message or prompt.

IRL File, Receive

Purpose: Accepts a file from the host and saves it under the specified filename. If the filename is not included, the reader displays the Receive screen, which lets you select a COM port and filename. For help, see "Receiving IRL Files" in Chapter 7.

Note: You can use this command only from the IRL Desktop.

From Host: *.%filename*

Keypad: In the IRL Desktop, choose File and then choose Receive.

IRL Command: Not supported

Scan: Receive IRL File



.%

IRL File, Transmit

Purpose: Sends the specified file to the host. If the filename is not included, the reader displays the Transmit screen, which lists all .IRL and .IRD files in the current directory. For help, see "Transmitting IRL Files" in Chapter 7.

Note: You can use this command only from the IRL Desktop.

From Host: *%%filename*

Keypad: In the IRL Desktop, choose File and then choose Transmit.

IRL Command: Not supported

Scan: Transmit IRL File



%%

IRL Program, Download

Purpose: Downloads the program you specify from the host computer to the reader. For help, see “Downloading an IRL Program” in Chapter 7.

The command renames the program to {IRL-1}.IRL and copies it to the directory specified by the IM_IRLPROG path in your AUTOEXEC.BAT file. If the program path is on a nonwritable drive, the program is copied to the data path. If there is an {IRL-1}.IRL program already in the directory, it is overwritten. If the command detects an error, an error message appears and control returns to the IRL Desktop.

To download an IRL program, send a Start of Program (SOP) character followed by the program to be downloaded from the host computer. You can set the SOP character in the reader’s configuration. The default is <SI>. For help, see “IRL SOP” in Chapter 12.

You can also use PC-IRL, Collect, DCM, DFM, or Interscan to download IRL programs. For help, see the product’s manual.

Note: You can use this command only from the IRL Desktop.

From Host: <SOP>
Keypad: Not supported
IRL Command: Not supported
Scan: Not supported

IRL Program, Exit

Purpose: Exits the IRL program that is running. For help, see “Exiting an IRL Program” in Chapter 7.

From Host: /\$

Keypad: Press the application break sequence. For help, see “Breaking Out of an Application” in Chapter 9.

IRL Command: Not supported

Scan: Exit IRL Program



/\$

IRL Program, Resume

Purpose: Starts running the program named in the {LATEST}.RSM file exactly where the program left off when it was halted or exited. For help, see “Resuming IRL Programs” in Chapter 7.

Note: You can use this command only from the IRL Desktop.

From Host: \$.

Keypad: In the IRL Desktop, choose File and then choose Resume.

IRL Command: Not supported

Scan: Resume IRL Program



\$.

IRL Program, Run

Purpose: Runs the default IRL program {IRL-1}.IRL. For help, see “Running an IRL Program” in Chapter 7.

Note: You can use this command only from the IRL Desktop.

From Host: //

Keypad: In the IRL Desktop, choose File and then choose Run.

IRL Command: Not supported

Scan: Run IRL Program



//

Laser On and Off

The Laser On and Off commands are the same as pulling and releasing the scanner trigger. After a Laser On command, the scanner operates differently depending on the scanner mode and scanner trigger configuration settings:

- If you configure the reader to use One-Shot Scanner mode and level triggering, the scanner automatically turns off after a good read of a bar code label, or after the scanner timeout period elapses.
- If you configure the reader to use Automatic Scanner mode and level triggering, the scanner remains on after a good read of a bar code label. You use the Scanner Timeout command or the Laser Off command to turn off the scanner.

Note: Intermec does not recommend that you use a Laser On or Off command with the Scanner Trigger command set to edge triggering.

Purpose: The Laser On command is the same as pulling the scanner trigger.

From Host: / .

Keypad: Not supported

IRL Command: Z"/."

Scan: Not supported

Purpose: The Laser Off command is the same as releasing the scanner trigger. Its effect depends on the scanner and trigger mode configuration settings as described above.

From Host: /%

Keypad: Not supported

IRL Command: Z"/%"

Scan: Not supported

Prepare for Reboot

Purpose:	Causes the PSK library to notify the BFT-ready PSK application that the host wants to reboot the system and establish a binary file transfer (BFT) session. The PSK application accepts the Prepare for Reboot command and sends a Ready for Reboot message to the host. For help, see "Downloading Applications Across the Network" in Chapter 6.
From Host:	..+%1 Prepare for Reboot ..+%0 Cancel the Prepare for Reboot command
Keypad:	Not supported
IRL Command:	Not supported
Scan:	Not supported

Reboot

Purpose:	Causes the JANUS reader to warm boot and establish a binary file transfer (BFT) session with a host computer. The host must have already sent a Prepare for Reboot command and the BFT-ready PSK application has responded with a Ready for Reboot message. For help, see "Downloading Applications Across the Network" in Chapter 6.
From Host:	..%\$1 Reboot ..%\$0 Cancel the Reboot command
Keypad:	Not supported
IRL Command:	Not supported
Scan:	Not supported



Viewport Movement

You can display one section of a PC-size screen on the reader's smaller display. You will only see 16 lines and 20 characters of data at one time. However, you can use the reader's display as a viewport to move around and see the entire screen. By moving the viewport, you use the reader's virtual display of 25 lines by 80 characters—the same size as a PC screen.



You can use the viewport movement commands described in this section to move the viewport in the virtual display.

Note: To use the display as a viewport, you must configure the reader's display size to 25 x 80. For help, see "Display Setup" in Chapter 12.



Viewport Down

Purpose:	Moves the viewport down one step in the virtual display, except when it is already at the bottom line or row. You can set the number of lines the viewport moves up or down in a single step. For help, see "Viewport Movement Steps" in Chapter 12.
From Host:	Not supported
Keypad:	
IRL Command:	Z"%+"
Scan:	Viewport Down  *%+*



Viewport Up

Purpose:	Moves the viewport up one step in the virtual display, except when it is already at the top line or row. You can set the number of lines the viewport moves up or down in a single step. For help, see "Viewport Movement Steps" in Chapter 12.
From Host:	Not supported
Keypad:	
IRL Command:	Z"%/"
Scan:	Viewport Up  *%/*



Viewport Left

Purpose:	Moves the viewport one step to the left in the virtual display, except when it is already at the first column. You can set the number of columns the viewport moves left or right in a single step. For help, see "Viewport Movement Steps" in Chapter 12.
From Host:	Not supported
Keypad:	
IRL Command:	Z"%-"
Scan:	Viewport Left  *%-*

Viewport Right

Purpose:	Moves the viewport one step to the right in the virtual display, except when it is already at the last column. You can set the number of columns the viewport moves left or right in a single step. For help, see “Viewport Movement Steps” in Chapter 12.
From Host:	Not supported
Keypad:	
IRL Command:	Z".-"
Scan:	Viewport Right  *.-*


Viewport End

Purpose:	Moves the viewport to the lower right corner of the virtual display.
From Host:	Not supported
Keypad:	
IRL Command:	Not supported
Scan:	Viewport End  *..%*

Viewport Home

Purpose: Moves the viewport to the upper left corner (home position) of the virtual display.

From Host: Not supported

Keypad:   

IRL Command: Not supported


Scan: Viewport Home

..%/

Viewport Page Down

Purpose: Moves the viewport down one page in the virtual display. A page is 16 lines by 20 characters—the reader's display size.

From Host: Not supported



Keypad:   

IRL Command: Not supported



Scan: Viewport Page Down

..%-

Viewport Page Up

Purpose:	Moves the viewport up one page in the virtual display. A page is 16 lines by 20 characters—the reader's display size.
From Host:	Not supported
Keypad:	
IRL Command:	Not supported
Scan:	Viewport Page Up  *..%+*



Viewport to Cursor

Purpose:	Moves the viewport to the cursor's position. This command may not work if you are using the reader in Graphics mode.
From Host:	Not supported
Keypad:	
IRL Command:	Not supported
Scan:	Viewport to Cursor  */-*

Cursor to Viewport

Purpose: Moves the cursor to the viewport. If there is no cursor position available in the viewport, the reader will sound an error beep. This command does not work on applications that have different definitions for cursor movement.

From Host: Not supported

Keypad:   

IRL Command: Not supported

Scan: Cursor to Viewport



..%%

Configuration Command Reference

This chapter is an alphabetical list of all the configuration commands supported on the reader.

Using Configuration Commands

A configuration command changes the way the reader operates. For example, you can change the Beep Volume and make the reader beep very loud in a noisy environment. You can execute configuration commands by:

- scanning a command from a Code 39 or Code 93 bar code label.
- choosing a command from a menu by pressing keys on the keypad.
- sending a command from a host computer.
- executing a command in an IRL program or applications using Reader Services.

Note: *You can send configuration commands from a host computer only when the application is programmed to accept the command syntax.*

You can find the following information about each configuration command in this chapter:

- Command description and purpose
- Default setting
- Command syntax and options
- Bar code labels you can scan to set or change each command

The configuration commands are listed alphabetically by command name. For a list of bar code symbology, communications, or operations commands, use the next table, “Configuration Commands Listed by Category.” If you want to look up a command by its syntax, see the “Configuration Commands by Syntax” list in Appendix A.

Note: *For help about the radio frequency (RF) configuration commands, see the JANUS 900 MHz Radio Frequency Quick Reference Guide.*

Configuration Commands Listed by Category

This chapter lists the configuration commands in alphabetical order. Use this next list to find the configuration commands you may need to set for bar code symbologies, communications, and operations.

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Entering Variable Data in a Configuration Command

You can enter variable data for many of the configuration commands. For example, you can set the End of File (EOF) character to any ASCII character. You need to follow these general instructions to enter variable data.

To enter variable data in a configuration command

1. Scan a bar code label with this syntax:

+/\$+command

where:

+/ is the syntax for the Enter Accumulate Mode command.

/\$+ is the syntax for the Change Configuration command.

command is the syntax for the command you want to change.

For example, the command syntax for EOF is *FAdata*. To change the EOF configuration, scan this bar code:

Enter Accumulate Mode / Change Configuration / Set EOF



+/\$+FA

2. Scan a bar code label from the “Full ASCII Bar Code Chart” in Appendix C. To set EOF to SOH (Start of Heading), scan this label:

SOH



<SOH>

3. Scan the Exit Accumulate Mode bar code label to update the reader's configuration:

Exit Accumulate Mode



-/

Address, Multi-Drop

Purpose: Defines the address of the communications port when you are using the Multi-Drop communications protocol. Each multi-drop address has unique POL and SEL characters that are automatically set when you configure the address. For help, see “POL and SEL Combinations for Multi-Drop Protocol” in Appendix C.

Note: You must select the communications port and protocol before you can set the parameters to define that protocol. For help, see “Communications Protocol, Configure” later in this chapter.

Default: A

Syntax: HCdata
where *data* can be A through Z or 0 through 5.

Scan: 1. Scan this bar code:

Enter Accumulate Mode / Change Address



+/\$+HC

2. Scan a bar code for *data* from the “Full ASCII Bar Code Chart” in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode



-/

AFF (Affirmative Acknowledge)

Purpose: Enables or disables the handshake event that is an affirmative acknowledge to a message. You must enable both AFF and NEG to have a valid configuration.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see "Communications Protocol, Configure" later in this chapter.

Default: Disabled

Syntax: PGdata
where *data* can be any ASCII character.

Scan: To disable AFF, scan this bar code:

Disable AFF



\$+PG

Or: To set AFF to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set AFF



+/\$+PG

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode



_/

Automatic Shutoff

Purpose: Defines the maximum length of time the reader remains on when there is no activity. When you do not use the reader for the length of time set for this command, the reader automatically shuts off and goes into Suspend mode. The reader also goes into a suspend state when you press $\text{\textcircled{10}}$ to turn the reader off. When you press $\text{\textcircled{10}}$ to turn the reader on again, the reader resumes exactly where it left off and all reader memory is saved.

Power Management Tip: You should use the Automatic Shutoff feature to preserve the NiCad battery pack's power.

Note: If the reader is in a communications dock or a power supply is connected to the reader through an optical link adapter, automatic shutoff is disabled.

Default: 1 minute

Syntax: EZdata

Acceptable values for *data* are:

0M	Disabled (always on)
1M-60M	Shutoff time in minutes
15S	15 seconds

Scan: To set the timeout to 15 seconds, scan this bar code:

Set Automatic Shutoff to 15 Seconds



\$+EZ15S

Or: To set the timeout in minutes:

1. Scan this bar code:

Enter Accumulate Mode / Set Automatic Shutoff



+/\$+EZ

2. Scan a numeric value for *data* from these bar codes:



0



1

Automatic Shutoff (continued)



2



3



4



5



6



7



8



9

3. Scan this bar code:

Timeout in Minutes



M

4. Scan this bar code:

Exit Accumulate Mode



*-/

Baud Rate

Purpose: Sets the baud rate for the selected communications port on the reader. The baud rate must match the baud rate of the device (for example, the host computer) that the reader is communicating with.

For Polling Mode D protocol, you must set the baud rate to 1200 or higher. For Multi-Drop protocol, you must set the baud rate to 2400 or higher.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see “Communications Protocol, Configure” later in this chapter.

Default: 9600 baud

Syntax:*IAdata*Acceptable values for *data* are:

0	110 baud
1	300 baud
2	600 baud
3	1200 baud
4	2400 baud
5	4800 baud
6	9600 baud
7	19200 baud
8	38400 baud

Scan:

One of these bar codes:

110 Baud



\$+IA0

300 Baud



\$+IA1

600 Baud



\$+IA2

1200 Baud



\$+IA3

2400 Baud



\$+IA4

4800 Baud



\$+IA5

9600 Baud



\$+IA6

19200 Baud



\$+IA7

38400 Baud



\$+IA8

Beep Duration

Purpose: Defines the low and high beep duration of the default reader beeps. There are two types of beeps:

- Low beep
- High beep

Default: 50 ms for both the low and high beep

Syntax: BD*data*

Acceptable values for *data* are from 1 to 60000 ms (60 seconds).

Scan: 1. Scan this bar code:

Enter Accumulate Mode / Change Beep Duration



+/\$+BD

2. Scan a numeric value for *data* in milliseconds from these bar codes:



0



1



2



3



4



5



6



7



8



9

3. Scan one of these bar codes to set the duration for the low or high beep:

Low Beep



L


High Beep



H

4. Scan this bar code:

Exit Accumulate Mode



-/

Beep Frequency

Purpose: Defines the individual frequencies of the default reader beeps. There are two types of beeps:

- Low beep
- High beep

Default: 1000 Hz for the low beep
2000 Hz for the high beep

Syntax: BFdata
Acceptable values for *data* are from 20 to 20,000 Hz (20 KHz).

Note: If you set the frequency outside the range of 100 Hz to 10,000 Hz, the beeps are inaudible.

Scan: 1. Scan this bar code:

Enter Accumulate Mode / Change Beep Frequency



+/\$+BF

2. Scan a numeric value for *data* in Hz from these bar codes:

 *0*	 *1*
 *2*	 *3*
 *4*	 *5*

Beep Frequency (continued)



6



7



8



9

3. Scan one of these bar codes to set the frequency for the low or high beep:

Low Beep



L

High Beep



H

4. Scan this bar code:

Exit Accumulate Mode



_/

Beep Volume

Purpose: Adjusts the volume of the reader's audio signals. For a list of all the beep sounds and audio signals, see "Understanding the Reader's Audio Signals" in Chapter 2. Set the beep volume according to operator preference and work environment.

Default: Normal

Syntax: *BV data*

Acceptable values for *data* are:

- 0 Off
- 1 Quiet
- 2 Normal
- 3 Loud
- 4 Very loud
- 8 Lower volume
- 9 Raise volume

Scan: One of these bar codes:

Off



\$+BV0

Quiet



\$+BV1

Normal



\$+BV2

Loud



\$+BV3

Very Loud



\$+BV4

Or: Scan one of these bar codes repeatedly to achieve the desired volume:

Raise Beep Volume



\$+BV9

Lower Beep Volume



\$+BV8

Codabar

Purpose: Enables or disables decoding of Codabar symbology. Codabar is a self-checking, discrete symbology that has these 16 characters in its set: 0 to 9, dollar sign (\$), colon (:), slash (/), period (.), plus (+), and minus (-). Codabar is commonly used in libraries, blood banks, and air-parcel express applications. The American Blood Commission (ABC) Codabar requires that you retain the start/stop code digits when processing a Codabar symbol. As a result, configuration CD10 is an illegal configuration.

Default: Standard Codabar, ABCD Start/Stop Transmitted

Syntax: CD*data*

Acceptable values for *data* must be two digits, corresponding to:

Digit	Value	Description
<i>First</i>	0	Disabled
	1	ABC
	2	Standard
	3	Concatenated
<i>Second</i>	0	Discard Start/Stop
	1	ABCD Enabled, Start/Stop Transmitted
	2	DC1-DC4 Enabled, Start/Stop Transmitted

Scan: One of these bar codes:

Disabled, Discard Start/Stop



\$+CD00

ABC, ABCD Start/Stop



\$+CD11

ABC, DC1-DC4 Start/Stop



\$+CD12

Standard, Discard Start/Stop



\$+CD20

Standard, ABCD Start/Stop



\$+CD21

Standard, DC1-DC4 Start/Stop



\$+CD22

Concatenated, Discard Start/Stop



\$+CD30

Concatenated, ABCD Start/Stop



\$+CD31

Concatenated, DC1-DC4 Start/Stop



\$+CD32

Code 11

Purpose: Enables or disables decoding of Code 11 symbology. Code 11 is a very high density, discrete numeric bar code. It is most extensively used in labeling telecommunications components and equipment.

Default: Enabled with two check digits

Syntax: *CGdata*

Acceptable values for *data* are:

- 0 Disabled
- 1 Code 11 enabled with one check digit
- 2 Code 11 enabled with two check digits

Scan: One of these bar codes:

Disable Code 11



\$+CG0

Code 11 Enabled With One Check Digit



\$+CG1

Code 11 Enabled With Two Check Digits



\$+CG2

Code 16K

Purpose: Enables or disables decoding of Code 16K symbology. Code 16K is a two-dimensional (stacked rows), ultra-high density bar code. It is based on Code 128 and is used widely to label unit-dose packaging for the healthcare industry.

Default: Standard

Syntax: CPdata

Acceptable values for *data* are:

- 0 Disabled
- 1 Standard Code 16K enabled
- 2 Code 16K enabled with Function Code 1

When you enable Code 16K with Function Code 1, the reader decodes the bar code label and checks for a Function Code 1 in the first data character position. If a Function Code 1 is the first character, the reader substitutes this Code 16K symbology identifier string for the Function Code 1 character.

] K1

Scan: One of these bar codes:

Disable Code 16K



\$+CP0

Standard Code 16K Enabled



\$+CP1

Code 16K Enabled With Function Code 1



\$+CP2

Code 2 of 5

Purpose: Enables or disables decoding of Code 2 of 5 symbology. Code 2 of 5 uses the bars to encode information and the spaces to separate the individual bars. This code is discrete and self-checking. You can only enable Code 2 of 5 if the Interleaved 2 of 5 (I 2 of 5) code is disabled. If you enable I 2 of 5, Code 2 of 5 is automatically disabled.

Default: Disabled

Syntax: *CCdata*

where *data* consists of three digits as follows:

<i>First digit:</i>	0	Code 2 of 5, 3 Bar Start/Stop
	1	Code 2 of 5, 2 Bar Start/Stop
<i>Second and third digits:</i>	00	Disable Code 2 of 5
	01-32	Label Length

Scan: To disable Code 2 of 5, scan this bar code:

Disable Code 2 of 5



\$+CC00

Or: To enable Code 2 of 5:

1. Scan one of these bar codes:

Code 2 of 5, 3 Bar Start/Stop



+/\$+CC0

Code 2 of 5, 2 Bar Start/Stop



+/\$+CC1

Code 2 of 5 (continued)

2. Scan a two-digit numeric value to set the label length (01-32) from these bar codes.



0



1



2



3



4



5



6



7



8



9

3. Scan this bar code:

Exit Accumulate Mode



/

Code 39

Purpose: Enables or disables decoding of Code 39 symbology. Code 39 is discrete, variable length, and self-checking. The character set is uppercase A to Z, 0 to 9, dollar sign (\$), period (.), slash (/), percent (%), space (), plus (+), and minus (-).

There are three types of ASCII the reader decodes:

- Code 39 non-full ASCII
- Code 39 full ASCII
- Code 39 mixed-full ASCII

Code 39 non-full ASCII Non-full ASCII uses a one-character encoding scheme. For example, you encode the data “SAMPLE” as follows:



SAMPLE

This label decodes as *SAMPLE*.

Code 39 full ASCII Full ASCII uses a two-character encoding scheme to extend the character set to 128 characters. You use the dollar sign (\$), slash (/), percent (%), or plus (+) followed by an uppercase letter to represent one of the characters in the extended set. You must encode lowercase letters as a plus sign (+) followed by their uppercase equivalents. For a list of ASCII characters and their Code 39 representations, see the “Full ASCII Table” in Appendix C.

Use Code 39 full ASCII to enter ASCII control characters or lowercase characters as data. You should also enable Code 39 full ASCII to use ASCII command characters.

For example, you encode the data “sample” in Code 39 full ASCII as follows:



+S+A+M+P+L+E

In Code 39 non-full ASCII, this label decodes as *+S+A+M+P+L+E*. In Code 39 full ASCII, this label decodes as *sample*.

Code 39 mixed-full ASCII Use mixed-full ASCII when printers encode the same label two different ways. For example, if you have a bar code with the data \$%a, some printers encode the data as follows:



/D/E+A

Code 39 (continued)

In the Full ASCII Table in Appendix C, /D represents \$ and /E represents %. If you configure the reader for Code 39 full ASCII, the reader decodes the data as \$%a because there are three valid full ASCII character pairs to represent the data.

Other printers encode the data \$%a as:



\$%+A

The \$ and % are valid Code 39 characters in the non-full ASCII character set. However, the reader will not decode this label if it is configured for full ASCII, because the data is not represented by valid full ASCII character pairs. To decode the label correctly, you need to configure the reader for mixed-full ASCII.

When you configure the reader for Code 39 mixed-full ASCII, the reader will decode both of the labels above as \$%a.

Mixed-full ASCII interprets any valid full ASCII character pairs that appear in the label, but does not require that all data be encoded with a valid full ASCII character pair. If you are uncertain how your labels are encoded, configure the reader for mixed-full ASCII, which decodes all valid Code 39 labels.

If you configure the reader for Code 39 full ASCII, you should check for Code 39 mixed-full ASCII. Mixed-full ASCII does not apply when you configure the reader for non-full ASCII.

Note: *The interpretive text shown under bar code labels does not always accurately reflect the data that is encoded in the label. The interpretive text represents how the label should be decoded.*

Use this table to help configure your reader.

Code 39 Option	Bar Code Label	Decodes
Non-full ASCII	\$%+A	\$%+A
	/D/E+A	/D/E+A
Full ASCII	\$%+A	No decode
	/D/E+A	\$%a
Mixed-full ASCII	\$%+A	\$%a
	/D/E+A	\$%a

Default: Enable Code 39 Full ASCII with no check digit (111)

Syntax:

CBdata

Acceptable values for *data* must be three digits, corresponding to:

<i>First digit:</i>	0	Disabled
	1	Enabled with no check digit
	2	Enabled with check digit
	3	HIBC (Health Industry Bar Code)
	4	With AIAG check digit
<i>Second digit:</i>	0	Discard check digit
	1	Transmit check digit
<i>Third digit:</i>	0	Code 39 non-full ASCII
	1	Code 39 full ASCII
	2	Code 39 mixed-full ASCII

Note: *Selecting HIBC Code 39 automatically sets the configuration to non-full ASCII with the check digit transmitted.*

Scan:

To disable Code 39:

Disable Code 39



\$+CB0

Or:

To enable Code 39:

1. Scan this bar code:

Enter Accumulate Mode / Enable Code 39



+/\$+CB

2. Scan one of these bar codes to set the first digit:

Without a Check Digit



1

With a Check Digit



2

HIBC Code 39



3

With AIAG Check Digit



4

Code 39 (continued)

3. Scan one of these bar codes to set the second digit:

Discard Check Digit



0

Transmit Check Digit



1

4. Scan one of these bar codes to set the third digit:

Code 39 Non-Full ASCII



0

Code 39 Full ASCII



1

Code 39 Mixed-Full ASCII



2

5. Scan this bar code:

Exit Accumulate Mode



-/

Code 49

Purpose: Enables or disables decoding of Code 49 symbology. Code 49 is a multirow symbology for high data density. The last character in each row is used for row checking and the last two characters of the symbol are used for overall checking.

Function codes designate where to place the predefined data string in a Code 49 label. Whenever a reader encounters a function code, it replaces the function code with the defined string before transmitting the data to the workstation. A single Code 49 symbol may contain several different variable length data fields. Function Code 1 (F1) identifies a data system. Function Code 2 (F2) indicates the end of a data field.

Default: Code 49 Enabled, Function Code 1 disabled, Function Code 2 set to CR LF, and Function Code 3 disabled.

Syntax:

<i>CJdata</i>	Code 49
<i>CKdata</i>	Function Code 1
<i>CLdata</i>	Function Code 2
<i>CMdata</i>	Function Code 3

Acceptable values for *data* are:

<i>Code 49:</i>	0	Disabled
	1	Enabled

Function Code 1: Any two ASCII characters.

Function Code 2: Any four ASCII characters

Function Code 3: Any two ASCII characters

Scan: One of these bar codes:

Disable Code 49



\$+CJ0

Enable Code 49



\$+CJ1

Scan: To disable any of the function codes, scan one of these bar codes:

Disable Function Code 1



\$+CK

Disable Function Code 2



\$+CL

Code 49 (continued)

Disable Function Code 3



\$+CM

Or:

To set one of the function codes to a character string:

1. Scan one of these bar codes:

Enter Accumulate Mode / Set Function Code 1



+/\$+CK

Enter Accumulate Mode / Set Function Code 2



+/\$+CL

Enter Accumulate Mode / Set Function Code 3



+/\$+CM

2. Scan any character from the "Full ASCII Bar Code Chart" in Appendix C. You can define two characters each for Function Codes 1 and 3, and four characters for Function Code 2.
3. Scan this bar code:

Exit Accumulate Mode



-/

Code 93

Purpose: Enables or disables decoding of Code 93 symbology. Code 93 is a variable length, continuous symbology that uses four element widths. It complements Code 39.

Default: Enabled

Syntax: *CFdata*

Acceptable values for *data* are:

0 Disabled

1 Enabled

Scan: One of these bar codes:

Disable Code 93



\$+CF0

Enable Code 93



\$+CF1

Code 128

Purpose: Enables or disables decoding of Code 128 symbology. Code 128 is a very high density alphanumeric symbology that supports the extended ASCII character set. It is a variable length, continuous code that uses multiple element widths.

Default: Standard

Syntax: CHdata

Acceptable values for *data* are:

- 0 Disabled
- 1 Standard Code 128
- 2 UCC/EAN Code 128

Scan: One of these bar codes:

Disable Code 128



\$+CH0

Enable Standard Code 128



\$+CH1

Enable UCC/EAN Code 128



\$+CH2

Notes: If you configure Standard Code 128, the reader will not decode Function Code 1 characters in the first position of a bar code label. Any subsequent Function Code 1 characters are translated to the ASCII GS character as a separator for variable length fields.

If you configure UCC/EAN Code 128, the reader will decode a bar code label as Standard Code 128 unless one of the first two characters are a start character and a Function Code 1. In this case, the bar code label is processed as described next:

1. The Function Code 1 character is not transmitted.
2. The three symbology ID characters,]C1, are transmitted.
3. The remaining Code 128 characters are decoded as Standard Code 128.

Command Processing

Purpose: Command processing allows you to disable or enable reader commands. For example, you can disable the Backlight command. There are two ways to enable or disable reader commands:

- Use the Command Processing configuration command described here.
- Use the Reader Commands option on the Op menu in the Interactive Configuration application (IC.EXE) program.

If you want to disable or enable several commands, it is easier to use IC.EXE. For help, see Chapter 5, “Configuring the Reader.”

Default: All reader commands enabled

Syntax: *DCdata*

Acceptable values for *data* are:

0	Disable all reader commands
1	Enable all reader commands
2	Disable override
3	Enable override
<i>command0</i>	Disable reader command
<i>command1</i>	Enable reader command

The override option is a temporary setting that allows you to enable all the reader commands for as long as you need them. When you want to return to the previous setting, you disable the override.

Note: If you disable all the reader commands (*\$+DC0*), you cannot change the reader’s configuration or exit from an IRL program. To enable the reader commands again, use IC.EXE, or edit the configuration “*.ini” file.

Scan: To enable all the reader commands or override the current settings, scan one of these bar codes:

Disable All Reader Commands



\$+DC0

Enable All Reader Commands



\$+DC1

Disable Override



\$+DC2

Enable Override



\$+DC3

Command Processing (continued)

Or: To disable or enable specific reader commands, perform these steps:

1. Scan this bar code:

Enter Accumulate Mode / Command Processing



+/\$+DC

2. Scan the bar code to disable or enable one reader command.

Note: If there are two bar codes for a reader command, you must scan them in order, left to right.

Backspace



_

(continued)



+

Backlight



%

Change Configuration



\$+

Clear



_

(continued)



_

Enter Accumulate Mode



+

(continued)



/

Exit Accumulate Mode



_

(continued)



/

IRL File, Clear



.\$

IRL File, Receive



.%

IRL File, Transmit



%%

IRL Program, Exit



/

IRL Program, Resume



\$.

Laser Off



/%

Viewport Down



%+

Viewport Left



%-

Viewport End



..%.

Viewport Page Down



..%-

Viewport to Cursor



/-

IRL Program, Download



<SI>

(continued)



/

IRL Program, Run



//

Laser On



/.

Viewport Up



%/+

Viewport Right



.-

Viewport Home



..%/+

Viewport Page Up



..%+

Cursor to Viewport



..%%

Command Processing (continued)

Alternate Key Code Entry



.

Multiple-Read Labels



.

Prepare for Reboot



..+%

Reboot



..%\$

Set Clock



/+

Note: To disable or enable Command Override or the Enter key, see the next section, "Disabling or Enabling Command Override and Enter."

3. Scan one of these bar codes:

Disable the Command



0

Enable the Command



1

4. Repeat Steps 2 and 3 to disable or enable another reader command.

Note: You can accumulate up to 250 characters in the buffer. If the data accumulated exceeds 250 characters, you will hear an error beep and the reader will reject the last bar code read.

5. Scan this bar code:

Exit Accumulate Mode



-/

Disabling or Enabling Command Override and Enter

Purpose: You can use the Command Processing configuration command to disable or enable two additional reader commands: Command Override and Enter. You can also use IC.EXE to disable or enable these two commands. For help, see Chapter 5, “Configuring the Reader.”

Default: Command Override and Enter enabled

Syntax: DC<command>*data*
Acceptable values for *data* are:
0 Disable command
1 Enable command

Scan: To disable or enable Command Override, scan one of these bar codes:

Disable Command Override



\$+DC<DLE>0

Enable Command Override



\$+DC<DLE>1

Or: To disable or enable Enter, scan one of these bar codes:

Disable Enter



\$+DC<CR>0

Enable Enter



\$+DC<CR>1

Defining the Reader Commands

Chapter 11, "Reader Command Reference," describes all the reader commands that you can enable or disable with Command Processing, except Alternate Key Code Entry and Multiple-Read Labels. These two reader commands are described next.

Alternate Key Code Entry

If you enable the Alternate Key Code Entry command, you can use each key's four-digit hexadecimal key code value in bar code labels to select options, enter data, and move around in IC.EXE, Communications Manager, and the IRL Desktop. For example, you can scan this label to move the cursor to the right in IC.EXE:

Cursor Right



.4DE0

If you disable the Alternate Key Code Entry command, the reader will interpret the hexadecimal key code value as regular data rather than as a code for a specific key or action. For help, see "Scanning Bar Codes to Select Menu Options" in Appendix C.

Multiple-Read Labels

A bar code label that has a space as the first character after the start code is a multiple-read label. The reader stores a multiple-read label in the buffer until you execute a command to transmit the label or scan a regular label. A regular bar code label is executed as soon as you scan it. If you use Command Processing, IC.EXE, or another method to disable multiple-read labels, the reader processes the bar code label as a regular label and reads and decodes the space as data.

Syntax: <Start Code><SP>data<Stop Code>

Example: Multiple-read bar code label



* A*

Communications Dock Port

Purpose: Sets the SELPORT signal on the reader's COM1, which selects the port on the communications dock through which the reader will communicate. When SELPORT is set to 0, the reader communicates through the dock's network port. When SELPORT is set to 1, the reader communicates through the dock's auxiliary port. You use the Communications Dock Port command only when the reader is in the communications dock.

Default: Network

Syntax: *IPdata*

Acceptable values for *data* are:

- 0 Network port
- 1 Auxiliary port

Scan: One of these bar codes:

Network Port



S+IP0

Auxiliary Port



S+IP1

Communications Port, Select COM Port

Purpose: All subsequent communications protocol configuration changes are assigned to the COM port you select in this command. After you select the COM port, you need to configure and activate the communications protocol, load the protocol handler, set the UART FIFO control register, and connect the device. For help, see “Configuring the Reader for Communications” in Chapter 6.

***Note:** Intermec recommends that you do not designate any JANUS port as COM3. Because COM1 and COM3 share an Interrupt Request (IRQ), you cannot use COM1 if you use COM3.*

Default: COM1

Syntax: ISdata

Acceptable values for *data* are:

- 1 COM1
- 4 COM4

Scan: Scan one of these bar codes:



Communications Port, UART Restore

Purpose: Defines the hex value used to restore the COM1 UART FIFO control register when you suspend and resume the reader while a communications application is running. To learn if you must set this value and to calculate which value to enter for this parameter, see “Specifying a Value for the FIFO Control Register” in Chapter 6.

Note: If your application uses UART 16x550 mode to its fullest extent, you need to investigate what setting is appropriate.

Default: 00

Syntax: IVdata

Acceptable values for *data* are:

00 0 Hex

XX Two characters representing the hex value that the UART FIFO control register is set to when the reader is turned on.

Scan: To set the hex value default, scan this bar code:

0 Hex



\$+IV00

Or: To set the hex value:

1. Scan this bar code:

Enter Accumulate Mode / Change Hex Value



+/\$+IV

2. Scan two bar codes for *data* from the “Full ASCII Bar Code Chart” in Appendix C.
3. Scan this bar code:

Exit Accumulate Mode



-/

Communications Protocol

Protocol determines how the reader communicates with the host through the DTE interface of the selected communications port. You can configure a different communications protocol for each communications port. Even if you use the same communications protocol, you must configure each communications port separately. You can also configure a different protocol for each communications port.

Before configuring a protocol, you need to select the communications port. For help, see “Communications Port, Select COM Port” earlier in this chapter.

To configure the communications protocol

1. Configure the protocol.
2. Activate the protocol.

After you activate the protocol, you need to load the protocol handler, set the UART FIFO control register, and connect the device. For help, see “Configuring the Reader for Communications” in Chapter 6.

Configure

Purpose: Configures the communications protocol for the selected communications port. The reader assigns all subsequent protocol configuration changes to the selected communications protocol. Next, set the parameters, such as baud rate or data bits, for the communications protocol.

***Note:** You cannot reconfigure some of the protocol characters for User-Defined if User-Defined is active. If User-Defined is the active protocol, set the active protocol to **None**. Once you configure User-Defined protocol, reactivate the protocol.*

Here are the parameters you can set for each communications protocol:

Multi-Drop protocol parameters

- Baud rate, parity, and data bits
- Transmit abort timeout
- Address, multi-drop

PC Standard protocol parameters

- Baud rate, parity, data bits, and stop bits

Point-to-Point protocol parameters

- Baud rate, parity, data bits, and stop bits
- Flow control
- Intercharacter delay, turnaround delay, and timeout delay
- Transmit abort timeout

Note: *If you use User-Defined or Point-to-Point protocol, you should only set the Timeout Delay command if the baud rate is 9600 or lower. You should disable Timeout Delay if the baud rate for either of these protocols is set to 19200 or higher.*

Polling Mode D protocol parameters

- Baud rate
- Flow control
- Transmit abort timeout

User-Defined protocol parameters

- Baud rate, parity, data bits, and stop bits
- Flow control and LRC
- Intercharacter delay, turnaround delay, and timeout delay
- Transmit abort timeout
- SOM, EOM (required)
- AFF, NEG, POL, REQ, RES, SEL

Note: *You must set AFF and NEG together. If you set REQ, you must also set AFF and NEG.*

You use the following characters with IRL and Communications Manager. These parameters are not directly supported by the Intermecc protocol handler.

- EOF, EOR, and records per block
- IRL parameters: BAK, End, EOP, PAK, PSS, Run, and SOP

If you want to configure the reader for User-Defined Multi-Drop protocol, select User-Defined protocol. For help, see “Communications Protocol, Multi-Drop, User-Defined” later in this chapter.

Note: *If you use User-Defined or Point-to-Point protocol, you should only set the Timeout Delay command if the baud rate is 9600 or lower. You should disable Timeout Delay if the baud rate for either of these protocols is set to 19200 or higher.*

Communications Protocol, Configure (continued)

Default: Point-to-Point

Syntax: PS*data*

Acceptable values for *data* are:

- 0 User-Defined
- 1 Point-to-Point
- 2 Polling Mode D
- 3 Multi-Drop
- 7 PC Standard

Scan: One of these bar codes:

User-Defined



\$+PS0

Point-to-Point



\$+PS1

Polling Mode D



\$+PS2

Multi-Drop



\$+PS3

PC Standard



\$+PS7

Activate

Purpose: Activates the communications protocol and the communications port you selected. Each port can only have one active protocol at a time.

Note: The reader cannot use the active protocol to communicate until you load the corresponding protocol handler. For help, see “Configuring the Reader for Communications” in Chapter 6.

Default: Point-to-Point

Syntax: PAdata

Acceptable values for *data* are:

- 0 User-Defined
- 1 Point-to-Point
- 2 Polling Mode D
- 3 Multi-Drop
- 7 PC Standard
- 9 None

Scan: One of these bar codes:

User-Defined Protocol



\$+PA0

Point-to-Point Protocol



\$+PA1

Polling Mode D Protocol



\$+PA2

Multi-Drop Protocol



\$+PA3

PC Standard Protocol



\$+PA7

No Protocol



\$+PA9

Multi-Drop, User-Defined

Purpose: Multi-Drop, User-Defined is an option of User-Defined protocol. You must set the POL and SEL characters to define a unique device address. For help, see "POL and SEL Combinations for Multi-Drop Protocol" in Appendix C.

Note: You must select User-Defined protocol before you can enable Multi-Drop, User-Defined protocol. For help, see "Communications Protocol, Configure" earlier in this chapter. To activate Multi-Drop, User-Defined protocol, select User-Defined in the configuration command Communications Protocol, Activate.

Default: Disabled

Syntax: PMdata
Acceptable values for *data* are:
0 Disabled
1 Enabled

Scan: One of these bar codes:

Disable Multi-Drop, User-Defined



\$+PM0

Enable Multi-Drop, User-Defined



\$+PM1

Data Bits

Purpose: Sets the number of data bits the reader uses when communicating with another device (i.e., host computer).

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: 7

Syntax: `IIdata`

Acceptable values for *data* are:

7 7 data bits

8 8 data bits

Scan: One of these bar codes:

7 Data Bits



`*S+II7*`

8 Data Bits



`*S+II8*`

Decode Security

Purpose: Defines the security level to use when decoding bar codes. When you select a lower decode security level, the reader can decode bar codes with poorer print quality.

Note: Only use the low parameter as a temporary solution until you can improve the bar code label print quality.

Default: Moderate

Syntax: CSdata

Acceptable values for *data* are:

- 0 Low
- 1 Moderate
- 2 High

Scan: One of these bar codes:

Low Decode Security



\$+CS0

Moderate Decode Security



\$+CS1

High Decode Security



\$+CS2

Display Backlight Timeout

Purpose: Defines the amount of time the backlight remains on. The backlight timeout setting significantly affects the reader's battery life. If you set a longer backlight timeout value, you will use the power in the NiCad battery pack at a faster rate.

Default: 10 seconds

Syntax: DF*data*

Acceptable values for *data* are:

- 00 Disabled
- 01- 60 Timeout in seconds

Scan: To disable the backlight timeout, scan this bar code:

Disable Backlight Timeout



\$+DF00

Or: To set the backlight timeout:

1. Scan this bar code:

Enter Accumulate Mode / Set Backlight Timeout



+/\$+DF

2. Scan a two-digit numeric value for *data* from these bar codes.



0



1



2



3



4



5



6



7



8



9

3. Scan this bar code:

Exit Accumulate Mode



-/

Display Contrast

Purpose: Defines the contrast (light or dark) of the characters against the reader display.

Default: 3 (maximum contrast)

Syntax: *DJdata*
Acceptable values for *data* are 0 (light) to 7 (dark).

Scan: One of these bar codes:

0 - Light



\$+DJ0

1



\$+DJ1

2



\$+DJ2

3 - Maximum Contrast



\$+DJ3

4



\$+DJ4

5



\$+DJ5

6



\$+DJ6

7 - Dark



\$+DJ7

Lighter





\$+DJ8

Darker



\$+DJ9

Display Mode, IRL

- Purpose:** Determines how IRL displays and handles data. The reader has two IRL display modes: buffered and transparent.
- Buffered Display** A buffered display formats the display text with a full block character and a Carriage Return Line Feed (CR LF) after each data record. When you run an IRL program, the CR LF is actually executed before the next IRL prompt.
- Transparent Display** A transparent display does not add a CR LF after each data record. Scanned data records are concatenated together. Autowrap and autoscroll features are disabled. When the cursor gets to the end of a line, it does not wraparound. When the cursor reaches the bottom of the display, it does not scroll up. You must include control codes in the IRL program to format the display and move the cursor around. For example, you can use a CR LF sequence to move down one display line or to scroll the display after the last line. Error messages are not displayed.
- Default:** Buffered
- Syntax:** `DMdata`
- Acceptable values for *data* are:
- 0 Buffered
 - 1 Transparent
- Scan:** One of these bar codes:
- Buffered Display Mode
- 
- *\$+DM0*
- Transparent Display Mode
- 
- *\$+DM1*

Display Setup

Purpose: Defines the number of lines and columns in the display image, the Video mode, at what line the display scrolls, and the character height. The reader's video modes are used in the same way as on a PC.

The reader's display size is 16 lines or rows by 20 characters. You can use the display as a viewport to the reader's virtual display of 25 lines by 80 characters. If you select the 25 x 80 display size, you can set the Video mode, character height, and scroll line; otherwise, those parameters are preset to match the display size. For help, see "How to Use the Reader's Display" in Chapter 2.

Note: If you are working at the DOS prompt, Intermec recommends that you set the display size to 25 x 80 or you may see inconsistent display results.

While you run an application, the reader reverts to Automatic Viewport Movement mode and scrolls at line 25 unless your application sets these values. When you exit the application, the reader restores your previous configuration values.

Default:

<i>First digit:</i>	Display size 25 lines by 80 characters (25 x 80)
<i>Second digit:</i>	Video mode 3 (normal character width, Color mode)
<i>Third digit:</i>	Scrolls at line 16
<i>Fourth digit:</i>	Normal character height

Syntax: DSdata


Acceptable values for *data* are four digits corresponding to:

<i>First digit:</i>	0	25 x 80 (lines by characters)
	1	16 x 20
	2	8 x 20
	3	16 x 10
	4	8 x 10
<i>Second digit:</i>	0	Video mode 0 (double character width, monochrome)
	1	Video mode 1 (double character width, color)
	2	Video mode 2 (normal character width, monochrome)
	3	Video mode 3 (normal character width, color)
<i>Third digit:</i>	0	Scroll at line 25
	1	Scroll at line 16
	2	Scroll at line 8
<i>Fourth digit:</i>	0	Normal character height
	1	Double character height

Note: The JANUS reader display is a monochrome display. In Color Video mode, the display supports gray scales. Existing applications may have a more readable display by using either Monochrome or Color mode.

Scan:

One of these bar codes to set the display options:

Note: When you scan a label that changes the Video mode, the screen goes blank. To activate the screen, begin entering data or press  if you are at the DOS prompt.

25 x 80, Video Mode 2, Scroll at Line 25, Normal Character Height



\$+DS0200

25 x 80, Video Mode 2, Scroll at Line 25, Double Character Height



\$+DS0201

25 x 80, Video Mode 2, Scroll at Line 16, Normal Character Height



\$+DS0210

25 x 80, Video Mode 2, Scroll at Line 8, Double Character Height



\$+DS0221

25 x 80, Video Mode 3, Scroll at Line 25, Normal Character Height



\$+DS0300

25 x 80, Video Mode 3, Scroll at Line 25, Double Character Height



\$+DS0301

25 x 80, Video Mode 3, Scroll at Line 16, Normal Character Height



\$+DS0310

25 x 80, Video Mode 3, Scroll at Line 8, Double Character Height



\$+DS0321

Display Setup (continued)

25 x 40, Video Mode 0, Scroll at Line 25, Normal Character Height



\$+DS0000

25 x 40, Video Mode 0, Scroll at Line 25, Double Character Height



\$+DS0001

25 x 40, Video Mode 0, Scroll at Line 16, Normal Character Height



\$+DS0010

25 x 40, Video Mode 0, Scroll at Line 8, Double Character Height



\$+DS0021

25 x 40, Video Mode 1, Scroll at Line 25, Normal Character Height



\$+DS0100

25 x 40, Video Mode 1, Scroll at Line 25, Double Character Height



\$+DS0101

25 x 40, Video Mode 1, Scroll at Line 16, Normal Character Height



\$+DS0110

25 x 40, Video Mode 1, Scroll at Line 8, Double Character Height



\$+DS0121

16 x 20 (lines by characters)



\$+DS1

8 x 20 (lines by characters)



\$+DS2

16 x 10 (lines by characters)



\$+DS3

8 x 10 (lines by characters)



\$+DS4

EOF (End of File)

Purpose: Defines the end of file character for the communications port when transmitting a file from the reader.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see "Communications Protocol, Configure" earlier in this chapter. The configured option may be overridden when you use certain communications protocols. The EOF will not be overridden when you use User-Defined protocol.

Default: Disabled

Syntax: FAdata
where *data* can be any ASCII character.

Scan: To disable EOF, scan this bar code:

Disable EOF



\$+FA

Or: To set EOF to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set EOF



+/\$+FA

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.
3. Scan this bar code:

Exit Accumulate Mode



-/

EOM (End of Message)

Purpose: Attaches an EOM to the end of a data block to indicate the end of data transmission to and from a reader. You can disable the EOM transmit and receive characters, define EOM transmit and receive to the same characters, or define EOM transmit and receive to different characters.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: EOM Transmit and Receive are set to CR (0DH) and LF (0AH) (carriage return line feed)

Syntax:

PF	Disable EOM transmit and receive
PFdata	Enable EOM transmit and receive

PI	Disable EOM transmit only
PIdata	Enable EOM transmit only

PJ	Disable EOM receive only
PJdata	Enable EOM receive only

where *data* can be one or two ASCII characters.

Scan: To disable EOM, scan one of these bar codes:

Disable EOM Transmit and Receive



\$+PF

Disable EOM Transmit Only



\$+PI

Disable EOM Receive Only



\$+PJ

Or: To set EOM Transmit and Receive to the same ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Enable EOM Transmit and Receive



+/\$+PF

EOM (continued)

2. Scan one or two bar codes for *data* from the “Full ASCII Bar Code Chart” in Appendix C.
3. Scan this bar code:

Exit Accumulate Mode



-/

Or:

To set EOM Transmit and Receive to different ASCII characters:

Note: You can enable an EOM Transmit character and disable the EOM Receive character, or vice versa.

1. Scan this bar code to set the EOM Transmit character:

Enter Accumulate Mode / Enable EOM Transmit Only



+/\$+PI

2. Scan one or two bar codes for *data* from the “Full ASCII Bar Code Chart” in Appendix C.
3. Scan this bar code:

Exit Accumulate Mode



-/

4. Scan this bar code to set the EOM Receive character:

Enter Accumulate Mode / Enable EOM Receive Only



+/\$+PJ

5. Scan one or two bar codes for *data* from the “Full ASCII Bar Code Chart” in Appendix C.
6. Scan this bar code:

Exit Accumulate Mode



-/

EOR (End of Record)

Purpose: Attaches an EOR to the end of every record of a file transmit.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

The configured option may be overridden when you use certain communications protocols. EOR will not be overridden when you use User-Defined protocol.

Default: Disabled

Syntax: FBdata
where *data* can be one or two ASCII characters.

Scan: To disable EOR, scan this bar code:

Disable EOR



\$+FB

Or: To set the EOR character to an ASCII character(s):

1. Scan this bar code:

Enter Accumulate Mode / Set EOR



+/\$+FB

2. Scan one or two bar codes for *data* from the “Full ASCII Bar Code Chart” in Appendix C.
3. Scan this bar code:

Exit Accumulate Mode



_/

Flow Control

Purpose: Regulates the data transmission through the communications port. The reader is a DTE device.

Clear To Send/Request To Send (CTS/RTS) is a hardware signal flow control. The reader sets RTS high when it is ready to transmit. The reader checks CTS when it tries to transmit data.

XON/XOFF response causes the reader to respond to XON/XOFF characters received while transmitting. XON/XOFF control specifies that the reader transmits XON/XOFF characters to control the incoming data flow. XON/XOFF response and control specify that the reader responds to and transmits XON/XOFF characters.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see "Communications Protocol, Configure" earlier in this chapter.

Default: None

Syntax: ILdata

Acceptable values for *data* are:

- 0 None
- 1 CTS checking/RTS control
- 2 XON/XOFF response
- 3 XON/XOFF control
- 4 XON/XOFF response and control

Scan: One of these bar codes:

No Flow Control



\$+IL0

CTS Checking/RTS Control



\$+IL1

XON/XOFF Response



\$+IL2

XON/XOFF Control



\$+IL3

XON/XOFF Response and Control



\$+IL4

Intercharacter Delay

Purpose: Defines the amount of time the reader waits before sending each character to the host. It modifies outgoing data only by slowing the speed of transmission. A character delay can be useful when the reader is communicating with a controller through a modem using full-duplex operation.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: 0 sec

Syntax: IDdata

Acceptable values for *data* are:

0	0 ms
1	1 ms
2	2 ms
3	5 ms
4	10 ms
5	20 ms
6	50 ms
7	100 ms

Scan: One of these bar codes:

Intercharacter Delay, 0 ms



\$+ID0

Intercharacter Delay, 1 ms



\$+ID1

Intercharacter Delay, 2 ms



\$+ID2

Intercharacter Delay, 5 ms



\$+ID3

Intercharacter Delay, 10 ms



\$+ID4

Intercharacter Delay, 20 ms



\$+ID5

Intercharacter Delay, 50 ms



\$+ID6

Intercharacter Delay, 100 ms



\$+ID7

Interleaved 2 of 5

Purpose: Enables or disables decoding of Interleaved 2 of 5 (I 2 of 5) symbology. I 2 of 5 is a high-density, self-checking, continuous numeric symbology. It is mainly used in inventory distribution and the automobile industry.

Enabling I 2 of 5 automatically disables Code 2 of 5.

Default: Variable length with a check digit

Syntax: *CAdata*

Acceptable values for *data* are:

0	Disabled
2-32	Fixed length (even number only)
97	Variable length without a check digit
98	Case code (6 or 14) with a check digit
99	Variable length with a check digit



Caution

Using the variable length without a check digit configuration option can cause substitution errors.

Conseil

Des erreurs de substitution peuvent survenir si vous utilisez la longueur variable sans option de vérification de configuration de chiffres.

Scan: One of these bar codes:

Disable Interleaved 2 of 5



\$+CA0

Enable Variable Length Without a Check Digit



\$+CA97

Enable Variable Length With a Check Digit



\$+CA99

Enable Interleaved 2 of 5, Case Code



\$+CA98

Or:

To set Interleaved 2 of 5 to a fixed length:

1. Scan this bar code:

Enter Accumulate Mode / Set Fixed Length



+/\$+CA

2. Scan a numeric value for *data* from these bar codes. (Use even numbers 2-32 only)



0



1



2



3



4



6



8

3. Scan this bar code:

Exit Accumulate Mode



-/

IRL BAK (Bad Program Acknowledge)

Purpose: The reader sends a BAK to indicate that it cannot successfully download an IRL program.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see "Communications Protocol, Configure" earlier in this chapter.

Default: BEL

Syntax: ZBdata
where *data* can be any ASCII character.

Scan: To disable BAK, scan this bar code:

Disable BAK



\$+ZB

Or: To set BAK to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set BAK



+/\$+ZB

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode



_/

IRL End Program Block

Purpose: Indicates the last block of an IRL program when you download a program to the reader.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: SO (shift out)

Syntax: `XDdata`
where *data* can be any ASCII character.

Scan: To disable IRL End Program Block, scan this bar code:

Disable IRL End Program Block



\$+XD

Or: To set IRL End Program Block to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / IRL End Program Block



+/\$+XD

2. Scan a bar code for *data* from the “Full ASCII Bar Code Chart” in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode



-/

IRL EOP (End of Program)

Purpose: An EOP indicates the end of an IRL program block when you download a program to the reader.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see "Communications Protocol, Configure" earlier in this chapter.

Default: SYN (synchronous idle)

Syntax: XBdata
where *data* can be any ASCII character.


Scan: To disable EOP, scan this bar code:

Disable EOP

\$+XB


Or: To set EOP to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set EOP

+/\$+XB

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode

_/

IRL PAK (Program Acknowledge)

Purpose: The reader sends this character to the host computer to acknowledge an IRL program that it has received.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: RS (record separator)

Syntax: `ZAn`
where *n* can be any ASCII character.

Scan: To disable PAK, scan this bar code:

Disable PAK



\$+ZA

Or: To set the PAK to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set PAK



+/\$+ZA

2. Scan a bar code for *n* from the “Full ASCII Bar Code Chart” in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode



-/

IRL PSS (Program Statement Separator)

Purpose: Separates individual IRL program statements from each other.

Note: Do not define PSS as the same character used for EOM. You must select the communications port and protocol before you set the parameters that define the protocol. For help, see "Communications Protocol, Configure" earlier in this chapter.

Default: CR (carriage return)

Syntax: XE*data*
where *data* can be any ASCII character.

Scan: To disable PSS, scan this bar code:

Disable PSS



\$+XE

Or: To set the PSS to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set PSS



+/\$+XE

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode



_/

IRL Run

Purpose: Designates the end of an IRL program download and causes the reader to execute the program. The Run command takes the place of the last EOP character in the downloaded program.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: DC2

Syntax: XCdata
where *data* can be any ASCII character.

Scan: To disable IRL Run, scan this bar code:

Disable IRL Run



\$+XC

Or: To set IRL Run to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set IRL Run



+/\$+XC

2. Scan a bar code for *data* from the “Full ASCII Bar Code Chart” in Appendix C.
3. Scan this bar code:

Exit Accumulate Mode



-/

IRL SOP (Start of Program)

Purpose: Defines the beginning of an IRL program download from the host computer.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: SI (shift in)

Syntax: XAdata
where *data* can be any ASCII character.

Scan: To disable SOP, scan this bar code:

Disable SOP



\$+XA

Or: To set SOP to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set SOP



+/\$+XA

2. Scan a bar code for *data* from the “Full ASCII Bar Code Chart” in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode



-/

Key Code Look-Up Table

Purpose: You can remap up to 20 scanned characters to a keystroke equivalent.

Default: 102-key PC keyboard (no modifications)

Syntax: WMdata
where *data* can be any ASCII character.

Scan: To reset the look-up table to the default setting, scan this bar code:

Clear Key Code Look-Up Table



\$+WN

Or: To modify any scanned character, complete these steps:

1. Scan this bar code:

Modify Key Code Look-Up Table



+/\$+WM

2. Scan a bar code for *data* for the key you want to redefine. Use the “Full ASCII Bar Code Chart” in Appendix C.

Note: Enclose the redefined character and ASCII value in quotes to prevent the reader from interpreting the option as a reader or configuration command (see the example).

3. Find the four-digit hexadecimal value for the key you want to assign. For help, see “Key Codes” in Appendix C.
4. Scan a bar code for each digit using the “Full ASCII Bar Code Chart” in Appendix C.
5. Scan this bar code:

Exit Accumulate Mode



-/









Key Code Look Up Table (continued)

Example: You want to redefine the uppercase letter A to the [(left square bracket). In the Full ASCII Table, the hex value for [is 5B. To redefine A, enter this command:

```
$+WM"A1A5B"
```

You can also change the Key Code Look-Up Table in IC.EXE.

To redefine A to [in IC.EXE

1. From the Op menu in IC.EXE, select Key Codes.
2. Select Redefine.
3. Press  .
4. Press  to move to the next field.
5. To enter the hexadecimal value for [, press    .
6. Press .
7. Exit IC.EXE and save your changes.

Keypad Caps Lock

Purpose: Turns the caps lock on and off. With the caps lock turned on, all alphabetic characters you type on the keypad will be uppercase or capital letters. By default, the reader turns the caps lock off when you boot the reader.

Default: Caps lock off

Syntax: KAdata

Acceptable values for *data* are:

- 0 Caps lock off
- 1 Caps lock on

Scan: One of these bar codes:

Caps Lock Off



\$+KA0

Caps Lock On



\$+KA1

Keypad Clicker

Purpose: Enables or disables the keypad clicks. The reader sounds a click each time you press a key or decode a two-dimensional symbology.

Default: Enabled

Syntax: *KCdata*
Acceptable values for *data* are:
0 Disable keypad clicker
1 Enable keypad clicker

Scan: One of these bar codes:

Disable Keypad Clicker




S+KC0

Enable Keypad Clicker



S+KC1

Keypad Ctrl Key Functions

Purpose: Defines the functionality of the Control () key.

Default: All Ctrl key functions enabled

Syntax: *KBdata*

Acceptable values for *data* are:

- 0 Enable Ctrl key
- 1 Prohibit Ctrl-Alt-Del sequence (warm reboot)
- 2 Prohibit Ctrl key combinations

Scan: One of these bar codes:

Enable Ctrl Key



\$+KB0

Prohibit Ctrl-Alt-Del







\$+KB1

Prohibit Ctrl Key Combinations



\$+KB2

Keypad, Numeric

Purpose: Defines the ability to enable the numeric keypad from the reader keypad as described in Chapter 2, “Learning How to Use the Reader.” You can set the reader to simulate the numeric keypad on a 102-key PC keyboard. Press     to enable the reader’s number pad. You can use the Keypad, Numeric command to prohibit the use of the numeric keypad if you want to avoid inadvertently enabling the number pad.

Default: Permit entering number pad

Syntax: *KDdata*

Acceptable values for *data* are:

- 0 Prohibit entering number pad
- 1 Permit entering number pad

Scan: One of these bar codes:

Prohibit Entering Number Pad



\$+KD0

Permit Entering Number Pad



\$+KD1

LRC

Purpose: The Longitudinal Redundancy Check character is an error-checking character that you can append to transmitted and received blocks of data.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see "Communications Protocol, Configure" earlier in this chapter.

Default: Disabled

Syntax: IFdata

Acceptable values for *data* are:

0 LRC disabled

1 LRC enabled

Scan: One of these bar codes:

Disable LRC



\$+IF0

Enable LRC



\$+IF1

MSI

Purpose: Enables or disables decoding of MSI symbology. MSI code is similar to Plessey code. MSI code includes a start pattern, data characters, one or two check digits, and a stop pattern.

Default: Disabled

Syntax: CNdata

Acceptable values for *data* are:

<i>First digit:</i>	0	Disabled
	1	No check digits
	2	1 modulus 10 check digit
	3	2 modulus 10 check digit
<i>Second digit:</i>	0	Discard check digit
	1	Transmit check digit

Scan:

One of these bar codes:

Disable MSI



\$+CN00

MSI Without Check Digits



\$+CN10

MSI With 1 Modulus 10 Check Digit, Discard Check Digit



\$+CN20

MSI With 1 Modulus 10 Check Digit, Transmit Check Digit



\$+CN21

MSI With 2 Modulus 10 Check Digits, Discard Check Digits



\$+CN30

MSI With 2 Modulus 10 Check Digits, Transmit Check Digits



\$+CN31

NEG (Negative Acknowledge)


Purpose: Indicates a negative acknowledgment to a transmitted message. You must enable both NEG and AFF to have a valid configuration.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see "Communications Protocol, Configure" earlier in this chapter.

Default: Disabled


Syntax: PHdata
where *data* can be any ASCII character.

Scan: To disable NEG, scan this bar code:


Disable NEG

\$+PH

Or: To set NEG to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set NEG

+/\$+PH

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.
3. Scan this bar code:

Exit Accumulate Mode

_/

Parity

Purpose: Sets the parity of the selected communications port. The reader uses parity for error checking in data transmissions.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: Even

Syntax: `IBdata`

Acceptable values for *data* are:

- 0 No parity
- 1 Even parity
- 2 Odd parity
- 3 Mark parity
- 4 Space parity

Scan: One of these bar codes:

No Parity



\$+IB0

Even Parity



\$+IB1

Odd Parity



\$+IB2

Mark Parity



\$+IB3

Space Parity



\$+IB4

Plessey

Purpose: Enables or disables decoding of Plessey symbology. Plessey code is pulse-width modulated. It includes a start character, data characters, an eight-bit cyclic check digit, a termination bar, and usually a reverse start character. The code is continuous and not self-checking. You need to configure two parameters for Plessey code: Start Code and Check Digit.

Default: Disabled

Syntax: *CIdata*

Acceptable values for *data* are:

- 00 Disabled
- 10 Plessey with reverse start code
- 30 Transmit check digit
- 31 Discard check digit

Scan: To disable Plessey:

Disable Plessey



\$+CI00

Or: To set Plessey, complete these steps:

1. Scan this bar code:

Plessey With Reverse Start Code



\$+CI10

2. Scan one of these bar codes to transmit or retain the check digit:

Transmit Check Digit



\$+CI30

Discard Check Digit



\$+CI31

POL

Purpose: Solicits or requests data from a polled device.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: Disabled

Syntax: HBdata
where *data* can be any ASCII character.

Scan: To disable POL, scan this bar code:

Disable POL



\$+HB

Or: To set POL to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set POL



+/\$+HB

2. Scan a bar code for *data* from the “Full ASCII Bar Code Chart” in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode



-/

Postamble

Purpose: Sets the postamble that is appended to any data you scan with the reader. Common postambles include cursor controls such as tabs or carriage return line feeds.

Note: A postamble is not added to scanned data when you run IRL programs.

Default: <CR>

Syntax: AE*data*

Acceptable values for *data* are up to 25 ASCII characters. If you enter the AE command without *data*, the postamble is disabled. You must enclose the *data* within quotation marks if the *data* is a reserved word, such as a reader configuration command (see the example).

Scan: To disable the postamble, scan this bar code:

Disable Postamble



\$+AE

Or: To set the postamble to an ASCII character string:

1. Scan this bar code:

Enter Accumulate Mode / Set Postamble



+/\$+AE

2. Scan a value for *data* from the "Full ASCII Bar Code Chart" in Appendix C. The postamble can be from 1 to 25 characters.
3. Scan this bar code:

Exit Accumulate Mode



-/

Example: You want to set the postamble to the letters “BV,” which also represents the Beep Volume configuration command. Enter the postamble by scanning this bar code:

Set Postamble to BV



\$+AE"BV"

If you omit the quotation marks, the reader interprets the command as two commands: AE to set the postamble to no characters, and BV to change the beep volume.

Preamble

Purpose: Sets the preamble that precedes any data you scan with the reader. Common preambles include a data location number or an operator number.

Note: A preamble is not added to scanned data when you run IRL programs.

Default: Disabled

Syntax: ADdata

Acceptable values for *data* are up to 25 ASCII characters. When you enter the AD command without *data*, the preamble is disabled. You must enclose the *data* within quotation marks if the *data* is a reserved word, such as a reader configuration command (see the example at the end of this section).

Scan: To disable the preamble, scan this bar code:

Disable Preamble



\$+AD

Or: To set the preamble to an ASCII character string:

1. Scan this bar code:

Enter Accumulate Mode / Set Preamble



+/\$+AD

2. Scan a value for *data* from the “Full ASCII Bar Code Chart” in Appendix C. The preamble can be from 1 to 25 characters.

Preamble (continued)

3. Scan this bar code:

Exit Accumulate Mode



-/

Example:

You want to set the preamble to the letters “BV,” which also represents the Beep Volume configuration command. Enter the preamble by scanning this bar code:

Set Preamble to BV



\$+AD"BV"

If you omit the quotation marks, the reader interprets the command as two commands: AD to set the preamble to no characters, and BV to change the beep volume.

Records Per Block

Purpose:

Defines the maximum number of data records transmitted per block of data. Usually files are transmitted record by record. This configuration allows you to transmit multiple records per data block. A block of data is transmitted during a single transmission, like an individual data record is normally.

Note: The configured option may be overridden when you use certain communications protocols. Records Per Block will not be overridden when you use User-Defined protocol.

You must select the communications port and protocol before you set the parameters that define the protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default:

1 record transmitted per block

Syntax:

FCdata

Acceptable values for *data* are:

- 0 All records are transmitted in one block
- 01-99 Records transmitted per block

Scan: To have all records transmitted in one block, scan this bar code:

All Records = 1 Block



\$+FC0

Or: To set the records per block:

1. Scan this bar code:

Enter Accumulate Mode / Set Number of Records Per Block



+/\$+FC

2. Scan a two-digit numeric value for *data* from these bar codes:



0



1



2



3



4



5



6



7



8



9

3. Scan this bar code:

Exit Accumulate Mode



-/

REQ (Request for Acknowledge)

Purpose: Enables or disables a request for a repeat handshake event. If you enable REQ, you must also enable AFF and NEG to have a valid configuration.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see "Communications Protocol, Configure" earlier in this chapter.

Default: Disabled

Syntax: PDdata
where *data* can be any ASCII character.


Scan: To disable REQ, scan this bar code:

Disable REQ

\$+PD


Or: To set REQ to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set REQ

+/\$+PD

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode

_/

RES (Reset)

Purpose: Enables or disables a reset event.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: Disabled

Syntax: `PCdata`
where *data* can be any ASCII character.

Scan: To disable RES, scan this bar code:

Disable RES



\$+PC

Or: To set RES to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set RES



+/\$+PC

2. Scan a bar code for *data* from the “Full ASCII Bar Code Chart” in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode



-/

Scan Ahead

Purpose: Enables or disables scan ahead. If you enable this parameter, you can scan a number of labels that are held in a stack until the reader can process the data. If you disable this parameter, the reader processes each label you scan before you can scan the next label.

Default: Disabled

Syntax: *SDdata*

Acceptable values for *data* are:

- 0 Disabled (scan one label at a time)
- 1 Enabled (scan many labels at a time)

Scan: One of these bar codes:

Disable Scan Ahead





\$+SD0

Enable Scan Ahead



\$+SD1

Scanner Mode

- Purpose:** Defines how the scanner operates when the trigger is pulled. There are two types of modes:
- One-Shot mode requires you to pull the trigger each time you want to scan a bar code. Once you scan a bar code, the scanner turns off.
 - Automatic mode allows you to pull the trigger once and scan a series of bar codes. When you release the trigger, the scanner turns off. To scan the same bar code more than once, you must release the trigger or scan a different bar code before attempting a second scan.
- Default:** One-Shot mode
- Syntax:** *SBdata*
- Acceptable values for *data* are:
- 0 One-Shot mode
 - 1 Automatic mode
- Scan:** One of these bar codes:
- Enable One-Shot Mode
- 
- *\$+SB0*
- Enable Automatic Mode
- 
- *\$+SB1*

Scanner Redundancy

Purpose: Defines the number of scans (voting) the scanner takes of the same label that must decode correctly for a good read of the label. Voting allows the reader to decode the same bar code multiple times during a single-trigger event, and to compare the decoded information a specific number of times before signaling a good read. There are three options:

Low Allows the reader to accept the first good read, which speeds up reader performance. This setting is recommended when scanning good quality bar codes.

Normal The reader decodes the bar code a minimum number of times in each trigger event.

High The reader scans and decodes the bar code a maximum number of times in each trigger event. The specific number of comparisons depends on each bar code symbology. The high setting is recommended when scanning poor quality labels that may cause substitution errors.

For example, when you scan Code 39 labels and the scanner redundancy is set to normal, two successive matching decodes in a single-trigger event are required. When scanner redundancy is set to high, three successive matching decodes in a single-trigger event are required.

Default: Normal

Syntax: *SRdata*

Acceptable values for *data* are:

- 0 None
- 1 Normal
- 2 High

Scan: One of these bar codes:

None

*\${SR0}

Normal

*\${SR1}

High

*\${SR2}

Scanner Timeout

Purpose: Defines the maximum length of time the scanner stays on following each trigger pull.

Default: Disabled (no timeout)

Syntax: *SAdata*
 Acceptable values for *data* are:
 0 Disabled
 1-60 Shutoff time in seconds

Scan: 1. Scan this bar code:

Enter Accumulate Mode / Change Scanner Timeout



*+ / S + SA *

2. Scan a numeric value for *data* from these bar codes:



0



1



2



3



4



5



6



7



8



9

3. Scan this bar code:

Exit Accumulate Mode



*- / *

Scanner Trigger

- Purpose:** Scanner trigger allows you to set level triggering or edge triggering.
- With level triggering, you pull the trigger and the laser turns on and stays on until you release the trigger.
 - In edge triggering, you pull the trigger and the laser turns on and stays on. When you pull the trigger a second time, the laser turns off. Simply releasing the trigger does not turn the laser off. If the laser is left on, the scanner timeout turns the laser off.

Default: Level triggering

Syntax: *SCdata*

Acceptable values for *data* are:

- 0 Level triggering
- 1 Edge triggering

Scan: One of these bar codes:

Enable Level Triggering

*\${SC0}

Enable Edge Triggering

*\${SC1}

SEL (Select)

Purpose: Defines the character that requests permission for the controller to send data to the polled device.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: Disabled

Syntax: HAdata
where *data* can be any ASCII character.

Scan: To disable SEL, scan this bar code:

Disable SEL



\$+HA

Or: To set SEL to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set SEL



+/\$+HA

2. Scan a bar code for *data* from the “Full ASCII Bar Code Chart” in Appendix C.
3. Scan this bar code:

Exit Accumulate Mode



-/

SOM (Start of Message)

Purpose: SOM is the first character in a message sent to or received from the host computer.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see "Communications Protocol, Configure" earlier in this chapter.

Default: Disabled

Syntax: PEdata
where *data* can be any ASCII character.

Scan: To disable SOM, scan this bar code:

Disable SOM



\$+PE

Or: To set SOM to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set SOM



+/\$+PE

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.
3. Scan this bar code:

Exit Accumulate Mode



_/

Stop Bits

Purpose: Sets the number of stop bits on the communications port.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see “Communications Protocol, Configure” earlier in this chapter.

Default: 1 stop bit

Syntax: `ICdata`

Acceptable values for *data* are:

- 1 1 stop bit
- 2 2 stop bits

Scan: One of these bar codes:

1 Stop Bit



`*$+IC1*`

2 Stop Bits



`*$+IC2*`

Timeout Delay

Purpose: Defines the length of time the reader waits between characters when receiving a message. When the timeout expires, an I/O error occurs.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see "Communications Protocol, Configure" earlier in this chapter.

If you are using User-Defined or Point-to-Point protocol, you should only set the Timeout Delay command if the baud rate is 9600 or lower. You should disable Timeout Delay if the baud rate for either of these protocols is set to 19200 or higher.

Default: 10 sec

Syntax: IEdata

Acceptable values for *data* are:

0	5 ms
1	100 ms
2	500 ms
3	2 sec
4	10 sec
5	20 sec
6	40 sec
7	60 sec
8	No timeout

Scan: One of these bar codes:

No Timeout Delay



\$+IE8

Timeout Delay, 5 ms



\$+IE0

Timeout Delay, 100 ms



\$+IE1

Timeout Delay, 500 ms



\$+IE2

Timeout Delay, 2 sec



S+IE3

Timeout Delay, 10 sec



S+IE4

Timeout Delay, 20 sec



S+IE5

Timeout Delay, 40 sec



S+IE6

Timeout Delay, 60 sec



S+IE7

Transmit Abort Timeout

Purpose: Defines the length of time the reader waits to receive a message if one of these conditions is true:

- CTS is continuously false for the timeout period.
- XOFF condition does not change within the timeout period.
- POL not received (polling protocol) within the timeout period.

Transmit Abort Timeout is similar to the Timeout Delay configuration, but it only applies to the three conditions listed above.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see "Communications Protocol, Configure" earlier in this chapter.

Default: Disabled

Syntax: IHdata

Acceptable values for *data* are:

0 Disabled
1-65000 Timeout in ms

Scan: To disable Transmit Abort Timeout, scan this bar code:

Disable Transmit Abort Timeout



\$+IH0

Or: To set a timeout value:

1. Scan this bar code:

Enter Accumulate Mode / Change Transmit Abort Timeout



+/\$+IH

2. Scan a numeric value of one to five digits for *data* from these bar codes:



0



1



2



3



4



5



6



7



8



9

3. Scan this bar code:

Exit Accumulate Mode



-/

Turnaround Delay

Purpose: Defines the length of time the reader waits to respond after receiving data from the host computer.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see "Communications Protocol, Configure" earlier in this chapter.

Default: 0 sec

Syntax: IGdata

Acceptable values for *data* are:

0	0 ms
1	1 ms
2	2 ms
3	5 ms
4	10 ms
5	20 ms
6	50 ms
7	100 ms

Scan: One of these bar codes:

No Turnaround Delay



\$+IG0

Turnaround Delay, 1 ms



\$+IG1

Turnaround Delay, 2 ms



\$+IG2

Turnaround Delay, 5 ms



\$+IG3

Turnaround Delay, 10 ms



\$+IG4

Turnaround Delay, 20 ms



\$+IG5

Turnaround Delay, 50 ms



\$+IG6

Turnaround Delay, 100 ms



\$+IG7

UPC/EAN

Purpose: Enables or disables the decoding of Universal Product Code (UPC)/European Article Numbering (EAN) symbology. UPC/EAN are fixed length, numeric, continuous symbologies that use four element widths. A reader that is configured to decode EAN bar codes can decode UPC, but the reverse is not true. UPC code is a subset of EAN code.

To define the UPC/EAN symbology, you set up to seven digits. The fifth, sixth, and seventh digits are optional. To set the sixth digit, you must set the fifth digit. To set the seventh digit, you must set all seven digits.

Default:

<i>First digit:</i>	UPC-A/EAN-13 enabled
<i>Second digit:</i>	UPC-E enabled
<i>Third digit:</i>	EAN-8 enabled
<i>Fourth digit:</i>	Supplementals allowed
<i>Fifth digit:</i>	Transmit check digit
<i>Sixth digit:</i>	Transmit number system digit
<i>Seventh digit:</i>	Retain leading zero for UPC-A

Syntax: CEdata

where *data* must be 4 to 7 digits selected from this list:

<i>First digit:</i>	0	UPC-A/EAN-13 disabled
	1	UPC-A/EAN-13 enabled
	2	UPC-A only enabled
<i>Second digit:</i>	0	UPC-E disabled
	1	UPC-E enabled
<i>Third digit:</i>	0	EAN-8 disabled
	1	EAN-8 enabled
<i>Fourth digit:</i>	0	Supplementals are not allowed
	1	Supplementals are allowed
<i>Fifth digit:</i>	0	Discard check digit
	1	Transmit check digit
<i>Sixth digit:</i>	0	Discard number system digit
	1	Transmit number system digit
<i>Seventh digit:</i>	0	Discard the leading zero for UPC-A
	1	Retain the leading zero for UPC-A

UPC/EAN (continued)

Scan: To disable UPC/EAN, scan this bar code:

Disable UPC/EAN



\$+CE000000

Or: To enable UPC/EAN:

1. Scan this bar code:

Enter Accumulate Mode / Enable UPC/EAN



+/\$+CE

2. Scan one of these bar codes to set the first digit:

Disable UPC/EAN-13



0

Enable UPC/EAN-13



1

Enable UPC-A Only



2

3. Scan one of these bar codes to set the second digit:

Disable UPC-E



0

Enable UPC-E



1

4. Scan one of these bar codes to set the third digit:

Disable EAN-8



0

Enable EAN-8



1

5. Scan one of these bar codes to set the fourth digit:

Supplementals Not Allowed



0

Supplementals Allowed



1

6. (Optional) Scan one of these bar codes to set the fifth digit:

Discard Check Digit



0

Transmit Check Digit



1

7. (Optional) Scan one of these bar codes to set the sixth digit:

Discard Number System Digit



0

Transmit Number System Digit



1

Note: If you discard the number system digit, one leading digit is discarded from UPC-A, UPC-E, and EAN-8, and two leading digits are discarded from EAN-13.

8. (Optional) Scan one of these bar codes to set the seventh digit:

Discard Leading Zero for UPC-A



0

Transmit Leading Zero for UPC-A



1

Note: This option applies only when you enable UPC-A/EAN-13.

9. Scan this bar code:

Exit Accumulate Mode



_/

Viewport Movement Keys

Purpose: Allows you to use the compound function and arrow keys to move the viewport around the virtual display. You must set the Display Setup command to 25 x 80 to use the reader's viewport. For help, see "Display Setup" earlier in this chapter.

Default: Enabled

Syntax: DVdata
Acceptable values for *data* are:
0 Disable viewport movement keys
1 Enable viewport movement keys

Scan: One of these bar codes:

Disable Viewport Movement Keys



\$+DV0

Enable Viewport Movement Keys



\$+DV1

Viewport Movement Mode

Purpose: Enables Manual or Automatic Viewport Movement mode. In Manual mode, you manually move the viewport around the reader's virtual display. In Automatic mode, the viewport automatically follows the cursor around the reader's virtual display.

You must set the Display Setup command to 25 x 80 to use the reader's viewport. For help, see "Display Setup" earlier in this chapter.

Note: While you run an application, the reader reverts to Automatic Viewport Movement mode and scrolls at line 25 unless your application sets these values. When you exit the application, the reader restores your previous configuration values.

Default: Enable Automatic Viewport Movement mode

Syntax: *DZdata*

Acceptable values for *data* are:

0 Enable Manual Viewport Movement mode
1 Enable Automatic Viewport Movement mode

Scan: One of these bar codes:

Enable Manual Viewport Movement Mode



\$+DZ0

Enable Automatic Viewport Movement Mode



\$+DZ1

Viewport Movement Steps

Purpose: Defines the number of horizontal and vertical steps the viewport moves when you enter a viewport up, down, right, or left command. The horizontal steps are the number of characters the viewport moves left or right. The vertical steps are the number of lines or rows the viewport moves up or down. You must set the Display Setup command to 25 x 80 before you can move the viewport. For help, see “Display Setup” earlier in this chapter.

Default: 10 horizontal steps and 9 vertical steps

Syntax: *DYdata*

Acceptable values for *data* are:

1-20H 1 to 20 horizontal steps or characters
1-9V 1 to 9 vertical steps or lines

Scan: To define the number of steps:

1. Scan this bar code:

Enter Accumulate Mode / Viewport Movement Steps



+/\$+DY

Viewport Movement Steps (continued)

2. Scan a one- or two-digit numeric value for *data* from these bar codes:



0



1



2



3



4



5



6



7



8



9

3. Scan one of these bar codes to set the horizontal or vertical step:

Horizontal Step



H

Vertical Step



V

4. Scan this bar code:

Exit Accumulate Mode



_/



Reader Specifications

This appendix lists the reader's physical and environmental specifications, and describes the types of memory available on the reader. It also lists the reader's default configuration and provides a configuration command reference list in alphabetical order by command syntax.

Physical and Environmental Specifications

You can use the tables in this section to find technical information about these features and options:

- Reader Dimensions
- Power Specifications
- Temperature Specifications
- Humidity Specifications
- Display
- Memory
- Data Communications
- Cables for Data Communications
- Keypad Options
- Symbologies
- Laser Scanners and Optical Parameters

Reader Dimensions

Length	8.0 inches (20.3 cm)
Width	3.3 inches (8.4 cm)
Depth	2.25 inches (5.7 cm) excluding the reader handle
Weight:	
J2020	22 ounces (623.7 g) without the NiCad battery pack
JR2020	26 ounces (737.1 g) without the NiCad battery pack

Power Specifications

Primary	Sealed 1000 mAh NiCad battery pack
Backup	1000 mAh lithium cell

Temperature Specifications

You need to operate and store the reader within the temperature ranges listed in this table.

Type of Operation	Fahrenheit Temperature Range	Celsius Temperature Range
Charging the battery pack	+50°F to +104°F	+10°C to +40°C
Operating the reader	-4°F to +122°F	-20°C to +50°C
Storing the reader:		
With the battery pack installed	-4°F to +95°F	-20°C to +35°C
Without the battery pack installed	-4°F to +140°F	-20°C to +60°C

Humidity Specifications

You need to operate and store the reader within the noncondensing humidity percentages listed next.

Type of Humidity	Humidity Range
Operating humidity	10% to 90% relative humidity
Storage humidity	10% to 90% relative humidity

Display

- CGA compatible
- 16 lines x 20 columns, backlit LCD display
- 25 lines by 80 columns, virtual display with viewport feature

Memory

- 512K ROM drive resident in flash memory (drive C)
- 2MB ROM (drive D)
- 1MB battery-backed RAM
- PC card drive supports Type I and II PC cards for additional storage and I/O expansion

Data Communications

- Infrared serial communications port interface
- RS-232C, RS-422, RS-485
- Protocols: Multi-Drop, PC Standard, Polling Mode D, User-Defined

Cables for Data Communications

Use these cables with the JL2010 Optical Link Adapter to connect the reader to a host computer or other device.

Cable	PC Connector	Part Number
3-wire, null modem	DB25 port connector	047569
5-wire, null modem	DB9 port connector	059167
7-wire, null modem	DB25 port connector	048693

Use these cables with the JD2020 Communications Dock to connect the reader to a host computer or other device.

Note: When you run Interlnk with the reader connected to a host computer through the communications dock, you must use a 3-wire cable.

Cable	PC Connector	Part Number
3-wire, null modem	DB25 port connector	052477
3-wire, null modem	DB9 port connector	047569
7-wire, null modem	DB25 port connector	048668
7-wire, null modem	DB9 port connector	048693

Keypad Options

- Full alphanumeric keypad with 54 keys available in English, French, German, Italian, and Spanish
- Large numeric keypad with 36 keys available in English
- Terminal emulation keypads for IBM 3270 and 5250

Symbologies

- Codabar
- Code 11
- Code 16K
- Code 2 of 5
- Code 39
- Code 49
- Code 93
- Code 128
- Interleaved 2 of 5
- MSI
- Plessey
- UPC/EAN

Laser Scanners and Optical Parameters

Visible laser diode (670 nm)

Bar Code Specification	Depth of Field Standard Laser Scanner	Depth of Field Long-Range Laser Scanner
7.5 mil code	3 to 7 inches	
15.0 mil code	1 to 15 inches	5 to 30 inches
20.0 mil code	1 to 17 inches	5 to 40 inches
40.0 mil code	3 to 20 inches	6 to 50 inches
55.0 mil code	5 to 24 inches	12 to 60 inches

Default Configuration

The next table shows the reader's default configuration. You can use the Interactive Configuration application (IC.EXE) program to set the reader to the default configuration. For help, see "Restoring the Reader's Default Configuration" in Chapter 5.

Bar Code Symbolologies

Parameter	Default
Codabar	Standard, ABCD start/stop transmitted
Code 11	Enabled with two check digits
Code 16K	Standard
Code 2 of 5	Disabled
Code 39	Full ASCII Code 39 enabled with no check digit
Code 49	Enabled, Function Codes 1 and 3 disabled, Function Code 2 set to CR LF
Code 93	Enabled
Code 128	Standard
Interleaved 2 of 5	Variable length with a check digit
MSI	Disabled
Plessey	Disabled
UPC/EAN	UPC-A/EAN-13 enabled, UPC-E and EAN-8 enabled, supplementals allowed, transmit check digit, transmit number system digit, and retain leading zero for UPC-A

Communications

Parameter	Default
Address, Multi-Drop	A
AFF (Affirmative Acknowledge)	Disabled
Baud Rate	9600
Communications Dock Port	Network
Communications Port, Select COM Port	COM1
Communications Port, UART Restore	00 Hex

Communications (continued)

Parameter	Default
Communications Protocol	
Configure	Point-to-Point
Activate	Point-to-Point
User-Defined Multi-Drop	Disabled
Data Bits	7
EOF (End of File)	Disabled
EOM (End of Message)	Transmit and receive characters set to CR and LF
EOR (End of Record)	Disabled
Flow Control	None
Intercharacter Delay	0 seconds
IRL BAK (Bad Program Acknowledge)	BEL
IRL End Program Block	SO (shift out)
IRL EOP (End of Program)	SYN (synchronous idle)
IRL PAK (Program Acknowledge)	RS (record separator)
IRL PSS (Program Statement Separator)	CR (carriage return)
IRL Run	DC2 (device control 2)
IRL SOP (Start of Program)	SI (shift in)
LRC (Longitudinal Redundancy Check)	Disabled
NEG (Negative Acknowledge)	Disabled
Parity	Even
POL (Polling)	Disabled
Records Per Block	1 record transmitted per block
REQ (Request for Acknowledge)	Disabled
RES (Reset)	Disabled
SEL (Select)	Disabled
SOM (Start of Message)	Disabled
Stop Bits	1
Timeout Delay	10 seconds
Transmit Abort Timeout	Disabled
Turnaround Delay	0 seconds

Operations

Parameter	Default
Automatic Shutoff	1 minute
Beep Duration	50 milliseconds for low and high beep
Beep Frequency	1000 Hz for low beep, 2000 Hz for high beep
Beep Volume	Normal
Command Processing	All reader commands enabled
Decode Security	Moderate
Display Backlight Timeout	10 seconds
Display Contrast	3 (maximum contrast)
Display Mode, IRL	Buffered
Display Setup	25 x 80, Video mode 3, scroll at line 16, normal character height
Key Code Look-Up Table	102-key PC keyboard (no modifications)
Keypad Caps Lock	Caps lock off
Keypad Clicker	Enabled
Keypad Ctrl Key Functions	All Ctrl functions enabled
Keypad, Numeric	Permit entering numeric keypad
Postamble	<CR>
Preamble	Disabled
Scan Ahead	Disabled
Scanner Mode	One-Shot mode
Scanner Redundancy	Normal
Scanner Timeout	Disabled (no timeout)
Scanner Trigger	Level triggering
Viewport Movement Keys	Enabled
Viewport Movement Mode	Automatically follow the cursor
Viewport Movement Steps	10 horizontal steps and 9 vertical steps

900 MHz RF Communications

Parameter	Default
Acknowledgment Delay	100 milliseconds
Broadcast Receipt	Enabled
Channel Allow	All channels are excluded from the search pattern.
Channel Select	924 MHz
Device Address	0 (turned off)
Duty Cycle Percent	30%
Duty Cycle Period	1 second
Loopback	Disabled
Network ID	Channel search disabled
Repeat Count	0 (no repeaters)
Retry Limit	0 (optimized setting)
RF Protocol	Enabled
RFNC Address (RF Network Controller)	RFNC 0

Note: For help on the RF configuration commands, see the JANUS 900 MHz Radio Frequency Quick Reference Guide (Part No. 060207).

Configuration Commands by Syntax

The next table lists all of the configuration commands that are available on the J2020 and JR2020 readers. It lists the configuration commands in alphabetic order by syntax.

Note: For help on the RF configuration commands, see the JANUS 900 MHz Radio Frequency Quick Reference Guide (Part No. 060207).

Syntax	Command	For Help, See Page
ADdata	Preamble	12-79
AEdata	Postamble	12-78
BDdata	Beep Duration	12-12
BFdata	Beep Frequency	12-13
BVdata	Beep Volume	12-15
CAdata	Interleaved 2 of 5 Code (1 2 of 5)	12-58
CBdata	Code 39	12-21
CCdata	Code 2 of 5 (2 of 5)	12-19
CDdata	Codabar	12-16
CEdata	UPC/EAN	12-97
CFdata	Code 93	12-27
CGdata	Code 11	12-17
CHdata	Code 128	12-28
CIdata	Plessey	12-76
CJdata	Code 49	12-25
CKdata	Code 49 Function Code 1	12-25
CLdata	Code 49 Function Code 2	12-25
CMdata	Code 49 Function Code 3	12-25
CNdata	MSI	12-72
CPdata	Code 16K	12-18
CSdata	Decode Security	12-44
DCdata	Command Processing	12-29
DFdata	Display Backlight Timeout	12-44
DJdata	Display Contrast	12-46
DMdata	Display Mode, IRL	12-47

Configuration Commands by Syntax (continued)

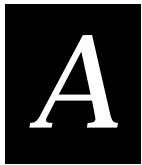
Syntax	Command	For Help, See Page
DSdata	Display Setup	12-48
DVdata	Viewport Movement Keys	12-100
DYdata	Viewport Movement Steps	12-101
DZdata	Viewport Movement Mode	12-100
EZdata	Automatic Shutoff	12-9
FAdata	EOF (End of File)	12-52
FBdata	EOR (End of Record)	12-55
FCdata	Records Per Block	12-80
HAdata	SEL (Select)	12-89
HBdata	POL	12-77
HCdata	Address, Multi-Drop	12-7
IAdata	Baud Rate	12-10
IBdata	Parity	12-75
ICdata	Stop Bits	12-91
IDdata	Intercharacter Delay	12-57
IEdata	Timeout Delay	12-92
IFdata	LRC (Longitudinal Redundancy Check)	12-72
IGdata	Turnaround Delay	12-96
IHdata	Transmit Abort Timeout	12-94
IIdata	Data Bits	12-43
ILdata	Flow Control	12-56
IPdata	Communications Dock Port	12-35
ISdata	Communications Port, Select COM Port	12-36
IVdata	Communications Port, UART Restore	12-37
KAdata	Keypad Caps Lock	12-68
KBdata	Keypad Ctrl Key Functions	12-70
KCdata	Keypad Clicker	12-69
KDdata	Keypad, Numeric	12-71
NM02data	RF Loopback	See RF guide
NM03data	RF Broadcast Receipt	See RF guide

Configuration Commands by Syntax (continued)

Syntax	Command	For Help, See Page
PAdata	Communications Protocol, Activate	12-41
PCdata	RES (Reset)	12-83
PDdata	REQ (Request for Acknowledge)	12-82
PEdata	SOM (Start of Message)	12-90
PFdata	EOM (End of Message)	12-53
PGdata	AFF (Affirmative Acknowledge)	12-8
PHdata	NEG (Negative Acknowledge)	12-74
PIdata	Transmit EOM (End of Message) Only	12-53
PJdata	Receive EOM (End of Message) Only	12-53
PMdata	Communications Protocol, User-Defined Multi-Drop	12-42
PSdata	Communications Protocol, Configure	12-38
Rchannel data	RF Channel Allow	See RF guide
RFdata	RF Protocol	See RF guide
RHdata	RF Device Address	See RF guide
RLdata	RF Retry Limit	See RF guide
RMdata	RF Acknowledgment Delay	See RF guide
RTdata	RFNC (RF Network Controller) Address	See RF guide
RUdata	RF Repeat Count	See RF guide
RVdata	RF Channel Select	See RF guide
RWdata	RF Network ID	See RF guide
RXdata	RF Duty Cycle Period	See RF guide
RYdata	RF Duty Cycle Percent	See RF guide
SAdata	Scanner Timeout	12-87
SBdata	Scanner Mode	12-85
SCdata	Scanner Trigger	12-88
SDdata	Scan Ahead	12-84
SRdata	Scanner Redundancy	12-86
WMdata	Key Code Look-Up Table	12-67
XAdata	IRL SOP (Start of Program)	12-66
XBdata	IRL EOP (End of Program)	12-62

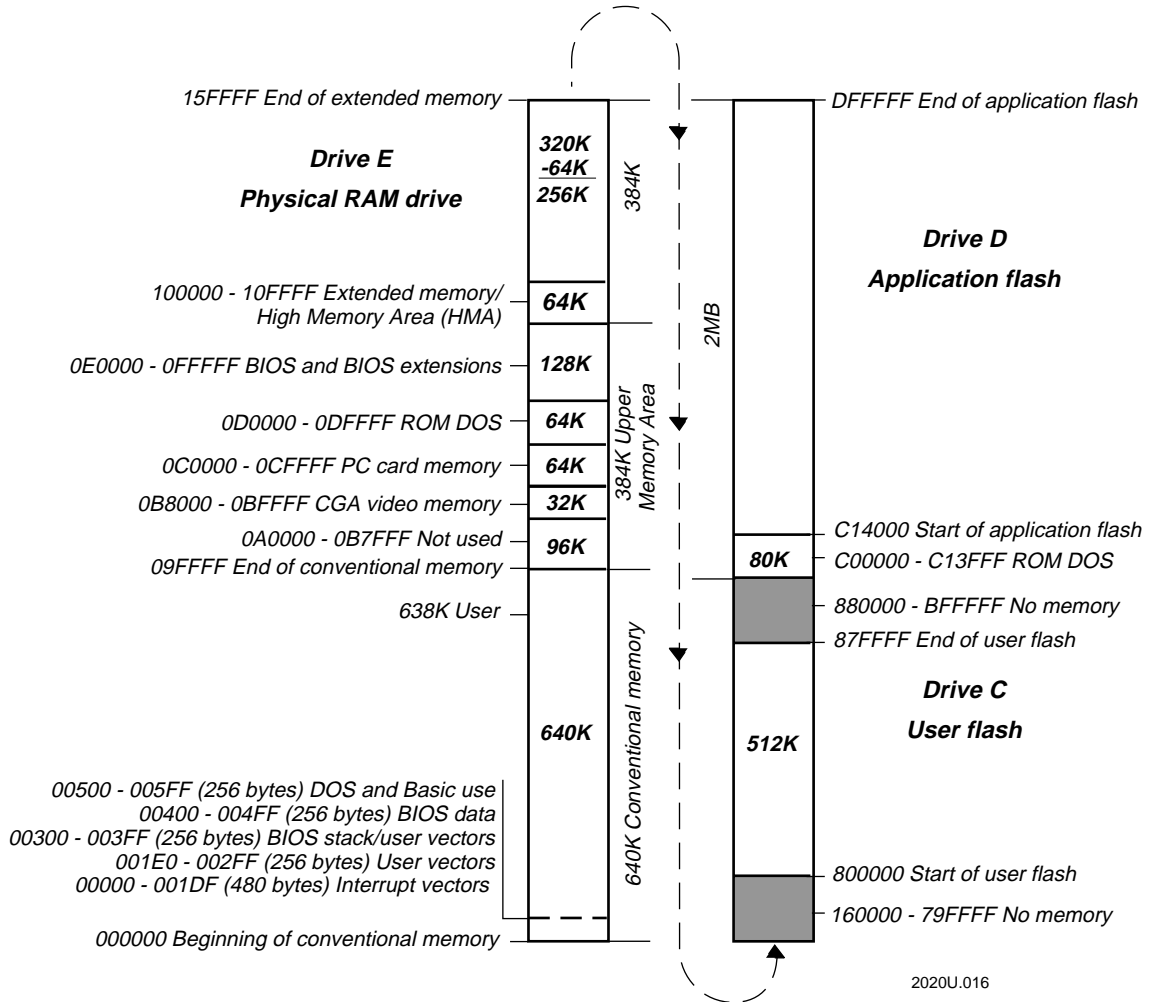
Configuration Commands by Syntax (continued)

Syntax	Command	For Help, See Page
<i>XCdata</i>	IRL Run	12-65
<i>XDdata</i>	IRL End Program Block	12-61
<i>XEdata</i>	IRL PSS (Program Statement Separator)	12-64
<i>ZAdata</i>	IRL PAK (Program Acknowledge)	12-63
<i>ZBdata</i>	IRL BAK (Bad Program Acknowledge)	12-60



Types of Memory Used in the Reader

The JANUS reader uses the types of memory described in this section. Memory in the reader is similar to that of a PC in some ways, and very different in other ways. One major difference is that the reader uses memory to simulate disk drives. This memory map shows how the reader uses memory.



Conventional Memory (0 Through 640K)

The reader has 1MB of battery-backed dynamic RAM. The first 640K is conventional memory and is virtually the same as that of a PC. You can use this memory to run applications. The ROM DOS 5.0 operating system loads at 0 and works up, followed by the statements and drivers in the CONFIG.SYS file, then COMMAND.COM, TSR (terminate and stay resident) programs, and commands in the AUTOEXEC.BAT file.

Upper Memory Area

The area between the 640K and 1024K is known as the upper memory area. The upper memory area is physically composed of a 256K flash ROM chip (system flash) and the video memory chip. Like a PC, this area contains the BIOS and video buffers. On the reader, the upper memory area also contains PC card memory and ROM DOS. The 384K upper memory area maps just above 640K conventional memory.

Rolled-Over Memory

The reader has 1MB of battery-backed DRAM. From the memory existing between the 640K and 1MB boundaries, 384K is remapped or “rolled-over” above 1MB to create the RAM drive. If you do not need the RAM drive, you can access rolled-over memory as extended memory through a device driver or an application that uses HIMEM.SYS.

RAM Drive

Part of rolled-over memory is configured as a RAM drive (drive E) on the JANUS reader. The default CONFIG.SYS file loads HIMEM.SYS and uses the SRAMDISK.SYS device driver to create the RAM drive.

You can use the RAM drive to store files just like a disk drive on your PC. File access is usually faster on a RAM drive than a physical disk drive. Unlike a PC, any files on the RAM drive are saved during a warm boot. However, any files on the RAM drive are cleared when you cold boot the reader.

The reader requires 64K of the rolled-over memory area for the high memory area (HMA) and another 64K is used as extended memory, leaving a maximum of 256K available to store files. If you are not using a PC card, Intermec recommends that you use the RAM drive for data files that are stored frequently. The RAM drive is not as secure as a PC card since the drive is erased when you cold boot the reader.

Extended Memory

The reader is initially configured with 64K of extended memory available, which is allocated for use by Intermecc applications (IC.EXE and IRL). To remove the RAM drive and use the available extended memory, you need to change or delete the SRAMDISK statement in the CONFIG.SYS file. You can also use extended memory for overlay memory.

The reader provides extended memory for control and access to RAM above 1MB. The extended memory conforms to XMS specification 2.0. Extended memory is initialized and managed by the HIMEM.SYS driver. HIMEM.SYS looks at all the memory in the system and takes control of everything above 1024K. You must load all drivers in extended memory through the HIMEM.SYS interface. If a driver is not compatible with HIMEM.SYS, you cannot load it.

Some applications may require you to exclude memory from HIMEM.SYS management, leaving some extended memory available. If this is necessary, you should reconfigure the RAM drive (E) to use the available extended memory. DOS drivers must check in with HIMEM.SYS for their memory assignments within the XMS managed by HIMEM.SYS. Currently, the RAM drive uses the XMS interface through HIMEM.SYS.

Expanded Memory

Once more than 1MB of memory is installed on a PC, it can be used as expanded memory and is a way for the system to access memory beyond the 1MB barrier. To use expanded memory on a PC, you need an expanded memory board and an expanded memory manager.

Expanded memory is not available on the JANUS reader.

High Memory Area (HMA)

The high memory area (HMA) is a 64K block of memory, starting 16 bytes below the 1024K mark, and is the first 64K of extended memory.

Since HMA can only hold one item, the first program that requests HMA uses it, regardless of the size of the program. You cannot use the statement DOS=HIGH on the reader because DOS already resides in ROM in an upper memory block.

Note: *The HMA is used by Reader Services. If HIMEM.SYS is not loaded or if HMA is being used by another driver, Reader Services is not loaded and the JANUS 2020 does not function as a bar code reader.*

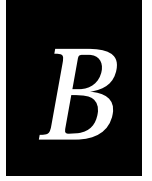
User Flash Memory

User flash memory contains the 512K ROM drive C. It is mapped to 800000H. The reader's drive C is similar to the hard drive C on your PC and contains the startup files, CONFIG.SYS and AUTOEXEC.BAT.

Since drive C is a ROM drive that resides in flash memory, you cannot write files to this drive as you would on your PC. You must use the Auto-Loader or MkImage and PutImage to modify the startup files or change other files on drive C. For help, see Chapter 3, "Learning About the Software."

Application Flash Memory

Application flash memory is the 2MB ROM drive D. It is mapped to C00000H. DOS files and utilities are stored on drive D. You cannot modify or add files to drive D. The reader uses approximately 80K of the application flash memory for ROM DOS leaving a 1.943MB ROM drive D.



Reader Keypad Charts



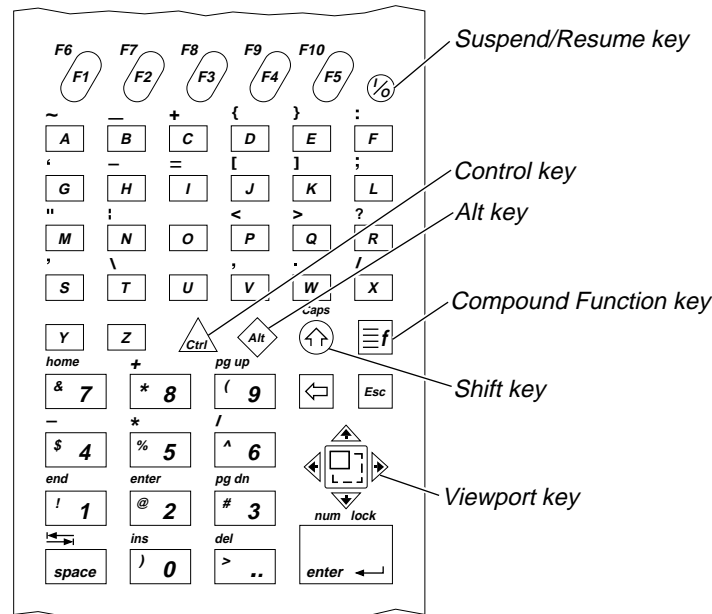
This appendix provides a keypad chart that shows how to enter all characters on an alphanumeric and large numeric keypad.

Using the Reader Keypad Charts

These charts list the keystroke sequences for entering all 102 PC characters or keys on the JANUS 2020's alphanumeric (English version) and large numeric keypad.

English (U.S.) Alphanumeric Keypad

Use this keypad chart to enter any character or function on the alphanumeric keypad (English version). For help, see "Using the Alphanumeric Keypad" in Chapter 2.



2020U.177

English (U.S.) Alphanumeric Keypad

To Enter	Press the Key(s)	To Enter	Press the Key(s)
resume/suspend		viewport to cursor	
enter	or	cursor to viewport	
a to z	to	F1 to F5	to
A to Z	to	F6 to F10	to
0 to 9	to	F11	
space		F12	
. (period)	or	tab	
backspace		backtab	
escape		~ (tilde)	
compound function		_ (underline)	
right ctrl		+	or
left ctrl	or	{	
right alt		}	
left alt	or	: (colon)	
right shift		' (left single quote)	
left shift		- (dash)	or
caps lock		=	
cursor up		[
cursor down]	
cursor left		;(semicolon)	
cursor right		" (quotation marks)	
viewport up		| (pipe)	
viewport down		<	
viewport left		>	
viewport right		?	
viewport end		' (right single quote)	
viewport home		\	
viewport page up		, (comma)	
viewport page down		. (period)	or

English (U.S.) Alphanumeric Keypad (continued)

To Enter	Press the Key(s)	To Enter	Press the Key(s)
/	X or 6	end	1
! (exclamation point)	1	enter	2 or
@	2	page down	3
#	3	- (dash)	4 or H
\$	4	* (asterisk)	5 or 8
%	5	/	6 or X
^	6	home	7
&	7	+	8 or C
* (asterisk)	8 or 5	page up	9
(	9	scroll lock	
)	0	pause	
insert	0	print screen	
delete	.	ctrl break	

Note: You can use the 0 to 9 key combinations shown above only when the number pad is disabled. For help, see “Using the Number Pad” in Chapter 2.

English (U.S.) Alphanumeric Keypad (continued)

To Use the Number Pad

Enable the number pad

Press the Key(s)



Turn Num Lock on and off



Disable the number pad



With Num Lock Turned On

To Enter Press the Key(s)

0 to 9 [0] to [9]

space [space] or [↑] [space]

. (period) [.]

end [↑] [1]

cursor down [↑] [2]

page down [↑] [3]

cursor left [↑] [4]

cursor right [↑] [6]

home [↑] [7]

cursor up [↑] [8]

page up [↑] [9]

insert [↑] [0]

delete [↑] [.]

With Num Lock Turned Off

To Enter Press the Key(s)

end [1]

cursor down [2]

page down [3]

cursor left [4]

cursor right [6]

home [7]

cursor up [8]

page up [9]

insert [0]

delete [.]

space [space] or [↑] [space]

0 to 9 [↑] [0] to [↑] [9]

. (period) [↑] [.]

English (U.S.) Alphanumeric Keypad (continued)
To Use Control Mode

1. Enter Control mode
2. Adjust the display
3. Exit Control mode

Press the Key(s)

see the next table

**To Adjust the Display**

Make the display contrast darker



Make the display contrast lighter



Turn the display backlight on or off



Change the scroll line to line 8



Change the scroll line to line 16



Change the scroll line to line 25



Change the characters to normal height



Change the characters to double height



Use automatic viewport movement



Use manual viewport movement



Make the beep volume quieter



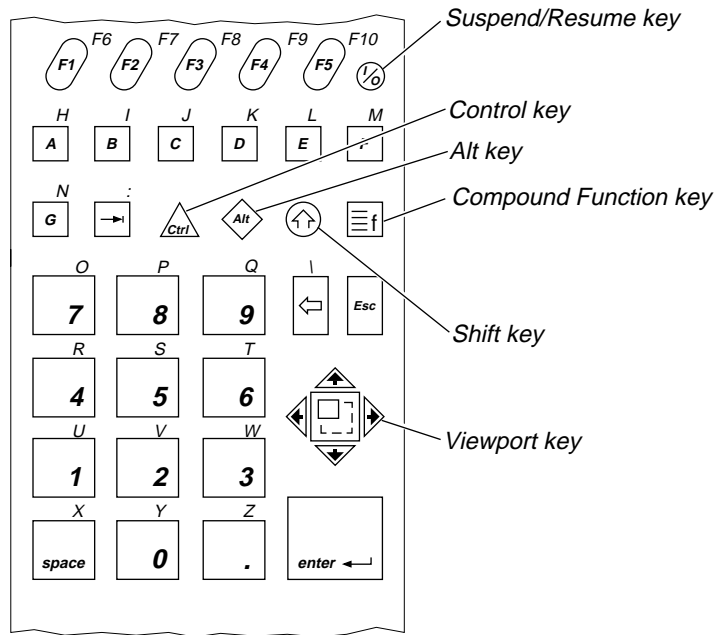
Make the beep volume louder



Note: You can use Control mode to adjust the display at the DOS prompt or when you run an application. For help, see “Adjusting the Display From the DOS Prompt” in Chapter 2.

Large Numeric Keypad

Use this keypad chart to enter any character or function on the large numeric keypad (English version). For help, see "Using the Large Numeric Keypad" in Chapter 2.



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Large Numeric Keypad

To Enter	Press the Key(s)
resume/suspend	
enter	or
0 to 9	to
space	
. (period)	
a to g	to
h	
i	
j	
k	
l	
m	
n	
o	
p	
q	
r	
s	
t	
u	
v	
w	
x	
y	
z	
A to G	to
H	
I	
J	

To Enter	Press the Key(s)
K	
L	
M	
N	
O	
P	
Q	
R	
S	
T	
U	
V	
W	
X	
Y	
Z	
tab	
backtab	
right ctrl	
left ctrl	or
right alt	
left alt	or
right shift	
left shift	
caps lock	
compound function	
backspace	
escape	
cursor up	

Large Numeric Keypad (continued)

To Enter	Press the Key(s)
cursor down	
cursor left	
cursor right	
viewport up	
viewport down	
viewport left	
viewport right	
viewport end	
viewport home	
viewport page up	
viewport page down	
viewport to cursor	
cursor to viewport	
F1 to F5	to
F6 to F10	to
F11	
F12	
: (colon)	
\	
! (exclamation point)	
@	
#	
\$	
%	
^	
&	
* (asterisk)	or
(
)	

To Enter	Press the Key(s)
>	
<	
, (comma)	
' (apostrophe)	
" (quotation marks)	
[
]	
_ (underline)	
| (pipe)	
; (semicolon)	
enter	or
end	
=	
page down	
- (dash)	
* (asterisk)	or
/	
home	
+	
page up	
insert	
delete	
scroll lock	
pause	
print screen	
ctrl break	
?	
` (left single quote)	
~ (tilde)	



Large Numeric Keypad (continued)

<p>To Enter</p> <p>+</p> <p>{</p> <p>}</p>	<p>Press the Key(s)</p> <p> C</p> <p> D</p> <p> E</p>	<p>To Enter</p> <p>- (dash)</p> <p>/</p>	<p>Press the Key(s)</p> <p> F</p> <p> G</p>
--	---	--	---

Note: You can use the to key combinations shown above only when the number pad is disabled. For help, see “Using the Number Pad” in Chapter 2.

To Use the Number Pad

Enable the number pad

Turn Num Lock on and off

Disable the number pad

Press the Key(s)

With Num Lock Turned On

<p>To Enter</p> <p>0 to 9</p> <p>space</p> <p>. (period)</p> <p>end</p> <p>cursor down</p> <p>page down</p> <p>cursor left</p> <p>cursor right</p> <p>home</p> <p>cursor up</p> <p>page up</p> <p>insert</p> <p>delete</p>	<p>Press the Key(s)</p> <p> to </p> <p> or </p> <p></p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p> <p> </p>
--	--

With Num Lock Turned Off

<p>To Enter</p> <p>end</p> <p>cursor down</p> <p>page down</p> <p>cursor left</p> <p>cursor right</p> <p>home</p> <p>cursor up</p> <p>page up</p> <p>insert</p> <p>delete</p> <p>space</p> <p>0 to 9</p> <p>. (period)</p>	<p>Press the Key(s)</p> <p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p></p> <p> or </p> <p> to </p> <p> </p>
--	---

Large Numeric Keypad (continued)

To Use Control Mode

1. Enter Control mode
2. Adjust the display
3. Exit Control mode

Press the Key(s)

 - 

see the next table



To Adjust the Display

Make the display contrast darker



Make the display contrast lighter



Turn the display backlight on or off



Change the scroll line to line 8



Change the scroll line to line 16



Change the scroll line to line 25



Change the characters to normal height



Change the characters to double height



Use automatic viewport movement



Use manual viewport movement



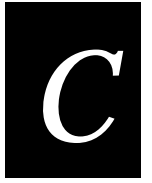
Make the beep volume quieter



Make the beep volume louder



Note: You can use Control mode to adjust the display at the DOS prompt or when you run an application. For help, see "Adjusting the Display From the DOS Prompt" in Chapter 2.



Configuration and Full ASCII Charts



This appendix includes reference tables you can use when configuring communications protocols and the key code look-up table on the reader. It also contains a full ASCII chart and charts of Code 39 bar code labels that you can scan with the JANUS 2020 reader.

Entering ASCII Control Characters

You may need to enter ASCII control characters to configure these parameters in IC.EXE or the Communications Manager screens:

- Preambles and postambles. You can include ASCII control characters in postambles and preambles.
- Protocol characters, such as EOR and EOM. For some communications protocols, you must set the protocol character to an ASCII control character.

To enter ASCII control characters for preambles and postambles

1. Decide which ASCII control character you want to set for the preamble or postamble. Use the next table to find the character and the escape sequence.

ASCII Control Character	Escape Sequence
\ Backslash	\\
BEL Bell	\a
BS Backspace	\b
CR Carriage Return	\r
FF Form Feed	\f
HT Horizontal Tab	\t
LF Line Feed	\n
Other ASCII control characters	\xhh where <i>hh</i> is the two-digit hexadecimal number for the ASCII control character.



If the table does not include the ASCII control character, you must use the Full ASCII Table later in this appendix to identify the two-digit hexadecimal number for the control character.


2. Use IC.EXE to configure a preamble or postamble. Move the cursor to the field for the preamble or postamble. For help using IC.EXE, see Chapter 5, “Configuring the Reader.”

3. Type the characters you identified in Step 1. Here are two examples:
 - You find Carriage Return (CR) Line Feed (LF) in the Entering ASCII Control Characters for Preambles and Postambles table. The CR is \r and the LF is \n. You type this value:
`\r\n`
 - You find ETX in the Full ASCII Table and learn that 03 is the two-digit hex number for ETX. You type \x followed by the hex number:
`\x03`

Note: *If you type the hex number for an ASCII character above 7F hex (128 decimal), the reader displays the extended ASCII character instead of its numeric value in the dialog box.*






































To enter ASCII control characters for protocol characters

1. Decide which ASCII control character you want to set for the protocol character. Use the next table to find the character and the key sequence.
2. Use IC.EXE or Communications Manager to configure a communications protocol. Move the cursor to the field for the protocol character. For help using IC.EXE, see Chapter 5, "Configuring the Reader." For help using Communications Manager, see Chapter 6, "Networking the Reader."
3. Press the key sequence you identified in Step 1. For example, to enter the ASCII character STX, press  . The word <STX> appears in the field.

Note: *To disable a protocol character, move the cursor to the space next to the protocol character and press .*



Entering ASCII Control Characters for Protocol Characters

ASCII Control Character	Key Sequence	ASCII Control Character	Key Sequence	ASCII Control Character	Key Sequence
ACK	 F	ENQ	 E	NUL	 
BEL	 G	EOT	 D	RS	 
BS	 H	ESC	 A	SI	 O
CAN	 X	ETB	 W	SO	 N
CR	 M	ETX	 C	SOH	 A
DC1	 Q	FF	 L	STX	 B
DC2	 R	FS	 	SUB	 Z
DC3	 S	GS	 	SYN	 V
DC4	 T	HT	 I	US	 
DLE	 P	LF	 J	VT	 K
EM	 Y	NAK	 U		

Note: IRL does not use these key sequences for the ASCII control characters FS, GS, RS, US, and NUL. The Interactive Configuration application (IC.EXE) and Communications Manager do use them.

Configuration Options for User-Defined Protocol

User-Defined protocol supports 24 different configurations. The six key parameters that determine the User-Defined configuration are POL, SEL, RES, REQ, AFF, and NEG. The next table lists all the valid combinations for these six User-Defined protocol parameters. The most common User-Defined configurations have been named and are listed first in the table.

User-Defined Configuration	POL	SEL	RES	REQ	AFF	NEG
User-Defined Point-to-Point protocol	—	—	—	—	—	—
ACK/NAK protocol	—	—	—	—	X	X
ACK/NAK protocol with timeout	—	—	—	X	X	X
One-character solicitation with handshake	X	—	—	X	X	X
User-Defined Polling Mode D protocol	X	X	X	X	X	X
Unnamed protocol	—	—	X	—	—	—
Unnamed protocol	—	—	X	—	X	X
Unnamed protocol	—	—	X	X	X	X
Unnamed protocol	—	X	—	—	—	—
Unnamed protocol	—	X	—	—	X	X
Unnamed protocol	—	X	—	X	X	X
Unnamed protocol	—	X	X	—	—	—
Unnamed protocol	—	X	X	X	X	X
Unnamed protocol	X	—	—	—	—	—
Unnamed protocol	X	—	—	—	X	X
Unnamed protocol	X	—	X	—	—	—
Unnamed protocol	X	—	X	—	X	X
Unnamed protocol	X	—	X	X	X	X
Unnamed protocol	X	X	—	—	—	—
Unnamed protocol	X	X	—	—	X	X
Unnamed protocol	X	X	—	X	X	X
Unnamed protocol	X	X	X	—	—	—
Unnamed protocol	X	X	X	—	X	X

X Means the parameter is set to a character.

— Means the parameter is disabled.



POL and SEL Combinations for Multi-Drop Protocol

To configure User-Defined Multi-Drop protocol, you use POL and SEL character combinations. You must assign the POL and SEL protocol characters in a predetermined combination. The following table lists the device address and the corresponding POL and SEL combinations. When you configure Multi-Drop protocol, you select the device address and then the reader automatically sets the predefined POL and SEL combination listed for that address.

Device Address	POL	SEL	Device Address	POL	SEL
A	FS	GS	Q	<	=
B	RS	US	R	>	?
C	SP	!	S	@	A
D	"	#	T	B	C
E	\$	%	U	D	E
F	&	'	V	F	G
G	(	)	W	H	I
H	*	+	X	J	K
I	'	-	Y	L	M
J	.	/	Z	N	O
K	0	1	0	P	Q
L	2	3	1	R	S
M	4	5	2	T	U
N	6	7	3	V	W
O	8	9	4	X	Y
P	:	;	5	Z	[

Key Codes

Use the key codes to redefine scanned characters to a keystroke equivalent. Find each key's four-digit hexadecimal value in the Key Code table. You can use the key code in an application or to change the reader's key code look-up table. For help, see the "Key Code Look-Up Table" in Chapter 12.





Key Lists each key on a standard 102 key PC keyboard.

Normal Lists the key code value for each key.












Shift Lists the key code value for the Shift key plus the key.

Control Lists the key code for the Control key plus the key.

Alt Lists the key code for the Alt key plus the key.

For example, the key code for   (an uppercase letter A) is 1E41. The key code for   is 1E00.

Key Code Table





















Key	Normal	Shift	Control	Alt
	3B00	5400	5E00	6800
	4000	5900	6300	6D00
	8500	8700	8900	8B00
	3C00	5500	5F00	6900
	4100	5A00	6400	6E00
	8600	8800	8A00	8C00
	3D00	5600	6000	6A00
	4200	5B00	6500	6F00
	—	—	—	—
	3E00	5700	6100	6B00
	4300	5C00	6600	7000



Key Code Table (continued)

Key	Normal	Shift	Control	Alt
	—	—	0000	—
	3F00	5800	6200	6C00
	4400	5D00	6700	7100
	—	—	7200	—
	1E61	1E41	1E01	1E00
	3062	3042	3002	3000
	2E63	2E43	2E03	2E00
	2064	2044	2004	2000
	1265	1245	1205	1200
	2166	2146	2106	2100
	2267	2247	2207	2200
	2960	297E	—	2900
	2368	2348	2308	2300
	0C2D	0C5F	0C1F	8200
	1769	1749	1709	1700
	0D3D	0D2B	—	8300
	246A	244A	240A	2400
	1A5B	1A7B	1A1B	1A00
	256B	254B	250B	2500
	1B5D	1B7D	1B1D	1B00

Key Code Table (continued)

Key	Normal	Shift	Control	Alt
	266C	264C	260C	2600
	273B	273A	—	2700
	326D	324D	320D	3200
	316E	314E	310E	3100
	186F	184F	180F	1800
	1970	1950	1910	1900
	1071	1051	1011	1000
	1372	1352	1312	1300
	1F73	1F53	1F13	1F00
	2827	2822	—	2800
	1474	1454	1414	1400
	2B5C	2B7C	2B1C	2B00
	1675	1655	1615	1600
	2F76	2F56	2F16	2F00
	332C	333C	—	3300
	1177	1157	1117	1100
	342E	343E	—	3400
	2D78	2D58	2D18	2D00
	352F	353F	—	3500
	1579	1559	1519	1500



Key Code Table (continued)




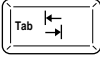


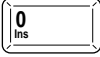

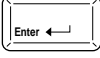

	Key	Normal	Shift	Control	Alt
		2C7A	2C5A	2C1A	2C00
(right)		—	—	—	—
(left)		—	—	—	—
(right)		—	—	—	—
(left)		—	—	—	—
(right)		—	—	—	—
(left)		—	—	—	—
		—	—	—	—
		0837	0826	—	7E00
		47E0	47E0	77E0	9700
		4700	4737	7700	See Note
		0938	092A	—	7F00
		4E2B	4E2B	9000	4E00
		4800	4838	8D00	See Note
		0A39	0A28	—	8000
		49E0	49E0	84E0	9900
		4900	4939	8400	See Note
(backspace)		0E08	0E08	0E7F	0E00
		011B	011B	011B	0100
		0534	0524	—	7B00

Key Code Table (continued)

Key	Normal	Shift	Control	Alt
	4A2D	4A2D	8E00	4A00
	4B00	4B34	7300	See Note
	0635	0625	—	7C00
	372A	372A	9600	3700
	4C00	4C35	8F00	See Note
	0736	075E	071E	7D00
	E02F	E02F	9500	A400
	4D00	4D36	7400	See Note
(left arrow)	4BE0	4BE0	73E0	9B00
	48E0	48E0	8DE0	9800
	0231	0221	—	7800
	4FE0	4FE0	75E0	9F00
	4F00	4F31	7500	See Note
	0332	0340	0300	7900
	E00D	E00D	E00A	A600
	5000	5032	9100	See Note
	0433	0423	—	7A00
	51E0	51E0	76E0	A100
	5100	5133	7600	See Note



Key Code Table (continued)

Key	Normal	Shift	Control	Alt
	50E0	50E0	91E0	A000
	4DE0	4DE0	74E0	9D00
	3920	3920	3920	3920
	0F09	0F00	9400	A500
	0B30	0B29	—	8100
	52E0	52E0	92E0	A200
	5200	5230	9200	—
	5300	532E	9300	—
	1C0D	1C0D	1C0A	1C00
	—	—	—	—

Note: You use a numeric keypad to enter these key code values by pressing the Alt key plus a three-digit number from 0-255. You must enable the number (with number lock turned on) pad on the reader to enter these hexadecimal key codes. For help, see “Using the Number Pad” in Chapter 2.

Full ASCII Table

This table lists the ASCII characters and their binary, hexadecimal, and Code 39 equivalents.

Full ASCII Table

Binary ⁰	Hex ¹	Dec ²	C39 ³	Char ⁴	Binary ⁰	Hex ¹	Dec ²	C39 ³	Char ⁴
00000000	00	00	%U	NUL	00100000	20	32	SP	SP ⁵
00000001	01	01	\$A	SOH	00100001	21	33	/A	!
00000010	02	02	\$B	STX	00100010	22	34	/B	"
00000011	03	03	\$C	ETX	00100011	23	35	/C	#
00000100	04	04	\$D	EOT	00100100	24	36	/D	\$
00000101	05	05	\$E	ENQ	00100101	25	37	/E	%
00000110	06	06	\$F	ACK	00100110	26	38	/F	&
00000111	07	07	\$G	BEL	00100111	27	39	/G	'
00001000	08	08	\$H	BS	00101000	28	40	/H	(
00001001	09	09	\$I	HT	00101001	29	41	/I)
00001010	0A	10	\$J	LF	00101010	2A	42	/J	*
00001011	0B	11	\$K	VT	00101011	2B	43	/K	+
00001100	0C	12	\$L	FF	00101100	2C	44	/L	,
00001101	0D	13	\$M	CR	00101101	2D	45	/M	-
00001110	0E	14	\$N	SO	00101110	2E	46	/N	.
00001111	0F	15	\$O	SI	00101111	2F	47	/O	/
00010000	10	16	\$P	DLE	00110000	30	48	/P ⁶	0
00010001	11	17	\$Q	DC1	00110001	31	49	/Q	1
00010010	12	18	\$R	DC2	00110010	32	50	/R	2
00010011	13	19	\$S	DC3	00110011	33	51	/S	3
00010100	14	20	\$T	DC4	00110100	34	52	/T	4
00010101	15	21	\$U	NAK	00110101	35	53	/U	5
00010110	16	22	\$V	SYN	00110110	36	54	/V	6
00010111	17	23	\$W	ETB	00110111	37	55	/W	7
00011000	18	24	\$X	CAN	00111000	38	56	/X	8
00011001	19	25	\$Y	EM	00111001	39	57	/Y	9
00011010	1A	26	\$Z	SUB	00111010	3A	58	/Z	:
00011011	1B	27	%A	ESC	00111011	3B	59	%F	;
00011100	1C	28	%B	FS	00111100	3C	60	%G	<
00011101	1D	29	%C	GS	00111101	3D	61	%H	=
00011110	1E	30	%D	RS	00111110	3E	62	%I	>
00011111	1F	31	%E	US	00111111	3F	63	%J	?



Full ASCII Table (continued)

Binary ⁰	Hex ¹	Dec ²	C39 ³	Char ⁴	Binary ⁰	Hex ¹	Dec ²	C39 ³	Char ⁴
01000000	40	64	%V	@	01100100	64	100	+D	d
01000001	41	65	A	A	01100101	65	101	+E	e
01000010	42	66	B	B	01100110	66	102	+F	f
01000011	43	67	C	C	01100111	67	103	+G	g
01000100	44	68	D	D	01101000	68	104	+H	h
01000101	45	69	E	E	01101001	69	105	+I	i
01000110	46	70	F	F	01101010	6A	106	+J	j
01000111	47	71	G	G	01101011	6B	107	+K	k
01001000	48	72	H	H	01101100	6C	108	+L	l
01001001	49	73	I	I	01101101	6D	109	+M	m
01001010	4A	74	J	J	01101110	6E	110	+N	n
01001011	4B	75	K	K	01101111	6F	111	+O	o
01001100	4C	76	L	L	01110000	70	112	+P	p
01001101	4D	77	M	M	01110001	71	113	+Q	q
01001110	4E	78	N	N	01110010	72	114	+R	r
01001111	4F	79	O	O	01110011	73	115	+S	s
01010000	50	80	P	P	01110100	74	116	+T	t
01010001	51	81	Q	Q	01110101	75	117	+U	u
01010010	52	82	R	R	01110110	76	118	+V	v
01010011	53	83	S	S	01110111	77	119	+W	w
01010100	54	84	T	T	01111000	78	120	+X	x
01010101	55	85	U	U	01111001	79	121	+Y	y
01010110	56	86	V	V	01111010	7A	122	+Z	z
01010111	57	87	W	W	01111011	7B	123	%P	{
01011000	58	88	X	X	01111100	7C	124	%Q	|
01011001	59	89	Y	Y	01111101	7D	125	%R	}
01011010	5A	90	Z	Z	01111110	7E	126	%S	~
01011011	5B	91	%K	[	01111111	7F	127	%T ⁷	n ⁸
01011100	5C	92	%L	\					
01011101	5D	93	%M]					
01011110	5E	94	%N	^					
01011111	5F	95	%O	_					
01100000	60	96	%W	`					
01100001	61	97	+A	a					
01100010	62	98	+B	b					
01100011	63	99	+C	c					

Notes:

- 0 Bit positions are 76543210.
- 1 Hexadecimal value
- 2 Decimal value
- 3 Code 39 character(s)
- 4 ASCII character
- 5 SP is the SPACE character.
- 6 The Code 39 characters /P through /Y may be interchanged with the numbers 0 through 9.
- 7 May be interchanged with %X or %Y or %Z.
- 8 n is the DELETE character.

Full ASCII Control Characters Table

Control Character	Definition	Control Character	Definition
ACK	Acknowledgment	FF	Form Feed
BEL	Bell	FS	File Separator
BS	Backspace	GS	Group Separator
CAN	Cancel	HT	Horizontal Tab
CR	Carriage Return	LF	Line Feed
DC1	Device Control 1 (XON)	NAK	Negative Acknowledge
DC2	Device Control 2	NUL	Null, or all zeroes
DC3	Device Control 3 (XOFF)	RS	Record Separator
DC4	Device Control	SI	Shift In
DEL	Delete	SO	Shift Out
DLE	Data Link Escape	SOH	Start of Heading
EM	End of Medium	SP	Space
ENQ	Enquiry	STX	Start of Text
EOT	End of Transmission	SUB	Substitute
ESC	Escape	SYN	Synchronous Idle
ETB	End Transmission Block	US	Unit Separator
ETX	End of Text	VT	Vertical Tab



Full ASCII Bar Code Chart

The charts in this section list the Code 39 bar code label for each ASCII character. To use these bar code labels, you must configure the JANUS reader to use Code 39 in Full ASCII mode. For help, see “Code 39” in Chapter 12.

Control Characters

ACK



\$F

BEL



\$G

BS



\$H

CAN



\$X

CR



\$M

DC1



\$Q

DC2



\$R

DC3



\$S

DC4



\$T

DEL



\$%T

DLE



\$P

EM



\$Y

ENQ



\$E

EOT



\$D

ESC



\$%A

ETB



\$W

ETX



\$C

FF



\$L

FS



\$%B

GS



\$%C

HT



\$I

Control Characters (continued)

LF



\$J

NAK



\$U

NUL



\$%U

RS



\$%D

SI



\$O

SO



\$N

SOH



\$%A

STX



\$B

SUB



\$Z

SYN



\$V

US



\$%E

VT



\$K

Symbols and Punctuation Marks

! (exclamation point)



/A

" (quotation marks)



/B

#



/C

\$



/D

%



/E

&



/F

' (apostrophe)



/G

(



/H

)



/I

* (asterisk)



/J

+

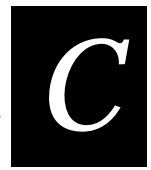


/K

- (dash)



/M





/


 /O


=

 %H

. (period)

 /N

, (comma)

 /L

: (colon)

 /Z


; (semicolon)

 %F

?

 %J

<

 %G

>

 %I

@

 %V

[

 %K

]


 %M

~ (tilde)

 %S

^

 %N


_ (underline)

 %O

\

 %L

` (left single quote)

 %W

| (pipe)

 %Q

{

 %P

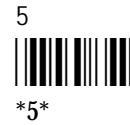
}

 %R

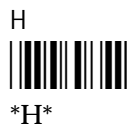
Space

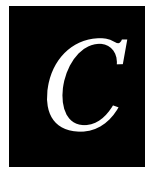
 ,

Numbers



Uppercase Letters





M



M

N



N

O



O

P



P

Q



Q

R



R

S



S

T



T

U



U

V



V

W



W

X



X

Y



Y

Z



Z

Lowercase Letters

a



+A

b



+B

c



+C

d



+D

e



+E

f



+F

g



+G

h



+H

i



+I


Lowercase Letters (continued)

j

+J


k


+K


l

+L

m

+M


n

+N

o

+O

p

+P


q


+Q


r

+R


s

+S

t

+T


u

+U


v

+V

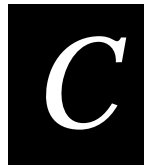
w

+W

x

+X

y

+Y

z

+Z



Scanning Bar Codes to Select Menu Options

You can scan the next bar code labels to select options and move around in these menu applications:

- Interactive Configuration application (IC.EXE)
- Communications Manager
- IRL Desktop

The bar codes in this section use the four-digit hexadecimal key code value for each key. You can create your own bar codes for every key by using the same syntax. For help, see “Creating Your Own Key Code Bar Code Labels” later in this appendix.

Enter



..1C0D

Esc



..011B

Cursor Up



..48E0

Cursor Down



..50E0

Cursor Left



..4BE0

Cursor Right



..4DE0

Page Up



..49E0

Page Down



..51E0

Home



..47E0

End



..4FE0

Insert



..52E0

Delete



..53E0

Scanning Bar Codes to Select Menu Options (continued)

Tab



..0F09

Backtab



..0F00

Backspace



..0E08

F1



..3B00

Creating Your Own Key Code Bar Code Labels

You can use each key's four-digit hexadecimal value to:

- Insert the value into the keypad buffer to use in IC.EXE, Communications Manager, or IRL Desktop.
- Redefine scanned characters to a keystroke equivalent to modify the reader's key code look-up table.

You can create your own bar code label for each key by using this syntax:

..*data*

where *data* is the four-digit hexadecimal key code value. Use the Key Code Table to find each key's four-digit hexadecimal value. For help, see "Key Codes" earlier in this appendix.

For example, the hexadecimal value for the uppercase letter B is 3042. Use this syntax to create a bar code label:

..3042

Create this bar code label:

B



..3042



Software Utility Reference



This appendix describes Interlnk, INTERLNK.EXE, INTERSVR.EXE, POWER.EXE, and the Auto-Loader batch files.

Interlnk

With Interlnk, you can easily transfer files between your reader and a host computer or another reader. You can also make all the drives on one computer appear as if they are physically located on the other, so that you have unrestricted access to the contents of all the drives.

The device running Interlnk is the client and is used to enter commands. The device responding to commands is the server. For help installing and running Interlnk, see “Running Interlnk to Transfer Files” in Chapter 6.

The command to begin running Interlnk is:

Syntax:

```
interlnk [client:=][server:]
```

where:

client specifies the letter of the client drive that is redirected to a drive on the server. The drive must be one that was redirected when you started Interlnk.

server specifies the letter of the drive on the Interlnk server that is redirected. The drive must be one listed under *This Computer (Server)* in the Interlnk Server Status screen.

Notes:

Installing the INTERLNK.EXE device driver You must load the INTERLNK.EXE device driver into memory before you can use the Interlnk command. For help, see the next section.

Displaying the status To display Interlnk’s current status, type the command on the client without including the *client:=server:* parameter.

Canceling redirection on a drive To cancel redirection of a client drive to a server drive, specify only the client drive and the equal sign (=) in the Interlnk command.

Examples:

To redirect drive F and G on the client to drive D and E on the server:

```
interlnk f=d g=e
```

To cancel the redirection of client drive G:

```
interlnk g=
```

INTERLNK.EXE

This device driver redirects requests for operations on Interlnk drives or printer ports to Intersvr drives or printer ports. You must load this device driver in the CONFIG.SYS file of the device running Interlnk (the client).

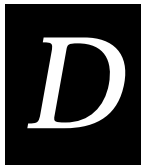
Add a command to the client's CONFIG.SYS that follows this syntax:

Syntax:

```
device=[drive:][path\]interlnk.exe [/drives:n] [/noprinter]
        [/com[:][n | address]] [/auto] [/noscan] [/low ]
        /baud:rate[/v]
```

where:

<i>drive:path</i>	specifies the location of the INTERLNK.EXE file
<i>/drives:n</i>	specifies the number of drives to redirect: 0 to redirect printers only 1 to redirect one drive 2 to redirect two drives 3 to redirect three drives (default) and so on.
<i>/noprinter</i>	specifies not to redirect printers. By default, Interlnk redirects all available printer ports.
<i>/com:n</i> <i>/com:address</i>	identifies the serial COM port that is connected to the server by specifying either the number (<i>n</i>) or address (<i>address</i>) of the port. If you omit <i>n</i> and <i>address</i> , Intersvr searches all serial ports and uses the first port that it finds connected to the client. If you specify the <i>/com</i> switch, the server searches only for serial ports. By default, all serial ports are scanned.
<i>/auto</i>	loads the INTERLNK.EXE device driver in memory only if the client can establish a connection with the server when the client starts up. By default, Interlnk is loaded even if the client cannot establish a connection with the server.
<i>/noscan</i>	loads the INTERLNK.EXE device driver in memory, but prevents a connection between client and server from being established. By default, the client tries to establish a connection with the server as soon as you load INTERLNK.EXE.
<i>/low</i>	loads the INTERLNK.EXE device driver into conventional memory even if upper memory is available. By default, INTERLNK.EXE is loaded into upper memory if DOS 5.0 upper memory block support and memory is available.



Syntax: (cont.)

`/baud:rate` sets a maximum baud rate for serial communication. Type 9600, 19200, 38400, 57600, or 115200. The default is 115200.

`/v` prevents conflicts with a computer's timer. Include this switch if you have a serial connection between computers and one of them stops running when you use Interlnk to access a drive or printer port.

Notes: **Position of the Interlnk command in the CONFIG.SYS file** The position of the device command that loads INTERLNK.EXE in the CONFIG.SYS can affect pre-existing drive assignments.

For example, suppose your computer includes a floppy disk drive (A), two hard disk drives (C and D), and two RAM drives (E and F). If you load the INTERLNK.EXE device driver before creating the RAM drives and you choose to redirect three drives, Interlnk assigns letters E, F, and G to the redirected drives, and letters H and I to the RAM drives. To prevent this situation from happening, load INTERLNK.EXE last in your CONFIG.SYS file.

Calculating the number of drives to redirect When you add the INTERLNK.EXE command to the host computer's CONFIG.SYS, you should set the `/drives` option to at least seven drives. The reader contains five default drives (C, D, E, F, G), and Interlnk assumes two more (A and B). If you specify fewer than seven drives, Interlnk will not redirect all the reader's drives. You need more than seven drives if the reader contains more than one physical RAM drive.

Saving memory The Interlnk device driver loads all of its code into memory. You can save memory by specifying the `/noprinter` or `/com` switch. If you specify the `/noprinter` switch, the Interlnk program does not load code that redirects printers. If you specify the `/com` switch, the program does not load code that supports parallel ports. Intermec recommends using the `/noprinter` and `/com` switches when INTERLNK.EXE is loaded on the reader.

Using a serial mouse with Microsoft Windows If you are using a serial mouse with Microsoft Windows, specify the `/com` switch to designate a COM port other than the one the mouse is using.

DOS version Some features of DOS may not be available to the client computer if you are running a different DOS version on your Interlnk server. For example, if you have large partitions on the server and are running DOS 3.0 on the client, the partitions are not available to the client because DOS 3.0 does not support them.

Running an application located on the server If you use Interlnk to run an application located on the server, make sure the application is configured for the computer you have designated as the client.

INTERLNK.EXE (continued)

Notes: (cont.) **Limitations** These commands do not work on devices running Interlnk:

CHKDSK	FORMAT	UNDELETE
DISKCOMP	MIRROR	UNFORMAT
DISKCOPY	SYS	

Interlnk does not redirect network, CD-ROM drives, or any other device that uses a redirection interface. For example, you cannot access a network drive that was redirected before Interlnk was started.

Examples:

If the Interlnk files are located in the INTERLNK directory on the host computer's drive C and you need to specify seven drives so that drives C through G on the reader will be redirected, add this line to the CONFIG.SYS file on the reader:

```
device=c:\interlnk\interlnk.exe /drives:7
```

If the Interlnk files are located in the root directory on drive D of the reader, you used the serial port to connect to another computer, and you want to start Interlnk without having the printers redirected, add this line to the CONFIG.SYS file on the reader:

```
device=d:\interlnk.exe /com /noprinter /drives:7
```

To make Interlnk use a non-standard COM port whose address is 3F8, add this line to your CONFIG.SYS file on the reader:

```
device=d:\interlnk.exe /com:3F8 /drives:7
```


Intersvr

Interlnk is loaded on the device designated as the client. The device running Intersvr is called the server. The server responds to commands typed on the client. When you run Intersvr in conjunction with Interlnk, it provides serial file transfer capability through redirected drives, and printing through redirected printer ports. For help installing and running Intersvr, see “Running Interlnk to Transfer Files” in Chapter 6.

Type this command to begin running Intersvr:

Syntax: `intersvr [drive:] [/x=drive:] [/com:n | address]
[/baud:rate] [/b] [/v]`

where:

- drive:** specifies the letter of a drive to be redirected. By default, all drives are redirected.
- /x=drive** specifies a drive that is not redirected. By default, all drives are redirected.
- /com:n** identifies the serial COM port that is connected to the server
/com:address by specifying either the number (*n*) or address (*address*) of the port.
- If you omit *n* and *address*, Intersvr searches all serial ports and uses the first port that it finds connected to the client. If you specify the **/com** switch, the server searches only for serial ports. By default, all serial ports are scanned.
- /baud:rate** sets a maximum serial baud rate. Type 9600, 19200, 38400, 57600, or 115200. The default is 115200.
- /b** displays the Interlnk Server Status screen in black and white. Use this switch if you are having problems reading your monochrome monitor.
- /v** prevents conflicts with a computer’s timer. Specify this switch if you have a serial connection between computers and one of them stops running when you use Interlnk to access a drive or printer port.

Notes: **Specifying the order of drives** Interlnk redirects drives in the order you specify. The first server drive specified is redirected to the first available client drive, the second server drive specified is redirected to the second available client drive, and so forth.

Intersvr (continued)

Notes: (cont.) **Copying the files from the reader** If you do not have the MS-DOS Programs companion disk, which contains the Interlnk and Intersvr files, you can copy the files from the reader. You need to connect the host computer to the reader using a 7-wire, null-modem serial cable and the Mode command must be available on the host computer where you are installing Interlnk. To copy the files to the host computer, type this command on the reader:

```
intersvr /rcopy
```

Using a serial mouse with Microsoft Windows If you are using a serial mouse with Microsoft Windows, and you start Intersvr while Windows is running, specify the /com switch to designate a COM port other than the one the mouse is using.

Using Interlnk in a task-switching or multitasking environment If you start Intersvr in a task-switching or multitasking environment, task-switching and key combinations that switch you out of your current task are disabled. To restore these functions, quit the server.

Limitations These commands do not work on the device running Intersvr:

CHKDSK	FORMAT	UNDELETE
DISKCOMP	MIRROR	UNFORMAT
DISKCOPY	SYS	

Interlnk does not redirect network, CD-ROM drives, or any other device that uses a redirection interface. For example, you cannot access a network drive that was redirected before Interlnk was started.

Examples: If you have two computers and each contains drives A, B, and C, you can start Intersvr and direct server drive C to client drive D, and A to E, and B to F, by typing this command on the server:

```
intersvr c: a: b:
```

To redirect all server drives except drive A and use COM4 to connect to the client, type this command on the server:

```
intersvr /x=a /com4
```

POWER.EXE

POWER.EXE lets you adjust the reader's power management at the DOS prompt. It provides power-saving features and an application program interface (API) that applications can use. POWER.EXE works through the Advanced Power Management (APM) interface. IRL programs and programs that use Reader Services do not require POWER.EXE.

To change the level of power management, type this command at the reader's DOS prompt:

Syntax: `[drive:][path]power.exe [adv[:max | reg | min] | std | off][/low]`

where:

<i>drive:path</i>	specifies the location of the POWER.EXE file.
adv:max	conserves the reader's power when applications and hardware devices are idle. Performance may be affected if an application is active instead of idle. Use max for maximum power conservation. Use reg to balance power conservation with performance. Use min (default) if performance is not satisfactory with max or reg.
adv:reg	
adv:min	
std	conserves the reader's power. Use std to conserve power by using only the power management features of your hardware. Use off to turn off POWER.EXE. If POWER.EXE is off, the date is not updated when you turn off the reader. If you use your own APM interface, it should be able to update the date each time the reader is turned on and the date has changed.
off	
low	loads POWER.EXE into conventional memory, even if the upper memory area is available. By default, POWER.EXE is loaded into upper memory if it is available.

Notes: To display the current power setting, type the command:

```
power
```

You can view the power settings screen with the viewport or use Interlnk to view the settings on the host.

POWER.EXE is embedded in the software and is set by default to adv:min. The JANUS 2020 has its own power management for maximum efficiency.

POWER.EXE gives you an estimate of the amount of NiCad power is left in the reader's battery pack. This estimate is accurate to $\pm 10\%$. The accuracy of the estimate depends upon variables such as the temperature and age of the battery pack. You may find that POWER.EXE performs differently for each battery pack. For example, when POWER.EXE indicates that the battery life is at 20%, the battery pack is getting low and you need to replace it soon.

Auto-Loader Batch Files

When you install Auto-Loader onto your host computer, eight batch files are copied to your host computer. You will use these batch files to change the contents of drive C on the reader:

- LOAD_USA.BAT or LOADLANG.BAT
- LOADADD.BAT
- LOADC.BAT
- LOADIMG.BAT
- LOADNEW.BAT
- LOADXIMG.BAT
- MAKE_USA.BAT or MAKELANG.BAT
- MAKENEW.BAT

Note: *The LOADC.BAT file is a master batch file called by the other batch files.*

This section covers these topics:

- Learning How to Use Auto-Loader
- Moving the Batch Files
- Using an External Power Supply
- How to Use Each Batch File

Learning How to Use Auto-Loader

Follow either of these methods to create an image file, which contains the files you want on the reader's drive C, and then load it onto the reader:

- Use LOAD_USA, LOADLANG, LOADADD, or LOADNEW to create and load the image file in a single step.
- Use MAKE_USA, MAKELANG, or MAKENEW to create the image file and store it on a host computer. Then use LOADIMG or LOADXIMG to load the image file onto the reader. This two-step method helps you create an image file to be loaded onto multiple JANUS readers.

For more help, see these chapters:

Chapter 3, “Learning About the Software” Describes how to install Auto-Loader, explains why you must use special utilities to change drive C, and includes instructions for executing the commonly used batch files.

Chapter 8, “Preparing the Reader for International Use” Describes how to use Auto-Loader to configure the reader to operate in a DOS National Language Support (NLS) language: French, German, Italian, or Spanish.

Moving the Batch Files

The batch files are customized for the drive and directory where you installed them. To move the batch files, you must reinstall Auto-Loader. For help, see “Installing Auto-Loader on Your Host Computer” in Chapter 3.

Using an External Power Supply

When you use Auto-Loader, you must connect an external power supply to the communications dock or optical link adapter. Auto-Loader uses MkImage and PutImage software. Because PutImage requires an external power supply, Auto-Loader also requires an external power supply.



Caution

The reader should be powered by an AC power source when you use the PutImage command in case the battery pack goes low while the flash is being erased. If the power goes down when using PutImage, the reader locks up and the system flash must be reloaded from the Boot Loader menu and you will lose data.

Conseil

Il faut alimenter le lecteur par une source de courant AC lors de l'exécution de la commande PutImage dans le cas où le jeu de piles s'affaiblit pendant l'effacement du flash. Si le courant est coupé lors de l'exécution de PutImage, le lecteur se verrouille, le flash système doit être rechargé du menu d'amorçage (Boot Loader) et vous perdez des données.

Using **LOAD_USA**

LOAD_USA creates an image file that contains only the three startup files in the C_FILES\COMMON directory: AUTOEXEC.BAT, AUTOINST.BAT, and CONFIG.SYS. Then LOAD_USA loads the image file onto drive C, deleting all the files currently on drive C.

Here is the syntax for LOAD_USA:

```
load_usa
```

Note: If you installed Auto-Loader for a DOS NLS country, the LOAD_USA batch file is not installed.

USING **LOADLANG**

LOADLANG creates an image file that contains only the three startup files in the C_FILES\COMMON directory. Then LOADLANG loads the image file onto drive C, deleting all the files currently on drive C.

The LOADLANG command also edits AUTOEXEC.BAT and CONFIG.SYS to support the DOS NLS language you specified when you installed Auto-Loader. For help, see Chapter 8, "Preparing the Reader for International Use."

Here is the syntax for LOADLANG:

```
loadlang
```

Note: If you installed Auto-Loader for a DOS NLS country, the LOADLANG batch file is installed instead of the LOAD_USA batch file.

Using **LOADADD**

LOADADD adds or replaces files on the reader's drive C without overwriting all of the files of drive C. You can also use LOADADD to configure the reader to operate in a DOS NLS language.

There are two LOADADD commands:

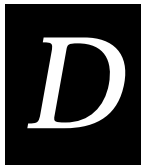
- loadadd nls
- loadadd *path\filename* [*path\filename path\filename...*]

where:

path is the drive and directory of the file to load.

filename is the name of the file to load.

You can specify more than one file or use *path*.** to load all the files from a directory.



The next tables describe how the two LOADADD commands work depending on the information you include in the command and whether you installed Auto-Loader for a DOS NLS country.

Command: `loadadd nls`

DOS NLS Support?	Description
No	<ul style="list-style-type: none"> • Creates an image file that contains the three startup files in C_FILES\COMMON and all files currently on drive C. • Loads the image file onto the reader's drive C. • Overwrites only the startup files on drive C.
Yes	<ul style="list-style-type: none"> • Creates an image file that contains the three startup files in C_FILES\COMMON and all files currently on drive C. • Appends commands to AUTOEXEC.BAT and CONFIG.SYS to support the DOS NLS language. • Loads the image file onto the reader's drive C. • Overwrites only the startup files on drive C.

Command: `loadadd path\filename [path\filename...]`

DOS NLS Support?	Description
No	<ul style="list-style-type: none"> • Creates an image file that contains files you specify in the command and all files currently on drive C. • Loads the image file onto the reader's drive C. • Overwrites files on drive C only if the command contains a file with the same name.
Yes	<ul style="list-style-type: none"> • Creates an image file that contains files you specify in the command, all files currently on drive C, and the three startup files in C_FILES\COMMON unless you specify startup files in the command. • Appends commands to AUTOEXEC.BAT and CONFIG.SYS to support the DOS NLS language. • Loads the image file onto the reader's drive C. • Overwrite files on drive C only if the command contains a file with the same name.

Using **LOADIMG**

LOADIMG loads the image file that you specify on the command line onto the reader's drive C. LOADIMG overwrites all files currently on drive C.

You must have created the image file already with the MAKENEW, MAKE_USA, LOADADD, LOADNEW, LOADLANG, or LOAD_USA. You may have renamed the image file from its default name, NEWDRV_C\DRIVEC.IMG.

LOADIMG is useful when you are loading an image file onto multiple JANUS readers.

Here is the syntax for LOADIMG:

```
loading path\filename
```

where:

path is the drive and directory of the image file to load.

filename is the name of the image file to load.

Using **LOADNEW**

LOADNEW creates an image file that contains any files you include in the command line. If you do not specify startup files in the command line, LOADNEW adds the three default startup files in C_FILES\COMMON to the image file. Then LOADNEW loads the image file onto the reader's drive C, deleting all the files currently on drive C.

If you specified a DOS NLS country when you installed Auto-Loader on the host computer, LOADNEW appends commands to the AUTOEXEC.BAT and CONFIG.SYS files to support that DOS NLS language.

Here is the syntax for LOADNEW:

```
loadnew path\filename [path\filename path\filename...]
```

where:

path is the drive and directory of the file to load.

filename is the name of the file to load.

You can specify more than one file or use *path*.** to load all the files from a directory.



Using LOADXIMG

LOADXIMG loads the default image file, NEWDRV_C\DRIVEC.IMG, onto the reader's drive C. LOADXIMG overwrites all files currently on drive C.

You must have created the image file already with the MAKENEW, MAKE_USA, LOADADD, LOADNEW, LOADLANG, or LOAD_USA commands.

LOADXIMG is useful when you are loading an image file onto multiple JANUS readers. Here is the syntax for LOADXIMG:

```
loadximg
```

Using MAKE_USA

MAKE_USA creates an image file that contains only the three startup files in C_FILES\COMMON. No other files are included in the image file.

You must use LOADXIMG or LOADIMG to load the image file onto the reader's drive C. The Make commands offer the advantage of allowing you to create an image file on the host that you can use to update multiple readers.

Here is the syntax for MAKE_USA:

```
make_usa
```

Note: If you installed Auto-Loader for a DOS NLS country, the MAKE_USA batch file is not installed.

Using MAKELANG

MAKELANG creates an image file that contains only the three startup files in C_FILES\COMMON. No other files are included in the image file.

The MAKELANG command also edits AUTOEXEC.BAT and CONFIG.SYS to support the DOS NLS language you specified when you installed Auto-Loader. For help, see Chapter 8, "Preparing the Reader for International Use."

You must use LOADXIMG or LOADIMG to load the image file onto the reader's drive C. The Make commands offer the advantage of allowing you to create an image file on the host that you can use to update multiple readers.

Here is the syntax for MAKELANG:

```
makelang
```

Note: If you installed Auto-Loader for a DOS NLS country, the MAKELANG batch file is installed instead of the MAKE_USA batch file.

Using MAKENEW

MAKENEW creates an image file that contains any files you include in the command line. If you do not specify startup files in the command line, MAKENEW adds the three default startup files in C_FILES\COMMON to the image file.

If you specified a DOS NLS country when you installed Auto-Loader on the host computer, MAKENEW appends commands to the AUTOEXEC.BAT and CONFIG.SYS files to support that DOS NLS language.

You must use LOADXIMG or LOADIMG to load the image file onto the reader's drive C. The Make commands offer the advantage of allowing you to create an image file on the host that you can use to update multiple readers.

Here is the syntax for MAKENEW:

```
makenew path\filename [path\filename path\filename...]
```

where:

path is the drive and directory of the file to include in the image file.

filename is the name of the file to include in the image file.

You can specify more than one file or use *path*.** to load all the files from a directory.



Glossary

Accumulate mode

Operating mode in which the reader stores scanned information in the reader's data buffer until the reader receives a enter command.

acknowledgment delay

Specifies the maximum amount of time that may elapse before the controller determines that a device did not receive the message.

AFF

Affirmative Acknowledge character. This character enables or disables the handshake event that is an affirmative acknowledge to a message.

alphanumeric keypad

The alphanumeric keypad is an all-purpose keypad with 52 keys. Although the keypad is smaller than a regular PC keyboard, you use special keys on the reader's keypad and press key combinations to access all 102 keys that are available on a PC keyboard. The alphanumeric keypad is available in English, French, German, Italian, and Spanish.

application break bit

A flag in the reader that an application checks when you turn on the reader. If the bit is not set to 1, the application will resume running. If the bit is set to 1, the application will not resume. You press the application break sequence to set the application break bit.

application break sequence

A series of keys you press to stop an application from resuming after you turn the reader off and then on again. Usually you use these keys when an application is locked up and you do not want to cold boot the reader to clear the memory.

Application companion disk

One of the disks that Intermec ships with your JANUS reader. This disk contains applications such as Communications Manager and IRLXDESK.EXE. This disk also contains PC card drivers and utilities that control the reader's operation, prepare the reader to use the different types of PC cards, customize the reader to use the PC card software, and provide you with helpful tools.

ASCII

American Standard Code for Information Interchange. A standard 7-bit code almost always transmitted with a parity bit for a total of 8 bits per character.

ASCII control character

One of the first 32 characters (0 through 31 in decimal representation) in the ASCII character set. Each of these characters has a standard control function, such as backspace or carriage return.

ATA flash PC card

A type of memory PC card that provides additional disk storage space, not more executable convention memory, on a JANUS reader.

audio signals

The reader has a beeper and a clicker that produce audio signals that indicate reader status. You can change the beep volume and enable or disable the keypad clicker with configuration commands.

Auto-Loader

A DOS utility used to change the contents of drive C. You can also use it to configure the reader to operate in any language supported by DOS NLS (National Language Support). You run Auto-Loader on a host computer connected to the reader's COM1 port.

Automatic mode

See Scanner mode.

automatic shutoff

A reader configuration feature that defines the maximum length of time the reader stays on when there is no activity. At automatic shutoff, the contents of reader memory are saved and the reader resumes where it left off when it is turned on again.

backlight

A light built into the reader display to make it easier to view the reader display in dimly lit environments.

backup battery

See lithium backup battery.

BAK

Bad Program Acknowledgment character. This character is sent from the reader to indicate that the IRL program received from the host could not be successfully compiled.

bar code density

Number of data characters that can be represented in a linear unit of measure. Often expressed in characters per inch.

bar code label

A label that contains a bar code symbol.

bar code symbology

A scheme for encoding data as bar code. Code 39, Interleaved 2 of 5, and Codabar are examples of different symbologies.

battery pack

See NiCad battery pack.

baud rate

The number of discreet conditions or signal events per second. In RS-232 and RS-422/485 systems, baud rate is the same as bits per second (bps).

binary file

A file that contains a sequence of 8-bit data characters or executable code. Compare to ASCII text file. Binary files require special software for transmission. See also binary file transfer.

binary file transfer (BFT)

The process or method for transmitting a binary file (such as an executable file) from one computer device to another.

boot

Usually means to invoke a bootstrap process, which involves building up a system from some simple preliminary instructions or information.

Boot Loader menu

The menu on the reader used to reboot the reader, to dump the reader's RAM, to reload or upgrade the reader's software, or to use Storage mode.

Boot Utilities companion disk

One of the disks that Intermec ships with your JANUS reader. This disk contains the files you need to load or upgrade the reader's system software. This disk also contains the README.DOC, a text file that describes important information about the reader that was unavailable when this manual was published. This disk also contains a batch file, INSTALL.BAT, that you can use to install Auto-Loader onto a host computer.

bps

Bits per second. The unit of measure used to describe the rate of data transmission. For example, 1200 bits per second means that there are 1200 data bits transmitted per second.

BRU

Base radio unit. A device that transmits messages over radio frequency (RF) waves between a controller and data collection devices.

CGA

Abbreviation for Color/Graphics Adapter. CGA is a video adapter board.

check character

A character included within a message for the purpose of performing a check to ensure the accuracy of the message.

check digit

A character included in a bar code whose value is used to do a mathematical check on the value of the decoded bar code to retain accuracy.

client

The computer from which you will access drives, directories, files, and programs that are stored on the server. See also server.

Codabar

A self-checking, discrete bar code symbology that has these 16 characters in its set: 0 to 9, dollar sign (\$), colon (:), slash (/), period (.), plus (+), and minus (-). Codabar is commonly used in libraries, blood banks, and air-parcel express applications. The American Blood Commission (ABC) Codabar requires that you retain the start/stop code digits when processing a Codabar symbol. The maximum density for a Codabar symbol is 12.8 characters per inch.

Code 2 of 5 (2 of 5)

A discrete, self-checking code for encoding numeric data only. The bars encode information and the spaces separate individual bars. It can achieve densities of 15 characters per inch.

Code 11

A very high density, discrete, numeric bar code developed by Intermecc. The character set includes the numbers 0 through 9 and the dash character (-). Each character is represented by a standalone group of three bars with two included spaces. This code is not self-checking. One or two check digits provide data security. Code 11 is most extensively used in labeling telecommunications components and equipment. Its maximum density is 15 characters per inch.

Code 128

A very high density alphanumeric symbology that supports the extended ASCII character set. It is a variable length, continuous code that uses multiple element widths. Code 128's high density makes it useful when printing data in a limited space. Its maximum density is 12.1 alphanumeric characters per inch or 24.2 numeric characters per inch.

Code 16K

A two-dimensional (stacked rows), ultra-high density bar code symbology. It is based on Code 128 and is used widely to label unit-dose packaging for the healthcare industry.

Code 39

A discrete, variable length, and self-checking bar code symbology. The character set is uppercase A to Z, 0 to 9, dollar sign (\$), period (.), slash (/), percent (%), space (), plus (+), and minus (-). Code 39 can be extended to the full 128 ASCII character set by use of a two-character encoding scheme (see full ASCII). Its maximum density is 9.8 characters per inch.

Code 49

A multirow symbology for high data density. The last character in each row is used for row checking and the last two characters of the symbol are used for overall checking. The character set includes all 128 ASCII characters. Its maximum density is 93.3 alphanumeric characters per inch or 154.3 numeric characters per inch.

Code 93

A variable length, continuous bar code symbology using four element widths. It can be used interchangeably with Code 39 when higher density printing is required. The character set is the same as Code 39. Its maximum density is 14.8 characters per inch.

cold boot

One of two ways to boot the reader; compare to warm boot. A cold boot invokes the BIOS boot sequence, which verifies that the 256K flash system image is not corrupt, clears all memory, and performs a complete power-on self test (POST) to ensure that the hardware and peripherals are operational. The cold boot initializes the system hardware for use by system software, loads the default configuration, runs AUTOEXEC.BAT and CONFIG.SYS, and loads DOS. Because the physical RAM drive is initialized, all files on drive E are lost. You may cold boot the reader to clear the reader's conventional memory, break out of an application that is locked in an infinite loop, or recover from an error condition.

COM port

Commonly used short form of communications port. Locations from which data can be passed into and out of the reader. COM ports offer serial communications, which means that data is transmitted one bit at a time over a single line from one computer to another.

Communications Manager

An application on the reader that lets you transmit and receive files, and see the status of the reader's COM port. This application is available on the Application companion disk 3.




communications protocol

A set of rules or standards designed to enable computers to connect with each other and exchange data. An example of a communications protocol is Point-to-Point protocol.

Communications Utilities

Transmit and receive functions that you can call with PSK functions or software interrupts. Included in the Reader Services programs.

Compound Function key

The Compound Function key is a special key on the JANUS keypad. You use the  key to access characters or perform functions that do not have an actual key on the keypad. When you press , the key is held in a buffer and the Compound Function key icon appears on the reader's display. Once you press a key other than , the key combination is entered into the reader and the icon disappears from the display.

configuration

The selected parameters that determine the operating characteristics of an electronic device.

configuration command

A configuration command changes the way the reader operates. You can enter a configuration command by typing on the keypad, by scanning a bar code label, or by sending a command from the host computer.

configuration file

A configuration file is an ASCII text file that contains settings for some or all of the reader's configuration parameters.

Configuration Manager

A Reader Services program on the reader that maintains the reader's current configuration file, ensures that the reader operates according to that configuration, and lets you change the configuration file.

Control mode

A reader mode you use to temporarily change some of the display parameters at the DOS prompt or when running an application. The parameters are reset when you boot the reader.

conventional memory

The reader has 1MB of battery-backed dynamic RAM. The first 640K is conventional memory and is virtually the same as that of a PC. You can use this memory to run applications.

cursor keypad

A set of keys on the reader that allows you to move the cursor around the screen.

data bits

The number of bits the reader uses when communicating with another device (i.e., host computer). Generally set at seven or eight.

default configuration

The values set for each configuration parameter when the reader is shipped.

device

Any physical item that is attached to a computer. A terminal, a printer, a reader, and a controller are all devices.

device driver

A software component that controls an external device. For example, a PC card device driver controls how the reader accesses the PC card.

DLE

The ASCII Data Link Exception character. It causes the character that follows it to be received as data, even if it is a protocol character. It allows for the use of control characters in preambles, data strings, and configuration command strings.

DOS code pages

A code page is a table that relates binary character codes used by a program to keys on the keypad or to characters on the display. All international keypads are translated using an installed DOS code page that contains the standard ASCII character set and a set of national language characters specific to the language the code page supports.

downline

When devices are connected to a computer, they are connected in a "line." Downline is a direction relative to the computer. If more than one computer is connected in a line, the upline computers usually handle data processing and the downline computers usually handle data collection and sometimes some data preprocessing. Contrast with upline.

DRAM

Abbreviation for dynamic random access memory. A type of RAM that stores information in integrated circuits containing capacitors. Since capacitors lose their charge over time, DRAM boards include logic to recharge, or "refresh," the RAM chips continuously. Since their internal circuitry is simple, DRAMs are more commonly used than static RAMs, even though they are slower. DRAM can hold approximately four times as much data as a static RAM chip of the same complexity. The reader has 1MB of battery-backed DRAM.

drive

An electromechanical device that reads from and writes to disks. The three types of common disk drives are floppy disk drives, hard disk drives, and PC card drives.

driver

See device driver.

EAN

European Article Numbering. International standard bar code for retail food packages corresponding to the Universal Product Code (UPC) in the United States. A reader that is configured to decode EAN bar codes can decode UPC, but the reverse is not true. UPC code is a subset of EAN code.

edge triggering

A scanner trigger configuration that makes the laser turn on after you pull the trigger and stay on until you pull it a second time. Simply releasing the trigger does not turn the laser off. If the laser is left on, the scanner timeout turns the laser off. Contrast with level triggering.

EMM

Expanded Memory Manager. Software that makes expanded memory available to EMS-compatible DOS programs.

end device

The device in the data collection system that collects and inputs data.

environment variable

A specification in a program that defines an operating parameter, such as the command path.

EOF

End of File character. Attached to the last record transmitted in a block of records and after the End of Record (EOR), if the EOF character field is enabled.

EOM

End of Message character. Sent at the end of reader and host messages. The transmitted and received EOM characters can be defined separately.

EOP

End of Program block character. Sent by the host after a block of IRL program statements to tell the reader that another block of IRL statements is coming.

EOR

End of Record character. Attached to the end of every record transmitted by the polled device if the EOR character field is enabled.

error message

A message from a device or program advising the user of an error that requires intervention to solve. For example, if you receive the error message "Error, incorrect number of parameters" while creating a drive image with MkImage, you should verify that the command line is correct and then try again.

expanded memory

Memory above 1MB that requires an expanded memory board and expanded memory manager.

extended memory

System memory above 1MB. The reader is initially configured with 64K of extended memory available, which is allocated for use by Intermec applications (IC.EXE and IRL). The reader provides extended memory for control and access to RAM above 1MB. The extended memory conforms to XMS specification 2.0. Extended memory is initialized and managed by the HIMEM.SYS driver.

extended memory manager

Software that makes extended memory available to DOS programs. For example, you must run an extended memory manager such as HIMEM.SYS on the reader to create and use a physical RAM drive.

FIFO control register (FCR)

First in/first out control register. The FCR contains a hex value that controls how the UART buffer operates. You may need to configure the JANUS to restore a hex value for the FCR in case you turn off the reader while running a communications application that uses UART 16x550 mode.

fixed length

Characteristic of a bar code symbology in which the number of characters per symbol is predetermined. Opposite of variable length.

flash PC card

A type of memory PC card that provides additional disk storage space, not more executable conventional memory, on the reader. Flash cards retain their data without the use of a backup battery.

flash ROM drive

Drives C and D on the reader are ROM drives that are implemented in flash memory. Drive C is upgradeable, but has limited write capability. Drive D cannot be modified. Both drives use a file allocation table (FAT) type format.

flow control

A method for controlling the flow of data between the reader and the serial port. It stops the transmitting device from sending data when the receiving device buffer fills up and starts it again when the buffer empties. Flow control can be done through software (XON/XOFF) or hardware (CTS/RTS).

full ASCII

An operating mode that sets the reader to properly decode Code 39 or Code 93 labels containing data that includes any of the 128 ASCII characters.

Graphics mode

One of two display modes on the reader. When the reader is set to use Graphics mode, you see a 128 x 160 pixel display size. You can use the reader's CGA display as a viewport to move around and see a 200 x 640 pixel virtual display. Contrast with Text mode.

handshake event

A communications event that signifies the completion of a data block transmission. The exchange signifies either an affirmative acknowledge (AFF) or a negative acknowledge (NEG). The handshake event is enabled by defining the AFF character to be other than NULL. Some computers use the characters XON and XOFF as handshaking characters.

HIBC

Health Industry Bar Code standard. A modified version of Code 39 that has 43 characters, uses the Modulus 43 check character, and reserves some character combinations for special usage.

high memory area (HMA)

HMA is a 64K block of memory, starting 16 bytes below the 1024K mark, and is the first 64K of extended memory. Since HMA can only hold one item, the first program that requests HMA uses it, regardless of the size of the program.

home

The viewport's home position is the upper left corner of the reader's virtual display.

horizontal reading angle

The horizontal angle of a reader's laser scanner to a bar code label. The optimum horizontal reading angle is near zero degrees.

host computer

A PC or other computer connected to the JANUS reader. Also called the host.

human-readable

A character printed in a font that can be read by a human, as opposed to bar code symbology that can only be read by a machine.

image file

An image file contains all the files you want to load onto the reader's drive C. Because drive C is a ROM drive that is implemented in flash memory, you can use DOS commands to read from drive C, but you must use special utilities to write to drive C.

input/output (I/O) PC card

A type of PC card, such as a modem card, that can be used to connect the reader to another device for communications. I/O cards comply with PCMCIA Standard 2.1.

Input Manager

A Reader Services program that you use as an interface for all data input and output from the reader's COM ports, scanner, and keypad. The Input Manager handles all power management tasks during data input and output.

Interactive Configuration application (IC.EXE)

A menu-driven application that lets you view the reader's current configuration, modify parameters, create configuration files, and configure the reader with any configuration file.

intercharacter delay

Amount of time between transmitting successive characters.

Interleaved 2 of 5 Code (I 2 of 5)

A high-density, self-checking, continuous numeric bar code symbology. A bar code developed by Intermec that encodes the digits 0 through 9. The name Interleaved 2 of 5 is derived from the method used to encode two characters. In this symbol, two characters are paired, using bars to represent the first character and the interleaved spaces to represent the second character. Each character has two wide elements and three narrow elements, for a total of five elements. It is mainly used in inventory distribution and the automobile industry. It can achieve a maximum density of 7.8 characters per inch.

Interlnk

A DOS communications program on the reader that you use to access the drives on a host computer as if they were on the reader, and vice versa.

Intersvr

A companion application to Interlnk that runs on the computer that acts as the server while Interlnk runs on the computer that is the client.

IRL (Interactive Reader Language)

A high-level programming language developed by Intermec for the JANUS reader.

IRL Desktop

The IRL operating environment on the JANUS reader is called the IRL Desktop. This application lets you use the reader to transmit, receive, and clear data files, and to download and run IRL programs.

IRQ

Interrupt request. Hardware lines over which devices such as the reader's input/output ports, the keypad, and disk drivers can send request-attention signals (commonly called "interrupts"). IRQs suspend current operations, save current work, and transfer control to a routine called an interrupt handler, which causes a specific set of instructions to be carried out by the computer's microprocessor.

keypad buffer

An area of memory that saves a limited number of operator keystrokes.

keypad clicker

A feature that makes the reader produce an audible click every time a key is pressed. This feature can be enabled or disabled with the Keypad Clicker configuration command.

large numeric keypad

One of the keypads available on the reader. The large numeric keypad has 34 keys and is available in English. The number keys are larger to make it easier to enter a lot of numeric data. See also alphanumeric keypad.

laser scanner

An optical bar code reading device that uses a low energy laser light beam to examine a spatial pattern, one part after another. It then generates analog or digital signals corresponding to the pattern. Laser scanners are often used in mark sensing, pattern recognition, character recognition, and bar code recognition. The laser scanner converts bar code symbols to electrical signals for input to a bar code reader decoder for processing and subsequent output through a data communications interface.

level triggering

A scanner trigger configuration that makes the laser turn on after you pull the trigger and stay on until you release the trigger. Contrast with edge triggering.

lithium backup battery

The reader contains a lithium backup battery that is designed to back up the RAM and clock while you remove a discharged NiCad battery pack and insert a charged battery pack. The lithium battery will provide backup battery power for 3 to 4 years if you correctly manage power on the reader.

logical COM4

Logical COM4 is the communications port for RF communications in a JR2020. This COM port is different from COM4, which is the Type II PC card drive when it contains a modem card. Accessing an RF network through logical COM4 does not conflict with accessing a serial communications network through COM4.

LRC

Longitudinal redundancy check character. This character is an error-checking character that is optionally appended to transmitted blocks of data and optionally checked on received blocks of data.

memory cards

See PC cards.

MkImage

One of two programs you can use to change the contents of drive C. MkImage creates an image file containing the files you want on drive C. You can run MkImage on a host computer, on the reader's PC card drive, or on the reader's RAM drive.

Modulus 43 check character

Check character derivation method for Code 39.

modem card

A Type II PC card that converts one form of a signal to another, which is suitable for transmission over communications circuits, typically from digital to analog and then from analog to digital.

MS-DOS Programs companion disk

One of the disks that Intermec ships with your JANUS reader. This disk contains commands and device drivers. Some of these commands and drivers are already installed on the reader. This disk also contains applications, such as INTERLNK.EXE, MkImage, and PutImage.

MSI code

Similar to Plessey code. MSI code includes a start pattern, data characters, one or two check digits, and a stop pattern. It is fixed length, continuous, and non self-checking. This code is used to mark retail shelves for inventory reordering. The character set is 0 to 9 plus additional symbols.

Multi-Drop address

The address of the COM port when you are using Multi-Drop communications protocol. Each Multi-Drop address has unique POL and SEL characters that are automatically set when you configure the address.

Multi-Drop protocol

Communications protocol similar to Polling Mode D, used when connecting multiple readers to a port concentrator. In Multi-Drop, each reader on the line must be assigned a unique POL and SEL character. Due to timeout parameters, the baud rate must be 2400 or higher.

multiple-read label

A bar code label that has a space as the first character after the start code. The reader stores a multiple-read label in the buffer until you execute a command to transmit the label or scan a regular label. Contrast with regular label.

NEG

Negative Acknowledgment character. Indicates a negative acknowledgment to a solicitation event or a data transmission event.

network

A collection of devices that can store and manipulate electronic data, interconnected in such a way that their users can store, retrieve, and share information with each other.

NiCad battery pack

Provides the main power source to operate the reader. The battery pack contains rechargeable nickel-cadmium (NiCad) battery cells.

NLS

National Language Support. A DOS feature that provides country-specific information and character set (code page) switching for international language support.

nonvolatile

Refers to memory that is saved when power is lost or turned off.

null modem cable

A cable that connects two computers and allows transmission of data between them without requiring a modem.

number pad

A set of keys on the reader that allows you to move the cursor around the screen and to type numbers and mathematical symbols. The reader's number pad is designed to work like the number pad on a regular PC keyboard.

One-Shot mode

See Scanner mode.

optical serial port

The reader's COM1 is an optical serial port. You can communicate through COM1 using a communications dock, optical link adapter, or another reader if you align the two readers' receive and transmit signals on their optical serial ports.

PAK

Program Acknowledgment character. Sent from the reader when the received IRL program compiles with no errors.

parameter

See configuration command.

parity

A system for encoding characters with odd or even bar code patterns. Parity provides a self-checking feature in bar codes and other data transmission techniques. Even parity characters have an odd number of binary ones in their structure.

PC card

A PC card is similar to a floppy disk. You can use Type I or II memory PC cards and Type II expansion PC cards. Memory cards provide additional disk storage space, not more executable conventional memory. Expansion cards (also called I/O cards) allow you to connect the reader to I/O devices. PC cards were previously called PCMCIA cards.

PCMCIA

Personal Computer Memory Card International Association. This group of manufacturers has defined a set of hardware and software standards for memory and expansion PC cards that are available for personal computers.

PC Standard communications protocol

A communications protocol that handles data transfer on a character-by-character basis or by either filling a receive buffer or transmitting a buffer of data. This protocol is designed to be compatible with the standard PC BIOS functions. The one exception is that the PC Standard protocol can buffer data that is received to avoid losing characters if a program has not checked for data recently.

physical RAM drive

See RAM drive.

Plessey Code

A fixed length, continuous, and not self-checking bar code symbology. Plessey code is pulse-width modulated. It includes a start character, data characters, an eight-bit cyclic check digit, a termination bar, and usually a reverse start character.

Point-to-Point protocol

Point-to-Point is an unsolicited protocol in which the reader transmits data whenever it has something to transmit. The data is followed by a CR LF as the EOM characters. The reader is always in a receiving state and does not wait for select commands. This protocol does not perform any error checking or acknowledgment handshaking. Point-to-Point protocol is typically used to connect the reader to a CRT terminal or host computer.

POL

Poll character. Sent by the host to request reader data. For User-Defined Multi-Drop protocol, you must define a unique character for each reader on a data line.

Polling Mode D

Polling Mode D is a communications protocol that requires the host computer to ask the reader for data it might have (polling) and to request to send data to the reader (selecting). Polling Mode D is used to connect multiple devices to a single multipoint controller. PC-IRL uses this protocol.

POST

Power-on self test. This test runs when you warm or cold boot the reader. The test ensures that the reader's hardware and peripherals are operational.

postamble

A field of data that is sent after the data in a message. It is typically used to tag transactions from the bar code reader for rapid processing by the host, and it expands the data field (record) length. Similar to the preamble.

power management

Software and procedures that extend the life of a reader's NiCad battery pack and lithium backup battery.

preamble

Predefined data that is automatically appended to the beginning of entered data. Similar to postamble.

protocol character

See ASCII control character.

protocol handler

A protocol handler provides communications services that let a reader send data to other devices by transmitting and receiving data as specified by the communications protocol. The basic reader can use PHIMEC and PHPSTD. RF readers can also use RFPH.

PSK

JANUS Programmer's Software Kit. A library of software functions for creating applications on the JANUS.

PSS

Program Statement Separator character. The PSS indicates the end of an IRL program statement. It separates individual IRL program statements from one another in a block of IRL program statements. PSS must not be defined the same as the EOM.

PutImage

One of two programs you can use to change the contents of drive C. PutImage places an image file created with MkImage on the reader. You can run PutImage only on the reader.

RAM

Random access memory. Memory that can be written into, or read, by locating any data address.

RAM drive

A disk drive that exists only in your reader's extended memory. You create, read, write, and delete files on a RAM drive the same way you can on a hard disk drive. RAM drives are faster than hard disk drives because the contents of a RAM drive are, by definition, always resident in RAM. The contents are destroyed when you cold boot the reader.

reader command

A reader command causes the reader to perform a task. You can enter a reader command by typing on the keypad, by scanning a bar code label, or by sending a command from the host computer.

Reader Services

A collection of programs on the reader that decode bar codes, process data input and output, configure the reader, and handle power management.

reader-to-reader

A method of communicating between two readers. By placing two readers so the receive signal on one reader aligns with the transmit signal on the other reader, and the transmit signal on the first reader aligns with the receive signal on the other reader, you can achieve direct communications between the two readers. For this type of communications, the readers should be no more than 1 inch apart.

records per block

The maximum number of data records transmitted per block of data. A block of data is transmitted during a single transmission event.

regular label

A bar code label that takes the form of <start code data stop code>. A regular bar code label is executed as soon as you scan it. Contrast with multiple-read label.

remark out

When you add a REM statement (short for REMark) at the beginning of a command line in a batch file, DOS treats the line as a remark instead of as a command. Any statement beginning with the characters REM will be ignored by the command processor. Typically, users will remark out device drivers in AUTOEXEC.BAT and CONFIG.SYS startup files.

REQ

Request for Acknowledgment character. Sent by the reader to the host to request a retransmission of an acknowledgment to a reader message.

RES

Reset character. Sent by the reader to end communications with the host. The RES character enables or disables the reset event, or resets the data transmission event to the solicitation event.

resume

When you press $\text{\textcircled{V}}$ to turn the reader back on, the reader resumes exactly where it was when you turned it off. If a program was running when you turned off the reader, the program continues running from the same point when you turn the reader back on.

RF data collection system

Radio frequency data collection system in which the individual components communicate with each other by radio signals.

RFPH

The RF protocol handler, which enables a JR2020 to communicate as an end device in an RF network. RFPH lets the reader transmit and receive data as specified by the RF communications protocol.

rolled-over memory

A type of dynamic random access memory (DRAM). The reader has 1MB of battery-backed DRAM. From the memory existing between the 640K and 1MB boundaries, 384K is remapped or "rolled-over" above 1MB to create the RAM drive. If you do not need the RAM drive, you can access rolled-over memory as extended memory through a device driver or an application that uses HIMEM.SYS.

ROM

Read only memory. Usually a small memory that contains often-used instructions, such as microprograms or system software. ROM is programmed during memory fabrication and cannot be reprogrammed.

ROM drive

A read-only memory drive. Drives C and D are ROM drives implemented in flash memory on the reader.

Scanner mode

Defines how the scanner operates when the trigger is pulled. There are two types of modes: One-Shot or Automatic. One-Shot mode requires you to pull the trigger each time you want to scan a bar code. Once you scan a bar code, the scanner turns off. Automatic mode allows you to pull the trigger once and scan a series of bar codes. When you release the trigger, the scanner turns off. To scan the same bar code more than once, you must release the trigger or scan a different bar code before attempting a second scan.

scanner timeout

Maximum time the laser is on. The laser will automatically turn off if timeout occurs before the trigger is released.

SEL

Select character. The character that requests permission for the controller to send data to the polled device.

serial communications

With serial communications, data is transmitted one bit at a time over a single line from one computer to another. Often serial communications link host computers to terminals and PCs to printers.

serial communications parameters

Parameters that control serial communications from one computer to another, such as baud rate and parity.

server

The computer that contains the drives, directories, files, and programs you want to access. See also client.

SOM

Start of Message character. The first character in messages sent to or received from the host.

SOP

Start of Program Block character. Sent by the host at the beginning of a block of IRL program statements.

spotting beam

An aiming feature of a laser scanner. A small beam of light briefly shines on the object being scanned, allowing the operator to position the scanner correctly for a good read.

SRAM drive

Static RAM. See RAM drive.

SRAM PC card

A type of memory PC card that provides additional disk storage space, not more executable conventional memory, on the reader. An SRAM card has a lithium battery to back up data for the life of the battery.

stop bits

A bit that signals the end of a character. One of the serial communications parameters.

Storage mode

A power management mode on the reader that lets you preserve the life of the lithium backup battery. Place the reader in Storage mode if you will not use the reader for 1 week or more. While the reader is in Storage mode, the NiCad battery pack must be removed; otherwise, the reader slowly drains the battery pack and backup battery. All data in conventional memory is lost when the reader enters Storage mode.

Suspend mode

The mode the JANUS reader enters when you press $\text{\textcircled{I/O}}$ to turn off the reader. In Suspend mode, the reader saves all memory and turns off the power to most hardware, including the CPU.

symbology

See bar code symbology.

Text mode

One of two display modes on the reader. By default, the reader uses Text mode and you can set the display size to 25 x 80, 16 x 20, 8 x 20, 16 x 10, and 8 x 10. If your application only recognizes DOS mode, you must use a display size of 25 x 80 or 25 x 40. The other display sizes are not DOS standard and are for use with custom applications. Text mode also supports two character attributes: blinking and reverse video. Contrast with graphics mode.

timeout

A defined time allowed for an event after which an alternative action is taken.

timeout delay

The time the reader waits between received characters before an I/O (input/output) error occurs.

TSR program

Terminate and stay resident program. A DOS program that remains loaded in conventional memory after you have terminated it. You must explicitly unload the TSR if you want to free the conventional memory it is using.

UART buffer

Universal Asynchronous Receiver/Transmitter buffer. The UART buffer contains bytes of data being sent or received by the reader. The FIFO control register controls how the UART buffer operates.

UPC/EAN Code

A fixed length, numeric, continuous bar code symbology that uses four element widths. A reader that is configured to decode EAN bar codes can decode UPC, but the reverse is not true. UPC code is a subset of EAN code. It is a numeric, 12-digit bar code symbology used extensively in retail, particularly the grocery industry. The character set is 0 to 9. Its maximum character density is 13.8 numeric characters per inch.

upline

A device that is at the computer end of a connection between a computer and a device is referred to as being upline. When devices are connected to a computer, they are connected in a “line.” Upline is a direction relative to the device, in contrast to downline.

upper memory area

The area between the 640K and 1024K. The upper memory area is physically composed of a 256K flash ROM chip (system flash) and the video memory chip. Like a PC, this area contains the BIOS and video buffers. On the reader, the upper memory area also contains PC card memory and ROM DOS. The 384K upper memory area maps just above 640K conventional memory.

User-Defined protocol

A custom communications protocol that can be modified to meet specific host requirements. For example, you can configure User-Defined to act like a Point-to-Point protocol, except that it requires an LRC and an acknowledgment from the receiver. You can also define the communications characters such as SOM, POL, or SEL, or disable these characters by setting them to null.

vertical reading angle

The vertical angle of a reader’s laser scanner to a bar code label. The optimum vertical reading angle is near 20 degrees.

viewport

A method for viewing a full PC-size screen (25 x 80) with the reader’s 16 x 20 display. You will only see 16 lines and 20 characters of data at one time. Use the reader’s display as a viewport to move around and see the entire screen.

virtual display

A PC-size screen (25 x 80) accessible through the reader’s smaller display for applications that need to be PC compatible. You can see 16 rows and 20 characters of the virtual display at one time. By moving the viewport, you use the reader’s virtual display of 25 lines by 80 characters—the same size as a PC screen.

Virtual Wedge

A Reader Services feature that lets the reader decode bar codes, making the reader functionally equivalent to a wedge reader connected to a PC.

volatile

Refers to memory that is not saved when power is lost or turned off.

warm boot

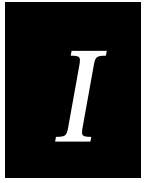
One of two ways to boot the reader; compare to cold boot. A warm boot performs the power-on self test (POST) to ensure that the hardware and peripherals are operational, runs CONFIG.SYS and AUTOEXEC.BAT, and displays the DOS prompt. The contents of both conventional memory and the physical RAM drive (drive E) remain intact. You may warm boot the reader to execute startup files, such as AUTOEXEC.BAT, that have changed. You may also warm boot to start Interlnk.

wedge reader

A bar code reader that connects to a PC. The wedge lets you scan bar code and enters the data into the PC as if it were typed at the keyboard.

XON/XOFF

A type of software flow control for communications between digital devices. It stops the host from sending data when the device buffer fills up (XOFF) and starts it again when the buffer empties (XON).



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