Intermec

Quick Reference Guide

JANUS™ 2020 Communications Dock

Federal Communications Commission Radio Frequency Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interferences that may cause undesired operation.

This equipment is intended for operation in a commercial environment, in compliance with the requirements for a Class A digital device, pursuant to Part 15 of the FCC Rules, and it must not be used in a residential environment; however, it has also been tested and found to comply with the more stringent requirements for a Class B device, pursuant to Part 15 of the FCC Rules. It generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions manual, it may cause interference to radio communications. If this equipment causes harmful interference, the user will be required to correct the interference at their own expense.

Note: In order to maintain compliance with FCC Rules, the I/O cables that interconnect between the device and any peripheral must be specified by Intermec.

Caution: Changes or modifications not expressly approved by Intermec could void the user's authority to operate this equipment.

Industry Canada Compliance

This digital apparatus does not exceed the Class B limits for radio emissions from digital apparatuses as set out in the radio interference regulations of Industry Canada.

Cet appareil numérique n'émet pas de bruits radioéléctriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioéléctrique édicté par Industrie Canada.

European Union Compliance

This product complies with EN 55022, EN 50082-1, and EN 60950 as required by the EMC Directive 89/336/EEC as amended by 92/31/EEC and by the Low Voltage Directive 73/23/EEC as amended by 93/68/EEC.

Additional EMI/RFI Compliance

This device meets the Class B limit requirements of CISPR 22.

Agency Approvals

The JD2020 is UL Listed (UL 1950), CSA Certified (C22.2 #950) and TUV "GS" Licensed (EN 60950 and DIN VDE 0805) for safety when powered by an external Intermec power supply. UL, CSA, and TUV have approved Intermec power supply 058399 for use with the JD2020.

Contents

This quick reference guide describes the communications dock and explains how to install, configure, and use the dock. A reference section provides battery troubleshooting and technical information about the dock.

Introduction

The JD2020 communications dock is an accessory for the JANUS™ 2020-series readers (J2020 and JR2020). The dock allows you to:

- transmit data between a JANUS 2020 reader and a host computer.
- charge the JANUS 2020 reader battery pack while the reader is in the communications dock.
- charge a spare battery pack in the dock's battery slot.
- communicate with other devices (host computer, concentrator, modem) via RS-232C or RS-422/485 connectors.
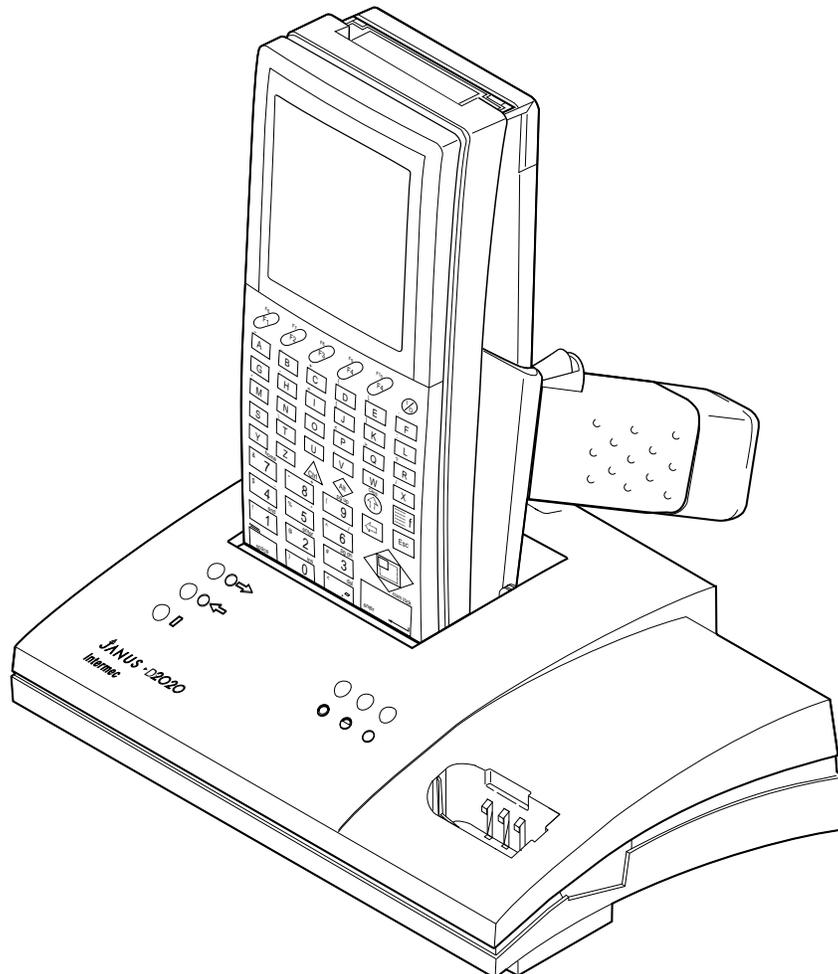
2020Q.001

Communications Dock Parts and Functions

This section explains the top and back panels of the communications dock.

Top Panel

The top panel of the communications dock has two slots:

Reader slot   You place the JANUS 2020 reader in this slot to communicate through the reader's COM1 port with the devices connected to the dock's network and auxiliary ports. The reader slot also charges the battery pack installed in the reader.

Battery slot   You use the battery slot to charge or discharge spare battery packs for the JANUS 2020 reader.

There are six LEDs that you can use to monitor the status of the reader and battery pack:
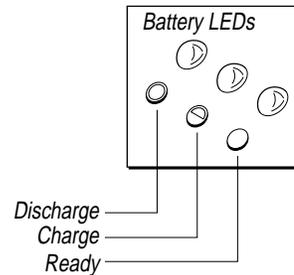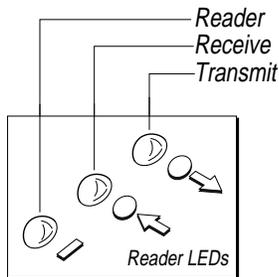
Reader LEDs	Description	Battery LEDs	Description
Reader	The reader is transmitting data	Discharge	The battery pack is discharging
Receive	The reader is receiving data.	Charge	The battery pack is charging.
Transmit	The reader is in the slot.	Readu	The battery pack is fully charged.

Back Panel

There are three connectors, one button, and a bank of DIP switches on the back panel of the dock:

Power supply connector   You use this connector to attach the external power supply cable to the communications dock. The external power supply provides 9.4 VDC for communications and battery charging.

Discharge button   You use this button to discharge a battery pack in the battery slot. You only need to discharge a battery pack that has lost its capacity to hold a charge.

DIP switches   There are four DIP switches which you set to select the cable interface and communication ports the dock will use. You can configure the dock so that the JANUS 2020 reader communicates with one or both ports.

Network connector   You can use the network connector to communicate with the JANUS 2020 reader, auxiliary port, or both. The connector supports the RS-232C DTE interface, and Intermec standard four-wire RS-422 interface or RS-485 multi-drop interface. The network interface only supports asynchronous protocols with the JANUS 2020 reader.

Auxiliary connector   You can use the auxiliary connector to communicate with the JANUS 2020 reader, network port, or both. The connector supports the RS-232C DCE interface and Intermec standard four-wire RS-422/RS-485 interface. The auxiliary interface only supports asynchronous protocols with the JANUS 2020 reader.

Communications Dock Details

Reader

Receive

Transmit

Reader Slot

Reader LEDs

Battery Slot

Battery LEDs

Discharge

Charge

Ready

Back Panel

NETWORK

AUXILIARY

Power Supply Connector

Discharge Button

DIP Switches

Network Connector

Auxiliary Connector
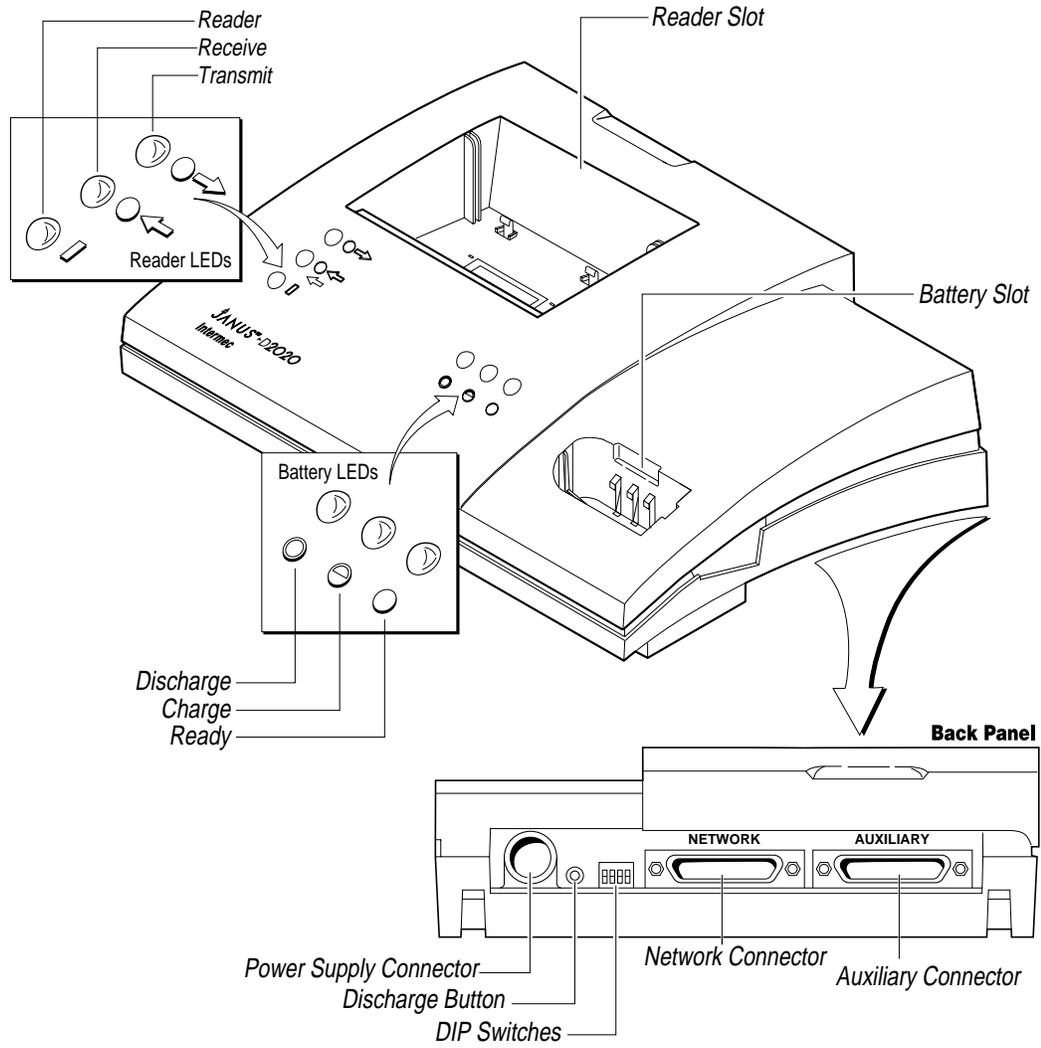
2020Q.002
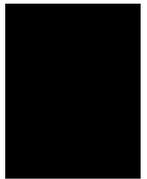
Installing the Communications Dock

1. Mount the communications dock on a desktop. (Optional.)

2. Connect the dock to a host computer, concentrator, or modem using RS-232C, RS-422, or RS-485 cables.

3. Configure the dock to select the ports (network, auxiliary, or both) on the dock that you are using to communicate with the reader.

4. Connect the power supply to the dock.

Mounting the Communications Dock

You can permanently mount the communications dock on a desktop using two 10-32 UNC 2A screws as shown. Mount the dock before you connect the cables and power supply.

Minimum height of the screw above the mounting surface is .25".
Use 10-32 UNC 2A screws.

Maximum .45"

.25" Minimum

4.00"

Side View

2020Q.003
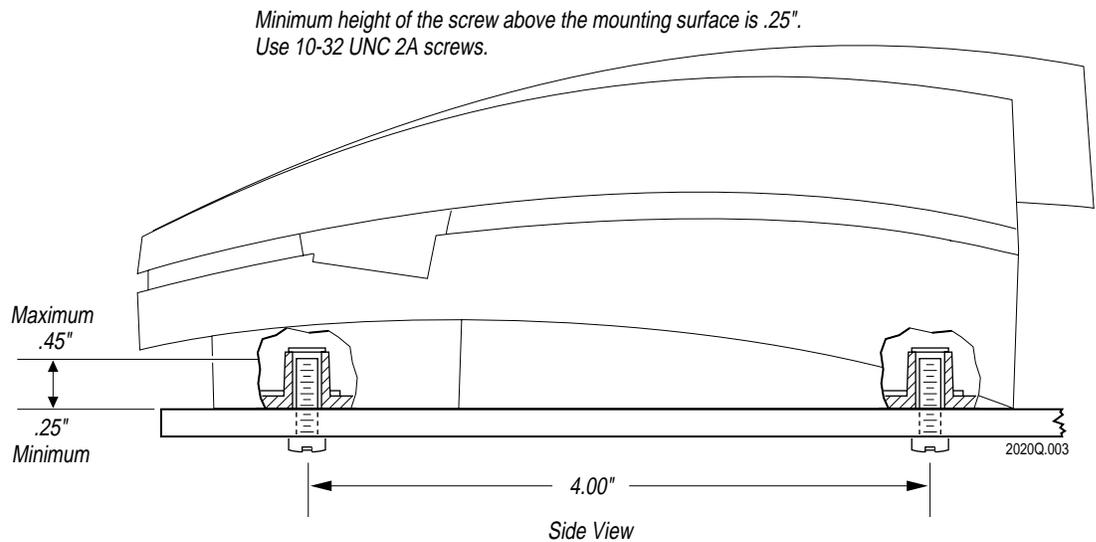
Note: If you mount the JD2020 communications dock on a table top or shelf, make sure you have enough vertical clearance to insert and remove the JANUS 2020 easily. Also remember to leave space behind the dock so that you can connect the power supply and reach the discharge button on the back panel.

Connecting the Cables

You connect the dock to a device (host computer, concentrator, or modem) using RS-232C, RS-422, or RS-485 cables. Use one of the cables listed in the following table to connect each device to the network or auxiliary port on the dock.

Device	Interface	Cable Part Number
PC (Communications port on PC is a DB25 connector)	RS-232 (25-25 pin)	048668
	RS-232 (25-25 pin)	052477
	RS-232 (25-25 pin)	052908
PC (Communications port on PC is a DB9 connector)	RS-232 (25-9 pin)	047569
	RS-232 (25-9 pin)	048693
	RS-232 (9-9 pin)	059167 (use with a 9-25 pin adapter)
9161 Port Concentrator	RS-232 (25-9 pin)	041789
	RS-422 (25-9 pin)	044926
9161 or 9154 Concentrator	RS-485 (25-9 pin)	047653
95XX Reader and Dock to Dock	RS-232 (25-25 pin)	047286
94XX TRAKKER (to the dock Network port)	RS-232 (25-10 pin)	048500
94XX TRAKKER (to the dock Auxiliary port)	RS-232 (25-10 pin)	048864
9570 Reader or Terminal (to the dock Auxiliary port)	RS-232 (25-25 pin)	043237

Note: Cable part numbers 048668 and 048693 do not work with Interlnk. Use a 3-wire RS-232 cable (such as 047569, 052477, or 052908) when working with Interlnk.

Configuring the Communications Dock

- Select the dock port(s) that you want to use, and configure the reader.
- Set the DIP switches on the dock to identify the type of cable and communications you will be using between the dock ports and the reader.

Configuring the Reader

1. Determine whether you want the JANUS 2020 reader to communicate with the dock's network port, auxiliary port, or both.
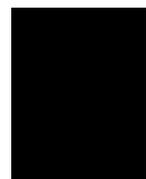
2. If the reader is going to communicate with both dock ports, you do not need to change the configuration on the reader. Move on to "Setting the DIP Switches" to configure the dock.

    If the reader is going to communicate with only one of the dock ports (network or auxiliary), you must set the SELPORT signal on the JANUS 2020 reader. This signal allows the reader to select and communicate with the correct port on the dock.

    You use the Communications Dock Port configuration parameter to set the SELPORT signal on the reader. To set the signal, scan one of the following bar codes:

Network Port

$+IP0

Auxiliary Port

$+IP1

Note: Refer to the JANUS 2020 User's Manual *for more information on the Communications Dock Port configuration parameter.*

Setting the DIP Switches

Use the "Dock Configuration Table" on the next page and follow these steps to set the DIP switches on the back panel of the dock:

1. Identify the dock port you are using: Network, Auxiliary, or Both.

2. Identify the communications you are using between the dock port(s) and the reader. The reader can communicate with the network port, auxiliary port, or both ports. The two ports on the dock can also be configured to communicate with the reader and each other.

3. Identify the type of cable interface you are using: RS-232, RS-422, or RS-485.

    Note: You can connect an RS-422 cable to one dock port and an RS-232 cable to the other dock port. In this case, you must configure the dock to use one of the RS-232 interface settings.

Example: 1011
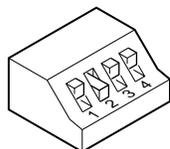
4. Find the DIP switch settings that match your dock configuration in the table. Set the DIP switches on the back panel. To set a DIP switch to 0, push the switch into the down or "off" position. To set a DIP switch to 1, push the switch into the up or "on" position.

Dock Configuration Table

			DIP Switches			
Dock Port	Port Communications	Cable Interface	1	2	3	4
Network port	Network port talks to JANUS 2020.	RS-232 or RS-422	0	0	1	0
	Network port talks to JANUS 2020.	RS-422	0	1	0	0
	Network port talks to JANUS 2020.	RS-485	0	1	0	1
Auxiliary port	Auxiliary port talks to JANUS 2020.	RS-232 or RS-422	0	0	1	0
	Auxiliary port talks to JANUS 2020.	RS-422	0	1	0	0
	Auxiliary port talks to JANUS 2020.	RS-485	0	1	0	1
Both ports	Network port talks to JANUS 2020 and auxiliary port.	RS-232 or RS-422	0	1	1	0
	Network port talks to JANUS 2020 and auxiliary port.	RS-422	1	0	0	0
	Network port talks to JANUS 2020.	RS-422	1	0	1	0
	Network port talks to JANUS 2020.	RS-485	1	0	X	1
	Both ports talk to the reader and each other.	RS-232 or RS-422	1	1	0	0
	Both ports talk to the reader and each other.	RS-422	1	1	1	0
	Both ports talk to the reader, but not each other.	RS-485	1	1	1	1

Note: X means the DIP switch can be set to 0 or 1

Connecting the Power Supply

The communications dock uses the Intermec Part No. 058399 power supply, which has a detachable power cord. The power supply operating range is 100 to 240 VAC at 47 to 63 Hz. To connect the external power supply, attach it to the power supply connector on the back panel of the dock and plug the power supply into an AC outlet.
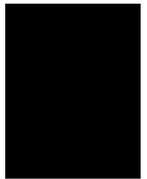
Operating the Communications Dock

Once the communications dock is installed and configured, you can use the dock to do the following:

- Communicate with the JANUS 2020 reader and other devices connected to the dock.

- Charge the JANUS 2020 reader battery packs.

- Discharge a spare battery pack.

In this section, three LED icons that represent the state of each battery LED may appear next to the step.

Discharge   **Charge**   **Ready**

off   flashing   on

Communicating with the JANUS 2020 Reader

To communicate with the reader and any other devices connected to the dock:

1. Insert the JANUS 2020 reader into the reader slot on the dock.

2. Turn the reader on. The Reader LED lights on the dock. If the Reader LED is not on, make sure the power supply is connected to the dock and plugged into an AC outlet.

3. Start your program on the reader or host computer. Data can begin transmitting between the reader and the devices connected to the dock ports.

   The Receive LED lights when the reader is receiving data. The Transmit LED lights when the reader is transmitting data.

If you cannot communicate with the reader, check the ports you are using on the dock and make sure the dock is configured correctly to match your installation. See "Configuring the Communications Dock" earlier in this section for more information.

Charging Batteries

There are two ways to charge the JANUS 2020 reader battery packs:

- Charge the battery pack using the battery slot in the dock.

- Charge the battery pack that is installed in the reader while the reader is in the dock.

Charging a Battery Pack in the Battery Slot

You can operate the JANUS 2020 reader and charge a spare battery pack in the dock at the same time. It is a good idea to have a spare, fully charged battery pack for the JANUS 2020 reader so that you can continue operating the reader without interruption. Use the dock's battery slot to charge only JANUS 2020 battery packs. Do not attempt to charge other types of battery packs in the dock.

To charge a battery pack

1. Insert the battery pack into the battery slot on the dock.

Power Supply

Battery Pack

2020Q.004
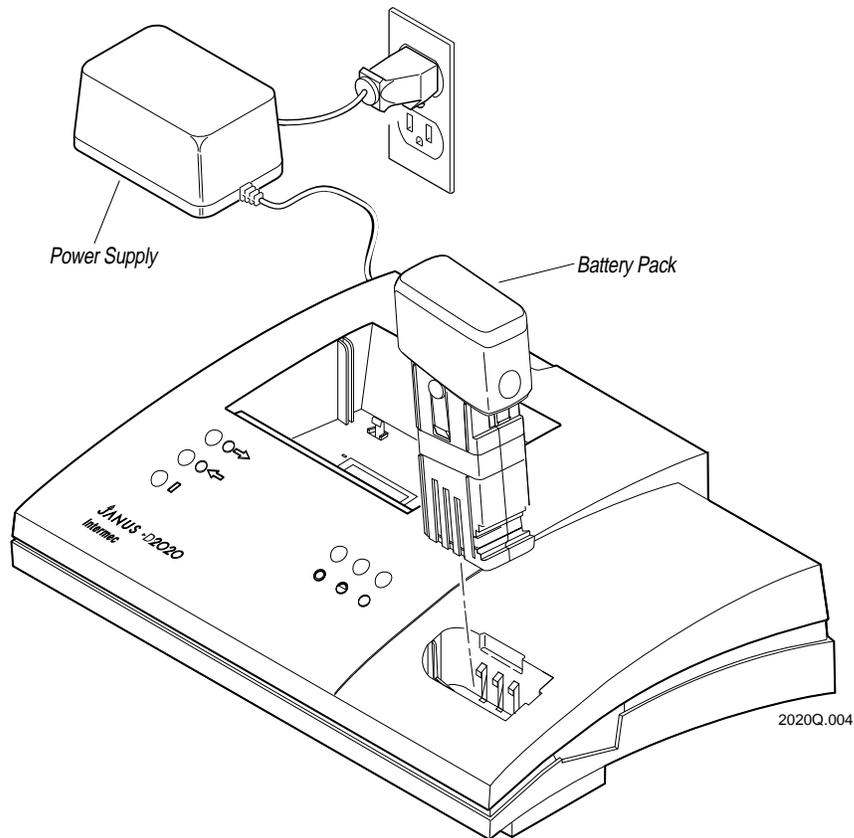
2. If you are charging a battery pack for the first time, the Charge LED flashes to indicate that the dock is precharging the battery. Once a battery pack has been precharged or if you have charged the battery pack before, the Discharge and Charge LEDs start flashing.

    If none of the battery LEDs flash, the battery pack is not fully inserted in the slot. Push the battery pack all the way into the slot.

Note: If you see any other combination of LED lights, there may be a problem with the battery pack. Refer to the "Battery Status Lights" section later in this quick reference guide to determine the problem.

3. The dock begins charging the battery pack. The battery pack is completely charged within 2.5 hours.

4. When the battery pack has been fully charged, the Charge LED flashes and the Ready LED is lit to indicate the dock has finished charging the battery pack. You can remove the battery pack from the slot.

   If you leave the battery pack in the slot, the charge current to the battery pack is reduced to maintain the full charge, but will not overcharge the battery pack.

If you lose power to the communications dock, the reader resumes where it left off and the battery pack continues charging or maintains its full charge when the power is returned.

Note: The optimum battery temperature to begin charging battery packs is 68°F (20°C). Battery packs charged at 68°F (20°C) have a higher charge capacity and hold more charging cycles than battery packs charged at a higher temperature.

Charging Batteries in the Reader
You are charging the battery pack installed in the reader whenever the reader is in the communications dock.

To charge the battery pack

1. Place the reader in the reader slot. The reader can be on or off.

2. The reader's battery pack is charged within 15 hours if the reader is off, and within 45 hours if the reader is on.

If you lose power to the communications dock, the reader resumes where it left off and the battery pack continues charging or maintains its full charge when the power is returned.

Note: Although the reader's battery pack is gradually charged while the reader is in the communications dock, the most effective way to charge the battery pack is to use the battery slot.

Discharging Battery Packs

The most effective way to charge a battery pack is to use the battery slot. The charging method used in the dock battery slot is designed to maximize battery life and prevent the loss of battery capacity due to the memory effect associated with NiCad batteries.

Usually it is not necessary to discharge a battery pack before charging it. If the battery pack is unable to hold a full charge, you can use the communications dock to discharge the battery pack, before charging it.

The discharge button on the charger activates the "discharge" cycle only if the battery slot is empty. If there is a battery pack in the battery slot when the button is pressed, it continues charging or discharging.

To discharge a battery pack

1. Press the discharge button on the back panel of the communications dock before inserting the battery pack. The Discharge LED lights.

   Once the Discharge LED turns on, you have 15 seconds to insert a battery pack. If the Discharge LED goes out before you insert the battery pack, press the discharge button again.

Discharge Button

2020Q.009
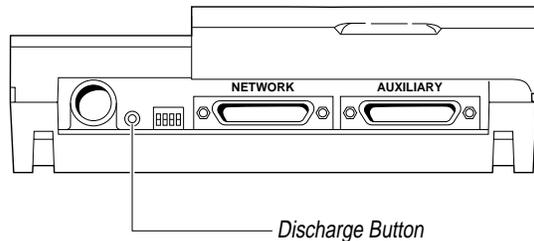
2. Insert the battery pack into the battery slot on the dock. The Discharge LED flashes and the communications dock begins discharging the battery. Allow several hours to completely discharge the battery pack.

   Once the battery pack is discharged, the Discharge and Charge LEDs start flashing and the dock begins charging the battery pack.

If you lose power to the communications dock, the battery pack will begin charging when the power is returned. If the battery was not completely discharged when the power was lost, remove the battery pack from the slot and repeat the steps above to discharge the battery.

Reference

This section provides reference material on these topics:

- Operating environment information
- How to daisy chain two or more communications docks
- Battery status lights
- Battery troubleshooting
- Pin assignments for the dock connectors

Operating Environment

Temperature

Battery Charging	50°F to 104°F (10°C to 40°C)
Reader Operating	-4°F to 122°F (-20°C to 50°C)
Storage without a battery pack	-4°F to 140°F (-20°C to 60°C)
Storage with a battery pack	-4°F to 95°F (-20°C to 35°C)

Note: The reader operating temperature range applies when the reader is operating in the communications dock.

Humidity
Non-condensing humidity:

Operating	10% to 90% relative humidity
Storage	10% to 90% relative humidity

How to Daisy Chain the Communications Docks

You can connect two or more communications docks together in a daisy chain, then connect the string of docks to a single serial port on a host computer. You can use the daisy chain to download a program to each JANUS 2020 reader in its dock. Only one RS-232 or RS-422 device (either the host computer or one JANUS 2020 reader) can transmit at a time.

To daisy chain the docks

1. Connect a cable from the network port on one dock to the auxiliary port on the next dock.

2. Repeat Step 1 to include each additional dock in the chain.

3. Connect the last dock at either end of the chain to the host computer or another device. The dock you choose depends upon which port you are using (network or auxiliary) to connect to the host computer or device.

Cables for Daisy Chaining

If you are using an RS-232 interface to the host computer, use straight-through cables to connect the docks in the chain.

If you are using an RS-422 interface, use a 5-pin cable with pins 7, 13, 14, 16, 19 straight-through to connect the docks in the chain.

Battery Status Lights

The battery LEDs allow you to monitor the status of the battery pack that is inserted in the battery slot. The next table shows the possible lighting combinations that you may see and the status each indicates.

Discharge	Charge	Ready	Indicates
off	off	off	The dock or charger is waiting for a battery, or there is no power to the dock or charger.
off	flashing	off	The battery is about to begin charging.
flashing	flashing	off	The battery is charging.
off	flashing	on	The battery is charged and ready.
on	off	off	The discharge button has been pushed and the slot is waiting for a battery to discharge.
flashing	off	off	The battery is discharging.
off	off	flashing	The battery did not charge in the allotted time. The battery may be damaged.
flashing	off	flashing	The battery has poor contact with the battery slot contacts or the battery may be damaged. (Discharge and Ready LEDs flash alternately)
flashing	flashing	flashing	A battery has been inserted that is not supported by the dock or charger. (all three LEDs flash in order)
flashing	flashing	flashing	The battery temperature is out of range. (Discharge and Ready LEDs flash alternately with Charge LED)
flashing	flashing	flashing	A battery has been inserted that may be damaged. (all three LEDs flash together)

● = off   ◯ = on   ☀ = flashing   2020Q.006

Note: When an LED flashes, it is either a solid, intermittently flashing light, or a dim, rapidly flashing light.

Battery Troubleshooting

| Battery LEDs	Problem	Solution
Discharge and Ready LEDs flash alternately with Charge LED.	The battery pack must always be between 50°F and 104°F (10°C and 40°C) to begin charging. If the battery pack temperature is outside this range, the dock stops charging the battery pack.	Remove the battery pack from the slot and make sure the battery pack is within the temperature range before you try to charge it again. To prevent temperature problems, keep the communications dock in a room that is within the temperature range and let the battery packs cool down before charging them.
Discharge and Ready LEDs flash alternately.	There is bad contact between the battery pack and the dock battery slot, or the battery is damaged.	Take the battery pack out of the slot and disconnect the power supply to the dock. Use rubbing alcohol and cotton swabs to clean the contact points on the battery pack and in the dock battery slot. Connect the power supply to the dock and repeat the procedure to charge or discharge the battery pack. If that does not fix the problem, your battery pack may be damaged.
All three LEDs flash at the same time.	The dock cannot raise the battery voltage to an adequate level. All three battery LEDs continue to flash at the same time until the battery pack is removed.	There may be something wrong with the battery pack. Remove the battery pack and then put the same battery back into the slot. If all three LEDs flash again, you have a bad battery pack that needs to be replaced.
The Ready LED flashes.	The dock cannot fully charge the battery pack within 2.5 hours.	There may be something wrong with the battery pack. Remove the battery pack and try discharging and then charging the battery pack. If the Ready LED flashes again, you have a bad battery pack that needs to be replaced.
All three LEDs flash in order.	You inserted a battery pack that is not supported by the communications dock.	Remove the battery pack from the slot. Insert a J2020 battery pack. You can only charge J2020 battery packs in the dock.

Pin Assignments for the Dock Connectors

The two ports on the communications dock use 25-pin D-style connectors. The following pinouts are used for the Network and Auxiliary connectors. The network connector is a DTE interface and the auxiliary connector is a DCE interface.

Network Connector

(14) Output Circuit A (out)
(15) Transmitter clock (in)
(16) Input Circuit A (in)
(17) Receiver clock (in)
(19) Output Circuit B (out)
(20) Data terminal ready (out)
(22) Ring indicator (in)

(1) Protective ground
(2) Transmitted data (out)
(3) Received data (in)
(4) Request to send (out)
(5) Clear to send (in)
(6) Data set ready (in)
(7) Signal ground
(8) Received line signal detector (in)
(11) Reserved
(13) Input Circuit B (in)

2020Q.007

Auxiliary Connector

(14) Input Circuit A (in)
(15) Transmitter clock (out)
(16) Output Circuit A (out)
(17) Receiver clock (out)
(19) Input Circuit B (in)
(20) Data terminal ready (in)
(22) Ring indicator (out)

(1) Protective ground
(2) Transmitted data (in)
(3) Received data (out)
(4) Request to send (in)
(5) Clear to send (out)
(6) Data set ready (out)
(7) Signal ground
(8) Received line signal detector (out)
(11) Reserved
(13) Input Circuit B (out)

2020Q.008

Note: *You place the JANUS 2020 reader in the dock to communicate with the devices that are connected to the dock ports. When you turn the reader on and place it in the reader slot, the DTR/DSR signals on the selected dock ports are set high to indicate to the host computer that the reader is in the dock. If you remove the reader from the slot while a device is communicating with the reader, the DTR/DSR signals on the dock ports go low to indicate to the host computer that the reader has been removed. The DTR/DSR signals on the dock ports are also set high when the dock ports are configured to talk to each other, and devices are connected and active on the ports.*