# PDT 1100 Terminal

## Product Reference Guide

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**70-35864-03**
**Revision A — December 2002**

Symbol Technologies, Inc. One Symbol Plaza, Holtsville N.Y. 11742-1300

# *PDT 1100 Terminal*
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*Revision A*
*December 2002*

symbol®

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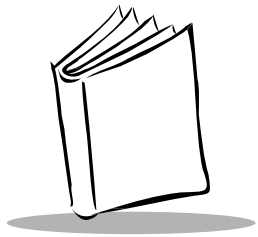

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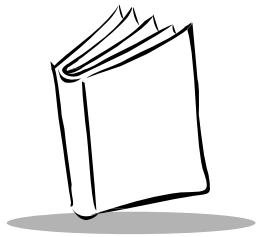

# *About This Guide*

The *PDT 1100 Product Reference Guide* provides instructions for setting up, initializing, operating, and maintaining the PDT 1100 Terminal, the CRD 1100 communications cradles, and the CRG 1100 4-slot battery charger.

## Chapter Descriptions

The following topics are included in this guide:

- Chapter 1, *Getting Started* describes the terminal and its initial setup.
- Chapter 2, *Operating the Terminal* describes basic use of the terminal.
- Chapter 3, *System Configuration* describes the system configuration software and its operation.
- Chapter 4, *System Mode* describes how to operate the terminal in system mode.
- Chapter 5, *Battery Charging and Terminal Maintenance* includes instructions for the CRD 1100 cradle and the CRG 1100 4-slot battery charger.
- Appendix A, *Specifications* provides information on specifications for the terminal, cradle, and 4-slot battery charger.
- Appendix B, *Sample Application* describes a basic scanning operation to help you get a feel for the terminal.
- Appendix C, *Alphabet Input Procedure* describes the use of the keypad for alphabetic input.
- *Appendix D, Error Messages* describes system errors and errors that occur when in system mode.

# Notational Conventions

The following conventions are used in this document:

- t Italics are used to highlight specific items in the general text, and to identify chapters and sections in this and related documents.
- t Bullets (•) indicate:
  - s action items
  - s lists of alternatives
  - s lists of required steps that are not necessarily sequential
- t Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

# Related Publications

- *PDT 1100 Quick Reference Guide*
  (p/n 70-35861-xx)
- *CRD 1100 Quick Reference Guide*
  (p/n 70-35862-xx)
- *CRG 1100 4-Slot Battery Charger Quick Reference Guide*
  (p/n 70-35863-xx)
- *PDT 1100 Terminal Programmer's Guide*
  (p/n 70-36099-xx)
- *PDT 1100 Basic Extension Library*
  (p/n 70-36100-xx)
- *PDT 1100 Transfer Utility Guide*
  (p/n 70-36368-xx)
- *PDT 1100 DLL Guide*
  (p/n 70-36556-xx)

# Service Information

If you have a problem with your equipment, contact the *Symbol Support Center* for your region. See page ix for contact information. Before calling, have the model number, serial number, and several of your bar code symbols at hand.

Call the Support Center from a phone near the scanning equipment so that the service person can try to talk you through your problem. If the equipment is found to be working properly and the problem is symbol readability, the Support Center will request samples of your bar codes for analysis at our plant.

If your problem cannot be solved over the phone, you may need to return your equipment for servicing. If that is necessary, you will be given specific directions.

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**Note:** *Symbol Technologies is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty. If the original shipping container was not kept, contact Symbol to have another sent to you.*

---

## *Symbol Support Center*

For service information, warranty information or technical assistance contact or call the Symbol Support Center in

**United States** [1]
Symbol Technologies, Inc.
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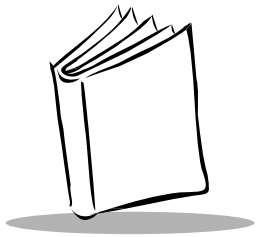
For the latest version of this guide go to:http://www.symbol.com/manuals.



# *Chapter 1*
# *Getting Started*

## Introduction

The PDT 1100 is a lightweight, battery-powered, hand-held laser bar code scanning terminal. The terminal is available in memory configurations of 2 MB and 512 K. The terminal can communicate in the following ways:

- infrared communications directly to a host computer with an IR port
- through the optional cradle
- by serial cable connected to a host computer.

This chapter helps you get started with your PDT 1100.

# Parts of the PDT 1100

Parts of the PDT 1100 terminal are illustrated in Figure 1.1. Refer to Table 1-1 and Table 1-2 for a description of these parts.

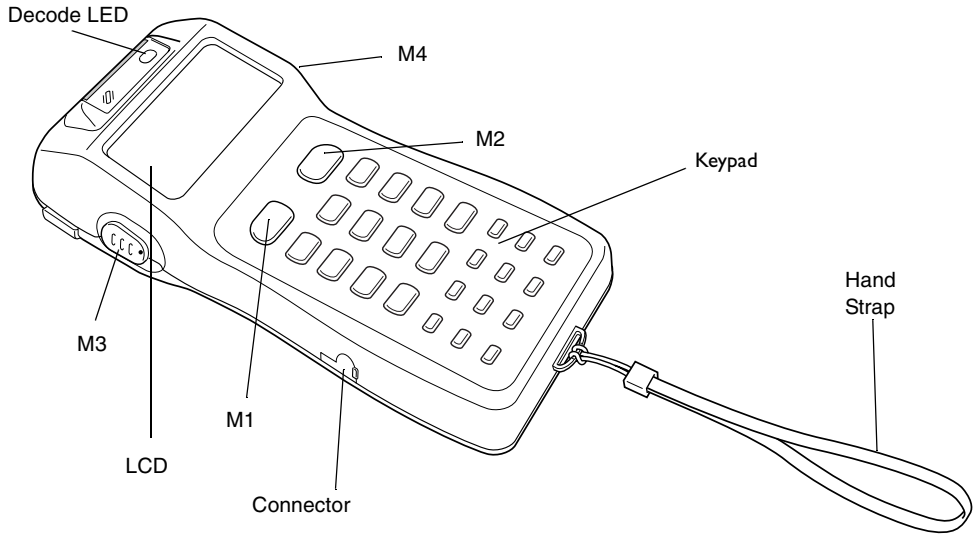



**Figure 1-1. Parts of the PDT 1100 Terminal**

**Table 1-1. Main Parts of the PDT 1100**

| Name | Description |
|---|---|
| Decode LED | Illuminates green when the bar code is successfully read. |
| Keypad and M keys | For entering data and for assigning trigger function. See Table 1-2 for more information. |
| Connector cover | Covers the direct-connect interface port. |
| Liquid Crystal Display (LCD) | Displays characters and graphics. |
| Hand strap | Secures the terminal to your hand (optional). |
| Battery cover | Covers the battery compartment. |
| Battery cover lock | Secures the battery cover. |
| Clip (optional) | Fastens the PDT 1100 to your pocket. |
| Scanner window | Emits the laser to decode bar codes. |
| IR port | Allows exchange of data and programs with the host computer. |

# Keypad

The keypad includes numeric keys, function keys, and M keys.

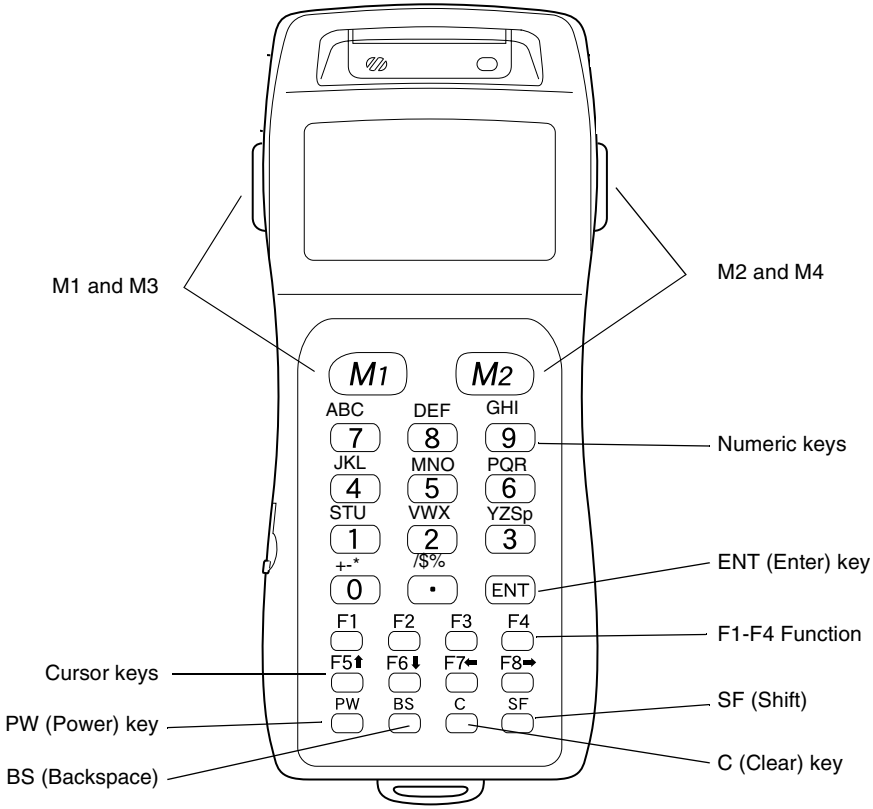



**Figure 1-2. Key Descriptions**

## *Functions of the PDT 1100 Keys*

The functions of the keys are programmable. Table 1-2 describes a set of sample functions.

**Table 1-2. Sample of Key Functions**

| Name | Function |
|---|---|
| M1, M2, M3, M4 | Activates the scanner by default. They may also be programmed as the ENT (Enter) key, SF (Shift) key, and Backlight On/Off key, and can be assigned string data in user programs. |
| F5-F8 Cursor Keys | Moves up or down lines, or moves character by character. |
| PW (Power) Key | Powers the unit on and off. |
| BS (Backspace) Key | Moves the cursor back one character. |
| Numeric Keys | Used for numeric input. |
| SF (Shift) Key | Used in combination with numeric keys for special functions. |
| C (Clear) Key | Clears the last entered data and returns to the original screen. |

# Batteries

The PDT 1100 uses alkaline batteries or an optional NiMH battery pack. The following sections provide information on installing the batteries, battery voltage indication, and battery replacement tips.

**Note:** *For best battery performance at low temperatures (at or below 0°C or 32°F) we recommend using the optional rechargeable NiMH battery pack.*

## *Installing Alkaline Batteries*

To install alkaline batteries:

1. Turn the PDT 1100 upside down. Slide the cover lock in the direction of the arrow and remove the battery cover.

2. Insert the two new AAA alkaline batteries using the proper polarity.

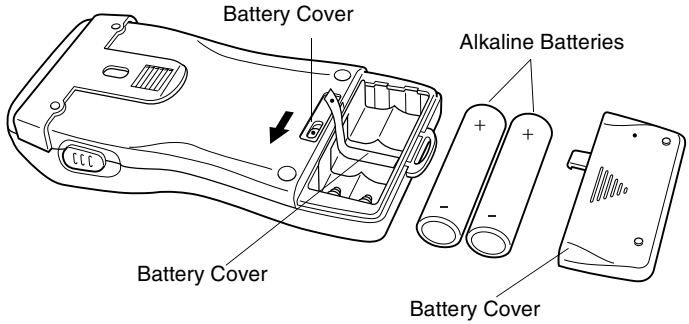



**Figure 1-3. Installing AAA Batteries**

3. Replace the battery cover, being careful not to pinch the battery pull strap between its cover and the bottom cover. Return the battery cover lock to its original position.

## *Installing an NiMH Battery Pack*

To install the NiMH battery pack:

1. Charge the NiMH battery pack (refer to instructions in Chapter 5, *Battery Charging and Terminal Maintenance*). Turn the PDT 1100 upside down. Slide the cover lock in the direction of the arrow and remove the battery cover.
2. Install the battery pack with the proper polarity so that the end of the battery pull strap appears above the battery pack. This facilitates easy removal of the pack. Grooves on the battery pack must align with the slot.
3. Replace the battery cover, being careful not to pinch the battery pull strap between its cover and the bottom cover. Return the battery cover lock to its original position.

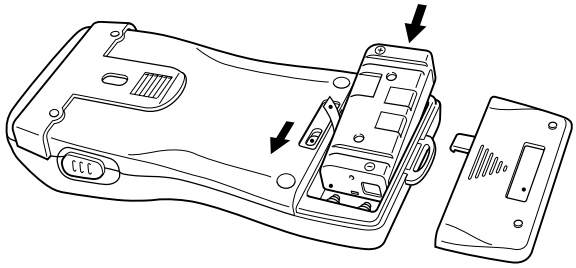


**Figure 1-4. Installing the Battery Pack**

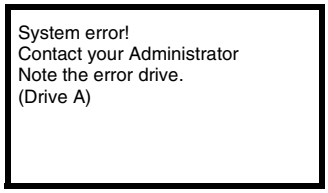
**Note:** *The NiMH battery pack is sold either in a set with its cover or by itself. Purchase the set with the cover if this is the first time the battery is being used.*

## *Charging the EDL Cap*

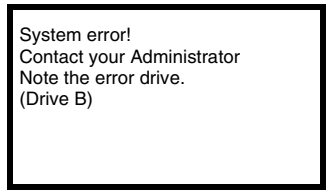
The Electric Double Layer (EDL) cap is an internal “battery” that provides backup power to maintain data when the batteries are out of the terminal. Charge the terminal for a minimum of two hours when powering up for the first time, or when the batteries are out of the terminal for a few minutes or more. There is insufficient backup power to maintain data if this is not done. There is no indication on the terminal or the cradle when the EDL cap is charging.

# Initializing the PDT 1100

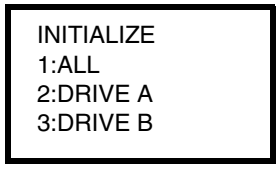
Power on the PDT 1100 by pressing the PW key. If this is the first time the terminal is powered on, or if it’s being powered on after a complete discharge, one of the following messages appears:




OR




1. Press the PW key while holding down the SF, M1 and 0 keys together to select the memory area to be initialized. The following screen appears:




- Press 1 then ENT to initialize both the flash ROM (except for its system area) and RAM. Select this when you first power on the terminal from the time of purchase.
- Press 2 then ENT to initialize RAM only.
- Press 3 then ENT to initialize the flash ROM (except for its system area).

2. The confirmation screen displays. Check the selected memory area on the second line.

```
INITIALIZE
(ALL)
OK?
1:Yes 2:No
```

   - Press 1 then ENT to shift to the message version selection screen before executing initialization.
   - Press 2 then ENT to cancel initialization and turn off the power.

3. The screen indicates that the PDT 1100 is initializing. When initialization is complete, the PDT 1100 displays a completion message then turns itself off.

---

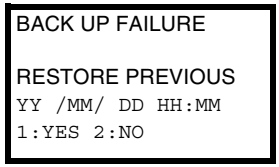
**Note:** *Powering off the PDT 1100 before the initialization completion screen appears interrupts initialization, requiring you to repeat initialization.*
*If the message "System error! Contact your administrator. Note the error drive. (DRIVE X)" appears after initialization, initialize the PDT 1100 again. If you initialize the PDT 1100 after downloading user programs and data, all programs and data stored in the target memory area are lost. Download them again if necessary. Initialization restores the LCD contrast level, communications conditions and other settings to the default values, so modify them if necessary.*

---

To repower the terminal and display the System Menu, hold down the SF key and 1 key, and press the PW key. Refer to Chapter 4, *System Mode* to continue.

### *Backup Failure*

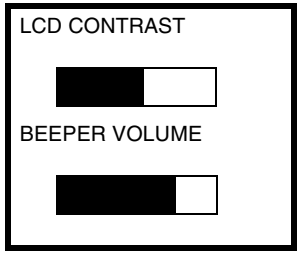
A backup failure occurs when the terminal was powered off before the data restoring process completes. The data after the current date displayed on the screen (YY/MM/DD HH:MM) is not backed up. The following screen appears:




Press the 1 key to go back to the data of the date displayed on the screen. If you press the 2 key, the terminal powers off. If you do not know which key to press, contact your system administrator.

## Adjusting Beeper and LCD Settings

With the power off, hold down the M1 key and press the PW key. The following screen displays for five seconds or until you press the ENT key.




### *Adjusting the LCD Contrast*

You can adjust the LCD brightness to eight contrast levels.

1. Use the F5 and F6 keys to select the LCD CONTRAST indicator.
2. To decrease the contrast, press the F7 key; to increase it, press the F8 key.

Press the ENT key or press no key for five seconds to enter your setting.

## Adjusting the Beeper Volume

You can adjust the beeper volume to four levels from OFF to MAX. With the power off, hold down the M1 key and press the PW key.

1. Use the F5 and F6 keys to select the BEEPER VOLUME indicator.
2. To lower the volume, press the F7 key; to raise the volume, press the F8 key.

Press the ENT key or press no key for five seconds to enter your setting.

## Beeper and Vibration Modes

The PDT 1100 has three ways to indicate that a bar code is scanned successfully:

- decode LED
- beeper
- vibration.

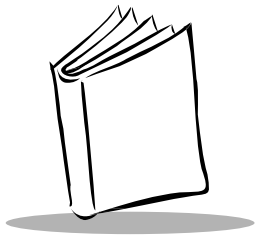
The confirmation LED and beeper are enabled by default. Beeper and vibration modes can be used simultaneously.

## Setting the Beeper/Vibration Mode

You can set the terminal to beep, vibrate, or do both upon a successful scan.

1. Press M1 and PWR to display the Beeper/Vibration mode screen.
2. Use F5 or F6 keys to select the Switching Beeper Volume indicator.
3. Press the F7 key twice to select Beeper mode.
4. Press the F8 key twice to select Vibration mode.
5. Press the F8 key once to select both Beeper and Vibration.

Press the ENT key or press no key for five seconds to enter your setting.



# *Chapter 2*
# *Operating the Terminal*

## Introduction

This chapter describes the PDT 1100 system preparation and initialization.

## Powering On the Terminal

The PW (Power) button is located in the lower left corner of the keypad. To power on the terminal, hold down the SF key, the 1 key, and press PW. If the terminal is being powered on for the first time, or is being powered on after a complete discharge, initialize the terminal. Refer to *Initializing the PDT 1100* on page 1-7.

## Using the Keypad

The keypad has standard numeric keys, as well as several keys that can be assigned special functions. Following are some tasks that can be performed using the keypad. For more information on the keypad, refer to Figure 1-2 on page 1-4.

### *Entering Numeric Data*

To enter numeric data, e.g., the quantity of goods, use the ten numeric keys and the ENT (enter) key.

If you enter a wrong value, press the C key to clear, or BS (Backspace) to delete the last character and enter the correct data.

## *Selecting Tasks*

If the LCD shows the selection (xxx) prefaced by a number (i.e., 1:xxx, 2:xxx), use the numeric keys to select the desired item and press the ENT key.

If a YES/NO screen (e.g., 1:Yes, 2:NO) appears, respond by pressing 1 for yes, 2 for no.

## *Entering Alphabetic Characters*

You may enter letters, characters and spaces from the keypad during execution of a user program. Refer to Appendix C, *Alphabet Input Procedure* for more information.

# Setting the Backlight

Hold down the SF (shift) key and press the M1 key to turn the backlight function on or off.

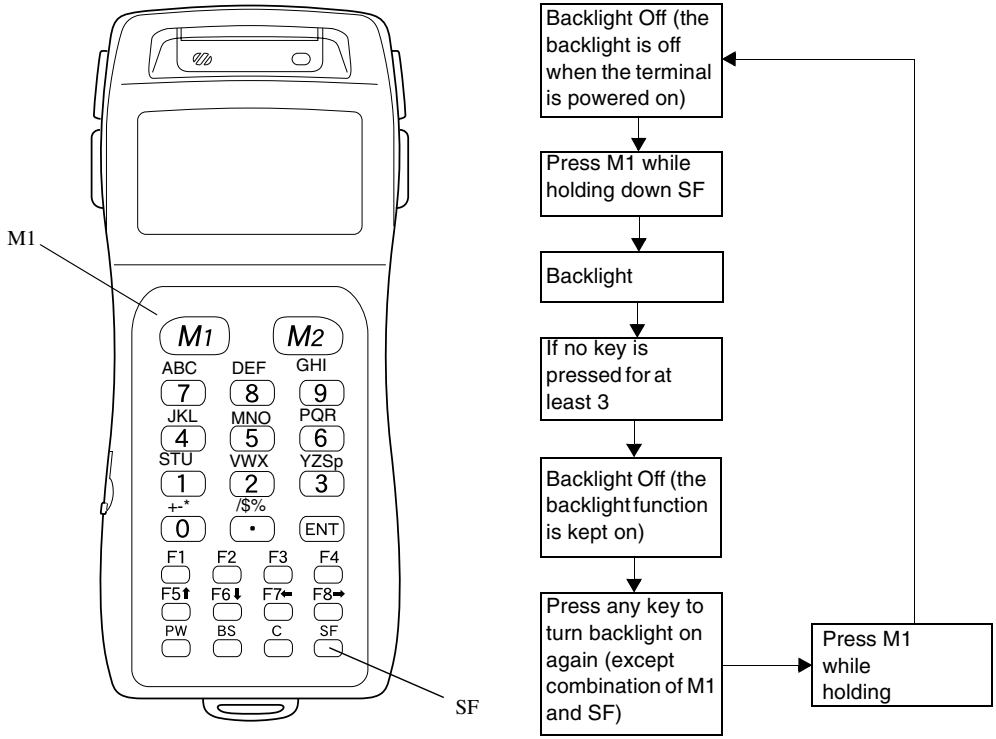


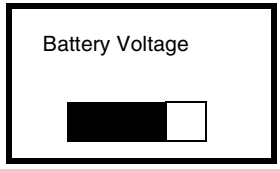

**Figure 2-1. Setting the Backlight**

**Note:** *M1 and SF are the default backlight function keys. You may use an application program to assign the backlight function to different keys, and to set the automatic shut-off time.*

# Checking the Battery Voltage Level

To check the battery voltage:

1. Hold down the SF key and press the ENT key. The battery voltage is displayed as a bar in the LED window.




2. Release the keys to erase the indication.

You can reprogram a different key to display the battery voltage level (instead of SF and ENT). The battery level shows the terminal voltage of the battery, not how much power is left. The voltage level may vary 1 to 2 levels depending upon the operation of the PDT 1100. Refer to Chapter 5, *Battery Charging and Terminal Maintenance* for information on charging batteries.

# Scanning Bar Codes

To scan bar codes, power on the terminal, aim the scanning window at the bar code, and press the `M1, M2, M3` or `M4` key. The LED illuminates green to indicate a successful decode and the terminal may beep.

- The scan beam must cross every bar and space on the symbol (as in the left bar code in Figure 2-2).
- If the PDT 1100 fails to read, change the angle by tilting the terminal up or down slightly, or change the distance of the terminal from the bar code. Hold the terminal farther for large symbols, and closer for symbols with bars that are close together.
- Position the terminal so that the target bar code comes within 22 inches (56 cm) from the scanning window. Refer to Figure 2-2.
- The scanning technique may differ depending upon the application used.

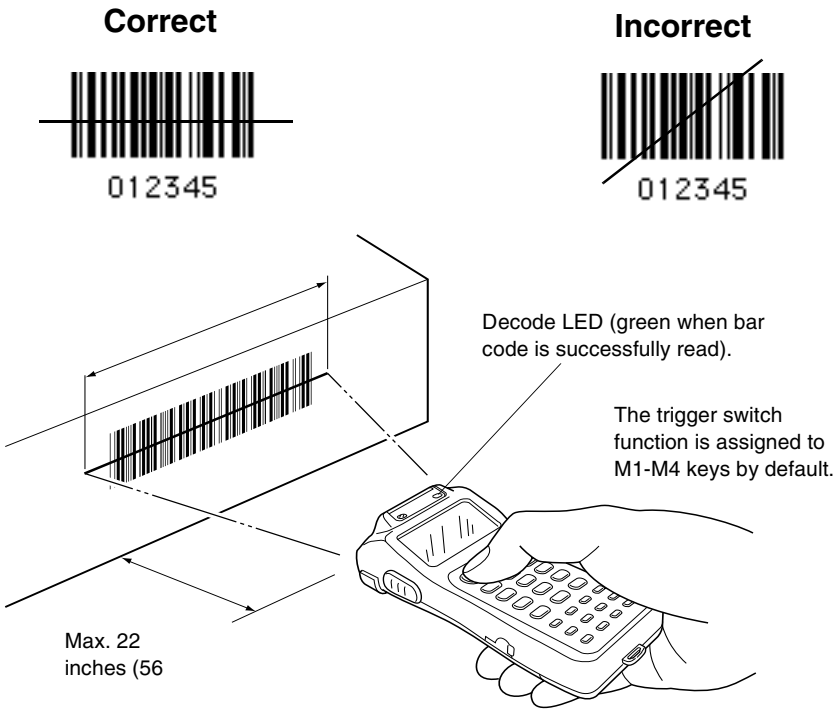



**Figure 2-2. Scanning a Bar Code**

# Communications

The PDT 1100 transmits data via the:

- cradle (the optional CRD 1100)
- optical interface using an infrared light beam
- directly through a cable to a host computer.

## *Using the CRD 1100 Cradle*

For optical communications, align the IR ports on the PDT 1100 and the CRD 1100 between 3-30 inches (10-80 cm), or place the PDT 1100 in the cradle.

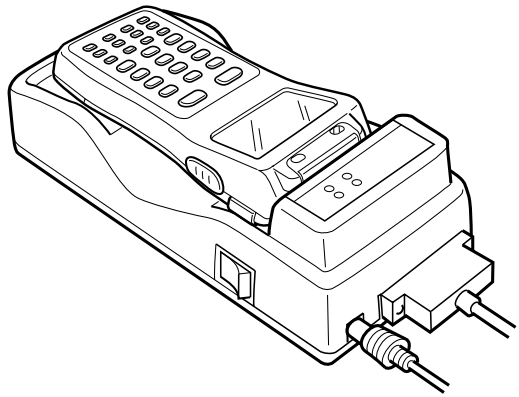


**Figure 2-3. Cradle Communications**

### Setting the Transmission Speed

Using the DIP switches on the bottom of the cradle, set the transmission speed of the CRD 1100 to the same value as that of the PDT 1100 and the host computer.

1. Turn the cradle upside down.
2. Remove the protective sheet from the CRD 1100.
3. Set the selectors of the DIP switches as shown in Figure 2-4.
4. Reinstall the protective sheet.

---

**Note:** *Do not set the DIP switches to any configuration other than one of these five.*

---

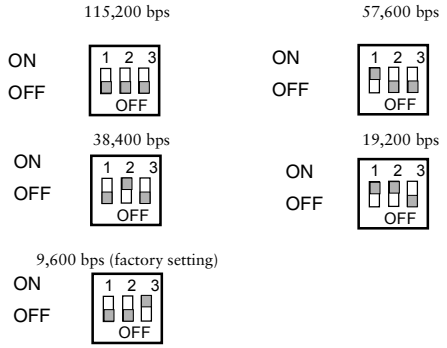



**Figure 2-4. Dip Switch Settings**

## Connecting the Interface Cable

To connect the CRD 1100 cradle to the host computer using the serial interface cable:

1. Power off both the cradle and the host computer.
2. Connect the 25-pin plug of the interface cable to the RS-232C interface port of the cradle.
3. Connect the other end of the interface cable to the host computer.

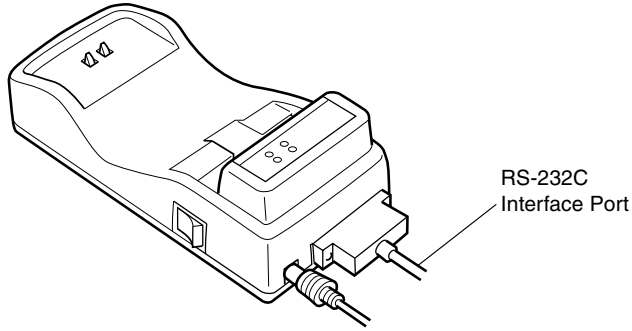



**Figure 2-5. Interface Cable Connection**

## Interfacing with the Host Computer

To transfer data between the terminal and the host computer:

1. Power on the host computer and start MS-DOS.
2. Power on the CRD 1100.
3. Turn off the PDT 1100, and place it in the cradle.

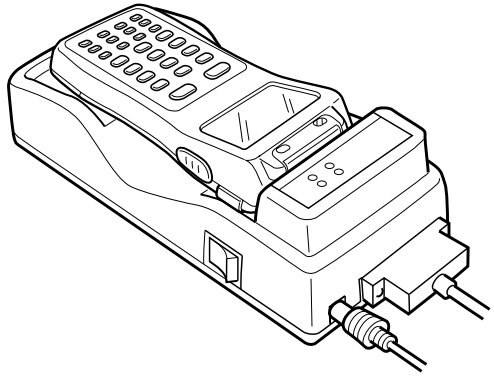


**Figure 2-6. PDT 1100 Inserted in Cradle**

4. Power on the PDT 1100 and run System Mode. Set the communications environments (communications protocol, interface port, communications parameters, and protocol options).
   - When using the IR-Transfer Utility C/IR-Transfer Utility E on the host computer, select the IR communications protocol.
   - Select the optical interface port.
5. Initiate a communications program (IR-Transfer Utility C/IR-Transfer Utility E/ Transfer Utility or equivalent) on the host computer.
6. To transfer data stored in the PDT 1100 to the host computer, select 3:UPLOAD on the System Menu in System Mode on the terminal. To transfer data from the host computer to the terminal, select 2: DOWNLOAD. The terminal and the host computer start communications with each other via the cradle. The Data LED illuminates at the start of communications, and goes off when data transmission is complete.

## *Using the Optical Interface*

The PDT 1100 communicates with other IR communication devices by aligning the IR ports. Ensure there is nothing obstructing the line of sight between the terminal and target and keep the terminal and target within 10-80 centimeters or 4-30 inches. The effective IR range and IR port angle may differ depending upon the target equipment; refer to the equipment's user manuals.

### Communications Failures

If the data communications transfer fails, move the PDT 1100 closer to the target, or change the IR port angle and try again. Some types of highly intensive indoor lighting (inverter-driven fluorescent lights) or direct exposure to sunlight can cause communications failures. To prevent interference, do not use any TV remote control near the IR communications system. Refer to Appendix A, *Specifications* for communications specifications.

## *Using the Direct Cable*

The PDT 1100 can also be connected directly to a host computer, a modem, or a printer with the optional RS-232C interface cable.

---

**Note:** *The terminals' interface port is not designed to withstand frequent connecting and disconnecting. If frequent communications are needed with a host computer that is not equipped with an IR port, use the CRD 1100 cradle.*

---

# Using the Hand Strap and Pocket Clip

## *Using the Hand Strap*

Attach the hand strap as shown. This prevents you from accidentally dropping the terminal.

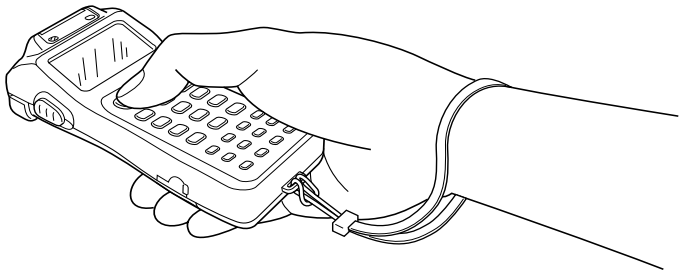


**Figure 2-7. Hand Strap**

## *Using the Pocket Clip*

With the optional clip, you can attach the PDT 1100 to your shirt pocket. To attach the clip to the terminal, first fit the left tab of the clip into the matching groove of the PDT 1100, then snap the other tab into place. To remove the clip, insert a flat-edged screwdriver at the edge and twist to disengage.

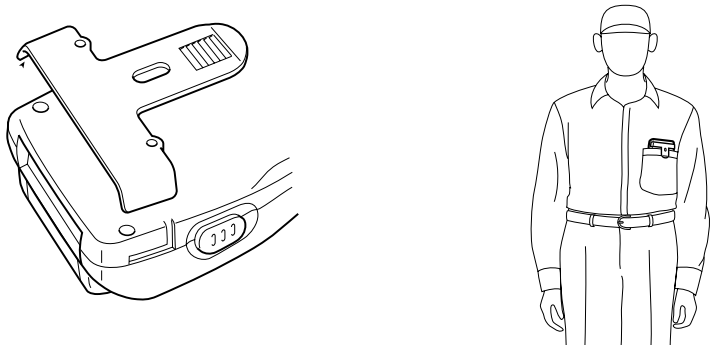
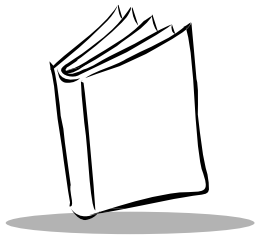


**Figure 2-8. Attaching and Using the Pocket Clip**



# *Chapter 3*
# *System Configuration*

## Introduction

System Mode is the terminals' operating software which allows you to execute programs, download and upload data, select terminal settings, and run tests.

## System Configuration

### *Hardware*

The following hardware is used with the PDT 1100 Terminal:

- Host computer (user supplied) - Allows you to edit, manage and download programs and data, and download extension programs. For host computers without IR interface ports, the CRD 1100 cradle and RS-232C interface cable permits data transmission.
- CRD 1100 (optional) - Exchanges programs and data with the PDT 1100 optically and with the host computer via the RS-232C interface.
- RS-232C interface cable (optional) - Connects the terminal or CRD 1100 to the host computer.

## Host Computer

An IBM PC/AT or PS/2 is required for this system. Table 3-1 lists the optional programs and OS.

**Table 3-1. Optional Application Programs and Operating Systems**

| Applications | Operating Systems |
|---|---|
| **Extension Library** | Windows version 3.1<br>Windows 95<br>WindowsNT 3.51<br>WindowsNT 4.0 |
| **BASIC 3.0 Compiler** | Windows 3.1- based |
| **Ir-Transfer Utility C** | Windows95/ WindowsNT based |
| **Ir-Transfer Utility E** | Windows95/ WindowsNT based |

## CRD 1100 and RS-232C Interface Cable

The CRD 1100 is an optional communications cradle which is required when your host computer is not equipped with an IR interface port. The cradle exchanges data and programs with the PDT 1100 terminal optically, and with the host computer via the RS-232C interface cable. You may connect the PDT 1100 directly to the host computer via cable or with a modem. Use a compatible direct-connect interface cable with all target equipment.

---

**Note:** *The direct-connect interface port of the PDT 1100 is not designed to withstand frequent connecting/disconnecting. Use the cradle (CRD-1100) when frequent communication is required.*

---

# *Software*

BASIC 3.0 software required for operating the PDT 1100 System Mode is stored in flash ROM. Optional software includes the Extension Library, Compiler, Ir-Transfer Utility C and Ir-Transfer Utility E. Each program is provided on diskette and runs on the host computer. You must have at least one of the Ir-Transfer Utility software programs to communicate with the terminal.

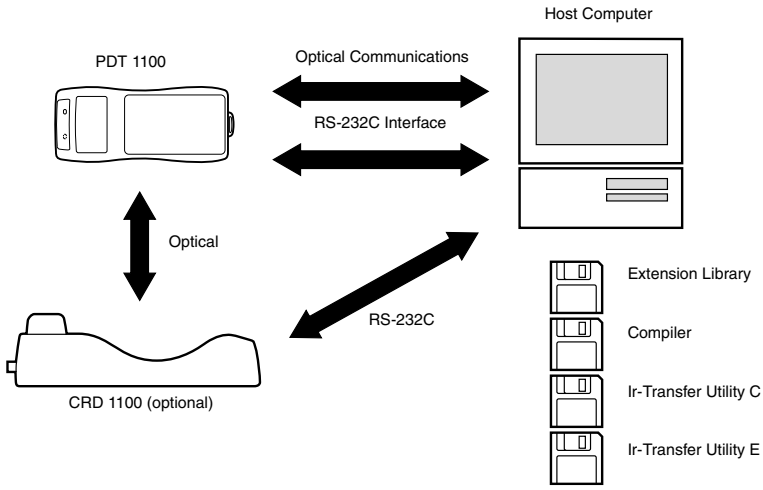



**Figure 3-1. PDT 1100 System Configuration**

## BASIC 3.0 Interpreter CRD 1100 Extension Library

This optional Extension Library supports the following functions:

- Displays ruled lines on the terminal's LCD
- Transmits files using the X-MODEM and Y-MODEM protocols.

These extension programs are stored in files named xxxx.FN3, where xxxx represents the function, and there is one file per function. Each file can be downloaded to the PDT 1100 using Ir-Transfer Utility C or Ir-Transfer Utility E.

## BASIC 3.0 Compiler

This optional program compiles a source program written in BASIC 3.0 Interpreter by an editor of the host computer running MS-Windows, into the object program (user program) to be used in the PDT 1100. The compiled program file is named XXX.PD3 where XXX is the file name set by the user and can be downloaded to the PDT 1100 using Ir-Transfer Utility C or Ir-Transfer Utility E.

### Ir-Transfer Utility C

This optional utility transfers files between the PDT 1100 and the host computer using the IR protocol. Refer to Chapter 4, *System Mode*.

Use this utility when transferring files under any of the following conditions:

- At transmission speeds of 115200 or 57600 bps (this may be limited depending upon the host computer type)
- Via the CRD 1100 (the PDT 1100 may be either separated from or placed on the CRD 1100)
- When transferring via the direct-connect interface of the PDT 1100 (maximum transmission speed is 38400 bps).

### Ir-Transfer Utility E

This optional utility transfers files between the PDT 1100 and the host computer using the IR protocol. Refer to Chapter 4, *System Mode*.

Use this utility when transferring files under any of the following conditions:

- Via an external IR transceiver
- Via an IR port integrated in a computer
- When the PDT 1100 is placed on the CRD 1100
- Via the direct-connect interface of the PDT 1100.

## Flash ROM and RAM

The PDT 1100 is equipped with a RAM and flash ROM. The flash ROM stores the factory-written System Program. You can download extension programs, user programs, and user data to either RAM or flash ROM.

### *RAM*

Programs and data stored in RAM are backed up by the terminal's lithium battery. If the battery output voltage drops below the specified level, RAM cannot retain its contents and stored files may be damaged.

User programs are only able to write data onto RAM.

In System Mode, RAM appears on the LCD as "DRIVE A" or "A:". Names of files stored in RAM are prefixed by "A:".

### *Flash ROM*

Unlike RAM, the flash ROM retains stored programs and data regardless of the voltage level of the lithium battery. The flash ROM limits the quantity of file rewriting operations to 10,000 times. After this, rewriting is no longer possible. Do not rewrite the flash ROM more than once a day.

You can write data onto the flash ROM to:

- Download a file in System Mode
- Copy a file from RAM in System Mode
- Download a file using XFILE statement in BASIC 3.0 Interpreter.

You cannot write data scanned with the PDT 1100 onto the flash ROM.

In System Mode, the flash ROM appears on the LCD as "DRIVE B" or "B:". Names of files stored in the flash ROM are prefixed by "B:".

## Software Structure

The System Program is located in the system area of the flash ROM. To use extension programs and user programs, download the program files into the user area of the flash ROM or RAM.

Before executing user programs, prepare a data file. Data files are stored in the user area of the flash ROM or RAM.

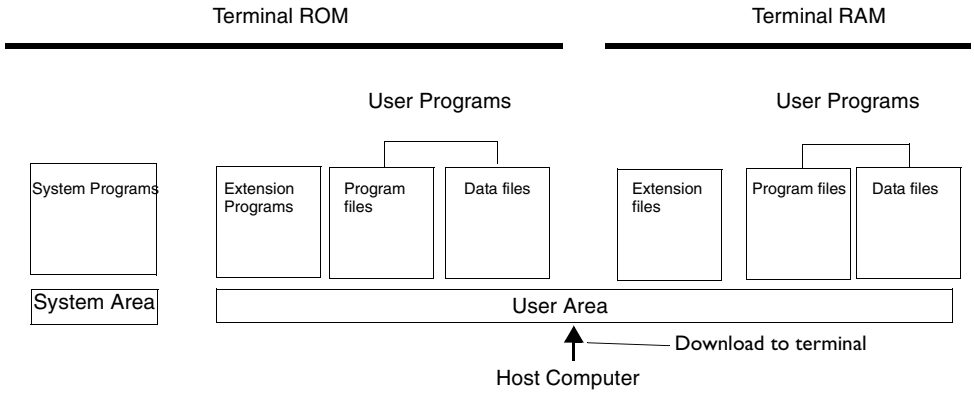



**Figure 3-2. ROM and RAM Storage Areas**

## *System Programs*

The PDT 1100 system includes:

- Drivers
- Interpreter
- System Mode.

### Drivers

Drivers control the PDT 1100 hardware. These programs may be accessed through the Basic 3.0 Interpreter or System Mode.

### Interpreter

This interprets and executes instructions in user programs written in BASIC 3.0 Interpreter.

### System Mode

This system program is designed exclusively for user programs used in the PDT 1100. System Mode sets up the execution environments for these programs, that is, it prepares downloading/uploading conditions, sets the calendar clock, and tests the PDT 1100 components including the LCD, beeper, and keypad. Following is the System Mode main menu. For more information on System Mode, refer to Chapter 4, *System Mode*.

```
SYSTEM MENU
1: EXEC PROGRAM
2: DOWNLOAD
3: UPLOAD
4: SET SYSTEM
5: TEST 6: VER
```

## *Extension Programs*

These programs add new functions to the system. To download an extension program in the BASIC 3.0 Extension Library, use Ir-Transfer Utility C or Ir-Transfer Utility E.

## *User Programs*

You can develop application programs to meet individual job requirements using the BASIC 3.0 Compiler. To download these user programs to the PDT 1100, use Ir-Transfer Utility C or Ir-Transfer Utility E.

# Infrared Communications

The PDT 1100 has an integrated infrared (IR) communications device which enables wireless transfer of programs and data between the PDT 1100 and the host computer and between PDT 1100s, instead of the conventional wire transfer.

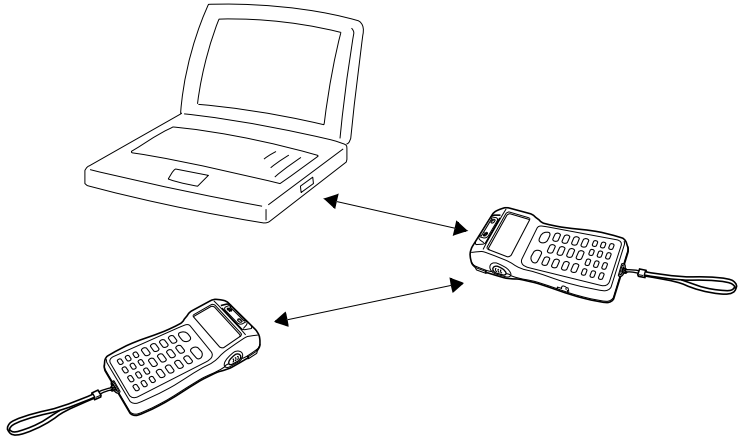


**Figure 3-3. Infrared Communications**

The IR communications device features the following:

- Wireless communications
- Small and lightweight design
- High transmission speed
- Freedom from the codes/regulations and licenses imposed on radio devices which differ from country to country.

The PDT 1100's physical layer has a maximum transfer distance of 39 inches (1 meter) and maximum transmission rate of 115.2 kbits per second. The PDT 1100 adopts the exclusive

IR protocol which allows you to develop user programs for IR communications in BASIC 3.0 Interpreter, as can be done with conventional wire communications.

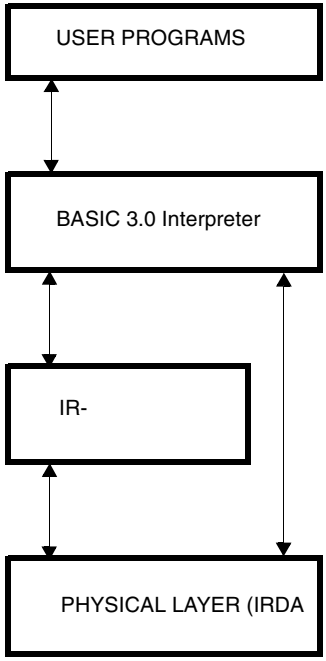
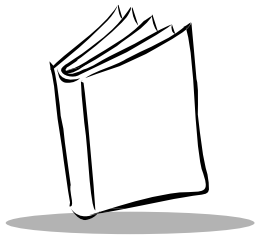



**Figure 3-4. IR Communication Chart**

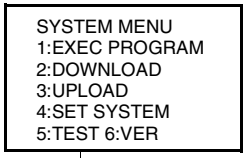


# *Chapter 4*
# *System Mode*

## Introduction

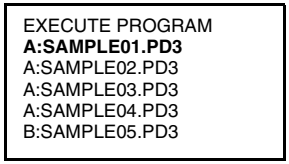
This chapter provides information on starting and working with PDT 1100's system mode. Figure 4-1 describes the system mode structure.

# Structure of System Mode




SYSTEM MENU Press the PW key while holding down the SF and 1 keys.

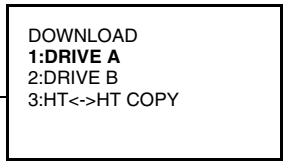
1




Program Execution

Selects a desired user program to be executed.

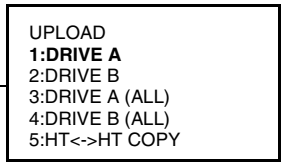
2




Downloading

Transfers user program files or data files from the host computer to RAM or flash ROM integrated in the PDT 1100. Downloading between terminals is also

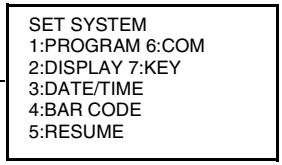
3




Uploading

Transfers user program files and data files stored in RAM or flash ROM of the PDT 1100 to the host computer.

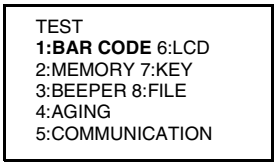
4




System Environment Setting

Sets a variety of environmental conditions, such as an execution program, message version, display font size (standard or small), system status indication, calendar clock, special bar code scanning parameters, resume function, communications parameters, interface port, and shift-key and M key functions.

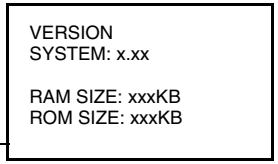
5




Testing

Used for the bar code scanning test, memory test, beeper test, aging test, communications test, LCD indication test, reading confirmation test, key-entry test,

6




Version Indication

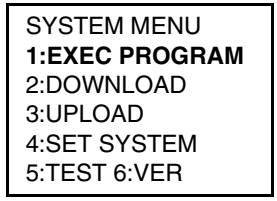
Displays the versions of memory-resident System Program and the sizes of RAM and flash ROM.

**Figure 4-1. System Mode Structure**

# Starting System Mode

To start System Mode:

1. Press and hold down the SF and 1 keys.
2. Press and release the PW key.
3. Release the SF and 1 keys.




The selected item is highlighted white-on-black with the cursor.

# Screen Navigation

The following table defines the keys to use to select menu items.

| | |
|---|---|
| Numeric keys | Selects the corresponding menu item on the screen. |
| F5 key | Moves the cursor up to select a different item. |
| F6 key | Moves the cursor down to select a different item. |
| F7 key | Moves the cursor to the left to select a different item. |
| F8 key | Moves the cursor to the right to select a different item. |
| ENT key | Enters the selected function. |
| C key | Returns to the preceding screen. Not used on the System Menu screen. |

# System Mode Functions

## *Program Execution*

1. Select "1:EXEC PROGRAM" on the System Menu.

```
SYSTEM MENU
1:EXEC PROGRAM
2:DOWNLOAD
3:UPLOAD
4:SET SYSTEM
5:TEST 6:VER
```

   The following screen appears.

```
EXECUTE
PROGRAM
A:SAMPLE01.PD3
A:SAMPLE02.PD3
A:SAMPLE03.PD3
A:SAMPLE04.PD3
```

2. If more than one program has been downloaded to the user area of the target memory, use the F5 and F6 keys to move the cursor to the desired program. If more than five programs have been downloaded, scroll the screen with the F6 key. RAM files are shown as "A:FILE NAME;" flash-ROM files are shown as "B:FILE NAME." If no program file is downloaded, the following message appears:

```
EXECUTE
PROGRAM
NO FILE EXISTS
```

3. Press ENT to enter your selection, or C to return to the System Menu.

## Downloading

If you are downloading from another PDT 1100, first perform the following:

1. At each PDT 1100, set the interface port. The default is an optical interface (OPT). Starting on the SYSTEM MENU, select "4:SET SYSTEM," "6:COM," then "3:COM PORT."
2. On the SET COM PORT screen, select the optical interface (OPT) or direct-connect interface (IFC) of "2:SYSTEM MODE."
3. When using the direct-connect interface, pull out the connector cover on each PDT 1100. Connect the ports on the PDT 1100s using the direct-connect interface cable (with 3-pole mini stereo plugs).
4. On the uploading PDT 1100, run System Mode and select "3:UPLOAD," then "5:HT<->HT COPY."

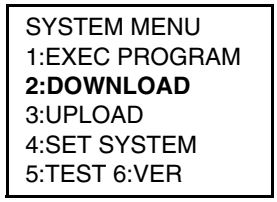
To download files to the terminal:

---

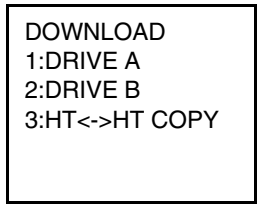
**Note:** *If you download a file with the same name as one already used in the user area of the target memory, the new file replaces the old one.*

---

1. On the downloading PDT 1100, select "2: DOWNLOAD" on the System Menu.




   The Download menu displays.

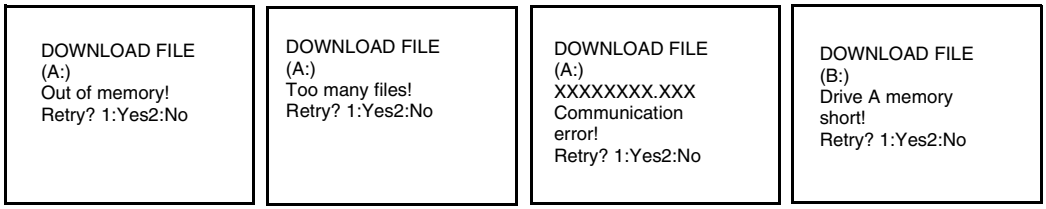



2. Select an item from the download menu.
   - Press 1 then ENT to download a user program file (object file compiled by the BASIC 3.0 Compiler) or data file to RAM.

- Press 2 then ENT to download a user program file (object file compiled by the BASIC 3.0 Compiler) or data file to flash ROM.
- Press 3 and ENT to copy all files, system parameters, and calendar clock data from the connected PDT 1100.
- Press the C key to return to the System Menu.

## Downloading Errors

If an error occurs during downloading, the PDT 1100 beeps three times and displays one of the following screens:




To retry the download, press 1 then ENT; to abort, press 2 then ENT.

**Table 4-1. Download Error Problems and Solutions**

| Error Message | Problem | Solution |
|---|---|---|
| Out of memory! | The designated memory is insufficient for storing files to be downloaded. | Press the 2 key to return to the SYSTEM MENU, then delete unnecessary files in the memory or decrease the size of the file to be downloaded. |
| Too many files! | The current download exceeds the maximum of forty files in the memory. | Press the 2 key to return to the SYSTEM MENU. If you attempted to download more than one file, delete unnecessary files in memory or decrease the number of files to be downloaded. |
| XXXXXXXX.XXX Communication error! | Downloading has failed. | To retry downloading, press the 1 key. To return to the SYSTEM MENU, press the 2 key. Check the interface port and communications parameters in the SET SYSTEM menu or perform the communications test in the TEST menu. Check the communications parameters setup of the host computer. |

**Table 4-1. Download Error Problems and Solutions (Continued)**

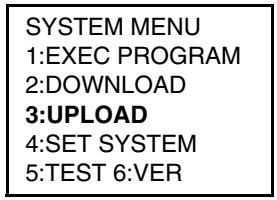
| | | |
|---|---|---|
| Drive A memory short! | RAM is insufficient for copying files stored in flash ROM. | Press the 2 key to return to the SYSTEM MENU, then delete unnecessary files in RAM. |

**Note:** *When receiving downloaded files to flash ROM, the PDT 1100 may copy the files stored in flash ROM into RAM. This requires an unused user area of 64 kilobytes in RAM. If there is no area for copying in RAM, "Drive A memory shut" message appears.*

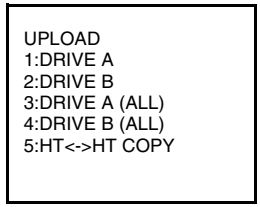
## *Uploading*

To upload files from the terminal:

1. Select "3: UPLOAD" on the System Menu.




   The following screen displays:




2. Select an item from the Upload menu.
   - Press 1 then ENT to upload a user program file or data file stored in RAM.
   - Press 2 then ENT to upload a user program file or data file stored in flash ROM.
   - Press 3 then ENT to upload all files stored in RAM.

- Press 4 then ENT to upload all files stored in flash ROM.
- Press 5 and ENT to copy all files, system parameters, and calendar clock data to the connected PDT 1100. At the receiving PDT 1100, select “2: DOWNLOAD” and “3:HT<-> COPY” in System Mode. Refer to *Downloading* on page 4-5 before selecting this option.

3. If you select "1: DRIVE A" or "2: DRIVE B," the following screen shows all program files and data files stored in the selected memory. If you select any other items, this screen is skipped.

```
UPLOAD FILE
(A:)
SAMPLE01.PD3
SAMPLE02.PD3
SAMPLE03.PD3
SAMPLE04.PD3
```

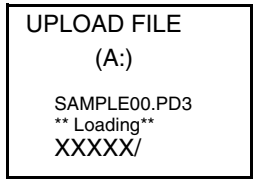
4. Select the file to be uploaded and press ENT. If you select "1:DRIVE A" through "4:DRIVE B (ALL)" when no data files are stored in the specified memory, the following message appears.

```
UPLOAD FILE
      (A:)

**********
NO FILE EXISTS
**********
```

   Press the C key to return to the upload menu.

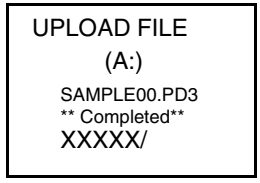
5. After you make an uploading selection, a screen indicating the PDT 1100 is waiting for a file(s) to be uploaded displays.

6. If an IR-Transfer Utility C/IR-Transfer Utility E or equivalent program begins (upon receipt of an ACK code from the host computer), the PDT 1100 indicates a file is loading. (Refer to the *PDT 1100 Transfer Utility Guide* p/n 70-36368-xx). While uploading, the following screen displays the file name and the number of sent records/total number of records.




   To abort the uploading operation and return to the Upload menu, press the C key.

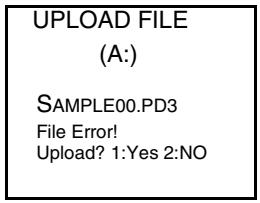
7. When the upload is completed, the following screen displays:.




When uploading is complete, the number of sent records is equal to the total number of records and the terminal beeps once. Press the C key to return to the Upload menu. If you selected "3: DRIVE A (ALL)," "4: DRIVE B (ALL)," or "5: HT<->HT COPY", the previous screen sequence is repeated for each file uploaded.

## Uploading Errors

If an error occurs during uploading, one of the following screens appears and the terminal beeps three times. To retry the upload, press the 1 then ENT key; to abort, press the 2 then ENT key.




OR

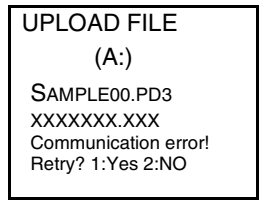


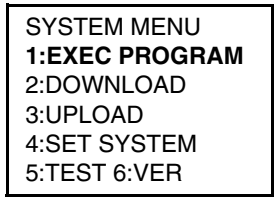
**Table 4-2. Upload Error Problems and Solutions**

| Error Message | Problem | Solution |
|---|---|---|
| File Error! | The file you attempted to upload is damaged. | To upload the damaged file as is, press the 1 key. Press the 2 key to abort the file upload. |
| XXXXXXX.XXX Communication error! | Uploading has failed. | To retry uploading, press the 1 key. To return to the SYSTEM MENU, press the 2 key. Check the interface port and communications parameters in the SET SYSTEM menu or perform the communications test in the TEST menu. Also check the communications parameters setup of the host computer. |

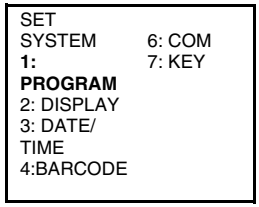
## *System Environment Setting*

To change system settings:

1. Select "4: SET SYSTEM" on the System Menu.




   The following screen displays:



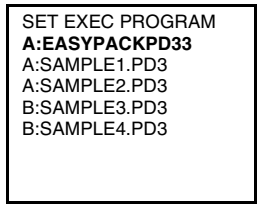

2. Select an item from the Set System menu.
   - Press 1 to set an execution program that runs when the terminal powers on.

- Press 2 to set the message version, display font size (standard or small), and system status indication (shift-key icon).
- Press 3 to set the calendar clock (date and time).
- Press 4 to set scanning parameters (black-and-white inverted label reading and the decoding level) and the minimum number of digits to read for bar codes (ITF, STF and Codabar).
- Press 5 to set the resume function.
- Press 6 to set the communications options (interface port and communications parameters).
- Press 7 to define the functions of the shift key and the M keys.

## Setting an Execution Program

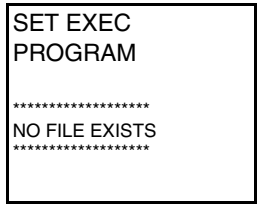
To select an execution program:

1. Select "1: PROGRAM" on the SET SYSTEM menu. The following screen displays:




2. Select an execution program to run when power is applied to the terminal. The files in RAM display as "A:FILE NAME;" the flash-ROM files are "B:FILE NAME."

   If no program files are stored in memory, the following screen appears.




3. Press ENT to enter your selection or C to return to the Set System menu.

## Setting Font Size and System Status Indication

To select the display font size and to turn the system status indicator on or off:

1. Select "2: DISPLAY" on the Set System menu. A screen displays indicating the font size and whether the system status is ON or OFF.
2. Select an item.
   - Press 1 to change the display font size used in application programs to the standard (8-dot) or small (6-dot).
   - Press 2 to turn the system status indication on or off. If it is set to on, the shift-key icon appears.
3. Use the F7 and F8 keys and select a font/status setting.

---

**Note:** *You may also turn the system status indication on or off using the OUT statement in user programs. Refer to the PDT 1100 Terminal Programmer's Guide.*

---

Selecting ON for System Status displays the SF icon, which indicates the keys on the keypad are shifted.

## Setting the Calendar Clock

To set the calendar clock:

1. Select 3: DATE/TIME on the Set System menu and press the ENT key.

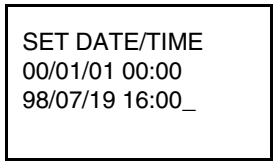
```
SET SYSTEM
1:PROGRAM 6:COM
2:DISPLAY 7:KEY
3:DATE/TIME
4:BARCODE
5:RESUME
```

The following screen appears.

```
SET DATE/TIME
00/01/01 00:00
_ / /:
```

2. Use the numeric keys to enter the year (only the last two digits), month, day, hour (in 24-hour format), and minute in this order. Add a 0 (zero) preceding one-digit entries.

   For example, to set the date to July 19, 1998 and the time to 4:00pm, press 9, 8, 0, 7, 1, 9, 1, 6, 0, and 0.




   If you make a wrong entry, press the BS key to delete it, then enter the correct data.

3. Press ENT to enter the setting or the C key to return to the Set System screen. Settings are accepted only if all fields are completed.

## Setting Bar Code Scanning Parameters

The 4:BARCODE option on the Set System menu is used to set the following options:

### *Inverted Label Reading*

This black-and-white inverted label reading function (INVERT) enables the PDT 1100 to read white bars on a black background. Activating this function may increase the frequency of scanning errors.

### *Decode Level*

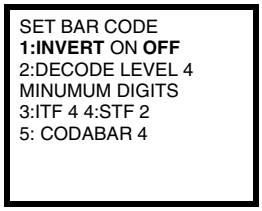
Decode level (DECODE LEVEL) can be set to a value from 1-9. Decreasing this value increases bar code scanning efficiency, but also increases the risk of misreading low-quality or damaged bar codes. Increasing this value decreases scanning efficiency, but it eliminates almost all possibilities of misreading. The default is 4.

### *Minimum Digits*

Minimum number of digits to be read for ITF, STF, or CODABAR (MINIMUM DIGITS) can be set to 2-20 for ITF, 1-20 for STF, or 3-20 for Codabar. Setting a small number increases the frequency of digit-missing scanning or misreading of poor quality bar codes. Setting a large number eliminates almost all possibilities of error. The default is 4 for ITF and Codabar, and 2 for STF.

To set bar code scanning parameters:

1. Select 4: BAR CODE on the Set System menu to display the following screen:

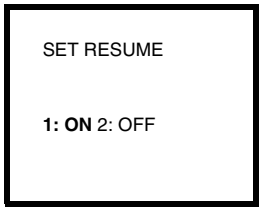



2. Select one of the following:
   - Press 1 to activate or deactivate the black-and-white inverted label reading function.
   - Press 2 to set the decode level
   - Press 3 to set the minimum number of digits for ITF
   - Press 4 to set the minimum number of digits for STF
   - Press 5 to set the minimum number of digits for Codabar.
3. Select a desired setting using the F7 and F8 keys.
   - To increase the decode level, press the F8 key; to decrease it, press the F7 key
   - To increase the number of digits to be read for ITF, STF and CODABAR, press the F8 key; to decrease it, press the F7 key.
4. Press the ENT key. To return to the Set System menu, press the C key.

## Setting the Resume Function

The resume function resumes the display shown before power off, when the terminal is powered up. To set the resume function:

1. Select 5: RESUME on the Set System menu. The following screen displays:



2. Select one of the following:
   - Press 1 to activate the resume function which resumes the display shown
   - Press 2 to deactivate the resume function.
3. Press ENT to enter your selection, or C to return to the Set System menu.

## Setting Communications Environments

After the PDT 1100 is initialized, the interface port and communications parameters are set as listed in the default tables below. Do not access them unless necessary.

**Table 4-3. Interface Port Parameters Default**

| Parameter | Default |
|---|---|
| **Interface Port** | OPT (Optical interface port) |
| **Communications protocol** | protocol |
| **Communications parameters for the optical interface port** | |
| **TRANSMIT SPEED** | 9600 bps |
| **PULSE WIDTH**<br>**(Output pulse width of IR beam)** | 1.63 ms |
| **PROTOCOL**<br>**(Protocol options)** | SERIAL No. ON: Adds serial numbers to data blocks. |
| | Adds a horizontal parity. |
| | LINKUP TIME: 30 seconds |
| | FIELD SPACE: Ignore |

**Table 4-4. Comm. Parameter Default for Direct-Connect Interface**

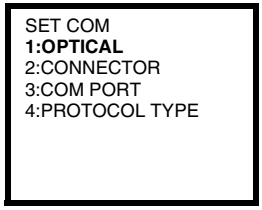
| Communications Parameters | Defaults |
|---|---|
| **TRANSMIT SPEED** | 19200 bps |
| **PARITY BIT** | None |
| **DATA BIT (Character length)** | 8 bits |
| **STOP BIT** | 1 bit |

**Table 4-4. Comm. Parameter Default for Direct-Connect Interface (Continued)**

| Communications Parameters | Defaults |
|---|---|
| **PROTOCOL (Protocol options)** | Adds serial numbers to data blocks. |
| | H. PARITY ON: Adds a horizontal parity. |
| | LINKUP TIME: 30 seconds |
| | FIELD SPACE: Ignore |

To change communication environments:

1. Select the 6: COM on the Set System menu. The following screen displays:



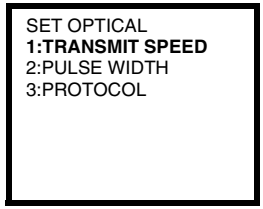

2. Select one of the following:
   - Press 1 to select the communications parameters setting screen for the optical interface.
   - Press 2 to select the communications parameters setting screen for the direct-connect interface.
   - Press 3 to select the interface port setting screen.
   - Press 4 to select the communications protocol type setting screen.
3. Press ENT to enter your selection, or C to return to the Set System menu.

The following sections provide instructions for setting each of these options.

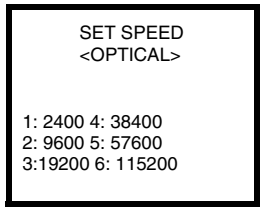
### *Optical Parameters*

To set communications parameters for the optical interface:

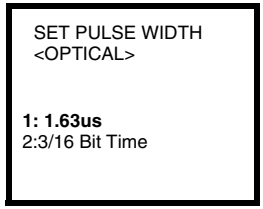
1. Select 1:OPTICAL on the SET COM menu. The following screen displays:




2. Select each of the following:
   a. Press 1 to select the transmission speed. The following screen displays:

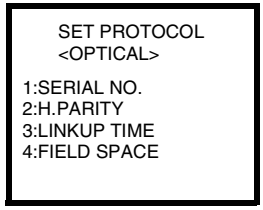



   b. Select the transmission speed using the numeric keys or F5 and F6 keys. Press ENT to enter your selection, or C to return to the Set Com menu.
   c. Press 2 to select the IR beam output pulse width. The following screen displays:




   d. Select the pulse width using the numeric keys or F5 and F6 keys. Press ENT to enter your selection, or C to return to the SET OPTICAL screen.

e. Press 3 to select the communications protocol option. The following screen displays:




f. Select one of the following using the numeric keys or F5 and F6 keys.

---

**Note:** *If the IR protocol is selected, the serial number and horizontal parity settings are ignored.*

---

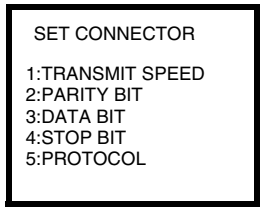
- Select 1:SERIAL NO. on the SET PROTOCOL menu to select whether to add serial numbers to data blocks.
- Select 2:H.PARITY on the SET PROTOCOL menu to select whether to add a horizontal parity.
- Select 3:LINKUP TIME on the SET PROTOCOL menu to select the timeout length (in seconds) to be applied when a link is to be established.
- Select 4:FIELD SPACE on the SET PROTOCOL menu to select whether space codes in the tail of a data field should be ignored or handled as data.

g. Press ENT to enter your selection, or C to return to the Set Optical screen.

### *Connector Parameters*

To set the communications parameters for the direct-connect interface:

1. Select 2:CONNECTOR on the SET COM menu. The following screen displays:




2. Select one of the following options using the numeric keys or F5 and F6 keys.

---

**Note:** *If the IR protocol is selected, the parity bit, character length, and stop bit length settings are ignored.*

---

   a. Select 1:TRANSMIT SPEED to display the transmission speed screen. Select the transmission speed using the numeric keys or F5 and F6 keys.
   b. Select 2:PARITY BIT for the parity screen. Select the parity (none, odd or even) using the numeric keys or F5 and F6 keys.
   c. Select 3:DATA BIT to display the character length screen. Select the character length using the numeric keys or F5 and F6 keys.
   d. Select 4:STOP BIT to set stop bits. Select the stop bit length using the numeric keys or F5 and F6 keys.
   e. Select 5:PROTOCOL to set communications protocol. Select a screen using the numeric keys or F5 and F6 keys, then press ENT.

---

**Note:** *If the IR protocol is selected, the serial number and horizontal parity settings are ignored.*

---

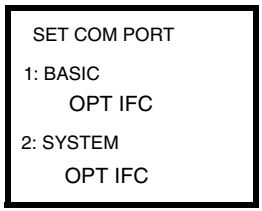
- Select 1:SERIAL NO. on the SET PROTOCOL menu to determine whether the system should add serial numbers to data blocks. Use the numeric keys or F5 and F6 keys to select 1:ON or 2:OFF, then press the ENT key. To return to the Set Protocol menu, press the C key.
- Select 2:H.PARITY to select whether the system should add a horizontal parity. Select 1:ON or 2: OFF, then press ENT. To return to the Set Protocol menu, press the C key.

- Select the 3:LINKUP TIME to select the timeout length (in seconds) to be applied when a link is to be established. Select 1:ON or 2: OFF, then press ENT. To return to the SET PROTOCOL menu, press the C key.
- Select the 4:FIELD SPACE to select whether space codes in the tail of a data field should be ignored or handled as data. Select 1:Ignore or 2: Data, then press ENT. To return to the SET PROTOCOL menu, press the C key.

### *Com Port Parameters*

To set the interface port:

1. Select 3:COM PORT on the SET COM menu. The following screen displays.

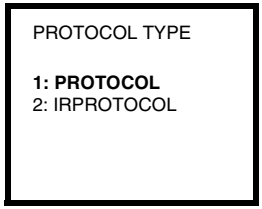



2. Select one of the following:
   - Press 1 to select the optical or direct-connect interface port used for user programs written in BASIC 3.0 Interpreter (OPEN “COM:” or XFILE statement).
   - Press 2 to select the optical or direct-connect interface port used for downloading or uploading files in System Mode.
3. Press ENT, or C to return to the Set Connector screen.

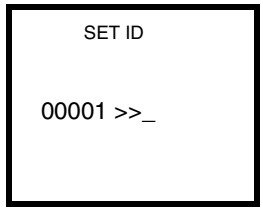
### *Protocol Type Setting*

To set the communications protocol type:

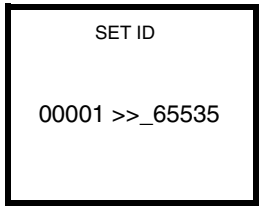
1. Select the 4:PROTOCOL TYPE on the SET COM menu. The following screen displays:



2. Select one of the following:
   - Press 1 to select the protocol for downloading or uploading files in System Mode or for the execution of XFILE statement in BASIC 3.0 Interpreter. Select this protocol for file transmission with Transfer Utility.
   - Press 2 to select the IR protocol for downloading or uploading files in System Mode or for the execution of XFILE statement in BASIC 3.0 Interpreter. Select this protocol for file transmission with IR-Transfer Utility C/IR-Transfer Utility E.
3. If you selected 2: IRProtocol, the following screen displays:




4. Enter the ID number of the PDT 1100 using the numeric keys, then press ENT, or just press ENT to retain the current setting.




---

**Note:** *An ID number is a five-digit decimal character string ranging from 00001 to 65535. You cannot enter a value less than five digits.*

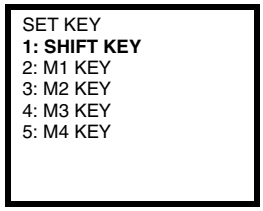
---

If you make a wrong entry, press the BS key to delete it then enter the correct data. Press the C key until you return to the Main Menu.

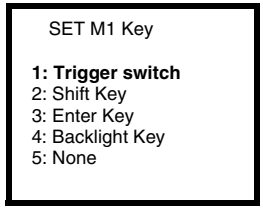
## Setting the Shift Key and M Keys

To define the function of the Shift key and the M keys:

1. Select the 7:KEY on the Set System menu. The following screen displays:




2. Select a key to define.
   a. Press 1 to switch to the shift key definition screen.
   - Select NONLOCK to shift the keypad only when the SF key is held down.
   - Select ONETIME to shift only the first key pressed after the SF key. The following keys are not shifted.
   - Press 2 through 5 to set the key functions. The following screen displays (M1 key is shown here):




   - Select Trigger Switch to assign the M key as the trigger switch.
   - Select Shift Key to assign the M key as the SF key.
   - Select Enter Key to assign the M key as the ENT key.
   - Select Backlight Key to assign the M key as the backlight function on/off key.
   - Select None to ignore the key entry.

   b. Press ENT to enter your selection, or C to return to the Set System menu.

---

**Note:** *All M keys are assigned the trigger function by default. In user programs, a string data can also be assigned to these M keys.*

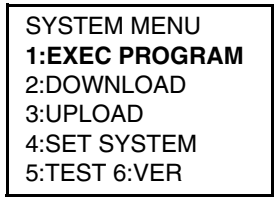
*The backlight function on/off key can be assigned to only one of the*

*M1 through M4 keys. The last key defined acts as the backlight function on/off key and one defined earlier is ignored.*

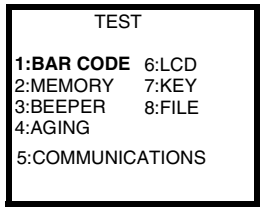
## Testing

The PDT 1100 terminal conducts tests of all systems upon initialization. To perform a system test:

1. Select 5:TEST on the system menu.




   The following screen displays:



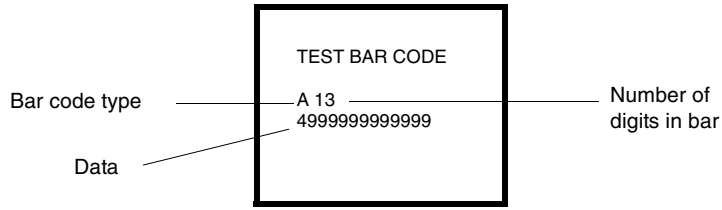

2. Select a test to run:
   - Press 1: BAR CODE to select the bar code reading test.
   - Press 2:MEMORY to select RAM read/write test.
   - Press 3:BEEPER to select the beeper scale test.
   - Press 4:AGING to select the aging test.
   - Press 5:COMMUNICATIONS to select the communications test.
   - Press 6:LCD to select the LCD and reading confirmation LED tests.
   - Press 7:KEY to select the key entry, beeper and vibrator tests.
   - Press 8:FILE to select the file checksum test.
3. Press ENT to enter your selection, or the C key to return to the System Menu.

**Note:** *If an error occurs in any of the above tests, contact your nearest Symbol Support Center. See Symbol Support Center on page -ix for more information.*

The following sections explain each test.

## Bar Code Reading Test

If you selected 1: BAR CODE on the TEST menu, scan a bar code with the PDT 1100 and check the data displayed on the LCD.




The PDT 1100 beeps, the decode LED turns green, and the data displays with the bar code type and the number of data digits. Up to 64 digits of data are displayed; the excess is discarded.

The following table defines the bar code type ID letter displayed on the screen.

**Table 4-5. Bar Code Type Identifiers**

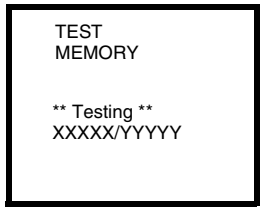
| Bar Code Type | ID Letters |
|---|---|
| EAN-13, UPC-A | A |
| EAN-8 | B |
| UPC-E | C |
| Standard 2 of 5 (STF) | H |
| Interleaved 2 of 5 (ITF)* | I |
| CODABAR (NW7) | N |

| | |
|---|---|
| CODE39 | M |
| CODE93 | L |
| CODE128 | K |
| EAN-128 | W |

* The PDT 1100 can only read ITF bar codes with 4 digits or more in length.

## Memory Test

If you selected 2:MEMORY on the TEST menu, the following screen displays, then writes and reads onto/from all areas of RAM and checks the address.

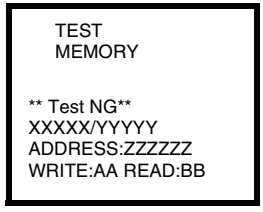



Where:

XXXXX = Tested RAM capacity (unit: kilobytes)

YYYYY = Total RAM capacity (unit: kilobytes)

If an error is detected, the PDT 1100 beeps three times, displays the following screen, and terminates the test.




Where:

ZZZZZZ = Address where an error has occurred

AA = Data to write

BB = Data read out from RAM

After a successful RAM test, the PDT 1100 beeps once, displays a confirmation message, and returns to the TEST menu.

## Beeper Scale Test

If you select 3:BEEPER on the TEST menu, the beeper sounds at three octaves as follows.

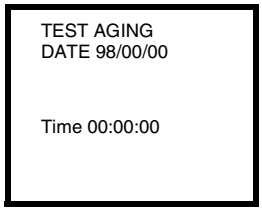
**Table 4-6. Beeper Scale and Frequency**

| Scale | Frequency (Hz) | | | |
|---|---|---|---|---|
| do | 523 | 1046 | 2093 | 4186 |
| re | 587 | 1174 | 2349 | - |
| mi | 659 | 1318 | 2637 | - |
| fa | 698 | 1396 | 2793 | - |
| sol | 783 | 1567 | 3135 | - |
| la | 880 | 1760 | 3520 | - |
| ti | 987 | 1975 | 3951 | - |

When the test is complete, the PDT 1100 returns to the TEST menu. To stop this test while in progress, turn the power off, then on.

## Aging Test

If you select 4:AGING on the TEST menu, choose the aging test while the current date and time is displayed on the LCD. (This test is intended for personnel who check the PDT 1100 in the factory.)



**Note:** *Selecting this test disables the powering-off function. Be sure to turn the power off or press the C key to return to the TEST menu.*

## Communications Test

Before testing the optical interface, arrange two PDT 1100s, one as a master station and the other as a slave station (to be tested) with their IR ports facing each other as illustrated in Figure 4-2. In this test, the slave PDT 1100 transmits data to the master PDT 1100 and receives the data sent back from the master PDT 1100.

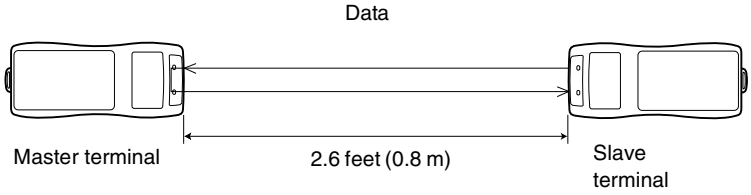
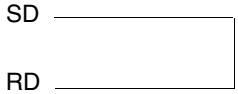



**Figure 4-2. PDT 1100 Master/Slave Setup**

Before testing the direct-connect interface, arrange the 3-pole mini stereo plug as illustrated below and connect it to the direct-connect interface port on the PDT 1100.



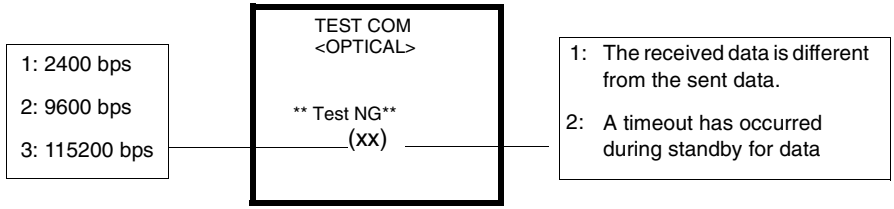

Select 5:COMMUNICATIONS on the TEST menu to select an interface test.

- Press 1:OPTICAL to switch to the MASTER/ SLAVE selection screen for the optical interface test.
- Press 2:CONNECTOR to test the direct-connect interface port.

To select the optical interface test:

1. Select 1:OPTICAL on the TEST COM menu.
2. At the slave PDT 1100 to be tested, select 1:SLAVE and at the master PDT 1100, select 2:MASTER. During the test, the screen indicates the test is running.

3. If an error occurs, the slave PDT 1100 beeps three times and displays the following screen.

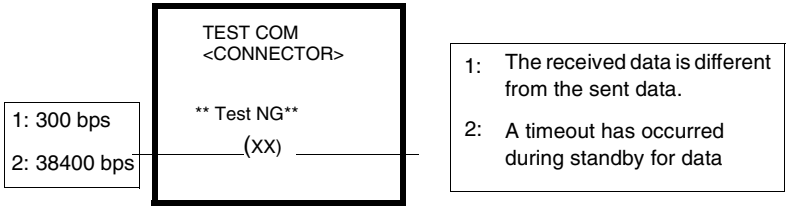



   Press the C key to return to the TEST COM menu. The master PDT 1100 automatically returns to the TEST COM menu 10 seconds after an error occurs.

4. When the test is complete, the tested slave PDT 1100 beeps once and indicates the test is OK.
5. Press the C key to return to the TEST COM menu. The master PDT 1100 automatically returns to the TEST COM menu.

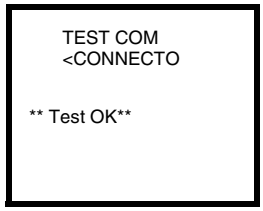
To test the direct-connect interface port:

1. Select 2:CONNECTOR on the TEST COM menu to initiate the test.
2. If an error occurs, the PDT 1100 beeps three times and displays the following screen.




   Press the C key to return to the TEST COM menu.

3. When the test is complete, the PDT 1100 beeps once and displays the following screen.




4. Press the C key to return to the TEST COM menu.

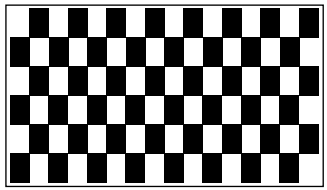
## LCD and Reading Confirmation LED Tests

If you select 6:LCD on the TEST menu, the test pattern shown below displays and the decode LED turns green. Press the ENT key to shift the screen to the next test pattern. To return to the previous screen, press the BS key. To stop this test while in progress, press the C key.

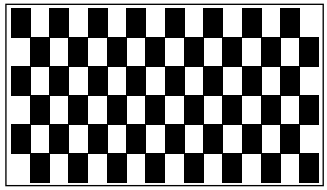
This is the first test pattern.

Press ENT. Everything disappears and the decode LED turns red.

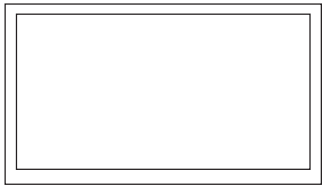
Press ENT. The checker pattern shown below appears and the decode LED turns off.



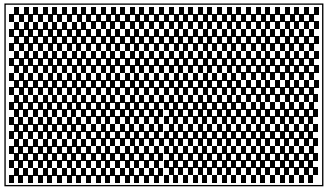
Press ENT. The checker pattern is reversed.



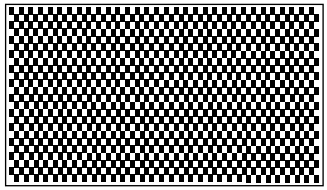
Press ENT. An outline with a width of one dot appears.



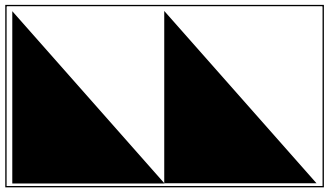
Press ENT. The fine checker pattern appears.



Press ENT. The fine checker pattern is reversed.



Press ENT. Two right-angled triangles appear.



Press ENT. When the test pattern sequence is complete, the screen displays symbols.

```
 !"#$%&'()*+,-./
0123456789:;<=>?
@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[¥]^_
`abcdefghijklmno
pqrstuvwxyz{|}
```

Font size (standard or small) depends upon the setting made previously. When the test is complete, the PDT 1100 beeps once and returns to the TEST menu.

## Key Entry & Beeper and Vibration Test

If you select 7:KEY on the TEST menu, the following screen displays and prepares the PDT 1100 keypad for entry. Press individual keys to display the identifier letters in the positions assigned to those keys and sound the beeper or activate the vibrator (beeping and vibrating continues while the individual key is held down). Press the same key again to erase the displayed letter.

The following table shows the relationship between the keys, the identifier letters displayed on the LCD, and the frequencies (Hz) of the beeper.

**Keys and Identifier Letters for Beeper Frequencies**

| Key | Letter | Beeper (Hz) | Key | Letter | Beeper (Hz) | Key | Letter | Beeper (Hz) |
|---|---|---|---|---|---|---|---|---|
| M1 | L | 523 | 6 | 6 | 1046 | F3 | C | 2637 |
| M2 | M | 587 | 1 | 1 | 1174 | F4 | D | 2793 |
| M3 | N | Activates Vibrator (Note) | 2 | 2 | 1318 | F5 | E | 3135 |
| M4 | O | Activates Vibrator (Note) | 3 | 3 | 1396 | F6 | F | 3520 |
| 7 | 7 | 659 | 0 | 0 | 1567 | F7 | G | 3951 |
| 8 | 8 | 698 | . | . | 1760 | F8 | H | 4186 |
| 9 | 9 | 783 | ENT | = | 1975 | BS | I | 4699 |
| 4 | 4 | 880 | F1 | A | 2093 | C | J | 5274 |
| 5 | 5 | 987 | F2 | B | 2349 | SF | K | 5587 |
| Note: M3 and M4 keys do not beep upon testing. | | | | | | | | |

After all keys are pressed and displayed on the LCD, this test is complete and the screen returns to the TEST menu.

## File Test

If you select 8: FILE on the TEST menu, the following screen displays and tests all files stored in RAM and flash ROM.

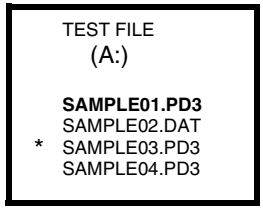
```
TEST FILE

1:DRIVE A
2:DRIVE B

SIZE XXXX
FREE XXXX
```

- Press 1:DRIVE A to test all files stored in RAM.

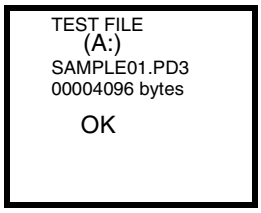
- Press 2:DRIVE B to test all files stored in flash ROM.
- SIZE indicates the size of the user area used in RAM or flash ROM when 1:DRIVE A or 2:DRIVE B is selected, respectively.
- FREE indicates the size of the unused user area in RAM or flash ROM when 1: DRIVE A or 2: DRIVE B is selected, respectively.

If RAM and/or flash ROM contain defective file(s), an asterisk (*) appears; for example, *1: DRIVE A or *2: DRIVE B, respectively. The following example shows that RAM contains a defective file(s). To return to the TEST menu, press the C key. The current setting is highlighted.

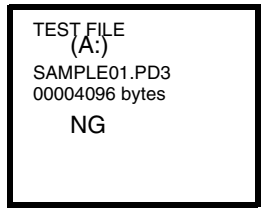
To find the defective file(s), select the drive with the asterik on the TEST FILE menu, then press the ENT key. The file selection screen displays. Defective files are prefixed by an asterisk (*).




This example shows that 1:DRIVE A has been selected. Select a file to display file size and test results. When there are more than four files, the screen scrolls.




OR




Press the C key to return to the file selection screen.

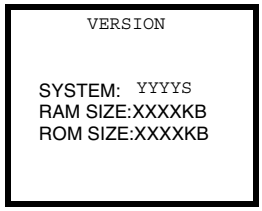
---

**Note:** *If a defective file is found, delete it or overwrite it using the same name file. Defective files can be uploaded on the UPLOAD menu.*

*We recommend that important files be uploaded before they are deleted.*

## *Version Indication*

Select the "6:VER" on the SYSTEM MENU to view the version of the memory-resident System Program, and the sizes of RAM and flash ROM. Press the C key to return to the SYSTEM MENU.




# Copying and Deleting Files

System Mode can also be used to delete and copy files. With the SYSTEM MENU displayed, hold down the SF key and press 0 to delete, or 1 to copy files.

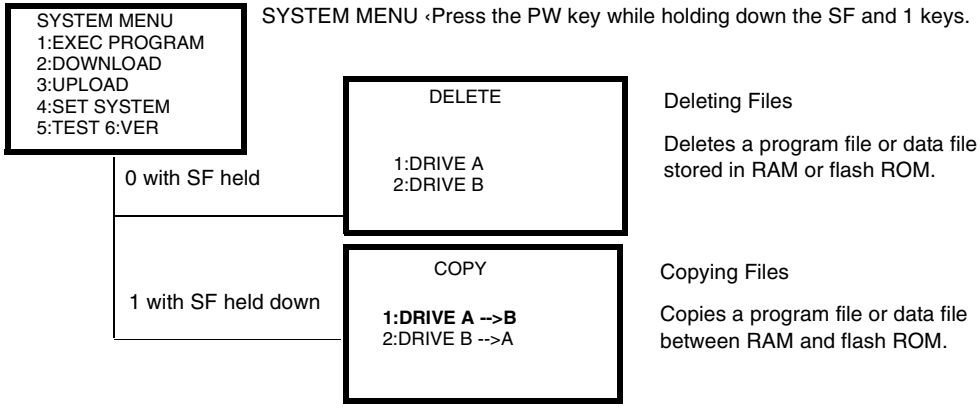
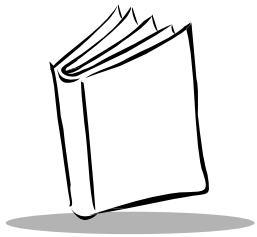



**Figure 4-3. Copying and Deleting Files**



# *Chapter 5*
# *Battery Charging and Terminal Maintenance*

## Introduction

This chapter provides information on charging the NiMH battery pack, and maintaining, storing, and troubleshooting the PDT 1100, CRD 1100, and CRG 1100.

# Parts of the CRD 1100 Cradle

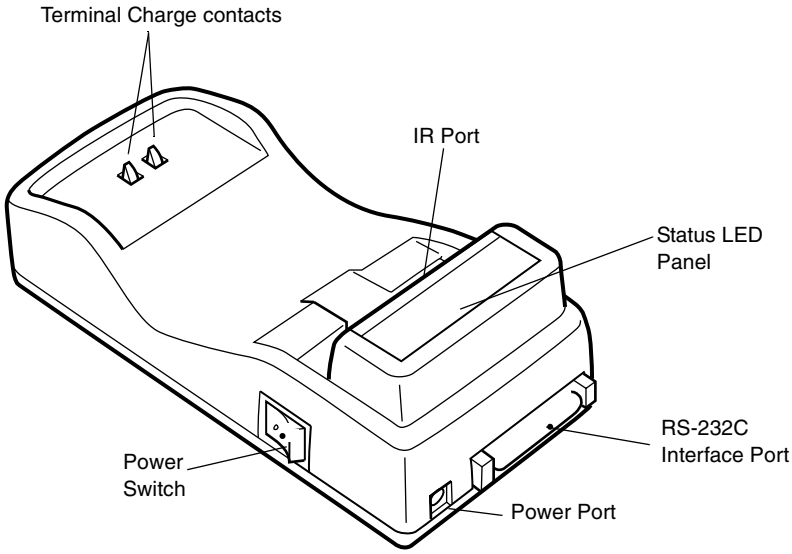



**Figure 5-1. CRD 1100 Components**

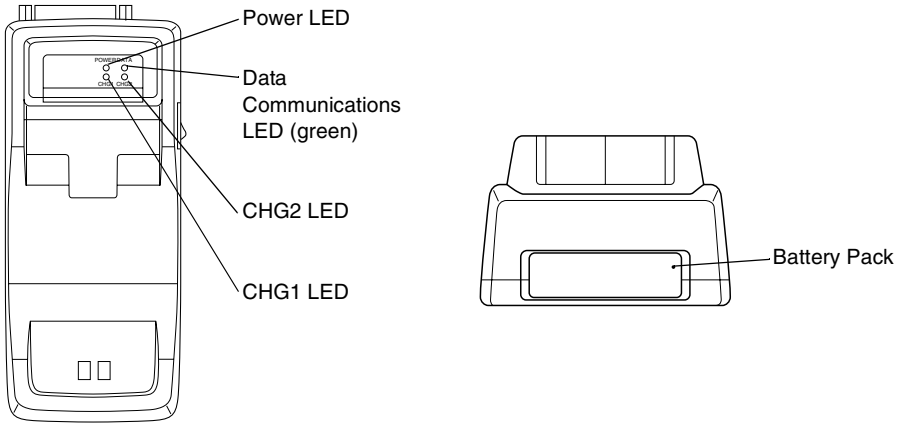



**Figure 5-2. LEDs and Charge Slot**

## *Component LED Descriptions*

Table 5-1 describes the components of the cradle and functions of the LED lights.

**Table 5-1. CRD Components**

| Name | Description |
|---|---|
| Terminal charge contacts | Contacts for charging the NiMH battery while in the terminal (not provided on the non-charging CRD 1100). |
| IR port | Exchanges data optically with the terminal. |
| Status LED panel | Indicates communication and charging status. |
| RS-232C interface port | Exchanges data with the host computer via serial cable. |
| Power port | Plug AC power supply into this port. |
| Power switch | Turns the cradle on and off. |
| Power LED (green) | Lights when power is provided to the CRD 1100. |
| Data communications LED (green) | Lights when cradle is communicating with host computer. |
| CHG2 LED (yellow) | Battery pack charge light. Lights when charging a NiMH battery pack in the battery slot. When charge is complete, flashes. |
| CHG1 LED (yellow) | Lights when the cradle is charging a NiMH battery loaded in the terminal. When charge is complete, flashes. |
| Battery pack slot | For charging the battery removed from the terminal (not provided on the non-charging CRD 1100). |

# Powering the CRD 1100 Cradle

The CRD 1100 is powered by an AC input 100-240VAC/DC output 12V 1.5A power supply (p/n 50-14000-03), and a DC inter-connect cable (p/n 50-16002-013).

1. Power off the CRD 1100.
2. Connect the DC inter-connect cable to the CRD 1100, and the other end to the power supply.
3. Connect the power supply to the wall outlet.
4. Power on the CRD 1100.

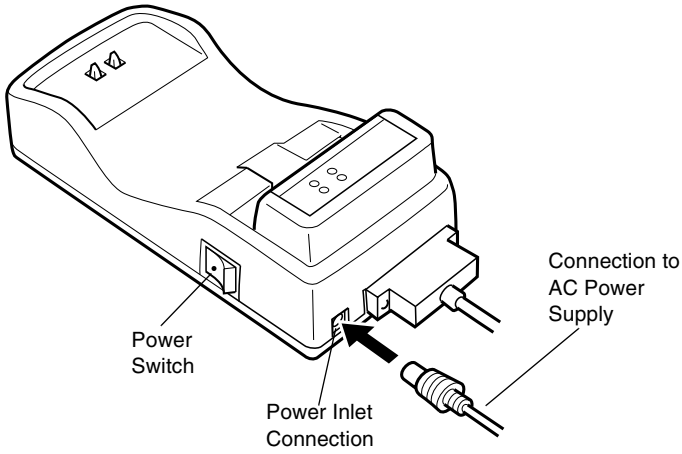



**Figure 5-3. AC Power Supply Connection**

# Charging the NiMH Battery Using the CRD 1100

The NiMH battery pack may be charged in the PDT 1100, or by itself.

## *Service Life of the Battery*

Due to normal wear and tear, the NiMH battery gradually deteriorates and the service period becomes shorter, even if the battery is fully charged. Generally, after about 200 charge cycles, the battery needs to be replaced. Recycle or dispose of battery properly.

## *Memory Effect*

If the battery is not fully charged, or if it undergoes repeated cycles of incomplete charging, the service period may shorten before the battery is really expired. This is known as “memory effect”. This can be eliminated or reduced by fully charging and then discharging the battery in the terminal as shown on the terminal’s battery indicator, or by doing battery maintenance cycling in the cradle. Refer to *Battery Pack Maintenance Cycling* on page 5-6.

## *Recharging the Battery in the PDT 1100*

To charge the battery in the PDT 1100:

1. Turn on the CRD 1100.
2. Place the PDT 1100 (with the battery loaded) in the cradle. After approximately 10 hours, the CHG1 LED flashes at 2 second intervals. This indicates that charging is complete.

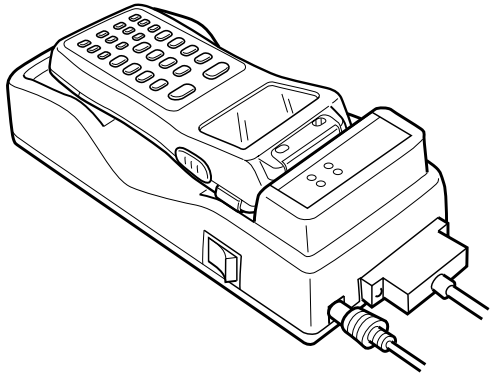
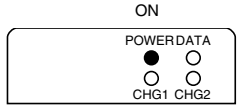


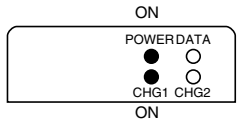
**Figure 5-4. Charging the PDT 1100 Battery**

## LED Indications for Recharging in the PDT 1100

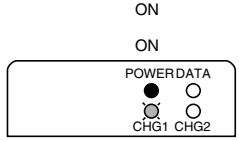
The cradle is on standby mode.




Charging begins.




The battery is fully charged and trickle charging begins.




Flashing at 2-second intervals.

## *Battery Pack Maintenance Cycling*

Battery pack maintenance cycling fully discharges and then recharges the battery pack in the cradle.

---

**Note:** *Do not fully discharge the battery pack more than once a month. Repeated discharging (after every use, for example) results in a quickly deteriorating battery.*

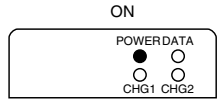
---

To perform battery pack maintenance cycling:

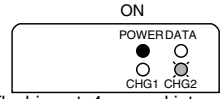
1. Power on the CRD 1100.
2. Remove the battery pack from the PDT 1100 terminal and insert it into the battery pack slot.
   - When the battery pack is seated properly in the slot and begins charging, the CHG2 LED flashes quickly (.4 second intervals).
   - The CRD 1100 discharges the battery pack. This takes 3 hours or less, depending upon the original condition of the battery pack.
   - When discharging is complete, the CHG2 LED stays on and the battery pack begins charging.
   - After about 10 hours, the LED flashes slowly (at 2 second intervals) indicating that charging is complete.
3. Remove the battery pack from the cradle.

### LED Indications for Maintenance Cycling

The cradle is on standby mode.

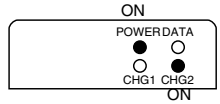



The battery begins discharging.

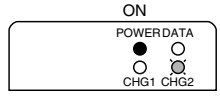



Flashing at .4-second intervals.

After discharge, the battery begins charging.




The battery is fully charged and trickle charging begins.




Flashing at 2-second intervals.

## *Charging Without Discharge Mode*

To charge the battery pack without discharging it first:

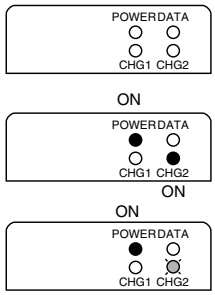
1. Power off the CRD 1100.
2. Insert the NiMH battery pack into the battery pack slot.
3. Power on the CRD 1100.
   - CHG2 LED illuminates and the battery begins charging.
   - After about 10 hours, the LED flashes slowly (at 2 second intervals) indicating that charging is complete.
4. Remove the battery pack from the cradle.

### LED Indications for Charging Without Discharge Mode

With the cradle powered off, load a battery pack into the CRD 1100.

Power on the CRD 1100. The battery begins charging.

The battery is fully charged and trickle charging begins.




Flashing at 2-second intervals.

# Using the CRG 1100 4-Slot Battery Charger

The CRG 1100 4-slot battery charger charges four NiMH battery packs simultaneously. One slot has discharge capability. Only the rechargeable NiMH battery pack designed for the PDT 1100 terminal can be charged in this charger. Figure 5-5 and Figure 5-6 show the front and back of the CRG 1100. Figure 5-7 illustrates the LED Indicator Panel display.

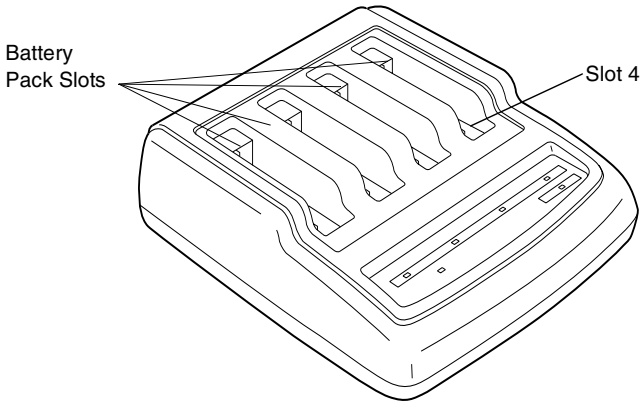



**Figure 5-5. Front View of the CRG 1100**

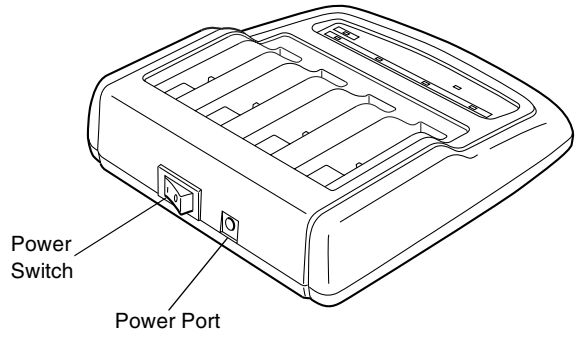



**Figure 5-6. Rear View of the CRG 1100**

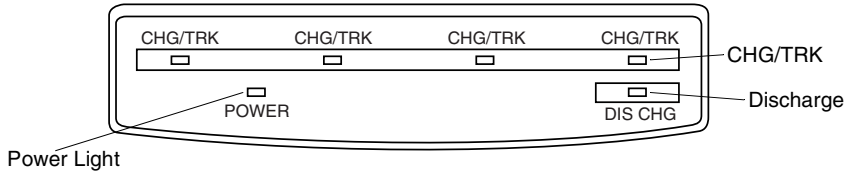



**Figure 5-7. LED Indicator Panel**

The following table describes the parts of the CRG 1100.

**Table 5-2. CRG 1100 Components**

| Name | Description |
|---|---|
| Battery Slot | Charges a rechargeable NiMH battery pack. |
| Slot 4 | Discharges and charges an NiMH battery pack. |
| Power Switch | Powers the unit on and off. |
| Power Port | Plug AC power supply into this port. |

**Table 5-2. CRG 1100 Components (Continued)**

| Name | Description |
|---|---|
| Power Light | Illuminates when power is supplied. Blinks when power supply is faulty. |
| CHG/TRK Light | Illuminates throughout normal charging, blinks in case of abnormalities in battery charging (about every .5 seconds). Blinks about every 2 seconds during trickle charging. |
| DIS CHG Light | Lights up during discharge (slot 4 only). |

## *Connecting the Power Supply*

The CRG 1100 is powered by an AC input 100-240VAC/DC output 12V 1.5A power supply (p/n 50-14000-103), and requires a DC inter-connect cable (p/n 50-16002-013).

1. Connect the DC inter-connect cable to the CRG 1100 and the other end to the power supply.

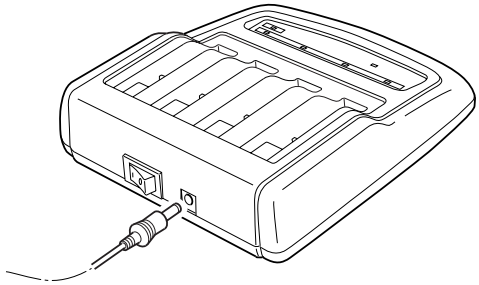


**Figure 5-8. Connection of the AC Power Supply**

2. Connect the power supply to the wall outlet.

## *Charging a Battery Pack*

The four battery slots on the CRG 1100 can charge independently. Slot 4 includes a discharge function.

To charge a battery pack:

1. Turn the power switch to ON. The power light illuminates.

2. Insert the battery pack in a charging slot.

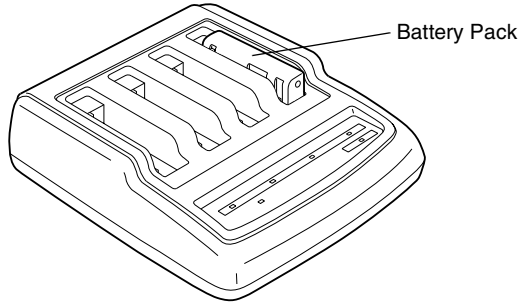



**Figure 5-9. Battery Pack in Charger**

3. The CHG/TRK light illuminates for that slot, indicating charging
4. Charging completes after about 10 hours. The trickle charging (CHG/TRK) light blinks.
5. Remove the battery pack from the charger.

## *Battery Pack Maintenance Cycling*

If the battery pack begins to have a reduced operating time between charges, it may be due to “memory effect”. This effect can be eliminated or reduced by battery pack maintenance cycling, which fully discharges and then recharges the battery pack. Do not discharge completely more than once a month, or the battery pack will deteriorate quickly.

To perform battery maintenance cycling:

1. Ensure that the power switch on the charger is OFF.
2. Insert a battery pack into slot 4.
3. Turn the power switch ON.
4. The DIS CHG light illuminates to indicate the battery pack is being discharged.
5. Charging begins when discharge is complete. The discharge/charge process takes about 13 hours.

# Batteries

## Charging the EDL Cap

Charge the terminal for a minimum of two hours when powering up for the first time, or when the batteries are out of the terminal for a few minutes or more. There is insufficient backup power to maintain data if this is not done. There is no indication on the terminal or the cradle when the Electric Double Layer (EDL) cap is charging.

## Battery Tips

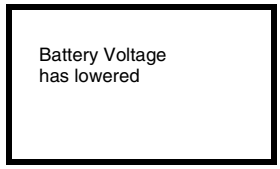
- When you first load batteries or a battery pack into a PDT 1100 that is new or hasn't been used for a long time, batteries must remain in the terminal for 24 hours. This allows the memory backup source integrated into the PDT 1100 to charge. This rechargeable memory backup source backs up the memory in the PDT 1100 when no batteries/battery pack is loaded, or the voltage level of the batteries/battery pack drops below the specified level. The memory backup source is automatically charged by the batteries/battery pack.
- Replace the batteries or battery pack quickly. Leaving the PDT 1100 with no batteries or battery pack for a long time may cause loss of memory contents or a system error indicated by the message: "System error! Contact your administrator. Note the error drive. (Drive X)" on the LCD.
- When disposing of the battery pack, cover the terminal pins with vinyl tape to prevent short-circuit.
- Upload data frequently since the data stored in RAM might be affected by the "soft error" or other environmental phenomena.

## Low Battery Indication

The PDT 1100 displays two messages indicating the battery voltage is getting low. The first message is only a warning, and the second message is a warning followed by immediate shutdown of the terminal until the batteries are replaced or the battery pack is recharged. This shutdown prevents the memory backup source from discharging and resulting in memory loss.

### Low Battery Indication—Level 1

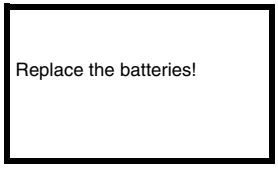
If the voltage drops below specific levels while the PDT 1100 is in operation, the terminal displays:



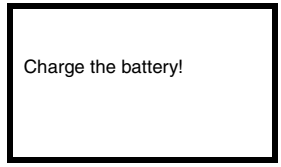

The PDT 1100 then beeps three times and resumes normal operation. This message means that the batteries will expire soon. Replace the alkaline batteries or replace/charge the battery pack.

### Low Battery Indication—Level 2

If you continue to use the PDT 1100 without battery replacement or recharge after the level 1 message appears, the PDT 1100 displays the following level 2 message, beeps five times, and turns itself off.




OR




If either message appears, immediately turn the power off and replace or recharge the batteries. If you are using AAA batteries, make sure you have new batteries available before removing the old batteries. Replace the batteries within 3 minutes to retain your data. After battery replacement, power on and check the operation.

## *Battery Replacement and Charging Tips*

- Before battery replacement, turn off the PDT 1100. Within three minutes after removal of the batteries/battery pack, load new batteries or a fully charged battery pack to avoid data loss. Power the PDT 1100 on and check its operation.

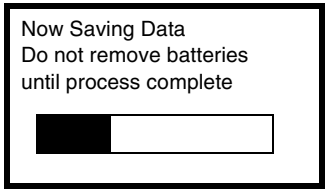
- When replacing alkaline batteries, always replace both.
- You may charge the NiMH battery pack with the optional CRD 1100 cradle or CRG 1100 charger four-slot battery charger.
- If the "Charge the battery!" or "Replace the batteries!" message appears after the PDT 1100 undergoes any shock or impact, turn the power off and on then check the battery output level. The battery may not have run out.

# Storing the Terminal

If you're not planning to use the terminal for a while, store the terminal with new batteries (AAA or a fully charged NiMH battery pack) loaded.

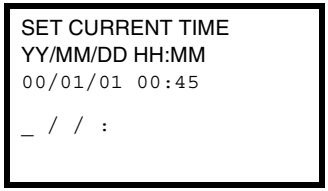
**Note:** *The batteries expire after two to three months, even if the terminal is not used. Replace the batteries before they expire or the PDT 1100 will not back up the memory. Do not leave the terminal without batteries for more than one hour. This may shorten the service life of the backup battery (rechargeable lithium battery) in the PDT 1100.*

If the PDT 1100 is to be stored for a long time without batteries, to flush the contents of RAM (system parameters and user data) to ROM, press and hold the PWR key for more than three seconds. The following message appears:




The backup process takes several minutes, depending on data capacity. The message disappears when backup is complete. Remove the batteries or battery pack.

When the terminal is stored without batteries, the clock in the terminal may stop. The following screen appears when you power on the terminal:



Set the current time. Contact your systems administrator for instructions.

# Troubleshooting

Following are checklists of common problems for the PDT 1100, CRD 1100, and CRG 1100.

## *PDT 1100*

**Table 5-3. Troubleshooting the PDT 1100**

| Problem | Possible Cause | Solution |
|---|---|---|
| PDT 1100 does not power on. | Battery pack is not installed. | Verify that the terminal has power from a battery pack. |
| | Battery pack is not charged. | Charge the battery pack. |
| | Battery pack is not installed correctly. | Install the battery pack correctly. |
| Scanner does not decode a bar code. | Scanning is not enabled. | Enable scanning on the host computer. |
| | Terminal is not programmed to read the type of bar code you are trying to scan. | Program the terminal to read the type of bar code you are trying to scan. |
| | The bar code is unreadable. | Make sure the bar code is not defective, e.g., smudged or dirty. |
| | Scan window is dirty. | Clean the scan window with lens tissue for use with eyeglasses. |
| No communication between terminal and host computer. | Loose cable connections (if cable is used). | Make sure the cable connections are not loose. |
| | Blocked IR port on terminal or cradle. | Make sure the IR ports on the terminal and the cradle are not blocked. |

## CRD 1100

**Table 5-4. Troubleshooting the CRD 1100**

| Problem | Possible Cause | Solution |
|---|---|---|
| No communication between terminal and cradle. | Terminal not seated properly in cradle. | Seat terminal properly in cradle. |
| | Power switch is off. | Turn power switch on. |
| Power light does not illuminate. | AC adapter not connected properly. | Properly connect AC adapter. |
| | Power switch is off. | Turn power switch on. |
| NiMH battery pack did not charge. | Battery pack failed. | Replace the battery pack. |
| | Insufficient charging time. | Allow the full 10 hours for battery pack to charge. |
| | Battery charging terminals on the battery pack and the charger are dirty. | Check and clean battery pack and charger terminals. |

## CRG 1100

**Table 5-5. Troubleshooting the CRG 1100**

| Problem | Possible Cause | Solution |
|---|---|---|
| The Power light does not illuminate. | AC adapter is not connected to an AC outlet. | Connect the AC adapter to an AC outlet. |
| | Charger power switch is not ON. | Set the power switch to ON. |

**Table 5-5. Troubleshooting the CRG 1100 (Continued)**

| Problem | Possible Cause | Solution |
|---|---|---|
| DIS CHG light does not illuminate. | Battery pack is not inserted properly in slot 4. | With the power switch OFF, insert the battery pack in slot 4 again, then turn the power switch ON. |
| | Battery charging terminals on the battery pack and the charger are dirty. | Clean the charging terminals on the battery pack and the charger. |
| CHG/TRK light does not illuminate. | Battery pack is not inserted properly in a charging slot. | Make sure the battery pack is properly inserted. |
| | Battery charging terminals on the battery pack and the charger are dirty. | Check and clean battery pack and charger terminals. |
| Power light blinks. | AC power output is too low. | Make sure AC power output is sufficient. |
| | Proper AC adapter is not used. | Use proper AC adapter. |
| The CHG/TRK light blinks. | There is an abnormality in the battery pack. | Insert another battery pack to see if the same problem occurs. If it does, contact the dealer. |

# *Appendix A*
# *Specifications*

## PDT 1100 Terminal Specifications

The PDT 1100 terminal product specifications are as follows:

**Table A-1. Terminal Specifications**

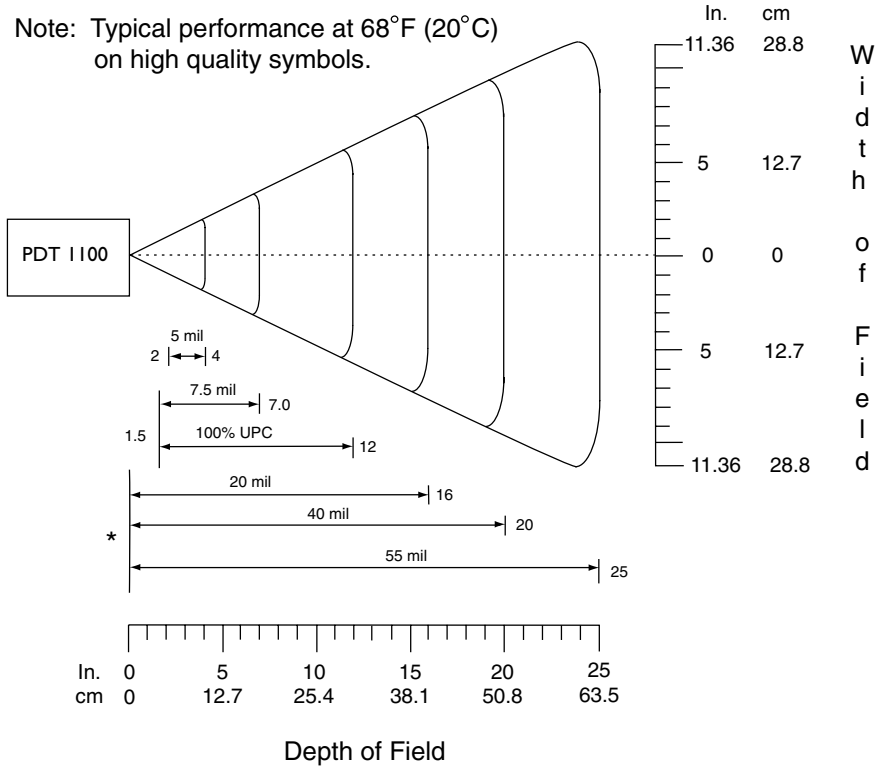
| | |
|---|---|
| **CPU** | 16-bit CMOS microprocessor |
| **Memory** | Flash ROM: 512 KB (including system area); RAM: 512 KB |
| **Application Development** | Proprietary Basic Compiler |
| **Display** | Dot Matrix, liquid crystal display (LCD) |
| **Decode Capability** | UPC/EAN, Code 39, Code 93, Interleaved 2 of 5, Discrete 2 of 5, USS-128, Codabar, UCC/EAN 128, ISBT- 128, Trioptic Code 39 |
| **Decode Range** | Maximum distance of 22 inches (56 cm) from the bar code reading window |
| **Dimensions** | 5.3” H x 2.3” W x 1.2” L (135 mm H x 59mm W x 30 mm L) |
| **Weight** | 5.7 oz (160 gm) |
| **Keyboard** | 24 keys including power key and four M keys |
| **Communications** | Optical interface: infrared interface; transmission rate: MAX 115.2 kbps; cable interface: Start/Stop synchronization; Transmission speed: Max 38,400 bps; signal level: RS 232. |
| **Light Source** | Visible laser diode at 670 nm |

**Table A-1. Terminal Specifications (Continued)**

| | |
|---|---|
| **Laser Class** | CDRH Class II and IEC Class 2 |
| **Scan Angle** | 53º nominal |
| **Scan Rate** | 36 ± 3 scans per second. |
| **Minimum Print Contrast** | 20% absolute dark/light reflectance at 670 nm |
| **Interface Type** | Serial RS-232, IrDA |
| **Power** | Two AAA alkaline batteries; new batteries provide up to 8,000 continuous scans; rechargeable NiMH battery pack optional. |
| **Operating Temperature** | 32º to 103º F (-0º to 40º C) |
| **Drop Specification** | Terminal withstands multiple 4 ft (1.2 meter) drops to concrete. |
| **Humidity** | 10 to 90% RH noncondensing |
| **Ambient Light** | Artificial: 450 ft.-candles (4,844 lux)<br>Sunlight: 8,000 ft.candles (86,112 lux) |

## *Scan Engine Decode Zone ($V_{cc}$ = 5V)*

The SE 1200 Wide Angle Scan Engine in your terminal decodes the symbols as shown in Figure A-1. Typical values are shown. Table A-2 lists the typical and guaranteed distances for selected bar code densities. The minimum element width (or “symbol density”) is the width in mils of the narrowest element (bar or space) in the symbol. The maximum usable length of a symbol at any given range is shown in Table A-2.




*Minimum distance determined by symbol length and scan angle

**Figure A-1. Scan EngineTypical Decode Zone**

**Table A-2. Scan Engine Decode Distances**

| Symbol Density | | Typical | | | | Guaranteed | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Min. | | Max. | | Min. | | Max. | |
| in. | mm | in. | cm | in. | cm | in. | cm | in. | cm |
| **0.005** | **0.127** | 2 | 5.08 | 4 | 10.16 | 2 | 5.08 | 4 | 10.16 |
| **0.0075** | **0.191** | 1.5 | 3.81 | 7 | 17.78 | 1.5 | 3.81 | 7 | 17.78 |

**Table A-2. Scan Engine Decode Distances (Continued)**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **100% UPC** | | 1.5 | 3.81 | 12 | 30.48 | 1.5 | 3.81 | 10 | 25.40 |
| **0.020** | **0.508** | * | | 16 | 40.64 | * | | 14 | 35.56 |
| **0.040** | **1.01** | * | | 20 | 50.80 | * | | 18 | 45.72 |
| **0.055** | **1.40** | * | | 25 | 63.50 | * | | 23 | 58.42 |

*Minimum distance determined by symbol length and scan angle.

# Bar Code Specifications

**Table A-3. Bar Code Specifications**

| Bar Code Type | Bar Dimensions | Readable Magnification |
|---|---|---|
| **Universal Product Codes** | | |
| EAN-13 | 0.26 to 0.66 mm<br>(10.24 to 13.0 mils) | 0.8 to 1.0 magnification |
| EAN-8 | 0.26 to 0.46 mm<br>(10.24 to 18.1 mils) | 0.8 to 1.4 magnification |
| UPC-A | 0.26 to 0.33 mm<br>(10.24 to 13.0 mils) | 0.8 to 1.0 magnification |
| UPC-E | 0.26 to 0.56 mm<br>(10.24 to 22.0 mils) | 0.8 to 1.7 magnification |
| 2-digit add-on | 0.26 to 0.66 mm<br>(10.24 to 26.0 mils) | 0.8 to 2.0 magnifications |
| 5-digit add-on | 0.26 to 0.66 mm<br>(10.24 to 26.0 mils) | 0.8 to 2.0 magnifications |
| Interleaved 2 of 5 (ITF) | 0.127 mm min. (5.0 mils min.)<br>PCS value ≥ 0.9 | |
| Standard 2 of 5 (STF) | Reflection intensity difference between white and black bars ≥ 80%. | |
| Codabar (NW7) | 0.15 mm min. (5.91 mils min.) | |

**Table A-3. Bar Code Specifications (Continued)**

| Bar Code Type | Bar Dimensions | Readable Magnification |
|---|---|---|
| Code 39 | (PCS value ≥ 0.45) | |
| Code 93 | 0.15 mm min. (5.91 mils min.)<br>PCS value ≥ 0.9 Reflection intensity difference between white and black bars ≥ 80% | |
| Code 128 | 0.19 mm min. (7.48 mils min.) | |

# Communications Specifications

Table A-4 lists the communications specifications for the PDT 1100 and a host computer via the CRD 1100 (optical interface) or direct-connect interface cable.

**Table A-4. Communication Specifications**

| Communications Port | Optical Interface | Direct-connect Interface |
|---|---|---|
| **Synchronization** | Start-stop | |
| **Transmission Speed** | 2400, 9600, 19200, 38400, 57600, or 115200 bps | 300, 600, 1200, 2400, 4800, 9600, 19200, or 38400 bps |
| **Character Length** | 8-bits | 7- or 8-bits |
| **Transmission Bit Order** | LSB (Least significant bit) first | |
| **Response Method** | ACK/NAK response | |
| **Vertical Parity** | None | Even, odd, or none |
| **Transparency** | Transparent or non-transparent mode | |
| **Stop Bit Length** | 1 bit | 1 or 2 bits |

## *Synchronization*

For accurate data transaction, synchronize the transmission between the sender and receiver. To do this, define the bit order, position, the character length, and the beginning and end of the character to be transmitted.

The start-stop synchronization is an asynchronous system which synchronizes each character as a unit; that is, it externally adds start and stop bits to the leading and trailing

bit positions of the character to be transmitted, respectively. A clock starts counting when it receives the start bit and it stops communicating when the stop bit is received. The number of the stop bits is selectable (1 or 2 bits).

## Optical Interface Communications Range

The optical interface's maximum effective range is 30 inches (80 cm) with the IR beam within a 10° angle of divergence.

## Transmission Code and Bit Order

All characters should be coded to 7- or 8-bit code for data transmission. The standard data exchange code of the PDT 1100 is 7- or 8-bit code. The transmission bit order is LSB (Least Significant Bit) first. Following is an example for transmitting character A (41h, 01000001b) coded to 8-level code with an even parity and a single bit for start and stop bits.

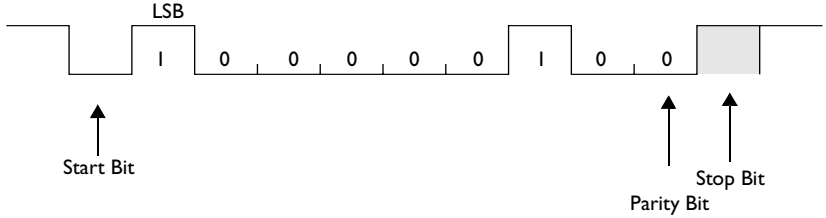



**Figure A-2. Transmission Example**

## Response Method

When two devices initiate communications, they exchange signals for correct data transmission. This procedure is called "handshaking" or "data link establishment phase." The sender sends a control code ENQ (05h) to inquire if the receiver is ready to receive data, and the receiver replies with a control code ACK (06h)(positive) or NAK (15h)(negative) to start data transmission.

## Vertical Parity

A vertical parity bit is a redundancy bit added to every character to be transmitted to check that data has been transmitted accurately. The parity bit should be set to "1" or "0" depending upon the parity parameter setting, to make the number of set bits in the character even or odd. The receiver counts the number of set bits in the transmitted character code to make sure that it has the selected number (even or odd) of set bits. The vertical parity bit immediately follows the MSB (Most Significant Bit) as shown in Figure A-3.

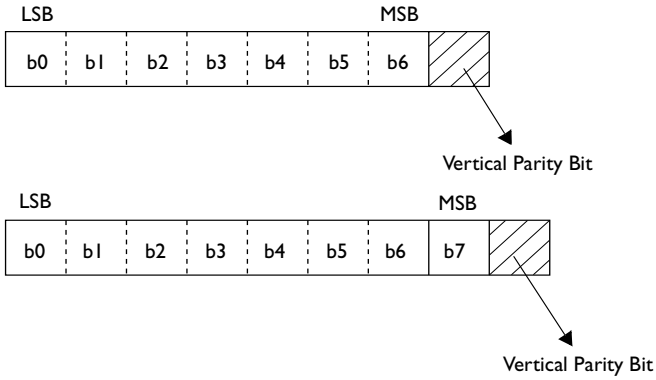



**Figure A-3. Vertical Parity**

## *BCC for Horizontal Parity Checking*

The PDT 1100 supports horizontal parity checking for every transmission block to check data transmission. A horizontal parity byte called BCC (Block Check Character) is appended after the ETX of every transmission block. Every parity bit of BCC is set so that all set bits at the same bit level (including a parity bit) in the transmission block characters have an even number by binary addition, excluding SOH, STX, and functions SOH$ and STX$. (For details about SOH$ and STX$ protocol functions which are unique to BASIC 3.0 interpreter, refer to the *PDT 1100 Terminal Programmer's Guide,* p/n 70-36099-xx.)

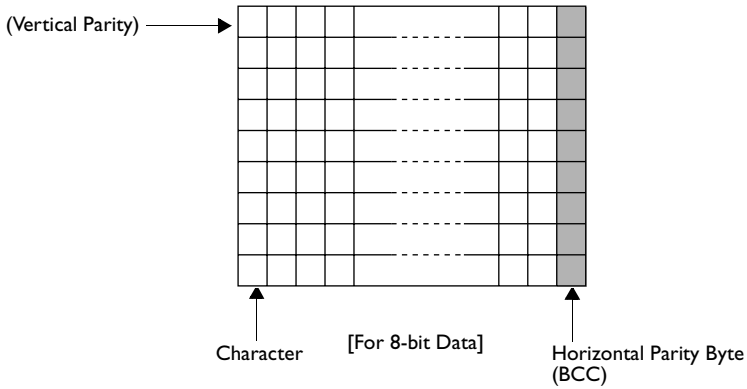



**Figure A-4. Horizontal Parity Checking**

## IR Protocol

The IR protocol is the communications procedure for the serial infrared link, used to transmit files between the PDT 1100 and a host (or between PDT 1100s). It adopts the ACK/NAK response method. The IR protocol can also be used for communications through the direct-connect interface. The IR protocol is composed of a defined set of the control character sequences including the following three phases:

- Phase 1: Establishment of data link - the sending station confirms that the receiving station is ready to receive data.
- Phase 2: Data transmission - the sending station transmits data to the target receiving station.
- Phase 3: Release of data link - the sending station confirms that transmitted data has been correctly received by the receiving station. If yes, the sending station terminates the data transmission and releases the data link.

This section lists the specifications for the optical interface and the direct-connect interface and describes the pin assignment.

## Optical (Infrared) Interface

- Synchronization: Start-stop
- Input signals: RD
- Output signals: SD
- Transmission speed: 115200 bps max.

## Direct-connect Interface

- Synchronization: Start-stop
- Transmission speed: 38400 bps max.
- Signal level: Conforms to the RS-232C interface
- Pin assignment: See Figure A-5.

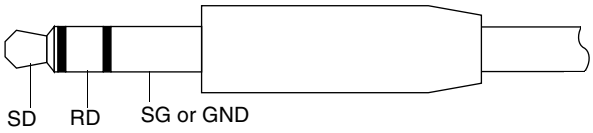



**Figure A-5. Pin Assignment**

**Table A-5. Pin Description**

| Pin No. | Signal | Functions | Signal Input/Output PDT 1100 External |
|---|---|---|---|
| 1 | SG (GND) | Signal Ground | ——— |
| 2 | SD | Send data | ——→ |
| 3 | RD | Receive data | ←—— |

# CRD 1100 Cradle Specifications

This section lists the cradle specifications and the requirements for charging a NiMH battery pack in the cradle.

**Table A-6. CRD 1100 Specifications**

| | |
|---|---|
| Power Source | 12 VDC (via the AC Power Supply) |
| Power Consumption | 2W |
| Dimensions<br>(W) x (L) x (H) | 82 x 190 x 57 mm<br>(3.23 x 7.48 x 2.24 inches) |
| Weight | Charging Cradle: Approx. 240 g (Approx. 8.47 oz.)<br>Non-charging cradle: Approx. 180 g (Approx. 6.35 oz.) |
| Operating Ambient Temperature | 0°C to 40°C (32°F to 103°F) |
| Operating Humidity | 20% to 80% RH (noncondensing) |

## *Charging/Discharging Requirements (CRD 1100)*

For charging a NiMH battery pack in the PDT 1100:

- Charge current: 70 mA
- Charge time: Approximately 10 hours.

For charging a NiMH battery pack alone:

- Charge current: 70 mA

- Charge time: Approximately 10 hours
- Discharge current: 180 mA
- Discharge time: Approximately 3 hours.

## Internal Connection in the CRD 1100

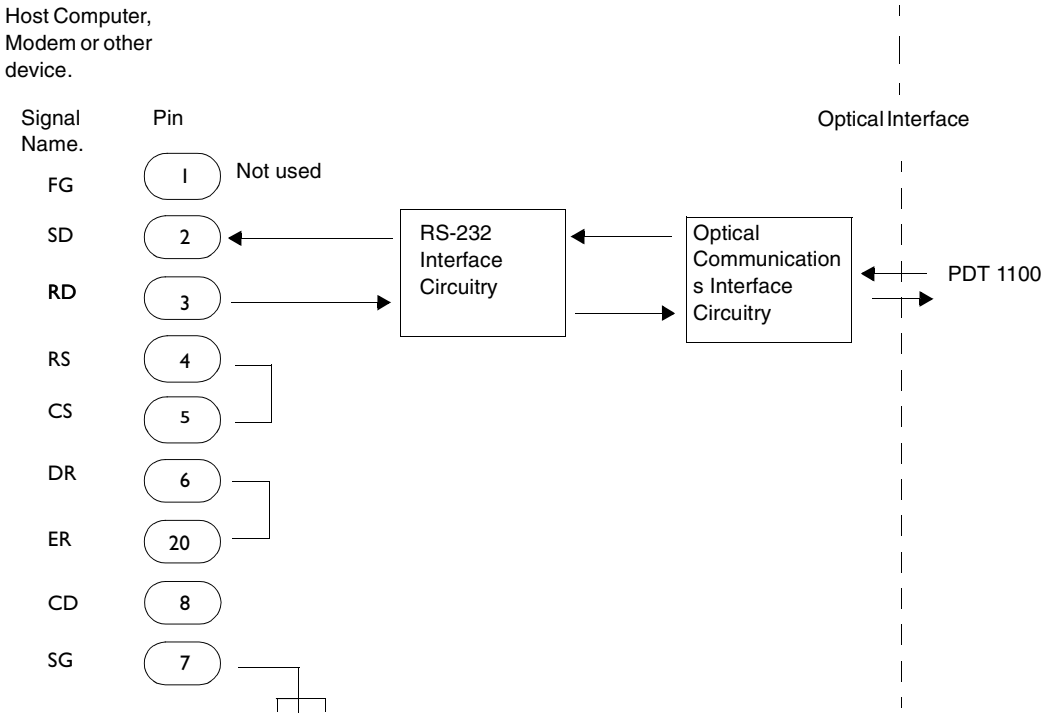



**Figure A-6. Internal Connection**

## *Interface Specifications*

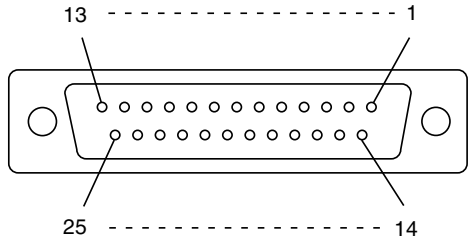



**Figure A-7. RS-232C Interface Port (Dsub-25S) on the CRD 1100**

**Table A-7. CRD 1100 Interface Port Specifications**

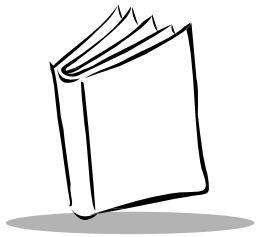
| Pin No. | Signal | Functions | Signal Input/Output PDT 1100 External |
|---|---|---|---|
| 1 | FG | Frame ground | ——— |
| 2 | SD | Send data | ——▶ |
| 3 | RD | Receive data | ◀—— |
| 4 | RS | Request to send | ——— |
| 5 | CS | Ready to send | ——— |
| 6 | DR | Data set ready | ——— |
| 7 | SG | Signal ground | ——— |
| 8 | CD | Carrier detect | ——— |
| 20 | ER | Data terminal equipment ready | ——— |

# CRG 1100 4-Slot Battery Charger Specifications

Table A-8 lists the 4-slot Battery Charger specifications.

**Table A-8. 4-Slot Battery Charger Specifications**

| Type | Description |
|---|---|
| Input Voltage | DC10 ~12V |
| Current Consumption | 2240mA (input voltage DC 12v) |
| Dimensions<br>(W) x (L) x (H) | 140cm x 140cm x 35cm<br>5.52 in. x 5.52 in. 1.38 in. |
| Weight | 210g [0.463 lb] ±10% |
| Operating Ambient Temperature | 0°C to 40°C (32°F to 103°F) |
| Operating Humidity | 20% to 80% RH (noncondensing) |

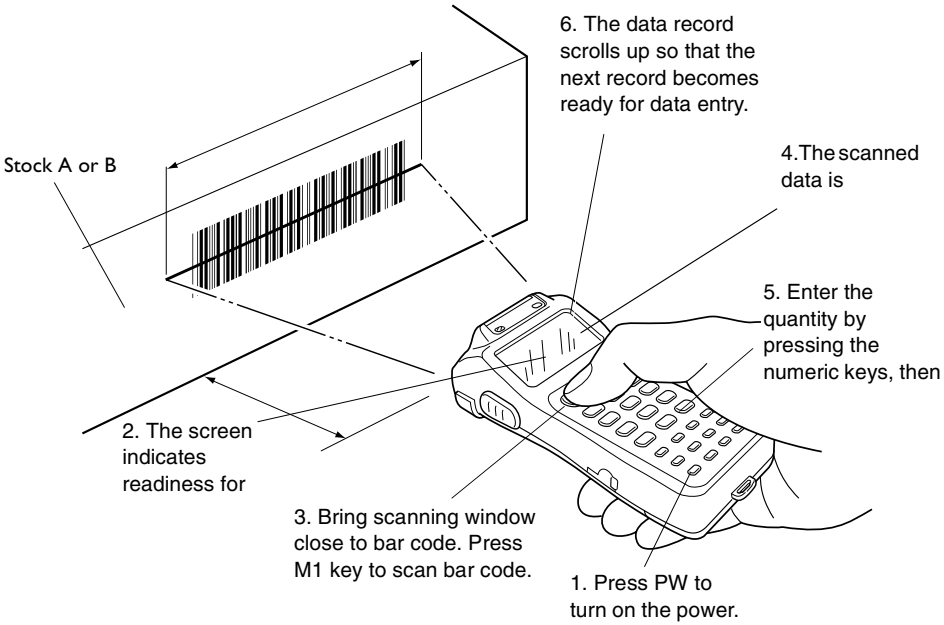


# *Appendix B*
# *Sample Application*

## Introduction

Following is a sample application to help the hands-on user in a scanning operation. For a typical inventory application, power the terminal on, scan the bar code on stock A, and key in the quantity. Scan the bar code on stock B, and key in the quantity. Repeat this operation.

# Typical Basic Operation



# *Appendix C*
# *Alphabet Input Procedure*

Each of 0-9 numeric keys and the period key is assigned three characters. For example, the 7 key is assigned A, B, and C. One of the three assigned characters can be assigned to these keys using the M1 alphabet input procedure. Note that the trigger switch function (default) or no function should be assigned to the M1 or M2 key used to program the keys.

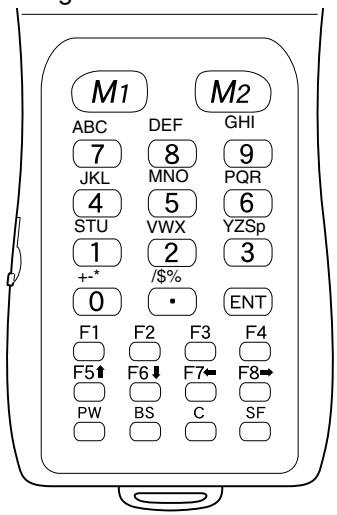



**Figure C-1. PDT 1100 Keypad**

# Alphabet Input Procedure

To activate the alphabet input function, issue an OUT statement in a user program, which sets 1 to bit 0 of port 5. To deactivate the function, issue an OUT statement which sets 0 to bit 0 of port 5.

- To activate: OUT 5, &h1
- To deactivate: OUT 5, &h0.

The alphabet input function is deactivated by default. To enter alphabetic characters from the keypad:

1. Check the position of the desired character (left, center, or right) relative to the three characters assigned to the target key.
2. Indicate that character's position by pressing the M1 or M2 key to cycle through the shift guidance blocks Left, Center, and Right on the LCD as described below.
3. While holding down the M1 or M2 key at the desired position (Left, Center, or Right), press the target key.

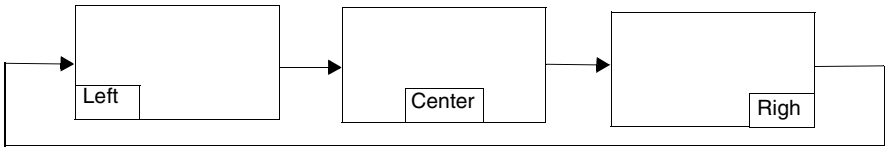
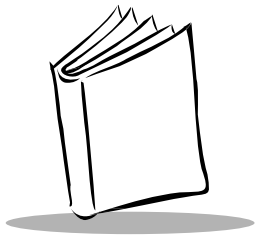



**Figure C-2. Using M Keys for Alphabetic Input**

## *Using the M1 and M2 Keys*

When the M1 or M2 key is held down, the shift guidance block appears on the top or bottom line, depending upon the current cursor position. That is, if the cursor lies on any of the lower lines, the shift guidance block appears on the top line; if it lies on any of the upper lines, the block appears on the bottom line. Press the target key while holding down the M1 or M2 key. To enter an N character, for example, use the M1 or M2 key to display the Center on the LCD. While displaying the Center, press the 5 key.

- For alphabet input, you can use the `BS, C,` and numeric keys as usual.
- The PDT 1100 overwrites the status indication ON to display the shift block Right.
- The activated or deactivated state of the alphabet input function is resumed.
- The shift block is not resumed.



# *Appendix D*
# *Error Messages*

This appendix contains information on the error messages that the PDT 1100 may display. The first section deals with System Errors, and the second section deals with errors in the System Mode. The tables describe the error messages, give possible causes for the problem, and note some possible solutions. In the event of a problem that cannot be solved, contact your Symbol Support Center.

## System Errors

If an error occurs in the system, one of the following error messages appears on the LCD.

**Table D-1. System Error Messages**

| Error Message | Problem | Possible Solution |
|---|---|---|
| **No System!** | A system Program Error has occurred. | Contact your nearest Symbol Support Center. |
| **Battery voltage has lowered** | Battery output has dropped below a specified lower level limit. | Batteries will require replacement or recharging soon. |
| **Replace the batteries! or Charge the battery!** | Battery output has reached a critical low. | Replace or recharge the batteries immediately. |
| **Reload the battery to restart! 01** | During execution, the System Program has attempted to write onto a write-protected area of RAM. | Unload and reload the alkaline batteries or the battery pack, then power on. |

**Table D-1. System Error Messages (Continued)**

| Error Message | Problem | Possible Solution |
|---|---|---|
| **Reload the battery to restart! 02** | During execution, the System Program received an invalid command code. | Unload and reload the alkaline batteries, or the battery pack, then power on. |
| **Flash ROM error! Contact your administrator** | The system failed to write onto flash ROM. The terminal beeps five times, then turns itself off. | Turn on the power again. If this occurs frequently, contact your nearest Symbol Support Center. |
| **RTC error! Contact your administrator** | The system failed to set the date and time to the real time clock (RTC) or failed to read out from it. | Turn on the power again. If this occurs frequently, contact your nearest Symbol Support Center. |
| **System error! Contact your administrator. Note the error drive (DRIVE X).** | An error is found in the system area of RAM or flash ROM during the memory backup test, which is activated when the power is turned on. This error message also appears the first time power is applied after purchase. | Initialize the PDT 1100. If the error persists after initialization, contact your nearest Symbol Support Center. |
| **Application error! Contact your administrator.** | An error occurred in the user area of RAM or flash ROM during the memory backup test activated when an application program is initiated. | Operate the PDT 1100 in System mode, and test files by executing “8 FILE” in the TEST menu. Download or delete defective files marked with an asterisk (*), then run the application program again. |
| **Resume Failure! Program restarts automatically.** | When the power was turned off, the system failed to save resume data, although the resume function set to ON. | The PDT 1100 displays this message for 2 seconds, then runs the execution program from start-up. |

# Errors in System Mode

If an error occurs during operation in System Mode, one of the following error messages appears on the LCD.

**Table D-2. System Mode Errors**

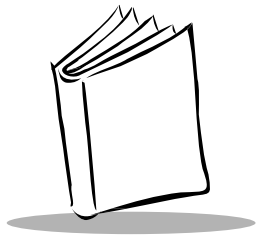
| Error Message | Problem | Possible Solution |
|---|---|---|
| **EXECUTE PROGRAM NO FILE EXISTS** | You attempted to execute a user program in the EXECUTE PROGRAM menu, when no user program files are stored in memory. | Load the appropriate program. |
| **SET EXEC PROGRAM NO FILE EXISTS** | In the SET SYSTEM menu, you attempted to select a user program file as an execution program to be run when the power is applied when no user program files are stored in memory. | Load the appropriate program. |
| **UPLOAD FILE (A:)**<br><br>**NO FILE EXISTS** | You attempted to select RAM or flash ROM for uploading in the UPLOAD menu when no data files are stored in the selected memory. | Press the C key to return to the SYSTEM MENU screen. |
| **DELETE FILE (A:)**<br><br>**NO FILE EXISTS** | You deleted all files stored in the designated memory in the DELETE menu. | Press the C (clear) key to return to the SYSTEM MENU screen. |
| **DOWNLOAD FILE (A:)**<br>**Out of memory!**<br>**Retry? 1:Yes2:No** | The designated memory is insufficient for storing files to be downloaded. | Press the 2 key to return to the SYSTEM MENU, then delete unnecessary files in the memory or decrease the size of the file to be downloaded. |

**Table D-2. System Mode Errors (Continued)**

| Error Message | Problem | Possible Solution |
|---|---|---|
| **DOWNLOAD FILE (A:)**<br>**Too many files!**<br>**Retry? 1:Yes2:No** | The current download will exceed the maximum of forty files in the memory. | Press the 2 key to return to the System Menu. If you attempted to download more than one file, delete unnecessary files in memory or decrease the number of files to be downloaded. |
| **DOWNLOAD FILE (A:)**<br>**XXXXXXXX.XXX**<br>**Communication error!**<br>**Retry? 1:Yes2:No** | Downloading failed. | To retry downloading, press the 1 key. To return to the System Menu, press the 2 key. Check the interface port and communications parameters in the SET SYSTEM menu or perform the communications test in the TEST menu. |
| **DOWNLOAD FILE (B:)**<br>**Drive A memory short!**<br>**Retry? 1:Yes 2:No** | RAM is insufficient for copying files stored in flash ROM.<br>When receiving downloaded files to flash ROM, the PDT 1100 may copy the files stored in flash ROM into RAM. This requires an unused area of 64 kilobytes in RAM. If this is not available, the error message shown at left appears. | Press the 2 key to return to the System Menu, then delete unnecessary files in RAM. |
| **UPLOAD FILE (A:)**<br>**SAMPLE00.PD3**<br>**File error!**<br>**Upload?1:Yes2:No** | The file you attempted to upload is damaged. | To upload the damaged file as is, press the 1 key, or press the 2 key to return to the System Menu. |

**Table D-2. System Mode Errors (Continued)**

| Error Message | Problem | Possible Solution |
|---|---|---|
| **UPLOAD FILE<br>(A:)<br>XXXXXXXX.XXX<br>Communication error!<br>Retry? 1:Yes2:No** | Uploading failed. | To retry uploading, press the 1 key. To return to the System Menu, press the 2 key. Check the interface port and communications parameters in the SET SYSTEM menu or perform the communications test in the TEST menu. Also check the communications parameters setup of the host computer. |
| **COPY FILE<br>(A->B)<br>Out of memory!** | The target memory is insufficient for storing files to be copied. | Press the C key to return to the System Menu, then delete unnecessary files in the memory. |
| **COPY FILE<br>(A->B)<br>Too many files!** | The current copying will exceed the maximum of forty files in the memory. | Press the C key to return to the System Menu, then delete unnecessary files in the memory. |



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## T



## U



## V

# *Tell Us What You Think...*

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How familiar were you with this product before using this manual?

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What topics need to be added to the index, if applicable?

_____

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What topics do you feel need to be better discussed? Please be specific.

_____

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What can we do to further improve our manuals?

_____

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