



PTC-870IM



## User's Guide



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# PTC-870IM

## User's Guide





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# Regulations 1

## General regulations

### FCC statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the Federal Communications Commission (FCC) rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

### DOC statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as outlined in the Radio Interference Regulations of the Canadian Department of Communications (DOC).

This Class A digital apparatus meets all requirements of the Canadian Interference-causing Equipment Regulations.

Cet appareil numérique de la Classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## **If your PTC contains a DATASPAN spread spectrum radio**

### **FCC regulations**

The PTC-870IM uses radios (transceivers) and radio communication in its operation. The PTC-870IM uses a spread spectrum radio transceiver that qualifies for unlicensed use. The FCC ID is on a label on the back of the unit.

### **DOC statement**

The PTC-870IM's radio is also approved for use in Canada. The PTC-870IM uses a spread spectrum radio transceiver that qualifies for unlicensed use. The Canadian DOC ID is on a label on the back of the unit.

This device complies with RSS-210 of Industry and Science Canada. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

## **If your PTC contains a MicroRadio**

### **FCC statement**

The MicroRadio in the PTC-870IM fully complies with FCC Part 15.249 limits for intentional radiation as well as FCC Part 15.209 for unintentional emissions.

### **FCC regulations**

The PTC-870IM uses radios (transceivers) and radio communication in its operation. The PTC-870IM is a low-power transceiver operating under FCC Part 15.249. No license is required for operation.

### **DOC statement**

The PTC-870IM's MicroRadio is also approved for use in Canada. No license is required for operation.

This device complies with RSS-210 of Industry and Science Canada. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

### **If your PTC contains an ARDIS radio**

The PTC-870IM's internal transmitter has been type accepted in accordance with FCC CFR Title 47, Part 90. The FCC ID, Canadian DOC ID, or ID number for another appropriate regulatory agency is on a label on the back of the PTC.

You must subscribe to the ARDIS radio network (U.S.), Bell-Mobility (Canada), or the DataTAC system carrier in the country of operation before using the internal ARDIS radio. You will need to provide the logical link identifier (LLI) number from the label on the rear of the unit for registration on the network. See your Telxon representative for information on subscribing to the network in the country in which the PTC will be used.

No license is required to operate this product in the U.S. or Canada. For information on operating regulations in other countries, see your Telxon representative.

# Safety information 2

! Never attempt to incinerate a nickel-cadmium battery; doing so could cause it to explode.

## Disposing of nickel-cadmium batteries

The PTC-870IM's nickel-cadmium bridge battery is not user accessible; however, it contains chemically active materials that are hazardous to the environment and must be disposed of properly.

Do not throw away the PTC-870IM when it has reached the end of its useful life. Send it to an authorized Telxon service center for bridge battery removal and recycling before the unit is permanently disposed of.

## If your PTC contains a radio

This device is compliant to the ANSI C95.1 (1992) Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields per FCC Docket 93-62.

## If your PTC uses an attached laser scanner

See the laser safety information included with your scanner.

# Scope of the manual 3

This manual provides general information on the PTC-870IM's parts, features, and accessories. It also explains how to operate and maintain the PTC.

This manual does not include the specific operating instructions for your organization's unique data collection program. Operating instructions and training should be available from your organization.

## Document conventions

The following conventions are used throughout this manual.

### Warnings

Warnings indicate potential bodily injury or death. They are set off in the left-hand columns of this manual by the following symbol: ⚠.

### Cautions

Cautions indicate potential damage to equipment. They are set off in the left-hand columns of this manual by the following symbol: !.

### Notes

Notes provide supplementary information. They are set off in the left-hand columns of this manual and are not preceded by a symbol.

# Overview of the PTC-870IM 4

The Telxon PTC-870IM (Industrial Mount) is a rugged, 486-processor-powered, PC-compatible, full-screen computer used to collect, store, and transmit data. It is designed to be attached to a warehouse vehicle via a mounting bracket.

The PTC-870IM automates your data collection procedures and is custom programmed to efficiently handle your organization's unique data collection jobs. Options for scanning bar codes and printing are also available.

The PTC runs a program specially designed to collect data for your organization. This program leads you through the data collection procedure with a series of display messages, prompts, and beeps. Messages tell you when you make an error and provide information on the program or the PTC's status. Prompts and beeps tell you when to enter data, what type of data to enter, and when you complete certain operations.

An optional version of the PTC-870IM is available for use in extremely cold environments, such as drive-in freezers.

The PTC-870IM is specially designed to be used in the field and in industrial settings. It is constructed to resist dust, dirt, and moisture and the vibrations and hazards found in these environments. Specifically, the case and internal components are designed to withstand cold, vibration, shock, and water.

## Entering data

Entering data into the PTC-870IM is easy. You can key in data through an optional keyboard, scan bar codes with a laser scanner, or select items on the PTC's screen (if your PTC has an optional touch



panel). Additionally, data can be sent and received through an optional internal radio.

### Through the keyboard

Entering data through the keyboard is similar to operating a calculator. As you press the data keys, the corresponding number or letter appears on the screen. Pressing the ENTER key stores data in the PTC's memory.

### With a laser scanner

A second method of entering data is with a laser scanner. When you scan a bar code the PTC is programmed to read, the PTC and scanner interpret the data and store it in the PTC's memory.

A bar code is a series of vertical bars and spaces used on nearly every item in business today.

### Via the optional touch panel

If your PTC has the optional touch panel feature, you can select items on the PTC's screen by using your finger to firmly press on the desired option.

! Use only your finger to select items on a touch panel screen. Using a pen or similar object will cause damage.

### Via a radio

Refer to **pages 21** and **38** for information on radio communication.

## Storing data

Data entered into the PTC can be stored in files in the PTC's random access memory (RAM) or on an optional internal solid-state hard drive.

Each file holds a separate group of application-related data. For example, a PTC used to collect many types of data (sales orders, inventory changes, and employee hours) would store all data relating to sales orders in one file, all data relating to inventory

changes in another, and all data relating to employee hours in still another.

## Communicating data

After collecting the data, the PTC must either transmit it to a host computer for processing or send it to a printer, or both, to make it useful to you and your organization.

Once the host computer receives the data from the PTC, it uses that data to update its master files and records. In some cases, the host computer may even transmit data back to the PTC, asking you, as the PTC's operator, to perform a new task.

# Getting started 5

## Unpacking the PTC-870IM

Any additional accessories, such as a laser scanner, are shipped in separate boxes.

Each shipping box contains

- a PTC-870IM,
- a power cable (if ordered),
- an AC power pack (if ordered),
- an antenna (if your PTC was ordered with a radio),
- a keyboard (if ordered),
- a mounting kit (if ordered),
- a *PTC-870IM Read-Me-First Sheet*, and
- a *PTC-870IM User's Guide*.

1. Remove the PTC and accessories from the box.
2. Remove all packing material from the PTC. Save the packaging in case the PTC is ever stored or shipped to Telxon for service.
3. Check the contents of the package to make sure you have received everything ordered.
4. Check the PTC and accessories for shipping damage. Pay particular attention to the PTC case and display screen.

If anything is missing or damaged, notify your Telxon sales representative.

## Lifting the keyboard off the PTC's screen (if a keyboard is attached to the unit)

If you ordered a keyboard and it is attached to the unit, follow the instructions in this section to lift it off the PTC's display screen.

! Do not try to adjust the keyboard without loosening the keyboard knobs; you could damage the PTC.

5. Loosen the keyboard knobs.
6. Using your thumb and index finger, squeeze the keyboard latches together.
7. While still holding the latches together, lift the keyboard off of the PTC and rotate it to the desired position.
8. Tighten the keyboard knobs to lock the keyboard in place.

## Supplying power to the PTC-870IM

If you wish to connect your PTC-870IM to vehicle power and to mount it to a warehouse vehicle, follow the instructions in [Appendix A](#).

If you wish to connect your PTC-870IM to AC power, follow the instructions in this section.

1. Plug the connector on the AC power pack into the PTC-870IM's power connector.
2. Plug the power pack into a standard electrical outlet (110 volts AC in the U.S. or Canada).

To use the PTC outside of the U.S. or Canada, you need a power pack designed for the country's AC voltage supply (e.g., 220 volts).

See [page 20](#) for more information on the PTC's bridge battery.

## Recharging the bridge battery

Before you use the PTC for the first time, connect it to AC or vehicle power for 10 to 12 hours to fully charge the internal bridge battery.

## Connecting the antenna

! Do not turn on the PTC-870IM or attempt to transmit data unless the antenna is attached; otherwise, the radio may be damaged.

If your PTC-870IM contains a single radio, screw the antenna into the antenna connector on the top of the unit.

If your PTC contains two radios, connect the antenna for the spread spectrum radio to the antenna connector on the top of the unit and the antenna for

the ARDIS radio or MicroRadio to the antenna connector on the bottom of the unit.

## Turning on the PTC-870IM

Press the On/Off button to turn on the PTC-870IM.

### Running the power-on self test

When you turn on the PTC-870IM, it automatically performs a series of self-diagnostic tests to ensure it is operating correctly. The Power LED blinks for approximately 5 seconds while the tests are being run.

If the Power LED does not light or the PTC does not turn on after 5 seconds, the diagnostics have discovered an error. Check the PTC's connection to AC or vehicle power and all other connections to the PTC. Then attempt to turn on the PTC again. If the error persists, refer to the "Troubleshooting" section on [page 42](#).

## Checking the PTC-870IM

1. Make sure the PTC is turned on.
2. Look at the PTC's display screen. What appears on the screen depends on the program your organization uses.

If the PTC is operating correctly, you should not see a blank display screen or hear any beeps warning you that an error has occurred.

Repeat the steps in this chapter if your PTC-870IM is not operating properly. If the problem persists, refer to the ["Troubleshooting"](#) section of this manual or contact the Telxon Customer Support Center at 1-800-800-8010.

# Parts 6

Figures 1 through 3 on pages 23 to 25 show and describe the external parts of the PTC-870IM. The parts listed on pages 20 through 22 are not shown in any of the figures.

## Bridge battery

An internal rechargeable nickel-cadmium bridge battery provides power to protect data stored in the PTC's RAM memory if the unit is disconnected from AC or vehicle power. The bridge battery can protect the PTC's memory for at least 60 hours, depending on the memory's size. It is recharged automatically while the unit is receiving power.

The bridge battery's condition is checked every time the PTC is turned on. If bridge battery power is low, the PTC beeps five times. If you hear these beeps or if the PTC has been disconnected from AC or vehicle power for over 60 hours, reconnect the power and allow the bridge battery to recharge for 10 to 12 hours.

The bridge battery is not user replaceable. When the bridge battery no longer holds a charge, send your PTC to an authorized Telxon service center to have the bridge battery replaced. The center will insert a new bridge battery into your PTC and follow the proper procedure to recycle the failed battery.

## Flash EPROMs

*Flash EPROMs* are electronic chips installed inside the PTC. In the PTC-870IM, they hold the operating system, device and utility programs, and perhaps your application program. If your PTC has an

The documentation provided with the Telxon Pen-based 11x4 Series Software Development Kit contains details on reprogramming flash EPROMs.

internal radio, a separate flash EPROM holds the program that controls the radio.

All of the flash EPROMs can be erased and reprogrammed while they are inside the PTC. First, the PTC must be connected to a host computer via cable. (See [Appendix C](#) for cable part numbers.) Then, using the FLASHPC.EXE utility program on the host and the FLASH386.EXE utility program on the PTC, any or all of the flash EPROMs can be reprogrammed.

## Mounting bracket

The mounting bracket, which is secured to the PTC by mounting handles, is used to attach the unit to the frame or housing of a warehouse vehicle such as a forklift.

## Non-vehicle mounting holes

For freezer units, make sure you leave enough clearance to replace the desiccant cartridge when necessary.

Four M6x1 metric threaded holes on the back of the PTC allow the unit to be mounted to a wall or a horizontal surface (instead of to a warehouse vehicle). See [page 49](#) for mounting instructions.

## Processor

The PTC's 50-MHz 486SLC microprocessor is fully IBM PC compatible and provides exceptional processing speed.

## Radio

The PTC-870IM can be equipped with a single ARDIS radio, spread spectrum radio, or MicroRadio or with two radios in the following combinations: a 2.4-GHz spread spectrum radio and an ARDIS radio or a 900-MHz or 2.4-GHz spread spectrum radio and a MicroRadio. A description of each radio follows.

No license is required to operate the ARDIS radio in the U.S. or Canada, but you must subscribe to the ARDIS radio network before the radio can be operated.

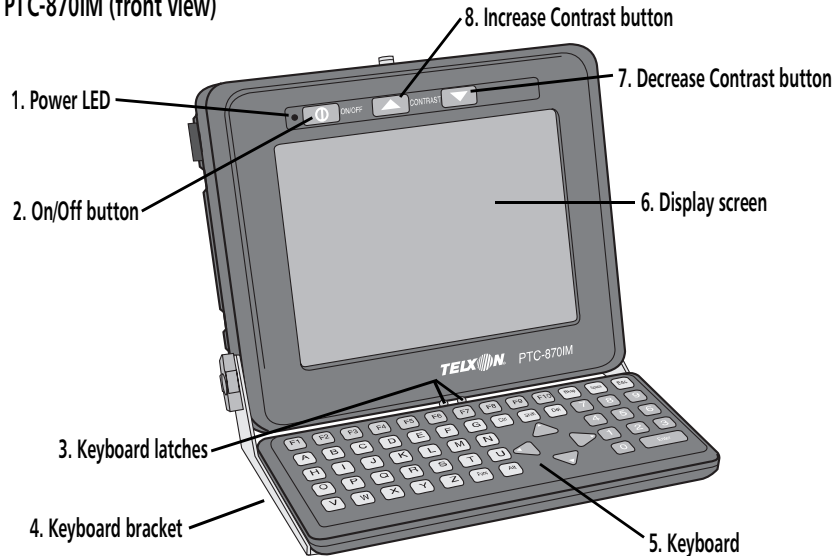
The PTC-870IM's MicroRadio can communicate with any other Telxon product containing a MicroRadio, for example, the PTC-921, AMT-925W, and POS-5000.

- An Advanced Radio Data Information Service (ARDIS) radio allows the PTC to communicate via the wide area ARDIS digital communication network or another DataTAC network.
- A DATASpan spread spectrum radio allows the PTC to interactively communicate in real-time with a host computer on a radio-based local area network. Spread spectrum provides secure, interference-free communication and does not require a license for operation.
- A MicroRadio allows communication with optional wireless accessories, including a printer and a wireless scanning terminal.

Your application program controls the radio. Refer to your application's manual for details on using the radio to transmit and receive data.

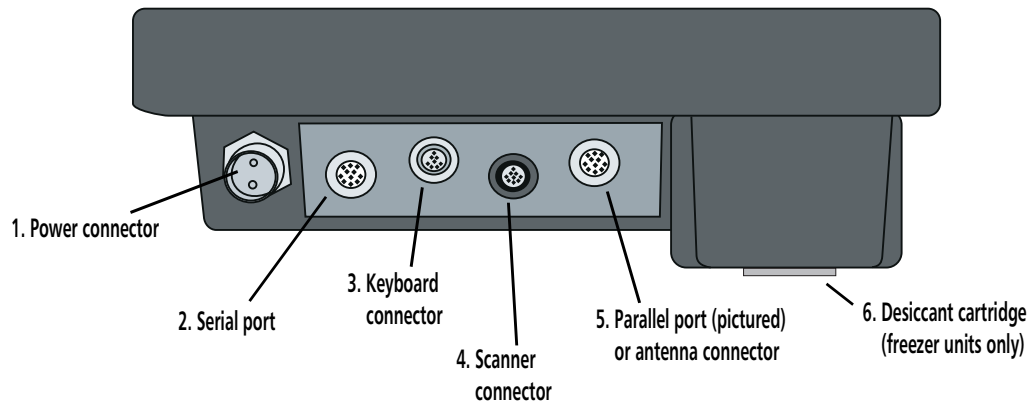


Figure 1. The PTC-870IM (front view)



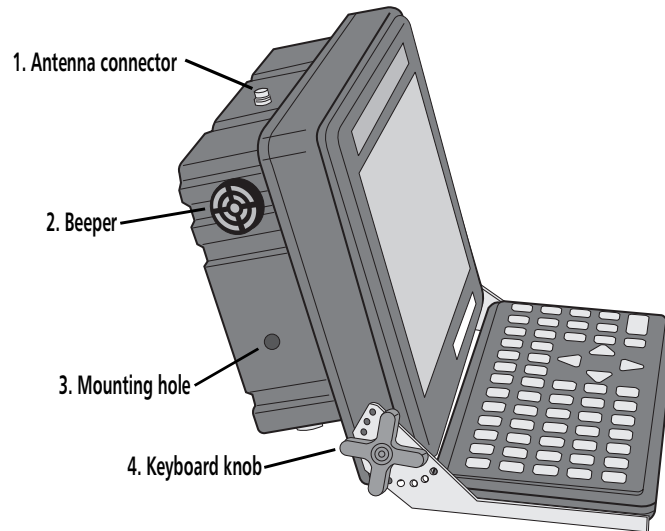
1. This green light-emitting diode (LED) indicates the status of the PTC. Refer to [page 43](#) for an explanation of the LED codes.
2. This button turns the PTC on or off.
3. Squeezing these two latches together allows the keyboard to be rotated into various positions.
4. This bracket allows an optional keyboard to be attached to the PTC. It also provides a flat surface for the keyboard to rest on.
5. Two types of optional PC/AT keyboards are available for use with the PTC: a QWERTY keyboard and an ABC keyboard. These two keyboards can be distinguished by the arrangement of their keys. For example, a QWERTY keyboard begins with the letters Q, W, E, R, T, Y, and an ABC keyboard displays its letters in alphabetical order. The ABC keyboard can be ordered as either a DOS or an emulation (3278 or 5250) keyboard. Specially sealed keyboards are available for freezer units. Follow the instructions on [page 31](#) to connect the keyboard to the PTC and to rotate the keyboard into a comfortable position.
6. The PTC's standard display screen is a transmissive, VGA-resolution liquid crystal display (LCD) with 640 by 480 lines of resolution and a built-in backlight to make it readable in dim conditions. An electro-luminescent (EL) panel display screen is available as an option. This screen does not have a backlight but can be used in temperatures as low as -22 degrees F/-30 degrees C (non-freezer units) or -30 degrees F/-34 degrees C (freezer units). An optional touch panel, which allows you to select menu options by touching the PTC's screen, is available for both display types. Freezer units, which use an EL panel display screen, have a built-in heater that automatically keeps frost and condensation off the screen.  
The screen displays data entered into the PTC and may show prompts, error messages, and other information.
7. Pressing this button decreases screen contrast in steps until it reaches minimum contrast. This button is not operable on PTCs with EL panel screens.
8. Pressing this button increases screen contrast in steps until it reaches maximum contrast. This button is not operable on PTCs with EL panel screens.

Figure 2. The PTC-870IM (bottom view)



1. The power cable or an optional AC power pack plugs into this connector to power the PTC. Two types of power cables are available: a 12-72 VDC power cable (for non-freezer units without a WAN radio or for freezer units) and an 11-20 VDC power cable (for non-freezer units with a WAN radio). The PTC's power range is identified on the unit below the power connector.
2. This 11-pin port connects the PTC via cable to standard RS-232 serial devices such as printers and modems. See [page 36](#) for instructions.
3. This connector allows you to connect a PC/AT keyboard to the PTC. See [page 31](#) for instructions.
4. This connector allows you to connect a laser scanner to the PTC. See [page 33](#) for instructions.
5. If your PTC contains two radios, the antenna for the ARDIS radio or MicroRadio plugs into this connector. If your PTC does not contain two radios, this area of the PTC may house a parallel port, which can be used to connect the PTC to standard parallel devices such as printers. See [page 37](#) for instructions on connecting a parallel device.
6. The desiccant cartridge absorbs moisture in the PTC when the unit is used in a freezer environment. The cartridge should be replaced when its window changes from blue (dry) to pink (saturated). Follow the instructions on [page 40](#) to replace the cartridge.

Figure 3. The PTC-870IM (side view)



1. If your PTC has an internal radio, an antenna screws into this connector. If your PTC has two radios, the antenna for the spread spectrum radio screws into this connector. If the unit does not have a radio, the connector is sealed with a rubber plug or a SEMS screw (see [Appendix C](#) for part numbers). The antenna sends and receives radio transmissions, allowing the PTC to communicate with a host computer. The antenna must be attached to the PTC before the unit can be used.
2. The PTC's beeper can be used by your application to warn you of problems or to prompt you to take an action. For example, the PTC warns you with a series of beeps if the bridge battery is running out of power. See [page 43](#) for an explanation of the standard beep codes. Other codes may be specific to your application. Your application controls how the beeper is used and may allow you to adjust the beeper's volume.
3. Mounting handles can be inserted into these two holes (one on each side of the PTC) to secure the unit to a mounting bracket. See [Appendix A](#) for instructions.
4. Loosening these two knobs (one on each side of the PTC) allows the keyboard to be rotated into various positions. Tightening the knobs secures the keyboard in position.

# Features 7

See [page 35](#) for a list of bar-code types the PTC can be programmed to read.

## Autodiscrimination between bar codes

Your PTC's application program may be set up to read and automatically discriminate between a number of bar-code types. See your organization's application manual or instructions for the bar-code types your PTC is programmed to recognize.

## Automatic keyboard recognition

The PTC automatically recognizes when a keyboard is attached and can immediately accept input from it.

## Automatic sleep and resume

### Sleep

The PTC-870IM goes into a sleep state in each of the following circumstances: if it is not used for a period of time or if it is turned off using the On/Off button. In the sleep state, the PTC turns off portions of its internal electronics to conserve power.

The PTC has two stages of sleep. The first stage begins after approximately 1 minute of inactivity or when the Off button is pressed. The PTC's screen goes blank, the backlight (if present) turns off, and other subsystems inside the PTC may slow down or turn off to conserve power. The PTC's Power LED blinks every 4 seconds to show that the PTC is in the first sleep stage. The application program running at the time stays on, and any data in RAM is protected.

The documentation provided with the Telxon Pen-based 11x4 Series Software Development Kit contains programming instructions.

The second stage begins after approximately 17 minutes of inactivity. The PTC automatically notes where you are in the application, stores that information, saves any data, and turns itself off. The Power LED also turns off.

The exact amount of time before the PTC goes into either sleep state depends on how your PTC is programmed.

## Resume

If the PTC is in one of the sleep stages, pressing the On/Off button turns the PTC back on and returns you to the point at which you left the application.

## Clock

The clock can be set using the MS-DOS TIME and DATE commands.

The PTC-870IM has a built-in clock that keeps track of the date (month, day, year, and day of the week) and the time (hours, minutes, seconds, and tenths of seconds). The clock operates continuously. How the clock is used depends on your application program. For example, the PTC can use the clock to show the date and time on its screen or to time-stamp a file.

## Internal heater (freezer units only)

The PTC-870IM's built-in heater turns itself on and off automatically to prevent frost and condensation from building up on the PTC's screen. A sensor on the display screen detects the surrounding temperature and turns the heater on or off accordingly.

## Memory

The PTC-870IM has two types of memory: read-only memory (ROM) and random access memory (RAM).

### ROM

The PTC has 2 megabytes (MB) of read-only memory. The first 256 kilobytes (KB) are used to store programs and information the PTC needs when it starts up. These include the MS-DOS operating system and the Basic Input/Output System (BIOS). The remainder is available to hold the pen operating environment, utility and device drivers, and an application program. If your PTC has a radio, 64 additional KB of ROM are installed to hold the radio's control program.

The documentation provided with the Telxon Pen-based 11x4 Series Software Development Kit contains details on reprogramming flash EPROMs.

The PTC's ROM is contained on electronic chips called *flash EPROMs*, which can be reprogrammed while inside the PTC. This makes it easy to update the operating system and your application program when necessary.

The advantage of having these programs in ROM is that they will remain loaded in the PTC even when it is rebooted. In this way, ROM acts much like a disk drive (ROMdisk) as far as the PTC is concerned.

Refer to the "Drive lettering" section on [page 29](#) for the drive letter assignments.

### RAM

The PTC's standard configuration has 2 MB of random access memory. (4-, 8-, and 12-MB options are also available.) RAM is used to store data the PTC needs while it is running. One MB of RAM is reserved for running the operating system and your application. The remaining RAM can be used by applications or as a RAMdisk (random access memory emulating a disk drive).

The documentation provided with the Telxon Pen-based 11x4 Series Software Development Kit contains information on creating a RAMdisk or expanded memory.

The PCMCIA slot is not user accessible.

Data stored in RAM can be easily read, written, and changed, but it is also volatile. All data in RAM (including the RAMdisk) will be lost if power to the unit is disconnected and the bridge battery runs out of power.

During normal operation, the PTC's sleep/resume feature automatically saves data in RAM and saves your place in the application.

You may also be able to use some or all of the RAM above 1 MB as expanded memory using a LIM EMS 4.0 driver.

Refer to the "Drive lettering" section below for the drive letter assignments.

### Drive lettering

The PTC-870IM's operating system identifies an internal PCMCIA slot, a ROMdisk, a RAMdisk, and a hard drive by assigning them drive letters as follows:

- Drives A and B are the internal PCMCIA slot.
- The ROMdisk (the application flash EPROM) is drive C, unless a RAMdisk has been created.
- If a RAMdisk exists, the RAMdisk is drive C, and the ROMdisk is drive D.
- If a hard drive is installed, it always receives the last drive letter. If no RAMdisk exists, the hard drive is D. If there is a RAMdisk, the hard drive is E.

Drives installed	PCMCIA	ROM	RAM	Solid-state hard drive
Letter assigned	A & B	C	Not installed	Not installed
	A & B	C	Not installed	D
	A & B	D	C	Not installed
	A & B	D	C	E
	A & B	Not installed	Not installed	C

The following applications, which run on top of MS-DOS, are available for the PTC-870IM: ANSI/VT220 (TCP or TXP), 3278, or 5250 emulation.

## Operating system/environment

The PTC-870IM's operating system is MS-DOS 6.22. A separate pen operating environment runs on top of MS-DOS and enables touch recognition for units that have the touch panel feature. The following pen operating environments are available from Telxon: PenRight!, PenDOS, PenRight! for Windows, and Windows for Pen Computing.

Both MS-DOS and the pen operating environment are preloaded into the PTC. However, your organization must load your application program.

## Screen contrast

The Increase and Decrease Contrast buttons are not operable on PTCs with EL panel screens.

For PTC-870IMs with transmissive LCD screens, the screen contrast can be increased or decreased using the PTC's Increase and Decrease Contrast buttons.



# Using a keyboard 8

If you ordered a keyboard for use with your PTC-870IM, follow the instructions below to connect it to the PTC.

The keyboard may or may not be bolted to the unit. If it is, follow the instructions in the “Adjusting the keyboard” section below to rotate the keyboard into a comfortable position.

## Connecting a keyboard to the PTC-870IM

1. Turn off the PTC.
2. Plug the keyboard's cable into the PTC's keyboard connector.

## Adjusting the keyboard

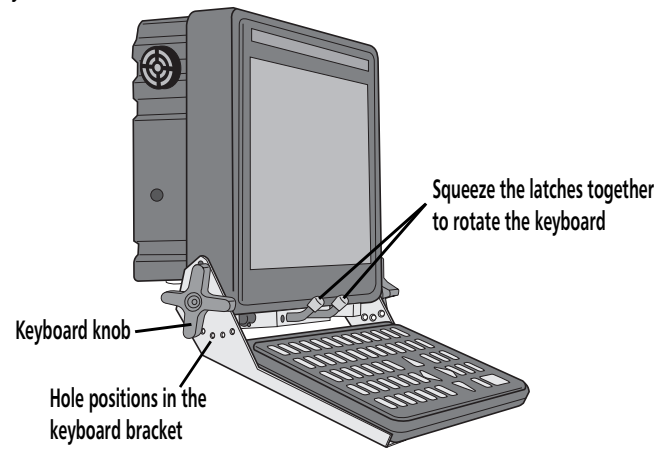
! Do not try to adjust the keyboard without loosening the keyboard knobs; you could damage the PTC.

1. Loosen the keyboard knobs.
2. Using your thumb and index finger, squeeze the keyboard latches together and rotate the keyboard into the desired position. See **Figure 4**.

A metal bar on the bottom of the unit slides into different hole positions in the keyboard bracket as you squeeze the latches and rotate the keyboard. See **Figure 4**.

3. Tighten the keyboard knobs to lock the keyboard in the desired position.

Figure 4. Adjusting the keyboard



# Using a laser scanner 9

The documentation provided with the Telxon Pen-based 11x4 Series Software Development Kit contains instructions on loading the driver.

An optional laser scanner can be connected to your PTC to allow bar codes on labels, boxes, etc. to be read directly into the PTC's memory.

The following procedures assume that a software driver for the laser scanner has already been installed in your PTC.

## Connecting a laser scanner

1. Turn off the PTC.
2. Plug the connector on the laser scanner into the PTC's scanner connector.

## Disconnecting a laser scanner

1. Turn off the PTC.
2. Turn off the laser scanner, if necessary.
3. Pull the connector on the laser scanner away from the PTC's scanner connector.

## Scanning bar codes

See [page 35](#) for a list of bar codes the PTC can be programmed to read.

If your application has been set up to read bar codes, your PTC can automatically recognize and interpret one or more types of codes. See your application's manual for the codes your PTC has been programmed to recognize.

Your application program may prompt you when it requires you to read a bar code. It may also alert you when a bar code has been read successfully or warn you when a read has failed.

⚠ Do not stare into the laser beam or point the scanner at anyone's eyes. Eye damage could occur.

See the instructions provided by your organization for the recommended scanning distance.

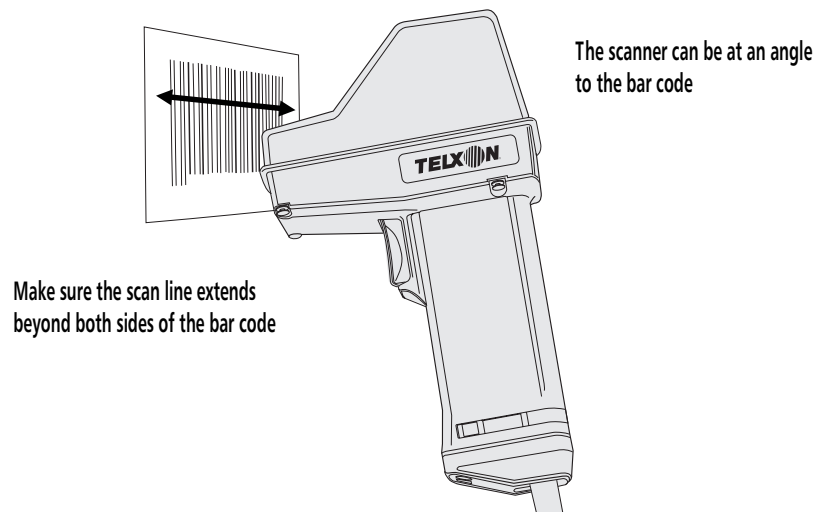
If your PTC has a backlight, it may be programmed to blink off during scanning operations to conserve power.

Follow this procedure to scan bar-code labels if your PTC is equipped with an external laser scanner.

1. Point the laser scanner at the label to be scanned. The scanner can be at an angle to the label. The maximum distance from the window on the nose of the scanner to the label depends on whether you have a short-range or long-range bar-code scanner and on the size of the label being scanned.
2. Press the trigger on the scanner to start scanning. Your scanner may have a light or other indicator to let you know it is scanning.
3. Watch the line of light made by the scanner as it scans the bar code. The line must pass over all of the bars on the label for the bar code to be read. See Figure 5.

If the scan is successful, the PTC may beep or inform you in some other way, depending on your application program. The scanner may also have a light that glows to indicate a successful scan. See the scanner's manual for details.

Figure 5. Reading a bar code with a laser scanner



See the information provided by your supervisor for the codes your PTC has been programmed to recognize.

## Supported bar-code types

The PTC-870IM can be programmed to read and automatically discriminate between the following bar-code types:

- Codabar
- Code 2 of 5
- Code 11
- Code 39
- Code 93
- Code 128
- EAN
- Interleaved 2 of 5
- Plessey
- UPC

# Communicating data 10

The PTC-870IM is able to communicate with other computers and PTCs. How it communicates and how it is connected depends on your application program and how your PTC-870IM is equipped.

The PTC-870IM can be set up for either one-way or two-way communication. It communicates through its 11-pin serial port, via its parallel port (if present), or through its internal radio.

## Using the serial port

Refer to **Appendix C** for a list of available cables.

To connect the PTC-870IM to another computer or PTC via the serial port, you need the correct cable. The cable you use depends on the device you are connecting the PTC to. See the manual or instructions included with your application program.

Use this same procedure to connect an accessory (other than a laser scanner or a keyboard) via cable to the PTC-870IM.

## Connecting a serial cable

1. Make sure you have the correct cable for the device you are connecting to. If you use the wrong cable, the PTC may not be able to communicate.
2. Turn off the PTC and the device to which you are connecting.
3. Line up the cable's 11-pin male connector with the PTC's serial port and press them together.
4. Connect the other end of the cable to the serial device or accessory.

! Do not force any connectors together if they do not mate easily. You could bend the pins or damage the connector.

5. Turn on the PTC and then turn on the device it is connected to.
6. To communicate, follow the instructions for your application program.

### Disconnecting a serial cable

1. Turn off the PTC.
2. Turn off the serial device or accessory.
3. Pull the cable's connector directly away from the PTC's serial port.
4. If necessary, disconnect the other end of the cable from the serial device or accessory.

! Pull on the cable connector when disconnecting. Pulling on the cable can break the internal wires.

### Using the parallel port

Refer to [Appendix C](#) for a list of available cables.

If your PTC does not have two internal radios, it may contain a parallel port, which can be used to connect the PTC to standard parallel devices such as printers. A parallel cable is required to make these connections.

### Connecting a parallel cable

1. Turn off the PTC and the parallel device to which you are connecting.
2. Line up the parallel cable's 25-pin connector with the connector on the parallel device and press them together.
3. Connect the other end of the cable to the PTC's parallel port.
4. Turn on the PTC and the device it is connected to.
5. To communicate, follow the instructions for your application program.

! Do not force any connectors together if they do not mate easily. You could bend the pins or damage the connector.

! Pull on the cable connector when disconnecting. Pulling on the cable can break the internal wires.

### Disconnecting a parallel cable

1. Turn off the PTC and the parallel device.
2. Pull the cable's connector directly away from the PTC's parallel port.
3. If necessary, disconnect the other end of the cable from the parallel device.

### Using the radio

! If your PTC has an internal radio, do not turn on the PTC or attempt to transmit data unless the antenna is attached; otherwise, the radio may be damaged.

All radio communication is controlled by your organization's application program. See the information provided with the program for details on using the radio to transmit and receive data.



# Maintaining the PTC-870IM 11

Optional freezer units can be operated at temperatures between -30 and 140 degrees F (-34 to 60 degrees C).

## Operating conditions

The PTC-870IM is designed for use in harsh environments. Units with a transmissive LCD screen can be operated at temperatures between 32 and 140 degrees F (0 to 60 degrees C); non-freezer units with an EL panel display screen can be operated at temperatures between -22 and 140 degrees F (-30 to 60 degrees C).

## Handling the PTC

The following information will help to ensure you receive reliable and trouble-free service from your PTC-870IM.

- Do not open the PTC-870IM's case. Only a trained technician can service the parts inside the PTC.
- Ensure that the PTC-870IM is off before connecting or removing any accessories.
- If your PTC has an internal radio, do not operate it without the antenna installed.
- Ensure that all accessories are connected correctly.
- Use only Telxon-approved accessories. Do not attempt to connect any electrical device that is not part of your PTC-870IM system to the PTC.
- If you store non-freezer versions of the PTC in below-freezing temperatures for more than 1 hour, you can improve the screen's performance by waiting until the unit warms up before using it.

## Storing the PTC

- Do not store the PTC-870IM in temperatures below –40 degrees F (–40 degrees C) or above 167 degrees F (75 degrees C).
1. Transfer any data stored in the PTC to a host computer or another PTC or print the data. See the manual or instructions for your organization's application program for directions.
  2. Make sure you have a copy of any programs stored in the PTC.
  3. Disconnect all accessories from the PTC.
  4. Pack the PTC in the original packing material or in a padded box and put it in a safe place.

## Cleaning the PTC

### Equipment required:

- A soft, lint-free cloth
- A nonabrasive liquid cleaner such as Windex

! Do not soak the cloth and do not spray or pour cleaning liquids directly onto the PTC.

To clean the PTC, slightly moisten a soft, clean, lint-free cloth with a mild, nonabrasive cleaner and wipe the outside surfaces. Do not use a paper towel.

If the PTC becomes extremely dirty or if liquids, dirt, or other foreign materials get inside the case, contact your Telxon service representative.

## Replacing the desiccant cartridge (freezer units only)

Refer to **Appendix C** for information on ordering replacement cartridges.

Check the color of the desiccant window periodically. When the window changes from blue (dry) to pink (saturated), you need to replace the desiccant cartridge. Follow the instructions in this section to replace the cartridge.

1. Unscrew the knob containing the desiccant window; then lift the cartridge out of the opening in the back of the PTC.
2. Unscrew the knob from the desiccant cartridge.
3. Discard the old cartridge.
4. Screw the knob onto a replacement cartridge, making sure that they are securely connected.
5. Insert the cartridge into the opening in the back of the PTC.
6. Turn the knob clockwise to screw it into the PTC's opening.
7. Tighten the knob to make sure it is secure.

## Servicing the PTC

Do not attempt to service the PTC. Only a trained Telxon technician may service the PTC-870IM.

## Disposing of the PTC

When your PTC-870IM has reached the end of its useful life, do not throw it away. Send it to an authorized Telxon service center for bridge battery removal and recycling before the unit is permanently disposed of.

# Troubleshooting 12

As a first step in resolving problems, consider the points in this section.

## General

- As soon as an error occurs, stop what you are doing. Write down what the system is doing and what actions you took immediately before the problem occurred.
- Make sure all devices (printer, laser scanner, etc.) are connected firmly to the PTC and are turned on.
- If any messages display on the screen, look them up in your software manuals.
- Does the Power LED glow? Does it stay on or blink?
- Has the beeper sounded? How many times and in what pattern? Do the beeps seem related to anything you are doing?
- Confirm that the PTC has been set up properly.
- If you are using more than one external device, disconnect all devices and reconnect them one at a time. Retest the PTC after you connect each device.
- If the PTC locks up (stops responding to the keyboard), perform a warm reboot.

Follow the instructions on [page 46](#).

## Beep codes

### Five beeps

- Five beeps means the bridge battery is running out of power. If you hear these beeps or if the PTC has been disconnected from AC or vehicle power for more than 60 hours, reconnect the power and allow the bridge battery to recharge for 10 to 12 hours.

## Power LED codes

### The Power LED is off

- The PTC is off. Press the On/Off button to activate it.

### The Power LED is glowing steadily

- The PTC is on and is receiving power.

### The Power LED is blinking slowly

- The PTC is in sleep mode. Press the On/Off button to activate the PTC and your application.

### The Power LED is blinking quickly

- The PTC is booting. Wait for a prompt or your application to appear on the screen.

## Common solutions

If you experience any of the problems in this section, follow the instructions provided.

### The PTC does not turn on

- Check the PTC's vehicle or AC power connection.
- Warm boot the PTC.
- Contact your Telxon service representative.

Follow the instructions on [page 46](#).

### **The PTC's screen is slow to refresh (non-freezer units only)**

- Wait until the PTC warms up if it has been stored or used in the cold.

### **The laser scanner does not read a label**

- Make sure the scanner's connector is firmly attached to the PTC's scanner connector.
- Make sure the bar-code label you are trying to scan is one of the bar-code types your PTC has been programmed to recognize.
- Move the laser scanner closer to or farther away from the bar-code label. You may not be scanning at the correct distance.
- Change the angle of the laser scanner to the bar-code label. You may be too far above or below the bar-code label or too far to the side to scan properly.
- Clean the scanner's lens with a soft cloth.
- Point the scanner at a blank surface and press the scanner trigger. Look for the scanning line that appears on the blank surface when the scanner is operating. If no scanning line appears, follow your organization's procedure to have the scanner serviced.

### **Your radio fails to establish contact**

- Change your location by a few feet and transmit again.
- Make sure the antenna is securely attached.
- Check the PTC's vehicle or AC power connection.
- Make sure the receiving equipment is turned on and is properly connected to the host computer.
- If the PTC still does not establish contact, follow your organization's procedure to have the PTC serviced.

### The PTC shows signs of internal condensation

- Check the window on the desiccant cartridge. If the window is pink, replace the cartridge following the instructions on **page 40**.

### Your application locks up

- Warm boot the PTC following the instructions on **page 46**.
- Follow your organization's procedure to have the PTC serviced.

## Getting help

Try the following before contacting Telxon:

- Review the documentation for your application.
- Review the troubleshooting section in the manual for your operating system.

### If you still cannot correct the problem,

- notify your Telxon service representative or
- contact the Telxon Customer Support Center at 1-800-800-8010.

# Rebooting the PTC 13

If your application locks up (stops responding to the keyboard), reboot your PTC. Rebooting stops the application, stops the PTC, resets the unit, and then restarts (boots) it. Under normal circumstances, a warm boot unlocks the unit.

## Performing a warm boot

! Any data that was not saved before the application locked up will be lost.


When you perform a warm boot, all programs and data saved in RAM are preserved. When the PTC starts again, it returns you to the beginning of the application, not to where you left off.

1. Turn off the PTC.
2. Hold down the Increase Contrast button and the On/Off button.
3. Release the Increase Contrast button.
4. Press and release the Increase Contrast button.
5. Release the On/Off button. Reset is now complete.
6. Press the On/Off button to restart the PTC. The Power LED blinks quickly to indicate a reboot. The screen is blank for up to 10 seconds while the unit begins its boot sequence.



# Appendix A

## Installing the PTC-870IM

 Only maintenance personnel or a trained Telxon service technician should install the PTC-870IM.

The following procedures describe how to mount a PTC-870IM onto a warehouse vehicle and connect it to vehicle power. Follow the procedures carefully to avoid damaging the PTC and/or the vehicle.

### Installing the mounting bracket

Follow the instructions below to attach the mounting bracket to a warehouse vehicle.

You must provide the hardware to perform this procedure.

The PTC should be located so that it is not resting against any structure (except the supplied bracket).

Make sure excessive pressure will not be placed on the cables and the antenna is away from any metallic obstructions.

If your PTC-870IM is replacing a PTC-860IM, remove the old bracket from the vehicle and line up the circular holes in the new bracket with the existing holes in the vehicle. Otherwise, fasten the mounting bracket to the vehicle through its slotted holes.

1. Gather the hardware and tools needed to bolt the mounting bracket onto the vehicle.
2. Select a location on the vehicle for the mounting bracket. The location should provide the driver with a good view of the PTC's display and should not interfere with the driver's vision or the vehicle's operation.
3. Before making the final decision, attach an antenna, the correct power cable, a laser scanner, and a serial cable to the PTC-870IM; hold the PTC in the desired location; and check for clearance of these items.
4. Fasten the PTC-870IM's mounting bracket securely to the frame or housing of the vehicle.

The PTC-870IM's power range is identified on the unit below the power connector.

! Terminate the power cable as close to the battery terminal as possible.

! If you do not follow this polarity, you could cause damage to the PTC or the vehicle.

## Connecting the vehicle power supply

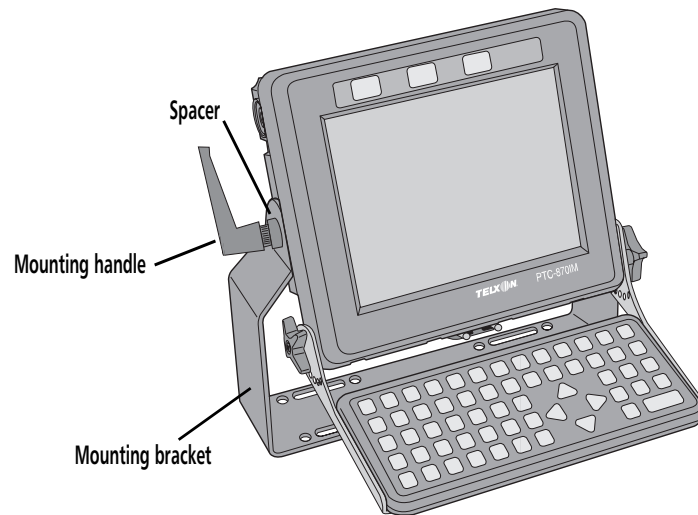
1. Verify that the vehicle's power range matches that of the PTC.
2. Disconnect the main battery from the vehicle's electrical system.
3. Using wire cutters, prepare the unterminated end of the power cable and wire it to the vehicle's DC power source. Observe the proper polarity as follows:  
  
Black wire = +  
  
White wire = –
4. Route the loose end of the power cable from the vehicle's power source to the PTC-870IM.
5. Secure the cable with cable ties to prevent it from snagging or catching on something.
6. Plug the power cable into the PTC's power connector.
7. Connect the main battery to the vehicle's electrical system.

## Mounting the PTC-870IM

### Equipment required:

- A PTC-870IM mounting kit containing two leather washers, two plastic spacers, and two mounting handles
1. Position the PTC inside the mounting bracket, making sure the holes on each side of the PTC line up with the holes in the top of the bracket.
  2. Insert the leather washers between the PTC and the mounting bracket, making sure all of the holes are aligned.

Figure 6. Mounting the PTC-870IM



3. Slide a spacer onto each mounting handle bolt. See Figure 6.
4. Insert the PTC's mounting handle bolts into the holes at the top of the mounting bracket and partially tighten them.
5. Adjust the PTC for the best viewing angle.
6. Tighten the mounting handles securely.

## Mounting the PTC-870IM to a wall or a horizontal surface

For freezer units, make sure you leave enough clearance to replace the desiccant cartridge when necessary.

Use the four M6x1 mounting holes on the back of the PTC-870IM, four M6x1 screws, and four .375-inch (.95-centimeter) long spacers to mount the PTC to a wall or a horizontal surface instead of to a warehouse vehicle (if desired).

# Appendix B

## Specifications

### Communication and I/O

Serial:	RS-232, RS-422, and RS-422 (terminated) via 11-pin port
Parallel:	Optional Centronix-compatible parallel port
Internal radio:	Optional ARDIS, 900-MHz or 2.4-GHz DATASPAN spread spectrum, or 900-MHz MicroRadio
Data rate:	215 to 860 kbps (900-MHz spread spectrum) 710 to 2000 kbps (2.4-GHz spread spectrum)
Keyboard:	Optional PC/AT via keyboard connector

Radio combinations are listed on [page 21](#).

### Display screen

Type:	Transmissive LCD or EL panel
Size:	LCD - 9.5 in (24.1 cm) diagonally EL panel - 10.4 in (26.4 cm) diagonally
Touch panel:	Optional for both display types
Pixel resolution:	640 x 480
Built-in heater:	Freezer units only

## Electrical

AC power: 110 volts

### Vehicle power

non-freezer units w/o a WAN radio: 12-72 VDC

non-freezer units w/ a WAN radio: 11-20 VDC

freezer units: 18-36 or 32-72 VDC

Bridge battery: Internal rechargeable 6-volt  
(5-cell, 450-mAhr) nickel-  
cadmium battery

## Environmental

### Operating temperature

units w/ an LCD panel: 32 to 140 degrees F  
(0 to 60 degrees C)

non-freezer units w/ an EL panel: -22 to 140 degrees F  
(-30 to 60 degrees C)

freezer units: -30 to 140 degrees F  
(-34 to 60 degrees C)

Humidity: 95% noncondensing

Storage temperature: -40 to 167 degrees F  
(-40 to 75 degrees C)

ESD protection: 15 kV

## Memory

ROM: 2 MB (256 KB for operating  
system)

RAM: 2 MB standard  
4 MB optional  
8 MB optional  
12 MB maximum

## Physical

Length:	11.5 in/29.2 cm
Height:	10.5 in/26.7 cm
Depth:	3.9 in/9.9 cm
Weight:	13 lb/5.9 kg (without a keyboard) 15 lb/6.8 kg (with a keyboard)

## Processor

Type:	486SLC
Speed:	50 MHz

## Storage

Hard drive:	Optional internal 20-, 40-, or 60-MB solid-state drive
-------------	--

# Appendix C

## Accessory part numbers

Contact your Telxon representative to order any of the following parts.

The following table contains part numbers for ordering PTC-870IM accessory hardware.

\* The mounting kit includes a mounting bracket, two mounting handles, two spacers, and two leather washers.

Item	Part number
<b>Hardware</b>	
Antenna, 900-MHz spread spectrum	18724-000
Antenna, 2.4-GHz spread spectrum	18488-001
Antenna, ARDIS	20451-000
Antenna, MicroRadio	18634-000
Antenna plug (no radio option)	
Rubber plug	22231-001
SEMS screw	22230-260
Desiccant cartridge	22212-200
Leather washer	21741-000
Mounting bracket	19741-100
Mounting handle	21623-000
Mounting kit*	22085-001
Spacer	12484-000
<b>Keyboards</b>	
DOS keyboard, non-freezer, ABC	20017-101
DOS keyboard, freezer, ABC	20017-201
3278 keyboard, non-freezer, ABC	20017-102
3278 keyboard, freezer, ABC	20017-202
5250 keyboard, non-freezer, ABC	20017-103
5250 keyboard, freezer, ABC	20017-203
DOS/3278/5250 keyboard, non-freezer or freezer, QWERTY	22880-001
<b>Power accessories</b>	
12-72 VDC power cable	10709-012
11-20 VDC power cable	10709-212
110-volt AC power pack	13190-001

\*The middle digit in the last three numbers of these part numbers indicates the cable length in feet.  
 0 = 3'      2 = 10'      4 = 25'  
 1 = 6'      3 = 15'      5 = 50'

☆The first digit in the last three numbers of these part numbers indicates whether the connector is male (-0XX) or female (-1XX).

Item	Part number
<b>Cables</b>	
IBM PC/AT-to-PTC cable*	12705-1X5
IBM PC/XT-to-PTC cable*	12705-1X4
RS-232 (Type I)-to-PTC cable*☆	12705-XX1
RS-232 (Type II)-to-PTC cable*☆	12705-XX2
RS-232 (Type III)-to-PTC cable*☆	12705-XX3
Parallel cable (6 ft/1.8 m)	20855-006
<b>Software</b>	
Telxon Pen-based 11x4 Series Software Development Kit	20181-000
PenRight! Pro Software Development Kit	P-80991-001
PenDOS Software Development Kit	P-81270-000



# Appendix D

## Communication connections

Figures 7 through 11 provide information on the connections used to establish and maintain communication between the PTC-870IM and other devices.

Figure 7. IBM PC/AT-to-PTC cable, P/N 12705-1X5

IBM PC/AT		PTC-870IM	
RXD	2	2	TXD
TXD	3	3	RXD
DSR	6	4	RTS
DTR	4	5	CTS
RTS	7	6	DSR
GND	5	7	DIGND
N.C.		8	CD
N.C.		9	DS0
CTS	8	10	DTR
N.C.		11	RI

Figure 8. IBM PC/XT-to-PTC cable, P/N 12705-1X4

IBM PC/XT			PTC-870IM		
RXD	3	_____	2		TXD
TXD	2	_____	3		RXD
DSR	6	_____	4		RTS
DTR	20	_____	5		CTS
RTS	4	_____	6		DSR
GND	7	_____	7		DIGND
N.C.		_____	8		CD
N.C.		_____	9		DS0
CTS	5	_____	10		DTR
N.C.		_____	11		RI

Figure 9. RS-232 (Type I)-to-PTC cable, P/N 12705-XX1

RS-232 Type I		PTC-870IM	
TXD	2	2	TXD
RXD	3	3	RXD
RTS	4	4	RTS
CTS	5	5	CTS
DSR	6	6	DSR
GND	7	7	DIGND
CD	8	8	CD
N.C.		9	DS0
DTR	20	10	DTR
RI	22	11	RI

This cable can be set for either RS-232 or RS-422 communication via jumper settings on the PTC's motherboard. For RS-422, the first four pins would be set as follows:

RS-422		PTC-870IM	
TXD+	2	2	TXD+
RXD+	3	3	RXD+
RXD-	4	4	RXD-
TXD-	5	5	TXD-

Figure 10. RS-232 (Type II)-to-PTC cable, P/N 12705-XX2

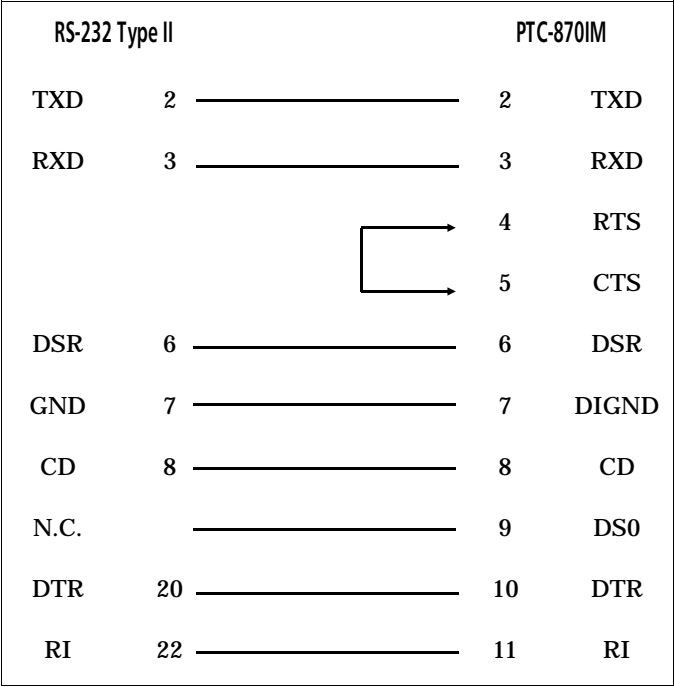
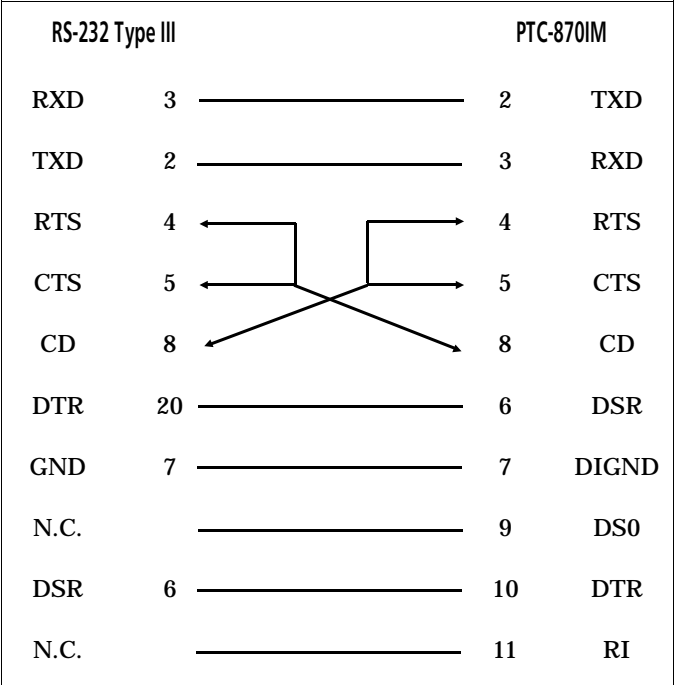


Figure 11. RS-232 (Type III)-to-PTC cable, P/N 12705-XX3



# Glossary

application	A PTC program that is designed to perform a specific task for the user. Examples include route accounting, payroll, price lookup, shipping, and inventory control.
ARDIS	Advanced Radio Data Information Service. A wide area radio frequency data network.
bar code	A series of vertical bars and spaces used to encode numeric or alphanumeric information. Bar codes are designed to be read by electronic means such as bar-code readers or laser scanners.
bar-code reader	An electrical device designed to recognize and decipher bar-code labels. When the bar-code reader passes over the bar code, it converts the bar code into electrical signals representing data. The PTC can then enter this data into files in its memory.
BIOS	Basic Input/Output System.
boot or boot-up	The process a PTC goes through when it first starts up. During boot-up, the PTC can run self diagnostics and configure hardware and software.
bps	Bits per second.
bridge battery	A battery used to protect data in the PTC's memory when power to the unit is disconnected.
byte	A group of eight bits that acts as a basic unit for information transfer and storage.
CD	Carrier detect signal. CD indicates that the modem is receiving a signal from the remote modem.
character	A letter, number, or symbol.

CTS	Clear-to-send signal. CTS indicates that the line between a modem and a terminal device is clear for transmission. CTS typically follows a raised request-to-send (RTS) signal.
data communication	The transport of encoded information from one point to another.
DATASpan	Telxon's spread spectrum radio.
DCE	Data communications equipment. A device that controls and converts incoming data or communication. For example, a modem.
desiccant cartridge	A cartridge inserted into freezer units to absorb internal moisture in the PTC.
digital	Discrete variable pulses or signal levels that represent continuously variable physical quantities.
display	The screen on the front of the PTC. It is used to show data entered into the PTC and warning prompts.
DSR	Data set ready signal. The modem sends DSR to the attached device to indicate that the modem is connected, on, and ready.
DTE	Data terminal equipment. A device comprising the data source. For example, the host computer.
DTR	Data terminal ready signal. The signal sent by the terminal device to the modem to indicate that the terminal is ready for transmission.
EL	Electro-luminescent. An EL panel display screen is available as an option for the PTC-870IM. This screen does not have a backlight but can be used in colder temperatures than an LCD screen.
ESD	Electrostatic discharge.
file	Any group or collection of related information stored in memory. To add data to a file or to read data from a file, the program must access the file by its file name.

flash EPROM	A type of erasable programmable read-only memory that can be erased and reprogrammed electronically while installed in a PTC.
function key	A key on the PTC's keyboard that is defined by an application to perform a specific task. When pressed, a function key executes a certain function (for example, ENTER, END, ON/OFF).
GND	Ground.
hardware	Equipment used in conjunction with programs or data communication. Contrast with <i>software</i> .
host computer	A personal computer or mainframe that receives and processes data from PTCs.
Hz	Hertz. A unit expressing frequency in vibrations per second.
interface	The connection between two devices, defined by common physical characteristics, signal characteristics, and signal meanings.
I/O port	Input/output port. The location on a PTC where RS-232-compatible accessories are attached. Also, the point through which the PTC sends and receives transmission signals.
LAN	Local area network. A radio network that supports data communication within a local area, such as within a warehouse or building. Contrast with <i>WAN</i> .
laser scanner	A type of bar-code reader that uses a beam of laser light.
LCD	Liquid crystal display. The PTC-870IM's standard display screen is an LCD.
LED	Light-emitting diode.
mAhr	Milliampere hour(s). A measurement of the ability to provide electrical power.



modem	Modulator-demodulator. A communication device that converts serial digital data from a transmitting device to a signal suitable for transmission over a telephone line and then reconverts the signal to serial digital data for the receiving device.
MS-DOS	Microsoft Disk Operating System.
network	An interconnection of computer systems, terminals, and data communication facilities.
prompt	Messages shown by the PTC that guide the operator through the steps of the application program. Prompts are different for different programs.
PTC	Portable Tele-Transaction Computer. A programmable device used to collect, store, and transmit data.
RAM	Random access memory. In a PTC, RAM chips store program files and data entered by the operator.
RAMdisk	A volatile disk simulated in RAM. It is treated by the MS-DOS operating system in the same way as a physical disk drive.
resume	A feature of the PTC-870IM that returns you to the point where you were in your application program when the PTC was turned off or went to sleep. See <i>sleep</i> .
RF	Radio frequency.
RI	Ring indicate signal. RI alerts a modem to a call waiting on the attached telephone line.
ROM	Read-only memory. In a PTC, ROM chips contain the operating system and the application program.
ROMdisk	A non-volatile disk simulated in ROM. It is treated by the MS-DOS operating system in the same way as a physical disk drive.

RS-232	An Electronic Industries Association (EIA) standard that defines the connector, connector pins, and signals used to transfer data serially from one device to another.
RS-422	An Electronic Industries Association (EIA) standard that defines the connector, connector pins, and signals used to transfer data serially from one device to another. RS-422 differs from RS-232 in providing a faster transmission speed and lower level of noise for communication over long distances.
RTS	Request-to-send signal. RTS initiates the data transmission sequence on a communication line between a modem and a terminal device.
RXD	Receive data signal. RXD indicates that a device is currently receiving data.
signals	Electronic impulses that transmit data from one device to another.
sleep	A power-saving feature of the PTC-870IM. The PTC is capable of slowing or turning off portions of its electronics to conserve power. Sleep occurs automatically when the PTC has not been used for a predetermined period of time.
software	A stored program or set of programs that is loaded into RAM for execution. Contrast with <i>hardware</i> .
Software Development Kit	A set of diskettes containing libraries of C programs and Telxon utilities to be used for programming pen-based applications for the PTC.
spread spectrum	A radio communication technology that distributes an RF signal over a wide range of frequencies for transmission; it then “despreads” the signal to the original frequency range at the receiver.

two-way communication	Exchange of information between two devices. After each block of data, the receiving device sends a positive or negative acknowledgment to the sending device.
TXD	Transmit data signal. TXD indicates that a device is currently transmitting data.
VAC	Volts alternating current. A unit of measure of electric potential or potential difference in a bidirectional electrical current.
VDC	Volts direct current. A unit of measure of electric potential or potential difference in a unidirectional electrical current.
WAN	Wide area network. A radio network that supports data communication beyond a local area. That is, information can be sent across a city, a state, or even nationwide. An ARDIS radio is an example of a WAN radio. Contrast with <i>LAN</i> .
warm boot	To turn on a PTC with its memory intact. A warm boot restores all hardware and causes the application program to return to the beginning.

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