SC-960RL/SC-960L

User’s Guide

On December 1, 2000 Symbol Technologies, Inc. completed the purchase of Telxon Corporation. References made herein to "Telxon" or "Telxon Corporation" should reflect "Symbol" or "Symbol Technologies, Inc.", respectively. Any questions, contact your Symbol representative.

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TELXON

SC-960RL/SC-960L

User's Guide

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Part Number: 21570-701-04
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Contents

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 numerique de la classe A respecte toutes les exigences du Reglement sur le material broilleur du Canada.

If your SC-960RL/SC-960L has an internal modem

FCC regulations

This device has been granted a registration number by the FCC, under Part 68 rules and regulations for direct connection to the telephone lines. In order to comply with these FCC rules, the following instructions must be carefully read and applicable portions followed completely:

1. The FCC has established rules that permit this device to be directly connected to the telephone network. Standardized jacks are used for these connections. This equipment should not be used on party lines or coin lines.

2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until repair has been made. If this is not done, the telephone company may temporarily disconnect service.

3. The telephone company may make changes in its technical operations and procedures; if such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes.

4. If the telephone company requests information on what equipment is connected to their lines, inform them of the following:

    a. The telephone number this unit is connected to

    b. The ringer equivalence number (REN)

    c. The USOC (RJ-11) jack required

    d. The FCC registration number

Items b, c, and d are indicated on the label. The REN is used to determine how many devices can be connected to your telephone line. In most areas, the sum of the RENs of all devices on any one line should not exceed five (5.0). If too many devices are attached, they may not ring properly.

5. In the event of equipment malfunction, all repairs should be performed by our Company or an authorized agent. It is the responsibility of users requiring service to report the need for service to our Company or to one of our authorized agents. Service information can be obtained at:

   Telxon Corporation
   3330 West Market Street
   Akron, OH 44334-0582

6. If, through abnormal circumstances, harm to the telephone lines is caused, the device should be unplugged until you determine if your device or the telephone is the source; it should not be reconnected until necessary repairs are effected.

7. Should the telephone company notify you that your device is causing harm, the device should be unplugged. The telephone company will, where practicable, notify you that temporary discontinuance of service may be required. However, where prior notice is not practicable, the telephone company may temporarily discontinue service, if such action is reasonably necessary. In such cases, the telephone company must

   a. promptly notify you of such temporary discontinuance,

   b. afford you the opportunity to correct the condition, and

   c. inform you of your rights to bring a complaint to the FCC under their rules.

8. The telephone company may make changes in its communications facilities, equipment, operations, or procedures, where such action is reasonably required in the operation of its business and is not inconsistent with FCC rules. If such changes can be reasonably expected to render any customer's devices incompatible with telephone company facilities, or require modification or alteration, or otherwise materially affect their performance, written notification must be given to the user to allow uninterrupted service.

DOC statement

Notice: The Canadian Department of Communications (DOC) label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by Telxon. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

! Users should not attempt to make such connections themselves but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

The load number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop, which is used by the device to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the load numbers of all the devices does not exceed 100. An alphabetic suffix is also specified in the load number for the appropriate ringing type (A or B), if applicable. For example, LN = 20 A designates a load number of 20 and an “A” type ringer.

Safety information 2

Disposing of nickel-cadmium batteries

The nickel-cadmium batteries that are recharged by the SC-960RL/SC-960L contain chemically active materials that are hazardous to the environment; therefore, they must be disposed of properly. Never attempt to incinerate a nickel-cadmium battery; doing so could cause it to explode. Telxon urges you to contact the Environmental Protection Agency, the Department of Natural Resources, a local hazardous waste disposal agency, or the Telxon Customer Support Center for assistance prior to disposing of your nickel-cadmium batteries.

Scope of the manual 3

This manual provides general information on how to install, operate, and maintain the SC-960RL and SC-960L Single-bay Communication Cradles. Use this manual as an introduction to your cradle along with the manual or instructions provided by your supervisor.

This manual does not provide instructions on how to perform the tasks specific to your job in your organization. For that information, refer to the manual or instructions provided by your supervisor.

Document conventions

The following conventions are used throughout this manual.

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 SC-960RL/SC-960L 4

The SC-960RL and SC-960L Single-bay Communication Cradles are accessories for the PTC-960RL and PTC-960L, respectively. The cradles work with the PTCs in two ways.

First, the cradle acts as a communication link between the PTC and a host computer. It can send data to and receive data from both units. The PTC and the cradle communicate with each other through their optical couplers and with the host computer via a cable or modem.

Second, the cradle automatically charges a PTC's nickel-cadmium battery pack and a spare battery pack when the PTC and spare pack are inserted into the cradle. It requires approximately 12 hours to charge both packs (plus the amount of time the PTC spends communicating with a host computer).

Light-emitting diodes (LEDs) on the cradle's front panel indicate power, communication, and battery charging status.

A *modem* is an electronic device that allows the cradle to send and receive signals over standard telephone lines.

The SC-960RL/SC-960L can be equipped with one of six country-specific internal modems that provides one-way or two-way communication. The cradle can also be connected to an external modem. See Appendix A for more information about modem options.

The cradle can be used by itself or can be connected directly to other SC-960RL/SC-960Ls to form a system of up to 32 cradles.

Getting started 5

Unpacking the SC-960RL/SC-960L

Any additional accessories are shipped separately.

Each shipping box contains

- an SC-960RL or an SC-960L,
- a 12-VDC, 800-mA power pack,
- a cradle base (if your cradle was ordered as a table-top version),
- an *SC-960RL/SC-960L Read-Me-First Sheet*, and
- an *SC-960RL/SC-960L User's Guide*.

See Appendices B and C for cable part numbers and information.

If you will be connecting the cradle to a host computer, you need a properly wired cradle-to-host cable, available separately.

1. Remove the cradle from the box.
2. Remove all packing material from the cradle. Save the packaging in case the cradle is ever stored or shipped to Telxon for service.
3. Check the contents of the package to make sure you have received everything ordered.

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

4. Check the cradle and accessories for shipping damage.

Parts 6

Figures 1 and 2 on pages 17 and 18 show and describe the parts of the SC-960RL/SC-960L. The parts listed below are not shown in either figure.

Cradle base

A cradle base is shipped with every table-top version of the SC-960RL or SC-960L. The base holds the cradle in place on a flat horizontal surface. It can be permanently mounted through its four mounting holes.

Modem module (optional)

See Appendix A for a list of available modem modules. See page 23 for information on connecting the internal modem to telephone lines.

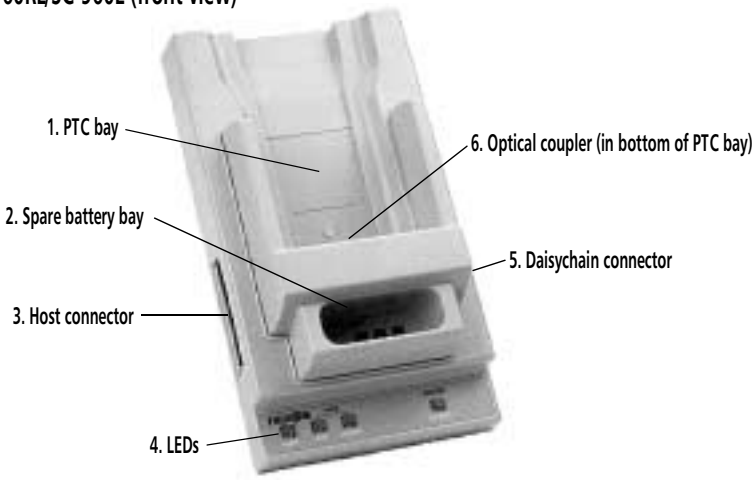
The SC-960RL/SC-960L can be equipped with an internal modem module that provides communication capability over standard telephone lines between a PTC installed in the cradle and a host computer. Either one-way half-duplex or two-way full-duplex communication is available.

Power pack

The power pack, which provides power to the cradle, plugs into the cradle's power connector and into an electrical outlet (110 volts AC in the U.S. or Canada). It provides 12 volts of direct current (VDC) at 800 milliamperes (mA).

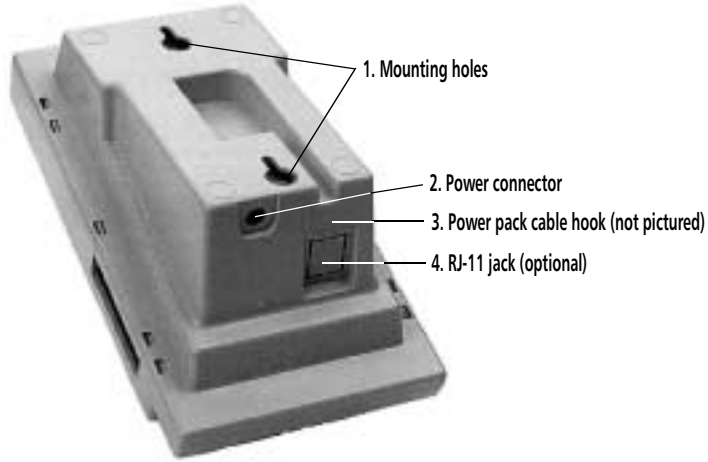
Each cradle, whether installed individually or as part of a system of connected cradles, must have its own power pack.

Figure 1. The SC-960RL/SC-960L (front view)



1. This area of the cradle holds a PTC-960RL or a PTC-960L. The bay contains the cradle's optical coupler and battery charging contacts.
2. This area of the cradle holds a spare nickel-cadmium battery pack. The bay contains battery charging contacts.
3. This female 25-pin connector connects via cable to a host computer or external modem. When cradles are connected together, this connector (on all cradles in the system except the one in the left-most position) plugs into the daisychain connector of another SC-960RL/SC-960L.
4. These light-emitting diodes indicate power, communication, and battery charging status. See Appendix D for an explanation of the LEDs.
5. This male 25-pin connector plugs into the host connector of another SC-960RL/SC-960L to form a system of daisychained cradles. You can connect up to 32 cradles in a system.
6. The SC-960RL/SC-960L's optical coupler provides an optical communication path to and from a PTC residing in the cradle's PTC bay.

Figure 2. The SC-960RL/SC-960L (back and bottom view)*



* This view of the SC-960RL/SC-960L shows the cradle in its wall-mount configuration.

1. These mounting holes allow table-top versions of the cradle to be secured in a cradle base and wall-mount versions to be mounted on a wall via a standard telephone wall mounting plate. See Chapter 8 for details.
2. A 12-VDC, 800-mA power pack plugs into this connector and an electrical outlet to supply power to the cradle.
3. Sliding the power pack's cable under this hook helps to prevent the cable from becoming unplugged.
4. If your SC-960RL/SC-960L was ordered with an internal modem, it will have an RJ-11 jack, a standard modular telephone-type jack. It can be used to connect the cradle directly to a telephone line.
   If your SC-960RL/SC-960L was not ordered with an internal modem, it can be connected to most standard external modems. You will need to connect a cradle-to-modem cable to the cradle's host connector and to the connector on the external modem. See Appendix B for cable part numbers.

Features 7

The SC-960RL/SC-960L Single-bay Communication Cradle performs the following functions:

- Links a PTC-960RL or a PTC-960L to a host computer
- Communicates with the host computer either directly through a cable or remotely over telephone lines via a built-in or external modem
- Provides standard RS-232 communication with the host computer or external modem
- Directly connects to other SC-960RL/SC-960Ls to form a system of cradles with a single communication connection to a host computer or modem

See Chapter 14 for additional information.

- Provides a communication connection for reprogramming the PTC's internal flash EPROM
- Automatically charges the installed PTC's nickel-cadmium battery pack and a spare battery pack
- Displays the charging status of the PTC's battery pack and a spare battery pack and the communication status of the PTC
- Rests in a cradle base on a horizontal surface or permanently mounts on a wall

Installing a single cradle 8

Mounting the SC-960RL/SC-960L

The wall-mount version is illustrated in Figure 3. Notice how the power connector is on the same end of the cradle as the 25-pin connectors.

If you want to change your cradle's mounting configuration, contact your Telxon service representative.

Your SC-960RL/SC-960L was ordered from the factory as either a table-top or wall-mount version. See Figure 3.

To mount the table-top version, follow the instructions on page 21. To hang the wall-mount version, see the instructions on page 22.

Figure 3. SC-960RL/SC-960L wall-mount configuration

In the wall-mount configuration, the cradle's power connector is on the same end of the cradle as the 25-pin connectors.

Mounting to a horizontal surface

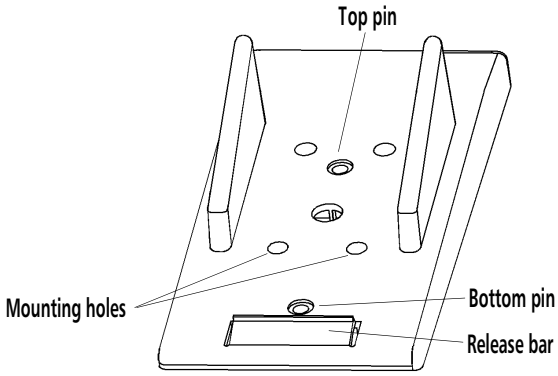
Equipment required:

- A drill with a 1/8-inch drill bit
- Four 1/8-inch mounting screws
- A screwdriver or a power driver
- Four 1/8-inch nuts
- A wrench or a pair of pliers

1. Place the cradle base on a flat horizontal surface, such as a table or desk.
2. To permanently mount the cradle base to the horizontal surface, follow steps a through d.
    a. Drill guide holes through the base's four mounting holes and into the surface below.
    b. Insert a mounting screw into one of the mounting holes and tighten.
    c. If the screw extends below the mounting surface, thread a nut onto the screw and tighten.
    d. Repeat steps b and c for each of the remaining screws.
3. Remove the rubber feet from the bottom of the cradle.
4. Hold the cradle over the cradle base.
5. Position the cradle's top mounting hole over the top pin in the cradle base. See Figure 4.
6. Firmly slide the cradle away from you.
7. Make sure the cradle is securely connected to the cradle base.

To disconnect the cradle from the cradle base, grasp the cradle and firmly slide it toward you.

Figure 4. The cradle base (front, top, and right side view)



Mounting to a wall

Equipment required:

- A standard telephone wall mounting plate

1. Follow the manufacturer's instructions to install the telephone mounting plate.
2. Position the cradle's mounting holes over the mounting plate's pins and gently pull down on the cradle to secure it to the plate.

Connecting to a host computer or external modem

Equipment required:

- A cradle-to-host or cradle-to-modem cable
- A 12-VDC, 800-mA power pack (provided)
- An electrical outlet within 6 feet (1.8 meters) providing 110 volts AC in the U.S. or Canada

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

! Do not force any connectors together if they do not connect easily; you could damage them.

1. Connect the male connector on the cradle-to-host or cradle-to-modem cable to the host connector on the left side of the cradle.
2. Connect the other end of the cable to the host computer or modem.

   Follow the installation instructions provided in the modem operator's guide to make this connection.

   If you are connecting the cradle to an external modem, you must connect the modem to a telephone line.
3. Plug the connector on the power pack's cable into the cradle's power connector.
4. Slide the power pack's cable under the hook below the RJ-11 jack to prevent the cable from becoming unplugged.
5. Plug the power pack into an electrical outlet.
6. Turn on the host computer or modem, if necessary.

Connecting the internal modem

If your SC-960RL/SC-960L has an internal modem, follow the instructions in this section to connect it.

Equipment required:

- A modular telephone cable
- A modular telephone wall jack within 6 feet (1.8 meters) of the cradle
- A 12-VDC, 800-mA power pack (provided)
- An electrical outlet within 6 feet (1.8 meters) providing 110 volts AC in the U.S. or Canada

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

1. Plug one end of a modular telephone cable into the cradle's RJ-11 jack. Plug the other end of the telephone cable into a wall jack. In both cases, push the cable's connector into the jack until you hear the connector's tab click into place.

2. Plug the connector on the power pack's cable into the cradle's power connector.
3. Slide the power pack's cable under the hook below the RJ-11 jack to prevent the cable from becoming unplugged.
4. Plug the power pack into an electrical outlet.

Connecting cradles together 9

Cradles that are connected together in a system share the same connection to the host computer or external modem or share the same internal modem.

Cradles in a section are usually connected directly together, with the daisychain connector on the first cradle's right side plugging directly into the host connector on the second cradle's left side.

A system can be assembled as a single section or as two or more separate sections that are connected together by cradle-to-cradle extension cables. See Appendix B for the cable part number and Appendix C for the cable diagram.

The maximum number of cradles in a system is 32. These may be in a single section or in two or more sections. The maximum length of any cable in the system–cradle-to-host, cradle-to-modem, or cradle-to-cradle–is 50 feet (15.2 meters).

Figure 5 shows typical cradle configurations.

If more than 32 cradles are connected, they must be divided into separate systems, and each system must have its own connection to the host computer or external modem.

Equipment required:

Only table-top versions require clips.

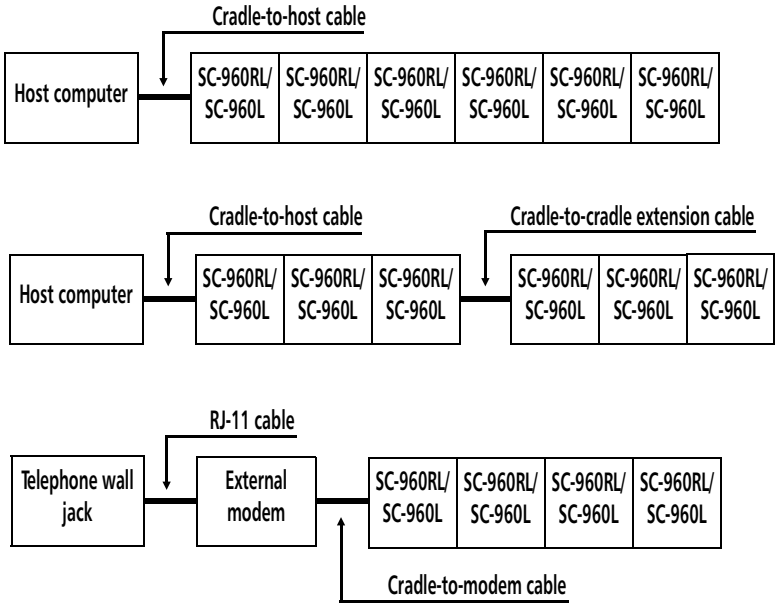
See Appendices B and C for cable part numbers and descriptions.

- Two fastener clips per every two cradles
- The proper cradle-to-host, cradle-to-modem, and cradle-to-cradle cables, if necessary
- One 12-VDC, 800-mA power pack for each cradle (provided)
- A modular telephone cable, if an internal modem is installed in one of the cradles
- A modular telephone wall jack, if an internal modem is installed in one of the cradles

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

- An electrical outlet (providing 110 volts AC in the U.S. or Canada) for each cradle

Figure 5. Typical cradle configurations



1. Make sure your system has no more than 32 cradles and each cable is not longer than 50 feet (15.2 meters).

A *screw lock* is the hexagonal extension or nut that accepts the screws on an attaching cable and holds the connectors together.

2. Remove the screw locks from the cradle connectors that will be connected directly together. Leave the screw locks on any connectors that will have cables attached to them.

Follow the instructions in Chapter 8 to mount the cradles to a wall or horizontal surface.

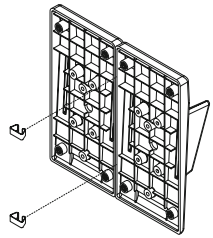
3. Line up the cradles in a row, in the approximate positions where they are to be installed. Leave enough room behind the cradles to connect the power packs.

4. Starting with the two cradles farthest to the left, line up the left-most cradle's daisychain connector with the host connector on the left side of the second cradle.

! Do not force the cradle connectors together if they do not connect easily. Make sure they are properly aligned and no pins are bent.

5. Gently press the two cradles together so the pins on the left cradle's connector go into the holes on the right cradle's connector.
6. If your cradles are table-top versions, use two fastener clips to connect the cradles' bases. See Figure 6.

Figure 6. Installing fastener clips



7. Repeat Steps 4 through 6 for the remaining cradles in the section and then for any additional sections.
8. If necessary, use a similar procedure to connect any cables that join sections of cradles.

Each cradle must have its own power pack. One pack cannot power all the cradles in the system.

9. After all the cradles have been connected together, attach a power pack to each cradle. Do this by connecting the power pack's cable to the cradle's power connector. Then slide the power pack's cable under the hook below the RJ-11 jack to prevent the cable from becoming unplugged.

! Do not force any connectors together if they do not connect easily; you could damage them. Make sure they are lined up correctly, no pins are bent, and nothing is obstructing either connector.

10. If necessary, connect the cradle-to-host or cradle-to-modem cable to the host connector on the left-most cradle in the system and then connect the other end of the cable to the host computer or external modem.
11. If the left-most cradle in the system contains an internal modem, plug a standard modular telephone cable into that cradle's RJ-11 jack and then plug the other end of the telephone cable into a telephone wall jack.

    In both cases, push the telephone cable's connector into the jack until you hear the connector's tab click into place.
12. Plug each cradle's power pack into an electrical outlet.
13. If necessary, turn on the host computer or external modem.

Inserting and removing a PTC 10

Inserting a PTC into the cradle

The SC-960RL is designed for use with only a PTC-960RL; likewise, the SC-960L is designed for use with only a PTC-960L. Use only the PTC model intended for use with your cradle.

1. Turn off the PTC.
2. Make sure the cradle's Power LED is glowing. If it is not, check the power pack's connections at the electrical outlet and the cradle.
3. With the front of the PTC facing you, insert the bottom of the PTC into the cradle's PTC bay until it will go no farther. The bay's Charging LED glows.

   The PTC is now in the cradle, ready to communicate and to have its battery pack charged.

! Do not force a PTC into the cradle if it does not slide in easily. Make sure that the PTC is properly aligned with the cradle's PTC bay and that nothing connected to the PTC is obstructing its entry into the bay.

Removing a PTC from the cradle

When the PTC's internal battery pack has been charged, the PTC can be removed from the cradle, provided any communication with the host computer is complete. The battery pack is charged continuously; remove the PTC after 12 hours.

1. Make sure the PTC is off.
2. Grasp the PTC and carefully lift it up and out of the cradle.

Inserting and removing a spare battery pack 11

Inserting a spare battery pack into the cradle

1. Make sure the cradle's Power LED is glowing. If it is not, check the power pack's connections at the electrical outlet and the cradle.
2. Hold the battery pack vertically, with the Telxon label facing you and the two exposed battery contacts pointing down.
3. Gently insert the battery pack into the cradle's spare battery bay until it will go no farther. The bay's Charging LED glows.

! Do not force a battery pack into the cradle if it does not slide in easily. Make sure the pack is properly aligned with the bay.

Removing a spare battery pack from the cradle

When the spare battery pack has been charged, it can be removed from the cradle. The battery pack is charged continuously; remove the pack after 12 hours.

1. Grasp the battery pack and lift it out of the cradle.

Charging battery packs 12

Charging precautions

Follow these guidelines when using the SC-960RL/ SC-960L to charge PTC battery packs:

- Do not attempt to charge any battery pack that has not been designed for use with a PTC-960RL or PTC-960L.
- Do not charge battery packs under extremely hot or cold conditions. The recommended charging temperature is 50 to 110 degrees F (10 to 43 degrees C).

The charging process

The battery pack may grow slightly warmer while it is charging; this is normal.

Charging begins automatically when you insert a PTC-960RL/PTC-960L or a spare battery pack into the appropriate bay in the cradle.

See Appendix D for an explanation of the battery charging status LEDs.

The cradle charges one or two battery packs in approximately 12 hours (plus the amount of time the PTC spends communicating with the host).

Once a battery pack has been charged, it can be removed and replaced with another battery pack. Wait at least 2 seconds after removing a battery pack before inserting a new one.

If the PTC or spare battery pack is left in the cradle after charging, the cradle will maintain the battery pack at peak efficiency until the PTC or spare pack is removed.

Communicating data 13

All communication between a PTC-960RL/PTC-960L and the SC-960RL/SC-960L takes place through the PTC's and the cradle's optical couplers. The cradle acts as a communication link between the PTC and a host computer or an external modem.

See Appendix B for cable part numbers and Appendix C for cable diagrams.

To communicate with a host computer or an external modem, the cradle can be directly connected via an RS-232-type serial cable. Instructions for making the appropriate connections are provided in the "Connecting to a host computer or external modem" section on page 22.

See Appendix A for the modem types and communication standards supported.

If the SC-960RL/SC-960L contains an internal modem, the cradle can communicate with a host computer over standard telephone lines. Depending on the modem installed, either one-way half-duplex communication or two-way full-duplex communication is available. Instructions for making the appropriate connections are provided in the "Connecting the internal modem" section on page 23.

Communication is managed automatically by your organization's application program. See the instructions or manual provided by your supervisor for the proper procedure to follow.

Flashing through the cradle 14

Flash EPROMs are electronic components inside a PTC that store the operating system and application programs.

A PTC-960RL/PTC-960L's flash EPROM can be reprogrammed through the SC-960RL/SC-960L by a user application after the initial load. Follow the guidelines listed below and the instructions in the *Guide to the Flash Utilities (TCAL or MS-DOS Version)* to reprogram a PTC's flash EPROM through the cradle.

Flashing guidelines

- The initial flashing of the PTC's operating system and application must be done through a null-modem cable that is directly connected to the PTC and a PC.
- Make sure the PTC containing the flash EPROM to be reprogrammed is installed securely in the cradle's PTC bay.

For this procedure to work successfully, the PTC must have more than two times as much RAM as application ROM.

- The PTC's application ROM (ARC) can be reflashed only if an application running on the PTC executes the following procedure:

  1. The application selects the optical port and downloads an application image into the RAM E-disk file system through the cradle.

  2. The application then makes a PTC kernel call to transfer the image from RAM to the application ROM (ARC).

Maintaining the SC-960RL/SC-960L 15

Operating conditions

The SC-960RL/SC-960L is designed to work in environments that are free of dust, dirt, and moisture. Do not use the cradle in temperatures below 50 degrees F (10 degrees C) or above 110 degrees F (43 degrees C). Do not leave the cradle where moisture will condense on it.

Handling the cradle

The cradle is well constructed and durable; however, it is a precision electronic device and must be treated as such. Following the procedures in this section will help to ensure you receive reliable service.

- Do not attempt to repair the cradle. No user-serviceable parts are inside.
- Make sure all cables are connected correctly and locked firmly into place and the correct cables are used.

Cleaning the cradle

To clean the cradle, slightly moisten a soft, clean, lint-free cloth with a mild, nonabrasive cleaner (such as Windex) and wipe the cradle's outside surface.

- Do not use a paper towel to clean the cradle.
- Do not soak the cloth and do not spray or pour cleaning liquids directly onto the cradle.
- Use a brush or soft cloth to clean any dirt from the battery charging contacts.

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

Storing the cradle

- Do not store the cradle in temperatures below –20 degrees F (–29 degrees C) or above 140 degrees F (60 degrees C).
- Do not store the cradle in a damp or humid environment (over 95% noncondensing).

Servicing the cradle

Do not attempt to service the cradle. Only a trained Telxon technician may service the cradle. Follow the procedure set up by your organization to have the cradle serviced properly.

Troubleshooting 16

The cradle fails to communicate with the host computer or external modem

- Make sure you are using the correct connecting cables.
- Make sure the cables are properly connected.
- Make sure the cradle's power pack is connected to the cradle and plugged into a functioning electrical outlet.
- Make sure the host computer or external modem has been turned on.
- If the cradle still fails to communicate, contact your Telxon service representative.

The PTC fails to communicate through the cradle

- Make sure the PTC is on.
- Make sure the cradle is on. Check the power pack's connections at the cradle and the electrical outlet.
- Make sure the PTC is properly installed in the cradle.
- If the PTC still fails to communicate, contact your Telxon service representative.

The PTC's battery pack or the spare battery pack fails to recharge

- Make sure the PTC or spare battery pack is properly installed in the cradle. The Charging LED lights when the PTC or battery pack is inserted correctly.

See page 33 for instructions.

- Clean the contacts on the PTC's battery pack or on the spare battery pack.
- Replace the PTC's nickel-cadmium battery pack or the spare battery pack with another one and try to recharge it.
- If the battery pack still fails to recharge, contact your Telxon service representative.

The Power LED does not light

- Make sure the cradle's power pack is plugged into an electrical outlet and the connector on the end of the power pack's cable is snug in the cradle's power connector.
- Plug the power pack into another electrical outlet.
- If the Power LED still does not light, contact your Telxon service representative.

The PTC bay Charging LED does not light when a PTC is in the cradle

- Move the PTC to a spare SC-960RL/SC-960L, if one is available.

  If the Charging LED on the spare cradle does not light, the battery pack inside the PTC is faulty and must be replaced.

  If the Charging LED on the spare cradle glows, the original cradle may be defective. Contact your Telxon service representative.

See page 12 for instructions on properly disposing of nickel-cadmium battery packs.

The spare battery bay Charging LED does not light when a spare battery pack is in the cradle

- Move the battery pack to a spare SC-960RL/ SC-960L, if one is available.

  If the Charging LED on the spare cradle does not light, the battery pack is faulty and must be replaced.

  If the Charging LED on the spare cradle glows, the original cradle may be defective. Contact your Telxon service representative.

See page 12 for instructions on properly disposing of nickel-cadmium battery packs.

Other problems

If you experience any other problems with your SC-960RL/SC-960L that you cannot solve, contact Telxon's Customer Support Center for assistance at 1-800-800-8010.

Appendix A

Specifications

Communication

Data communication via 25-pin connectors:	Full duplex, 300 to 38.4 K bits per second (bps)
Maximum system size:	32 cradles; 50 ft/15.2 m is the max. length of any single attached cable
Available modems and communications supported:	MM-202 (Bell 202 and V.23 half duplex, 1200 bps, direct connect. Auto-dials and auto-answers in pulse mode.)
	MM-224 (V.22bis, V.22, Bell 212A, and Bell 103. Auto-dials and auto-answers.)
	MM-224MV (Bell 103/V.21 at 0 to 300 bps, Bell 212A at 1200 bps, and V.22bis at 2400 bps. Also supports MNP-5 and V.42bis.)

Additional modems may be available. Contact your Telxon sales representative for information.

Electrical

Power pack:	12 VDC, 800 mA
Battery charging time:	12 hours for one or two battery packs (plus the time the PTC spends communicating with a host computer)

Environmental

Operating temperature:	50 to 110 degrees F (10 to 43 degrees C)
Storage temperature:	–20 to 140 degrees F (–29 to 60 degrees C)

Physical

Length:	7.7 in/19.56 cm
Width:	4.3 in/10.9 cm
Height:	4.5 in/11.4 cm
Weight:	13 oz/.37 kg (wall-mount version) 21 oz/.6 kg (table-top version)
Capacity:	One PTC and one spare battery pack

Appendix B

Accessory part numbers

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

Table 1 lists part numbers for ordering SC-960RL/ SC-960L accessories.

Table 1. Accessory part numbers

Item	Part number
12 VDC, 800 mA power pack	10142-100
Cradle base	22219-001
Daisychain accessory kit	22528-000*
Modems	
MM-202	16077-001
MM-224	16077-002
MM-224MV	16077-003
Standard communication cables	
Cradle-to-9-pin host cable	P-80910-100
Cradle-to-25-pin host cable	11345-1X0**
Alternate communication cables	
Cradle-to-9-pin host cable	13656-322
Cradle-to-25-pin host cable	10582-001
Other cables	
Cradle-to-modem cable	11346-000
Cradle-to-cradle extension cable	10930-120
Manuals	
PTC-960RL User's Guide	21568-000
PTC-960L User's Guide	21569-000
Guide to the Flash Utilities (TCAL or MS-DOS Version)	16541-000

*The daisychain accessory kit contains 12 fastener clips and an instruction sheet.

**The "X" in the last three digits of this part number indicates the cable length in feet. You may adjust this number according to your requirements.

Refer to Appendix C for details on each of these cables.

Appendix C

Communication connections

This chapter provides information on the connections used to establish and maintain communication between the SC-960RL/SC-960L and other devices.

Pinouts

Table 2 lists the pinouts for the cradle's 25-pin host connector.

Table 2. Host connector pinouts

Pin	Signal	Description
1	GND	Signal ground
2	TXD	Transmit data
3	RXD	Receive data
4	RTS	Request to send
5	CTS	Clear to send
6	DSR	Data set ready
7	GND	Signal ground
8	CD	Carrier detect
9	TEST5V	5-volt test
10	N.C.	No connection
11	N.C.	No connection
12	DS0	Device select 0
13	DS1	Device select 1
20	DTR	Data terminal ready
22	RI	Ring indicate

Cables

This section lists the cables that can be used by the SC-960RL/SC-960L and indicates the function of each. Figures 7 through 12 illustrate the cable configurations.

Standard communication cables

When possible, the following communication cables should be used to connect the cradle to a host computer:

- Cradle-to-9-pin host cable P-80910-100
- Cradle-to-25-pin host cable 11345-1X0

These cables can be used with the Telxon TCOM-204 communication package as well as with custom host communication packages. For custom packages, however, the host software must be developed such that the RI signal on the cradle side is not asserted during periods of inactivity. If the RI signal is always asserted, the PTC in the cradle will never suspend, and the PTC's battery pack will not be recharged by the cradle.

Alternate communication cables

The following communication cables should be used only to maintain compatibility with older Telxon communication packages, specifically PC-TCOS, TCOM-101, and TCOM-201:

- Cradle-to-9-pin host cable 13656-322
- Cradle-to-25-pin host cable 10582-001

Other cables

The *cradle-to-modem cable* (11346-000) is used to connect the cradle to an external modem.

The *cradle-to-cradle extension cable* (10930-120) is used to increase the distance between daisychained cradles.

Figure 7. Cradle-to-9-pin host cable (standard), P/N P-80910-100

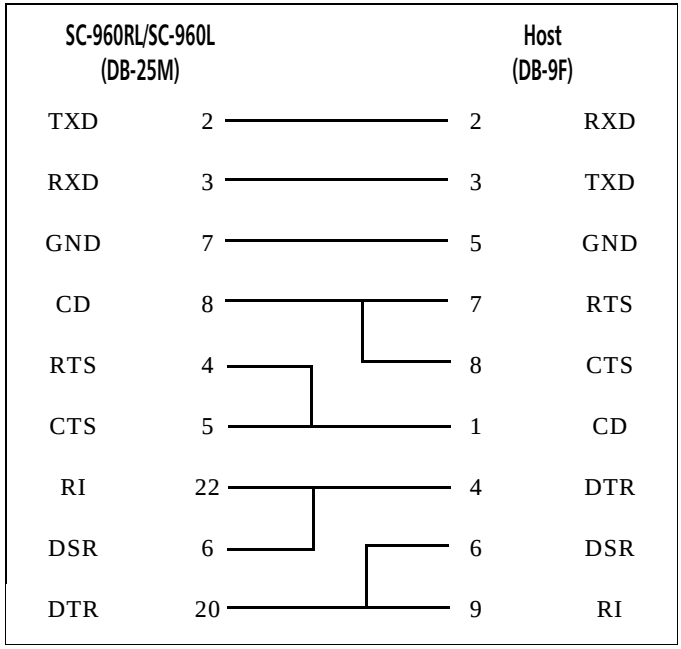


Figure 8. Cradle-to-25-pin host cable (standard), P/N 11345-1X0

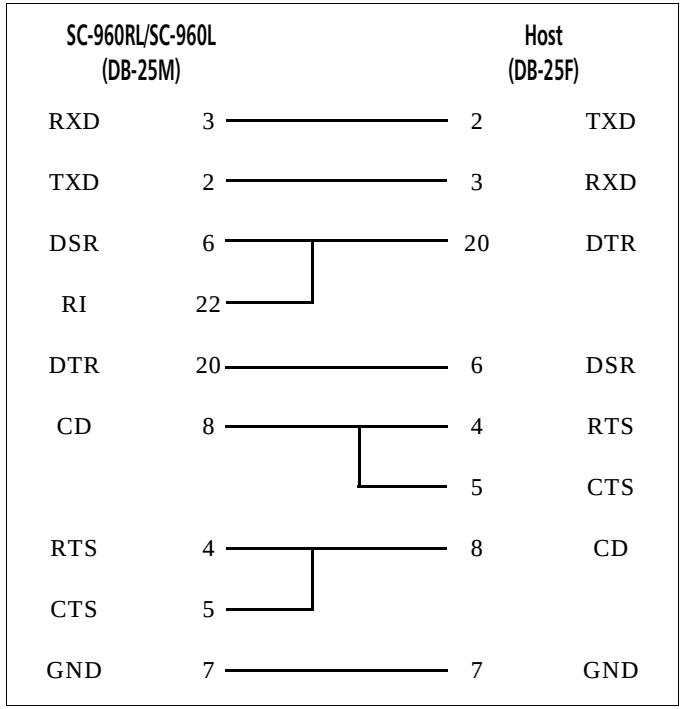


Figure 9. Cradle-to-9-pin host cable (alternate), P/N 13656-322

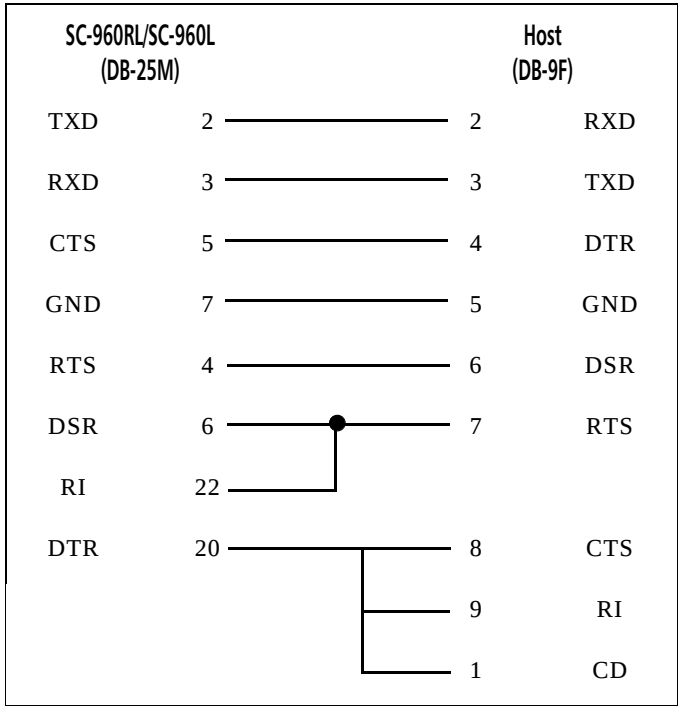


Figure 10. Cradle-to-25-pin host cable (alternate), P/N 10582-001

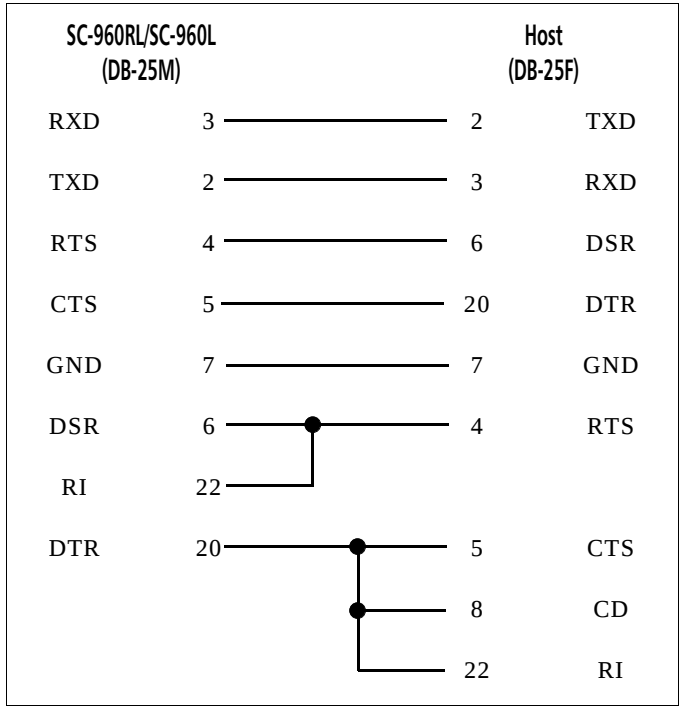


Figure 11. Cradle-to-modem cable, P/N 11346-000

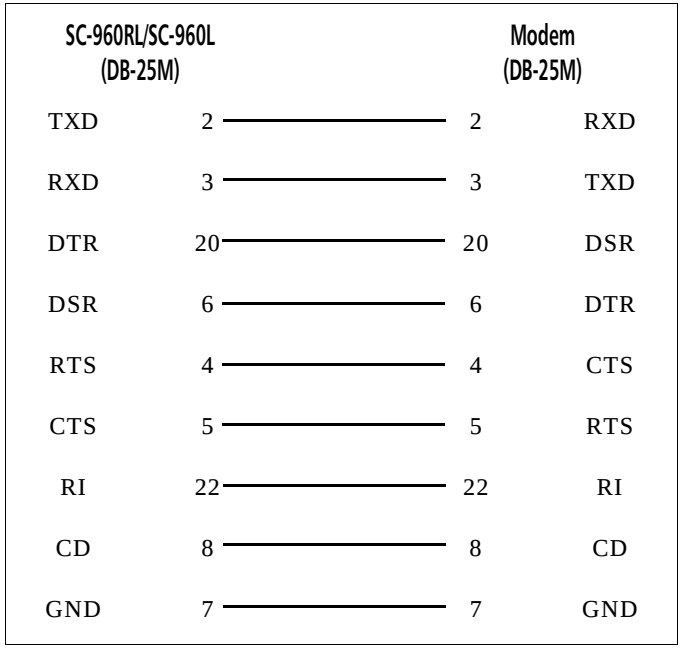
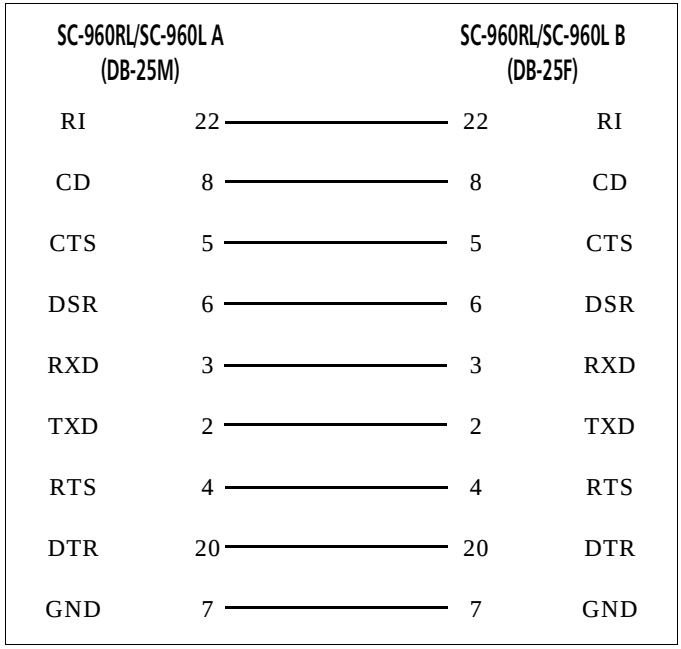


Figure 12. Cradle-to-cradle extension cable, P/N 10930-120



Appendix D

LED status indicators

Light-emitting diodes (LEDs) on the SC-960RL/SC-960L's front panel indicate the status of the cradle, an installed PTC, and an installed battery pack.

Figure 13 shows the SC-960RL/SC-960L's LED status panel.

Figure 13. LED status panel

Power LED

This red LED glows when power is applied to the cradle.

PTC bay Busy LED

This red LED glows when a PTC is in its bay and is communicating with a host computer or modem.

PTC bay Charging LED

This green LED glows when the PTC's internal battery pack is being charged.

Spare battery bay Charging LED

This green LED glows when a spare battery pack is being charged.

Table 3 helps you to interpret the status LEDs.

Table 3. Status LED interpretation

Status	Power LED	PTC bay Busy LED	PTC bay Charging LED	Spare battery bay Charging LED
Cradle is receiving power	On	On or off	On or off	On or off
PTC is communicating through cradle	On	On	On or off	On or off
No battery in cradle	On	Off	Off	Off
Cradle is charging PTC's battery pack	On	On or off	On	On or off
Cradle is charging spare battery pack	On	On or off	On or off	On

Glossary

application	A PC, mainframe, or PTC program that is designed to perform a specific task for a user. Examples include route accounting, payroll, price lookup, shipping, and inventory control.
auto-answer	The ability to detect an incoming call, answer the call, and attempt to establish communication.
bit	The fundamental binary unit, either a 1 (on) or a 0 (off). In ASCII code, seven bits represent one character of data.
bps	Bits per second. A rate of electronic data transmission.
CD	Carrier detect signal. CD indicates that the modem is receiving a signal from the remote modem.
CTS	Clear-to-send signal. CTS indicates that the line between a modem and a terminal device is clear for transmission. CTS usually follows a raised request-to-send (RTS) signal.
data communication	The transport of encoded information from one device to another.
DSR	Data set ready signal. The modem sends DSR to the attached device to indicate that the modem is connected, on, and ready.
DTR	Data terminal ready signal. The signal sent by the terminal device to the modem to indicate that the terminal is ready for transmission.
GND	Ground.
host computer	A personal computer or mainframe that processes and stores data supplied by PTCs.

I/O port	Input/output port. A connection on the cradle through which the SC-960RL/SC-960L sends data and instructions to other devices and receives data and instructions from them. Also the connector on the cradle to which cables or accessories are attached.
LED	Light-emitting diode. The LEDs serve as indicator lights on the cradle.
mA	Milliampere. A measurement of the ability to provide electrical power.
modem	Modulator-demodulator. A communication device that converts the 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.
nickel-cadmium battery	A type of rechargeable battery used to power a PTC and some of its accessories.
one-way communication	The transport of information from one device to another without interruption. In one-way communication, the receiving device cannot respond directly to the sending device.
port	See *I/O port*.
PTC	Portable Tele-Transaction Computer. A programmable, battery-powered, hand-held device used for collecting, storing, and transmitting data.
RI	Ring indicate signal. RI alerts a modem to a call waiting on the attached telephone line.
RJ-11	A single-line, analog telephone jack termination.
RS-232	An Electronic Industries Association (EIA) standard that defines the connector, the connector pins, and the signals used to serially transfer data from one device to another.

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 is the data that is being received.
SC-960RL/SC-960L Single-bay Communication Cradle	A device that charges a PTC-960RL/PTC-960L's nickel-cadmium battery pack and a spare battery pack and allows the PTC to communicate with a host computer.
signals	Electronic impulses that transmit data from one device to another.
two-way communication	The 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 is the data that is being transmitted.
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.

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