MRC-921 MircoBase

User's Guide

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TELXON

MRC-921 MicroBase

User's Guide

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MRC-921 MicroBase
User's Guide

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Regulations 1

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 user's guide, 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.

The MicroRadio in the MRC-921 MicroBase fully complies with FCC Part 15.249 limits for intentional radiation as well as FCC Part 15.209 for unintentional emissions.

FCC regulations

The MRC-921 MicroBase uses radios (transceivers) and radio communication in its operation. The MRC-921 is a low-power transceiver operating under FCC Part 15.249. No license is required for operation.

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).

The MRC-921 MicroBase'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.

Safety information 2

Using the radio

The FCC with its action in General Docket 79-144, March 13, 1985, has adopted a safety standard for human exposure to radio frequency (RF) electromagnetic energy emitted by FCC regulated equipment. Telxon subscribes to the same safety standard for the use of its products. Proper operation of this radio will result in user exposure substantially below the FCC recommended limits.

- Do not hold any component containing a radio such that the antenna is very close to, or touching, exposed parts of the body, especially the face or eyes, while transmitting. Hold such a component 6 inches (15.2 centimeters) or more from your face.
- Do not allow children to play with any radio equipment containing a transmitter.
- Do not operate a portable transmitter near unshielded electrical blasting caps or in an explosive atmosphere unless it is a type especially qualified for such use.
- Do not turn on the MRC-921 MicroBase or attempt to transmit data unless the antenna is attached; if the antenna is not attached, the radio module may be damaged.

Disposing of nickel-cadmium batteries

Nickel-cadmium batteries 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 the MRC-921 MicroBase's parts, features, and accessories. It also explains how to operate and maintain the cradle.

Document conventions

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.

Related publications

Refer to Appendix B for a list of manuals and their part numbers.

The following manuals may be helpful as you operate the MRC-921 MicroBase:

- *MRC-921 Technical Reference,* which contains configuration information
- *PTC-921 User's Guide*

Overview of the MRC-921 MicroBase 4

Figure 1 shows a typical MRC-921 MicroBase system.

The MRC-921 MicroBase is a communication cradle that allows a wireless MicroRadio-based scanner, such as the PTC-921, to communicate with a host. The cradle connects to the host's serial port via cable and communicates through an RS-232 asynchronous protocol.

The MRC-921 can support one to five PTCs, depending on the size and frequency of transactions.

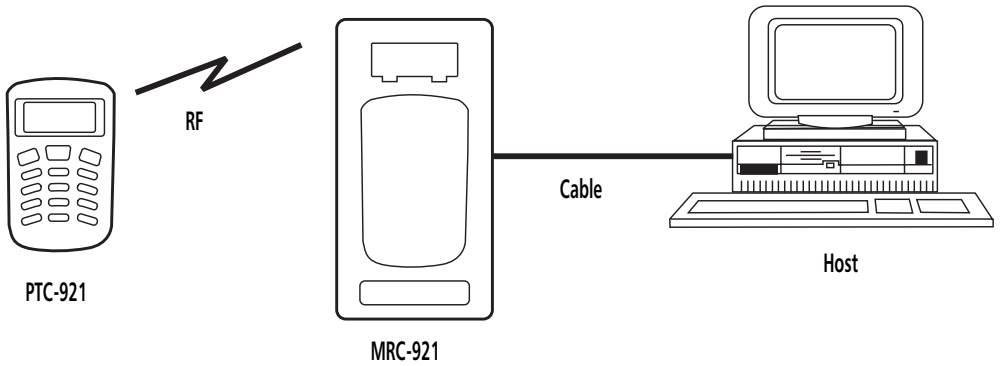
The cradle allows interactive communication between the host and multiple PTCs. Therefore, data and messages can be sent both to and from the host.

This unit also recharges the nickel-cadmium battery packs that supply power for the PTC-921. Each charger can hold a PTC-921 and a spare battery pack.

The spare battery bay contains a fast charger, which charges spare PTC-921 battery packs in 4 hours.

The PTC bay can be ordered as either a fast or trickle charger. A fast-charging bay charges the battery pack in the PTC in 4 hours. A trickle-charging bay charges the PTC's battery pack in 12 to 16 hours.

Figure 1. A typical MRC-921 MicroBase system



Getting started 5

Unpacking the MRC-921

Any additional accessories are shipped in separate boxes with their own manuals.

Each shipping box contains

- an MRC-921 MicroBase,
- a power pack (if ordered),
- an external antenna (if ordered),
- spare PTC-921 battery packs (if ordered),
- an *SC-921 and MRC-921 Instruction Sheet*,
- an *MRC-921 MicroBase User's Guide*, and
- a *Guide to Maintaining NiCd Batteries*.

1. Remove the MRC-921 from the box.
2. Remove all packing material from the MRC-921. 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 MRC-921 for shipping damage.

Connecting the external antenna (if ordered)

The MRC-921 comes with an internal antenna. An external antenna can be added to increase coverage.

If your MRC-921 was shipped with an external antenna, follow these instructions to connect it to the cradle.

1. Screw the antenna onto the antenna connector on the MRC-921's left side.

Supplying power to the MRC-921

Equipment required:

- A 12-volt, 800-mA power pack
- An electrical outlet within 6 feet (1.8 meters) of the MRC-921 providing 110 volts AC in the U.S. or Canada

To use the unit outside of the U.S. or Canada, you need a power pack designed for a 220-volt AC outlet.

1. Place the MRC-921 on a flat surface in a location where the temperature will be between 50 degrees F (10 degrees C) and 110 degrees F (43 degrees C).
2. Plug the power pack's connector into the MRC-921's power connector.
3. Plug the power pack into the electrical outlet.

Running the power-on self test

When you plug in the MRC-921, it performs a series of self-diagnostic tests to ensure it is operating correctly. These tests are indicated by flashing patterns of the PTC and spare battery pack light-emitting diodes (LEDs).

Refer to the "Troubleshooting" section on page 24 for information on possible errors.

If the MRC-921 passes these diagnostics, all the LEDs turn off after 10 seconds, provided the unit does not contain a PTC or spare battery pack. If any LEDs stay lit, the diagnostics have discovered an error.

Parts 6

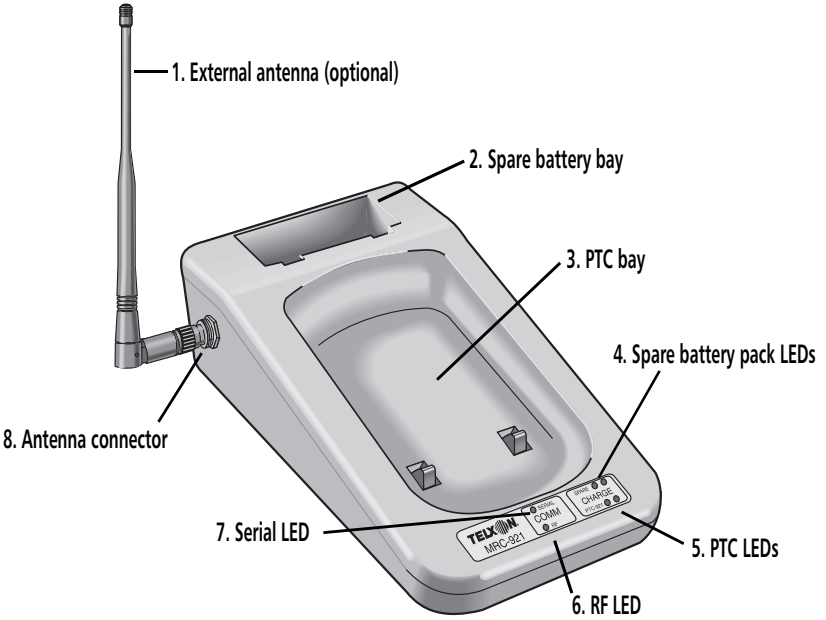
Figures 2 and 3 on the following pages show and describe the external parts of the MRC-921 MicroBase. The part listed below is internal and, therefore, is not shown in either of the figures.

MicroRadio

See Appendix A for radio specifications.

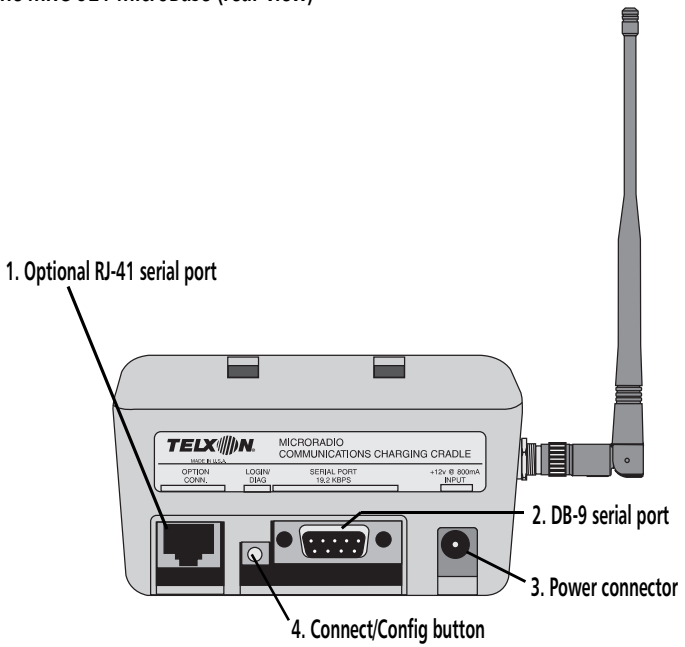
This short-range radio in the MRC-921 is used to communicate with the MicroRadio in a wireless scanner (PTC-921).

Figure 2. The MRC-921 MicroBase (front view)



1. An external antenna can be ordered to expand the coverage of the cradle's MicroRadio. Coverage increases from 50 ft (15.2 m) with a standard internal antenna to 100 ft (30.5 m) with an external antenna.
2. This bay holds a PTC-921 spare battery pack for recharging. The bay fast charges a fully discharged spare pack in 4 hours.
3. This bay holds a PTC-921 and recharges the battery pack within it. The bay can be ordered as a 4-hour fast charger or as a 12- to 16-hour trickle charger.
4. These LEDs indicate the charging status of the spare battery pack. Refer to the table on page 18 for an explanation of the LEDs.
5. These LEDs indicate the charging status of the battery pack in the PTC-921. Refer to the table on page 18 for an explanation of the LEDs.
6. This LED glows when the MRC-921 is communicating via its MicroRadio.
7. This LED glows when the MRC-921 is communicating via its DB-9 serial port or optional RJ-41 serial port.
8. An external antenna screws onto this connector to increase the MicroRadio's range.

Figure 3. The MRC-921 MicroBase (rear view)



1. This RJ-41 serial port connects the MRC-921 via cable to a host's RS-232 serial port for communication or configuration. Refer to the *MRC-921 Technical Reference* for configuration instructions.

2. This 9-pin serial port connects the MRC-921 via cable to a host's RS-232 serial port for communication or configuration. Refer to the *MRC-921 Technical Reference* for configuration instructions.

3. A 12-volt, 800-mA power pack plugs into this connector to supply power to the MRC-921.

4. Pressing this button upon power-up will restore all MRC-921 configuration settings to their default values. Refer to the *MRC-921 Technical Reference* for configuration information.

Recharging battery packs 7

! Use the MRC-921 to recharge only PTC-921 battery packs.

Follow the instructions in this section to use the MRC-921 as a battery charger.

! Recharging a cold battery pack can damage it.

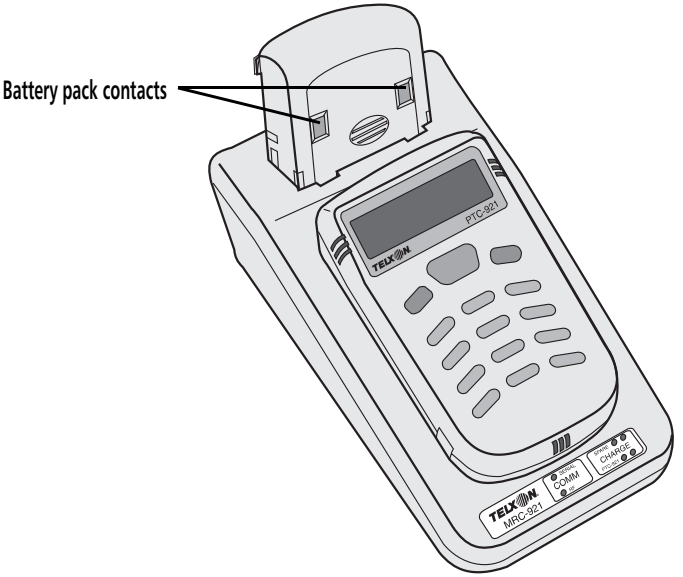
Allow any battery pack used in below-freezing temperatures to warm up to room temperature before recharging.

1. Insert the spare battery pack and the PTC into their appropriate bays in the MRC-921. Insert the spare pack so its contacts will connect with the contacts in the spare battery bay. See Figure 4.

A battery pack that is not fully discharged takes less than 4 hours to charge.

2. The MRC-921 automatically begins charging the battery packs. Each bay's red LED lights. Allow approximately 4 hours for fast charging.

Figure 4. Recharging battery packs



If the PTC bay was ordered as a trickle charger, the battery pack in the PTC will take 12 to 16 hours to charge.

If the PTC bay is a trickle charger, its green LED will *never* light. The cradle does not indicate a full-charge state.

3. When each bay's green LED lights, the battery pack in that bay is charged and can be removed and used.

Refer to the "Troubleshooting" section on page 24 for information on possible errors.

The following table interprets the PTC and spare battery pack LEDs.

Status condition	Red LED	Green LED
No battery	Off	Off
Charging	On	Off
Fully charged	Off	On
Error	Blinking	Blinking

Connecting the MRC-921 to a host 8

The MRC-921 MicroBase can communicate with a variety of host devices, such as personal computers and point-of-sale (POS) terminals. Each host can accept data from the MRC-921 through its RS-232 serial port.

Follow the instructions in this section to connect your MRC-921 to a host.

Connecting to the host's serial port

1. Make sure the MRC-921's power pack is not plugged into an electrical outlet.
2. Turn off the host to which the MRC-921 will be connected.

See Appendix B for a list of available cables.

3. Line up the 9-pin connector on the appropriate MRC-921-to-host cable with the cradle's DB-9 serial port.

   or

   Line up the RJ-41 connector on the appropriate MRC-921-to-host cable with the cradle's optional RJ-41 serial port.

! Do not force the connectors together. You could bend the pins.

4. Gently press the two connectors together.
5. Connect the other end of the cable to the host's serial port.

Refer to page 13 for details.

6. Plug the MRC-921's power pack into an electrical outlet.
7. Turn on the host to which the cradle is connected.

Configuring the MRC-921 9

Before the MRC-921 MicroBase can send data from the wireless scanner (PTC-921) to the host, the cradle must be properly configured for communication. Specifically, parameters such as the radio channel, baud rate, communication protocol, and so on need to be selected.

If it has not been configured, refer to the *MRC-921 Technical Reference* for configuration information.

Check with your supervisor to verify that your MRC-921 has been properly configured for communication.

Communicating data 10

After the MRC-921 has been connected to the host and properly configured, communication usually follows this general pattern:

1. All three units (PTC-921, MRC-921, and host) are turned on.

The default message is usually an asterisk (*).

2. The PTC-921 initiates communication with the MRC-921. After a successful logon, a default message displays on the PTC's screen.

3. Data is entered (either by being scanned or typed with the keyboard) into the PTC-921.

The data usually includes the PTC unit ID, the data-entry type (scanned or keyed), and the bar-code type.

4. The data is sent via the PTC-921's MicroRadio to the MRC-921.

5. The MRC-921 forwards the data to the host.

Refer to the *MRC-921 Technical Reference* for a list of messages that may display on the PTC's screen.

6. If the data is received successfully, an asterisk displays on the PTC-921's screen.

   If the data is not received successfully, an RF link error displays on the PTC-921's screen.

7. Communication continues with the PTC-921 sending data to the host through the MRC-921.

Maintaining the MRC-921 11

The MRC-921 is well constructed and durable; however, it is a precision electronic device and must be treated as such. Follow the procedures in this section to ensure reliable service.

Operating conditions

The MRC-921 is designed to operate in environments that are normally free of dust, dirt, and moisture. It can be operated at temperatures between 50 degrees F (10 degrees C) and 110 degrees F (43 degrees C).

Handling the MRC-921

- Do not open the MRC-921. No user-serviceable parts are inside.
- Charge only nickel-cadmium battery packs that have been designed for use in the PTC-921. Do not recharge other types of rechargeable batteries or any type of alkaline batteries.
- Do not insert anything other than the specified battery packs into the MRC-921's spare battery bay.
- If you store a battery pack in below-freezing temperatures for more than 1 hour, do not charge the battery pack until it warms up to room temperature.
- Protect the MRC-921 from excessive heat, cold, moisture, and harsh, dirty environments.
- Do not leave the MRC-921 where moisture can condense on it.

Storing the MRC-921

- Do not store the MRC-921 in temperatures below –20 degrees F (–29 degrees C) or above 140 degrees F (60 degrees C).
- Do not store the MRC-921 in a damp or humid environment (over 95% noncondensing).

Pack the MRC-921 in the original packing material or in a padded box and put it in a safe place away from dust, dirt, humidity, and excessive heat or cold.

Cleaning the MRC-921

To clean the MRC-921, slightly moisten a soft, clean, lint-free cloth with a mild, nonabrasive cleaner and wipe the cradle's outside surface.

- Do not use a paper towel to clean the MRC-921.
- Do not soak the cloth used to wipe the MRC-921 and do not spray or pour cleaning liquids directly onto the cradle.

If the MRC-921 becomes extremely dirty or if liquids, dirt, or other foreign materials get inside the case, contact your Telxon service representative.

Servicing the MRC-921

Do not service the MRC-921. Only a trained Telxon technician may service the cradle.

Troubleshooting 12

LEDs remain on after the power-on self test

- Remove the spare battery pack and PTC, if present, from the MRC-921. Unplug the power pack; then plug it in again.
- If the LEDs remain lit, call your Telxon service representative.

The red LED for the PTC does not light

- Make sure the PTC is installed correctly in its bay.
- Exchange the battery pack in the PTC-921 with the spare battery pack.

  If the red PTC LED now lights, the first battery pack is faulty and must be discarded.

  If the red LED still fails to light, call your Telxon service representative.

Refer to page 9 for information on disposing of your nickel-cadmium battery pack.

The red LED for the spare battery pack does not light

- Make sure the battery pack is installed correctly in its bay.
- Exchange the spare battery pack with the battery pack in the PTC-921.

  If the red spare battery pack LED now lights, the spare battery pack is faulty and must be discarded.

  If the red LED still fails to light, call your Telxon service representative.

Refer to page 9 for information on disposing of your nickel-cadmium battery pack.

Both LEDs for the PTC are blinking

- Make sure the PTC is installed correctly in its bay.
- Exchange the battery pack in the PTC-921 with the spare battery pack.

Refer to page 9 for information on disposing of your nickel-cadmium battery pack.

If the LEDs stop blinking, the first battery pack is faulty and must be discarded.

If both LEDs continue to blink, call your Telxon service representative.

Both LEDs for the spare battery pack are blinking

- Make sure the battery pack is installed correctly in its bay.
- Exchange the spare battery pack with the battery pack in the PTC-921.

Refer to page 9 for information on disposing of your nickel-cadmium battery pack.

If the LEDs stop blinking, the spare battery pack is faulty and must be discarded.

If both LEDs continue to blink, call your Telxon service representative.

The battery pack in the PTC or spare battery bay takes too long to recharge

- Make sure the battery pack is inserted correctly.
- Clean the contacts on the battery pack.
- Try another battery pack to make sure the MRC-921 is working correctly.
- If the battery pack still takes too long to recharge, call your Telxon service representative.

The green LED for the PTC never lights

If the PTC bay was ordered as a trickle charger, the green LED will never light. This is normal.

- Call your Telxon service representative.

The green LED for the spare battery pack never lights

- Call your Telxon service representative.

Other problems

If you experience any other problems or difficulties with your MRC-921 MicroBase, notify your Telxon service representative or contact the Telxon Customer Support Center at 1-800-800-8010.

Appendix A

Specifications

Communication

Host interfaces	
DB-9 serial port:	Built-in one- or two-way 9-pin RS-232 port, up to 38.4K bps async
RJ-41 serial port:	(Optional) Built-in one- or two-way RJ-41 serial port

Electrical

Charging time	
Fast charger:	4 hours
Trickle charger:	12 to 16 hours
MRC-921 input voltage requirement:	12 VDC 800 mA

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)
Relative humidity:	95% noncondensing

Physical

Capacity:	One PTC-921 and one spare battery pack
Length:	6.8 in/17.3 cm
Width:	5.2 in/13.2 cm

Depth:	3 in/7.6 cm
Weight:	10.5 oz/.3 kg

Radio

Type:	MicroRadio
Operating frequency:	902.5 to 927.5 MHz
Antenna:	Internal (standard) or external (optional)
Range	
Internal antenna:	35 to 50 feet (10.7 to 15.2 meters)
External antenna:	75 to 100 feet (22.9 to 30.5 meters)

Appendix B

Hardware part numbers

The following table lists part numbers for ordering the MRC-921 MicroBase and accessories.

Item	Part number
MRC-921 MicroBase	17853-001
Accessories	
External antenna	18634-000
Power pack	10142-200
Spare PTC-921 6-volt nickel-cadmium battery pack	16880-001
Cables	
MRC-921-to-host cable (9-pin)	See *
MRC-921-to-host cable (RJ-41)	See *
Manuals	
MRC-921 Technical Reference	19457-000
PTC-921 User's Guide	16899-000
Guide to Maintaining NiCd Batteries	16488-000

* Contact your Telxon representative to obtain part numbers for these cables.

Glossary

asynchronous transmission	A transmission with variable time intervals between successive data characters. In asynchronous communication, each data character is framed by start and stop bits.
battery pack	A sealed set of rechargeable nickel-cadmium batteries used in the PTC-921 and recharged by the MRC-921.
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.
data communication	The transport of encoded information from one device to another.
host computer	A personal computer or mainframe that receives and processes data from remote PTCs.
LED	Light-emitting diode. The indicator lights on the MRC-921 are of this type.
nickel-cadmium battery	A type of rechargeable battery used in PTC-921 battery packs.
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.
RF	Radio frequency.
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.

signals	Electronic impulses that transmit data from one device to another.
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.
VDC	Volts direct current. A unit of measure of electric potential or potential difference in a unidirectional electrical current.

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