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MICROSCAN[®]

Quadrus EZ Reader User's Manual



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About the Quadrus EZ Reader

The key features of the Quadrus EZ are:

- A multi-function EZ button for location, calibration, and reading
- “X” pattern symbol locator
- High speed image processing up to 60 reads per second
- Factory-adjustable focus 2 to 10 inches
- Ability to read both 2D and linear symbols
- Ability to read difficult symbols
- Secondary video input from RS-170 non-interlaced analog cameras

To aid in setup, the Quadrus EZ incorporates three primary features:

- An “X” locator identifies the center point of the FOV
- A calibration feature to optimize readability
- A green flash (visible from all angles) to signal a successful read

Host Communications

There are four ways to configure and test the Quadrus EZ:

1. EZ button.
2. Microscan’s Windows-based **ESP** (Easy Setup Program), which offers point-and-click ease of use and visual responses to user adjustments.
3. Serial commands, such as **<K100,1>**, that can be sent from **ESP’s Terminal** window or another terminal program.
4. The tree control menus and graphic interfaces in **ESP’s App Mode**.

About the Quadrus EZ Reader User's Manual

This manual provides complete information on setting up, installing, and configuring the reader. The chapters are presented in the order in which a reader might be set up and made ready for operation.

Highlighting

Serial commands, selections inside instructions, and menu defaults are highlighted in **red bold**. Cross-references are highlighted in **blue**. Web links and outside references are highlighted in **blue bold italics**. References to menu topics are highlighted in **Bold Initial Caps**. References to topic headings within this manual or other documents are enclosed in quotation marks.

Warning and Caution Summary



- Viewing the Quadrus EZ's LED output with optical instruments such as magnifiers, eye loupes, or microscopes within a distance of 100 mm could cause serious eye injury.
- Maximum LED light output: 648 cd.
- Wavelength: 464 nm; 518 nm; 635 nm.
- Location of the Quadrus EZ's LED aperture window:



LED Aperture Window

- **CAUTION:** Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Statement of Agency Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

For connection to a UL-listed direct plug-in power unit marked Class II and rated 10 to 28 VDC at 10 watts (CCD) or 8 watts (CMOS), or greater if using electrical accessories.

European models must use a similarly rated Class I or Class II power supply that is certified to comply with standard for safety IEC 60950.

Approvals

This equipment is in compliance or approved by the following organizations:

- CDRH (Center for Devices & Radiological Health)
- FCC (Federal Communications Commission)
- CE (Conformité Européenne)
- BSMI (Bureau of Standards, Metrology and Inspection)

1 Quick Start

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This chapter is designed to get your reader up and running quickly using the reader's **EZ** button or **ESP (Easy Setup Program)** so the user can get a sense of its capabilities and test sample symbols.

Detailed setup information for installing the reader into the actual application can be obtained in the subsequent chapters.

In addition to **ESP**, you can send commands to your reader by serial commands and through the reader's embedded menus.

Step 1 — Check Required Hardware

To get started with just the EZ Button

You will need:

- A **Quadrus EZ Reader (1)**, FIS 6700-XXXX.
- An **IB-150 Kit**, 98-000040-02, which includes a **cable**, 61-000034-02, and the **IB-150 Interface Box (2)**, 99-000008-02.
- A **Power Supply (3)**, 97-100004-15 (90-264 VAC, 24VDC).

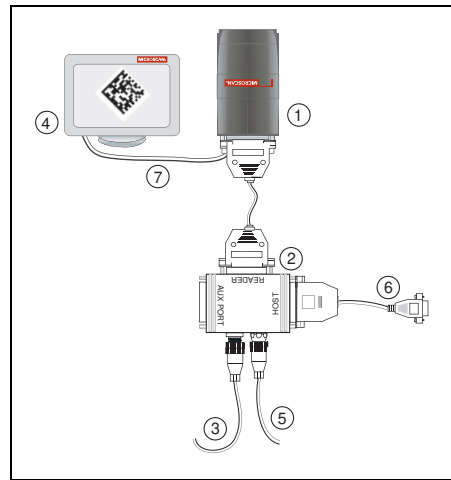
If connecting to a host by RS-232

You will also need the following:

- A **host computer** with either a terminal communications program or Microscan's **ESP**, which runs under Windows operating system, Windows 98 or higher.
- An **IB-150 Host Communications Cable (6)**, 61-000034-02 (25-pin socket to 9-pin socket).
- **Object Detector (5)** (optional), 99-000017-01.

If connecting to a host by TCP/IP

See Chapter 15, [Ethernet](#).



Hardware Configuration

Caution: Be sure that all cables are connected **BEFORE** applying power to the system. Always power down **BEFORE** disconnecting any cables.

Step 2 — Connect the System

You can connect the Quadrus EZ by EZ button, RS-232, or TCP-IP (Ethernet).

Connecting for EZ Button Setup without a Host

- Connect the **Quadrus EZ Reader** to the **IB-150 Kit**, 98-000040-02.
- Connect **Power Supply**.
- Apply power to the reader.

Connecting by RS-232

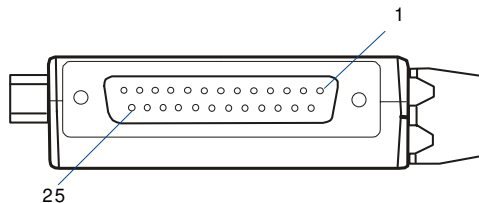
- Connect the reader to the **IB-150 Kit**, 98-000040-02.
- Connect the **IB-150 Host Communications Cable**, 61-000034-02, to the host and the host connector on the side of the **IB-150** interface box.

Note: When wiring the interface box to a host with a 25-pin host connector, cross pins 2 and 3. When wiring the interface box to a host with a 9-pin host connector, do NOT cross pins 2 and 3.

1. Connect power supply.
2. Apply power to the reader.

Connecting to a Host by TCP/IP

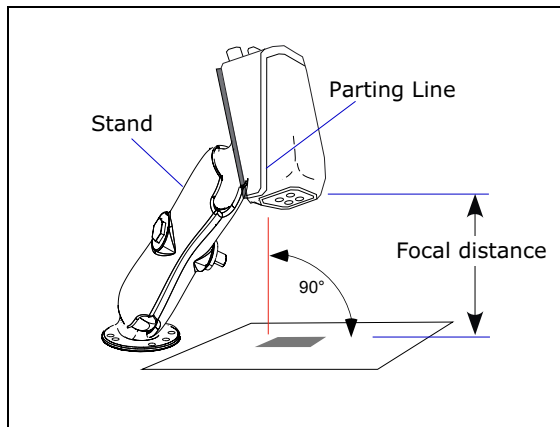
See Chapter 15, [Ethernet](#).



Side View of IB-150 showing Host 25-pin Socket Connection

Step 3 — Position Reader and Symbol

- Position the reader at the focal distance recommended on the back of the reader, for example **FD = 4"**.
- Tip the reader relative to the symbol to avoid the glare of direct (specular) reflection. The case parting line should be perpendicular to the plane of the symbol by either pitching the symbol or the reader as shown.
- Position the reader in a place devoid of sunlight.
- Symbols can be rotated (tilted) in any angle; however, for best results symbols should be aligned with the FOV (field of view).



Reader Position

- In the case of linear symbols, aligning the bars in the direction of their movement (“ladder” orientation) will minimize the chances of blurring and produce better reads.
- Avoid excessive skew or pitch. Maximum skew is $\pm 30^\circ$; maximum pitch is $\pm 30^\circ$.

Note: For instant setup and validation, the Quadrus EZ can be hand-held or laid on its side; but for accuracy a mounting stand such as the one shown above is recommended.

Step 4 — Install ESP

ESP stands for **E**asy **S**etup **P**rogram.

ESP provides a quick and easy way to set up and configure your reader.

If installing from a Microscan Installation and Support CD:

1. Insert your Microscan Installation and Support CD in your computer's CD drive.
2. Choose **ESP Software** from the main menu.
3. Launch **Setup.exe** under **ESP** and follow the prompts.

If downloading from the web:

1. Go to <http://www.microscan.com/downloadcenter>
2. Create a new "myMicroscan" member account or, if you are already a member, enter your user name and password.
3. Click the **Download Software** link and extract the latest version of **ESP** to a directory location of your choice. *Note where your **ESP.exe** file is stored on your hard drive.*
4. At the end of the installation process, the following icon will appear on your desktop:



5. Click the **ESP** icon to start the program.

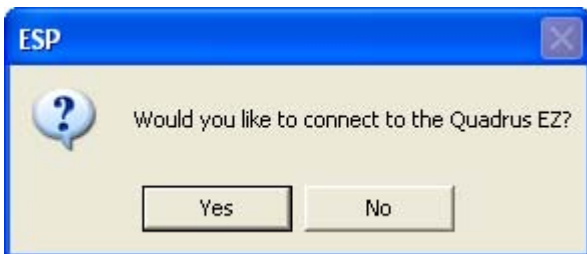
Step 5 — Select Model

When you start the program, the following menu will appear:



Note: If you need to select another model later, click the **Switch Model** button.

1. Click the Quadrus EZ button and then click **OK**. If you do not want to make this selection every time you start **ESP**, uncheck “Show this window at Startup”.
2. Select the default reader name (**Quadrus EZ-1**), or type a name of your choice in the **Description** text field and click **OK**.
3. Click **Yes** when this dialog appears:

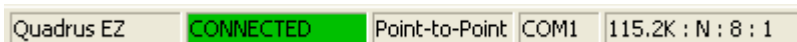


Step 6 — Select Communications Protocol

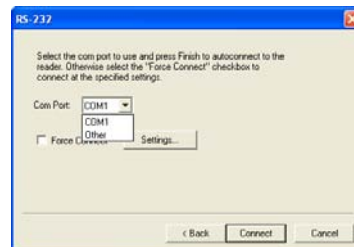
When the **Select Protocol** dialog appears, choose either **RS-232** or **TCP/IP** (Ethernet) and click **Next**.

RS-232

1. In the RS-232 dialog, if your communications port is not the default **COM1**, use the dropdown menu to change your communications port.
2. Click **Connect**.
3. When connected, the **CONNECTED** message will appear in a green box in the status bar on the bottom right of the dialog.



4. If the connection fails, click the **Autoconnect** button, select a different Com port, and try again.



Note: If your host settings cannot be changed to match the reader's settings, check the **Force Connect** box.

TCP/IP (Ethernet)

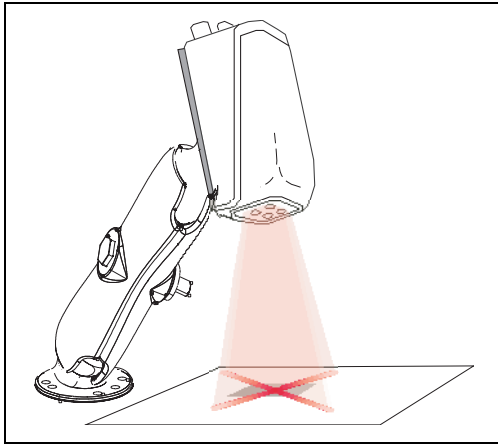
Both **ESP** and the reader will need to have TCP/IP addresses assigned.

1. If no address has been assigned to the reader, go to Chapter 15, **Ethernet**. If your reader has already been assigned IP addresses, enter the IP address in the dialog box.
2. Click **Connect**.



Tip: If you do not see either the **CONNECTED** or **DISCONNECTED** messages at the bottom of your dialog, try expanding the **ESP** window horizontally.

Step 7 — Locate the Symbol in the FOV



In this step, you move the symbol or the reader so that the “X” pattern is centered over the symbol.

It is important that the whole symbol falls within the field of view (FOV) of the reader. (The FOV is what appears in the Locate/ Calibrate window.)

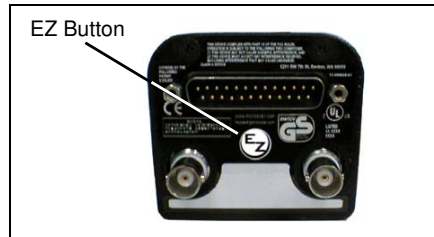
Note: Holding the **EZ** button until you hear **4 beeps** enables **Live** video output (if attached to a monitor).

Locate by EZ Button

When not connected to a computer, the **EZ** setup button will allow you to quickly locate a symbol in the reader’s FOV.

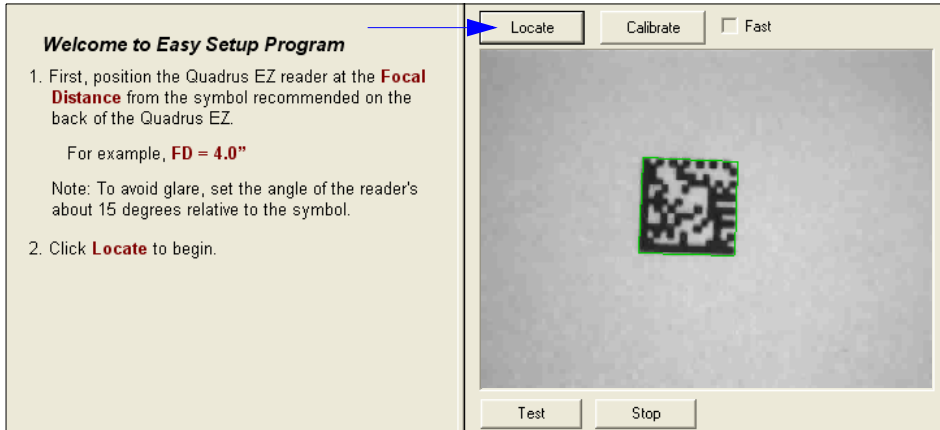
1. Hold down the **EZ** setup button for about one second and release when you hear one short beep. You will see the blue **X**-pattern.
2. Center the **X**-pattern on the symbol.

Note: To end all EZ button functions, press the **EZ** button and quickly release.

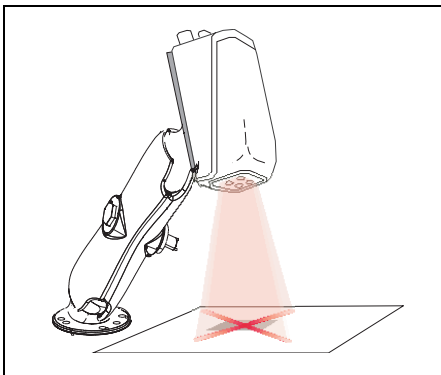


Locate by ESP

1. In the EZ menu, click the **Locate** button to enable the **X**-pattern.



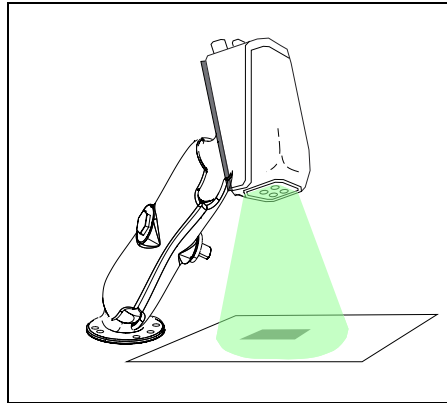
2. You will see the **X**-pattern in front of the reader.
3. Center the **X**-pattern over the symbol you want to read.
4. Click the **Stop** button to end the locate mode.



Step 8 — Calibrate Settings

Quadrus EZ image settings can be adjusted automatically for optimum readability by either the **EZ** setup button or **ESP**.

During the calibration routine, the reader will flash its LEDs while searching through various IP (image processing) settings and matching them with the highest read rates. Upon successful completion of this routine, a green LED pattern will flash brightly and illuminate the symbol. If unsuccessful, the reader will emit 5 short beeps and stop searching.



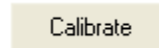
Calibrate by EZ Button

1. Hold down the **EZ** setup button about 2 seconds and release when you hear **two short beeps**.
2. The reader will search through various IP settings and match them with the highest read rates.

Note: To end all EZ button functions, press the EZ button and quickly release.

Calibrate by ESP

1. Click the **Calibrate** button.
2. The reader will search through various IP settings and match them with the highest read rates.



A successful calibration will display a green frame around the symbol. Following this, a message, "Uploading all reader parameters" will appear. After a moment the symbol's data and related features will be presented under the "Symbol Information" box below the image display window.

Calibrate by Serial Command

Send **<op,6,1>** to begin calibration. Send **<op,6,0>** to end calibration.

Step 9 — Perform Readability Test

This test will let you know the percent of good reads per captures achieved by the reader.

Testing by EZ Button

1. To start the read rate test, hold down the **EZ** setup button about 3 seconds until you hear **three short beeps** and see the alternating IP and finder pattern LEDs.

While the symbol is being decoded, the read rate LEDs will indicate the corresponding read rate percentage on the side of the unit.

2. To end the read rate test, press the **EZ** button and quickly release.

Testing by ESP

1. Click the **Test** button to start the read rate test and **Stop** to end it.

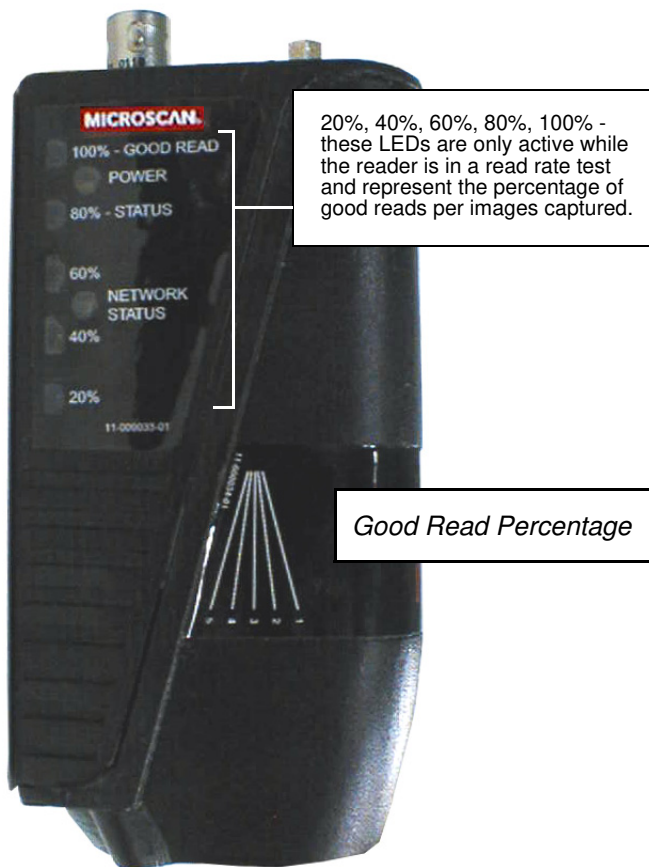
If your symbol has been successfully decoded, its data and related features will be presented under “Symbol Information.”

Also, while the symbol is being decoded, the read rate LEDs will indicate the corresponding read rate percentage on the side of the unit as shown above.

2. To end the test, click the **Stop** button.

Testing by Serial Command

You can also start a test with the **<C>** or **<Cp>** command and end it with the **<J>** command.



Step 10 — Applications

To make setup changes to the Quadrus EZ, click the **App Mode** button.



From here you can make changes in the configuration files that appear on the second row of icons.

You can also do the following:

- Send or Receive commands by clicking the **Send/Recv** button.
- Make changes to Camera options by clicking the **Camera** button.
- Access the Terminal window to see data or entering serial commands by clicking the **Terminal** button.
- Review status settings or make changes to operational commands by clicking the **Utilities** button.
- Format data for output by clicking the **Output Format** button.

For details, see **ESP Help** in the pulldown menu.

The window on the left represents the tree control. The window on the right is where image captures are displayed.

Step 11 — Make Menu Changes and Save in ESP

To make changes to a configuration setting:

1. **Left click** on the + to expand tree.
2. **Double click** on parameter and click once in selection box to view options.
3. Place your cursor in the selection box, scroll down to the setting you want to change and **click** once on the setting.
4. **Left click** again on the open screen to complete the selection.

Parameters	ESP Values
[-] Communications	
[-] Host Port Connections	
Baud Rate	9600
Parity	Even
Stop Bits	One
Data Bits	Seven
Host Protocol	Point-to-Point
[+] Preamble	Disabled
[+] Postamble	Enabled*
	Disabled
	Enabled*

5. **Right click** on the open screen and select **Save to Scanner** to implement the command in the reader.

You have 3 choices for saving:

- **Send, No Save.** Changes will be lost when power is recycled.

Caution: This only saves certain commands to memory.

- All other commands are saved for power-on, the same as the **Send and Save** option.
- **Send and Save.** This activates all changes in current memory *and* saves to the scanner for power-on.
- **Send and Save as Customer Settings.** Same as above, except that these settings are saved to a special section of NOVRAM.

Note: This option must be enabled under the Options pull down menu before it will be available as a save option.