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## Introduction

Zilog's Ethernet Smart Cable, part number ZENETSC0100ZACG, allows you to connect Z8 Encore!<sup>®</sup>, Z8 Encore! XP<sup>®</sup>, ZNEO<sup>™</sup> and eZ80Acclaim!<sup>®</sup> development boards to a Zilog Developer Studio II (ZDSII) host system using an Ethernet connection.

This user manual provides instructions for installing the Ethernet Smart Cable hardware. Instructions are also provided for Ethernet-equipped host PCs that are not network-connected. After the Ethernet Smart Cable is connected, proceed with debugging as described in the documentation specific to your development kit.

## Kit Contents

To determine the contents of your kit, refer to the Ethernet Smart Cable Packing List (PAK0019), a paper insert included with your kit.

## Software and Hardware Requirements

The requirements for using the Ethernet Smart Cable are:

- A host PC with ZDSII v4.10.0 or later for Z8 Encore!, eZ80Acclaim!, or ZNEO. To determine ZDSII requirements for your host system, refer to the quick start guide for your specific development kit. The latest version of ZDSII is available as a free download from [the Zilog Store](#).
- An available 10/100Mbps Ethernet connection.

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► **Note:** If you are using ZDSII – eZ80Acclaim! versions earlier than 4.10.0, see the [Using the Ethernet Smart Cable on ZDSII – eZ80Acclaim! Versions Earlier than 4.10.0](#) section on page 11.

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## Supported Target Environments

The supported target environments are described in the following table.

Development Board	System Clock		Power Supply		Current*
	Minimum	Maximum	Minimum	Maximum	
Z8 Encore!	32kHz	20MHz	2.7V	3.6V	2mA
ZNEO	10kHz	20MHz	2.7V	3.6V	2mA
eZ80Acclaim!	5MHz	50MHz	3.0V	3.6V	2mA

**Note:** \*Add this Ethernet Smart Cable current as a requirement for your target's power supply.

## Installing the Ethernet Smart Cable

The Ethernet Smart Cable is optimized for use on an Ethernet network in which a dynamic host configuration protocol (DHCP) server assigns IP addresses. The following sections provide instructions for connecting the Ethernet Smart Cable to a DHCP-based network, or directly to an Ethernet-equipped host PC.

The Ethernet Smart Cable's factory default settings include:

- DHCP enabled
- IP address: 192.168.1.50 (this address will be different if a DHCP server is available to assign an address)
- Subnet mask: 255.255.255.0
- Gateway: 192.168.1.254
- No password required

If you need to change the cable's factory default settings, follow the steps described in the [Changing the Default Settings of the Ethernet Smart Cable](#) section on page 8.

► **Note:** When a DHCP server is unavailable, the Ethernet Smart Cable defaults to using IP address 192.168.1.50. If your network uses static IP addresses on a different subnet, connect the Ethernet Smart Cable to a stand-alone PC configured as described in the next section.

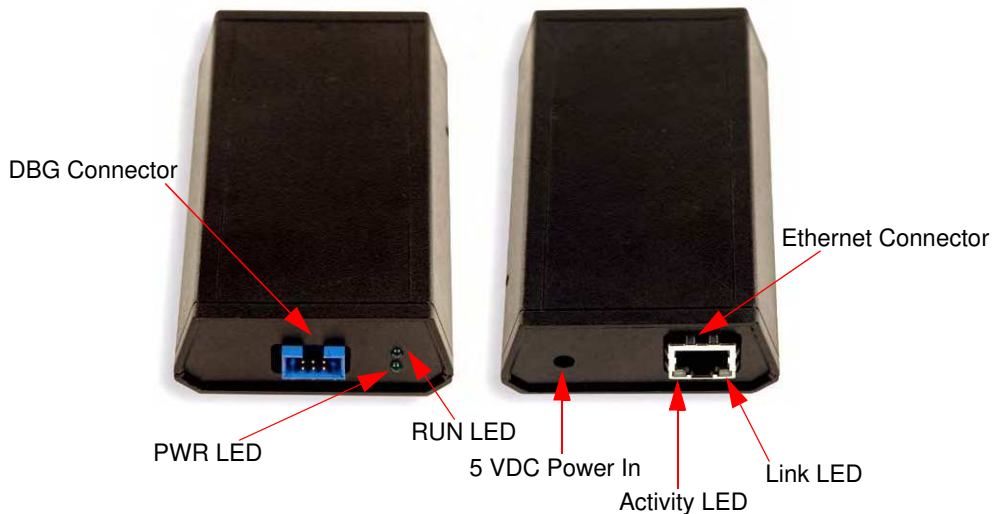
## Connecting the Ethernet Smart Cable to a DHCP-Based Network

The following considerations must be determined prior to connecting the Ethernet Smart Cable to a DHCP-based network:

- An active Ethernet connection must be available, such as from an Ethernet hub
- A standard CAT-5 Ethernet cable must be available

Observe the following steps to connect the Ethernet Smart Cable:

1. Connect the Ethernet Smart Cable to an Ethernet connection.
2. Connect the 5V DC power supply to the Ethernet Smart Cable power connector. As a result, the green PWR and RUN LEDs will illuminate. The green link LED on the Ethernet Smart Cable RJ-45 connector illuminates, as shown in Figure 1, indicating a live Ethernet connection. The green activity LED on the Ethernet Smart Cable RJ-45 connector flickers, indicating network activity.



**Figure 1. Ethernet Smart Cable, Front View and Rear View**

3. Launch ZDS II.
4. Navigate via the **File** menu in ZDS II to open one of the projects listed in the samples directory of your ZDS II installation.
5. Select **Project** → **Settings** to display the **Project Settings** dialog.
6. Select the **Debugger** tab.
7. From the **Debug Tool** drop-down menu, select **EthernetSmartCable**.
8. Click the **Setup** button. Your Ethernet Smart Cable will be listed in the **Smart Cables Available** list. Select the checkbox for your Ethernet Smart Cable, then click the **OK** button.

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► **Note:** If you have more than one Ethernet Smart Cable, you can uniquely identify them by comparing the MAC address listed in the **Smart Cables Available** list with the label on the bottom of the Ethernet Smart Cable.

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9. Click the **OK** button in the **Project Settings** window. Your project is now configured to run with the newly installed Ethernet Smart Cable.
10. Connect the target board to the Ethernet Smart Cable as described in the [Connecting to the Target Board](#) section on page 11.

## **Connecting the Ethernet Smart Cable Directly to a Host PC**

When using a host PC that is not network-connected, configure the PC as follows to connect it to the Ethernet Smart Cable.

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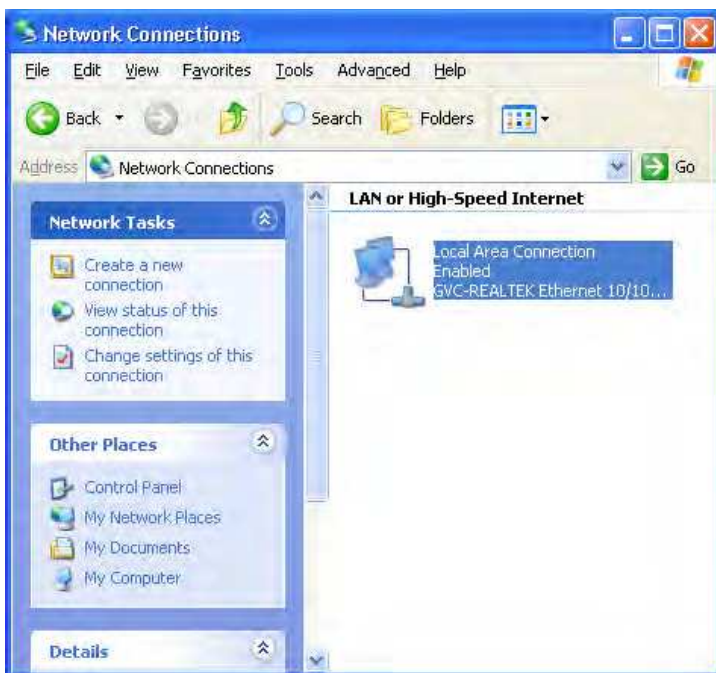
► **Note:** The following instructions are designed for use on a MS Windows XP platform. If your Windows operating system is different, refer to MS Windows OS online help for details.

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Observe the following steps to connect the Ethernet Smart Cable to a host PC:

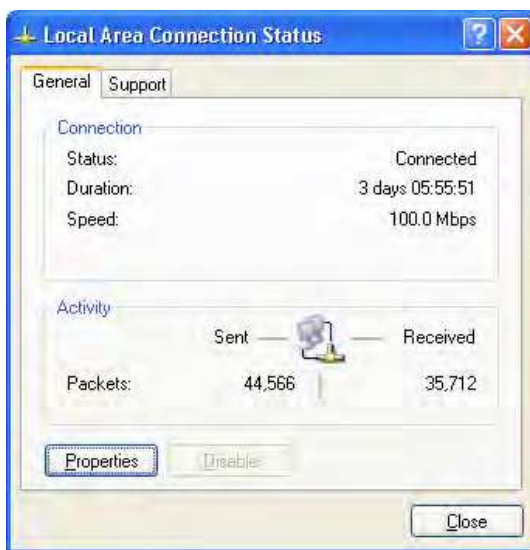
1. Power on your host PC before proceeding.

2. Use the Ethernet crossover cable supplied with the Ethernet Smart Cable to connect the Ethernet Smart Cable to the host PC's Ethernet port.
3. Connect the 5V DC power supply to the Ethernet Smart Cable power connector. As a result, the green PWR and RUN LEDs will illuminate. The green link LED on the Ethernet Smart Cable's RJ-45 connector illuminates (see [Figure 1](#) on page 3), indicating a live Ethernet connection. The green activity LED on the Ethernet Smart Cable RJ-45 connector flickers, indicating network activity.
4. On the host PC, open the Windows Control Panel and double-click the **Network and Internet Connections** icon. The **Network Connections** dialog box will appear, as shown in Figure 2.



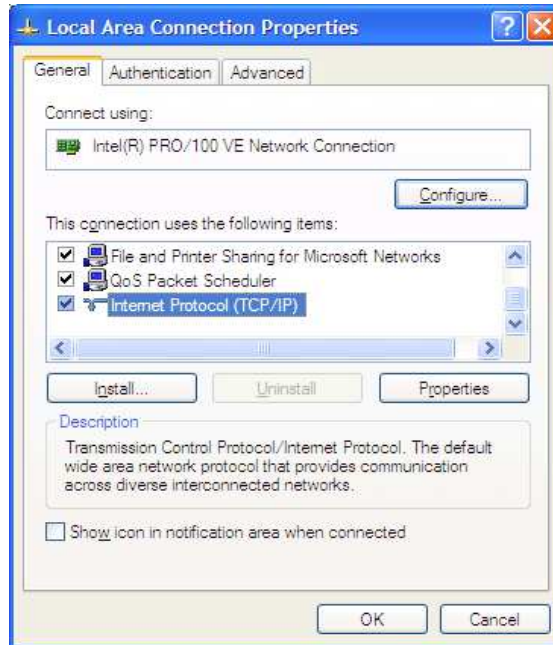
**Figure 2. The Network Dialog**

5. In the panel labeled **LAN or High-Speed Internet**, double-click the **Local Area Connection** icon. The **Local Area Connection Status** dialog box will appear, as shown in Figure 3.



**Figure 3. The Local Area Connection Status Dialog**

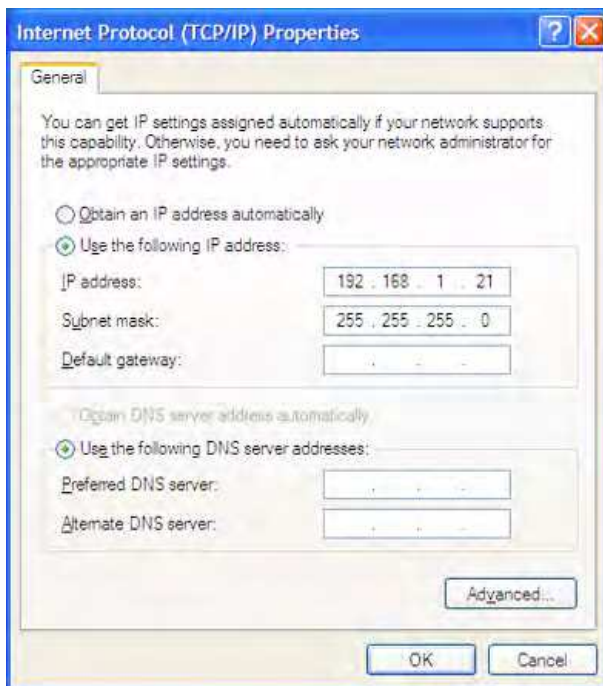
6. In the **Local Area Connection Status** dialog box, click the **Properties** button. The **Local Area Connection Properties** dialog box will appear, as shown in Figure 4.



**Figure 4. The Local Area Connection Properties Dialog**

7. In the panel labeled **This connection uses the following items:**, select the **Internet Protocol (TCP/IP)** item to highlight it, and click the **Properties** button (see Figure 4 for an example). The **Internet Protocol (TCP/IP) Properties** dialog box will appear, as shown in Figure 5.





**Figure 5. The Internet Protocol Properties Dialog**

8. Enter an IP address of 192 . 168 . 1 . 21 and a subnet mask of 255 . 255 . 255 . 0. These values place the PC on the same network as the Ethernet Smart Cable, and do not conflict with the IP address of the Ethernet Smart Cable.
9. Click **OK** and restart the PC.

The PC is now ready to communicate with Ethernet Smart Cable via the ZDSII software. The default IP address of the Ethernet Smart Cable unit is 192 . 168 . 1 . 50.

## **Changing the Default Settings of the Ethernet Smart Cable**

The Ethernet Smart Cable is equipped with a web interface that allows you to change its default settings. To access the Ethernet Smart Cable web interface, you must know the

cable's IP address, which can be obtained from ZDSII in the ZDSII **Project Settings** window; see [Steps 5 through 9](#) on page 4).

Observe the following steps to change the Ethernet Smart Cable's default settings:

1. Obtain the Ethernet Smart Cable IP address.
2. Open your web browser to the IP address located in Step 1. The Ethernet Smart Cable home page will appear, as shown in Figure 6. The **Settings** tab on this page provides access to the Ethernet Smart Cable's network settings. The **Password** tab, shown in Figure 7, allows you to set a password for Ethernet Smart Cable access.

The screenshot displays the 'Ethernet Smart Cable' web interface. At the top, it shows 'Hardware 0-30 · Firmware Version 1.10'. Below this is a navigation bar with two tabs: 'Settings' (which is active) and 'Password'. The main content area contains several configuration fields:

- Name:** Ethernet Smart Cable
- DHCP Client:**  Enable  Disable
- IP Address:** 192.168.1.50
- Subnet Mask:** 255.255.255.0
- Default Gateway:** 192.168.1.254
- TCP Port:** 4040 (4000-65535)
- DTLi Buffer Size (bytes):** 8192 (64-8192)
- DTLi Variable Count:** 255 (8-255)
- Factory Defaults:**  Restore

At the bottom of the settings area are 'Submit' and 'Refresh' buttons. At the very bottom of the page are 'Reboot' and 'Close' buttons.

**Figure 6. Ethernet Smart Cable Home Web Page**



**Figure 7. Ethernet Smart Cable Password Web Page**

3. After the configuration in the **Settings** tab are changed, click the **Submit** button. A message acknowledging that changes have been made will appear beneath the web page.
4. To make the changes permanent, reboot the Ethernet Smart Cable by pressing the **Reboot** button. As a result, the Ethernet Smart Cable will reboot. If you have changed the cable's IP address, redirect the web browser to point to the new IP address. If the IP address remains at its previous setting, the Ethernet Smart Cable home page will appear again, displaying the changes you made.

## **Restoring the Ethernet Smart Cable Factory Settings**

Observe the following steps to restore the Ethernet Smart Cable to its factory settings.

1. Locate the reset switch access hole in the side of the Ethernet Smart Cable housing.
2. Using a straightened paper clip, press and hold the reset switch for six seconds. The Run LED will extinguish while the switch is pressed, and will illuminate again after the factory settings are restored.

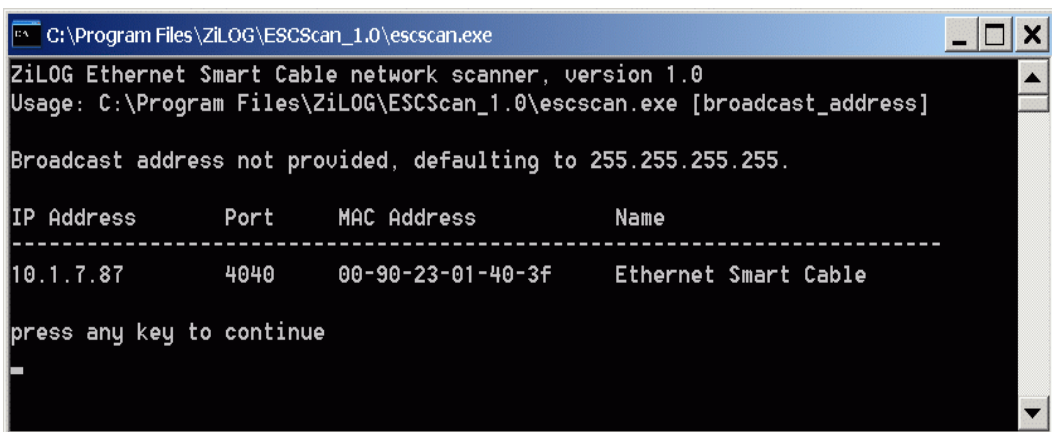
## Connecting to the Target Board

Attach one end of the six-conductor ribbon cable to the Smart Cable six-pin DBG connector, as shown in [Figure 1](#) on page 3. Attach the free end of the ribbon cable to the connector on the target board. Ensure that pin 1 on the ribbon cable (indicated by the dark stripe) is aligned with pin 1 on the target connector. To learn more about connecting the Ethernet Smart Cable to your target board, refer to the [eZ80Acclaim! Design for Debug Technical Note \(TN0035\)](#) or the [Z8 Encore! Design for Debug Technical Note \(TN0036\)](#).

## Using the Ethernet Smart Cable on ZDSII – eZ80Acclaim! Versions Earlier than 4.10.0

Observe the following procedure to obtain the IP address of the Ethernet Smart Cable when configured for DHCP.

1. Download the ESCScan utility installation file from [the Zilog Store](#); simply click the **Downloadable Software** category, in which you'll find ESCScan listed as Product ID SD0012.
2. Run the installation file to install it to your local drive.
3. Run the `escscan.exe` application file from the installation directory; it will appear similar to the example screenshot shown in Figure 8.



```
C:\Program Files\ZiLOG\ESCScan_1.0\escscan.exe
ZiLOG Ethernet Smart Cable network scanner, version 1.0
Usage: C:\Program Files\ZiLOG\ESCScan_1.0\escscan.exe [broadcast_address]

Broadcast address not provided, defaulting to 255.255.255.255.

IP Address      Port      MAC Address    Name
-----
10.1.7.87       4040      00-90-23-01-40-3f  Ethernet Smart Cable

press any key to continue
```

**Figure 8. escscan.exe Application Screenshot**

4. Note the IP Address. If you have several Ethernet Smart Cables connected to the network, an IP address will be shown for each particular Ethernet Smart Cable's MAC address.
5. Press any key to exit the utility.
6. You must use the IP address determined in Step 4 when configuring **ZDSII**; simply navigate via **ZDSII Project** → **Settings** → **Debugger** → **Configure ZPAKII** → **IP Address**. For more information about this utility, refer to its `readme.txt` document.

## Troubleshooting Tips

If a hardware failure is suspected, contact [support.zilog.com](http://support.zilog.com) for assistance. However, before submitting a problem report to Zilog Customer Support, follow the instructions in this section.

### ZDSII Cannot See the Ethernet Smart Cable

If ZDSII cannot detect the Ethernet Smart Cable, try the following workarounds:

- Remove power from the Ethernet Smart Cable, wait five seconds, then reapply power. Refresh the list of available smart cables. The Ethernet Smart Cable should now appear.
- Verify that the Ethernet cable you are using is the correct type. (If you are connecting the Ethernet Smart Cable directly to a PC, you must use a crossover cable. Do not use a crossover cable to connect the Ethernet Smart Cable to a hub or standard Ethernet connection.)
- Verify that UDP port 3000 is open in your local firewall. The ZDSII software uses UDP port 3000 to search for Ethernet Smart Cable IP addresses and requires access to that port through your local firewall. After the port is open, ZDSII should then be able to identify the IP address assigned to the Ethernet Smart Cable by your DHCP server.



**Warning:** DO NOT USE THIS PRODUCT IN LIFE SUPPORT SYSTEMS.

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