

## Introduction

This quick start guide helps you to get started with the Zilog TCP/IP Software Suite for Zilog's eZ80Acclaim!<sup>®</sup> family, which includes the eZ80F91, eZ80F92 and eZ80F93 microcontrollers and the eZ80L92 microprocessor.

## ZTP Overview

The Zilog TCP/IP Software Suite (ZTP) is an integrated, preemptive, multitasking operating system and TCP/IP protocol stack that is optimized for embedded systems. Powered by the Zilog Real-Time Kernel (RZK), ZTP offers full-feature operating system and network services that occupy a minimum of program memory. Applications can be integrated with ZTP through its easy-to-use and well-documented Application Programming Interfaces (APIs).

ZTP software can be visualized as two planes:

- The first plane, referred to as the *OS plane*, represents the Zilog Real-Time Operating System, RZK
- The second plane, referred to as the *stack plane*, represents the embedded TCP/IP protocol stack

Modules in the stack plane require the services of the OS plane to ensure that they coexist with other applications that compete for the processor. The OS plane includes the following features:

- Scheduler
- Memory manager
- Interprocess communications services

Table 1 lists the names of each of the layers in the ZTP protocol stack by client, server or peer type.

**Table 1. ZTP Protocol Layers**

| <b>Protocol</b> | <b>Full Name</b>                      | <b>Client, Server or Peer</b> |
|-----------------|---------------------------------------|-------------------------------|
| ARP             | Address Resolution Protocol           | Peer                          |
| DHCP            | Dynamic Host Configuration Protocol   | Client                        |
| DNS             | Domain Name Server                    | Client                        |
| FTP             | File Transfer Protocol                | Client and Server             |
| HTTP            | Hypertext Transfer Protocol           | Server                        |
| ICMP            | Internet Control Message Protocol     | Peer                          |
| IGMP            | Internet Group Management Protocol    | Peer                          |
| IP              | Internet Protocol                     | Peer                          |
| PPP             | Point-to-Point Protocol               | Peer                          |
| PPPoE           | Point-to-Point Protocol over Ethernet | Client                        |
| RARP            | Reverse Address Resolution Protocol   | Peer                          |
| SMTP            | Simple Mail Transfer Protocol         | Client                        |
| SNMP            | Simple Network Management Protocol    | Server                        |
| SNTP            | Simple Network Time Protocol          | Client                        |
| SSL*            | Secure Socket Layer Protocol          | Server                        |
| TCP             | Transmission Control Protocol         | Peer                          |
| Telnet          | Telnet                                | Client and Server             |
| TFTP            | Trivial File Transfer Protocol        | Client                        |
| TimeP           | Time Protocol                         | Client                        |
| UDP             | User Datagram Protocol                | Peer                          |

**Note:** \*The SSL protocol is available only with the SSL package.

## System Requirements

This section describes the hardware and host system requirements for installing and using ZTP.

### Target Hardware Requirements

ZTP is intended to be used with the following members of the eZ80Acclaim! family of microcontrollers: eZ80F91, eZ80F92, eZ80F93 and eZ80L92. Sample projects included with ZTP target eZ80 development kits that contain one of these microcontrollers. Please refer to the documentation included with your particular eZ80 development kit to learn how to set up your eZ80 development kit hardware.

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## Recommended Host System Configuration

Please refer to the [Zilog Developer Studio II - eZ80Acclaim! User Manual \(UM0144\)](#) to determine your minimum host system configuration. When connecting the debug hardware to the host PC, please refer to the [Ethernet Smart Cable User Manual \(UM0207\)](#) or to the [USB Smart Cable User Manual \(UM0181\)](#).

## Installing and Uninstalling ZTP

The ZTP TCP/IP Software Suite is integrated with ZDSII and is an integral part of the ZDSII installation. Installing or uninstalling ZDSII automatically installs or uninstalls ZTP.

### Installing ZTP

Observe the following procedure to install ZTP:

1. Copy the ZDSIIeZ80\_Acclaim\_<version>.exe file to an appropriate directory on the host PC.
2. Launch ZDSIIeZ80\_Acclaim\_<version>.exe to install ZTP. By default, the installation path is C:\Program Files\Zilog.

### Uninstalling ZTP

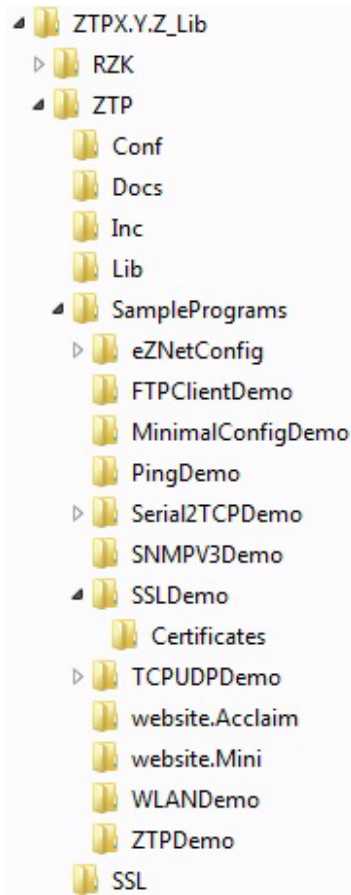
To uninstall ZTP, launch the **InstallShield Wizard**. When the **InstallShield Wizard** finds an already-installed version of ZDSII, it allows you to modify, repair or remove the previous installation. Alternatively, navigate via the Windows **Start** menu to **Settings** → **Control Panel** → **Add and Remove Programs** to select the installed version of ZDSII and uninstall it from the PC.

## The ZTP Directory Structure

After installing ZDSII on your PC, the ZTP directory structure is created in the installed directory. By default, ZTP is installed in the following path:

```
C:\Program Files\Zilog\ZDSII_eZ80Acclaim!_A.B.C\ZTP\ZTPX.Y.Z_Lib
```

In this path, A.B.C represents the ZDSII version number, and X.Y.Z represents the version number of the ZTP release. Figure 1 displays the hierarchy of the ZTP directory structure.



**Figure 1. Directory Structure of the ZTP\_X.Y.Z\_Lib Release**

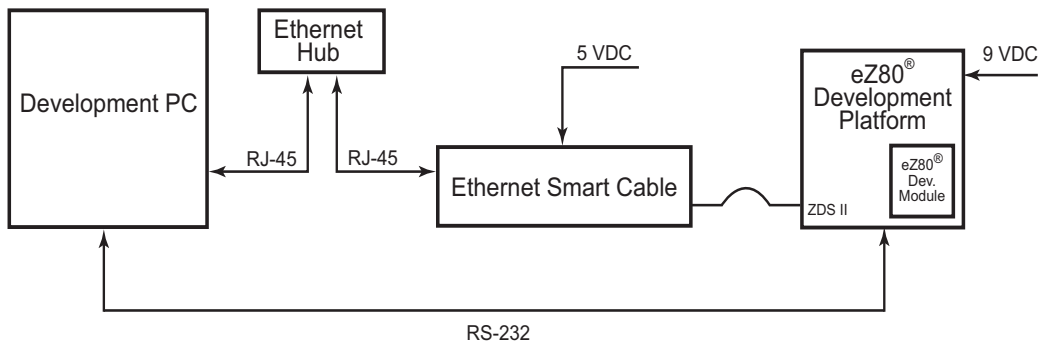
The `..\ZTP\Docs` directory is a common directory that includes all ZTP-related documents. Table 2 lists the files contained within the `..\ZTP\Docs` directory.

**Table 2. ZTP-Related Documents**

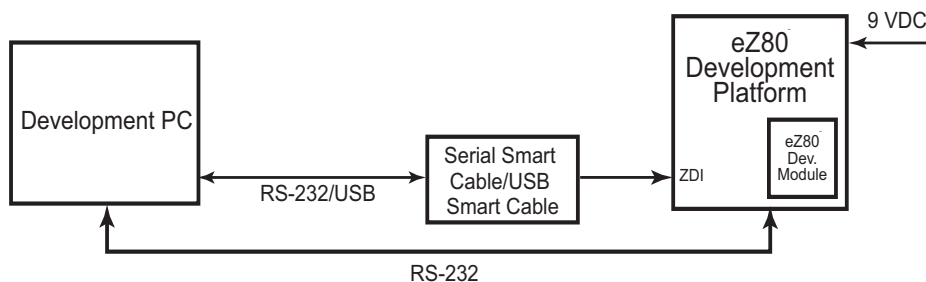
| Directory   | Documents                | Title   |
|-------------|--------------------------|---|
| ..\ZTP\Docs | RM0040                   | Zilog TCP/IP Software Suite Reference Manual                    |
|             | RM0041                   | Zilog TCP/IP Software Suite Programmer's Guide                  |
|             | QS0049                   | Zilog TCP/IP Software Suite Quick Start Guide                   |
|             | PB0154                   | Zilog TCP/IP Software Suite Product Brief                       |
|             | RZK_ZTP_ReleaseNotes.txt | Zilog TCP/IP Software Suite Release Notes for the ZDSII release |

## Hardware Setup

Figures 2 and 3 display the typical hardware setup for the ZTP sockets demo application that is used to illustrate socket programming for the network data transfer. The hardware setup in Figure 2 uses Ethernet Smart Cable and Figure 3 uses Serial Smart Cable/USB Smart Cable for debugging.



**Figure 2. Hardware Setup for ZTP Demo Applications Using ZPAKII**



**Figure 3. Hardware Setup for ZTP Demo Applications Using a Serial Smart Cable or USB Smart Cable**

Observe the following procedure to set up the hardware:

1. Set the jumper pin connections on the eZ80 Development Platform to their default settings.
2. Connect the power supply (9V) cables to the eZ80 Development Platform.
3. If you are using the *Ethernet Smart Cable*, continue to [Step 4](#). If you are using the *Serial Smart Cable*, skip ahead to [Step 7](#). If you are using the *USB Smart Cable*, skip to [Step 8](#).
4. Connect the Ethernet Smart Cable's 6-pin header to the ZDI J4 port on the eZ80 Development Platform.
5. Connect one end of the RJ-45 cable to the Ethernet port on the Ethernet Smart Cable unit, and connect the other end to the LAN. This connection is required if you plan to debug your project with ZDSII.
6. Connect the power supply (5V) to the Ethernet Smart Cable unit, then skip to Step 9.
7. Connect the ZDI target interface module of the Serial Smart Cable to the ZDI J4 port on the eZ80 Development Platform, and connect the other end to the serial port on the Development PC.
8. Connect the ZDI target interface module of the USB Smart Cable to the ZDI J4 port on the eZ80 Development Platform, and connect the other end to the USB port on the Development PC.
9. Connect one end of the RJ-45 cable to the Ethernet port on the eZ80xxx module, and connect the other end to the LAN.

10. Connect the RS-232 cable to the eZ80 Development Platform and to the COM1 port of the Development PC.

## Configuring the HyperTerminal Application

Before starting the demo application, observe the following procedure to configure the HyperTerminal program.

1. In Windows, launch the HyperTerminal application by navigating via the Windows **Start** menu to **Programs** → **Accessories** → **Communications** → **HyperTerminal**. The **Connection Description** dialog box appears.
2. Enter the name for a new connection in the **Connection Description** dialog and click **OK**. The **Connect To** dialog box appears.
3. In the **Connect using:** text field, select the COM port to which the serial cable is connected, then click **OK**. The **Port Settings** dialog box appears for the selected port.
4. In the **Port Settings** dialog box, enter the following values in their respective text fields:

|                 |           |
|-----------------|-----------|
| Bits per second | 57600 bps |
| Data bits       | 8         |
| Parity          | None      |
| Stop bits       | 2         |
| Flow control    | None      |

5. Click **OK**. The connection to the eZ80 Development Platform is established via the serial port.
6. Click **RESET** on the eZ80 Development Platform.

## Executing the ZTP Demo Application

The following sections describe how to execute the ZTP demo application.

### Running the RAM-Based ZTP Demo Project Using ZDSII

Observe the following procedure to execute the ZTP demo project in the ZDSII development environment.

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► **Note:** An SMTP server is required to run the ZTP demo project.

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1. Set up the hardware as shown in [Figure 2](#) on page 5.
2. Launch ZDS II by clicking the Windows **Start** menu and selecting **All Programs**. Scroll through the list of programs and select the **Zilog ZDSII – eZ80Acclaim! X.Y.Z** folder option, then click **ZDSII – eZ80Acclaim!\_A.B.C**.
3. From the **File** menu in ZDS II, select **Open Project** to open the sample ZTP demo project. This project is located in the following path:  

```
<ZDS Installed Dir>\ZTP\ZTPX.Y.Z_Lib\ZTP\SamplePrograms\  
ZTPDemo\ZTPDemo_xxx.zdsproj>
```

In the above path, xxx represents the eZ80F91, eZ80F92, eZ80F93 or eZ80L92 target device.
4. From the **Project** menu in ZDS II, select **Settings**. The **Project Settings** dialog box appears.
5. In the **Project Settings** dialog box, select the **Debugger** tab. In the **Debugger** tab, the appropriate target-setting file is checked.
6. Click the **Setup** button in the **Debugger** tab under **Debug Tool**. The **Setup Ethernet Smart Cable Communication** dialog box appears. Select **Ethernet Smart Cable**. (For development kits that do not include an Ethernet Smart Cable, select the **Serial Driver** target setting instead of the **Ethernet Driver** target setting.)
7. In the **IP Address** field of the Setup Ethernet Smart Cable window, the IP address is selected automatically.
8. Click **OK** in the **Setup Ethernet Smart Cable Communication** dialog box to return to the **Project Settings** dialog box.
9. Click **OK** to close the **Project Settings** dialog box.
10. As the network configurations apply to the network, change the default network settings in the `iftbl` structure table of the `ZTPConfig.c` configuration file, which is located in the `..\ZTP\Conf` folder of the library package. In the `iftbl` for the Ethernet interface, specify the default IP address, the default gateway and the default subnet mask. For details about how to change these default network settings, refer to the [Zilog TCP/IP Software Suite Programmer's Guide \(RM0041\)](#).



11. Select **Build** → **Set Active Configuration** to open the **Select Configuration** dialog box. In this dialog, select the RAM configuration.
12. Select **Build** → **Rebuild All** to rebuild the application and generate a ZTPDemo\_xxx\_Ram.lod file.
13. Select **Debug** → **Download Code** to download the ZTPDemo\_xxx\_Ram.lod file, located in the project path, to the eZ80 Development Platform.
14. To run the demo application, select **Debug** → **Go**. To use the ZTP demo application, see the [Using ZTP](#) section on page 10.

## Running an HTTP Server on the eZ80F910200KITG Kit

Observe the following procedure to run an HTTP server using the eZ80F910200KITG Development Kit.

1. Set up the hardware as displayed in [Figure 2](#) on page 5.
2. Launch ZDSII by clicking the Windows **Start** menu and selecting **All Programs**. Scroll through the list of programs and select the **Zilog ZDSII – eZ80Acclaim! X.Y.Z** folder option, then click **ZDSII – eZ80Acclaim!\_A.B.C**.
3. From the **File** menu in ZDSII, select **Open Project** to open the sample ZTP demo project. This project is located in the following path:  

```
<ZDS Installed Dir>\ZTP\ZTPX.Y.Z_Lib\ZTP\SamplePrograms\  
ZTPDemo\ZTPDemo_F91_Mini.zdsproj>
```
4. Follow [Steps 4](#) through [10](#) in the [Running the RAM-Based ZTP Demo Project Using ZDSII](#) section on page 7.
5. Select **Build** → **Set Active Configuration** to open the **Select Configuration** dialog box. In this dialog, select the **Flash** configuration.
6. Select **Build** → **Rebuild All** to rebuild the application and generate a ZTPDemo\_F91\_Mini.hex file.
7. Select **Debug** → **Download Code** to download the ZTPDemo\_F91\_Mini.hex file, located in the project path, to the eZ80F91 Mini E-Net Development Platform.
8. To run the demo application, select **Debug** → **Go**.
9. During initialization, the ZTPDemo project will display its IP address in the PC's terminal program. Record this IP address (write it down) so that it can be used in subsequent steps.

10. On the PC, launch a web browser (such as Internet Explorer).
11. In the browser's URL text box (a.k.a. URL bar), enter a . b . c . d . This a . b . c . d octet nomenclature represents the IP address that you recorded in [Step 9](#).

## Using ZTP

Observe the following procedure to use ZTP's set of features.

1. When you execute the ZTP demo application on any of the eZ80 development platforms, a login prompt is displayed in the HyperTerminal application.
2. The ZTP shell login and password are set in the `ZTPConfig.c` file, which is located in the `.. \ZTP \Conf` folder. Log in with these credentials to the ZTP shell.

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► **Note:** The default username and password are `anonymous` and `anonymous`, respectively.

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3. To view a list of shell commands, enter the question mark (?) character or the `help` command in the ZTP shell.

The following operations are performed in the ZTP demo:

1. Print network interface information for all of the available interfaces using the `ifstat` shell command.

### Sample Usage

```
[ZTP EXTf: /]>ifstat
```

```
-----  
IFace IP address Def Gtway State Type H/W Address  
0 172.16.6.53 172.16.6.1 UP Ethernet 0:90:23:0:9:9  
1 192.168.2.1 192.168.2.2 DOWN PPP -  
-----
```

The interface information above is also displayed while the system is booting up.

2. Browse the ZTP web pages by specifying the IP address of the eZ80 CPU as a URL in a browser running on a workstation. Ping can also be initiated from the ZTP shell prompt to any other workstation.
3. Ping the eZ80 CPU by specifying the IP address of the workstation.
4. Add a user to the eZ80 database using the `addusr` command. You can log in from an FTP client, Telnet client, or the HyperTerminal shell, provided that the system admin-

istrator has already set your username and password. The default login and password are anonymous and anonymous, respectively.

### Sample Usage

```
[ZTP EXTf: /]>addusr john john123
```

5. Use the `mail` shell command to interactively compose an email message that is sent to an SMTP server for delivery to a specified recipient.

### Sample Usage

```
[ZTP EXTf: /]>mail
Press <ESC> then <Enter> to exit early
Enter the name or IP of the SMTP server: zilog.com
Enter the port number to connect to (normally 25): 25
Enter the email Subject: ez80
Enter the recipient's email address:sclaus@northpole.com
Enter the sender's email address: ez80@zilog.com
Enter the body of the email (ESC/Enter to complete):test
mail
^[
Please wait while the message is processed.
Mail message was successfully sent.
```

To learn more about these shell commands, refer to the *ZTP Shell Command Reference* section of the [Zilog TCP/IP Software Suite Programmer's Guide \(RM0041\)](#).

## Creating a New ZTP Project

The simplest way to create a new ZTP project is to copy one of the existing sample projects into a new folder and modify it as per your requirements. For information about how to add and remove files from a project, as well as a description of the advanced features of the tool, refer to the [Zilog Developer Studio II – eZ80Acclaim! User Manual \(UM0144\)](#). For details about creating new projects and the required settings for RAM projects, refer to the [Zilog TCP/IP Software Suite Programmer's Guide \(RM0041\)](#).

## Related Documentation

The following documents apply to the eZ80Acclaim! family of microcontrollers, which includes the eZ80F91, eZ80F92 and eZ80F93 MCU and the eZ80L92 MPU.

- Zilog Developer Studio II – eZ80Acclaim! User Manual (UM0144)
- eZ80 CPU User Manual (UM0077)
- eZ80Acclaim! External Flash Loader Product User Guide (PUG0016)
- ZPAKII Debug Interface Tool Product User Guide (PUG0015)
- eZ80Acclaim! Development Kits Quick Start Guide (QS0020)

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