



DKAN0006A

eZ80F91 Ethernet Quick Start Guide

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Introduction

This quick start guide features the eZ80F91 Module and Development Kit from Zilog. The development kit contains the motherboard, daughter board, Zilog Development Studio II (ZDS II), Zilog smart cable, Real-Time Zilog Kernel (RZK) and Zilog TCP/IP Protocol (ZTP).

This guide aids in the development of Ethernet applications that utilize eZ80F devices and the RZK and ZTP software stacks from Zilog, particularly the I2C protocol for peripheral communication and the HTML server and SMTP client protocols. This guide is based on the eZ80 Acclaim!® MCU and the ZTP stack, which supports SMTP Client.

This implementation does not include Zilog's SSL protocol. Therefore, it requires the use of an unsecured SMTP server to relay the emails. An understanding of the ZDS II or a similar IDE is assumed, along with general knowledge of TCP/IP, and the supporting protocols such as HTTP and SMTP.

Application

Implementing a TCP/IP Stack on an eZ80 Acclaim Kit

This section requires the eZ80 Acclaim Kit (eZ80F910300ZCOG), ZDS II 4.11.0, ZTP 2.1.0, and an SMTP server. The following are instructions on the implementation process.*

1. Start ZDS II – eZ80Acclaim! 4.11.0.
2. Open the project ZTPDemo_F91.zdsproj, located in the following directory: “C:\Program Files\ZiLOG\ZTP_2.1.0_Lib_ZDS\ZTP\SamplePrograms\ZTPDemo”.
3. Open the ZTPConfig.c file and change the “Default IP address” and “Default Gateway” of “interface 0” in *struct If ifTbl[MAX_NO_IF]* to reflect your network settings. If you are using DHCP, you need to change the *b_use_dhcp* variable to *TRUE*. Also, note the username and password for the Telnet login, as it may be required later in your design.
4. Add the following files to the current project: DK_Email_Demo.c and dk_pin_isr.s. These files are modified versions of the gpiodemo.c and pb0_isr.s files created by Zilog. They handle the pin change interrupts that occur when SW1, SW2, or SW3 are pressed. The interrupt service routine (ISR) can be written to send an email when an interrupt occurs.

* If an unsecured SMTP server is inaccessible, one can be created using the Postfix package in a Linux machine. This is not covered here, but information is available on the internet. Note that it is necessary to create an SMTP relay server once Linux is completely installed.

5. In the `DK_Email_Demo.c` file, change the “Default Email Configurations” to configure the application.
6. Add the following code to the top of the `ZTPInit_Config.c` file.

```
extern void RZKApplicationEntry(void);
```

7. Add the following code to the bottom of the `main()` function in the `ZTPInit_Conf.c` file just above `RZK_kernelStart()`. This code is a function call to initialize the interrupts and the threads that handle them.

```
RZKApplicationEntry();
```

8. Once the project has successfully compiled, ZDS II automatically programs the device. Connect a serial cable from the console port on the demo board to the PC. To aid in debugging, open a terminal window (e.g. HyperTerminal, Tera Term) with these settings: com1, 57.6K, 8, none, 2, none. If the code compiled correctly and the interrupts are working properly, then text appears in the terminal window when a switch is pressed.[†]
9. Uncomment the `Email()` function that is located within the `PINIntTask()` function in the `DK_Email_Demo.c` file.
10. Build and run the program again. Now, when a switch is pressed, an email is sent to the destinations specified in step 5 through the SMTP server. To send emails using free SMTP server systems such as Gmail, Hotmail or Yahoo; the SSL protocol is needed for encryption purposes and is supported by Zilog. The SSL code is not used in this example, but it can be purchased from Zilog.
11. Now that the program is successfully working, view the default webpage that Zilog provides. Type the IP address of the module into the address bar of the internet browser, and the default Zilog HTTP page appears. To view the webpage outside of the local network, enable port forwarding and use port 80 (in the router settings menu). If your ISP provider has blocked port 80, or if you want to have more than one HTTP server, change the `ATPAppEntry()` function in the `main.c` file to specify the port.

```
http_init(http_defmethods,httpdefheaders,website,80);
```

12. To customize the webpage, start another session of ZDS II and open the `website.zdsproj` project: “C:\Program Files\ZiLOG\ZTP_2.1.0_Lib_ZDS\ZTP\SamplePrograms\website.Acclaim”.

Conclusion

This guide steps through implementing a TCP/IP stack on the Zilog eZ80F91 Module and Development Kit, enabling the user to quickly implement an application that sends an email in response to a trigger event.

[†] Wireshark, a network protocol analyzer, is another software tool for debugging network applications. It records and displays all of the traffic coming through the Network Interface Card (NIC).

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