

eZ80 Single-Board Computer

Installation Guide

Revision 0.7
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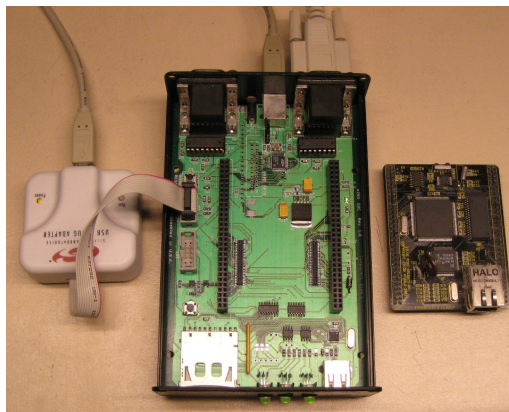
Revision History

Revision	Date	By	Description
0.5	2007-01-14	HMH	Initial Publicly Release
0.51	2007-01-14	HMH	Added pictures.
0.6	2007-05-07	HMH	Added USB Firmware Upgrade Procedure
0.7	2007-06-28	HMH	Added USB Printing Support Instructions.

Initial Hardware Configuration

1. Start with the eZ80SBC Board without the Zilog eZ80F91 Module installed. The USB Microcontroller should be programmed before this module is installed.
2. Connect the Silicon Labs USB Debug Adapter to the USBD_DEBUG connector on the eZ80SBC.
3. Connect the Silicon Labs USB Debug Adapter to a USB port on your computer.
4. Power the eZ80SBC either via the USB Device port on the rear of the eZ80SBC, or by the 5V power jack on the back of the eZ80SBC.
 - a. Make sure JP9 is set to USB (middle and USB pin of JP9 shorted with a jumper) if you are using the USB cable to power the eZ80SBC.
 - b. Make sure JP9 is set to EXT (middle and EXT pin of JP9 shorted with a jumper) if you are using an external 5V Power Supply to power the eZ80SBC through J2 of the eZ80SBC.
5. Verify that LED D9 is illuminated. This indicates that power is supplied to the eZ80SBC.
6. Connect a serial terminal or PC running Hyperterminal or another serial communication program to the lower port of P2. If connecting to a PC, you will need a Null-modem cable. The communication settings are as follows:
 - 57600 Baud
 - No Parity
 - 8-data bits.
 - 1-stop bit.
 - No Flow Control (neither Hardware Flow Control nor XON/XOFF)

Your eZ80SBC should look similar to this:



Picture 1 – Ready for USB Device Controller Firmware Download

Install the eZ80SBC Software Distribution

1. Install the eZ80SBC distribution, by running the eZ80sbc_Setup.msi Windows Installer Package:
 - a. Accept all of the default options, and keep clicking Next until finished.
 - i. This will install all eZ80SBC-related software in: C:\Program Files\HarteTec\ez80sbc\

Install the eZ80SBC USB Device Controller Firmware

If the USB Device Controller on your eZ80SBC has not been previously programmed, or if the version of the firmware on your eZ80SBC is less than build 1355, then you will need to download the USB Device Controller Firmware using a Silicon Laboratories Debug Adapter. If your eZ80SBC already has firmware build 1355 or above, then you can upgrade the firmware according to the instructions under “Upgrade the eZ80SBC USB Device Controller Firmware.”

1. Run the Firmware Download Utility:
Start Menu → All Programs → eZ80sbc → FLASH Upgrade via SiLabs Debug Adapter
2. Click on the **Connect** button. Then click **Download**. This will download the firmware to the USB Microcontroller. When the download is complete, click **Exit**.
3. At this point, you should see a sign-on on in the serial communication program similar to the following:

```
USB 2.0 eZ80 SBC Interface Debug Port
$Revision: 1007 $ of $Date: 2006-11-16 10:33:09 -0800 (Thu,
16 Nov 2006) $
```

```
Reset Source: 01
USBH Interrupt enable
Type 'h' for help.
>
```

Upgrade the eZ80SBC USB Device Controller Firmware

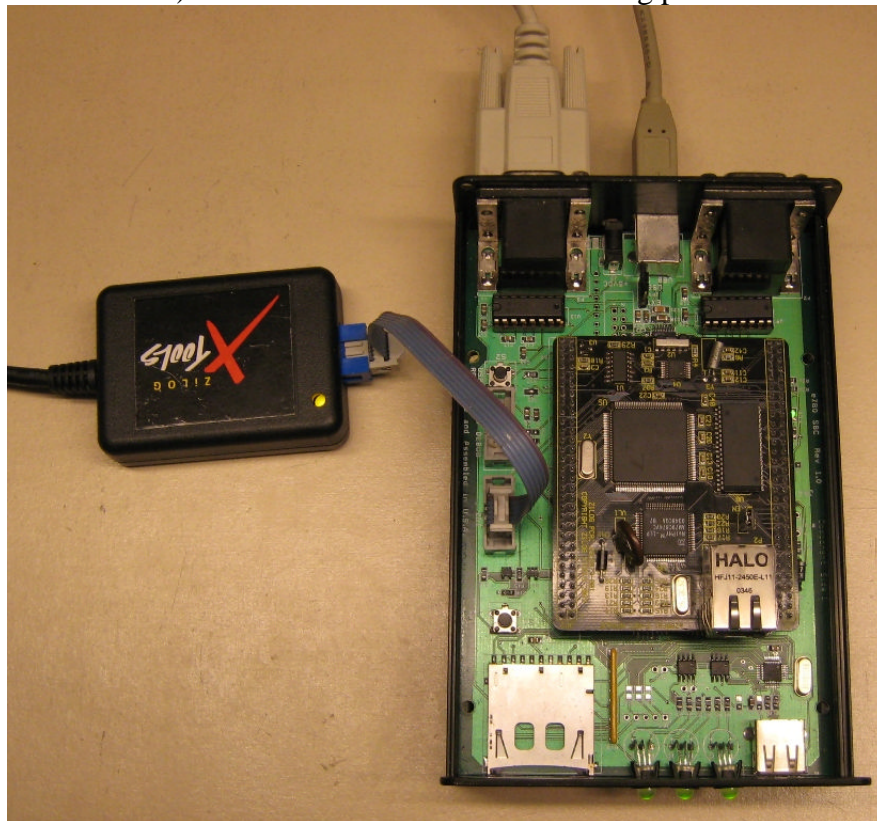
1. Run the Firmware Upgrade Utility:
Start Menu → **All Programs** → **eZ80sbc** → **FLASH Upgrade via USB**
2. Click on the **OPEN** button. Browse to the location:
C:\Program Files\HarteTec\ez80sbc\Firmware
3. Select and open the file: ez80sbcfw.hex and click Open.
4. Press the **FLASH** button to upgrade the FLASH.
5. When the download is complete, click **Exit**.

Install the Zilog eZ80F91 Ethernet Module

The eZ80SBC supports two different versions of the Zilog eZ80F91 Ethernet Module. One is the eZ80F91 Ethernet Module, and the other is the eZ80F91 Mini Enet Module. The Ethernet Module has two 2x30 0.1” spacing headers that provide connection to the eZ80SBC. The Mini Enet Module has two small surface-mount 56-pin connectors that connect it to the eZ80SBC. Depending on the module that you have, follow one of the sections below:

Zilog eZ80F91 Ethernet Module

This module plugs into connectors JP5 and JP6 on the eZ80SBC. Pin 1 of the module’s JP1 connector plugs into pin one of JP5 on the eZ80SBC. Pin 1 is numbered on the eZ80SBC, and numbered, and marked with a square around it on the eZ80F91 Ethernet Module. When the module is installed correctly, the module’s Ethernet port will face the front (SD Card Slot end) of the eZ80SBC. See the following picture for details:

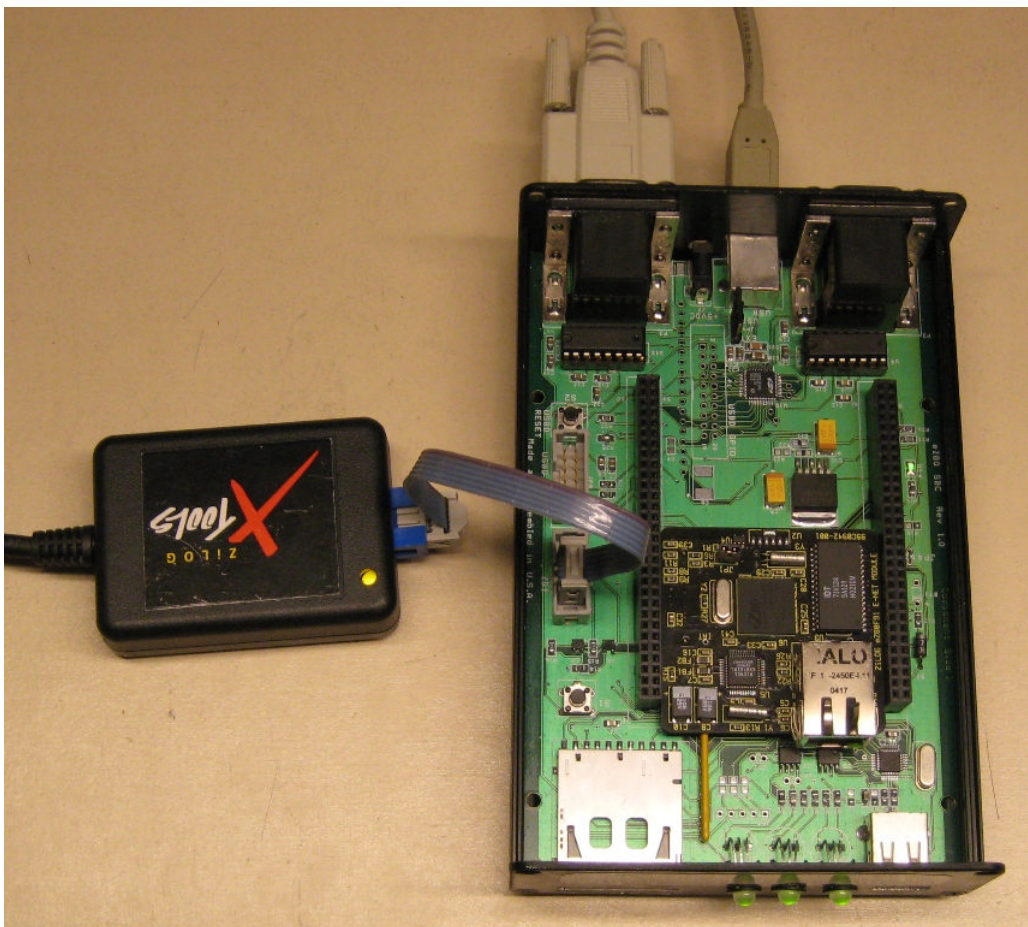


Picture 2 – eZ80SBC with eZ80F91 Ethernet Module, ready for eZ80 CP/M Download

Install the Zilog eZ80F91 Ethernet Module (Continued)

Zilog eZ80F91 Mini Enet Module

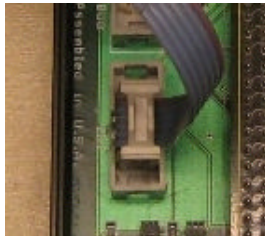
This module plugs into connectors JH1 and JH2 on the eZ80SBC. Pin 1 of the module's J1 connector plugs into pin one of JH1 on the eZ80SBC. Pin 1 is numbered on the eZ80SBC, and numbered, on the bottom of the Mini Enet Module. Be very careful to ensure that the Mini Enet Module is installed correctly, with all pins on the module inserted into the eZ80SBC's JH1 and JH2 sockets. When the module is installed correctly, the module's Ethernet port will face the front (SD Card Slot end) of the eZ80SBC. See the following picture for details:



Picture 3 – eZ80SBC with Mini Enet Module, ready for eZ80 CPM Download

Program CP/M Into the eZ80F91

1. Plug a Zilog USB Smart Cable into a free USB port on your computer. Install the drivers for the USB Smart Cable if the “Found New Hardware” wizard comes up.
2. Plug the six-pin ribbon cable from the Zilog USB Smart Cable into the connector marked ZDI on the eZ80SBC. Note that the connector is keyed to prevent incorrect connection. See Picture 3.
3. Download and Install the Zilog Smart Flash Programmer v2.0.1 from www.zilog.com.
4. Run the Smart Flash Programmer:
Start Menu → All Programs → Zilog Smart Flash Programmer 2.0.1 → Smart Flash Programmer 2.0.1
5. Open the Flash Project File:
File → Open Project
6. In the Project File Selection dialog box, navigate to the folder containing the CP/M image: **C:\Program Files\HarteTec\ez80sbc\ez80CPM**
7. If you are using the Zilog eZ80F91 Ethernet Module, open **cpm30_plt.zfpproj** project. If you are using the Zilog Mini Enet Module, open the **cpm30.zfpproj** project.
8. In the leftmost portion of the Smart Flash Programmer screen, select Communication.
9. Make sure communication type is set to USB, and then check the box next to the serial number of your attached USB Smart Cable.
10. Click Program/Verify to program the eZ80F91’s FLASH.
11. When programming completes, disconnect the 6-pin ribbon cable from the eZ80SBC’s ZDI connector.



Picture 3 – Connecting the ZDI Cable

Program CP/M Into the eZ80F91 (Continued)

12. Connect a serial terminal or PC running Hyperterminal or another serial communication program to the lower port of P3. If connecting to a PC, you will need a Null-modem cable. The communication settings are as follows:

- 115200 Baud
- No Parity
- 8-data bits.
- 1-stop bit.
- No Flow Control (neither Hardware Flow Control nor XON/XOFF)

13. Press the eZ80 Reset button (S1) on the eZ80SBC.

14. You should see a sign-on message in the serial communication program similar to the following:

```
64K CP/M V3.1 - eZ80F91 Rev 2 CBIOS v1.0.0.1450 of 2007-06-28 [PLT,  
RELEASE]  
Copyright (C) 1982, Digital Research  
Copyright (C) 2000-2007, Howard M. Harte
```

A>

USB Device Support

The eZ80SBC has a USB Host Controller that is interface to Full- or Low-Speed USB Devices. These devices include:

- USB to Parallel Port Adapter (USB Printing Support Class)
- USB Hubs
- USB Mass-Storage Devices (thumb drives, card readers, USB hard drives, etc.)¹
- USB Floppy Drives¹
- USB HID-Class Devices¹

¹These devices are recognized by the eZ80SBC but full software support is in development.

Currently, USB Hubs and Parallel Port Adapters are supported. The interface to CP/M is rudimentary at present, and requires a NULL-modem serial cable to connect the USB Microcontroller to the eZ80. This NULL-modem cable must be connected between the TOP two Serial Ports at the rear of the eZ80SBC.

You will also need to connect both the USB Microcontroller Console serial port and the eZ80 Console serial port to terminal devices operating at 115200 baud.

You can use the following steps to print in WordStar:

1. Plug a USB Parallel Port Adapter into the USB Host port at the front of the eZ80SBC.
2. Plug the USB Parallel Port Adapter into a Parallel Printer (I have successfully used a modern Laser Printer with excellent results.)
3. On the USB Microcontroller Console port, type 'b' to enumerate the USB device.
4. At the CP/M C> prompt, set the device mapping for the LST: device to the AUX port: `DEVICE LST:=AUX`
5. Run `WordStar.com`
6. Print `wsprint.tst`, a WordStar printer test document, which is three pages in length. Use the HPLJET printer setting, and make sure you set "Use Form Feeds" to "Y"

On the USB Microcontroller Console serial port:

USB 2.0 eZ80 SBC Interface Debug Port
Build 1.0.0.1450 of 2007-06-28

Reset Source: 01
USBH Interrupt enable

Type 'h' for help.

> **b**

Enumerating X:0x0205, index 0
USBH: Device Address set to 1.
Manufacturer: Belk USB Printing Support
Product: IEEE-1284 Controller
>

On the eZ80SBC Console serial port:

64K CP/M V3.1 - eZ80F91 Rev 2 CBIOS v1.0.0.1450 of 2007-06-28 [PLT,
RELEASE]
Copyright (C) 1982, Digital Research
Copyright (C) 2000-2007, Howard M. Harte

A>**C:**

C>**DEVICE LST:=AUX**

Physical Devices:

I=Input,O=Output,S=Serial,X=Xon-Xoff
CON 19200 IOSX AUX 19200 IOSX

Current Assignments:

CONIN: = CON
CONOUT: = CON
AUXIN: = AUX
AUXOUT: = AUX
LST: = AUX

C>**WS**

WordStar, CP/M Edition, Release 4

O P E N I N G M E N U

D open a document	L change logged drive/user
N open a nondocument	C protect a file
P print a file	E rename a file
M merge print a file	O copy a file
S check spelling of document	Y delete a file
I index a document	F turn directory off
T table of contents	Esc shorthand
X exit WordStar	R run a program
J help	

DIRECTORY Drive C

ASCII.WS	HELP.HLP	PROFILE.SUB	README.BAK	README.TXT
SPL.TXT	TEST.BAK	TEST.TST	TEST.TXT	VIDATT.Z80
WSPRINT.TST	WSREADME.TXT			

P

WordStar, CP/M Edition, Release 4

To skip further questions, press the Esc key at any point. Press RETURN at any question to use the default answer.

Document to print? WSPRINT.TST

RETURN done Backspace or ^H erase left

^U cancel Del erase char

Number of copies? 1

Pause between pages (Y/N)? N

Use form feeds (Y/N)? Y

Starting page? 1

Ending page?

Nondocument (Y/N)? N

Name of printer? HPLJET

```
C:WSPRINT.TST      P02      #01      Align
                   P R I N T I N G
P pause           ^U cancel printing
C continue after pausing
```