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# zilog<sup>®</sup> ZNEO<sup>®</sup> Series of Microcontrollers Development Kit

Quick Start Guide

QS005703-0908

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## Introduction

This Quick Start Guide describes how to set up Zilog's ZNEO<sup>®</sup> Series Development Kit and start using it to build designs and applications.

## Kit Contents

For a complete list of material shipped with the ZNEO Series Development Kit, refer to the *ZNEO<sup>®</sup> Series of Microcontrollers Development Kit Packing List (PAK0010)*.

## Requirements

Table 1 lists the system requirements for running Zilog Developer Studio II (ZDS II).

**Table 1. ZDS II System Requirements**

Recommended Configuration	Minimum Configuration
<ul style="list-style-type: none"><li>• PC running MS Windows XP Professional</li><li>• Pentium III/500 MHz or higher processor</li><li>• 128 MB RAM</li><li>• 110 MB hard disk space</li><li>• Super VGA video adapter</li><li>• CD-ROM drive</li><li>• One or more RS-232 communication ports</li><li>• USB High-Speed Port</li></ul>	<ul style="list-style-type: none"><li>• PC running MS Windows 98SE/ Win2000–SP4/WinXP Professional</li><li>• Pentium II/233 MHz processor</li><li>• 96 MB RAM</li><li>• 25 MB hard disk space (documentation not installed)</li><li>• Super VGA video adapter</li><li>• CD-ROM drive</li><li>• One or more RS-232 communication ports</li><li>• USB High-Speed Port</li></ul>

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## Configuring the 5 V DC Universal Power Supply

The universal power supply kit features several different plug adapters in one box and the power supply in another. The power supply ships with a slide-out plate that must be removed to insert the location-specific plug adapter.

If a location-specific adapter plug is required, follow the steps below to install it:

1. Remove the slide-out plate.
2. Select the AC plug adapter appropriate for your locale and insert it into the slot that remains after removing the slide-out plate.
3. Slide the new plug adapter into the slot until it snaps into place.

You can leave the adapter slot cover in place and plug in a standard computer equipment AC power cord (purchased separately) between the AC cord receptacle on the end of the power supply and an electrical outlet.

## Setting Up the Development Board

Setting up the ZNEO development board involves setting its jumpers and using the USB Smart Cable to connect the board to a high-speed or full-speed USB port on your ZDS II host system.



**Caution:** *Always use a grounding strap to prevent damage resulting from electrostatic discharge (ESD).*

[Figure 1](#) displays a photograph of the ZNEO development board.

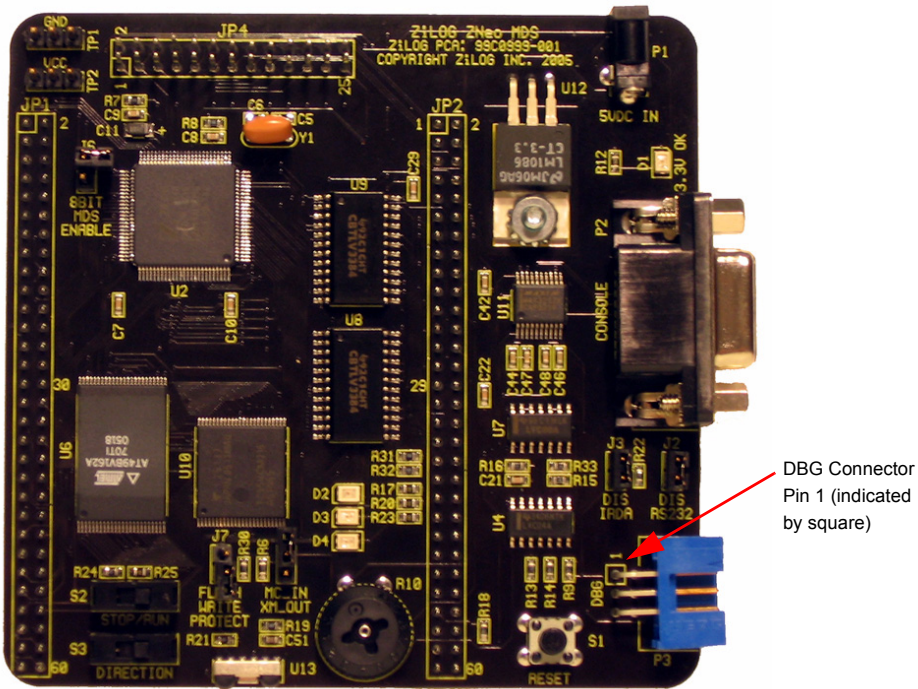


Figure 1. ZNEO Development Board

## Jumper Settings

The jumper settings to set up the ZNEO development board is provided below:

1. For initial setup, ensure that jumper J2, DIS RS232, is OUT (shunt not installed) and jumper J3, DIS IRDA, is IN (shunt installed). For detailed jumper descriptions, refer to the *Z16F2800100ZCOG ZNEO<sup>®</sup> Series Development Kit User Manual (UM0202)*.
2. The development kit is preprogrammed with code for demonstration and to verify that the board is working properly.

To run the preprogrammed Demo, ensure that jumpers and switches are set as follows:

- J1 OUT
- J2 OUT

- J3 IN
- J6 OUT
- J7 OUT
- Switch S2 in the RUN position.
- Switch S3 is used to control the sequence in which LEDs D2, D3, and D4 flash when running the Demo program.

For complete details on jumper settings for ZNEO Series development kits, refer to the *Z16F2800100ZCOG ZNEO® Series Development Kit User Manual (UM0202)*.

3. To run the preprogrammed Demo software, connect power, set the STOP/RUN switch S2 to the RUN position, and press reset switch S1. LEDs D2, D3, and D4 should blink in sequence.
4. After running the Demo software, disconnect power from the development board.
5. Install the included USB Smart Cable. If you have previously installed a USB Smart Cable as part of another Zilog® Development Kit, the drivers are already present on your system. Plug the USB Smart Cable supplied with the ZNEO development kit into an available USB port. The USB Smart Cable drivers automatically installs.

If the USB Smart Cable is never installed on your system, see [Installing USB Smart Cable](#) on page 5 to install the USB Smart Cable for the appropriate operating system.

Refer to the `readme.txt` file included with the ZNEO installation for additional information.



**Caution:** *Do not connect the power supply to the development board before connecting a USB Smart Cable to both the host PC and development board.*

## Installing the ZDSII–ZNEO® Series Software

Follow the steps below to install the ZDSII–ZNEO® Series software:

1. Insert the ZDS II CD into your computer's CD-ROM drive. **DemoShield** launches automatically. If it does not automatically launch, go to the root of the CD-ROM and double-click the file `launch.exe`.

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2. **DemoShield** provides several installation choices. Select **Install Zilog Developer Studio** to install now. You can install other software and accompanying documentation later.
  3. Follow the instructions on the screen to complete the installation.

## Installing USB Smart Cable

Follow the instructions below to install the USB Smart Cable and associated driver software:

### Windows Vista-32

Follow the steps below to install the USB Smart Cable for Windows Vista-32:

1. Connect the USB Smart Cable to the host PC. The **Found New Hardware** wizard is displayed.
2. Select **Locate and install driver software (recommended)**. The **User Account Control** window is displayed, click **Continue**. The **Driver Software Installation** window is displayed, and then the **Found New Hardware-USB Smart Cable** dialog box is displayed.
3. Select **I dont have the disc. Show me other options**.
4. Select **Browse my computer for driver software (advanced)**.
5. Browse to one of the following driver directory:  
<ZDS II Installation Directory>\device drivers\USB\x32  
<ZDS II Installation CD>\device drivers\USB\x32
6. Click **Next**. The **Windows Security** dialog box is displayed.
7. Select **Install this driver software anyway**.
8. When the software has been installed successfully, click **Close**.

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## Windows XP

Follow the steps below to install the USB Smart Cable for Windows XP:

1. Connect the USB Smart Cable to the host PC for the first time.  
The **Found New Hardware** wizard will activate automatically.
2. In the Wizard, select **Install from a list or specific location (Advanced)**; then click **Next**.
- ▶ **Note:** *If the Windows Logo testing dialog appears, select **Continue Anyway**.*
3. Select **Search for the best driver in these locations** and **Include this location in search**.
4. Browse to one of the following driver directory:  
<Zilog Developer Studio II Installation Directory>\  
device drivers\USB  
<Zilog Developer Studio II Installation CD>\Device Drivers\USB
5. Click **Next**, and then click **Next** again after the appropriate driver is found.
6. Click **Finish** to complete the installation.

## Windows 2000

Follow the steps below to install the USB Smart Cable for Windows 2000:

1. Connect the USB Smart Cable to the host PC for the first time.  
The **Found New Hardware** wizard should activate automatically.
2. In the Wizard, click **Next**.
3. Select **Search for a suitable driver for my device (Recommended)**; then click **Next**.
4. Select **Specify a location**; then click **Next**.
5. Browse to one of the following driver directory:  
<Zilog Developer Studio II Installation Directory>\  
device drivers\USB  
<Zilog Developer Studio II Installation CD>\Device Drivers\USB
6. Click **OK**, and then click **Next** after the appropriate driver is found.
7. Click **Finish** to complete the installation.

## Windows 98SE

Follow the steps below to install the USB Smart Cable for Windows 98SE:

1. Connect the USB Smart Cable to the host PC for the first time.  
The **Found New Hardware** wizard should activate automatically.
2. In the Wizard, click **Next**.
3. Select **Search for the best driver for your device (Recommended)**; then click **Next**.
4. Select **Specify a location**; then browse to one of the following driver directory:  
`<Zilog Developer Studio II Installation Directory>\  
device drivers\USB  
<Zilog Developer Studio II Installation CD>\Device Drivers\USB`
5. Click **Next**, and then click **Next** again after the appropriate driver is found.
6. Click **Finish** to complete the installation.

## Connecting the USB Smart Cable to the Target Board

Follow the steps below to connect USB Smart Cable to the development board:

1. Attach one end of the six-conductor ribbon cable (included) to the USB Smart Cable six-pin DBG connector. See [Figure 2](#) on page 7.
2. Attach the free end of the ribbon cable to the DBG 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 (see [Figure 1](#) on page 3 for location of pin 1 on the ZNEO development board).



**Figure 2. Connecting the Six-Conductor Ribbon Cable to the USB Smart Cable**

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## Applying Power to the Development Board

Follow the steps below to apply power to the ZNEO development board:

1. After installing the USB Smart Cable, connect the power supply to the development board at connector P1, then to an electrical outlet.
2. The green 3.3 V DC LED illuminates, indicating that power is being supplied to the board.

## Getting Started Using ZDS II

Follow the steps below to open and use the Z16F2800100ZCOG.zdsproj sample project. This project is designed to compile and download into ZNEO internal Flash Memory and blink the development board LEDs.

► **Note:** *These procedures reference the Z16F2800100ZCOG.zdsproj file located in the below path:*

```
c:\Program Files\ZiLOG\ZDSII_ZNEO_<version_number>\
samples\QuickStart\
```

*where <version\_number> is the ZDS II version number.*

*For example,*

```
c:\Program Files\ZiLOG\ZDSII_ZNEO_4.10.1\
samples\QuickStart\
```

1. To run the sample project with the ZDS II debugger enabled, set the jumpers on the development board as follows:
  - J1 OUT
  - J2 OUT
  - J3 IN
  - J6 OUT
  - J7 OUT
  - Switch S2 in the RUN position



- Switch S3 is used to control the sequence in which LEDs D2, D3, and D4 flash, when running the Demo program.
2. Connect and apply power to the development board as described in [Setting Up the Development Board](#) on Page 2 through Page 8.



**Caution:** *Do not apply power to the development board unless the USB Smart Cable is connected to the host PC and to the development board's DBG Port P3.*

3. Run the ZDS II software. By default, the ZDS II is located in the **Start** menu under:  
 Programs → ZiLOG ZDSII ZNEO <version\_number> → ZDSII ZNEO <version\_number>
4. Select **Open Project** from the **File** menu. The **Open Project** dialog box appears.

► **Note:** *The sample used in the following steps is in the 'C' programming language. An assembler version of the Quick Start sample is located in the samples\Assembly folder.*

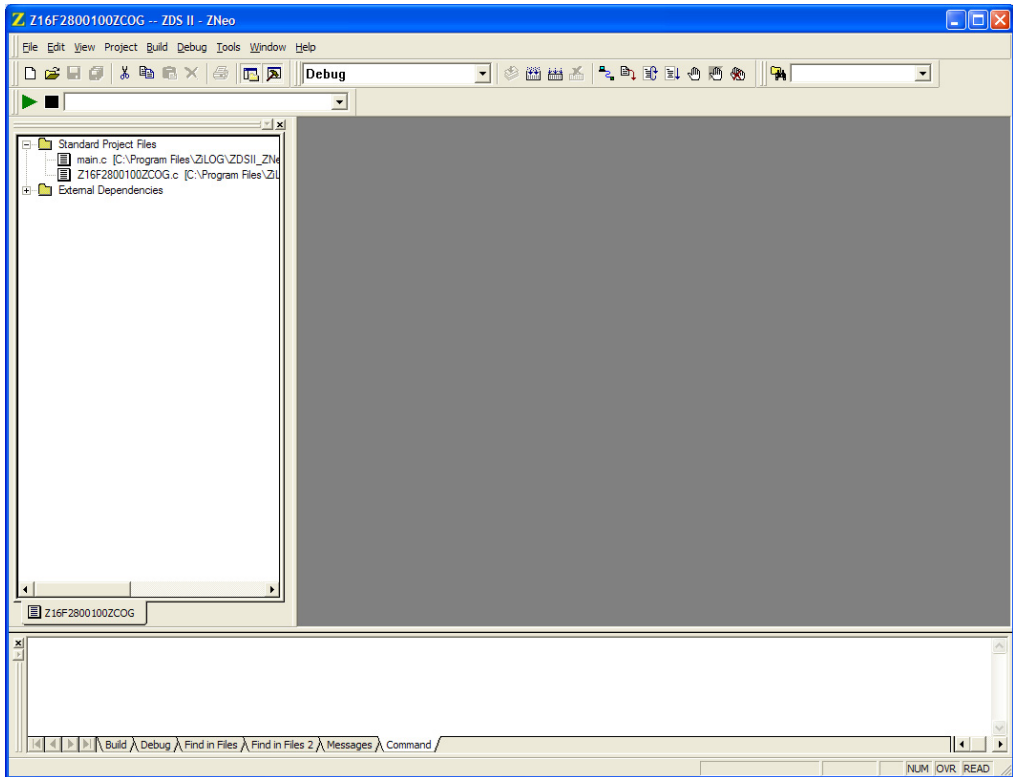
5. Browse to the `samples` folder for the `Z16F2800100ZCOG.zdsproj` file, located by default in below path:

```
c:\Program Files\ZiLOG\ZDSII_ZNEO_<version_number>\samples\QuickStart
```

6. Select the `Z16F2800100ZCOG.zdsproj` file and click **Open**. The initial ZDS II program screen opens (see [Figure 3](#) on page 10).

To view the project source files, double-click the **Project Files** folder on left side of the IDE interface. Double-click an individual file to open that file in the ZDS II file editor.

► **Note:** *The following figures are for reference only. The results may vary slightly due to configuration differences or later software revisions.*



**Figure 3. ZDS II Opening Screen**



Rebuild  
All Icon

7. Click the **Rebuild All** icon to build the project. Wait for the build to complete as indicated by the `Build Complete` confirmation in the status window at the bottom of the screen (see [Figure 4](#) on page 11).



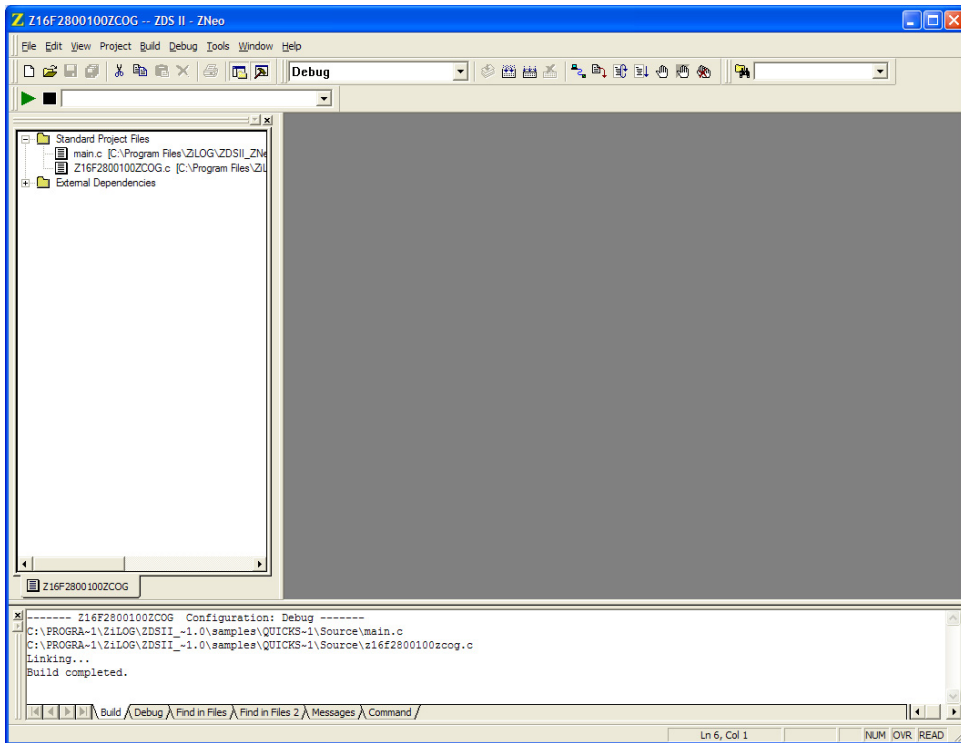
Reset  
Icon

8. Click the **Reset** icon to connect and download the code to the development board.

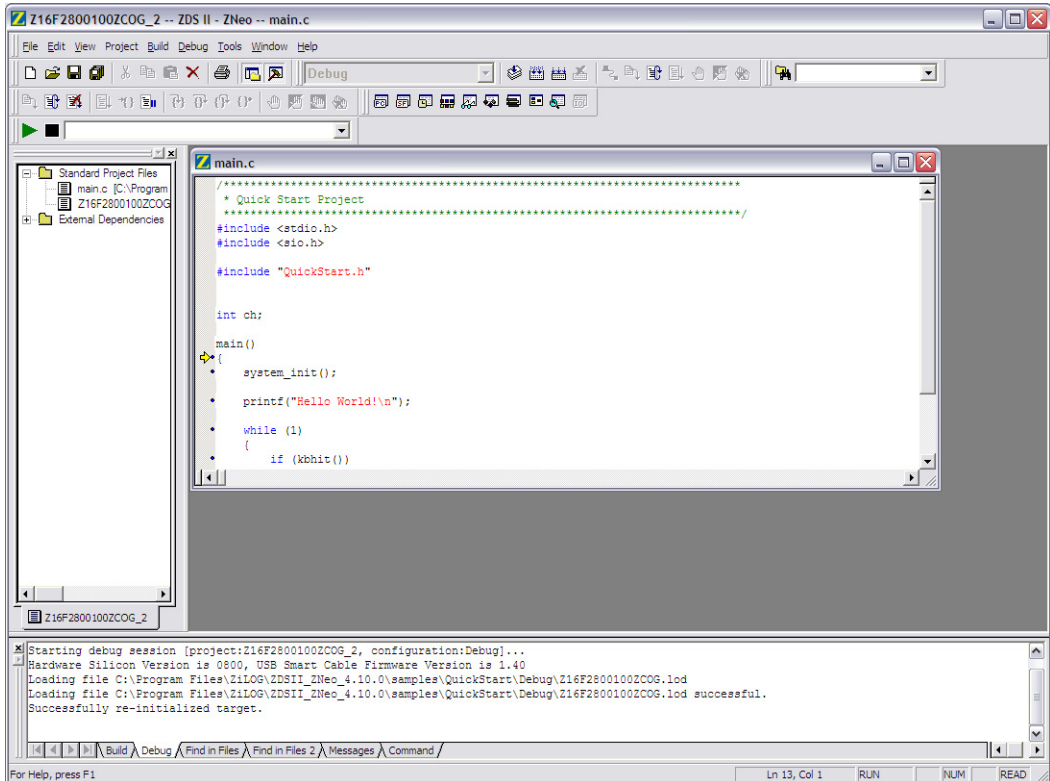
- Click **Go** to start the program. The screen changes as shown in [Figure 5](#) on page 12.



Go  
Icon



**Figure 4. ZDS II Build Completed Screen**



**Figure 5. ZDS II Screen After Pressing GO**

- LEDs D2, D3, and D4 on the development board begin blinking in sequence. If the LEDs do not blink, start over from [step 3](#) on page 9.
- Two-position slide Switch S3 controls the order in which the LEDs blink. To reverse the sequence of the LEDs and make them blink in the opposite direction, slide switch S3 to the opposite position.

For more information on using ZDS II and building projects for your ZNEO® development kit, refer to the *Zilog Developer Studio II—ZNEO® Series User Manual (UM0171)*.

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## Notes About ZNEO Development Board Memory Configuration

The ZNEO development board provides 1Mx16 External Flash and 256Kx16 External RAM to supplement the Flash Memory and RAM internal to the ZNEO CPU. The Quick Start sample supplied with the development kit defaults to loading into internal Flash Memory. However, you can easily download the Quick Start sample code into internal RAM, external RAM, or external Flash by selecting the appropriate **Build Configuration** from the drop-down menu at the top of the ZDS II user interface as described below.

Relocation of the sample program is controlled from the **Project** → **Settings** dialog box, in the **Linker** tab, through the **Address Spaces** category (The startup module supplied with the sample program takes care of the appropriate Address Space settings).

Complete information on internal and external memory configuration is described in Configuring Memory for Your Program section in the *Zilog Developer Studio II–ZNEO® Series User Manual (UM0171)*.

► **Note:** *Even though your code may be written for use in external RAM or external Flash Memory, ensure that the ZNEO chip gets its startup vector table and other critical information from internal Flash Memory. Your code must therefore accommodate this requirement. For more information, refer to Configuring Memory for Your Program section in the Zilog Developer Studio II–ZNEO® Series User Manual (UM0171).*

### Loading and Debugging Sample Code in Internal RAM

To load and debug the code in internal RAM, select **Internal\_RAM\_Debug** in the **Build Configuration** drop-down menu and click the **Rebuild** button. Once the project is rebuilt, use the **Download Code** option to load the code into internal RAM.

### Loading and Debugging Sample Code into External RAM

To load and debug the code in external RAM, select **External\_RAM\_Debug** in the **Build Configuration** drop-down menu and click the **Rebuild** button. Once the project is rebuilt, use the **Download Code** option to load the code into external RAM.

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## Loading and Debugging Sample Code in External Flash Memory

To load and debug the code in external Flash memory, select **External\_FLASH\_Debug** in the **Build Configuration** drop-down menu and click the **Rebuild** button. Once the project is rebuilt, use the **Download Code** option to load the code into external Flash memory.

## Using the Built-In ZDS II Flash Loader

You can use the built-in ZDS II Flash Loader to load release hex files into internal or external Flash Memory. The procedure is similar for loading the release hex files into internal Flash Memory.

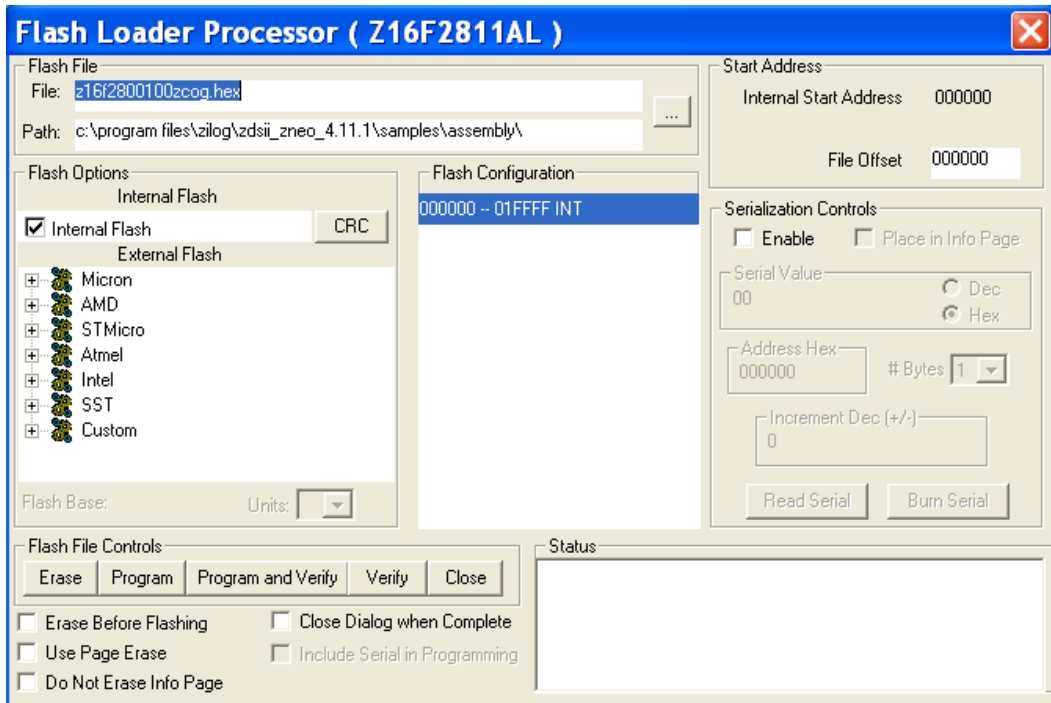
Follow the steps below to load a release hex file into external Flash Memory:

1. Select **External\_Flash\_Release** from the **Build Configuration** drop-down menu.
2. Click the **Rebuild All** icon to build the project. Wait for the build to complete as indicated by the `Build Complete` confirmation in the **Status** window at the bottom of the screen.

The resulting hex file will be located in below path:

```
c:\Program Files\ZiLOG\ZDSII_ZNEO_<version_number>\samples  
\QuickStart\External_Flash_Release\
```

3. Select **Tools** → **Flash Loader** to run the Flash Loader. The **Flash Loader** window is displayed. See [Figure 6](#) on page 15.



**Figure 6. Flash Loader Window**

4. In the **Flash Options** section of the Flash Loader, select the external Flash component that matches the device on your target (U6 on the ZNEO development board) from the **External Flash** list.
5. The Flash Loader should default to the directory and hex file for the project you built. If you do not see hex file `z16F2800100zcog.hex`, click the `...` button and browse to the following directory:

```
c:\Program Files\ZiLOG\ZDSII_ZNEO_<version_number>\samples
\QuickStart\External_Flash_Release\
```

Select the `z16F2800100zcog.hex` hex file and proceed.

6. Select **Program and Verify**.
7. Close the Flash Loader.

8. Connect to your target by clicking the **Connect to Target** icon.

You will see warnings about the absence of debug information. This is normal. However, you can single-step and set break points to debug your downloaded code.

9. Click the **Reset** icon in ZDS II, then click the **Go** icon.
10. LEDs D2, D3, and D4 on the development board begin blinking in sequence. If the LEDs do not blink, start over from [step 1](#) on page 14.
11. Two-position slide Switch S3 controls the order in which the LEDs blink. To reverse the sequence of the LEDs and make them blink in the opposite direction, slide switch S3 to the opposite position.
12. To return to the factory configuration, click the **Stop Debugging** icon to disconnect from the target. Then select **Debug** from the **Build Configuration** drop-down menu and click the **Rebuild All** icon.

You can now connect to the target and download the code.

Detailed instructions for using the Flash Loader are provided in the *Zilog Developer Studio II–ZNEO® Series User Manual (UM0171)*.

## Troubleshooting Tips




If you experience trouble running the demo program with the ZNEO development board, check the following troubleshooting tips before contacting Zilog Technical Support for assistance:

- Verify that you are using ZDS II v4.10.0 or later.
- Ensure that you are using the unmodified sample project code as described in [Getting Started Using ZDS II](#) on page 8.
- Verify that USB Smart Cable is properly connected to the host PC and the development board as described in [Setting Up the Development Board](#) on page 2. Ensure that pin 1 of the cable is properly aligned with DBG connector pin 1 of the development board.
- Apply power to the development board. The green 3.3 V DC LED should turn ON. If it is not illuminated, verify that power is properly connected to the board as described in [Configuring the 5 V DC Universal Power Supply](#) on page 2.



- In ZDS II, select the **Project** → **Settings** menu item. In the **Debugger** tab of the **Project Settings** window, in the **Target** section, verify that the **Z16F2800100ZCOG** option is selected. Verify that the drop-down menu in the **Debug Tool** section is set to **USBSmartCable**.

Click the **Setup** button in the **Debug Tool** box and verify that the serial number for the USB Smart Cable interface is present. If the serial number is missing, reinstall the USB Smart Cable driver software.

- In ZDS II, click the **Rebuild All**  button. Verify that the project rebuilds with no errors.
- Verify that the development board is not currently running any code — no LEDs should be blinking.
- In ZDS II, click the **IDE Reset**  button. ZDS II will connect to the development board and download code to it.
- Open the Windows Hyperterminal application (located in your **Accessories** program group) and connect a DB9-to-DB9 cable between your host PC and console port P2 of the development board. Set the communication settings to 57600 8 bits, no parity, one stop bit. This is noted on `main.c`.
- Click the **Go**  button. LEDs D2, D3, and D4 should blink in sequence. The hyperterminal should display the ‘Hello World!’ message.

If you perform these steps and cannot get the demo code to run, contact Zilog Technical Support at [www.zilog.com](http://www.zilog.com).



**Warning:** DO NOT USE IN LIFE SUPPORT

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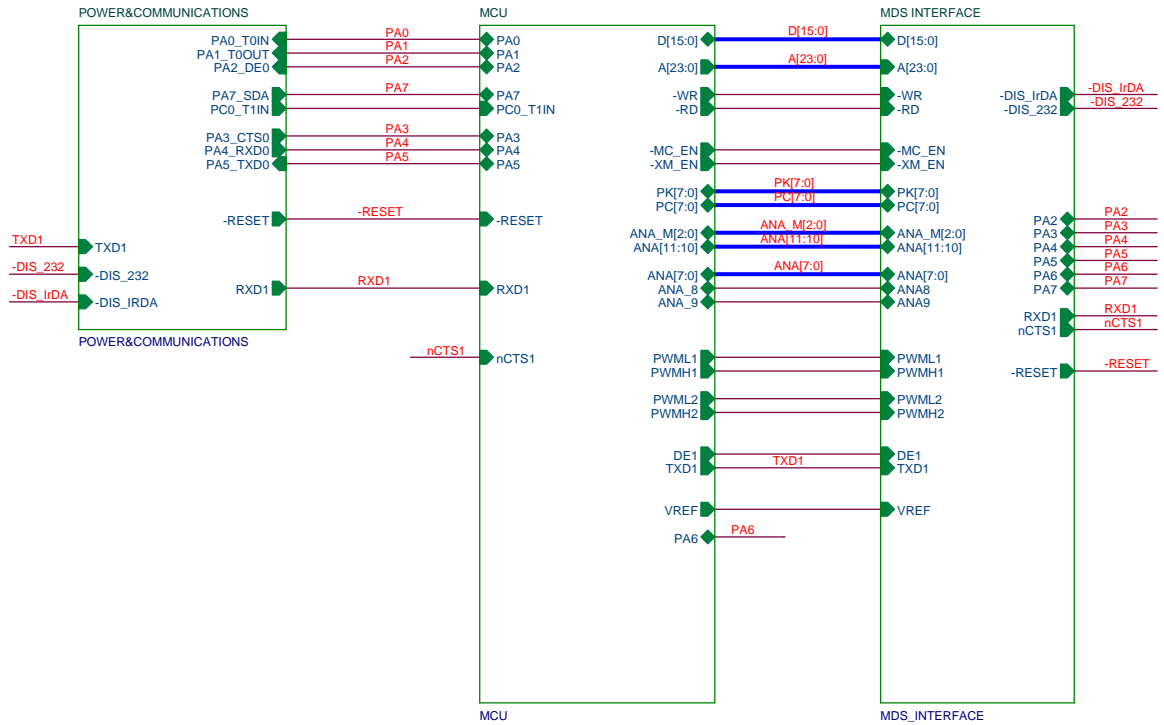
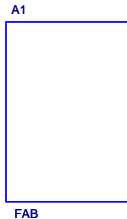
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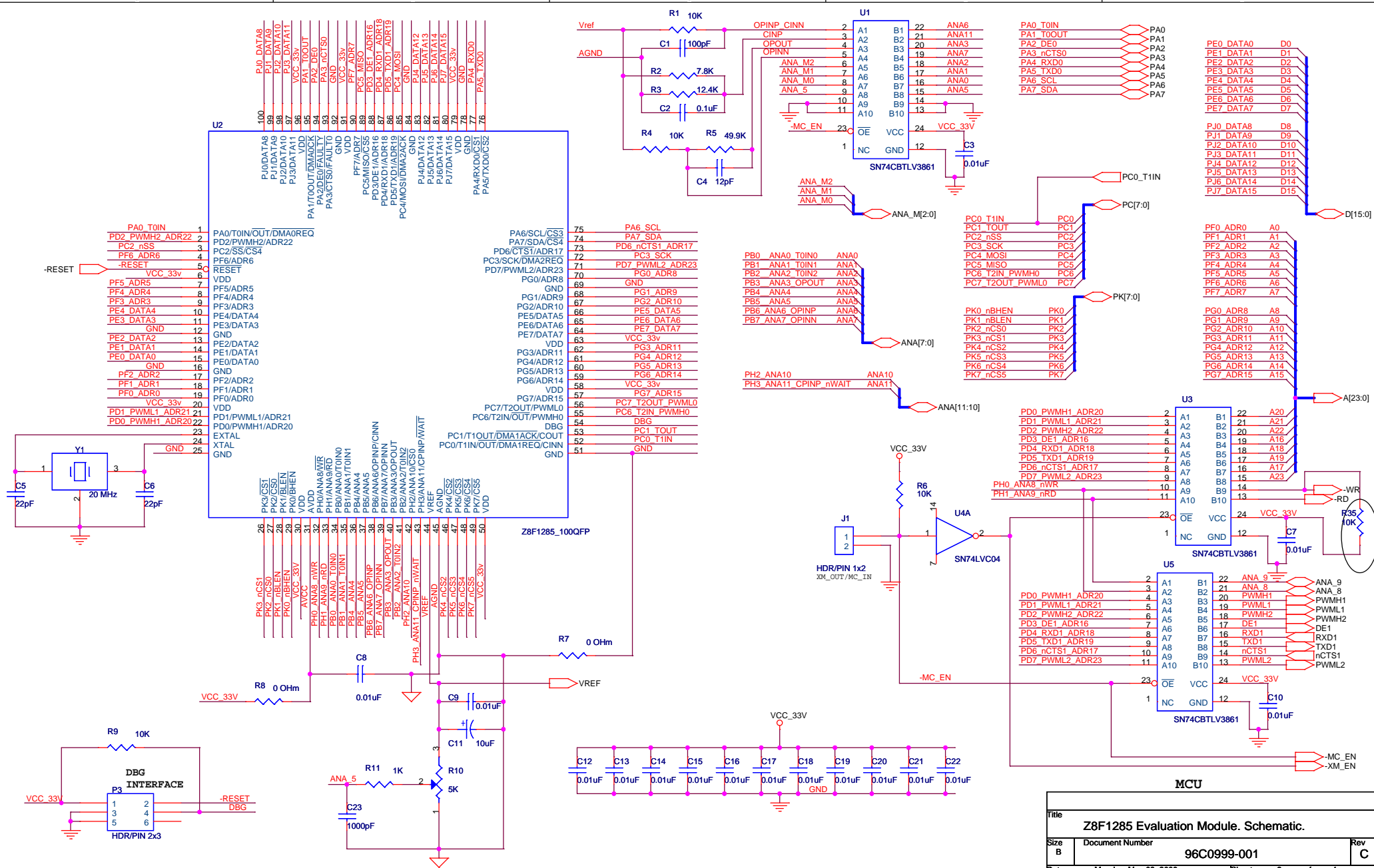
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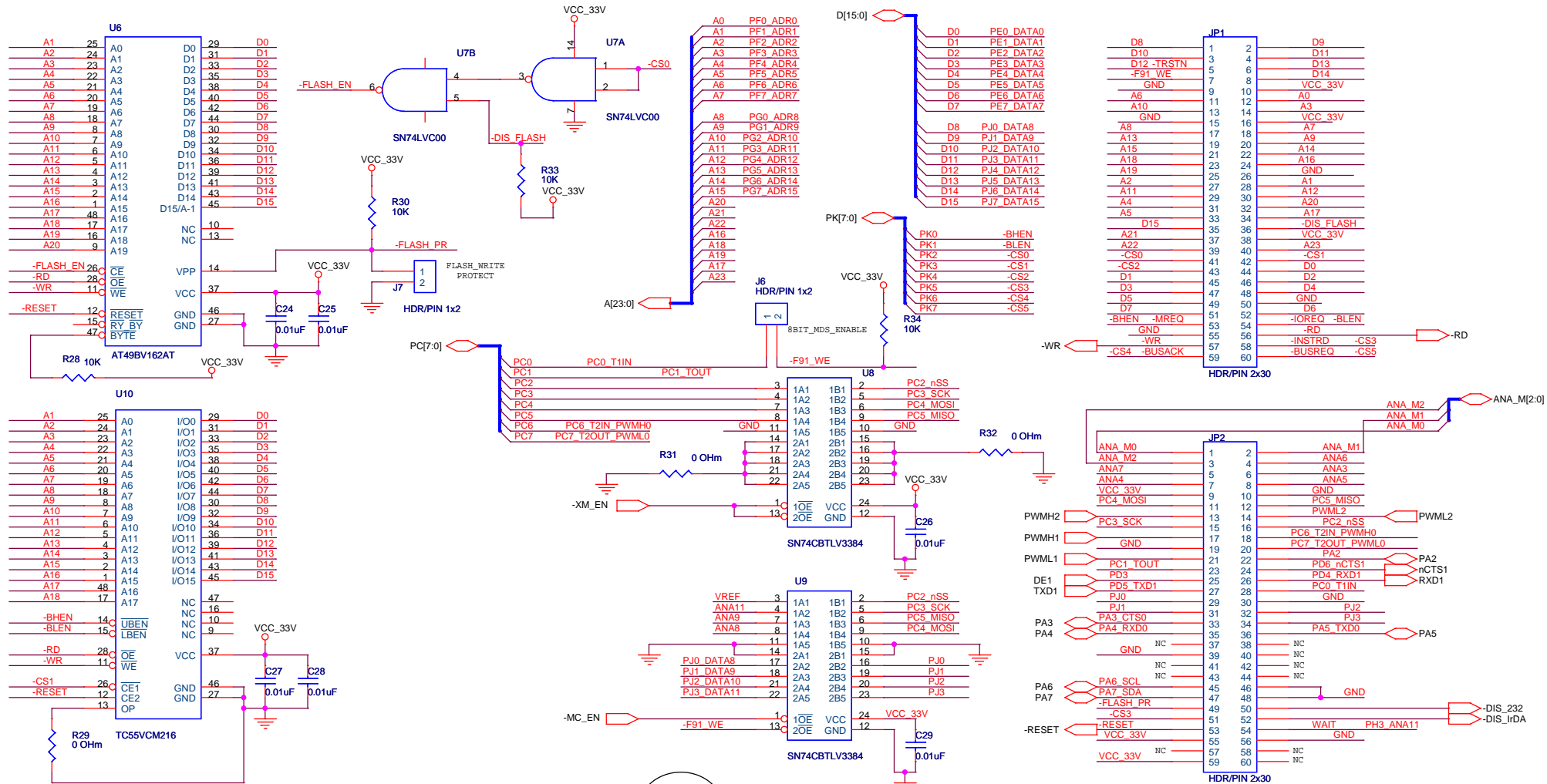


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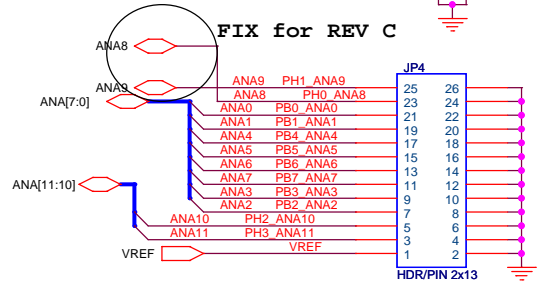
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Date:	Thursday, March 02, 2006		Sheet	1	of 4



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Size	Document Number	96C0999-001		Rev	C
Date:	Monday, May 08, 2006	Sheet	2	of	4



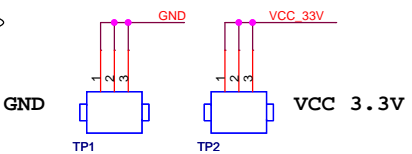
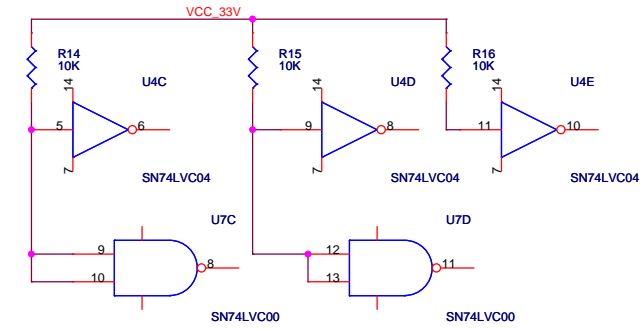
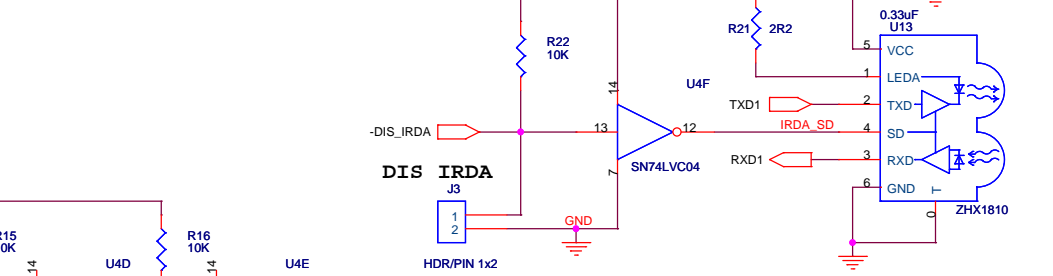
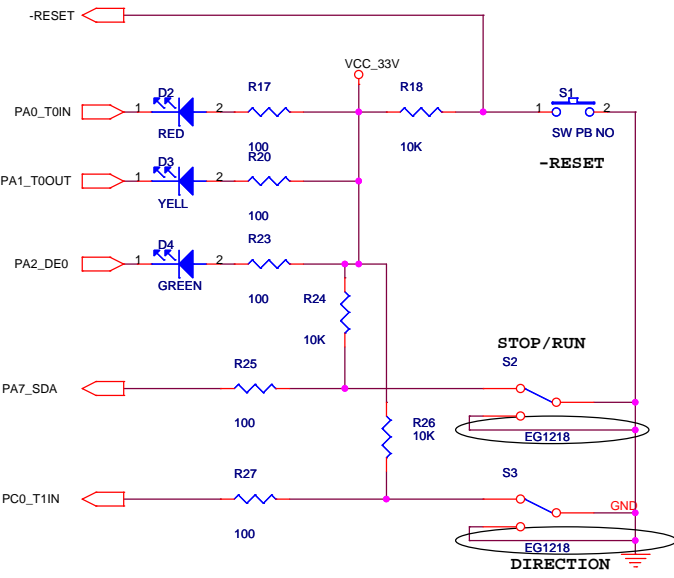
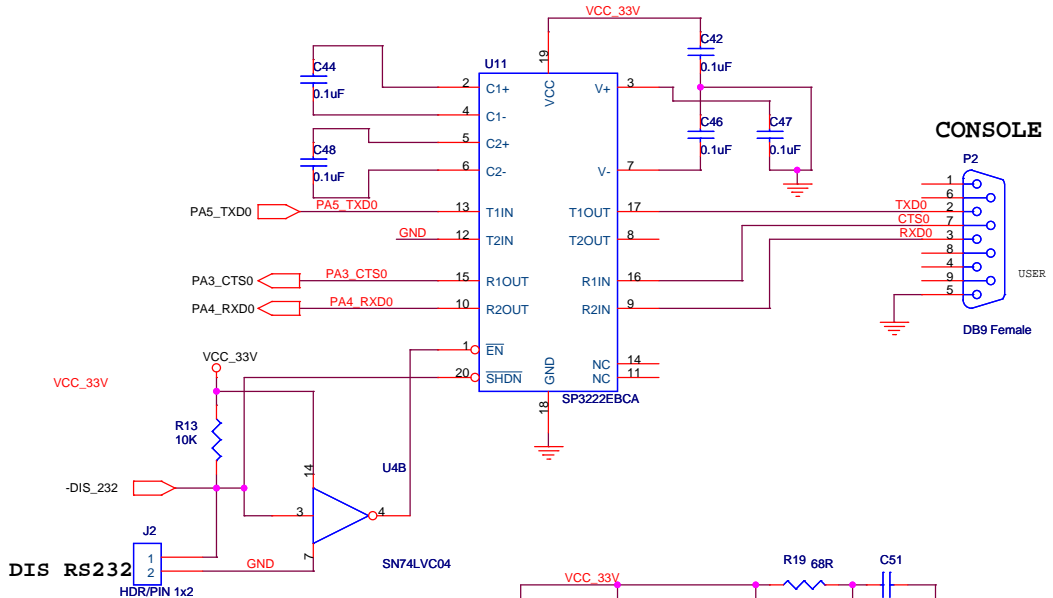
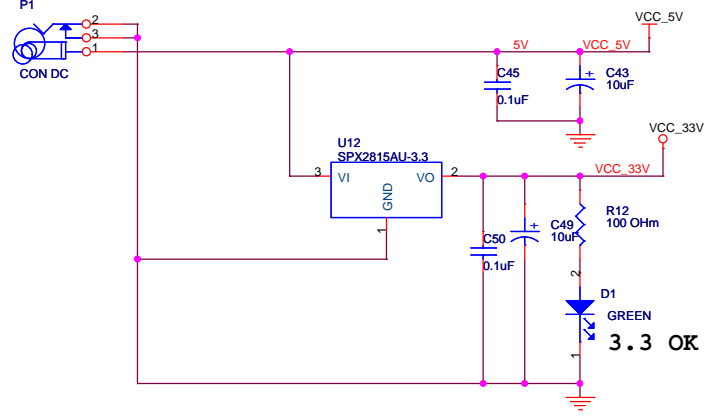
**FIX for REV C**



If Module is plugged onto the Dev Platform the local R5232 interface is disabled by pin 50 of JP2

**MEMORY AND MDS INTERFACE**

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Size	Document Number	96C0999-001		Rev	C
B	Date: Monday, May 08, 2006				Sheet 3 of 4



**POWER & LOCAL INTERFACES**

Title		
Z8F1285 Evaluation Module. Schematic.		
Size B	Document Number	Rev C
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Date:	Thursday, March 02, 2006	Sheet 4 of 4