MDS General-Purpose Board Quick Start Guide

QS004505-1207

Introduction

This Quick Start Guide provides configuration information for adding peripherals to your MDS-compatible project module and example projects to start using Zilog's Modular Development System General-Purpose (MDS-GP) application board, ZGENPRP0100MDS.

This document guides you through the following:

Kit Contents

The MDS kit includes the following:

- MDS-GP application board
- Zilog CD-ROM containing example projects
- Quick Start Guide and supported documentation
- 10 pin to DB9 serial cable

System Requirements

The MDS-GP application board requires an existing MDS-compatible processor module (MDS-PM) kit such as the eZ80F91 development kit from Zilog's eZ80Acclaim!® product line. The MDS system interface consists of two common 60 pin headers (labeled JP1 and JP2 on the MDS-GP board) that connect to mating connectors on the MDS-PM. Refer to your *MDS-PM kit documentation* for software and other requirements. The eZ80Acclaim! or Z8 Encore! XP® 64K Series Flash Microcontrollers or ZNEO® Z16F series processor module can fully utilize the MDS-GP board features. The smaller Z8 Encore! XP® F0822 Series Flash Microcontrollers and Z8 Encore! XP modules cannot use all MDS-GP board features.

Overview

The MDS-GP application board provides various peripheral interfaces that are controlled using an eZ80Acclaim! or Z8 Encore! XP or ZNEO Z16F family MDS-compatible processor module. Zilog's MDS processor modules are sold as stand-alone development kits that include everything you require to get started. Adding the MDS-GP application board to your MDS processor module expands the application development possibilities.

The MDS-GP application board provides a number of PCB footprints and connectors for additional features as required. Footprints are provided to support optional RF, GPS, and digital compass functions. Terminal blocks are provided for easy attachment to user-supplied hardware. A number of serial port options can be selected under software control or by using jumpers.

Figure 1 displays an MDS-GP application board with an optional GPS module installed. For technical details, refer to the *MDS General-Purpose Board User Manual (UM0169)*.

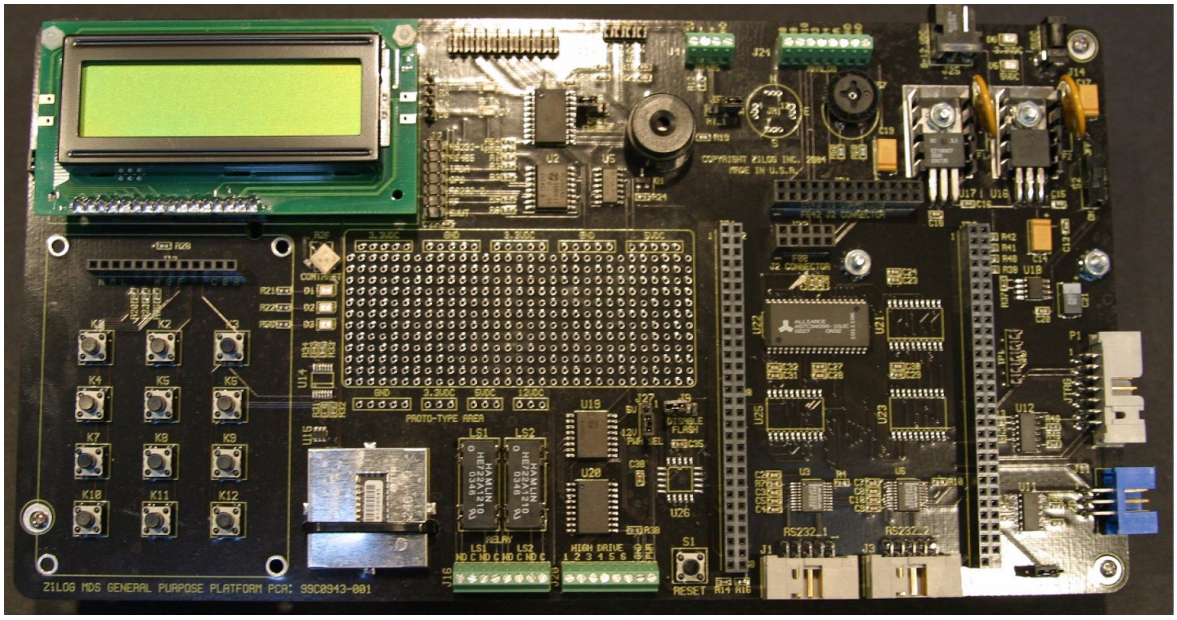

Figure 1. MDS-GP Board (Shown With Optional GPS Module)

Software Installation

Copy the example project directories from the included CD-ROM into the same directory in which you installed the copy of ZDS II that came with your MDS-PM development kit.

Power Supply Options

The MDS-GP board provides four different power input options.

Caution: *Connect only one power source at a time.*

- **5 V DC into J14** — The 5 V DC power supply included with Zilog MDS-PM development kits can be used for this input to power both the MDS-GP board and the MDS-PM module.
- **9 V to 12 V DC into J25** — If you intend to use the two relays supplied on the board, provide 9 V to 12 V DC on connector J25 to power the relays.
- **4 AA batteries in Battery Holder BT1**— Switch S2 present on top right-hand corner of the board turns the battery power source ON or OFF (Disconnected if J14 or J25 is used).

Caution: *Ensure S2 is OFF or remove the batteries before connecting another power source.*

- **12 V DC into RS-485 connector J4** — This connector provides another means for supplying power to the board (Battery holder BT1 must be empty).

Note: *Do not use the DC input jack on the MDS-PM board when it is plugged into the MDS-GP board. You must power the system with one of the MDS GP power supply inputs. If your application is using the on-board relays then you must provide 9 V to 12 V DC into the MDS-GP board or change out the relays to 5 V parts.*

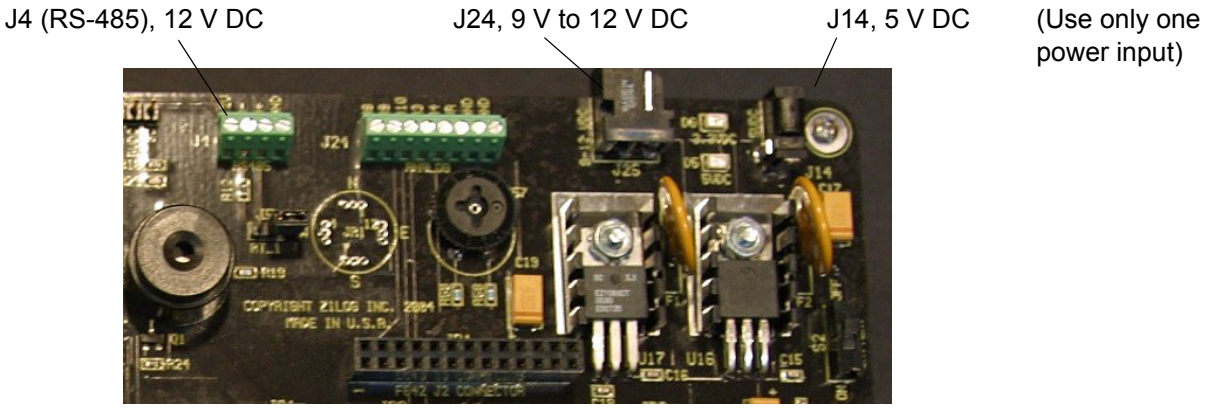

Figure 2. Power Supply Connectors (Upper Right Corner of MDS-GP Board)

(Remove batteries before connecting 12 V DC to the RS-485 interface, J4)

Figure 3. BT1 Battery Pack (Located on Back of MDS-GP Board)

Board Jumper Settings

Table 1 describes jumper set J2, which enables selected serial port functions. Do not install any of these jumpers if software control is used to enable RS-232 functions.

The example projects included in the MDS-GP CD-ROM are written using software to control the serial port configurations. While you can also provide serial port control via jumper J2, Zilog® suggests using software control as shown in the example projects. Software control allows you to change settings on the fly.

Table 1. Serial Port Control (Jumper Block J2)

Pins	Factory Default	Function
1, 2	OFF	Enable RS232–1 on J1
3, 4	OFF	Enable RS-485 on J4 (using COM 1)

Table 1. Serial Port Control (Jumper Block J2) (Continued)

Pins	Factory Default	Function
5, 6	OFF	Enable IrDA module (using COM 1)
7, 8	OFF	Enable GPS on J15 (using COM 2)
9, 10	OFF	Enable RS-232–2 on J3 (using COM 2)
11, 12	OFF	Enable RF on J17 (using COM1)
13, 14	OFF	Enable software UART (using COM2)

Caution: *You cannot use more than two serial functions at a time. Therefore, do not install more than two jumpers on jumper block J2 if you are not using software control. If you are using software control, do not install jumpers on J2.*

Table 2 describes miscellaneous jumper settings on the MDS-GP board.

Table 2. Miscellaneous Jumper Settings

Jumper	Symbol	Name	Factory Default	Function
J6	FL_WE	Flash Write Enable	OFF	Install this jumper to enable writing of the external flash memory boot block on the eZ80F91 Module.
J5	RT-1	RS-485 Term-Res Enable	OFF	Install this jumper to enable the RS-485 termination resistor.
J8	DACK_EN	Motorola bus mode Enable	OFF	Install this jumper if running Motorola bus mode when using the eZ80F91 Module.
J9	Disable Flash	eZ80F91 external Flash	OFF	Install this jumper to disable the external Flash memory on the eZ80F91 Module.
J27	PWR_Sel	Power Select	2, 3 (12 V DC)	This jumper selects the power supply used for the relays and high drive outputs available on J20. Jumper pins 1, 2 for 5 V DC.
J26	LCD_Sel	Source of LCD control	OFF	Install this jumper to select I^2C control of the LCD control pins.
J28	BL	LCD BackLight.	1, 2	This jumper controls the selection of the LCD back light control. Jumper pins 2, 3 for software control of backlight.
J29	ADC_POT	POT Select	ON	This jumper connects the on-board potentiometer to one ADC input.

Running Sample Projects

The CD-ROM included with the MDS-GP board includes sample projects for several Zilog® MDS-PMs (see Figure 4). To start using the MDS-GP board, refer to the section that applies to your particular MDS-PM.

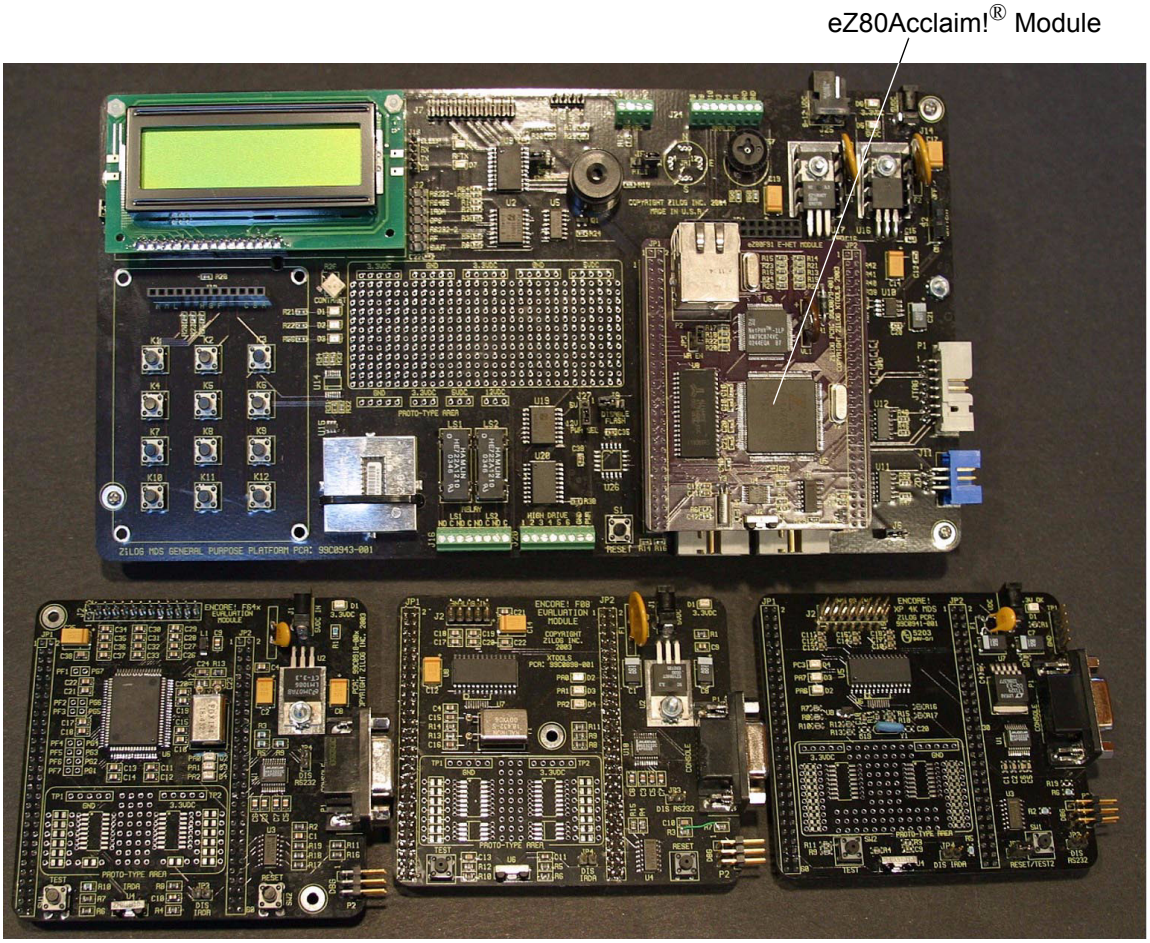

Figure 4. Typical MDS-GP Board Setup and Processor Modules

eZ80Acclaim! MDS Processor Modules

The `Acclaim` directory on the MDS-GP CD contains two projects supporting the eZ80Acclaim! MDS processor modules. These two projects are described below.

- F91_MDS_GP — A stand-alone application that includes a number of routines to control the MDS-GP board.
- ZTP_1.2.1_MDS_GP — This application requires Zilog's ZTP TCP/IP stack, available for download at www.zilog.com. This example shows how to interface to the keypad and the LCD display. It also

includes routines to configure the on-board I^2C bus expanders. To execute this project, copy the files under the `ZTP_1.2.1_MDS_GP` directory into the ZTP demo directory. Follow the readme and notes included with the ZTP software package.

Follow the steps below to build and run the stand-alone F91_MDS_GP example:

1. Ensure that all power is turned OFF. Plug the eZ80Acclaim!® MDS-PM into jumpers JP1 and JP2 on the MDS-GP board. Pin 60 on JP2 is a *keyed* pin that prevents you from plugging in the MDS-PM board backwards.
2. Ensure that all jumpers on the MDS-GP board are set to their factory default positions (see Board Jumper Settings on page 3.)
3. Connect the ZPAKII debug tool to ZDI connector J1. Power the ZPAKII unit and provide a power source into the MDS-GP board (see Power Supply Options on page 2).
4. Launch ZDS II v4.7.1 or later for the eZ80Acclaim! processor.

Notes: *Follow the steps below before opening the project in ZDS II:*

(a) Select **Tools** → **Options**. In the **Options** window, click **File Types** tab.

(b) For the **Web Files** File Group, add `*.bmp` to the **Associated File Types:** text box.

(c) Click **OK**.

5. Open the F91_MDS_GP project. Select the Flash build option, **Rebuild All**, then run the Flash Loader under the **Tools** menu. Select **Internal Flash** and the `F91_MDS_GP.ihx` file to download, erase, and burn this hex file to the eZ80F91 Module.
6. Reset the system using the reset button. A welcome message is displayed on the LCD. Push any key on the 3 by 4 keypad to generate a message on the LCD.

The stand-alone F91_MDS_GP application can drive either the on-board LCD or, optionally, a larger CrystalFontz 320x240 graphic LCD (see Figure 5). The CrystalFontz LCD uses the SED1335 controller and is pin-compatible with J7 on the MDS-GP board. Only a ribbon cable and backlight are required.

Figure 5. Optional CrystalFontz LCD

Z8F642 MDS-PM*

The `Encore642` directory on the MDS-GP CD contains F642_MDS_GP project that supports Z8 Encore! XP® 64K Series Flash Microcontrollers MDS processor modules. This project includes routines to control the keypad, LCD, buzzer, RS-232 port, Zilog's IrDA Lite protocol, and I^2C bus expanders.

Follow the steps below to build and run the stand-alone F642_MDS_GP project:

1. Ensure that all power is turned OFF and plug the F642 MDS-PM into jumpers JP1 and JP2 on the MDS-GP board. Pin 50 on JP2 is a *keyed* pin and prevents you from plugging in the MDS-PM board backwards. Plug connector J2 on the MDS-PM board into J21 on the MDS-GP board. This connector is the ADC input to the Z8 Encore! XP® 64K Series Flash Microcontrollers module.
2. Ensure that all jumpers on the MDS-GP board are set to their factory default positions (see Board Jumper Settings on page 3).
3. Connect smart cable to the DBG connector P2 on the MDS-PM board. Apply power to MDS-GP board (see Power Supply Options on page 2).
4. Launch ZDS II v4.7.2 or later for the Z8 Encore! XP processor and open the F642_MDS_GP project.
5. Build the project. Download the project using the **Download** option under the **Debug** menu bar. Reset and run the project. A welcome message is displayed on the LCD. Push any key on the 3 by 4 keypad to generate a message on the LCD.

Z8 Encore! XP® F0822 Series Flash Microcontrollers MDS-PM†

No example project was available at the time of release. Visit www.zilog.com for updates.

Z8 Encore! XP MDS-PM

The `EncoreXP` directory on the MDS-GP CD contains XP_MDS_GP project that supports Z8 Encore! XP MDS processor modules. This project includes routines to control the keypad, LCD, buzzer, RS232 port, and I^2C bus expanders.

Follow the steps below to build and run the stand-alone XP_MDS_GP project:

1. Ensure that all power is turned OFF. Plug the XP MDS-PM into jumpers JP1 and JP2 on the MDS-GP board. Pin 50 on JP2 is a *keyed* pin and prevents you from plugging in the MDS-PM board backwards.
2. Ensure that all jumpers on the MDS-GP are set to their factory default positions (see Board Jumper Settings on page 3).
3. Connect smart cable to the DBG connector P2 on the MDS-PM board. Apply power to MDS-GP board (see Power Supply Options on page 2).
4. Launch ZDS II v4.7.2 or later for the Z8 Encore! XP processor and open the XP_MDS_GP project.

* Early production of the Z8 Encore! XP processor modules did not include male headers installed in locations JP1 and JP2. You must install two dual-row 60-pin headers on your Z8 Encore! XP processor module before you can use your MDS-GP Development Kit with your Z8 Encore! XP processor module.

† Early production of the Z8 Encore! XP processor modules did not include male headers installed in locations JP1 and JP2. You must install two dual-row 60-pin headers on your Z8 Encore! XP processor module before you can use your MDS-GP Development Kit with your Z8 Encore! XP processor module.

5. Build the project and then download the project using the **Download** option under the **Debug** menu bar. Reset and run the project. A welcome message is displayed on the LCD. Push any key on the 3 by 4 keypad to generate a message on the LCD.

Note: *Revision A of the Z8 Encore! XP® MDS processor module supports both an internal and external clock source. When the Revision A Z8 Encore! XP MDS-PM module is plugged into the MDS-GP Board, the external clock source cannot be used.*

ZNEO® Z16F MDS-PM

The `ZNEO16F` directory on the MDS-GP CD consists of ZNEO_MDS_GP project that supports ZNEO® Z16F series MDS processor modules. This project includes routines to control the keypad, LCD, buzzer, RS232 port, Zilog's IrDA Lite protocol, and I^2C bus expanders.

Follow the steps below to build and run the stand-alone ZNEO_MDS_GP project:

1. Ensure that all power is turned OFF. Plug the ZNEO MDS-PM into jumpers JP1 and JP2 on the MDS-GP board. Pin 60 on JP2 is a *keyed* pin that prevents you from plugging in the MDS-PM board backwards. Plug connector J2 on the MDS-PM board into J21 on the MDS-GP board. This connector is the ADC input to the ZNEO Z16F series module.
2. Ensure that all jumpers on the MDS-GP board are set to their factory default positions (see Board Jumper Settings on page 3).
3. Connect the smart cable to the DBG connector P2 on the MDS-PM board. Apply power to MDS-GP board (see Power Supply Options on page 2).
4. Launch ZDS II v4.10.0 or later for the ZNEO Z16F processor and open the `ZNEO_MDS_GP` project.
5. Build the project and then download the project using the **Download** option under the **Debug** menubar. Reset and run the project. A welcome message is displayed on the LCD. Push any key on the 3 by 4 keypad to generate a message on the LCD.

Note: *ZNEO Z16F processor module requires minor changes for LCD and keypad interfacing. Refer to the MDS General-Purpose Board User Manual (UM0169).*

Warning: DO NOT USE IN LIFE SUPPORT

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