zilog

Modular Development System

General-Purpose Board Development Kit

User Manual

UM016905-1207

Revision History

Each instance in Revision History reflects a change to this document from its previous revision. For more details, refer to the corresponding pages and appropriate links in the table below.

Date	Revision Level	Description	Page No
December 2007	05	Updated Zilog logo and text, Disclaimer. Replaced Z8 Encore!® 64K Series MCUs with Z8 Encore! XP 64K Series Flash Microcontrollers and Z8 Encore! 8K/4K Series with Z8 Encore! XP® F0822 Series Flash Microcontrollers.	All
May 2006	04	Updated for ZDS II for eZ80Acclaim! v4.10.	All
February 2006	03	Added ZNEO Z16F series MCUs at the end of appendix:MDS-PM board pin maps and a note for ZNEO Z16F processor module. Added footnotes and caution statements (e.g. EMI), corrected font, branding & trademarking issues.	All
July 2004	02	Added footnotes and caution statements (e.g. EMI), corrected font, branding & trademarking issues.	All
April 2004	01	Original issue	All

Table of Contents

Introduction

Zilog's Modular Development System General-Purpose (MDS-GP) Application Board, ZGENPRP0100MDS, adds a variety of peripheral interfaces to Zilog's eZ80Acclaim!®or Z8 Encore! XP® or ZNEO® Z16F family of MDS-compatible processor modules. MDS-GP is the first of a series of application boards that makes it easier for developing products with Zilog® processors.

Zilog's MDS processor modules (MDS-PM) are available as stand-alone development kits that include a Zilog microprocessor and everything you need to get started. Adding the MDS-GP board to an MDS-PM development system provides interface to expand your application development possibilities.

Applications of MDS-GP include:

- High-current control of external devices, using the board's high-drive outputs or on-board relays.
- Miniature system-control panel, using the built-in keypad and LCD display.
- Optional plug-ins:
  - GPS to wireless data controller
  - Web-based wireless data system

Board Features

Key features of MDS-GP board includes:

- Support for the following MDS-compatible processor modules:
  - eZ80Acclaim!® modules
  - Z8 Encore! XP® 64K* Series Flash Microcontrollers modules
  - Z8 Encore! XP F0822* Series Flash Microcontrollers modules
  - Z8 Encore! XP® modules
  - ZNEO® Z16F series modules
- Board and processor module can be powered by any one of the following:
  - 5 V DC input jack (accepts most MDS-PM kit power supplies)
  - 9 V to 12 V DC input jack
  - 12 V DC on RS-485 interface
  - 4 AA-cell battery holder on back of board
- User interface input-output:
  - 2 line x 16 character LCD display
  - 3 x 4 matrix keypad
  - Pot control for one ADC channel
  - Buzzer
- Data and control input-output interfaces:
  - Software- or jumper-controlled serial port routing for connections to RS-232, RS-485, IrDA, or optional wireless and GPS modules.
  - Two 10 pin RS-232 ports.

*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.

  - RS-485 screw terminal block: +12 V DC, D+, D–, GND (This 12 V DC supply can be used to power the MDS-GP and processor module).
  - External eight bit data I/O connector (J7). Pin-compatible with CrystalFontz 320 x 240 graphic LCD.
  - Terminal blocks for easy connection to ADC channel inputs on Z8 Encore! XP® and ZNEO® Z16F processors that support it.
  - Six high-drive outputs with terminal blocks. Jumper selectable for 5 V DC or 12 V DC output.
  - Two relays with terminal block.
  - JTAG and Zilog® ZDI debug interfaces.
  - I^2C 4 pin I/O connector.
- On-board features and options:
  - 512 KB fast SRAM
  - Footprints for user-installed Flash memory devices
  - I^2C temperature sensor
  - Plug-in connector for optional trimble lassen SQ GPS module
  - Footprint for dinsmore 1490 digital compass
  - Plug-in connectors for optional maxstream 900 MHz or 2.4 GHz wireless data module
  - Large prototyping area
  - 4-layer printed circuit board
  - 5.25 by 9.75 inch dimensions

MDS-GP board Overview

The MDS-GP application board is controlled by an MDS-compatible processor module (MDS-PM). The MDS system interface consists of two common 60-socket headers (labeled JP1 and JP2 on the MDS-GP board) that connect to mating pins on the MDS processor module.

The eZ80Acclaim!®, Z8 Encore! XP® 64K Series Flash Microcontrollers, and ZNEO® Z16F processor modules can fully utilize the MDS-GP board features (see Board Features on page 2) whereas Z8 Encore! XP F0822 Series Flash Microcontrollers and Z8 Encore! XP modules cannot use all MDS-GP board features. The CD-ROM provided with MDS-GP kit includes sample projects that use many of the board's features.

For sample project descriptions, refer to *MDS General-Purpose Board Quick Start Guide (QS0045)*.

Note: *Z8 Encore! XP processor modules do not support I^2C features. Also, the external clock source present on revision A of the Z8 Encore! XP module cannot be used. You must select the internal 32 KHz or 5 MHz clock source on this module.*

Figure 1 displays the MDS-GP application board with compatible processor modules.

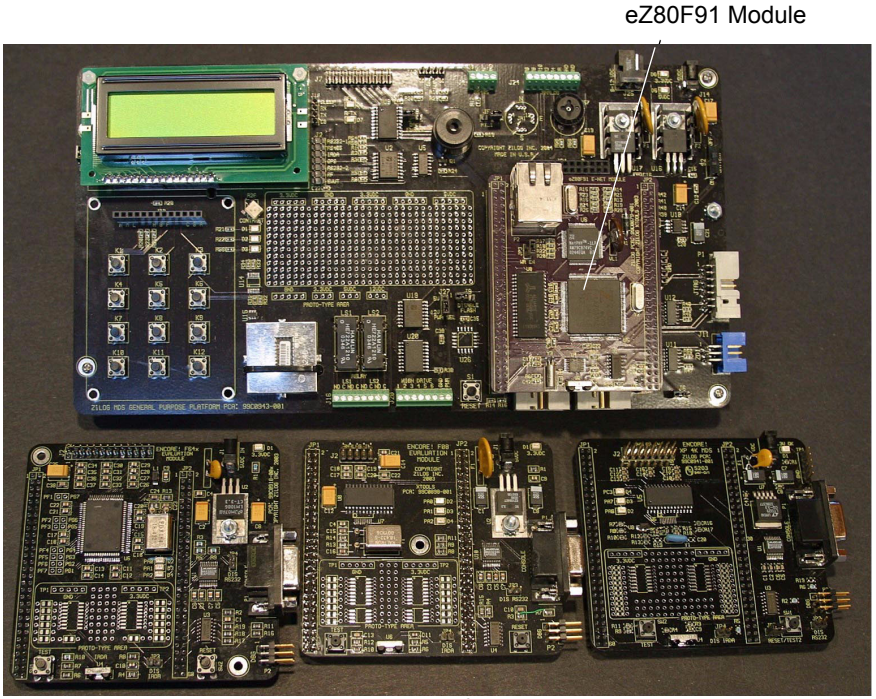

Figure 1. MDS-GP Board and Processor Modules

Kit Contents

The MDS-GP board development kit includes the following:

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

MDS-GP Board Features

Following sections describe features of the MDS-GP board:

- MDS Interface
- Power Supply Options
- External Data Bus I/O
- LCD Interface
- Keypad
- I^2C Expanders
- GPS and Wireless Data Options
- Software Selectable Serial Port Options
- Board Jumper Settings
- Relay/High Drive Outputs
- Temperature Sensor
- ADC Inputs
- RS-485 I/O
- Buzzer
- Digital Compass Option
- RAM and Flash Decode

MDS Interface

The MDS interface consists of two 0.1 inch, 60 pin sockets, labeled JP1 and JP2, on the MDS-GP board. All MDS-compatible processor modules include footprints for male headers to fit these sockets.

JP1 and JP2 reference signal names are based on the eZ80Acclaim!® processor modules. When using another processor module, see corresponding section in Appendix—MDS-PM Board Pin Maps on page 33.

Figure 2 displays the reference signal names for the MDS headers.

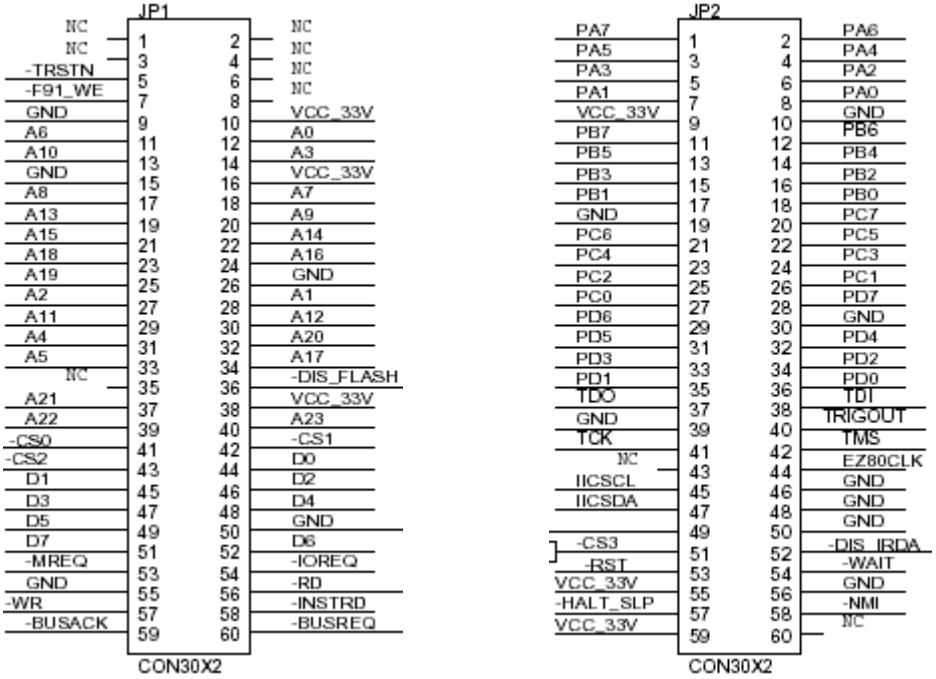

Figure 2. JP1 and JP2 Reference Signal Names

Power Supply Options

The MDS-GP board provides four different power input options (Figure 3 and Figure 4):

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

- **5 V DC into J14 —** The 5 V 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 processor module.
- **9 V to 12 V DC into J25 —** The eZ80Acclaim!® development kits ship with a 9 V DC power supply.
- **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).
- **4 AA cells in battery holder BT1 —** Switch S2 present on the top right-hand corner of the board turns the battery power source ON or OFF.

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

Notes: 1. *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.*

2. *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.*

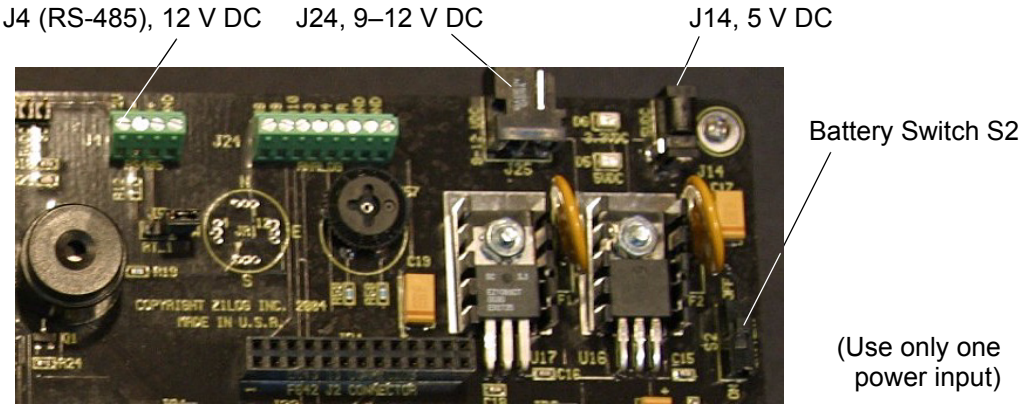

Figure 3. Power Supply Connectors (Top Right Corner of MDS-GP Board)

Figure 4. BT1 Battery Pack (Located on Back of MDS-GP Board)

External Data Bus I/O

The MDS-GP board includes a 20 pin header (J7) that provides bus access for any MDS processor module that supports an external data bus connec-

tion. This connector also provides 5 V DC power and a system reset line (see Figure 5). The chip select control for this bus is generated from PAL U26 and is programmed at the factory to decode address `Dxxxxh` on CS2.

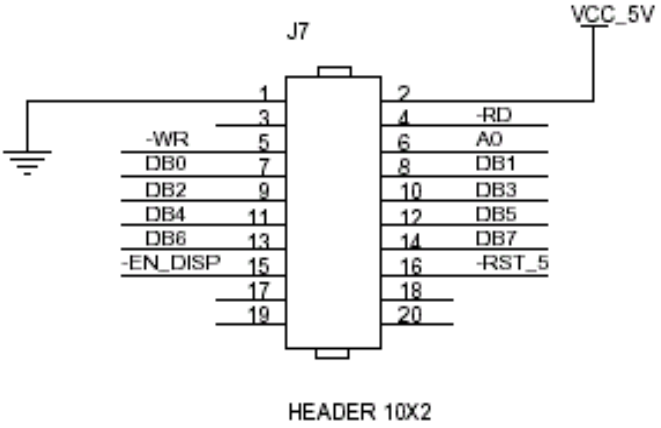

Figure 5. External Data Bus Header, J7

One application of this connector is to connect a higher-resolution graphic display. The J7 header pin-out is same as CrystalFontz displays. For example, you can connect a CrystalFontz 320 x 240 graphic LCD display using just a ribbon cable. You can also power the display inverter for back light control using the 5 V supply on this connector. The eZ80Acclaim!® software example includes routines that can be used to drive a CrystalFontz display.

LCD Interface

Figure 6 displays the LCD interface on the MDS-GP board. It provides the following two different interface options:

- Four-bit parallel interface (using GPIO pins), controlled by LCD enable, LCD RD/WR, and LCD register select signals.
- I²C/I²C bus expander interface enabled by jumper J26 (see I²C Expanders on page 16).

Note: *ZNEO® Z16F processor module requires minor changes for LCD interfacing by four-bit parallel interface (GPIO pins). See ZNEO® Z16F in* Appendix—MDS-PM Board Pin Maps *on page 33.*

LCD contrast can be adjusted using potentiometer R26. Software control of the back light can be enabled using jumper J28. The default configuration drives the LCD in a four-bit mode using GPIO port pins of your MDS processor module. For information on pins used, see Appendix—MDS-PM Board Pin Maps on page 33.

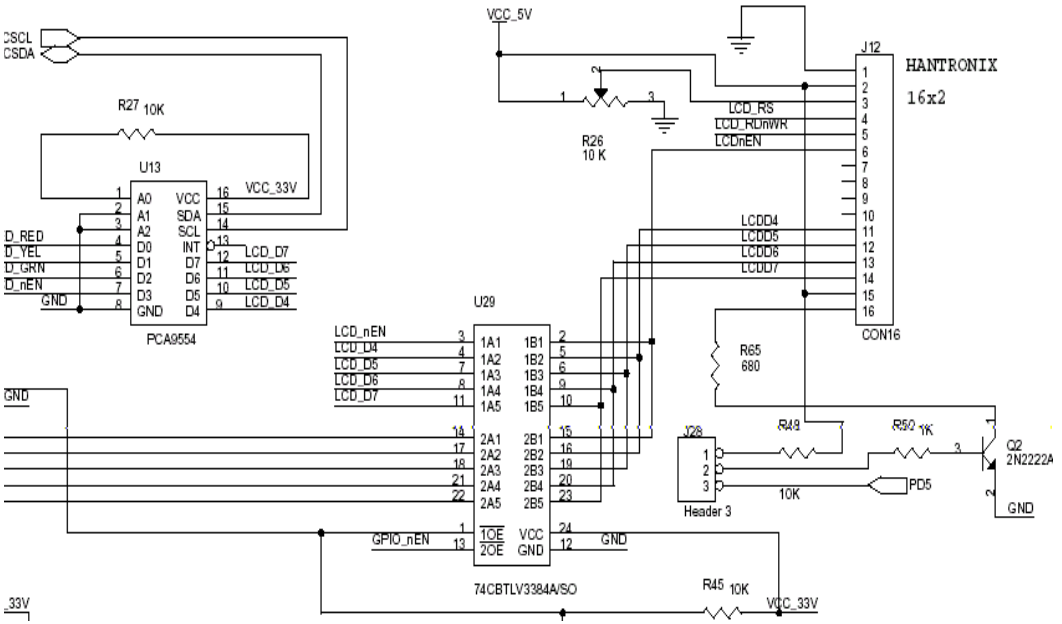

Figure 6. LCD Interface

Keypad

Figure 7 displays the MDS-GP board with a 3 x 4 matrix keypad. The keypad is controlled using GPIO port B. The four ROW pins have 10 K pull-up resistors and are configured as inputs. The three COL pins are configured as outputs. The software examples in this kit operate as follows:

- All ROW pins are configured as inputs, All COL pins are configured as outputs and are initialized High.
- In a interrupt routine, one COL pin is set Low and the ROW pins are polled to check for a Low state.
- If any ROW pin is polled Low, the key scan interrupt routine returns the key pushed.
- On each interrupt, a new COL pin is set Low. Three interrupts are required to perform a full scan.

Note: *ZNEO® Z16F processor module requires minor changes for keypad interfacing. See ZNEO® Z16F in* Appendix—MDS-PM Board Pin Maps *on page 33.*

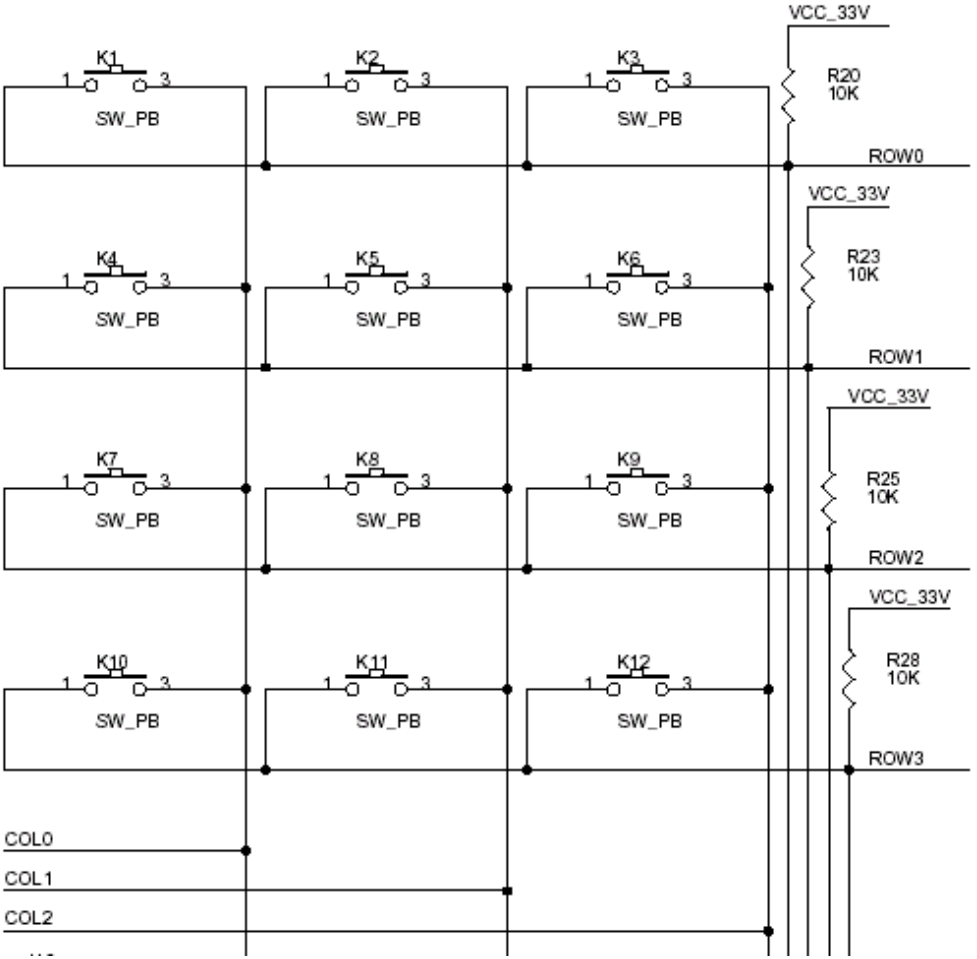

Figure 7. Keypad Circuit

I²C Expanders

Three I²C bus expanders are included on the MDS-GP board: U2, U13, and U19. The address of each device is hard-wired on the MDS-GP board and is set to the functions and addresses as shown in Table 1.

Table 1. I²C Bus Expanders

I²C Bus Expander	Address	Function
U2	0100010 R/W	Software serial port control jumpers
U13	0100001 R/W	LCD four bit data, LCD enable pin and LED control
U19	0100000 R/W	Relay/High drive outputs

GPS and Wireless Data Options

The MDS-GP board supports plug-in options for adding wireless data and GPS functions.

A two-way wireless module can be plugged into connectors J17 and J19 on the back of the MDS-GP board. The connector pinouts support the maxstream 900 MHz and 2.4 GHz radio modules. For module details and ordering information, visit www.maxstream.net.

A trimble lassen SQ GPS module can be plugged into connector J15. For module details and sales locations, visit www.trimble.com.

The MDS-GP board is equipped with two holes for adding a wire-tie to secure the module to the board. Figure 8 displays a maxstream wireless module installed on the underside of the MDS-GP board.

Note: *These modules are not included in the MDS-GP board kit.*

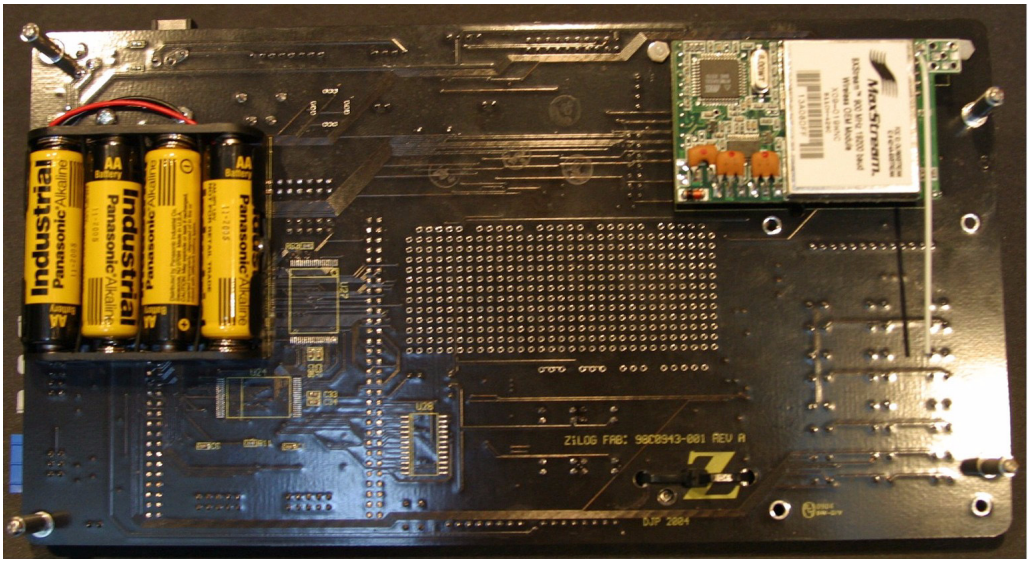

Figure 8. Back of MDS-GP Board with Batteries and Wireless Option

Software Selectable Serial Port Options

Following serial port options are available on the MDS-GP board:

- Two (four wire) 10 pin RS-232 ports on J1 (RS232-1) and J3 (RS232-2)
- GPS can be configured to replace RS232-2
- RF module can be configured to replace RS232-1
- RS-485 port on J4 can be configured to replace RS232-1
- IRDA port can be configured on MDS-PM to replace RS232-1

Only two different serial port options can be active at a time. The MDS-GP board provides two ways to set active serial port options (see Figure 9):

- Jumper select options on J2 (seeTable 2 on page 20).
- Use the I^2C bus expander U2 to select options through software. These options allow serial ports to be dynamically changed. You must remove all J2 jumpers for software selection to work.

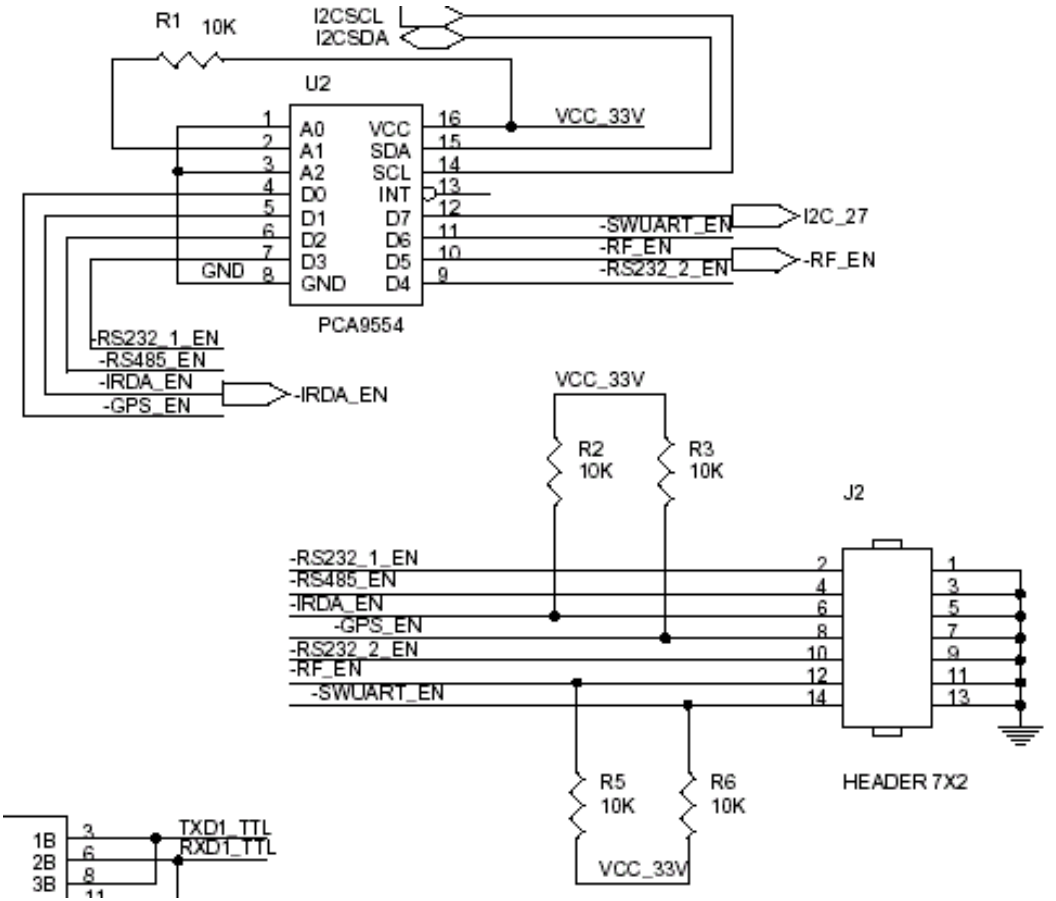

Figure 9. U2 and J2 Serial Port Option Select Circuits

Board Jumper Settings

Table 2 describes jumper set J2, which enables selected serial port functions. You must not install any of these jumpers if software control is used to enable serial port functions. The board is shipped with spare, unconnected shunts on Pin 2 and Pin 10.

Table 2. Serial Port Control

Pins	Factory Default	Function
1, 2	OFF	Enable RS232–1 on J1
3, 4	OFF	Enable RS485 on J4 (replacing RS232–1)
5, 6	OFF	Enable IRDA module (replacing RS232–1)
7, 8	OFF	Enable GPS on J15 (replacing RS232–2)
9, 10	OFF	Enable RS232– 2 on J3
11, 12	OFF	Enable RF on J17 (replacing RS232–1)
13, 14	OFF	Enable software UART (replacing RS232–2)

Table 3 describes miscellaneous jumper settings on the MDS-GP board.

Table 3. 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 eZ80Acclaim!® processor modules.
J5	RT-1	RS485 Term-Res Enable	OFF	Install this jumper to enable the RS-485 termination resistor.
J8	DACK_EN	Mot bus mode Enable	OFF	Install this jumper if running *mot* bus mode when using the eZ80Acclaim!® processor modules.
J9	Disable Flash	eZ80F91 External Flash	OFF	Install this jumper to disable the external flash memory on eZ80Acclaim!® processor modules.
J27	PWR_Sel	Power Select	2, 3	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, pins 2, 3 for 12 V DC.

Table 3. Miscellaneous Jumper Settings (Continued)

Jumper	Symbol	Name	Factory Default	Function
J26	LCD_Sel	Data Control for LCD	OFF	Install this jumper to select I^2C control of the LCD control pins.
J28	BL	LCD BackLight	1, 2	This jumper selects 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.

Relay/High Drive Outputs

Figure 10 displays the two relays and six high-drive outputs included on the MDS-GP board. By default, jumper J27 is set to route the 9 V to 12 V DC power input to both the relays and the high-drive outputs. If 5 V DC is used to power the MDS-GP board, then connect Pin 2 and Pin 3 on jumper J27 to apply 5 V DC on the high-drive outputs.

The two relays installed on the board are 12 V DC types. These relays are only supported when the 9 V to 12 V DC power supply input is used (see Figure 10).

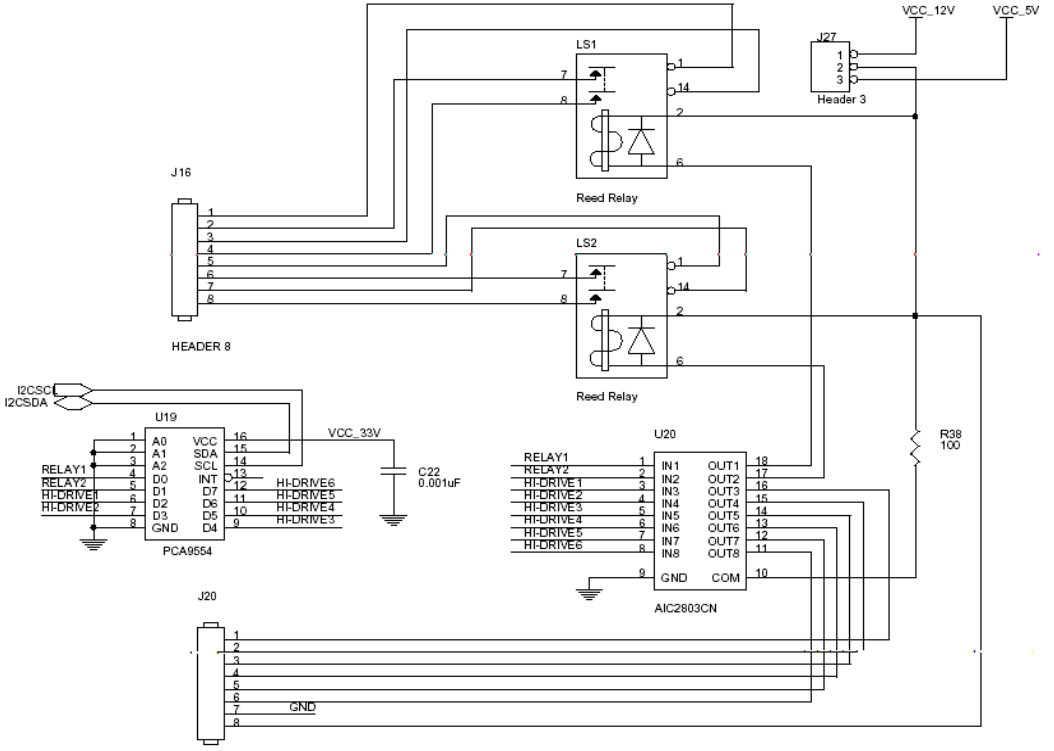

Figure 10. High-Drive and Relay Circuit

Temperature Sensor

Figure 11 displays the circuit for the I²C temperature sensor (U15) included on the MDS-GP board. The I²C address for this device is set to 1001000 R/W.

The sensor's over-temperature alarm output is shared with the keypad ROW output. If the over-temperature alarm is used to interrupt the system, check for a keypad ROW input before reading the temperature sensor register.

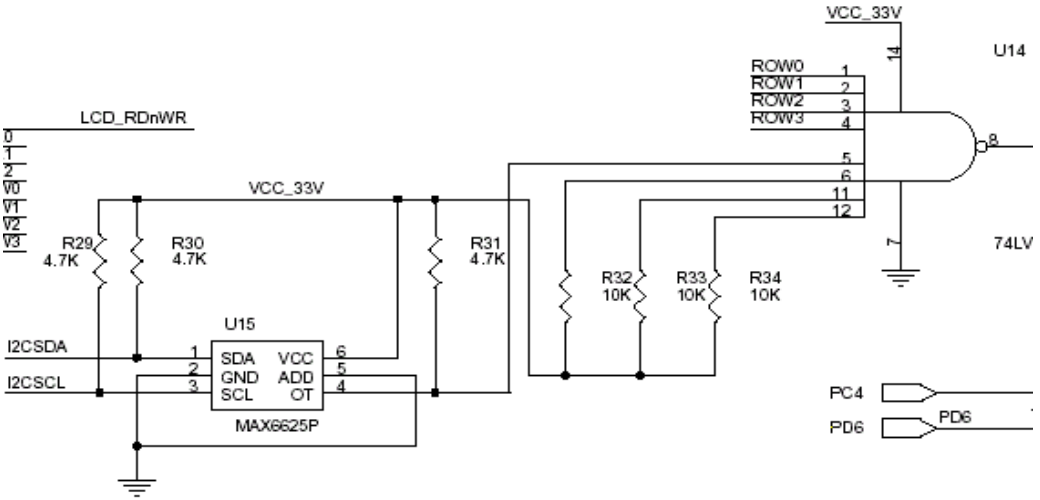

Figure 11. I²C Temperature Sensor Circuit

ADC Inputs

Screw terminal block J24 allows you to bring in signals to drive some ADC channels on a Z8 Encore! XP® MDS-PM, ZNEO® MDS-PM, or

some port pins on an eZ80Acclaim!® MDS-PM. The terminal block (see Figure 12) also provides 5 V DC, 3.3 V DC, and ground terminals.

Ensure that jumper J29 is removed while using this terminal block as port inputs. When J29 is installed, you can test the ADC using the on-board potentiometer, R57, shown in Figure 13.

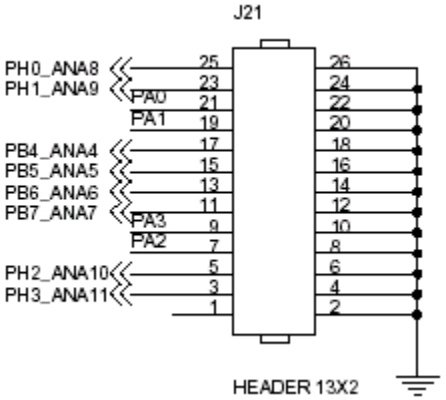

Figure 12. ADC Input Terminal Block

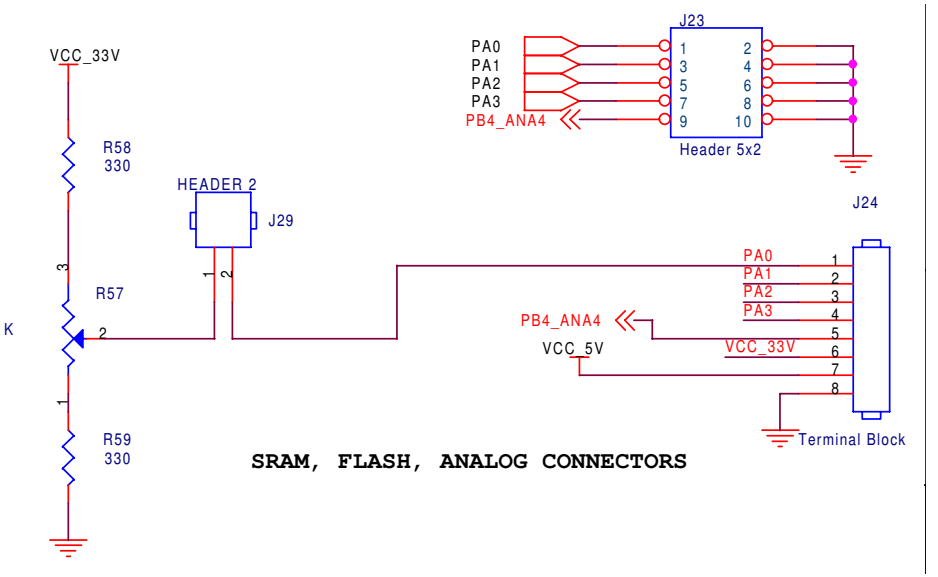

Figure 13. On-Board Potentiometer Circuit

RS-485 I/O

Figure 14 displays the RS-485 port provided on screw terminal block J4. This I/O can also provide power to the MDS-GP board through the 12 V DC and GND lines, terminal 1 and terminal 4. An RS-485 termination resistor can be enabled or disabled using jumper J5. The RS-485 driver U8 is enabled through the RS-485_EN signal, which is controlled via jumpers on J2 or by using the software I^2C expander feature as described in Software Selectable Serial Port Options on page 17.

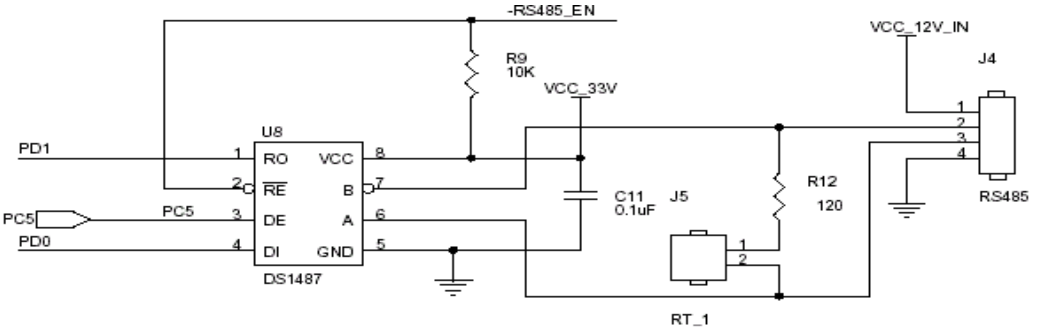

Figure 14. RS-485 I/O Circuit

Buzzer

A 5 V DC buzzer is included on the MDS-GP board. For information on pins used, see your module's section in Appendix—MDS-PM Board Pin Maps on page 33. Figure 15 displays the buzzer circuit using eZ80Acclaim!® signal names.

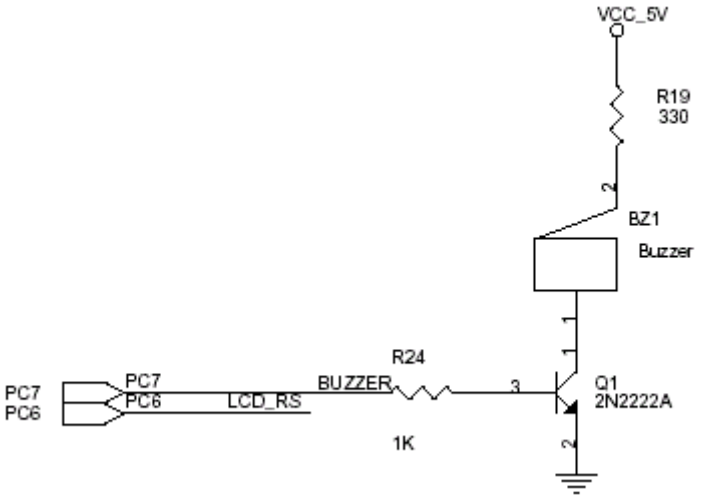

Figure 15. Buzzer Circuit (eZ80Acclaim!® Pins)

Digital Compass Option

A footprint for an optional dinsmore 1490 digital compass is provided on the MDS-GP board. This compass is a user-installed option, and 2525 not included in the kit. For specifications and ordering information, visit www.robsonco.com.

Caution: *Due to possible electromagnetic interference (EMI) from the circuitry surrounding the dinsmore 1490 digital compass, Zilog® recommends mounting this device off-board using a short ribbon cable.*

RAM and Flash Decode

The MDS-GP board includes 512 KB fast SRAM, device U22. This memory can only be used by MDS-PM board that supports an external address/data bus.

The MDS-GP board also includes two footprints on the back of the board for adding user- installed flash memory devices. Zilog® cannot control the quality of added flash devices or their installation, so use these footprints at your own risk.

Address decoding for the included SRAM, external I/O bus (see External Data Bus I/O on page 10), and user- installed flash is factory programmed by PAL U26, as shown in Table 4.

Table 4. PAL U26 Decode

Chip Select	Device	Decode Address	A23	A22	A21	A20
CS2	512 KB SRAM, U22	B0000h	1	0	1	1
	External bus, J7	D0000h	1	1	0	1
CS0	User-installed Flash, U24	40000h	0	1	0	0
	User-installed Flash, U27	50000h	0	1	0	1

Troubleshooting

Overview

Perform the following steps before contacting Zilog® customer support to submit a problem report:

1. Remove the MDS-GP board from the system; then, using your processor module's documentation, verify that your development system works correctly with the MDS-GP board removed.
2. Use the instructions provided in the *MDS General-Purpose Board Quick Start Guide (QS0045)* to reconnect the MDS-GP board and return its jumpers to their factory default settings.
3. Ensure that only one power supply is used which must be connected to the MDS-GP board, not the processor module. Verify the power supply input voltage with the system running.
4. Run the MDS-GP board example project appropriate for your processor module.

If a hardware failure is suspected, contact a local Zilog representative for assistance.

Schematics

MDS General Purpose Board

Figure 16 through Figure 23 provide schematic diagrams of the MDS-GP board.

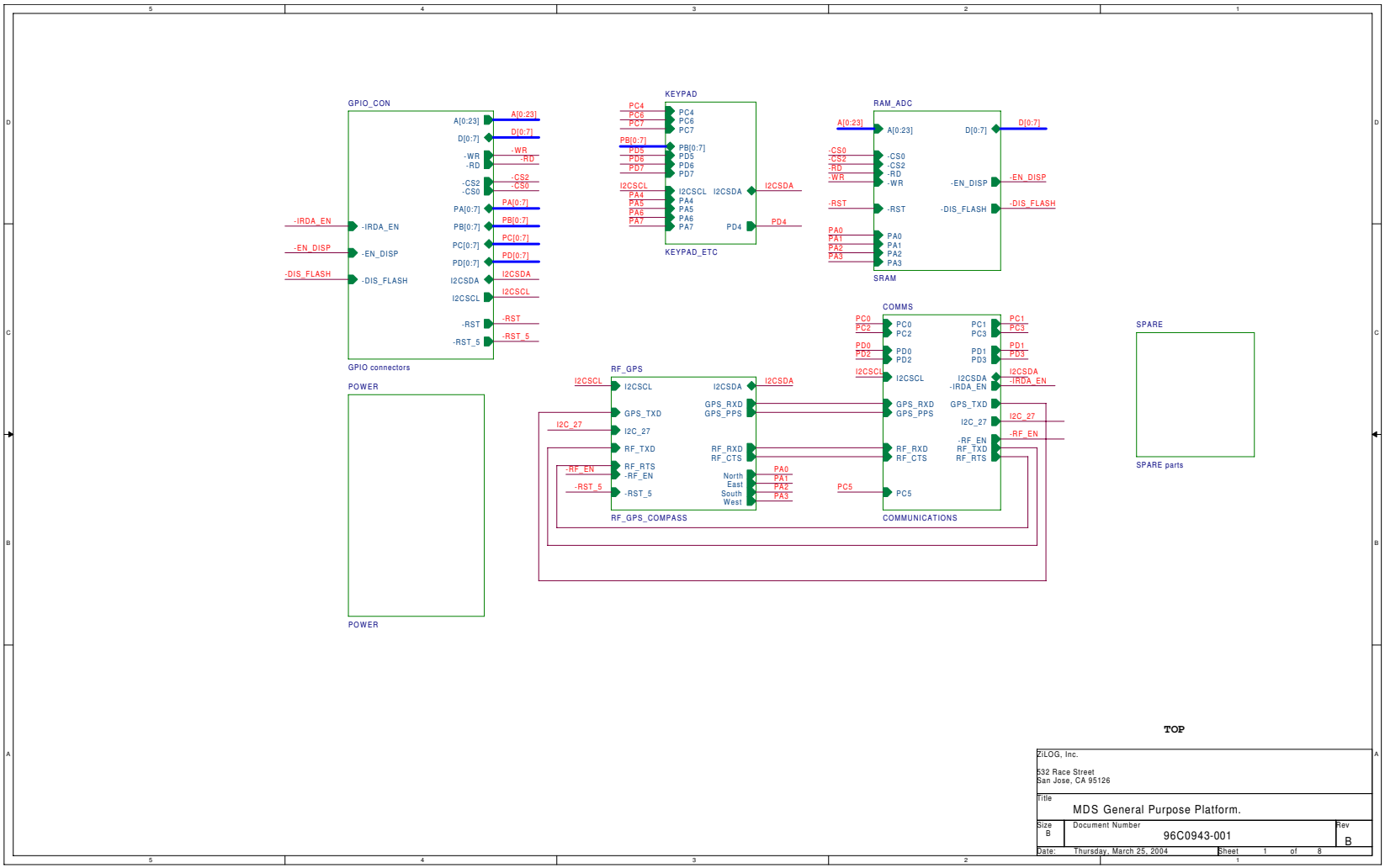

Figure 16. MDS-GP Board Schematic (1 of 8)

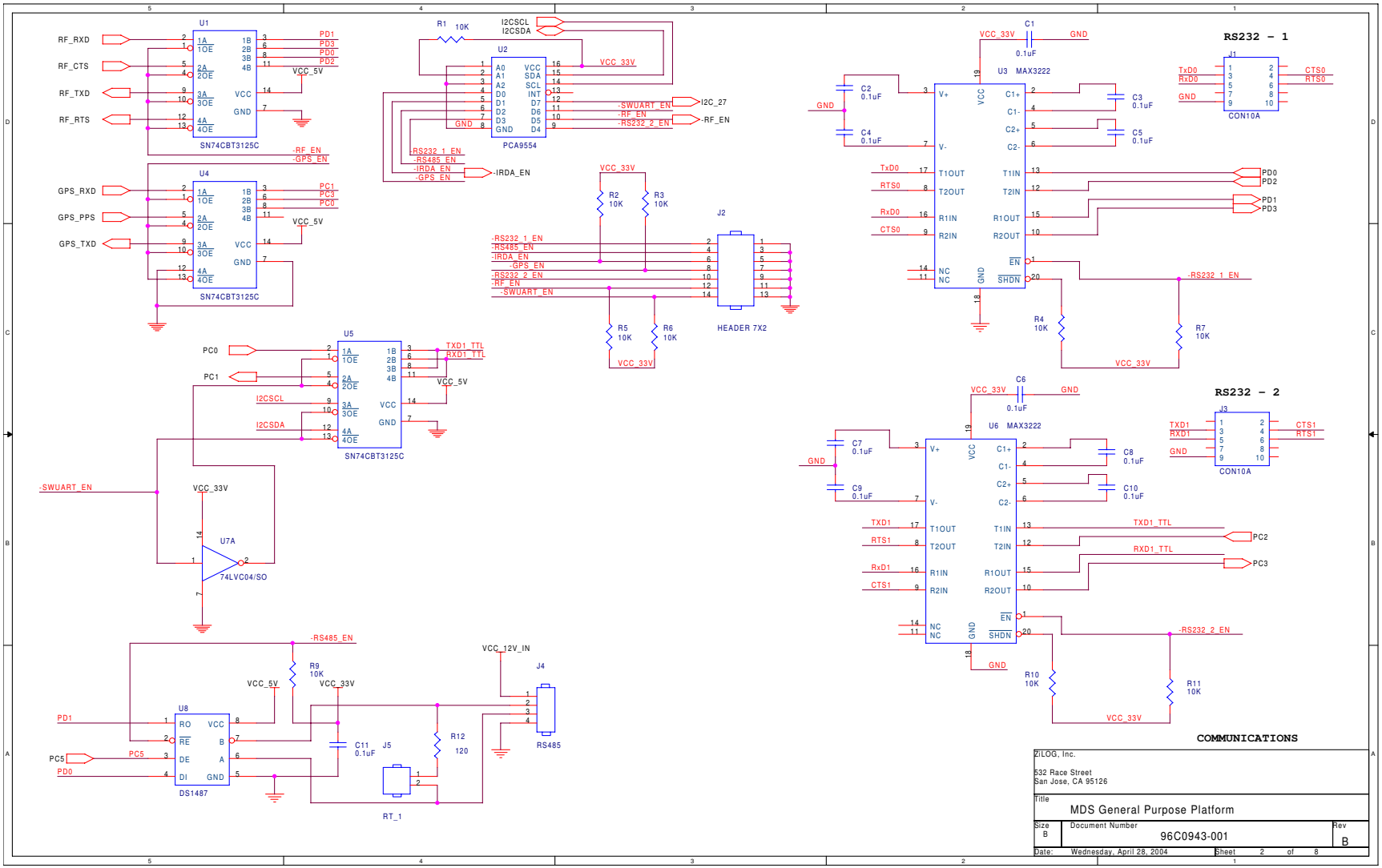

Figure 17. MDS-GP Board Schematic (2 of 8)

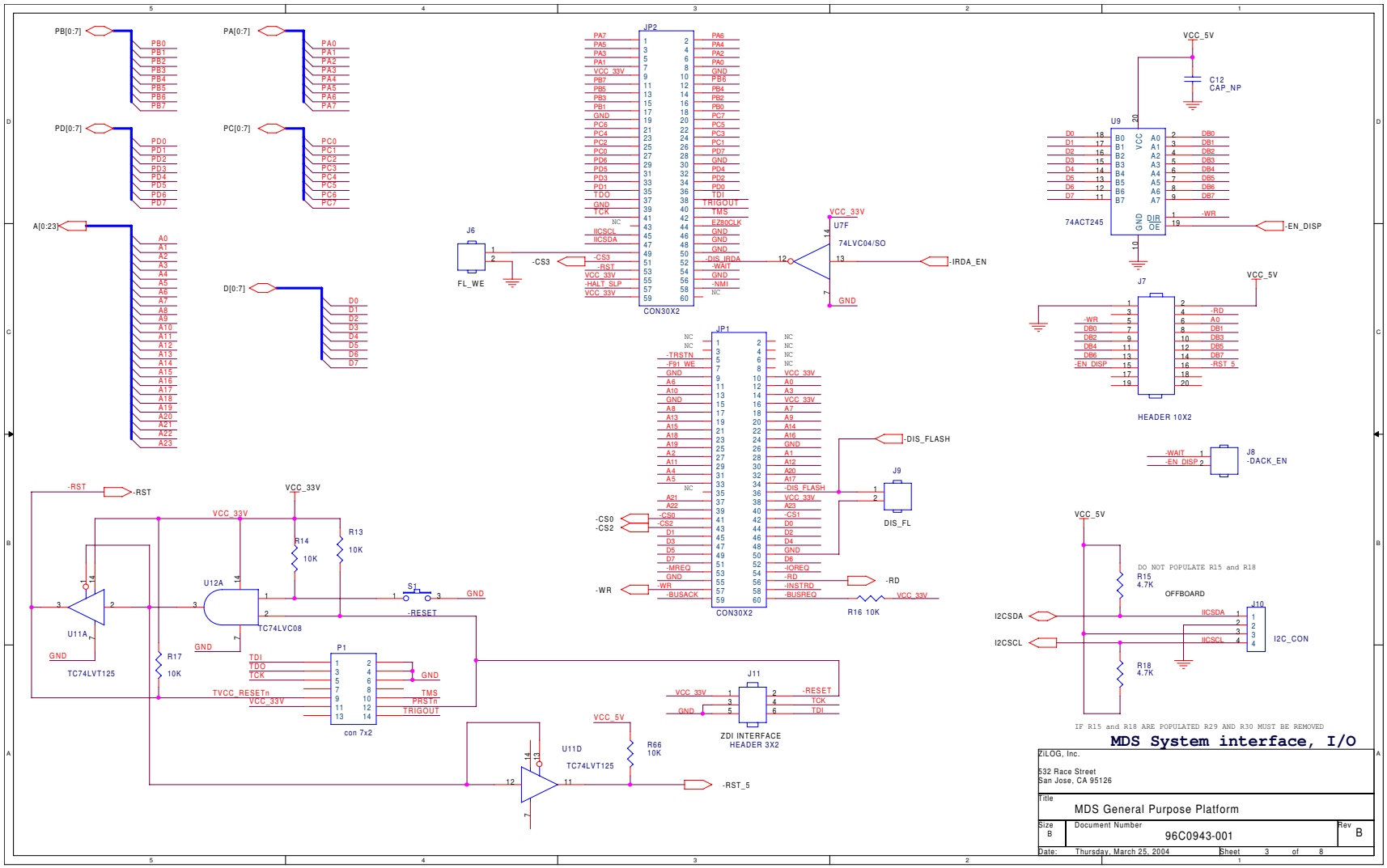

Figure 18. MDS-GP Board Schematic (3 of 8)

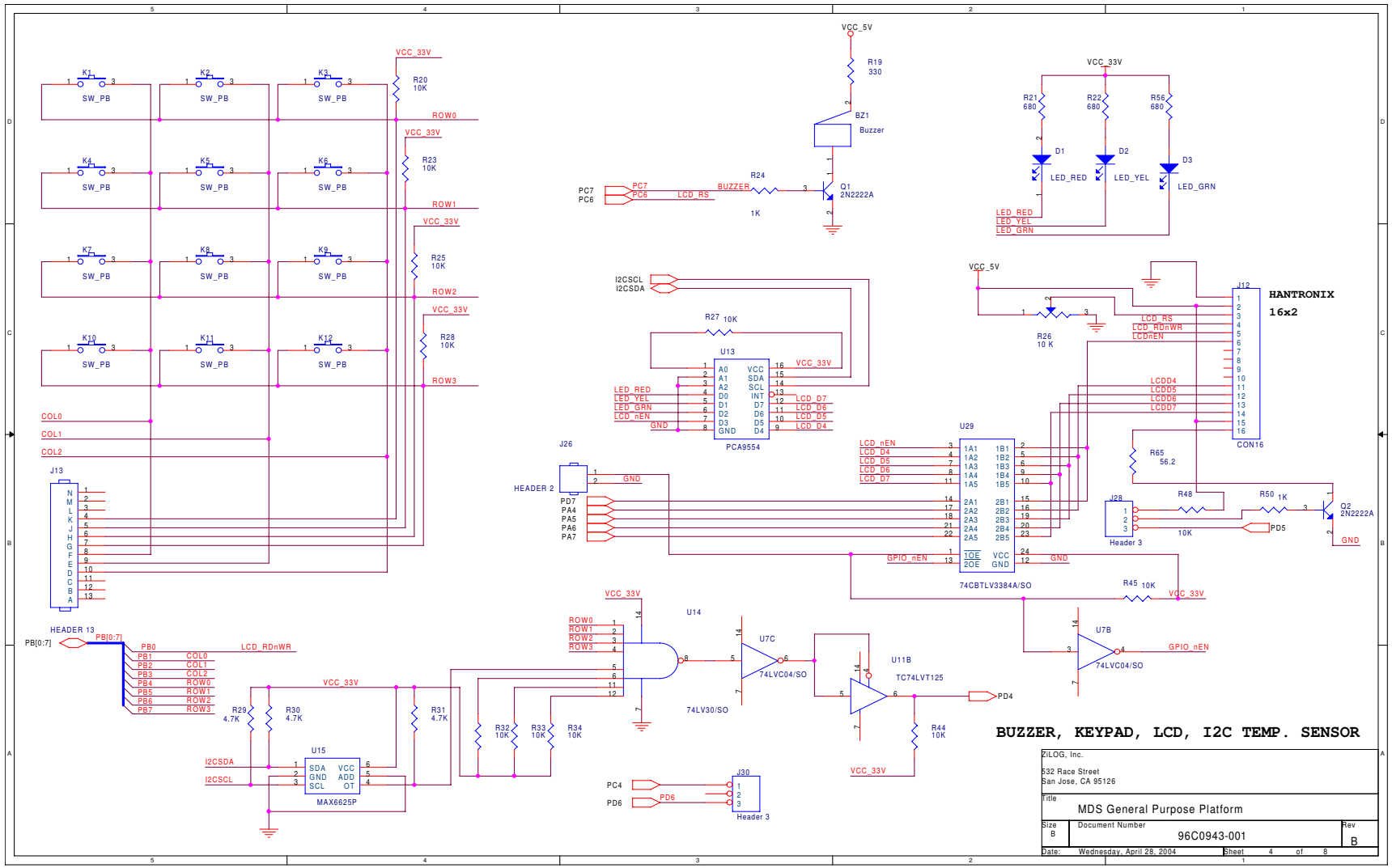

Figure 19. MDS-GP Board Schematic (4 of 8)

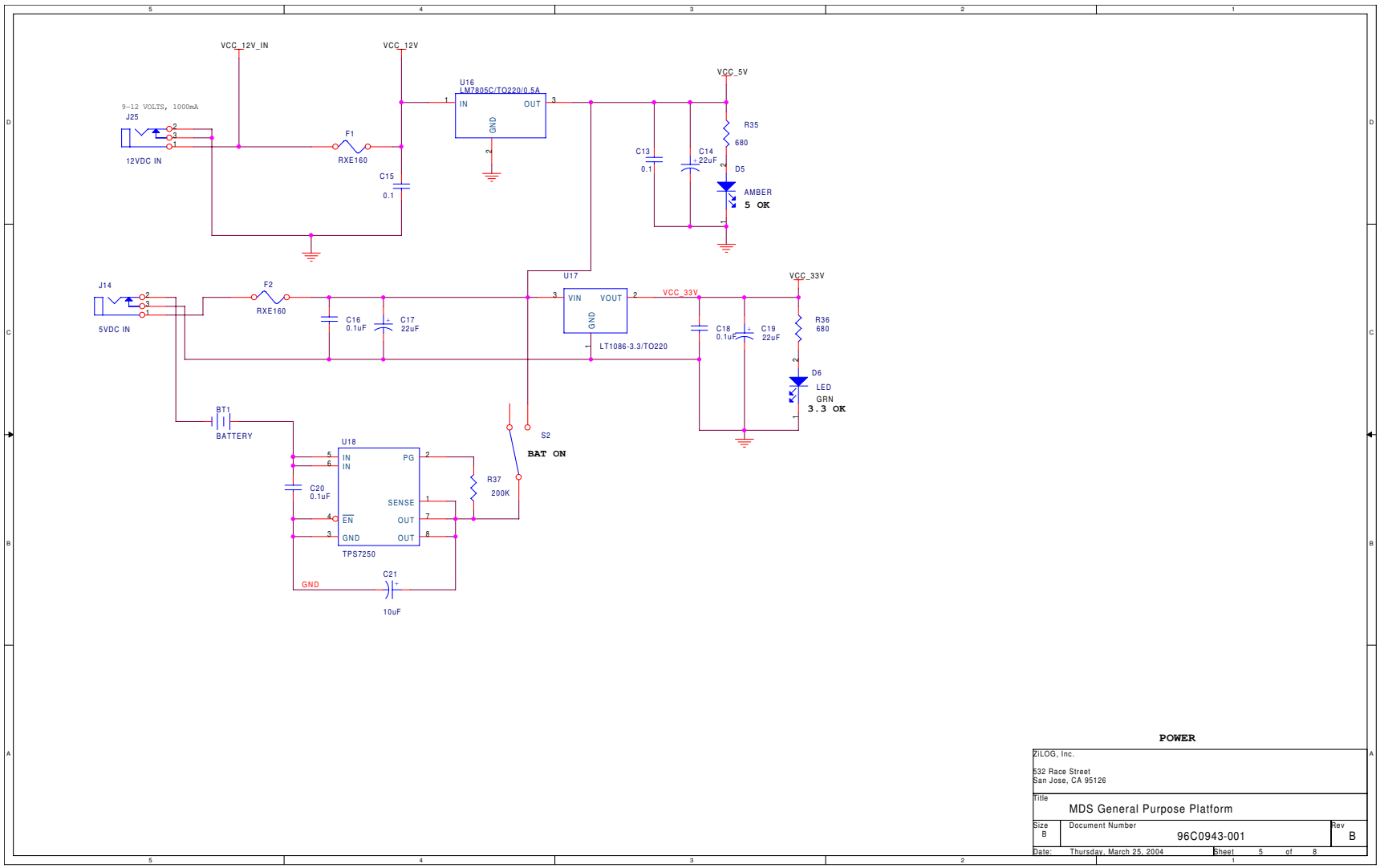

Figure 20. MDS-GP Board Schematic (5 of 8)

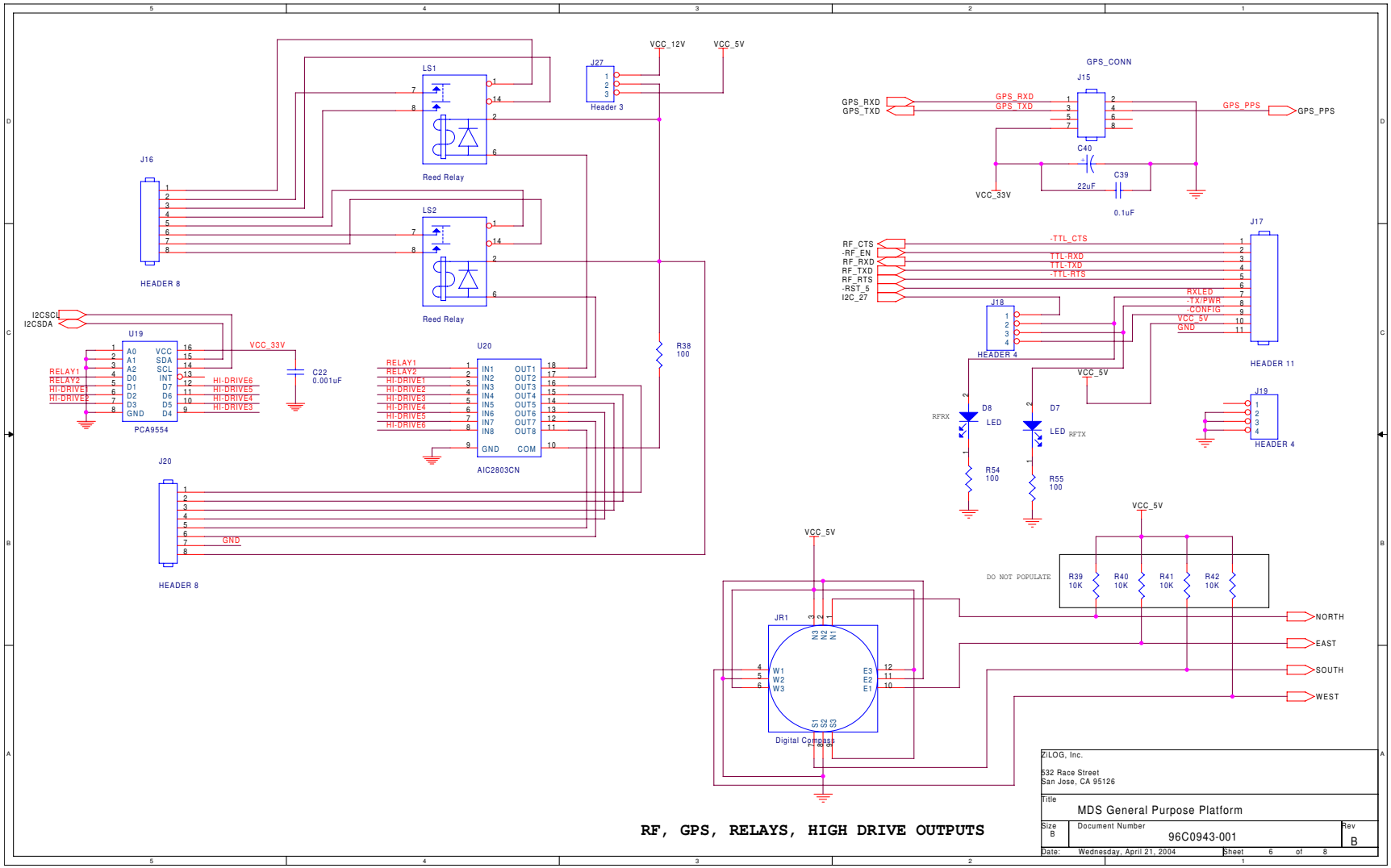

Figure 21. MDS-GP Board Schematic (6 of 8)

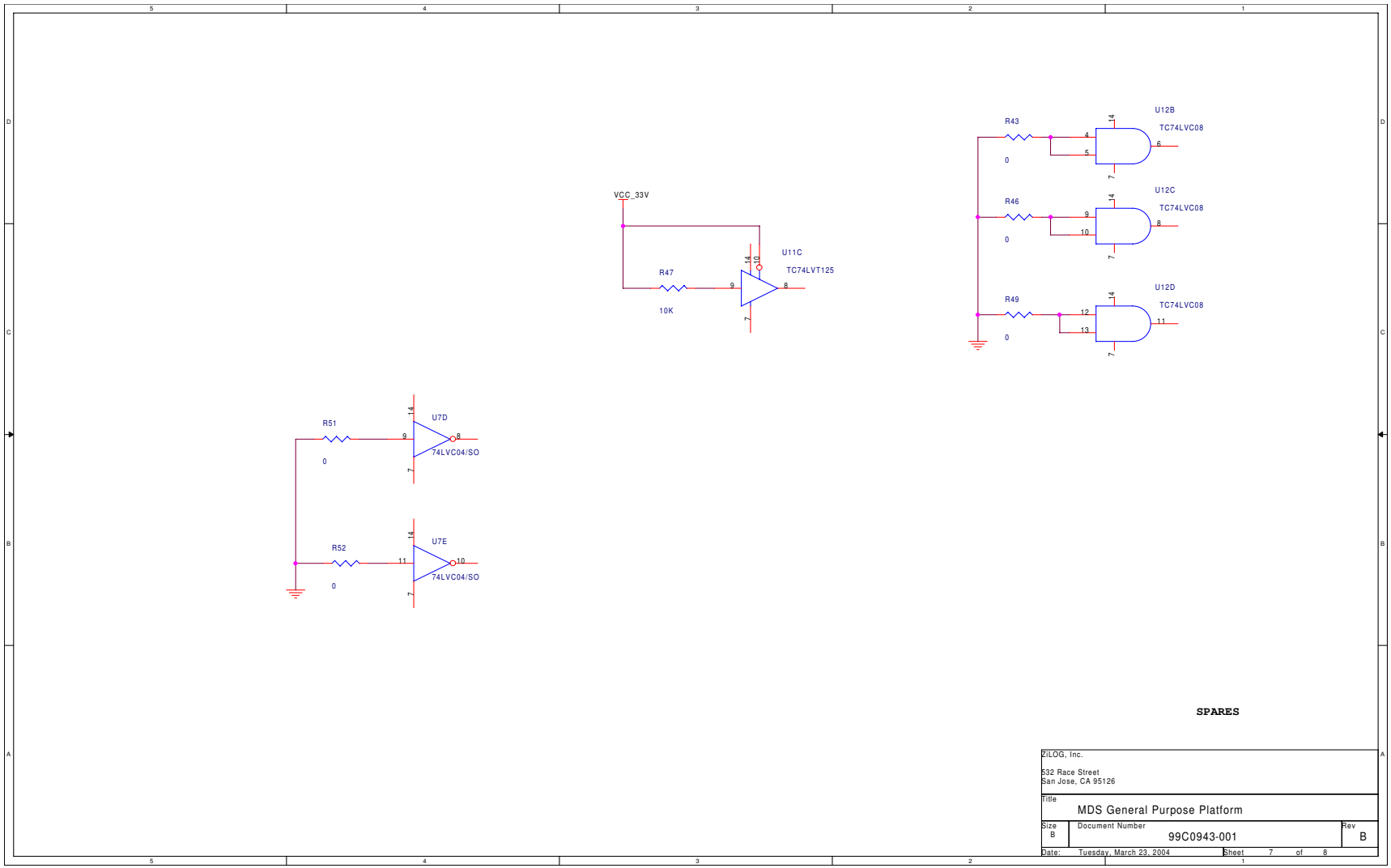

Figure 22. MDS-GP Board Schematic (7 of 8)

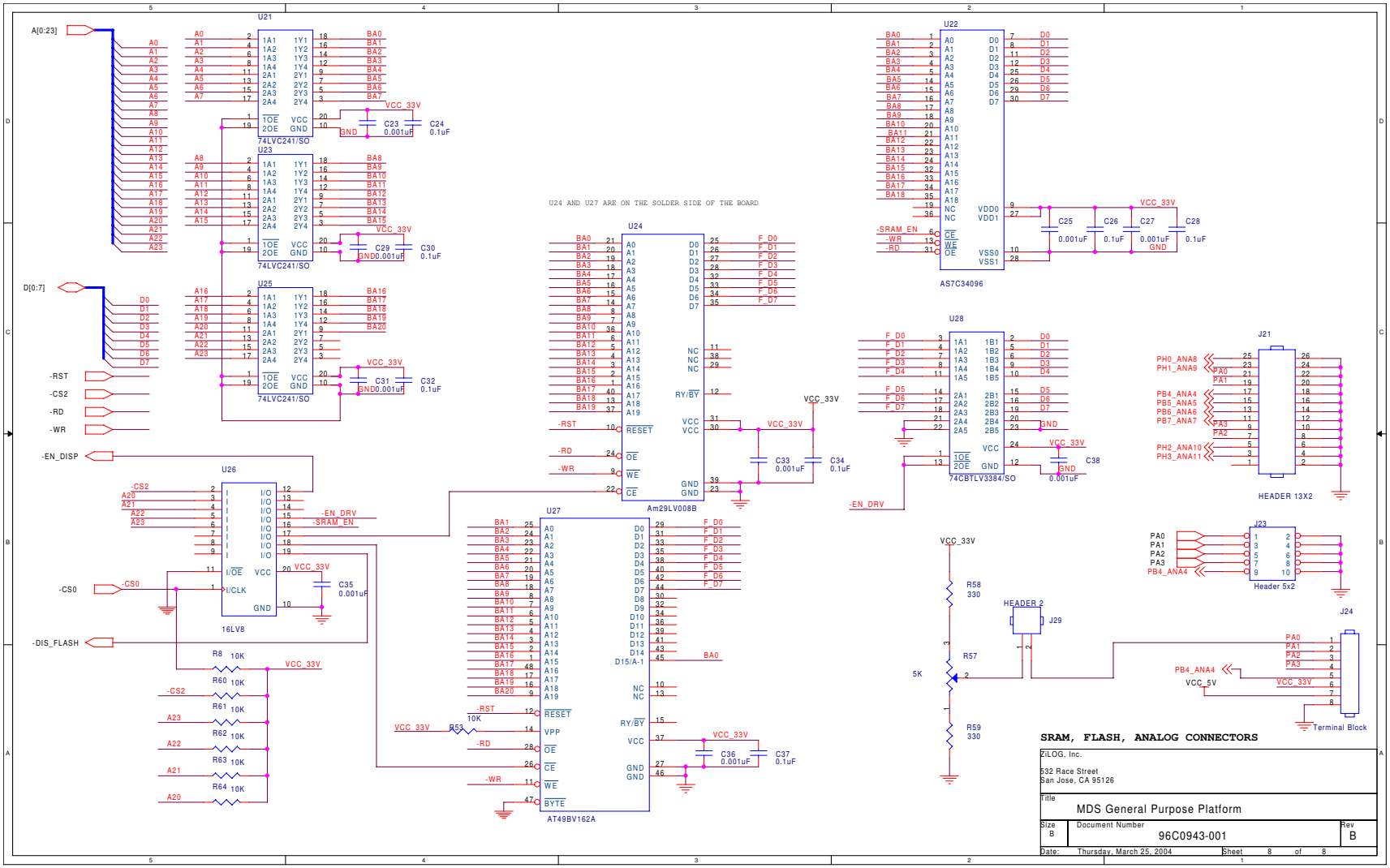

Figure 23. MDS-GP Board Schematic (8 of 8)

Appendix—MDS-PM Board Pin Maps

Signals on MDS-GP connectors J1 and J2 map to processor module signal names differently for different modules.

Following sections list MDS-GP interface signals with the corresponding processor module signals:

Current pin maps are also included in the sample project folders on the MDS-GP CD-ROM.

eZ80Acclaim!® MCUs

Spare Pins

PD6 (DCD input) and PC4 (DTR output).

LCD Control

The LCD has two different modes of operation, 4-bit bus mode and I^2C drive mode, controlled by jumper J26:

- J26 OFF, LCD bus mode enabled
- J26 ON, LCD I^2C drive mode enabled

Bus Mode LCD Control

- LCD_EN—PD7 (eZ80F91 MCU alternate function: RI input)
- LCD_RS—PC6 (eZ80F91 MCU alternate function: DCD input)
- LCD_RW—PB0
- LCD_D4—PA4
- LCD_D5—PA5
- LCD_D6—PA6
- LCD_D7—PA7

I^2C Drive Mode LCD Control

U13 I^2C bus address: 0100001 R/W

- LCD_EN—I^2C bus expander address 1—D3
- LCD_RS—PC6 (eZ80F91 MCU alternate function: DCD input)
- LCD_RW—PB0
- LCD_D4—I^2C bus expander address 1—D4

- LCD_D5—I^2C bus expander address 1—D5
- LCD_D6—I^2C bus expander address 1—D6
- LCD_D7—I^2C bus expander address 1—D7
- LCD BackLight—PD5

Buzzer Control

BUZZER—PC7 (eZ80F91 MCU alternate function: RI input)

KeyPad Control

- COL0—PB1
- COL1—PB2
- COL2—PB3
- ROW0—PB4
- ROW1—PB5
- ROW2—PB6
- ROW3—PB7
- IRQ_KEYPAD_TEMP—PD4 (eZ80F91 MCU alternate function: DTR output)

LED Control

U13 I^2C bus address: 0100001 R/W.

- RED_LED—I^2C bus expander address 1—D0
- YELLOW_LED—I^2C bus expander address 1—D1
- GREEN_LED—I^2C bus expander address 1—D2

Serial Port Control

Jumper J2 Signals

Enable only one serial port function per interface (COM1 or COM2).

- RS232_COM1_ENABLE—J2 pins 1, 2
- RS485_COM1_ENABLED—J2 pins 3, 4
- IrDA ENABLE (COM1)—J2 pins 5, 6
- RS232_GPS_COM2_ENABLED—J2 pins 7, 8
- RS232_COM2_ENABLE—J2 pins 9, 10
- RS232_RF_COM1_ENABLED—J2 pins 11, 12
- SOFTWARE_UART_COM1_ENABLED—J2 pins 13, 14

I^2C Bus Expander U2 Signals for Serial Port Control

U2 is an I^2C bus expander that can be used via software to control the signals on jumper J2. If the U2 I^2C expander is to be used, ensure all jumpers are removed from J2. U2 powers up with all pins in input mode.

The U2 bus expander I^2C address is 0100010 R/W.

- GPS_ENABLE—D0 = 0
- IrDA ENABLE—D1 = 0
- RS485 ENABLE—D2 = 0
- RS232_COM1_ENABLE—D3 = 0
- RS232_COM2_ENABLE—D4 = 0
- RF_ENABLE—D5 = 0
- SW_UART_ENABLE—D6 = 0
- Spare—D7

RS232-1 Signals

Enabled by jumper on J2 pins 1, 2, or by U2 pin D3. Uses COM1. When enabled, disables RS-485, IrDA, and RF.

- TXD—PD0_TXD0
- RXD—PD1_RXD0
- CTS—PD3_CTS0
- RTS—PD2

RS232-2 Signals

Enabled by jumper on J2 pins 9, 10, or by U2 pin D4. Uses COM2. When enabled,
disables GPS and Software UART.

- TXD—PC0_TXD1
- RXD—PC1_RXD1
- CTS—PC3_CTS1
- RTS—PC2 _RTS1

IrDA Module Signals

Enabled by jumper on J2 pins 5, 6, or by U2 pin D1. Uses COM1. When enabled, disables RS232-1, RS485, and RF.

- TXD—PD0_TXD0
- RXD—PD1_RXD0
- Not used—PD3
- IrDA_SD—PD2

Wireless (RF) Module Signals

Enabled by jumper on J2 pins 11, 12, or by U2 pin D5. Uses COM1. When enabled, disables RS232-1, RS485, and IrDA.

- RF_TXD—PD0_TXD0
- RF_RXD—PD1_RXD0
- RF_CTS0—PD3_CTS0
- RF_RTS0—PD2_RTS0
- RF_RESET—System Reset

GPS Module Signals

Enabled by jumper on J2 pins 7, 8, or by U2 pin D0. Uses COM1. Uses COM2. When enabled, disables RS232-2 and Software UART.

- GPS_TXD—PC0_TXD1
- GPS_RXD—PC1_RXD1
- GPS_PPS—PC3_CTS1 (Input)
- Not used—PC2

RS485 Port Signals

Enabled by jumper on J2 pins 3, 4, or by U2 pin D2. Uses COM1. When enabled, disables RS232-1, IrDA, and RF.

- RS485_TXD—PD0_TXD0
- RS485_RXD—PD1_RXD0
- Not used—PD3
- RS485_OE—PC5 (eZ80F91 MCU alternate function: DSR input)

Software UART Signals

Enabled by jumper on J2 pins 13, 14, or by U2 pin D6. When enabled, disable RS232-2 and GPS.

- SU_TXD—I2C_SCL
  (This function is not available for eZ80F91 Module)
- SU_RXD—I2C_SDA
  (This function is not available for eZ80F91 Module)
- CTS—PC3_CTS1
- RTS—PC2_RTS1

I^2C Temperature Sensor U15, Maxim MAX6625

U15 I^2C address: 1001000 R/W.

- IRQ_KEYPAD_TEMP—PD4 (eZ80F91 MCU alternate function: DTR output)

I^2C High Drive/Relay Control

I^2C address: 0100000 R/W.

- RELAY1—D0
- RELAY2—D1
- HD1-J20-1—D2
- HD2-J20-2—D3
- HD3-J20-3—D4
- HD4-J20-4—D5
- HD6-J20-5—D6

Digital Compass

Compass is not included.

- NORTH—PA0 J21-21, J24-1
  (eZ80F91 MCU alternate function: PWM0 output. Compare0 output)
- EAST—PA1 J21-19, J24-2
  (eZ80F91 MCU alternate function: PWM1 output. Compare1 output)
- SOUTH—PA2 J21-7, J24-3
  (eZ80F91 MCU alternate function: PWM2 output. Compare2 output)
- WEST—PA3 J21-9, J24-4
  (eZ80F91 MCU alternate function: PWM3 output. Compare3 output)

Z8 Encore! XP® 64K Series Flash Microcontrollers

Spare Pins

PD7_RCOUT and PD1_T3OUT

LCD Control

The LCD has two different modes of operation, 4-bit bus mode and I^2C drive mode, controlled by jumper J26:

- J26 OFF, LCD bus mode enabled
- J26 ON, LCD I^2C drive mode enabled

Bus Mode LCD Control

- LCD_EN—PD0_T3IN
- LCD_RS—PC1_T1OUT
- LCD_RW—PA0_TOIN
  (Pin also controls red LED D2 on the processor module)
- LCD_D4—PE4
- LCD_D5—PE5
- LCD_D6—PE6
- LCD_D7—PE7

I^2C Drive Mode LCD Control

U13 I^2C bus address: 0100001 R/W.

- LCD_EN—I^2C bus expander address 1—D3
- LCD_RS—PC1_T1OUT
- LCD_RW—PA0_TOIN
  (Pin also controls red LED D2 on the processor module)

- LCD_D4—I^2C bus expander address 1—D4
- LCD_D5—I^2C bus expander address 1—D5
- LCD_D6—I^2C bus expander address 1—D6
- LCD_D7—I^2C bus expander address 1—D7
- LCD Back Light—PF0

Buzzer Control

BUZZER—PA1_T0OUT
(Pin also controls Yellow LED on MDS-PM)

KeyPad Control

- COL0—PC0_T1IN
  (Pin also SW1 on MDS-PM board)
- COL1—PC2_SS
- COL2—PC3_SLK
- ROW0—PC6_T2IN
- ROW1—PC7_T2OUT
- ROW2—PC5_MISO
- ROW3—PC4_MOSI
- IRQ_KEYPAD_TEMP—PD2

LED Control

U13 I^2C bus address: 0100001 R/W.

- RED_LED—I^2C bus expander address 1—D0
- YELLOW_LED—I^2C bus expander address 1—D1
- GREEN_LED—I^2C bus expander address 1—D2

Serial Port Control

Note: *JP4 (DIS_RS232) on the processor module is don't care when the module is plugged into the MDS-GP board. The console RS-232 driver U1 is always disabled as the –DIS_RS232 signal is grounded by MDS-GP board via JP2-50.*

JP3(DIS_IrDA) on the processor module must be removed to allow the MDS-GP board to control the IrDA module. If this jumper is installed, IrDA on the processor module is always disabled.

Jumper J2 Signals

Enable only one serial port function per interface (COM1 or COM2).

- RS232_COM1_ENABLE—J2 pins 1, 2
- RS485_COM1_ENABLED—J2 pins 3, 4
- IrDA ENABLE (COM1)—J2 pins 5, 6
- RS232_GPS_COM2_ENABLED—J2 pins 7, 8
- RS232_COM2_ENABLE—J2 pins 9, 10
- RS232_RF_COM1_ENABLED—J2 pins 11, 12
- SOFTWARE_UART_COM1_ENABLED—J2 pins 13, 14

I²C Bus Expander U2 Signals For Serial Port Control

U2 is an I²C bus expander that can be used via software to control the signals on jumper J2. If the U2 I²C expander is to be used, ensure all jumpers are removed from J2. U2 powers up with all pins in input mode.

The U2 bus expander I²C address is 0100010 R/W.

- GPS_ENABLE—D0 = 0
- IrDA ENABLE—D1 = 0
- RS485 ENABLE—D2 = 0
- RS232_COM1_ENABLE—D3 = 0
- RS232_COM2_ENABLE—D4 = 0
- RF_ENABLE—D5 = 0
- SW_UART_ENABLE—D6 = 0
- Spare—D7

RS232-1 Signals

Enabled by jumper on J2 pins 1, 2, or by U2 pin D3. Uses COM1. When enabled, disables RS485, IrDA, and RF.

- TXD—PA5_TXD0
- RXD—PA4_RXD0
- CTS—PA3_CTS0 (Input)
- RTS—PG0 (Software RTS0 Output)

RS232-2 Signals

Enabled by jumper on J2 pins 9, 10, or by U2 pin D4. Uses COM2. When enabled, disables GPS and Software UART.

- TXD—PD5_TXD1
- RXD—PD4_RXD1
- CTS—PD6_CTS1 (Input)
- RTS—PD3 (Software RTS1 Output)

IrDA Module Signals

Enabled by jumper on J2 pins 5, 6, or by U2 pin D1. Uses COM1. When enabled, disables RS232-1, RS485, and RF.

- TXD—PA5_TXD0
- RXD—PA4_RXD0
- Not used PA3_CTS0
- Not used PG0

Wireless (RF) Module Signals

Enabled by jumper on J2 pins 11, 12, or by U2 pin D5. Uses COM1. When enabled, disables RS232-1, RS485, and IrDA.

- RF_TXD—PA5_TXD0
- RF_RXD—PA4_RXD0
- RF_CTS0—PA3_CTS0 (Input)
- RF_RTS0—PG0 (Software Output)
- RF_RESET—System Reset

GPS Module Signals

Enabled by jumper on J2 pins 7, 8, or by U2 pin D0. Uses COM1. Uses COM2. When enabled, disables RS232-2 and Software UART.

- GPS_TXD—PD5_TXD1
- GPS_RXD—PD4_RXD1
- GPS_PPS—PD6_CTS1 (Input)
- Not used—PD3

RS485 Port Signals

Enabled by jumper on J2 pins 3, 4, or by U2 pin D2. Uses COM1. When enabled, disables RS232-1, IrDA, and RF.

- RS485_TXD—PA5_TXD0
- RS485_RXD—PA4_RXD0
- Not used—PA3_CTS0 (Input)
- RS485_OE—PA2_DE0

Software UART Signals

Enabled by jumper on J2 pins 13, 14, or by U2 pin D6. When enabled, disables RS232-2 and GPS.

Note: *PA6 and PA7 are I^2C control pins.*

- SU_TXD—PA6_TXD1
- SU_RXD—PA7_RXD1
- CTS—PD6_CTS1 (Input)
- RTS—PD3 (Software RTS1 Output)

I²C Temperature Sensor U15, Maxim MAX6625

U15 I²C address: 1001000 R/W.

- IRQ_KEYPAD_TEMP—PD2

I²C High Drive/Relay Control

I²C address: 0100000 R/W.

- RELAY1—D0
- RELAY2—D1
- HD1-J20-1—D2
- HD2-J20-2—D3
- HD3-J20-3—D4
- HD4-J20-4—D5
- HD6-J20-5—D6

Digital Compass

Compass is not included.

Note: *PB0-3 are common to Port E0-E3.*

- NORTH—PE0 J21-21 J24-1
- EAST—PE1 J21-19 J24-2
- SOUTH—PE2 J21-9 J24-3
- WEST—PE3 J21-7 J24-4

ADC Channels on Terminal Block J24

- PIN 1—PB0_ANA0
  (Pot R57 is hooked up on this channel. Also Port PE0 is on this path)
- PIN 2—PB1_ANA1 (Also Port PE1 on this path)
- PIN 3—PB3_ANA3 (Also Port PE3 on this path)
- PIN 4—PB2_ANA2 (Also Port PE2 on this path)
- PIN 5—PB4_ANA4
- PIN6—3.3 V
- PIN7—5 V
- PIN8—GND

Processor Module LEDS and SW1 Test

- RED_LED—PA0_T0IN
  (In LCD Bus mode this also controls LCD_EN)
- YELLOW_LED—PA1_T0OUT
  (Also Buzzer control on MDS-GP)
- GREEN_LED—PA2
- SW1_TEST—PC0_T1IN

Z8 Encore! XP® F0822 Series Flash Microcontrollers

LCD Control

The LCD has two different modes of operation, 4-bit bus mode and I^2C, drive mode,
controlled by jumper J26:

- J26 OFF, LCD bus mode enabled
- J26 ON, LCD I^2C drive mode enabled

Bus Mode LCD Control

- LCD_EN— no connection
- LCD_RS—PC1_T1OUT
- LCD_RW—PA0_TOIN
  (Pin also controls red LED D2 on the Z8 Encore! XP® 64K Series Flash Microcontrollers MDS processor modules)
- LCD_D4— no connection
- LCD_D5— no connection
- LCD_D6— no connection
- LCD_D7— no connection

I^2C Drive Mode LCD Control

U13 I^2C bus address: 0100001 R/W.

- LCD_EN—I^2C bus expander address 1—D3
- LCD_RS—PC1_T1OUT
- LCD_RW—PA0_TOIN
  (Pin also controls red LED D2 on the Z8 Encore! XP® 64K Series

Flash
Microcontrollers MDS processor modules)

- LCD_D4—I^2C bus expander address 1—D4
- LCD_D5—I^2C bus expander address 1—D5
- LCD_D6—I^2C bus expander address 1—D6
- LCD_D7—I^2C bus expander address 1—D7

Buzzer Control

BUZZER—PA1_T1OUT

KeyPad Control

- COL0—PC0_T1IN
- COL1—PC2_SS
- COL2—PC3_SLK
- ROW0— no connection
- ROW1— no connection
- ROW2—PC5_MISO
- ROW3—PC4_MOSI
- IRQ_KEYPAD_TEMP—PA2
  (Pin also controls green LED D4 on the Z8 Encore! XP® 64K Series Flash Microcontrollers MDS processor modules)

LED Control

U13 I^2C bus address: 0100001 R/W.

- RED_LED—I^2C bus expander address 1—D0
- YELLOW_LED—I^2C bus expander address 1—D1

- GREEN_LED—I^{2}C bus expander address 1—D2

Serial Port Control

Note: *JP4 (DIS_RS232) on the processor module is don't care when the module is plugged into the MDS-GP board. The console RS-232 driver U1 is always disabled as the –DIS_RS232 signal is grounded by MDS-GP board via JP2-50.*

JP3(DIS_IrDA) on the processor module is to be removed to allow the MDS-GP board to control the IrDA module. If this jumper is installed, IrDA on the processor module is always disabled.

Jumper J2 Signals

Enable only one serial port function per interface (COM1 or COM2).

- RS232_COM1_ENABLE—J2 pins 1, 2
- RS485_COM1_ENABLED—J2 pins 3, 4
- IrDA ENABLE (COM1)—J2 pins 5, 6
- RS232_GPS_COM2_ENABLED—J2 pins 7, 8
- RS232_COM2_ENABLE—J2 pins 9, 10
- RS232_RF_COM1_ENABLED—J2 pins 11, 12
- SOFTWARE_UART_COM1_ENABLED—J2 pins 13, 14

I^{2}C Bus Expander U2 Signals For Serial Port Control

U2 is an I^{2}C bus expander that can be used via software to control the signals on jumper J2. If the U2 I^{2}C expander is to be used, ensure all jumpers are removed from J2. U2 powers up with all pins in input mode.

The U2 bus expander I^{2}C address is 0100010 R/W.

- GPS_ENABLE—D0 = 0

- IrDA ENABLE—D1 = 0
- RS485 ENABLE—D2 = 0
- RS232_COM1_ENABLE—D3 = 0
- RS232_COM2_ENABLE—D4 = 0
- RF_ENABLE—D5 = 0
- SW_UART_ENABLE—D6 = 0
- Spare—D7

RS232-1 Signals

Enabled by jumper on J2 pins 1, 2, or by U2 pin D3. Uses COM1. When enabled, disables RS485, IrDA, and RF.

- TXD—PA5_TXD0
- RXD—PA4_RXD0
- CTS—PA3_CTS0 (Input)
- RTS— not used

IrDA Module Signals

Enabled by jumper on J2 pins 5, 6, or by U2 pin D1. Uses COM1. When enabled, disables RS232-1, RS485, and RF.

- TXD—PA5_TXD0
- RXD—PA4_RXD0

Wireless (RF) Module Signals

Enabled by jumper on J2 pins 11, 12, or by U2 pin D5. Uses COM1. When enabled, disables RS232-1, RS485, and IrDA.

- RF_TXD—PA5_TXD0
- RF_RXD—PA4_RXD0

- RF_CTS0—PA3_CTS0 (Input)
- RF_RTS0—not used
- RF_RESET—System Reset

RS485 Port Signals

Enabled by jumper on J2 pins 3, 4, or by U2 pin D2. Uses COM1. When enabled, disables RS232-1, IrDA, and RF.

- RS485_TXD—PA5_TXD0
- RS485_RXD—PA4_RXD0
- RS485_OE—PA2

Software UART Signals

Enabled by jumper on J2 pins 13, 14, or by U2 pin D6. When enabled, disables RS232-2 and GPS.

Note: *PA6 and PA7 are I^2C control pins.*

- SU_TXD—PA6_TXD1
- SU_RXD—PA7_RXD1

I^2C Temperature Sensor U15, Maxim MAX6625

U15 I^2C address: 1001000 R/W.

- IRQ_KEYPAD_TEMP—PA2
  (Pin also controls green LED D4 on the Z8 Encore! XP® 64K Series Flash Microcontrollers MDS processor modules)

I²C High Drive/Relay Control

I²C address: 0100000 R/W.

- RELAY1—D0
- RELAY2—D1
- HD1-J20-1—D2
- HD2-J20-2—D3
- HD3-J20-3—D4
- HD4-J20-4—D5
- HD6-J20-5—D6

Digital Compass

Compass is not included.

- NORTH—PB0_ANA0
- EAST—PB1_ANA1
- SOUTH—PB2_ANA2
- WEST—PB3_ANA3

ADC Channels on Terminal Block J24

- PIN 1—PB0_ANA0

Note: *POT R57 is hooked up to this channel.*

- PIN 2—PB1_ANA1
- PIN 3—PB2_ANA2
- PIN 4—PB3_ANA3
- PIN 5— no connection

- PIN6—3.3 V
- PIN7—5 V
- PIN8—GND

Processor Module LEDS and SW1 Test

- RED_LED—PA0_T0IN
- (In LCD Bus mode, this also controls LCD_EN)
- YELLOW_LED—PA1_T0OUT
- GREEN_LED—PA2
- SW1_TEST—PC0_T1IN

Z8 Encore! XP® MCUs

LCD Control

The LCD has two different modes of operation, 4-bit bus mode and I^2C drive mode, controlled by jumper J26:

- J26 OFF, LCD bus mode enabled
- J26 ON, LCD I^2C drive mode enabled

Bus Mode LCD Control

- LCD_EN—RESET/PD0
- LCD_RS—PA7_T1OUT (Also D3 Yellow LED on MDS-PM)
- LCD_RW—PA0_TOIN
- LCD_D4—PC0_ANA4
- LCD_D5—PC1_ANA5
- LCD_D6—PC2_ANA6
- LCD_D7—PB4_ANA7

I^2C Drive Mode LCD Control

U13 I^2C bus address: 0100001 R/W.

Z8 Encore! XP® I^2C pins on PB6 and PB7.

- LCD_EN—I^2C bus expander address 1—D3
- LCD_RS—PA7_T1OUT
  (Also D3 Yellow LED on processor module)
- LCD_RW—PA0_TOIN
- LCD_D4—I^2C bus expander address 1—D4
- LCD_D5—I^2C bus expander address 1—D5

- LCD_D6—I^2C bus expander address 1—D6
- LCD_D7—I^2C bus expander address 1—D7

Buzzer Control

BUZZER—PA1_TOOUT

KeyPad Control

- COL0—PA6_T1OUT
  (Also D2 green LED control on MDS-PM Board)
- COL1—PB5
- COL2—PC3_COUT
  (Also D4 Red LED control on MDS-PM Board)
- ROW0—PC6
- ROW1—PC7
- ROW2—PC5
- ROW3—PC4
- IRQ_KEYPAD_TEMP—PA2
  (Also SW2 *test* input on MDS processor module)

LED Control

U13 I^2C bus address: 0100001 R/W.

- RED_LED—I^2C bus expander address 1—D0
- YELLOW_LED—I^2C bus expander address 1—D1
- GREEN_LED—I^2C bus expander address 1—D2

Serial Port Control

Note: *JP4 (DIS_RS232) on the processor module is don't care when the module is plugged into the MDS-GP board. The console RS-232 driver U1 is always disabled as the –DIS_RS232 signal is grounded by MDS-GP board via JP2-50.*

JP3(DIS_IrDA) on the processor module must be removed to allow the MDS-GP board to control the IrDA module. If this jumper is installed, IrDA on the processor module is always disabled.

Jumper J2 Signals

Enable only one serial port function per interface (COM1 or COM2).

- RS232_COM1_ENABLE—J2 pins 1, 2
- RS485_COM1_ENABLED—J2 pins 3, 4
- IrDA ENABLE (COM1)—J2 pins 5, 6
- RS232_GPS_COM2_ENABLED—J2 pins 7, 8
- RS232_COM2_ENABLE—J2 pins 9, 10
- RS232_RF_COM1_ENABLED—J2 pins 11, 12
- SOFTWARE_UART_COM1_ENABLED—J2 pins 13, 14

I^2C Bus Expander U2 Signals For Serial Port Control

U2 is an I^2C bus expander that can be used via software to control the signals on jumper J2. If the U2 I^2C expander is to be used, ensure all jumpers are removed from J2.
U2 powers up with all pins in input mode.

The U2 bus expander I^2C address is 0100010 R/W.

- GPS_ENABLE—D0 = 0
- IrDA ENABLE—D1 = 0

- RS485 ENABLE—D2 = 0
- RS232_COM1_ENABLE—D3 = 0
- RS232_COM2_ENABLE—D4 = 0
- RF_ENABLE—D5 = 0
- SW_UART_ENABLE—D6 = 0
- Spare—D7

RS232-1 Signals

Enabled by jumper on J2 pins 1, 2, or by U2 pin D3. Uses COM1. When enabled, disables RS485, IrDA, and RF.

- TXD—PA5_TXD0
- RXD—PA4_RXD0
- CTS—PA3_CTS0 (Input)
- RTS—Not used

IrDA Module Signals

Enabled by jumper on J2 pins 5, 6, or by U2 pin D1. Uses COM1. When enabled, disables RS232-1, RS485, and RF.

- TXD—PA5_TXD0
- RXD—PA4_RXD0
- Not used—PA3_CTS0
- Not used—PG0

Wireless (RF) Module Signals

Enabled by jumper on J2 pins 11, 12, or by U2 pin D5. Uses COM1. When enabled, disables RS232-1, RS485, and IrDA.

- RF_TXD—PA5_TXD0

- RF_RXD—PA4_RXD0
- RF_CTS0—PA3_CTS0 (Input)
- RF_RTS0—Not used
- RF_RESET—System Reset

RS485 Port Signals

Enabled by jumper on J2 pins 3, 4, or by U2 pin D2. Uses COM1. When enabled, disables RS232-1, IrDA, and RF.

- RS485_TXD—PA5_TXD0
- RS485_RXD—PA4_RXD0
- Not used—PA3_CTS0 (Input)
- RS485_OE—PA2/DE0

Software UART Signals

Enabled by jumper on J2 pins 13, 14, or by U2 pin D6. When enabled, disables RS232-2 and GPS.

Note: *PB6 and PB7 are I^2C control pins.*

- SU_TXD—PB6_TXD1
- SU_RXD—PB7_RXD1
- CTS—Not used
- RTS—Not used

I^2C Temperature Sensor U15, Maxim MAX6625

U15 I^2C address: 1001000 R/W.

- IRQ_KEYPAD_TEMP—PA2
  (Pin also controls green LED D4 on the Z8 Encore! XP® 64K Series Flash Microcontrollers MDS processor modules)

I²C High Drive/Relay Control

I²C address: 0100000 R/W.

- RELAY1—D0
- RELAY2—D1
- HD1-J20-1—D2
- HD2-J20-2—D3
- HD3-J20-3—D4
- HD4-J20-4—D5
- HD6-J20-5—D6

Digital Compass

Compass is not included.

- NORTH—PB0_ANA0 J24-1
- EAST—PB1_ANA1 J24-2
- SOUTH—PB2_ANA2 J24-3
- WEST—PB3_ANA3 J24-4

ADC Channels on Terminal Block J24

- PIN 1—PB0_ANA0

Note: *POT R57 is hooked up to this channel.*

- PIN 2—PB1_ANA1

- PIN 3—PB2_ANA2
- PIN 4—PB3_ANA3
- PIN 5— no connection
- PIN6—3.3 V
- PIN7—5 V
- PIN8—GND

Processor Module LEDS and SW1 Test

- RED_LED—PC3_COUT
- YELLOW_LED—PA7_T1OUT
- GREEN_LED—PA6_T1OUT
- SW1_TEST—PA2

ZNEO® Z16F Series MCUs

Spare Pins

PC1_T1OUT and PJ0

LCD Control

The LCD has two different modes of operation, 4-bit bus mode and I^2C drive mode, controlled by jumper J26:

- J26 OFF, LCD bus mode enabled
- J26 ON, LCD I^2C drive mode enabled

Bus Mode LCD Control

- LCD_EN—PC0_T1IN
- LCD_RS—PD1_PWML1
- LCD_RW—PC6_T2IN_PWMH0
  (Pin also controls red LED D2 on the processor module)
- LCD_D4—PB6_ANA6
- LCD_D5—PB2_ANA_M2
- LCD_D6—PB1_ANA_M1
- LCD_D7—PB0_ANA_M0

I^2C Drive Mode LCD Control

U13 I^2C bus address: 0100001 R/W.

- LCD_EN—I^2C bus expander address 1—D3
- LCD_RS—PD1_PWML1
- LCD_RW—PC6_T2IN_PWMH0

- LCD_D4—I^2C bus expander address 1—D4
- LCD_D5—I^2C bus expander address 1—D5
- LCD_D6—I^2C bus expander address 1—D6
- LCD_D7—I^2C bus expander address 1—D7
- LCD Back Light—PJ1

Buzzer Control

BUZZER—PC7_T2OUT

KeyPad Control

- COL0—PD0_PWMH1
- COL1—PC2_SS
- COL2—PC3_SLK
- ROW0—PD7_PWML2
- ROW1—PD2_PWMH2
- ROW2—PC5_MISO
- ROW3—PC4_MOSI
- IRQ_KEYPAD_TEMP—PJ2

LED Control

U13 I^2C bus address: 0100001 R/W.

- RED_LED—I^2C bus expander address 1—D0
- YELLOW_LED—I^2C bus expander address 1—D1
- GREEN_LED—I^2C bus expander address 1—D2

Serial Port Control

Note: *J2 (DIS_RS232) on the processor module is don't care when the module is plugged into the MDS-GP board. The console RS-232 driver U1 is always disabled because the –DIS_RS232 signal is grounded by MDS-GP board via JP2-50.*

J3(DIS_IrDA) on the processor module is to be removed to allow the MDS-GP board to control the IrDA module. If this jumper is installed, IrDA on the processor module is always disabled.

Jumper J2 Signals

Enable only one serial port function per interface (COM1 or COM2).

- RS232_COM1_ENABLE—J2 pins 1, 2
- RS485_COM1_ENABLED—J2 pins 3, 4
- IrDA ENABLE (COM1)—J2 pins 5, 6
- RS232_GPS_COM2_ENABLED—J2 pins 7, 8
- RS232_COM2_ENABLE—J2 pins 9, 10
- RS232_RF_COM1_ENABLED—J2 pins 11, 12
- SOFTWARE_UART_COM1_ENABLED—J2 pins 13, 14

I^2C Bus Expander U2 Signals For Serial Port Control

U2 is an I^2C bus expander that can be used via software to control the signals on jumper J2. If the U2 I^2C expander is to be used, ensure all jumpers are removed from J2. U2 powers up with all pins in input mode.

The U2 bus expander I^2C address is 0100010 R/W.

- GPS_ENABLE—D0 = 0
- IrDA ENABLE—D1 = 0
- RS485 ENABLE—D2 = 0

- RS232_COM1_ENABLE—D3 = 0
- RS232_COM2_ENABLE—D4 = 0
- RF_ENABLE—D5 = 0
- SW_UART_ENABLE—D6 = 0
- Spare—D7

RS232-1 Signals

Enabled by jumper on J2 pins 1, 2, or by U2 pin D3. Uses COM1. When enabled, disables RS485, IrDA, and RF.

- TXD—PA5_TXD0
- RXD—PA4_RXD0
- CTS—PA3_CTS0 (Input)
- RTS—PJ3 (Software RTS0 Output)

RS232-2 Signals

Enabled by jumper on J2 pins 9, 10, or by U2 pin D4. Uses COM2. When enabled, disables GPS and Software UART.

- TXD—PD5_TXD1
- RXD—PD4_RXD1
- CTS—PD6_CTS1 (Input)
- RTS—PD3 (Software RTS1 Output)

IrDA Module Signals

Enabled by jumper on J2 pins 5, 6, or by U2 pin D1. Uses COM1. When enabled, disables RS232-1, RS485, and RF.

- TXD—PA5_TXD0
- RXD—PA4_RXD0

- Not used PA3_CTS0
- Not used PJ3

Wireless (RF) Module Signals

Enabled by jumper on J2 pins 11, 12, or by U2 pin D5. Uses COM1. When enabled, disables RS232-1, RS485, and IrDA.

- RF_TXD—PA5_TXD0
- RF_RXD—PA4_RXD0
- RF_CTS0—PA3_CTS0 (Input)
- RF_RTS0—PJ3 (Software Output)
- RF_RESET—System Reset

GPS Module Signals

Enabled by jumper on J2 pins 7, 8, or by U2 pin D0. Uses COM2. When enabled, disables RS232-2 and Software UART.

- GPS_TXD—PD5_TXD1
- GPS_RXD—PD4_RXD1
- GPS_PPS—PD6_CTS1 (Input)
- Not used—PD3

RS485 Port Signals

Enabled by jumper on J2 pins 3, 4, or by U2 pin D2. Uses COM1. When enabled, disables RS232-1, IrDA, and RF.

- RS485_TXD—PA5_TXD0
- RS485_RXD—PA4_RXD0
- Not used—PA3_CTS0 (Input)
- RS485_OE—PA2_DE0

Software UART Signals

Enabled by jumper on J2 pins 13, 14, or by U2 pin D6. When enabled, disables RS232-2 and GPS.

Note: *PA6 and PA7 are I^2C control pins.*

- SU_TXD—PA6_TXD1
- SU_RXD—PA7_RXD1
- CTS—PD6_CTS1 (Input)
- RTS—PD3 (Software RTS1 Output)

I^2C Temperature Sensor U15, Maxim MAX6625

U15 I^2C address: 1001000 R/W.

- IRQ_KEYPAD_TEMP—PJ2

I^2C High Drive/Relay Control

I^2C address: 0100000 R/W.

- RELAY1—D0
- RELAY2—D1
- HD1-J20-1—D2
- HD2-J20-2—D3
- HD3-J20-3—D4
- HD4-J20-4—D5
- HD6-J20-5—D6

Digital Compass

Compass is not included.

- NORTH—PB5_ANA5 J21-21 J24-1
- EAST—PB4_ANA4 J21-19 J24-2
- SOUTH—PB3_ANA3 J21-9 J24-3
- WEST—PB7_ANA7 J21-7 J24-4

ADC Channels on Terminal Block J24

- PIN 1—PB0_ANA0
  (Pot R57 is hooked up on this channel)
- PIN 2—PB1_ANA1
- PIN 3—PB3_ANA3
- PIN 4—PB2_ANA2
- PIN 5—PB4_ANA4
- PIN6—3.3 V
- PIN7—5 V
- PIN8—GND

Processor Module LEDS and Switches

- RED_LED—PA0_T0IN
- YELLOW_LED—PA1_T0OUT
- GREEN_LED—PA2
- SW2_STOP/RUN—PA7_SDA
- SW3_DIRECTION—PC0_T1IN

Processor Module Changes for LCD and Keypad Interfacing

- ZNEO® processor module changes for LCD interfacing by four-bit parallel interface (GPIO pins):

  U1: Connect pin 6 to pin 18

  Connect pin 7 to pin 17

  Connect pin 8 to pin 16

  U5: connect pin 5 to pin 19

- ZNEO® processor module changes for keypad interfacing:

  U5: Connect pin 4 to pin 20

  Connect pin 6 to pin 18

  Connect pin 11 to pin 13

- ZNEO® processor module switch and jumper settings for LCD (parallel interface) and keypad interfacing:

  Jumper setting—Default

  Switch SW2_STOP/RUN—Open

  Switch SW3_DIRECTION—Open

Customer Feedback

For answers to technical questions about the product, documentation, or any other issues with Zilog's offerings, please visit Zilog's Knowledge Base at:

http://www.zilog.com/kb.

For any comments, detail technical questions, or reporting problems, please visit Zilog's Technical Support at:

http://support.zilog.com.

Warning: DO NOT USE IN LIFE SUPPORT

LIFE SUPPORT POLICY

ZILOG'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS PRIOR WRITTEN APPROVAL OF THE PRESIDENT AND GENERAL COUNSEL OF ZILOG CORPORATION.

As used herein

Life support devices or systems are devices which (a) are intended for surgical implant into the body, or (b) support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in a significant injury to the user. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.

Document Disclaimer

 Information in this publication concerning the devices, applications, or technology described is intended to suggest possible uses and may be superseded. ZILOG, INC. DOES NOT ASSUME LIABILITY FOR OR PROVIDE A REPRESENTATION OF ACCURACY OF THE INFORMATION, DEVICES, OR TECHNOLOGY DESCRIBED IN THIS DOCUMENT. ZILOG ALSO DOES NOT ASSUME LIABILITY FOR INTELLECTUAL PROPERTY INFRINGEMENT RELATED IN ANY MANNER TO USE OF INFORMATION, DEVICES, OR TECHNOLOGY DESCRIBED HEREIN OR OTHERWISE. The information contained within this document has been verified according to the general principles of electrical and mechanical engineering.

Z8, Z8 Encore!, eZ8, Z8 Encore! XP, Z8 Encore! MC, Crimzon, eZ80, and ZNEO are trademarks or registered trademarks of Zilog, Inc. All other product or service names are the property of their respective owners.