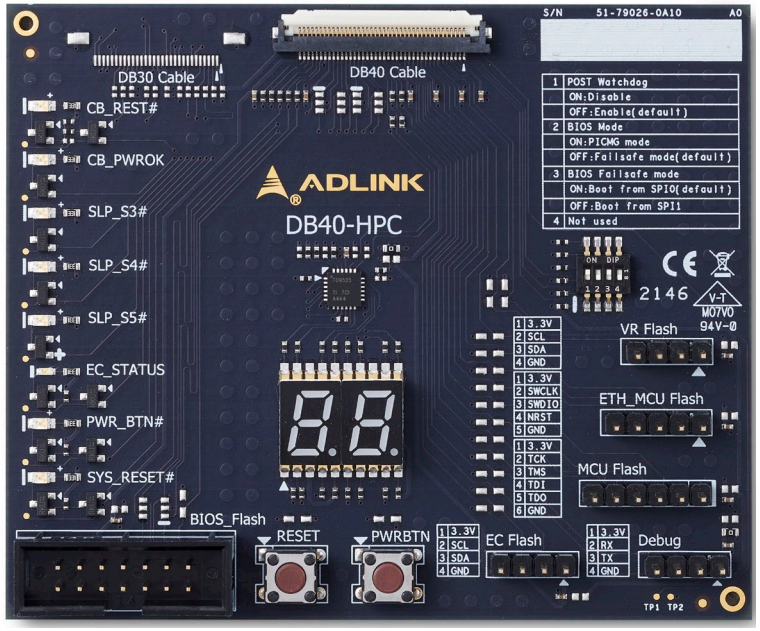
DB40 HPC

User's Guide



COM-HPC™

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Part Number: 50M-79026-1000

ADLINK
LEADING EDGE COMPUTING

Revision History

Revision	Description	Date	Author
1.0	Initial release	2023-11-10	CC

Preface

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Safety Instructions

For user safety, please read and follow all Instructions, **WARNING**s, **CAUTION**s, and **NOTE**s marked in this manual and on the associated equipment before handling/operating the equipment.

Read these safety instructions carefully.

1. Keep this manual for future reference.
2. Read the specifications section of this manual for detailed information on the operating environment of this equipment.
3. Turn off power and unplug any power cords/cables when installing/mounting or un-installing/removing equipment.
4. To avoid electrical shock and/or damage to equipment:
5. Keep equipment away from water or liquid sources;
6. Keep equipment away from high heat or high humidity;
7. Keep equipment properly ventilated (do not block or cover ventilation openings);
8. Make sure to use recommended voltage and power source settings;
9. Always install and operate equipment near an easily accessible electrical socket outlet;
10. Secure the power cord (do not place any object on/over the power cord);
11. Only install/attach and operate equipment on stable surfaces and/or recommended mountings;
12. If the equipment will not be used for long periods of time, turn off the power source and unplug the equipment.

Conventions

The following conventions may be used throughout this manual, denoting special levels of information

Note: This information adds clarity or specifics to text and illustrations.

Caution: This information indicates the possibility of minor physical injury, component damage, data loss, and/or program corruption.

Warning: This information warns of possible serious physical injury, component damage, data loss, and/or program corruption.

Getting Service

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1. Introduction

The DB40 HPC Debug board is used for COM-HPC modules during a project's development stage. It includes the following features:

- **Interface to SPI Flash** for BIOS update
- **Interface to EC** for EC update
- **Interface to MMC** for MMC update
- **Power and Reset Buttons**
- **Status LEDs and Test Points** for CB_REST#, CB_PWROK, SLP_S3#, SLP_S4#, SLP_S5#, EC_STATUS, PWR_BTN#, SYS_RESET#
- **Port 80 Decoding Interface** with hexadecimal LED display for Power on and Self-test (POST) via I^2C interface

Caution: The DB40 HPC Debug board can only be used on products that have the appropriate FFC debug connector for this usage.

Note:

1. MMC (Module Management Controller).is a part of remote management implementation and used to support IPMI. MMC will be optionally available on ADLINK's COM-HPC Server type modules.

2.VR_Flash and ETH_MCU Flash are used for internal engineering only and won't be described herein.

2. Specifications

2.1. Basic Information

Dimensions: 89 x 73 x 1.6 mm (WxHxD)

Operating temperature: 0°C to 60°C

Ordering number: 91-79026-000E
(ADLINK P/N, includes DB40 HPC Debug card and its necessary cables)

2.2. Block Diagram

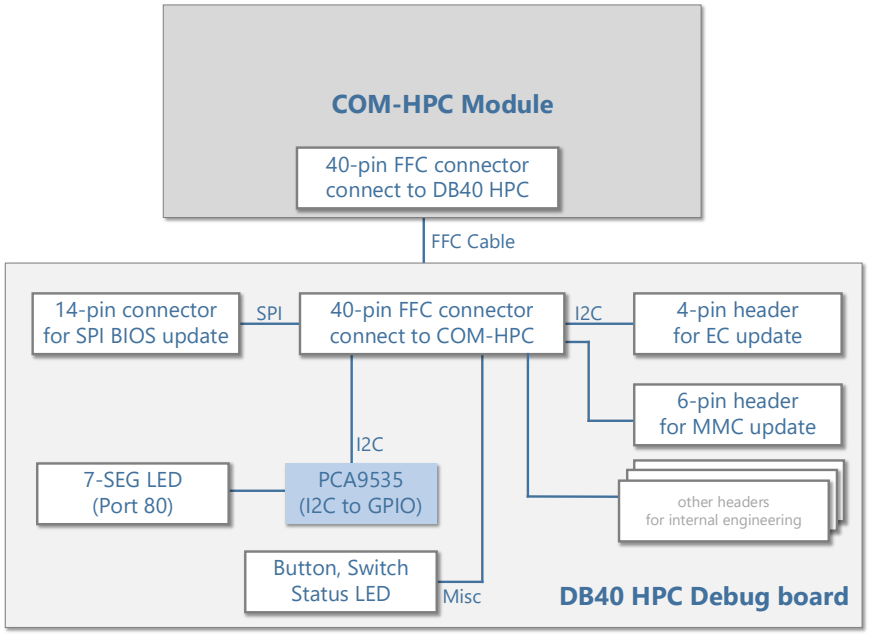

Figure 1 – Block diagram

2.3. Drawing

This section indicates the connectors, LEDs, switches, buttons, and additional items located on the DB40 HPC Debug card, as shown below.

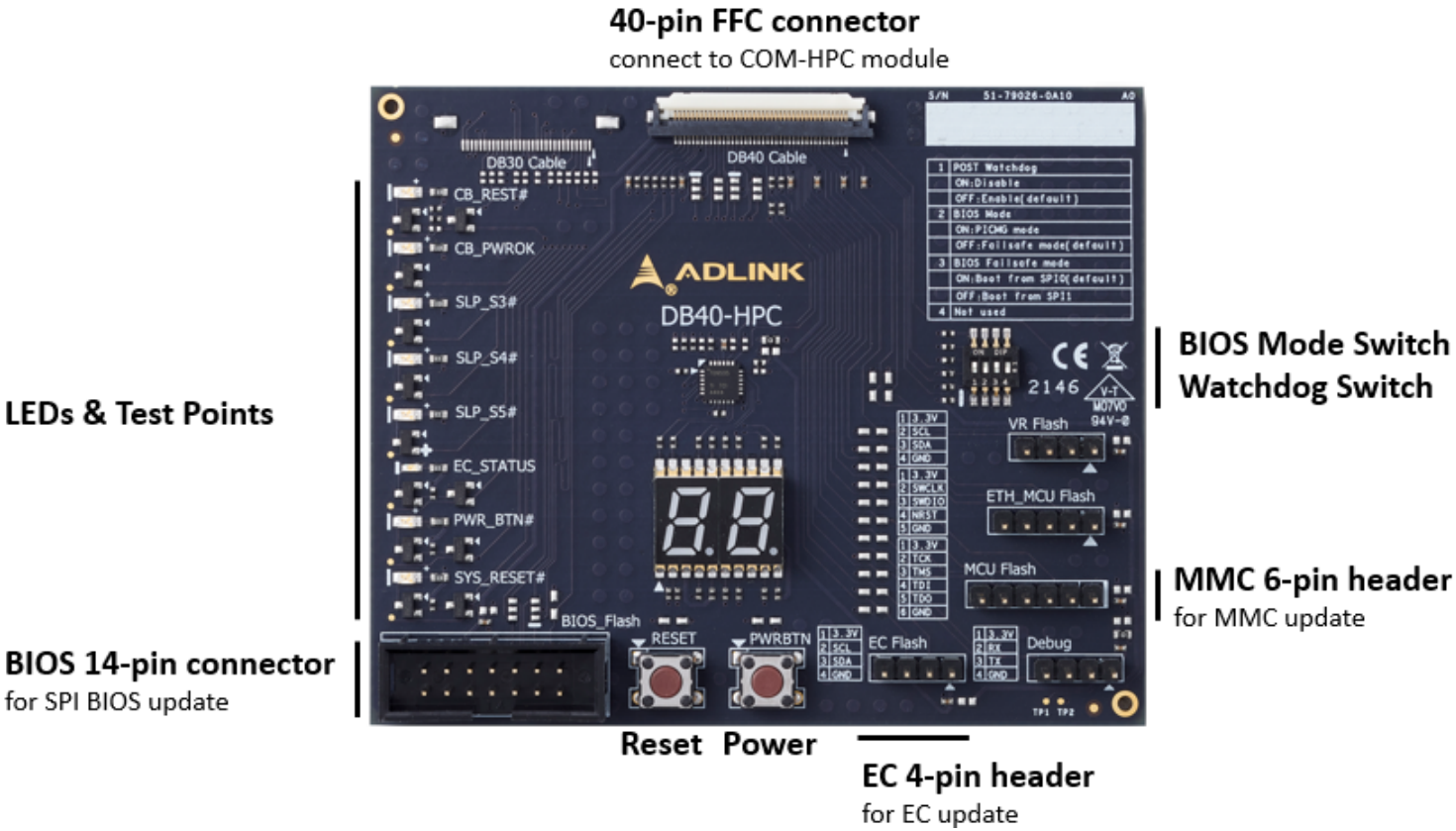

Figure 2 – Debug board drawing

2.4. Cable Connection

For firmware update, three cables are needs to be connected, as shown below.

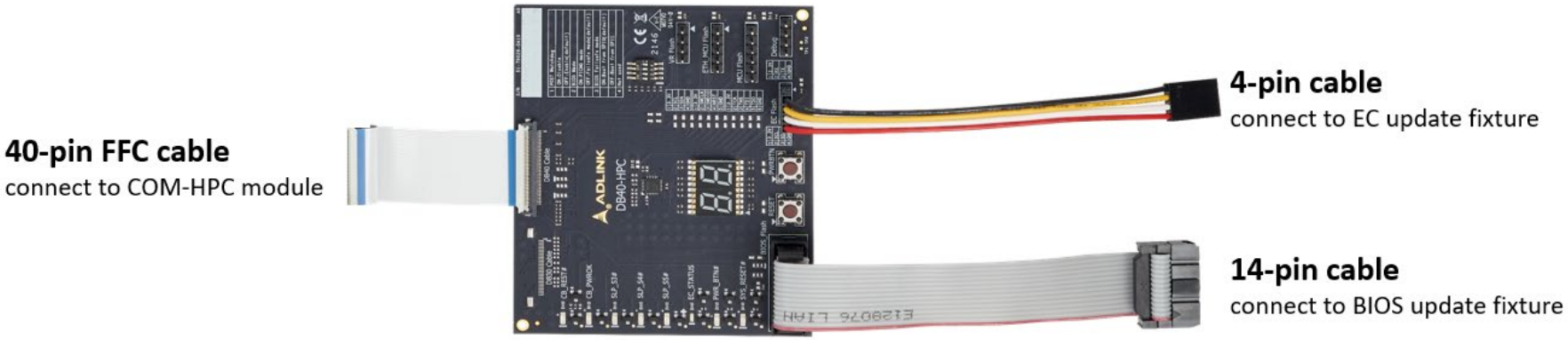

Figure 3 – Debug board and cable connections

3. Connector and Header Pinouts

This section describes the available connectors and pinouts on the board

3.1. 40-pin FFC connector to COM-HPC Modules

This interface is used to connect the debug board to the COM-HPC module using FFC (FlexFoil cable).

Connector type: FFC 40-pin, 0.5mm pitch

Pin #	Description
1	F_SEL_BIOS
2	F_BIOS_MODE
3	POSTWDT_DIS#
4	VR_PWR_3V3
5	VR_PMBUS_CLK
6	VR_PMBUS_DAT
7	MCU_PWR_3V3
8	MCU_SWCLK
9	MCU_SWDIO
10	MCU_NRST
11	MMC_PWR_3V3
12	MMC_TCK
13	MMC_TMS
14	MMC_TDI
15	MMC_TDO
16	GND
17	DB_UART_TX
18	DB_UART_RX
19	EC_WRST#
20	EC_PWR_3V3

Pin #	Description
21	EC_SMB_CLK_FLASH
22	EC_SMB_DAT_FLASH
23	EC_I2C_CLK_PORT80
24	EC_I2C_DAT_PORT80
25	SYS_RESET#
26	PWR_BTN#
27	EC_STATUS
28	SUS_S5#
29	SUS_S4#
30	SUS_S3#
31	CB_PWROK
32	CB_RESET#
33	3V3_DUAL
34	GND
35	SPI_BIOS_CS1#
36	SPI_BIOS_CS0#
37	SPI_BIOS_CLK
38	SPI_BIOS_MOSI
39	SPI_BIOS_MISO
40	SPI_PWR_3V3

3.2. BIOS 14-pin Connector

This interface is used to update the SPI BIOS flash located on the COM-HPC module by using a suitable SPI programmer, e.g. DEDIPROG SF100

Connector type: IDC 14-pin, 2.54mm pitch

Pin #	Description
1	Not connected
2	Not connected
3	SPI_BIOS_CS1#
4	Not connected
5	SPI_PWR_3V3
6	GND
7	SPI_BIOS_CS0#
8	SPI_BIOS_CLOCK
9	SPI_BIOS_MISO
10	SPI_BIOS_MOSI
11	Not connected
12	Not connected
13	Not connected
14	Not connected

3.3. EC 4-pin Header

This interface is used to update the EC (Embedded Controller) located on the COM-HPC module by using a suitable programmer, e.g. I2C interface

Header type: 2.54mm pitch

Pin #	Description
1	EC_PWR_3V3
2	EC_SMB_CLK_FLASH
3	EC_SMB_DAT_FLASH
4	GND

3.4. MMC 6-pin Header

This interface is used to update the MMC (Module Management Controller) located on the COM-HPC module by using a suitable programmer

Header type: 2.54mm pitch

Pin #	Description
1	MMC_PWR_3V3
2	MMC_TCK
3	MMC_TMS
4	MMC_TDI
5	MMC_TDO
6	GND

4. Buttons and Switches

This section describes the available buttons and switches on the board

4.1. Button

Power Button (PWRBTN): With this button, the PWRBTN# signal of the COM-HPC module can be triggered.

Reset Button (RESET): With this button, the SYS_RESET# signal of the COM-HPC module can be triggered.

4.2. Mode Switch

With this 4 pole DIP switch, users can select one of the several modes available.

Switch #	Function
1	POST WATCHDOG ON = Disable OFF = Enable (default)
2	BIOS MODE ON = PICMG MODE OFF = FAILSAFE MODE (default)
3	BIOS FAILSAFE MODE ON = Boot from SPI0 (default) OFF = Boot from SPI1
4	NOT USED

5. Port 80 and LEDs

This section describes the hexadecimal display and LED functionality

5.1. Port 80

During power-up and BIOS execution, the CPU will first retrieve commands from POST and then execute them. Each command has a corresponding debug port data code or BIOS POST checkpoint code. The results from each checkpoint can be reviewed on the LED display so the technician or administrator can properly debug the system. The POST code is written on I/O port 80 hex.

The POST code is shown on the two 7-segment LED displays on the debug board.

The Port 80 decoding interface is dependent on the module design.

5.2. LED Indicators

The LEDs indicates the state and/or status of certain system signals, as described below.

LED	Function
CB_RESET#	LED will lit on active reset signal of the carrier board
CB_PWROK	LED will lit on active power of the COM-HPC module
SLP_S3#	LED will lit on released SUS_S3# signal from the COM-HPC module
SLP_S4#	LED will lit on released SUS_S4# signal from the COM-HPC module
SLP_S5#	LED will lit on released SUS_S5# signal from the COM-HPC module
EC_STATUS	LED will show the status of the EC on the COM-HPC module
PWR_BTN#	LED will lit on active power button signal of the COM-HPC module
SYS_RESET#	LED will lit on active reset signal of the COM-HPC module

5.3. EC Status LED

The EC state and status is indicated via EC_STATUS LEDs

Behavior	Description
Blinking status LED	A blinking Status LED indicates a failure during power-up. The number of flashes indicates the error code. A missing/wrong system voltage, stuck on the reset line, BIOS failure, or an unexpected shutdown of an on-board power supply can all trigger this signaling code. Error codes are board specific. Please check the corresponding COM-HPC module manual for details.
Bright blue flash	A system state change occurs. Power-button activity, Reset-button activity, PCI_RST# activity or activity on SLP_Sx signals can all trigger this signaling mode.
Fast blinking status LED	If and when the board is running on Fail-Safe-BIOS, the Status LED will be blinking extremely fast until addressed.
Short bright blue flashes every 4s	System is in Suspend-to=RAM.