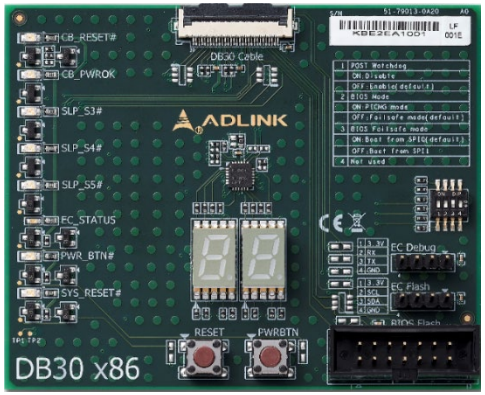
DB30 x86

User's Guide



COM Express®

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Part Number: 50M-79013-1000

ADLINK
LEADING EDGE COMPUTING

Revision History

Revision	Description	Date	Author
0.1	Preliminary release	2023-07-12	CC
0.2	Debug board drawing label updated	2023-07-13	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.

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

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1. Introduction

The DB30 x86 Debug board is used for COM Express modules during a project's development stage. It includes the following features

- **Interface to SPI Flash** for BIOS update
- **Interface to EC** for Embedded Controller (EC) update
- **Power and Reset Buttons**
- **Status LEDs and Test Point** for Power Button, Reset Button, CB__PWROK, CB_RESET#, SLP_S3#, SLP_S4#, SLP_S5#, EC_STATUS
- **Port 80 Decoding Interface** with hexadecimal LED display for Power on and Self-test (POST) via I^2C interface

Caution: The DB30 x86 Debug board can only be used on products that have the appropriate FFC debug connector for this usage.

2. Specifications

2.1 Basic

Size: 81.6 x 66.8 x 1.6 mm (WxHxD)

Operating temperature: 0°C to 60°C

Ordering number: 91-79013-0010

2.2 Block Diagram

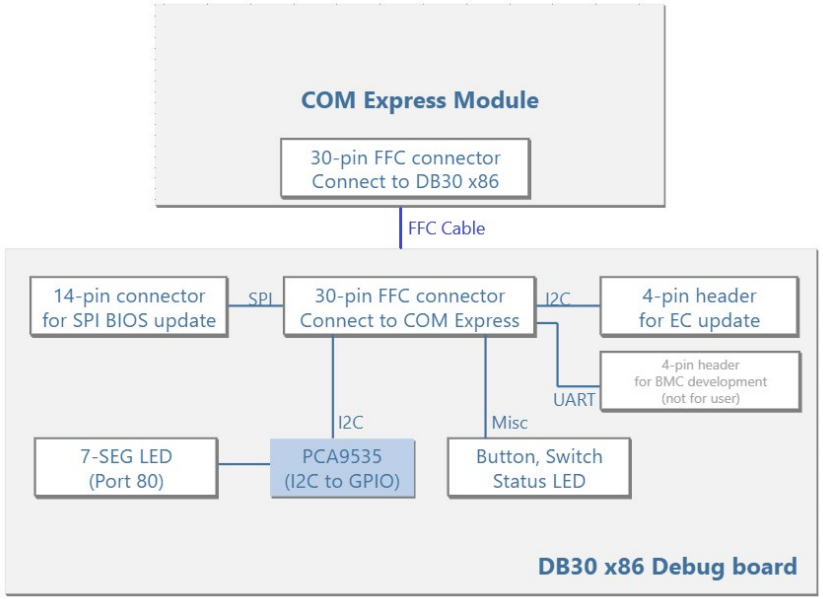

Figure 1 Block diagram

2.3 Drawing

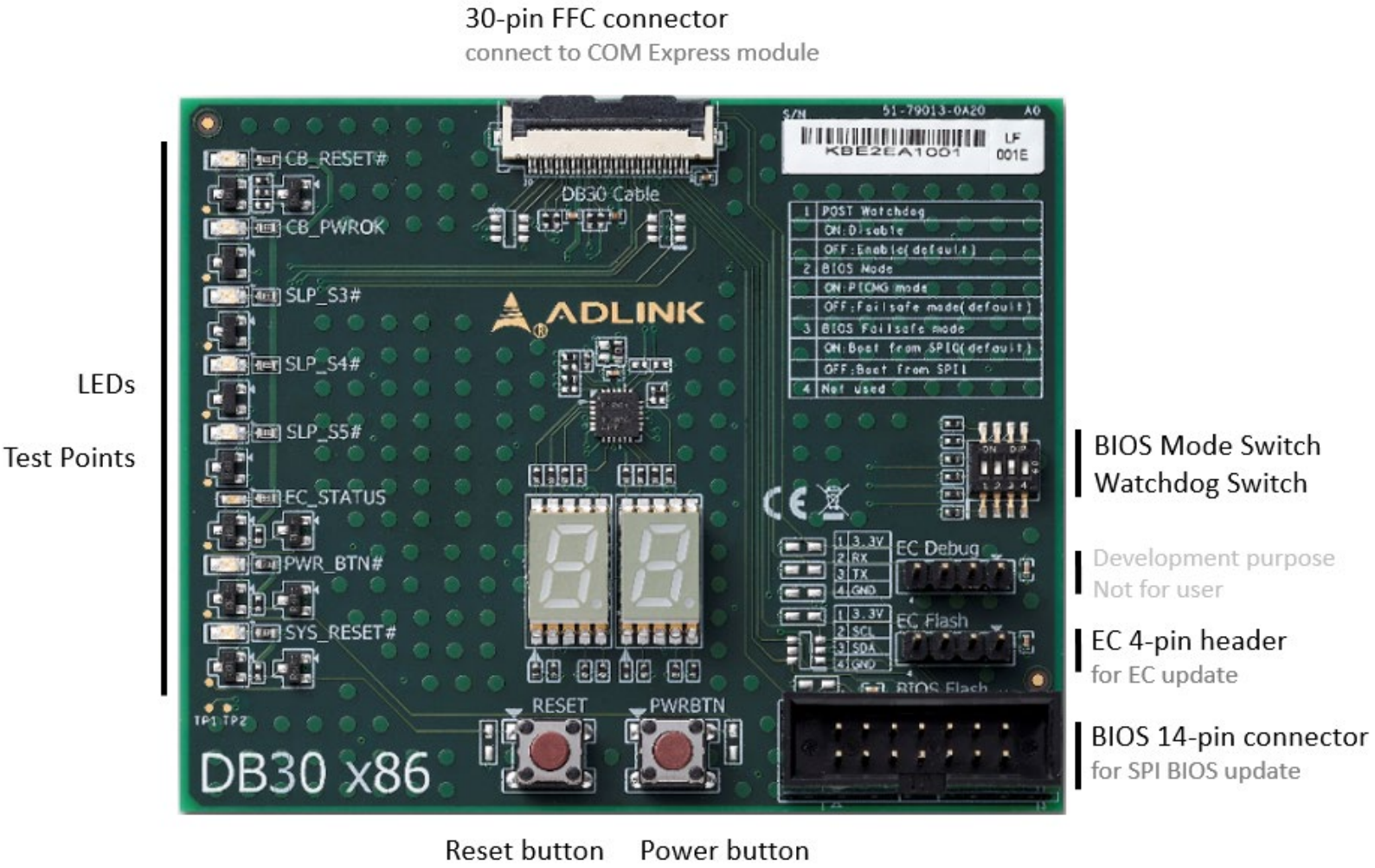

Figure 2 Debug board drawing

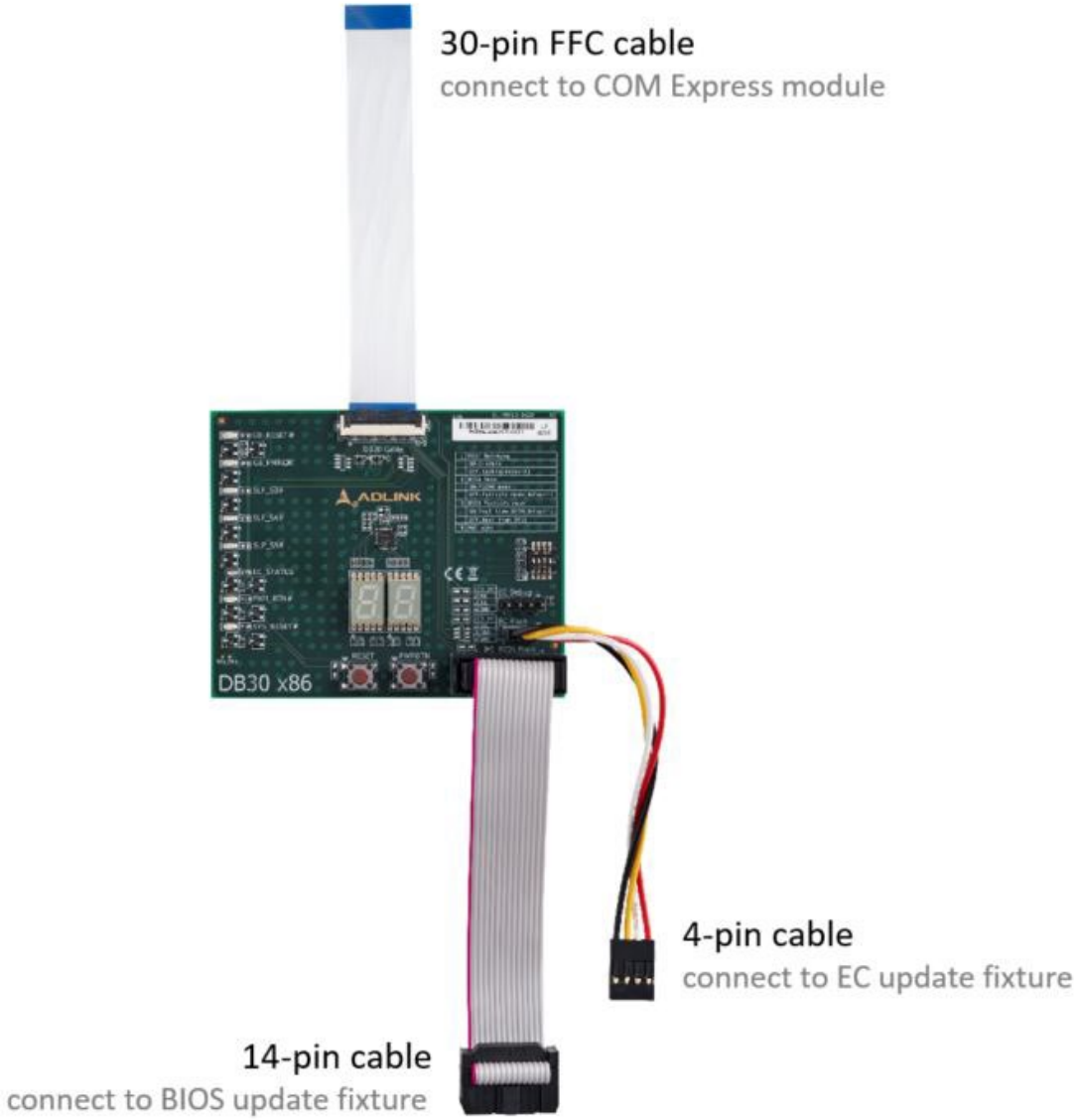

Figure 3 Debug board and its cables

3. Connector Pinouts

This section describes the available connectors on the debug board.

3.1 30-pin FFC Connector to COM Express Modules

This interface is used to connect the debug board to the COM Express module with FFC (FlexFoil cable)

Connector type: FFC 30-pin, 0.5mm pitch

Pin #	Description
1	VCC_SPI_IN
2	SPI_BIOS_CS0#
3	SPI_BIOS_MISO
4	SPI_BIOS_MOSI
5	SPI_BIOS_CLK
6	GND
7	CB_RESET#
8	SPI_BIOS_CS1#
9	POSTWDT_DIS#
10	SUS_S3#
11	SUS_S4#
12	SUS_S5#
13	EC_WRST#
14	3V3_A
15	GND

Pin #	Description
16	GND
17	SEL_BIOS
18	BIOS_MODE
19	DEBUG_PORT_I2C_DATA
20	DEBUG_PORT_I2C_CLK
21	3V3_EC_A
22	GND
23	EC_FLASH_SMB_DATA
24	EC_FLASH_SMB_CLK
25	PWRBTN#
26	SYS_RESET#
27	CB_PWROK
28	EC_STATUS
29	EC_UART_TX1
30	EC_UART_RX1

3.2 BIOS 14-pin Connector

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

Connector type: IDC 14pin, 2.54mm pitch

Pin #	Description
1	Not connected
2	Not connected
3	SPI_BIOS_CS1#
4	Not connected
5	VCC_SPI
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 Embedded Controller (EC) located on the COM Express module by using a suitable programmer

Connector type: 2.54mm pitch

Pin #	Description
1	3V3_EC_A
2	EC_FLASH_SMB_CLK
3	EC_FLASH_SMB_DATA
4	GND

4. Buttons and Switches

This section describes the buttons and switches on the debug board

4.1 Buttons

Power Button: with this button, the PWRBTN# signal for the COM Express module can be triggered

Reset Button: with this button, the SYS_RESET# signal for the COM Express module can be triggered

4.2 Switch

With this 4 pole DIP switch, several modes can be selected

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 Display

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 module design.

5.2 LED Indicators

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

5.3 EC Status LED

The EC state and status of (also known as BMC status) is indicated via 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 signalling code. Error codes are board specific. Please check the corresponding COM Express 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 signalling 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.g
Short bright blue flashes every 4s	System is in Suspend-to=RAM.

LED Error code message

Exception Code	Error Message
0	NOERROR
2	NO_SUSCLK
3	NO_SLP_S5
4	NO_SLP_S4
5	NO_SLP_S3
6	BIOS_FAIL
7	RESET_FAIL
8	RESETIN_FAIL
9	NO_CB_PWROK
10	CRITICAL_TEMP
11	POWER_FAIL
12	VOLTAGE_FAIL
13	RSMRST_FAIL
14	NO_VDDQ_PG
15	NO_V1P05A_PG
16	NO_VCORE_PG
17	NO_SYS_GD
18	NO_V5SBY
19	NO_V3P3A
20	NO_V5_DUAL
21	NO_PWRSRC_GD
22	NO_P_5V_3V3_S0_PG
23	NO_SAME_CHANNEL
24	NO_PCH_PG