COM Express Type 7 Starter Kit Plus

Quick Start Guide

COM Express®

Manual Rev.: 1.0
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Part Number: 50-1J092-1000

Leading **EDGE COMPUTING**

Preface

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Revision History

Revision	Description	Date	By
1.0	Initial release	2017-09-21	JC

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1. Introduction

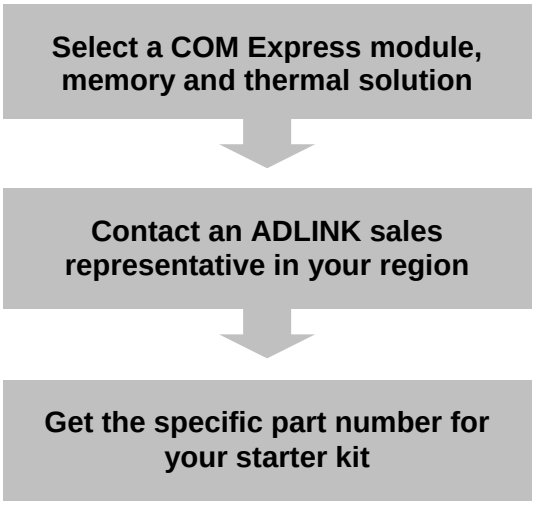
The Type 7 Starter Kit Plus is intended for testing and verification of COM Express systems based on Type 7 modules and includes everything customers need to begin their own design and development. The Type 7 Starter Kit Plus includes the Express-BASE7 ATX size COM Express Type 7 reference carrier board, a COM Express Type 7 module (of your choice), memory (of your choice), thermal solution (heatspreader or heatsink, of your choice) and additional items such as a debug card, cabling, and ATX power supply.

The complete kit allows cusomters to quickly emulate the functionality of their end product for software development and hardware verification. Drivers, BSP, carrier board design files (including schematics, mechanical drawings and BOM), certificates, test reports, COM Express module user's manual and thermal solution drawing are included to assist cusomters in designing their own custom carrier board.

The Type 7 Starter Kit Plus also includes additional development cards, such as a 10GbE adapter card that converts 10GBase-KR to 10GbE optical fiber (SFP+ Card) or 10GbE copper (BASE-T card) signals, a PCIe x16 to two PCIe x8 adapter card (P16TO28) and a debug card (DB40).

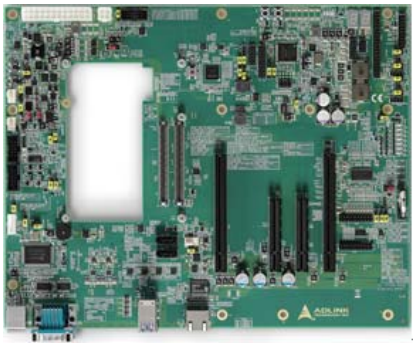
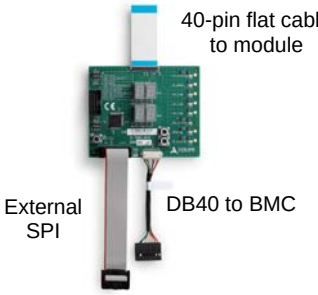
The Type 7 Starter Kit Plus also includes a USB flash drive with SEMA pre-installed in a Linux OS environment. This helps customers quickly review the features provided by the EAPI.

1.1. How to Order the Type 7 Starter Kit



1.2. What's Included in the Type 7 Starter Kit Plus

1.2.1. Standard Items

No.	Photo	Part Number	Description
1.		91-77105-0010	**Express-BASE7** Type 7 reference carrier board
2.		91-79301-0010	**PCIe x16 to two PCIe x8 adapter card** (P16TO28)
3.		91-79007-0020 30-30016-0000 30-10192-0000 30-20736-0000	**Debug Card** (DB40) 40-pin flat cable External SPI cable (used for BIOS update) DB40 to BMC cable (used for BMC FW update)
4.		31-32220-0000	**Power Supply Unit**
5.		29-02480-0040	**USB Flash Drive (**2pcs) One containing documents One with SEMA pre-installed in Linux OS
6.		30-10057-5010	**7-pin SATA cable** 180° (-) to 180°
7.		30-20171-1000	**SATA Power to Molex 4-pin cable**
		30-20027-3000	**PSU Converter Harness** ATX 20-pin to 24-pin
		30-00001-0030	**US Power Cord**, 10A, 125V
		30-00002-0010	**EU Power Cord**, 220V

1.2.2. Optional Items

No.	Photo	Part Number	Description
1.		-	**COM Express Type 7 module** of your choice
2.		-	**Memory module(s)** of your choice
3.	  	-	**Thermal solution** of your choice
4.		91-79010-0010	**10GbE SFP+adapter card*** Converts 2x 10GBASE-KR to 2x 10GbE optical fiber, SFP+ signals (requires selection of a Type 7 module supporting Optical Fiber mode)
5.		91-79009-0010	**10GbE BASE-T adapter card*** Converts 2x 10GBASE-KR to 2x 10GbE copper signals (requires selection of a Type 7 module supporting Copper mode)

*Note: Only one 10GbE adapter card will be included, depending on your choice of Type 7 module.

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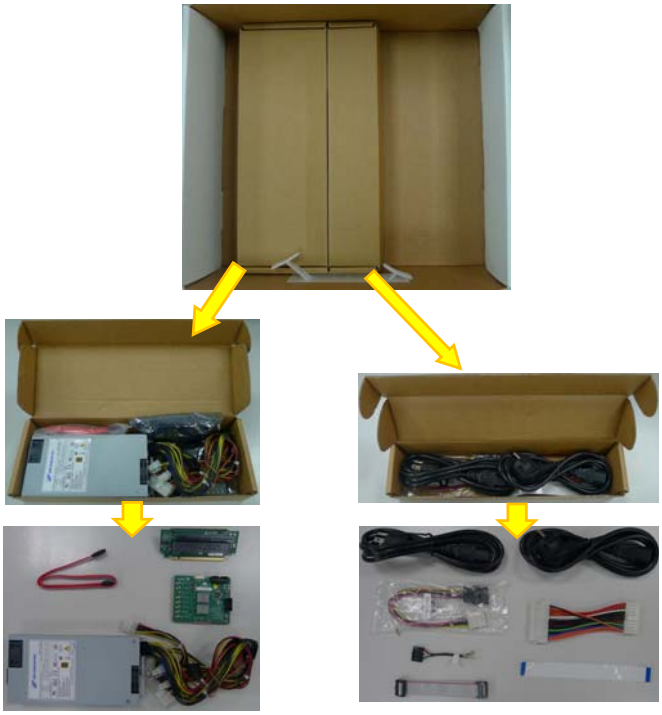
2. Getting Started

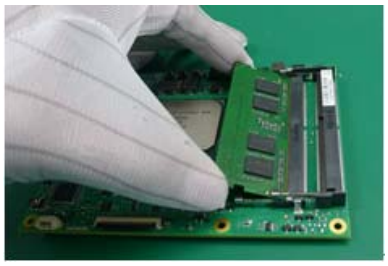
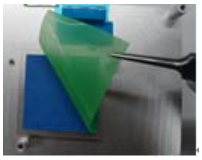
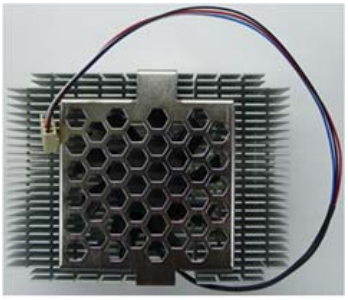
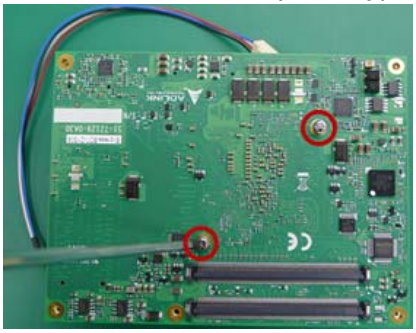
2.1. Unpacking

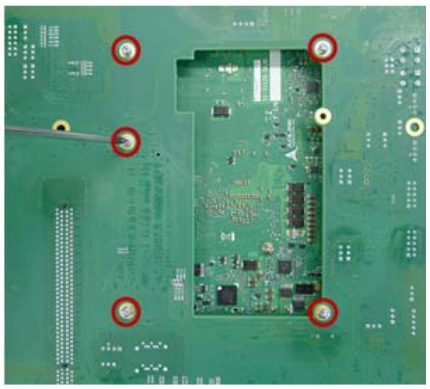
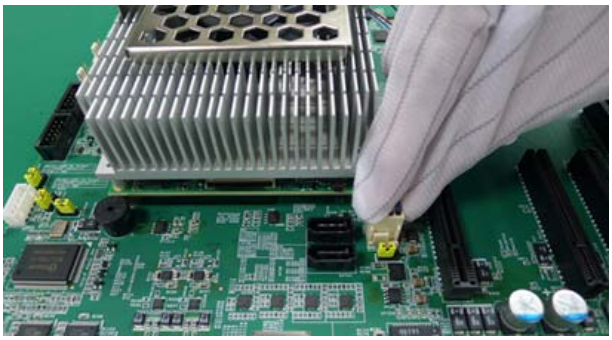
Check that the EPE foam layers contain the items shown below:

Remove the EPE foam layers and check accessory boxes contain items shown below:

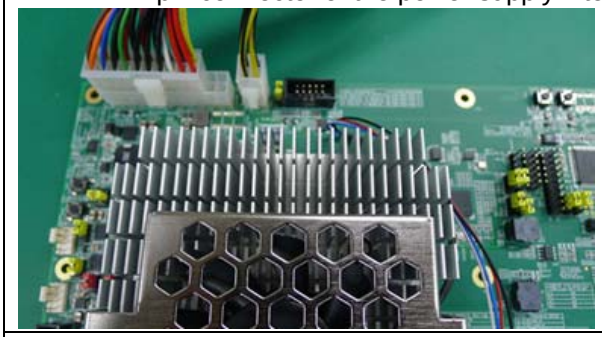
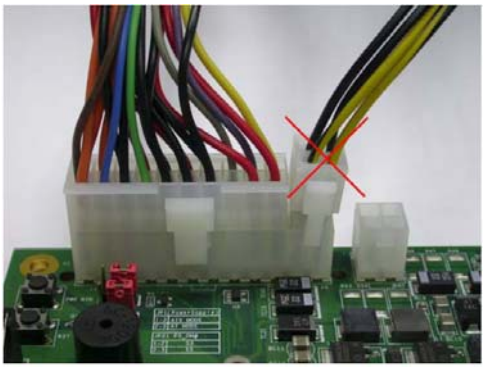


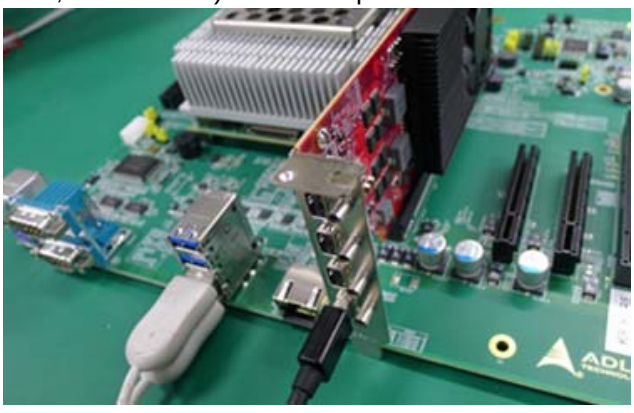
2.2. Board Installation

Procedure	Required Items
Step 1 Insert SO-DIMM memory into the COM Express Type 7 module's SO-DIMM socket. 	 
Step 2 Removed all protective membranes from the thermal pads. 	  
Step 3 Assemble the thermal solution onto the COM Express Type 7 module. 	
Step 4 Use the M2.5, L=6mm screws provided to fasten the thermal solution to the COM Express Type 7 module. 	

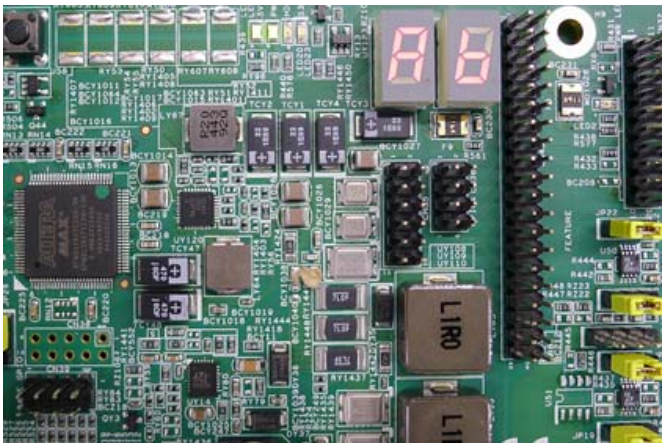
Procedure	Required Items
Step 5 Place the COM Express Type 7 module and thermal solution assembly onto the connectors on the carrier board as shown. 	
Step 6 Use the M2.5, L=16mm screws provided to secure the COM Express Type 7 module to the carrier board from the solder side. 	
Step 7 If you are installing a heatsink with fan, plug the fan connector into the carrier board as shown. 	None

2.3. Power and I/O Connectors

Connect the Power Supply	Required Items
Plug the ATX connector of the power supply into CN1 and plug the ATX 12V 4-pin connector of the power supply into CN5. 	
 CAUTION: **DO NOT** plug the ATX 12V 4-pin connector into the ATX 24-pin power connector.	
Plug the AC power cord into the power supply. 	

Connect the Keyboard, Mouse and External GPU Card	Required Items
Plug keyboard, mouse and display cable (if using an external GPU card, not included) into the Express-BASE7.  Console mode output also supported (Type 7 modules do not support graphics output).	None

2.4. Powering Up the Express-BASE7 System

Powering up the Express-BASE7 system	Required Items
The POST LEDs on the Express-BASE7 will display the bootup status – “A6” indicates a successful boot.  If no operating system is installed on the system, then the monitor will display the BIOS setup menu after the first boot up.	None

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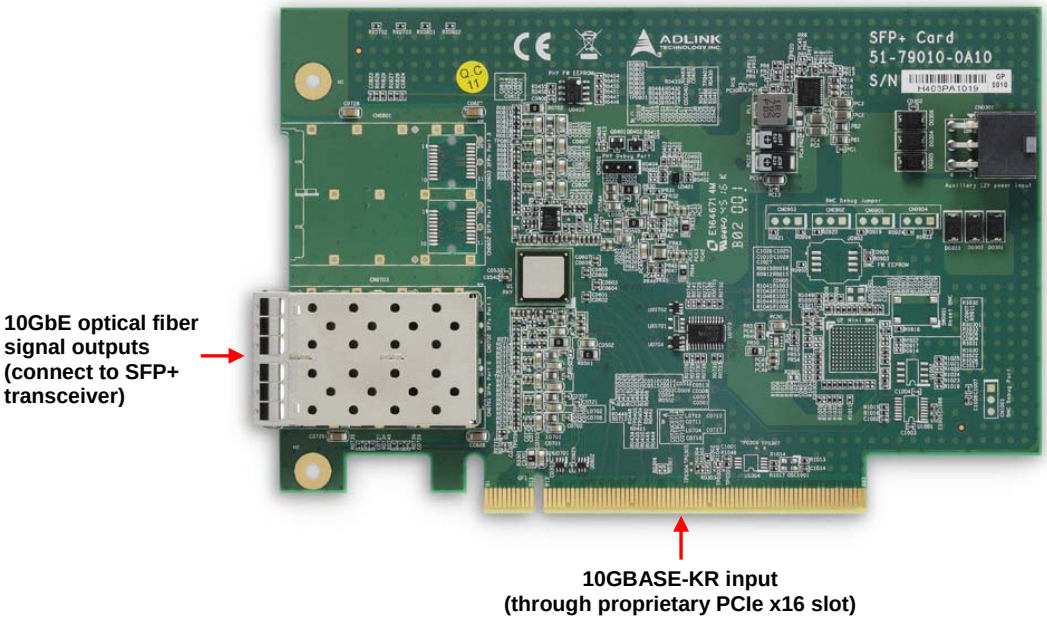
3. 10GbE Adapter Cards

ADLINK 10GbE Adapter Cards provide access to the COM Express Type 7 module's 10GBASE-KR interface and convert to 10GbE optical fiber or 10GbE copper (10GBASE-T) signals.

Note: An EEPROM dedicated for storing 10GbE controller firmware is located on the COM Express Type 7 module. The firmware supports either optical fiber PHY or copper PHY. Please choose an appropriate Type 7 COM Express module and paired 10GbE Adapter Card to achieve your desired functionality.

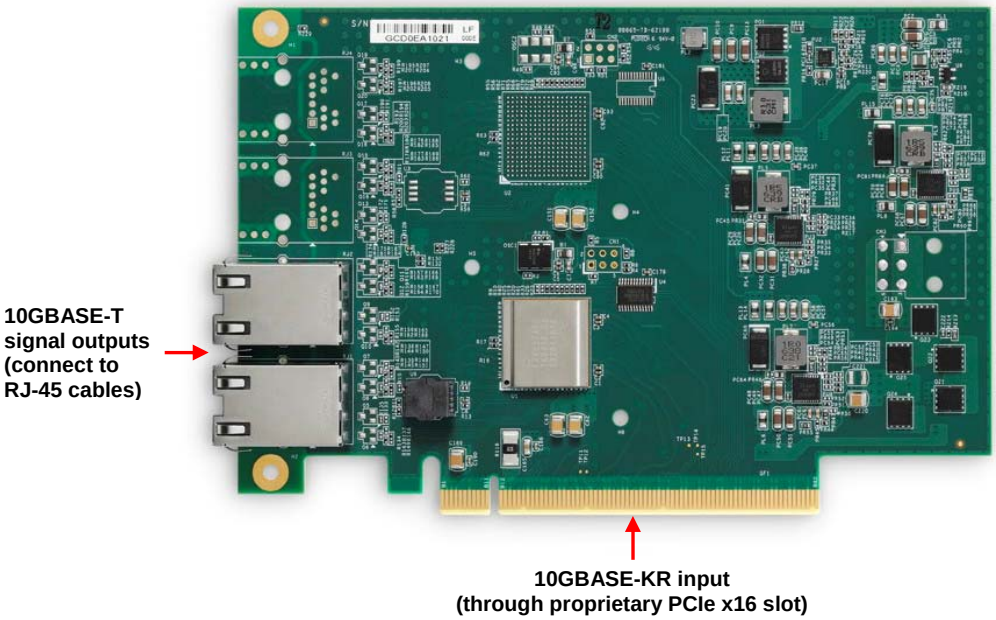
3.1. 10GbE SFP+ Card

The 10GbE SFP+ Card is a COM Express Type 7 10GbE optical fiber network adapter card that converts 10GBASE-KR & related sideband signals to 10GbE optical fiber interface and can connect to SFP+ transcievers through 10GbE optical fiber PHY. Please download the 10GbE SFP+ Card User's Manual from ADLINK website for more detailed information:
www.adlinktech.com/PD/web/PD_detail.php?cKind=&pid=1707



3.2. 10GbE BASE-T Card

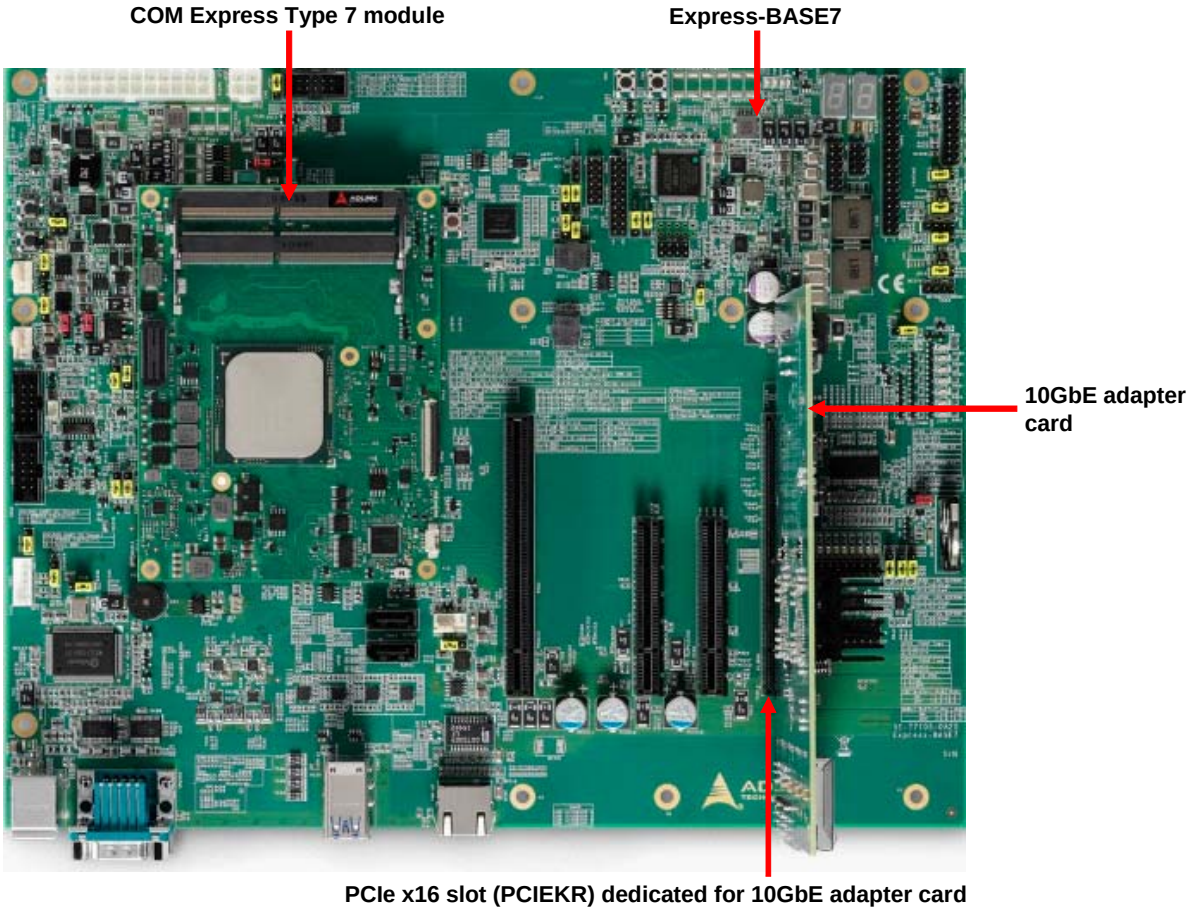
The 10GbE BASE-T Card is a COM Express Type 7 10GBASE-T network adapter card that converts 10GBASE-KR & related sideband signals to 10GBASE-T signals through 10GbE copper PHY. Please download 10GbE BASE-T Card User's Manual from ADLINK website for more detailed information:
www.adlinktech.com/PD/web/PD_detail.php?cKind=&pid=1708



3.3. 10GbE Adapter Card Installation

Below is an example of a 10GbE adapter card (use 10GbE Optical Fiber card) installed on the Express-BASE7 carrier board with a Type 7 COM Express module

Note: The PCIe x16 slot indicated below (PCIEKR) has a proprietary pinout dedicated for 10GbE adapter cards.



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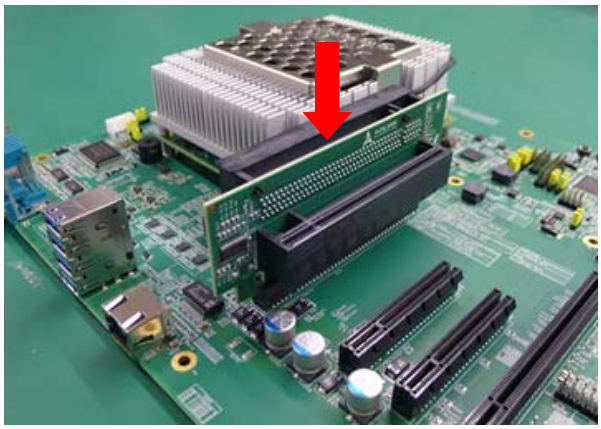
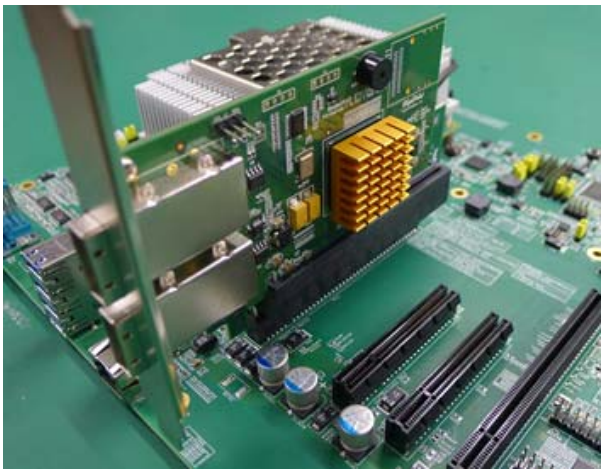
4. PCIe x16 to two PCIe x8 Adapter Card

The PCIe x16 to two PCIe x8 Adapter Card allows the use of two PCIe x8 add-on cards from a single PCIe x16 slot

Insert the adapter card into the PCIe x16 slot of the Express-BASE7 carrier board as shown below.



Insert PCIe x8 cards as required into the PCIe x8 slots of the adapter card.



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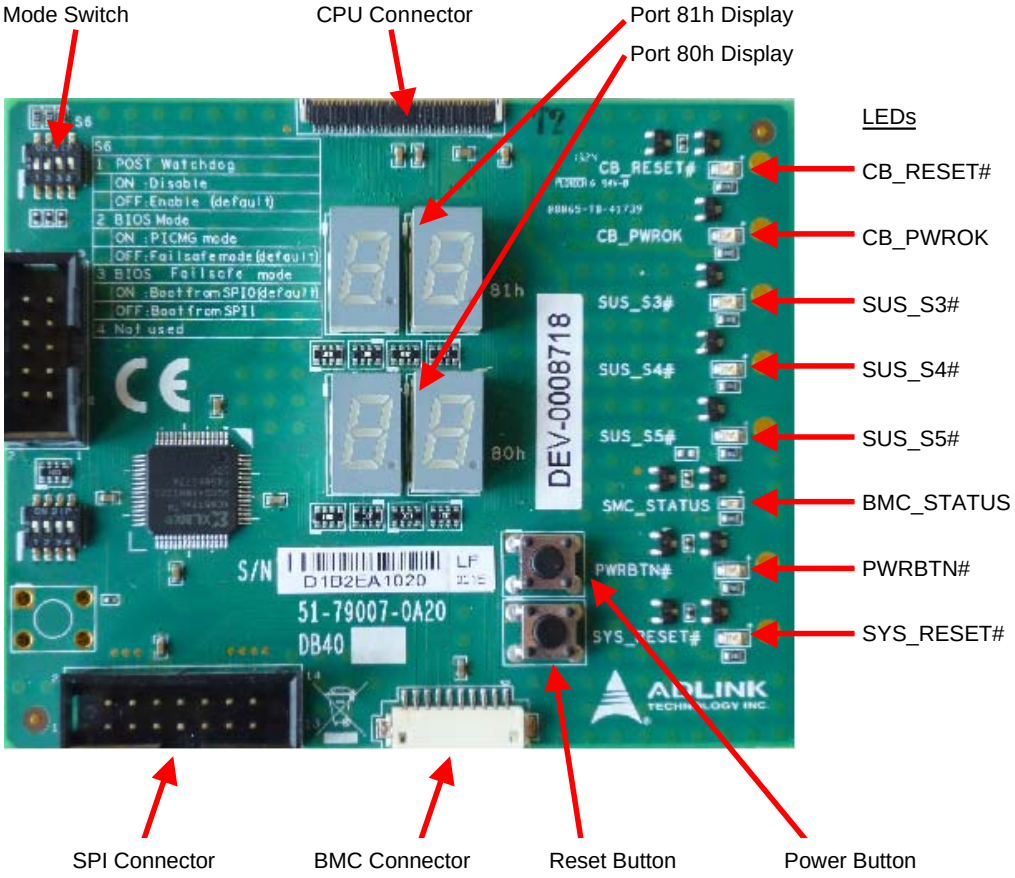
5. Debug Card

The DB40 Debug Card provides COM Express.system debugging functions and includes the following features:

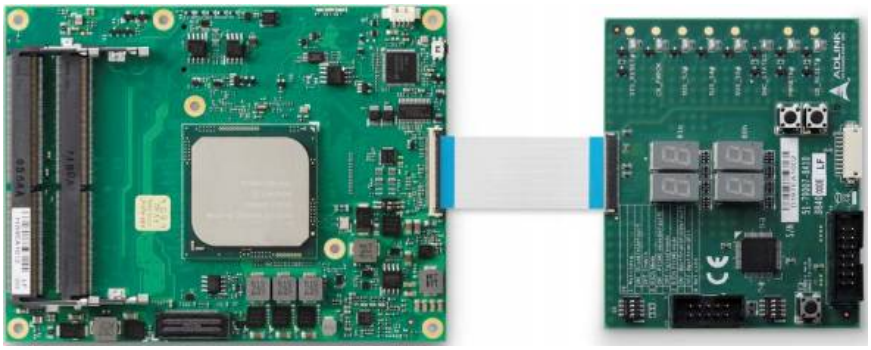
- **Port 80/81 Decoding Interface** with LED hexadecimal display for Power On Self Test (POST) via LPC interface
- **Interface to SPI Flash** for BIOS update
- **Interface to BMC** for Board Management Controller (BMC) update
- **Buttons** for Power and Reset
- **Status LEDs** for Power Button, Reset Button, CB_PWPOK, CB_RESET#, SLP_S3#, SLP_S4#, SLP_S5#

The DB40 Debug Card can only be used with COM Express products that have the appropriate 40-pin flat flexible connector (FFC).



5.1. Connecting the COM Express Module and Debug Card

Connect the COM Express module to the DB40 debug card using the 40-pin flat cable provided (P/N: 30-30016-0000).



5.2. Buttons and Switches

This section describes the buttons and switches on the DB40 debug card.

Power Button: toggles the PWRBTN# signal of the COM Express module.

Reset Button: toggles the SYS_RESET# signal of the COM Express module.

Mode Switch: this 4-pole DIP switch selects several modes :

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

5.3. Display and LEDs

This section describes the hexadecimal display and LED functionality.

5.3.1. Bootup Procedure

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 viewed on the DB40 Debug Card's LED display, allowing the techinican or administrator to debug the system. The POST code is written to I/O port 80h, and for extended POST codes port 80h and 81h are used.

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

5.3.2. LED Table

The following LEDs indicate status of system signals as shown in the table below.

LED	Function
CB_RESET#	LED lights on active reset signal of carrier board
CB_PWROK	LED lights on active power-OK from COM Express module
SUS_S3#	LED lights on released SUS_S3# signal from COM Express module
SUS_S4#	LED lights on released SUS_S4# signal from COM Express module
SUS_S5#	LED lights on released SUS_S5# signal from COM Express module
BMC_STATUS	LED shows the status of the BMC on the COM Express module
PWRBTN#	LED lights on active power button signal of COM Express module
SYS_RESET#	LED lights on active reset signal of COM Express module

5.3.3. BMC Status

The BMC_STATUS LED shows the status of the BMC on the COM Express module.

Behavior (blue)	Description
Blinking	A blinking BMC_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 onboard power supply is displayed by this signaling code. The error code is board specific (refer to the user's manual for your COM Express module).
Bright flash	A system state change occurs. Power-button activity, Reset-button activity, PCI_RST# activity or activity on the SLP_Sx signals is shown by this signaling mode.
Fast blinking	If the board is running on Fail-Safe-BIOS, the BMC_STATUS LED blinks very quickly.
Short bright flash every 4 seconds	System is in Suspend-to-RAM or Suspend-to-Disk state.

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Safety Instructions

Read and follow all instructions marked on the product and in the documentation before you operate your system. Retain all safety and operating instructions for future use.

- Please read these safety instructions carefully.
- Please keep this User‘s Manual for later reference.
- The equipment should be operated only from the type of power source indicated on the rating label. Make sure the voltage of the power source when connect the equipment to the power outlet.
- If your equipment has a voltage selector switch, make sure that the switch is in the proper position for your area. The voltage selector switch is set at the factory to the correct voltage.
- For pluggable equipment, that the socket-outlet shall be installed near the equipment and shall be easily accessible.
- Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
- If the equipment is not use for long time, disconnect the equipment from mains to avoid being damaged by transient overvoltage.
- All cautions and warnings on the equipment should be noted.
- Please keep this equipment from humidity.
- Do not use this equipment near water or a heat source.
- Lay this equipment on a reliable surface when install. A drop or fall could cause injury.
- Never pour any liquid into opening; this could cause fire or electrical shock.
- Openings in the case are provided for ventilation. Do not block or cover these openings. Make sure you provide adequate space around the system for ventilation when you set up your work area. Never insert objects of any kind into the ventilation openings.
- To avoid electrical shock, always unplug all power cables and modem cables from the wall outlets before removing covers.
- Lithium Battery provided (real time clock battery)

CAUTION – Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries according to the instructions

- If one of the following situations arises, get the equipment checked by a service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment has not work well or you can not get it work according to user‘s manual.
  - The equipment has dropped and damaged.
  - If the equipment has obvious sign of breakage.

Getting Service

Ask an Expert: http://askanexpert.adlinktech.com

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