



LEC-6032 Series

Industrial Communication Platform

User Manual

Rev 1.6

Date: Jan 19th, 2018

Revision History

Revision	Date	Description
0.1	December 17 th , 2015	Preliminary
1.0	December 25 th , 2015	Official release
1.1	January 28 th , 2016	Added model F
1.2	May 18, 2016	Updated the images of the add-on cards
1.3	July 8, 2016	Revised operating safety and lithium battery cautions
1.4	February 7, 2017	Revised LEC-6032C mechanical drawing, Front I/Os
1.5	July 28 th , 2017	Add Bios Settings
1.6	January 19 th , 2017	Add Appendix 3: P-Fail Relay for Dual Power Supply

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Online Resources

The listed websites are links to the on-line product information and technical support.

Resource	Website
Lanner	www.lannerinc.com
Product Resources	www.lannerinc.com/support/download-center
RMA	http://eRMA.lannerinc.com

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Compliances and Certification

CE Certification

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A Certification

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

EMC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used

in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Safety Guidelines

- Follow these guidelines to ensure general safety:
- Keep the chassis area clear and dust-free before, during and after installation.
- Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses/goggles if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit; always check the circuit.

LITHIUM BATTERY CAUTION:

Risk of explosion could occur if battery is replaced by an incorrect type. Please dispose of used batteries according to the recycling instructions of your country.

Operating Safety

- Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.

- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

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- Installation only by a trained electrician or only by an electrically trained person who knows all the applied or related installation and device specifications..
- Do not carry the handle of power supplies when moving to other place.
- The machine can only be used in a fixed location such as labs or computer facilities.

Mounting Installation Environment Precaution

1. Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
2. Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."

Consignes de sécurité

Suivez ces consignes pour assurer la securite generale :

- Laissez la zone du chassis propre et sans poussiere pendant et apres l'installation.
- Ne portez pas de vetements amples ou de bijoux qui pourraient etre pris dans le chassis. Attachez votre cravate ou echarpe et remontez vos manches.
- Portez des lunettes de securite pour proteger vosmyeux.
- N'effectuez aucune action qui pourrait creer un dangermpour d'autres ou rendre l'equipement dangereux.
- Coupez completement l'alimentation en eteignant l'alimentation et en debranchant le cordon d'alimentation avant d'installer ou de retirer un chassis ou de travailler a proximite de sources d'alimentation.
- Ne travaillez pas seul si des conditions dangereuses sont presentes.
- Ne considerez jamais que l'alimentation est coupee d'un circuit, verifiez toujours le circuit. Cet appareil genere, utilise et emet une energie radiofrequence et, s'il n'est pas installe et utilise

conformement aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- Jetez les piles usagées conformément aux instructions.
- L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.
- La machine ne peut être utilisée qu'à un lieu fixe comme en laboratoire, salle d'ordinateurs ou salle de classe.

Sécurité de fonctionnement

- L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
 - Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
 - Les décharges électrostatiques (ESD) peuvent endommager l'équipement et générer les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis. Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

Consignes de sécurité électrique

- Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm² ou 10 AWG.

Procédure de mise à la terre pour source d'alimentation

CC Procédure de mise à la terre pour source

d'alimentation CC

- Desserrez la vis du terminal de mise a la terre.
- Branchez le cable de mise a la terre a la terre.
- L'appareil de protection pour la source d'alimentation

CC doit fournir 30 A de courant. Cet appareil de protection doit etre branche a la source d'alimentation avant l'alimentation CC.

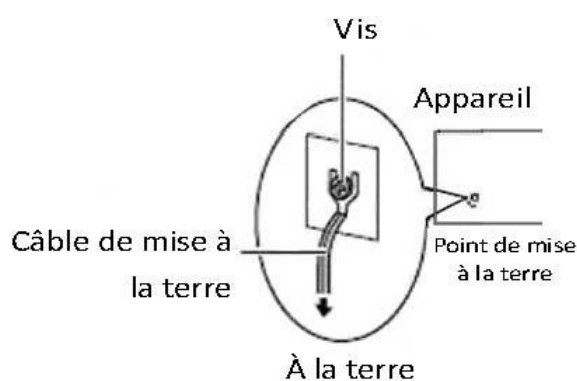


Table of Contents

Chapter 1: Introduction	10
Specifications	10
Ordering Information	12
Chapter 2: System Overview	13
Mechanical Drawing	13
Block Diagram	17
Front I/Os	19
Side I/Os	23
Rear I/Os	23
Chapter 3: Board Layout	24
Jumpers & Connectors Locations on the Motherboard	24
Jumpers & Connectors Locations (LEK-6032ENA: Add-on I/O Card for LEC-6032 B model)	25
Jumpers & Connectors Locations (LEK-6032FA: Add-on I/O Card for LEC-6032 C model)	26
Jumpers & Connectors Locations (LEK-6032ENB: Add-on I/O Card for LEC-6032 D model)	27
Jumpers & Connectors Locations (LEK-6032FB: Add-on I/O Card for LEC-6032 F model)	28
Jumpers and Connectors Table	29
Jumper Settings & Connector Pinout (Motherboard)	31
Jumper Settings & Connector Pinout (LEK-6032-EN A/B)	38
Jumper Settings & Connector Pinout (LEK-6032FA)	41
Jumper Settings & Connector Pinout (LEK-6032FB)	44
Chapter 4: Hardware Setup	47
Installing SO-DIMM Memory	49
Installing a Disk Drive	50
Mounting LEC-6032 by DIN Rail	52
Chapter 5: BIOS Setup	54
Notes: the images in the following section are for reference only. Main	54
Main	55
Advanced	56
LAN Boot Configuration	77
Chipset	78

Industrial Communication Platform

Security	82
Boot.....	83
Save & Exit	85
Appendix 1: Programming Watchdog Timer	90
Appendix 2: Lanner's Generation 3 Bypass	91
Appendix 3: P-Fail Relay for Dual Power Supply.....	93
Connecting the Alarm Device	94

Chapter 1: Introduction

Thank you for choosing LEC-6032 series. This industrial embedded Box PC is designed for networking capability for industrial environments. LEC-6032 is built with Intel Atom E3845 CPU inside for low processing power consumption. The system provides 5 LAN ports for network connections and 2 additional SFP ports for model type-C. To fit in harsh industrial environment, LEC-6032 can be mounted by DIN Rail and supports wide temperature operations. LEC-6032 is definitely the compact and robust embedded Box PC for industrial communications.

Product Features:

- Intel® Atom E3845 CPU
- 1 x 4 GB DDR3L SDRAM SO-DIMM socket
- USB: 1 x USB 2.0 Type-A port and 1 x USB 3.0 Type-A port
- Serial: 1 x RS-232 pin header. The port is enabled via cable connection.
- LAN port configuration
 - LEC-6032 B/D: 5 x RJ-45 10/100/1000 Mbps ports
 - LEC-6032 C: 5 x RJ-45 10/100/1000 Mbps ports and 2 x SFP GbE ports
 - LEC-6032 F: 3 x RJ-45 10/100/1000 Mbps ports and 4 x SFP GbE ports
- LAN Bypass (Lanner's Generation 3 bypass)
- Display: 1 x VGA pin header
- Storage: 1 x SATA 2.5" HDD/SSD kit
- Standards & Certifications: RoHS, CE, FCC
- Wide temperature : -40 to 75°C

Please refer to the following table for detailed specifications

Specifications

Processor	Intel® Atom™ Processor E3845(2M Cache, 1.91 GHz)
Memory	1 x SO-DIMM socket to support up to 4GB DDR3L SDRAM
BIOS	AMI SPI Flash BIOS
Serial	1 x RS-232 pin header 1 x DB9 with RS-232 (enabled by connecting the required cable with the pin header)
	ESD/surge protection

Industrial Communication Platform

		Serial Communication Parameters: ● Baud rate: up to 115200 bps
USB		1 x USB 3.0 Type-A port 1 x USB 2.0 Type-A port
Display		Intel® Integrated 1 x VGA internal pin header
Storage		1x SATA 2.5" HDD/SSD kit
Board-to-Board		2x40-pin PCIe based board-to-board connector
Network	Ethernet Controller	Intel® i210-IT/ Intel® i210-IS
	Ethernet Ports	● LEC-6032 B: 5 x 10/100/1000Mbps ports, Autosensing, RJ-45, w/ LED, w/ two bypass GEN 3 ● LEC-6032 C: 5 x 10/100/1000Mbps ports, Autosensing, RJ-45, w/ LED, w/ one bypass GEN 3 and 2 x 1000Mbps SFP ● LEC-6032 D: 5 x 10/100/1000Mbps ports, Autosensing, RJ-45, w/ LED, w/ one bypass GEN 3 ● LEC-6032 F: 3 x 10/100/1000Mbps ports, Autosensing, RJ-45, w/LED, w/one bypass Gen 3, and 4 x 1000Mbps SFP ports
	Protection	1.5KV built-in
LEDs		● HDD: Blinking indicates hard disk activities, whereas off indicates there is no hard disk present or data access activities. ● RUN: A programmable dual green/red LEDs which can be used for indicating system status. ● PWR: Green indicates power-on, whereas off indicates power-off status. ● SFP(only LEC-6032 C/F): Blinking indicates active, and green indicates link for fiber status. ● LAN: Active in blinking yellow LED, and speed in green (100Mbps) / yellow (1Gbps).
Physical Characteristics	Dimensions	78.0 x 146.0 x 127.0, unit: mm
	Housing	Aluminum

Industrial Communication Platform

	Mounting	DIN Rail
Power	Input Voltage	12 - 36Vdc power input via 6-pin Phoenix Contact connector
Reliability Tool	Automatic Reboot Setting	Watchdog Timer 1~255 level time interval system reset, software programmable
	Alter Tool	Built-in buzzer and RTC (real-time clock) with lithium battery backup
	Reset	HW / SW reset button through jumper select.
Environment	Operating Temperature	-40~75°C
	Non-operating Temperature	-40~85°C
	Humidity	5 to 95% (non-condensing)
Standards & Regulations	Green	RoHS
	EMC	CE, FCC

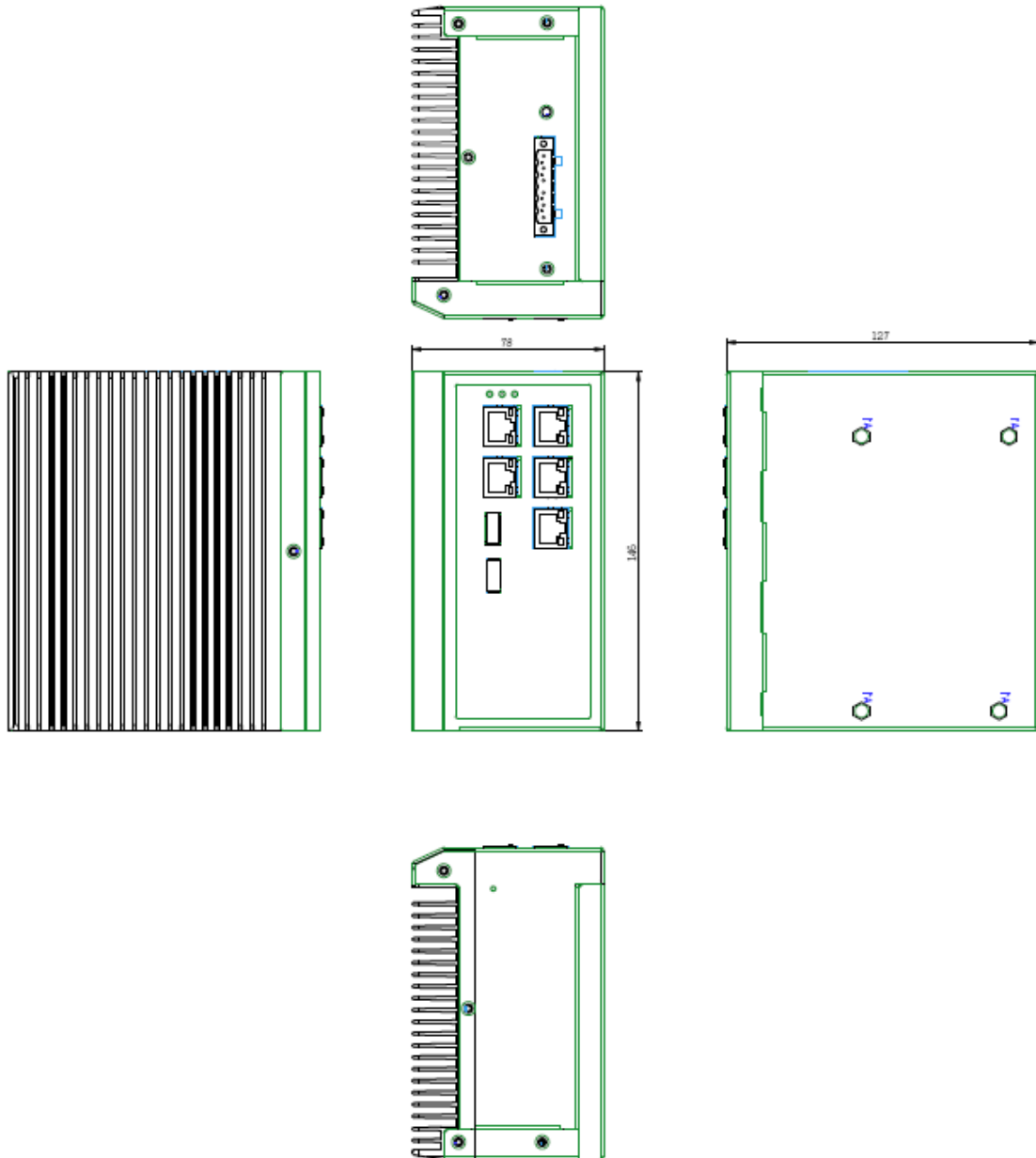
Ordering Information

LEC-6032 B (LEB-6032B / LEK-6032ENA)	Intel ATOM E3845 1.91GHz CPU, 5 x Intel I210IT GbE w/ two bypass GEN3, 1 x USB 2.0 + 1 x USB 3.0, 1 x DDR3L SO-DIMM, Internal pin header: 1 x Serial, 1 x VGA DC power input 12 - 36Vdc w/ 6-pin
LEC-6032 C (LEB-6032B / LEK-6020FA)	Intel ATOM E3845 1.91GHz CPU, 5 x Intel I210IT GbE w/ one bypass GEN3 + 2 x Intel I210IS GbE, 1 x USB 2.0 + 1 x USB 3.0, 1 x Serial, 1 x DDR3L SO-DIMM Internal pin header: 1 x VGA DC power input 12 - 36Vdc w/ 6-pin
LEC-6032 D (LEB-6032B / LEK-6032ENB)	Intel ATOM E3845 1.91GHz CPU, 5 x Intel I210IT GbE w/ one bypass GEN3, 1 x USB 2.0 + 1 x USB 3.0, 1 x Serial, 1 x DDR3L SO-DIMM, Pin header: 1 x VGA DC power input 12 - 36Vdc w/ 6-pin
LEC-6032 F (LEB-6032B / LEK-6032FB)	Intel ATOM E3845 1.91GHz CPU, 3 x Intel I210IT GbE w/ one bypass GEN3 + 4 x Intel I210IS GbE, 1 x USB 2.0 + 1 x USB 3.0, 1 x Serial, 1 x DDR3L SO-DIMM, Internal pin header: 1 x VGA, DC power input 12 - 36Vdc w/ 6-pin

Chapter 2: System Overview

Mechanical Drawing

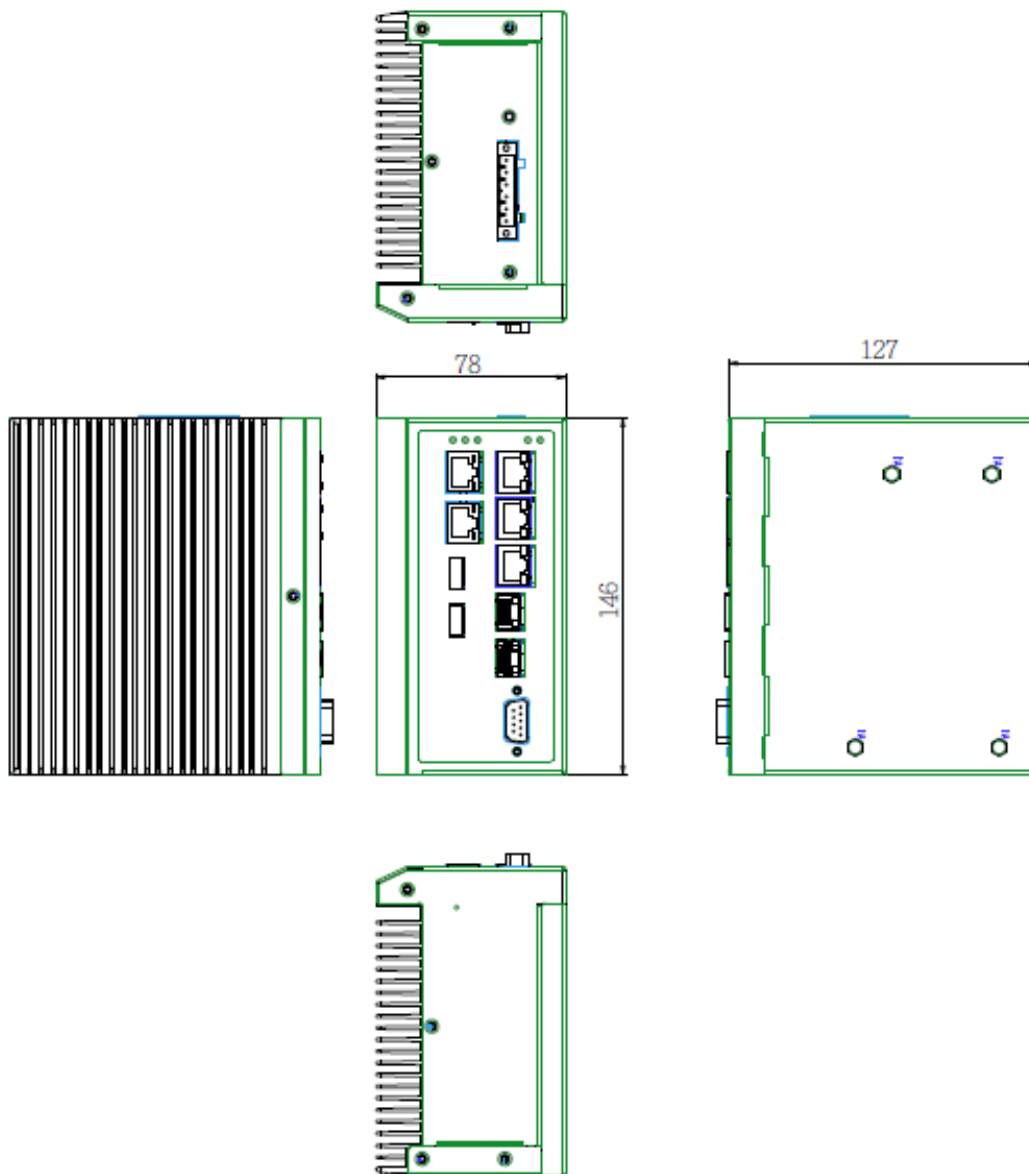
LEC-6032 B



Unit: mm

Industrial Communication Platform

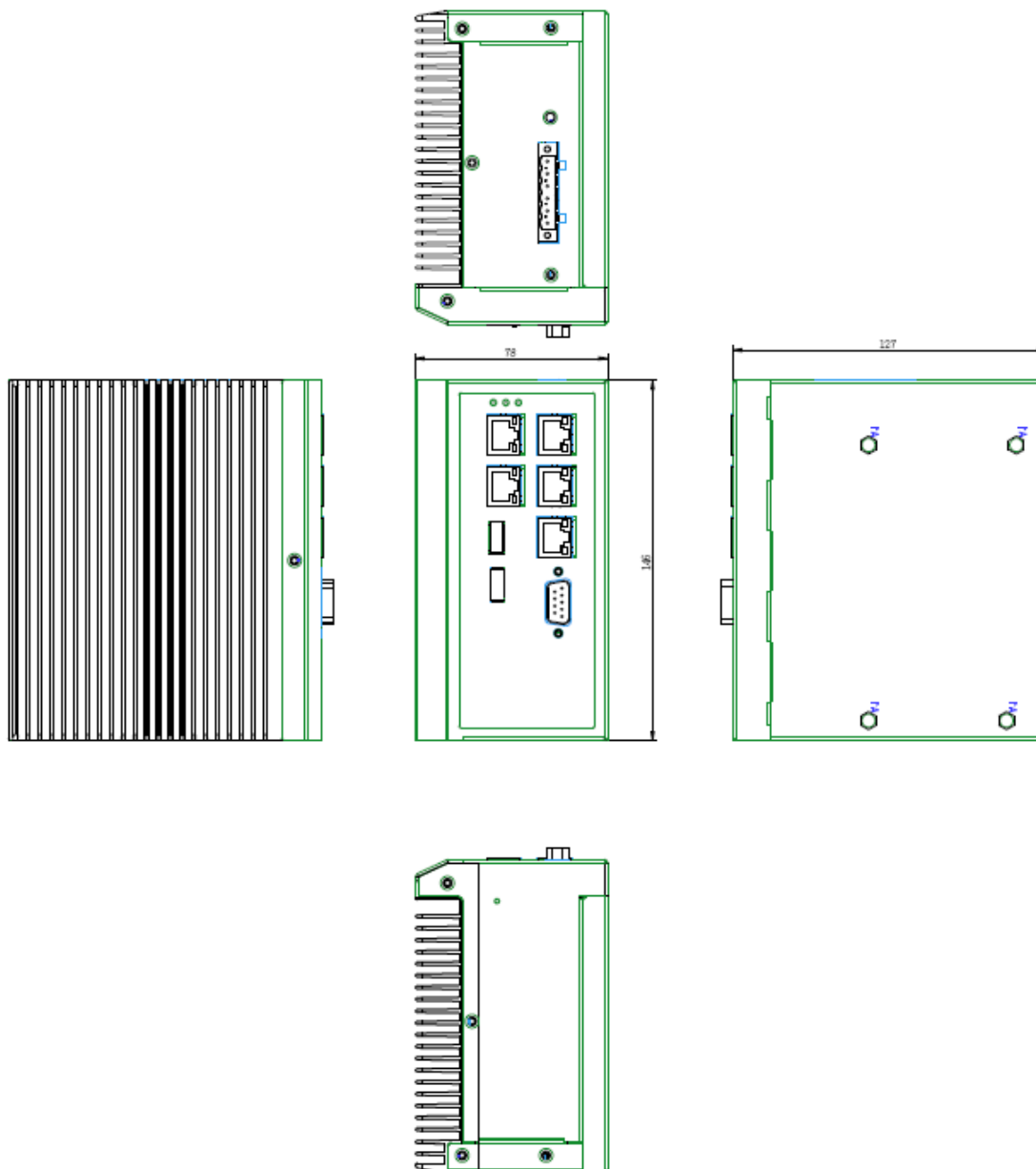
LEC-6032 C



Unit: mm

Industrial Communication Platform

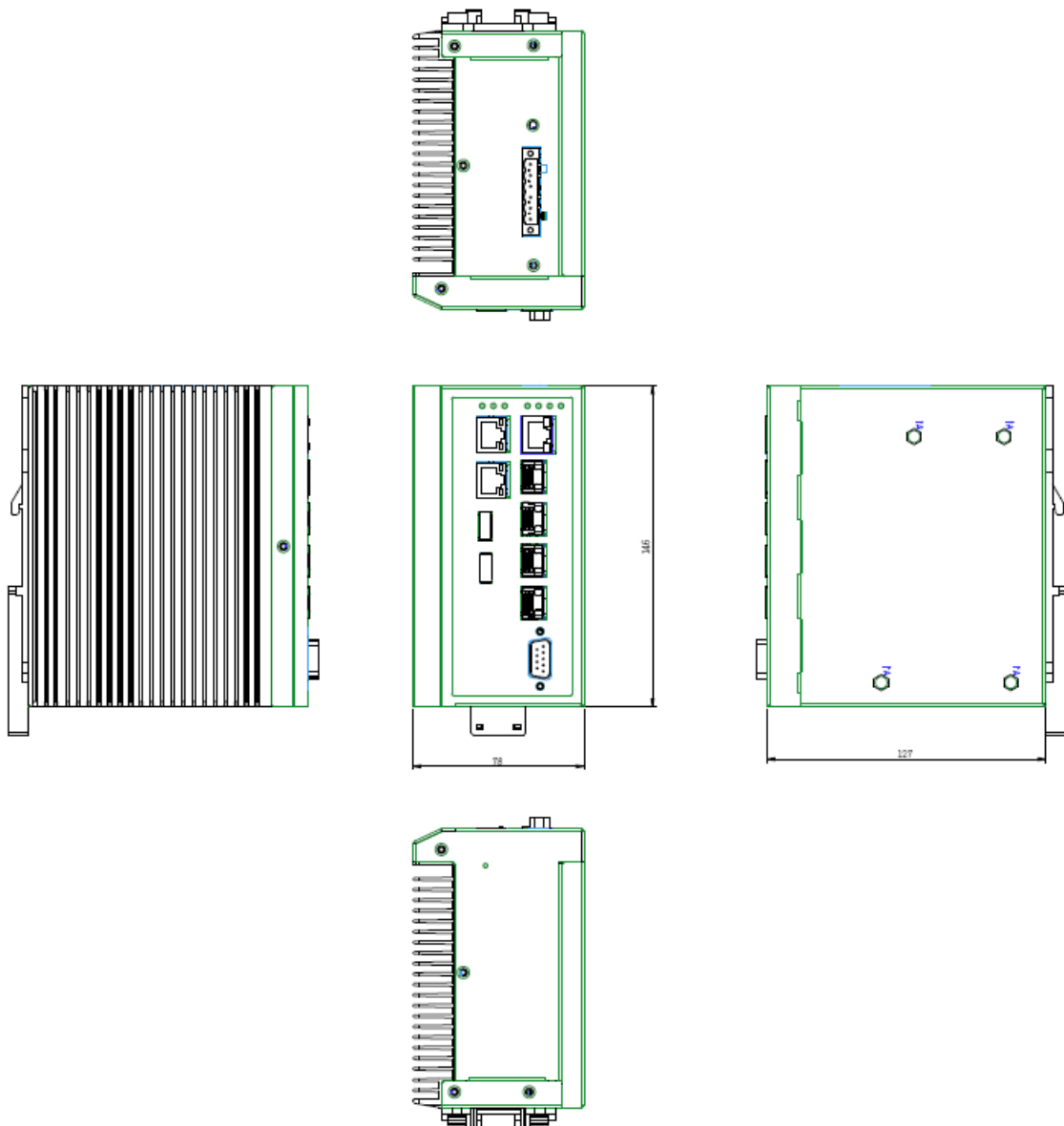
LEC-6032 D



Unit: mm

Industrial Communication Platform

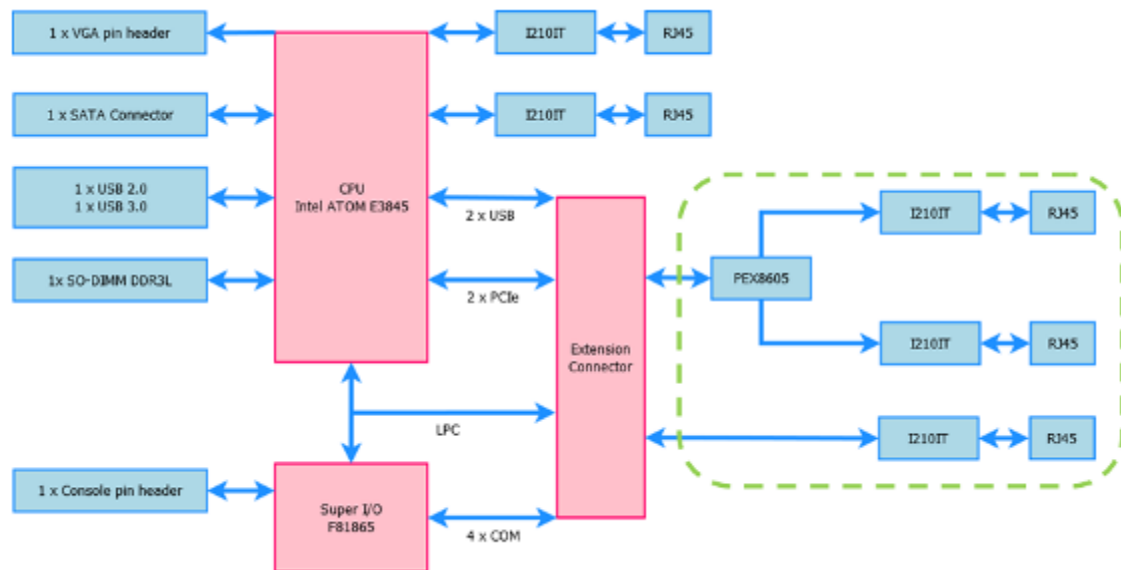
LEC-6032 F



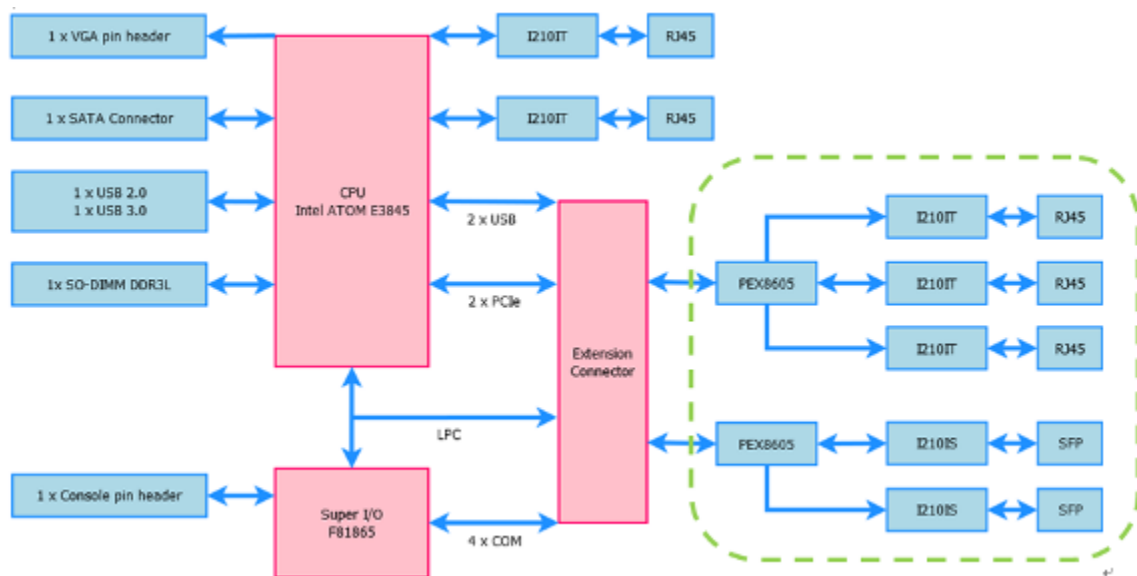
Unit: mm

Block Diagram

LEC-6032 B

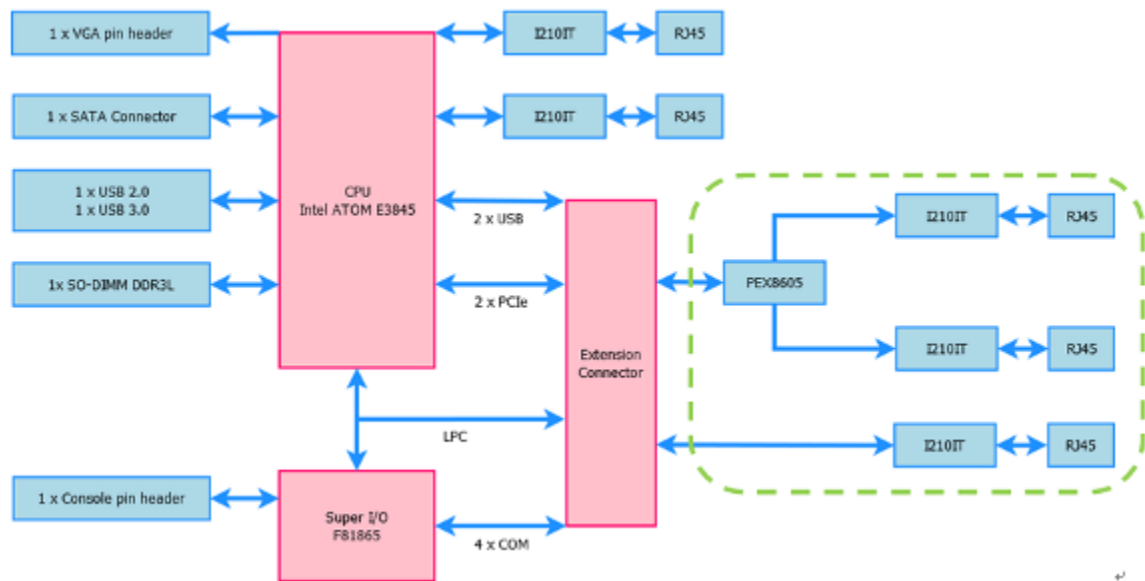


LEC-6032 C

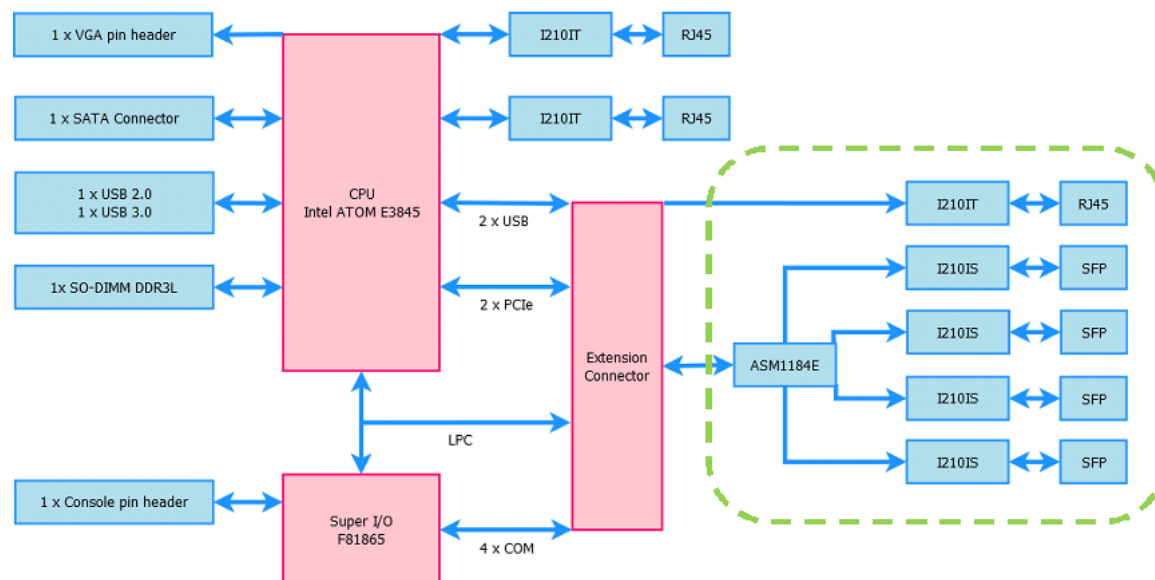


Industrial Communication Platform

LEC-6032 D

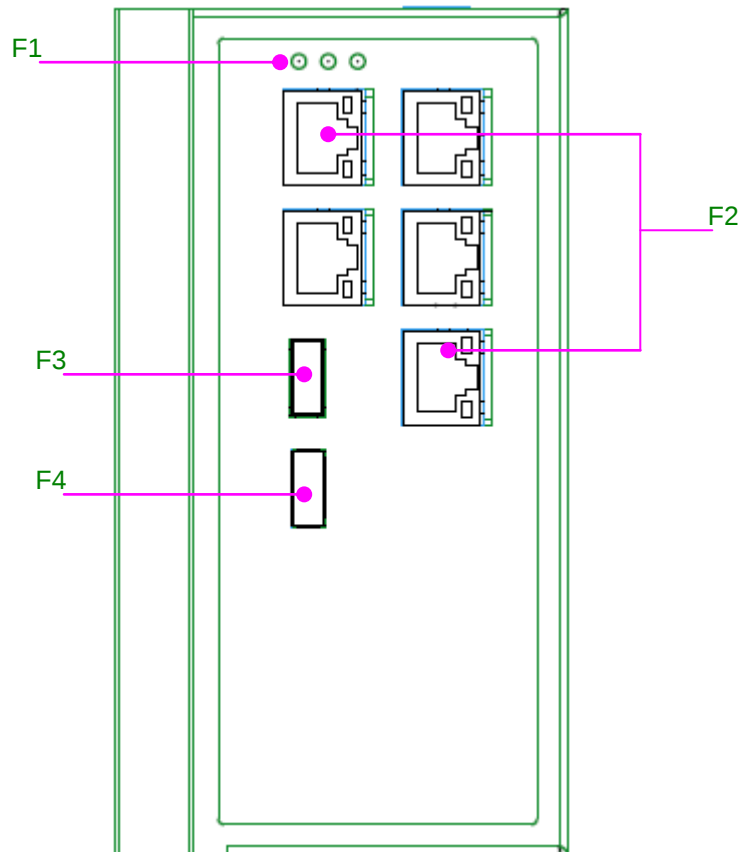


LEC-6032 F



Front I/Os

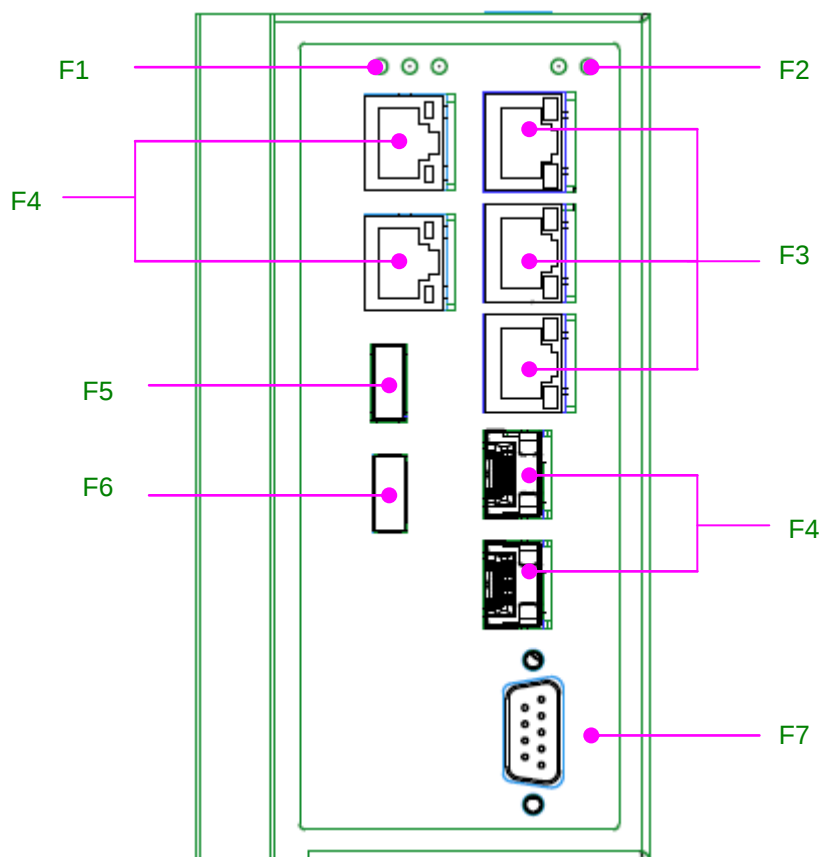
LEC-6032 B



F1 PWR/RUN/HDD LED	1 x PWR/RUN/HDD LED set for power, device and storage activity status
F2 LAN	5 x 10/100/1000 mbps RJ-45 LAN ports
F3 USB 2.0	1 x USB2.0 Type-A port
F4 USB 3.0	1 x USB3.0 Type-A port

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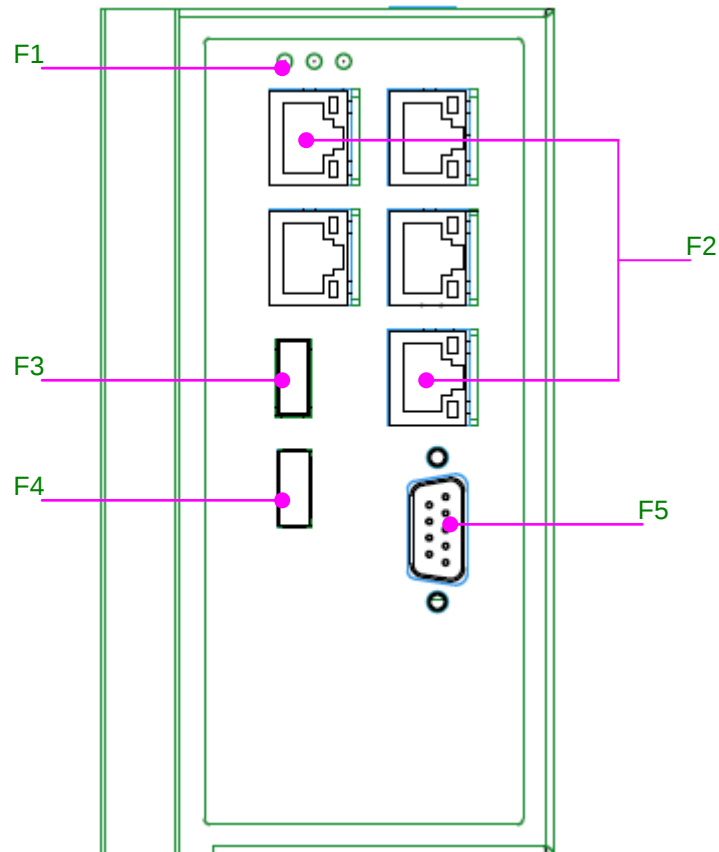
LEC-6032 C



F1 PWR/RUN/HDD LED	1 x PWR/RUN/HDD LED set for power, device and storage activity status
F2 SFP LED	Blinking indicates active, and green indicates link for fiber status
F3 LAN	5 x 10/100/1000 mbps RJ-45 LAN ports
F4 SFP	2 x SFP GbE ports
F5 USB 2.0	1 x USB2.0 Type-A port
F6 USB 3.0	1 x USB3.0 Type-A port
F7 DB9 COM	1 x DB9 COM port with RS-232 (enabled by connecting the required cable to the internal pin header)

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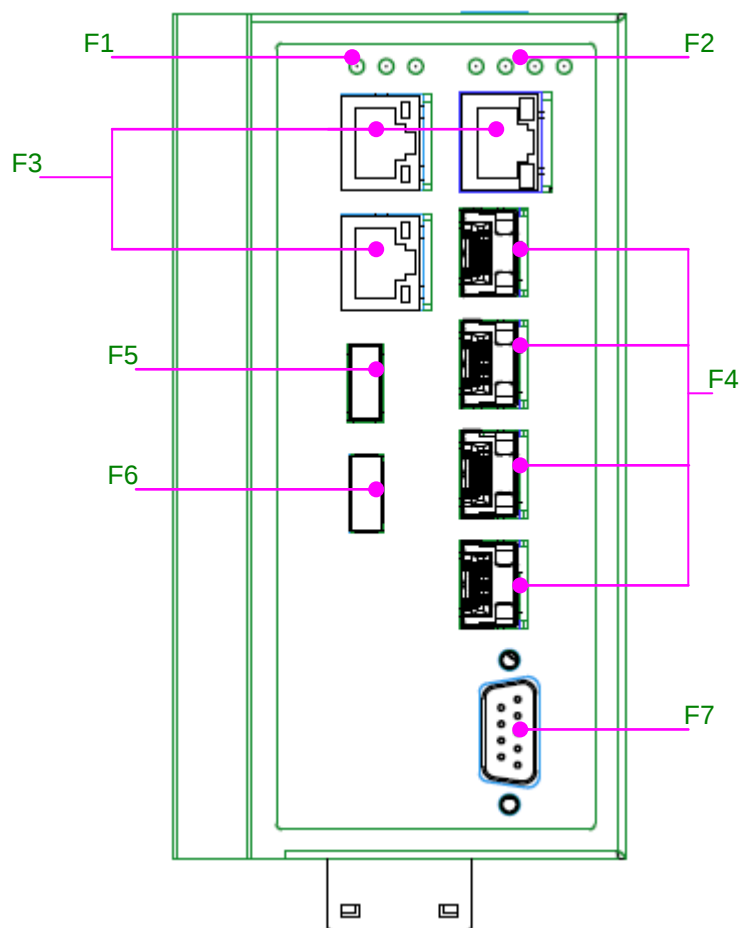
LEC-6032 D



F1 PWR/RUN/HDD LED	1 x PWR/RUN/HDD LED set for power, device and storage activity status
F2 LAN	5 x 10/100/1000 mbps RJ-45 LAN ports
F3 USB 2.0	1 x USB2.0 Type-A port
F4 USB 3.0	1 x USB3.0 Type-A port
F5 DB9 COM	1 x DB9 COM port with RS-232 (enabled by connecting the required cable to the internal pin header)

Industrial Communication Platform

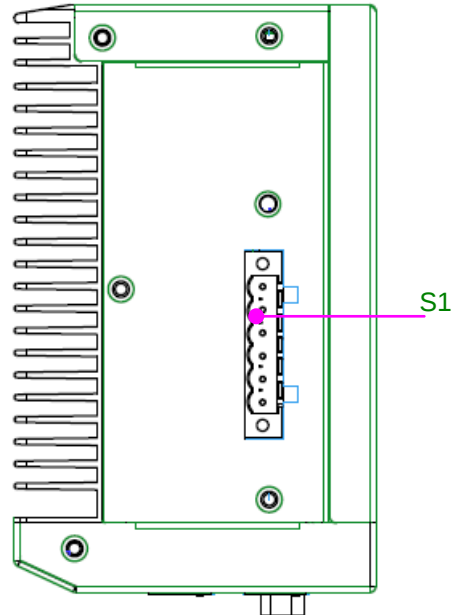
LEC-6032 F



F1 PWR/RUN/HDD LED	1 x PWR/RUN/HDD LED set for power, device and storage activity status
F2 SFP LED	Blinking indicates active, and green indicates link for fiber status
F3 LAN	3 x 10/100/1000 mbps RJ-45 LAN ports
F4 SFP	4 x SFP GbE ports
F5 USB 2.0	1 x USB2.0 Type-A port
F6 USB 3.0	1 x USB3.0 Type-A port
F7 DB9 COM	1 x DB9 COM port with RS-232 (enabled by connecting the required cable to the internal pin header)

Side I/Os

LEC-6032 B/C/D/F



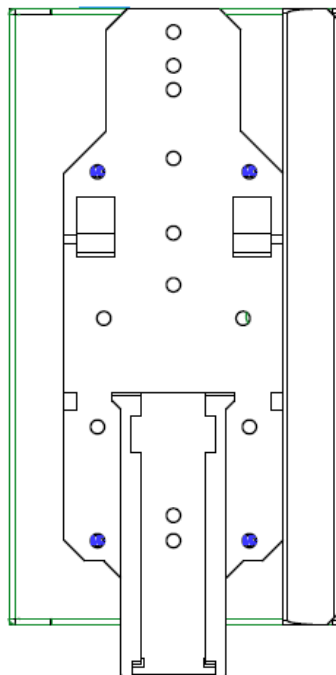
S1 Power Input

12 - 36Vdc power input via 6-pin Phoenix Contact connector

Rear I/Os

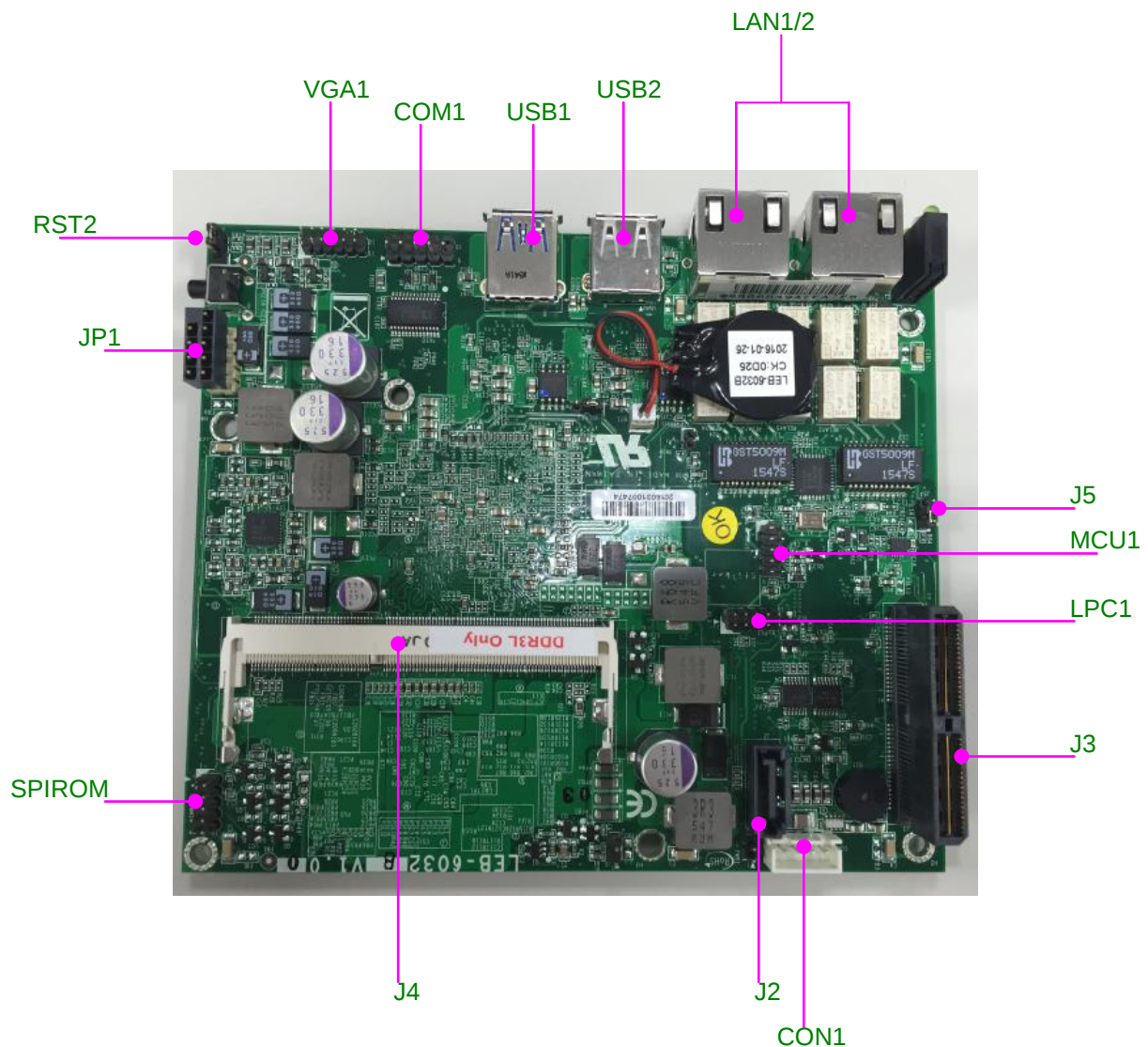
LEC-6032 B/C/D/F

The bracket on the rear is designed for DIN Rail mounting purpose.

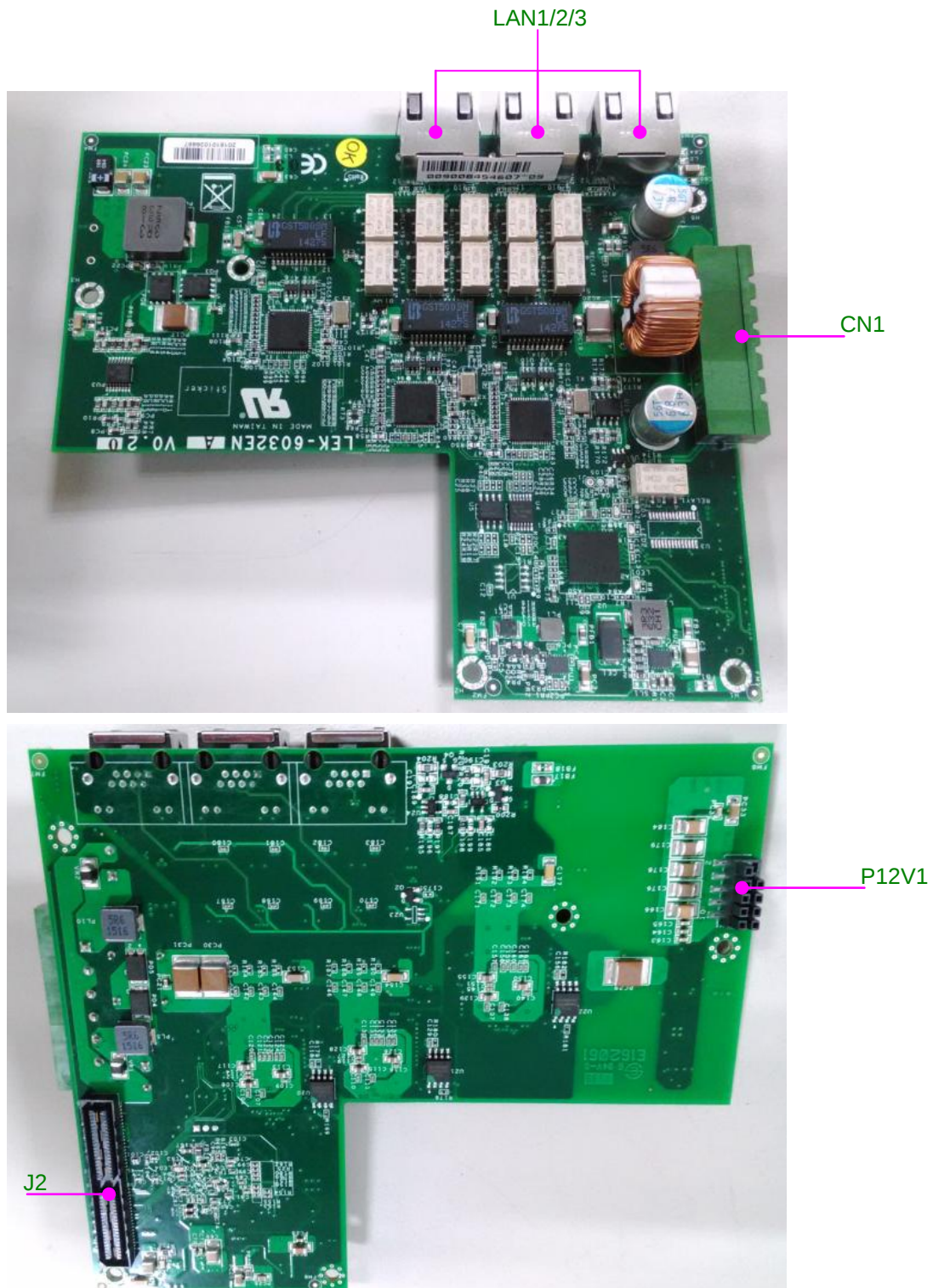


Chapter 3: Board Layout

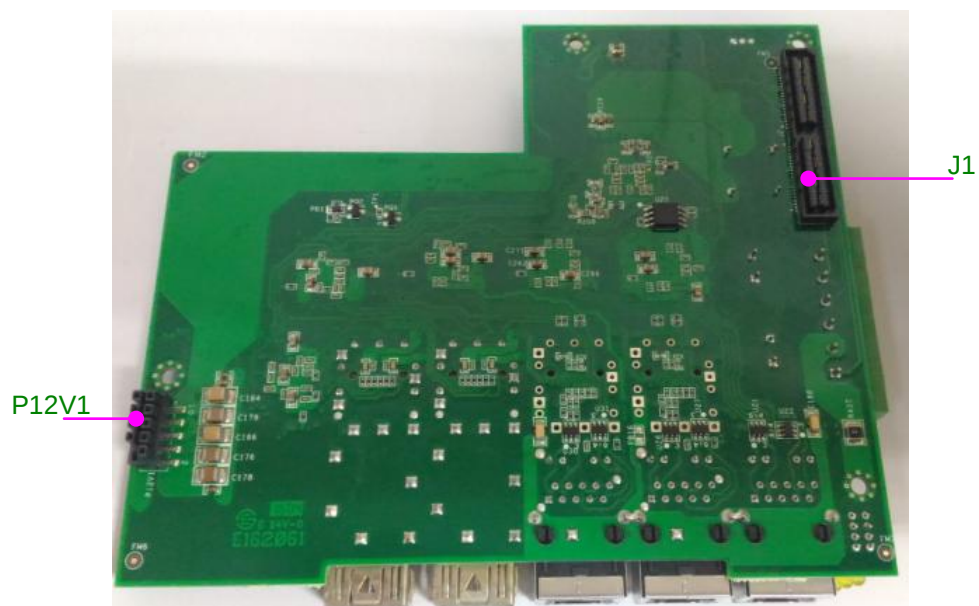
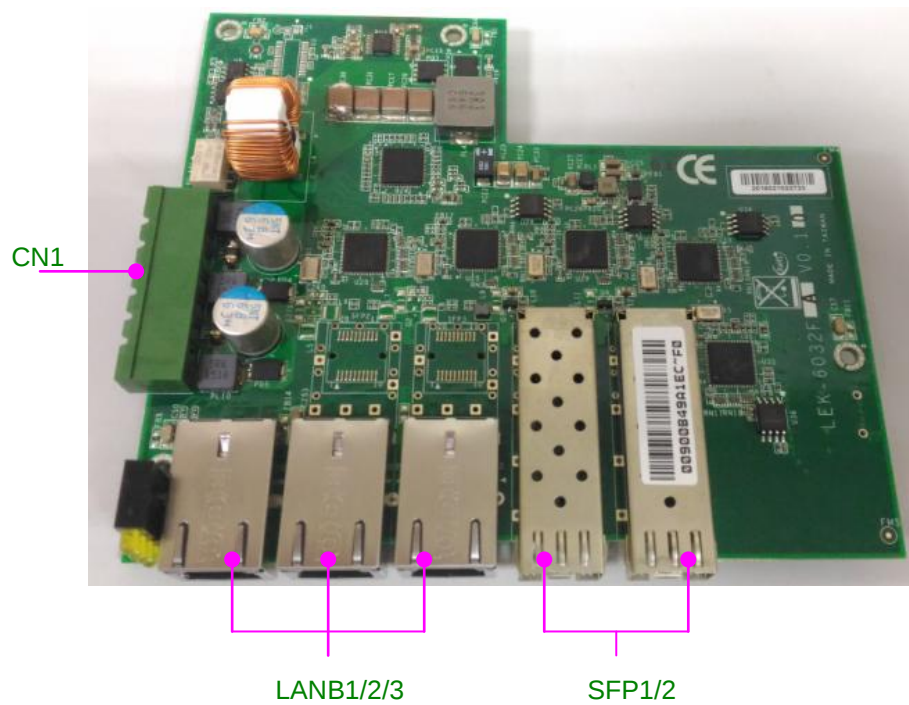
Jumpers & Connectors Locations on the Motherboard



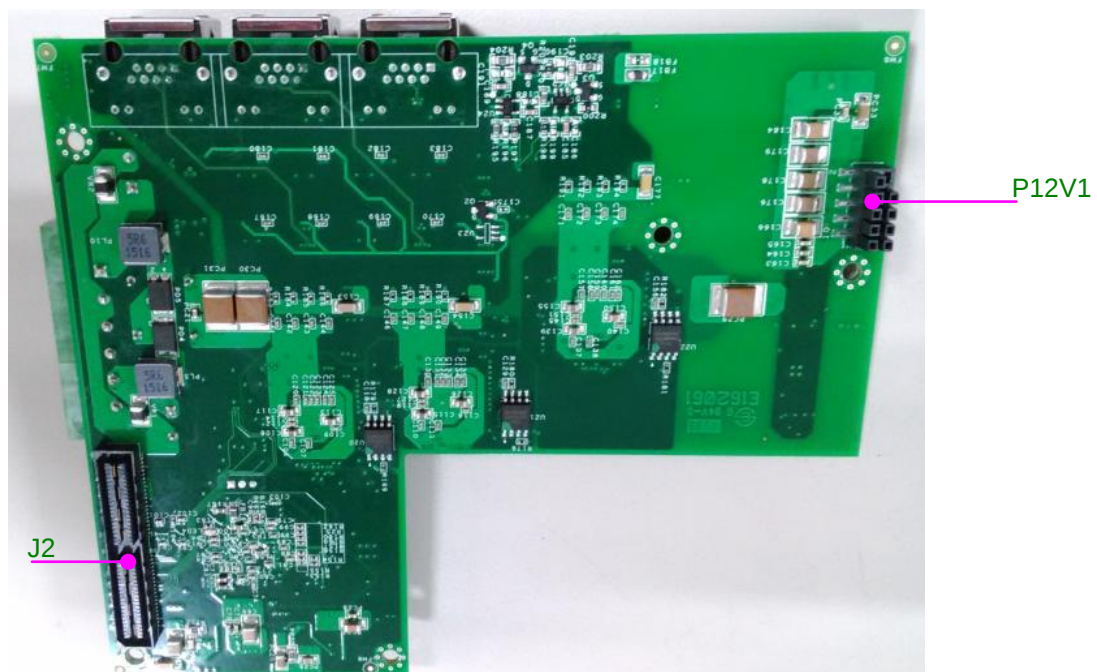
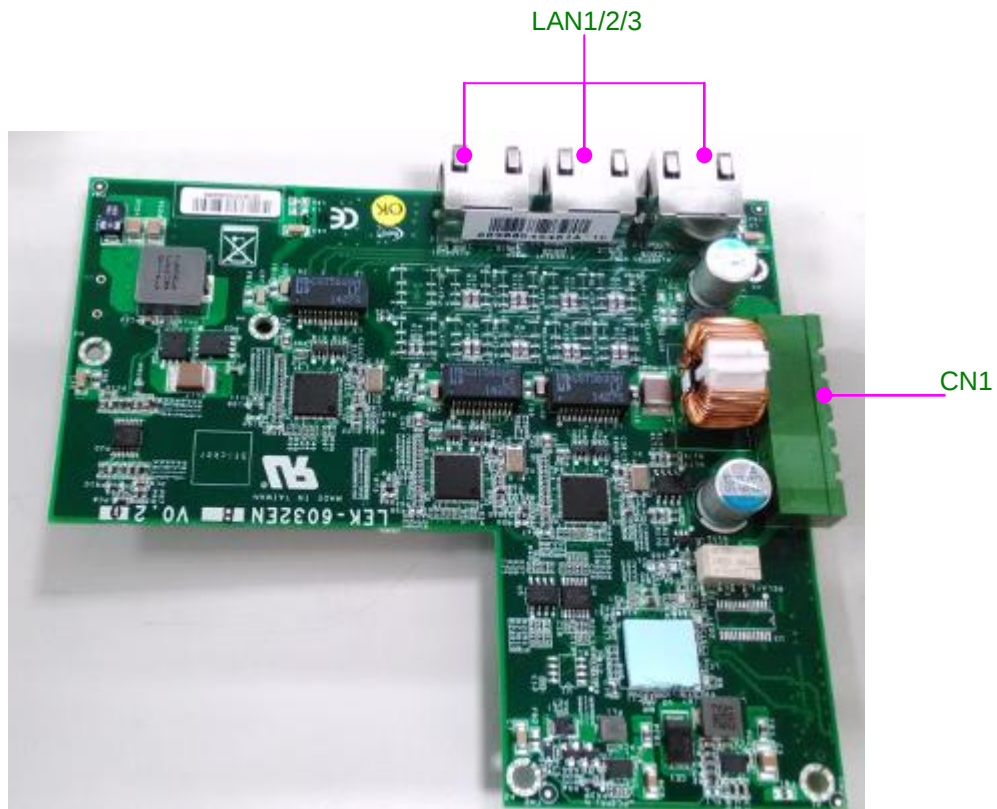
Jumpers & Connectors Locations (LEK-6032ENA: Add-on I/O Card for LEC-6032 B model)



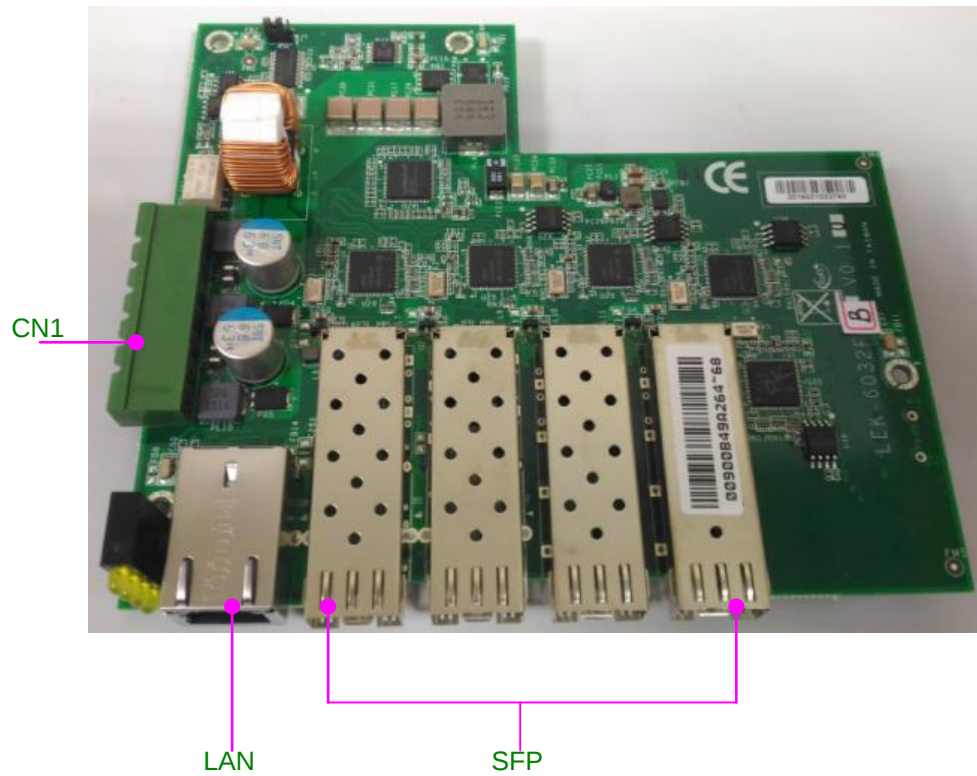
Jumpers & Connectors Locations (LEK-6032FA: Add-on I/O Card for LEC-6032 C model)



Jumpers & Connectors Locations (LEK-6032ENB: Add-on I/O Card for LEC-6032 D model)



Jumpers & Connectors Locations (LEK-6032FB: Add-on I/O Card for LEC-6032 F model)



Jumpers and Connectors Table

The Motherboard

Label	Description	Note
LAN1/2	2 x RJ-45 LAN ports	
USB1	1 x USB3.0 Type-A port	
USB2	1 x USB2.0 Type-A port	
COM1	RS-232 internal pin header	
VGA1	Internal VGA pin header	
RST2	Jumper setting for hardware/software reset	
JP1	Board-to-board power connector	
SPIROM1	For debug purpose	
J4	DIMM	
J2	SATA 7-pin signal connector	
CON1	SATA 4-pin power connector	
J3	2x40pin board-to-board connector	
LPC1	For debug purpose	
MCU1	LPC1114 burn connector	
J5	Clear CMOS	

LEK-6032 ENA/ENB as Add-On Card for LEC-6032 B/D

Label	Description	Note
CN1	6-pin power input	
LAN1/2/3	3 x GbE LAN ports	
P12V1	Board-to-board power connector	
J2	Board-to-board connector	

LEK-6032FA as Add-On Card for LEC-6032 C

Label	Description	Note
CN1	6-pin power input	
LANB1/2/3	3 x GbE LAN ports	
P12V1	Board-to-board power connector	
J1	Board-to-board connector	
SFP1/2	2 x SFP LAN ports	

Industrial Communication Platform

LEK-6032FB as Add-On Card for LEC-6032 F

Label	Description	Note
CN1	6-pin power input	
LAN	1 x GbE LAN ports	
P12V1	Board-to-board power connector	
J1	Board-to-board connector	
SFP	4 x SFP LAN ports	

Jumper Settings & Connector Pinout (Motherboard)

Jumper Setting

PWR1: Power On/Off

Jumper	Description
1-2	Power ON/OFF system
NC (Default)	Normal



CLR1 : Clear CMOS

Jumper	Description
1-2	Clear CMOS RAM
NC (Default)	Normal



J1: AT mode select

Jumper	Description
1-2	AT mode
NC (Default)	Normal



RST2: Hardware/Software select

Jumper	Description
1-2	Software reset
2-3 (Default)	Hardware reset



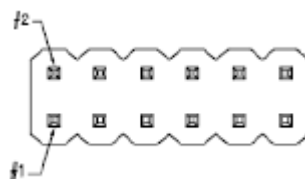
J5: LPC1114 Burn Select

Jumper	Description
2-3	Burn mode
NC (Default)	Normal



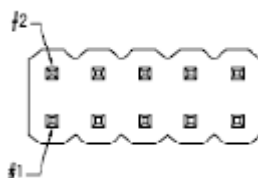
Connector Pin Assignment

VGA1: VGA pin header



Pin	Description
1	VGA_R
2	GND
3	VGA_G
4	GND
5	VGA_B
6	GND
7	VGA_HSYNC
8	GND
9	VGA_VSYNC
10	Ground
11	DD_DATA
12	DD_CLK

LPC1: LPC pin header (For debug purpose)

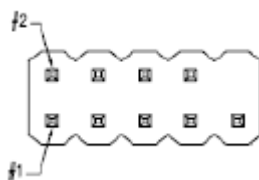


Pin No.	Description	Pin No.	Description
1	LPC_CLK_1	2	LPC_AD1

Industrial Communication Platform

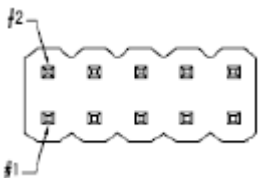
3	PLTRST_P80_N	4	LPC_AD0
5	LPC_FRAME_N	6	P3V3
7	LPC_AD3	8	GND
9	LPC_AD2	10	GND

COM1: serial COM pin header with RS-232 signal



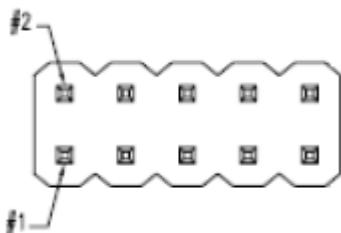
Pin No.	Description	Pin No.	Description
1	NC	2	NC
3	COM1_RXD	4	NC
5	COM1_TXD	6	NC
7	NC	8	NC
9	COM1_GND		

SPIROM1: SPI ROM Connector (For debug purpose)



Pin	Description	Pin	Description
1	SPI_HD1_N	2	PCH_SPI_CS1_N
3	PCH_SPI_CS0_N	4	V_3P3_SPI_R
5	PCH_SPI_MISO	6	SPI_HD0_N
7	NC	8	PCH_SPI_CLK
9	GND	10	PCH_SPI_MOSI

MCU1: LPC1114 Burn Connector



Industrial Communication Platform

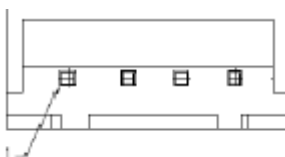
Pin	Description	Pin	Description
1	NC	2	NC
3	PIO1_6_RXD	4	PIO1_5_RTS_N
5	PIO1_7_TXD	6	PIO0_7_CTS_N
7	NC	8	NC
9	GND	10	P3V3SB

J2: SATA connector for SATA 2.5" HDD/SSD



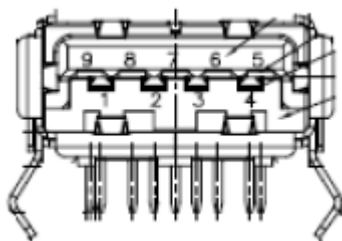
Pin	Pin signal
1	GND
2	SATA_TX1_C_DP
3	SATA_TX1_C_DN
4	GND
5	SATA_RX1_C_DN
6	SATA_RX1_C_CP
7	GND

CON1: SATA power connector supplying the power needed for a storage drive



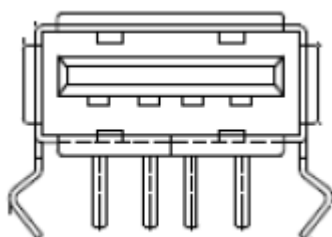
Pin	Pin signal
1	P12V
2	GND
3	GND
4	P5V

USB1: USB 3.0 Connector



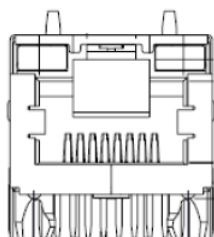
Pin	Description	Pin	Description
1	P5V_USB_L	5	USB3_SS_RX_DN
2	USB_P1_L_DN	6	USB3_SS_RX_DP
3	USB_P1_L_DP	7	GND
4	GND	8	USB3_SS_TX_DN
		9	USB3_SS_TX_DP

USB:2 USB 2.0 Connector



Pin	Description
1	P5V_USB0_L
2	USB_P1_L_DN
3	USB_P1_L_DP
4	GND

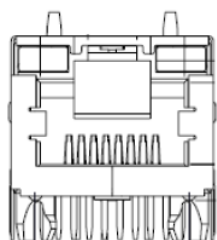
LAN1: LAN1 RJ-45 Connector



Industrial Communication Platform

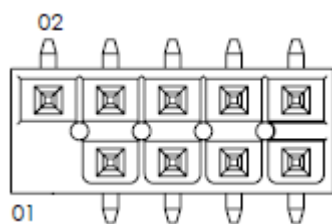
Pin	Description	Pin	Description
1	P1_MDXP0	7	P1_MDXP3
2	P1_MDZN0	8	P1_MDZN3
3	P1_MDXP1	9	P3V3S
4	P1_MDXP2	10	P1_LED_LINK_N
5	P1_MDZN2	11	P1_LINK1000
6	P1_MDZN1	12	P1_LINK100

LAN2: LAN2 RJ-45 Connector



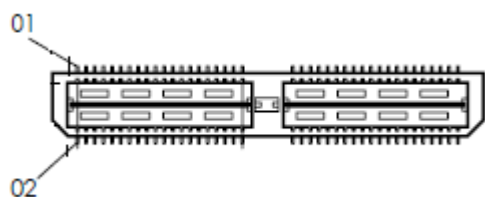
Pin	Description	Pin	Description
1	P2_MDXP0	7	P2_MDXP3
2	P2_MDZN0	8	P2_MDZN3
3	P2_MDXP1	9	P3V3S
4	P2_MDXP2	10	P2_LED_LINK_N
5	P2_MDZN2	11	P2_LINK1000
6	P2_MDZN1	12	P2_LINK100

JP1: Board to Board Power Connector



Pin	Description	Pin	Description
1	NC	2	P12V
3	GND	4	P12V
5	GND	6	P12V
7	GND	8	P12V
9	GND	10	P12V

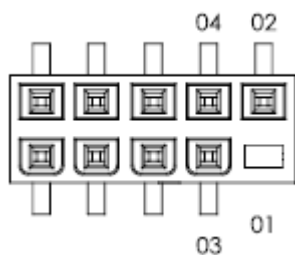
J3: Board to Board Connector 2x40-Pin



PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	GND	41	L_AD0	2	GND	42	PLTRST_BUF_N
3	USB_P2_DN	43	L_FRAME_N	4	PCIE_RX2_DN	44	WAKE_N
5	USB_P2_DP	45	SER_IRQ	6	PCIE_RX2_DP	46	SIO_GP00
7	GND	47	P5VS	8	GND	48	SIO_GP01
9	USB_P3_DN	49	P5VS	10	PCIE_TX2_C_DN	50	COM2_RTS#
11	USB_P3_DP	51	P5VS	12	PCIE_TX2_C_DP	52	COM2_TXD#
13	GND	53	P5VS	14	GND	54	P1_RT_1
15	LATCH_EN_GPH	55	P5VS	16	PCIE_RX3_DN	56	COM2_RXD#
17	LATCH_DIS_GPL	57	WDTO_OUT#	18	PCIE_RX3_DP	58	COM3_RTS#
19	GND	59	P3V3S	20	GND	60	COM3_TXD#
21	SMB_CLK_RESUME _IO	61	P3V3S	22	PCIE_TX3_C_DN	62	P1_S0_1
23	SMB_DATA_RESUM E_IO	63	P3V3S	24	PCIE_TX3_C_DP	64	COM3_RXD#
25	GND	65	P3V3S	26	GND	66	COM4_RTS#
27	USB_OC_N23	67	P3V3S	28	CLK_MULTI_IO_ DN	68	COM4_TXD#
29	GPIO_BYPASS_EN	69	P3V3S	30	CLK_MULTI_IO_ DP	70	P1_S0_2
31	GND	71	SIO_GP54	32	GND	72	COM4_RXD#
33	CLK_33M_TPM	73	P1V5	34	CLK_MINIPCIE_ DN	74	COM5_RTS#
35	L_AD3	75	P1V5	36	CLK_MINIPCIE_ DP	76	COM5_TXD#
37	L_AD2	77	P1V5	38	GND	78	LAN34GND
39	L_AD1	79	P1V5	40	GND	80	COM5_RXD#

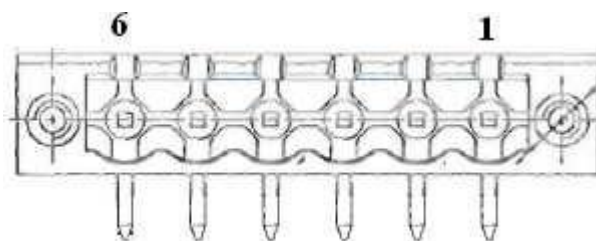
Jumper Settings & Connector Pinout (LEK-6032-EN A/B)

P12V1: Board to Board Power Connector



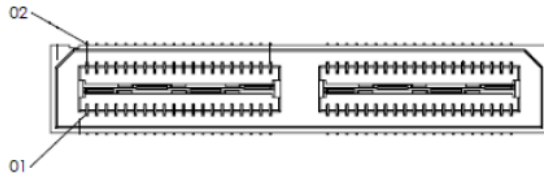
Pin	Description	Pin	Description
1	NC	2	P9V
3	GND	4	P9V
5	GND	6	P9V
7	GND	8	P9V
9	GND	10	P9V

CN1: Power Connector



Pin	Description
1	DC_PWR2
2	GND
3	ALARM2
4	ALARM1
5	DC_PWR1
6	GND

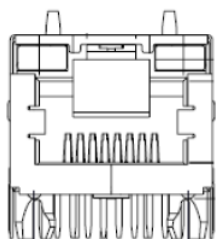
J2: Board to Board Connector 2x40-Pin



PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	GND	41	L_AD0	2	GND	42	PLTRST_BUF_N
3	USB_P2_DN	43	L_FRAME_N	4	PCIE_RX2_DN	44	WAKE_N
5	USB_P2_DP	45	SER_IRQ	6	PCIE_RX2_DP	46	SIO_GP00
7	GND	47	P5VS	8	GND	48	SIO_GP01
9	USB_P3_DN	49	P5VS	10	PCIE_TX2_C_DN	50	COM2_RTS#
11	USB_P3_DP	51	P5VS	12	PCIE_TX2_C_DP	52	COM2_TXD#
13	GND	53	P5VS	14	GND	54	P1_RT_1
15	LATCH_EN_GPH	55	P5VS	16	PCIE_RX3_DN	56	COM2_RXD#
17	LATCH_DIS_GPL	57	WDTO_OUT#	18	PCIE_RX3_DP	58	COM3_RTS#
19	GND	59	P3V3S	20	GND	60	COM3_TXD#
21	SMB_CLK_RESUME _IO	61	P3V3S	22	PCIE_TX3_C_DN	62	P1_S0_1
23	SMB_DATA_RESUM E_IO	63	P3V3S	24	PCIE_TX3_C_DP	64	COM3_RXD#
25	GND	65	P3V3S	26	GND	66	COM4_RTS#
27	USB_OC_N23	67	P3V3S	28	CLK_MULTI_IO_ DN	68	COM4_TXD#
29	GPIO_BYPASS_EN	69	P3V3S	30	CLK_MULTI_IO_ DP	70	P1_S0_2
31	GND	71	SIO_GP54	32	GND	72	COM4_RXD#
33	CLK_33M_TPM	73	P1V5	34	CLK_MINIPCIE_ DN	74	COM5_RTS#
35	L_AD3	75	P1V5	36	CLK_MINIPCIE_ DP	76	COM5_TXD#
37	L_AD2	77	P1V5	38	GND	78	LAN34GND
39	L_AD1	79	P1V5	40	GND	80	COM5_RXD#

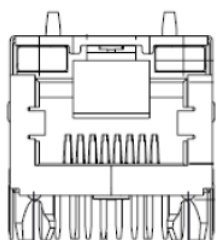
Industrial Communication Platform

LAN1: LAN1 RJ-45 Connector



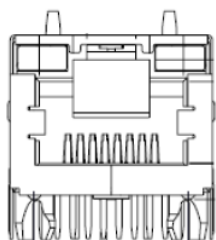
Pin	Description	Pin	Description
1	P1_MDXP0	7	P1_MDXP3
2	P1_MDZN0	8	P1_MDZN3
3	P1_MDXP1	9	P3V3S
4	P1_MDXP2	10	P1_LED_LINK_N
5	P1_MDZN2	11	P1_LINK1000
6	P1_MDZN1	12	P1_LINK100

LAN2: LAN2 RJ-45 Connector



Pin	Description	Pin	Description
1	P2_MDXP0	7	P2_MDXP3
2	P2_MDZN0	8	P2_MDZN3
3	P2_MDXP1	9	P3V3S
4	P2_MDXP2	10	P2_LED_LINK_N
5	P2_MDZN2	11	P2_LINK1000
6	P2_MDZN1	12	P2_LINK100

LAN3: LAN3 RJ-45 Connector

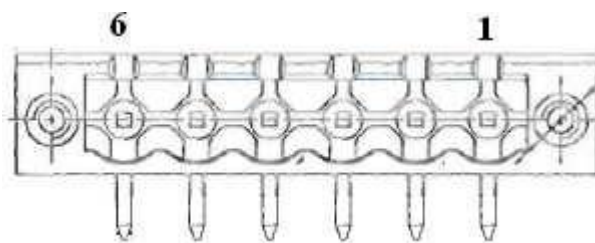


Industrial Communication Platform

Pin	Description	Pin	Description
1	P3_MDXP0	7	P3_MDXP3
2	P3_MDZN0	8	P3_MDZN3
3	P3_MDXP1	9	P3V3S
4	P3_MDXP2	10	P3_LED_LINK_N
5	P3_MDZN2	11	P3_LINK1000
6	P3_MDZN1	12	P3_LINK100

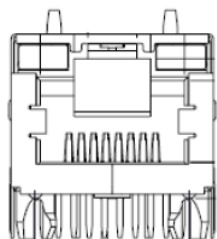
Jumper Settings & Connector Pinout (LEK-6032FA)

CN1: Power Connector



Pin	Description
1	DC_PWR2
2	GND
3	ALARM2
4	ALARM1
5	DC_PWR1
6	GND

LANB1/2/3: 3 x RJ-45 2.54mm 10/100/1000 Connectors with transformer and LED.

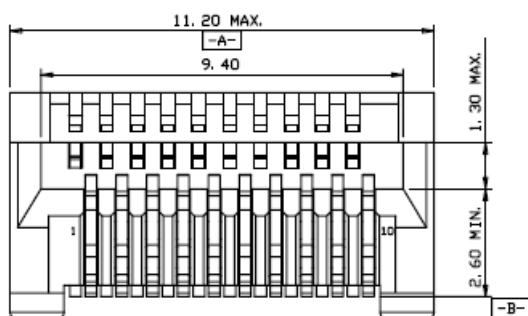


Pin	Description	Pin	Description
1	P1_MDXP0	8	P1_MDZN2
2	P1_MDZN0	9	P1_MDXP3
3	P1_MDXP1	10	P1_MDZN3

Industrial Communication Platform

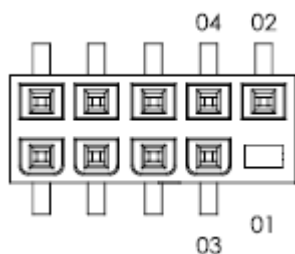
4	P1_MDXN1	11	P1_LINK100_R
5	LAN1_1.5	12	P1_LINK1000_R
6	LAN1_1.5	13	P3V3S
7	P1_MDXP2	14	P1_LED_ACT_R

SFP1/2: 2 x SFP LAN connectors 20-Pin female RA P0.8mm



Pin	Description	Pin	Description
1	GND	11	GND
2	SFP0_TX_FAULT	12	SFP0_RD_N
3	SFP0_TX_DIS	13	SFP0_RD_P
4	SFP0_I2C_SDA	14	GND
5	SFP0_I2C_SCL	15	P3V3_SFP0_R
6	SFP0_MOD_ABS	16	P3V3_SFP0_T
7	SFP0_RS0	17	GND
8	SFP0_RX_LOS	18	SFP0_TD_P
9	SFP0_RS1	19	SFP0_TD_N
10	GND	20	GND

P12V1: Board to Board 2.54mm Power Connector

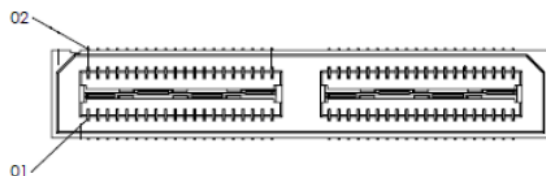


Pin	Description	Pin	Description
1	NC	2	P9V
3	GND	4	P9V

Industrial Communication Platform

5	GND	6	P9V
7	GND	8	P9V
9	GND	10	P9V

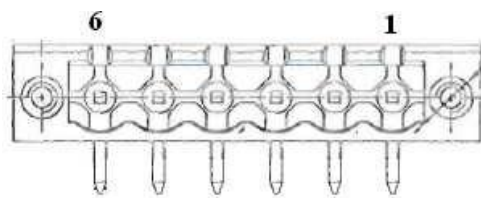
J2: Board to Board 0.8mm Connector 2x40-Pin



PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	GND	41	L_AD0	2	GND	42	PLTRST_BUF_N
3	USB_P2_DN	43	L_FRAME_N	4	PCIE_RX2_DN	44	WAKE_N
5	USB_P2_DP	45	SER_IRQ	6	PCIE_RX2_DP	46	SIO_GP00
7	GND	47	P5VS	8	GND	48	SIO_GP01
9	USB_P3_DN	49	P5VS	10	PCIE_TX2_C_DN	50	COM2_RTS#
11	USB_P3_DP	51	P5VS	12	PCIE_TX2_C_DP	52	COM2_TXD#
13	GND	53	P5VS	14	GND	54	P1_RT_1
15	LATCH_EN_GPH	55	P5VS	16	PCIE_RX3_DN	56	COM2_RXD#
17	LATCH_DIS_GPL	57	WDTO_OUT#	18	PCIE_RX3_DP	58	COM3_RTS#
19	GND	59	P3V3S	20	GND	60	COM3_TXD#
21	SMB_CLK_RESUME _IO	61	P3V3S	22	PCIE_TX3_C_DN	62	P1_S0_1
23	SMB_DATA_RESUM E_IO	63	P3V3S	24	PCIE_TX3_C_DP	64	COM3_RXD#
25	GND	65	P3V3S	26	GND	66	COM4_RTS#
27	USB_OC_N23	67	P3V3S	28	CLK_MULTI_IO_ DN	68	COM4_TXD#
29	GPIO_BYPASS_EN	69	P3V3S	30	CLK_MULTI_IO_ DP	70	P1_S0_2
31	GND	71	SIO_GP54	32	GND	72	COM4_RXD#
33	CLK_33M_TPM	73	P1V5	34	CLK_MINIPCIE_ DN	74	COM5_RTS#
35	L_AD3	75	P1V5	36	CLK_MINIPCIE_ DP	76	COM5_TXD#
37	L_AD2	77	P1V5	38	GND	78	LAN34GND
39	L_AD1	79	P1V5	40	GND	80	COM5_RXD#

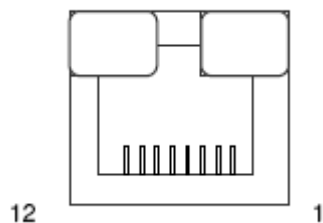
Jumper Settings & Connector Pinout (LEK-6032FB)

CN1: Power Connector



Pin	Description
1	DC_PWR2
2	GND
3	ALARM2
4	ALARM1
5	DC_PWR1
6	GND

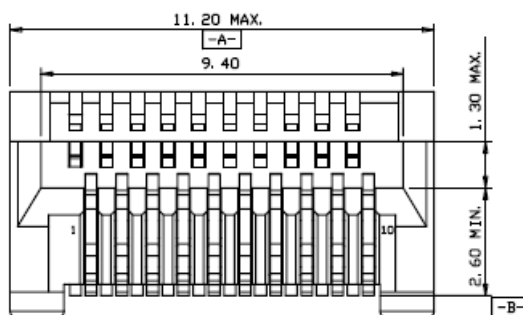
LAN: 1 x RJ-45 2.54mm 10/100/1000 Connectors with transformer and LED.



Pin	Description	Pin	Description
1	MD0+	8	MD2-
2	MD0-	9	MD3+
3	MD1+	10	MD3-
4	MD1-	11	LINK100
5	CT1	12	LINK1000
6	CT2	13	VCC3
7	MD2+	14	Active LED

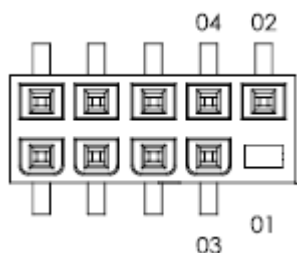
Industrial Communication Platform

SFP1/2: 2 x SFP LAN connectors 20-Pin female RA P0.8mm



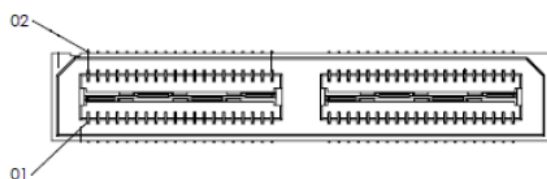
Pin	Description	Pin	Description
1	GND	11	GND
2	SFP0_TX_FAULT	12	SFP0_RD_N
3	SFP0_TX_DIS	13	SFP0_RD_P
4	SFP0_I2C_SDA	14	GND
5	SFP0_I2C_SCL	15	P3V3_SFP0_R
6	SFP0_MOD_ABS	16	P3V3_SFP0_T
7	SFP0_RS0	17	GND
8	SFP0_RX_LOS	18	SFP0_TD_P
9	SFP0_RS1	19	SFP0_TD_N
10	GND	20	GND

P12V1: Board to Board 2.54mm Power Connector



Pin	Description	Pin	Description
1	NC	2	P9V
3	GND	4	P9V
5	GND	6	P9V
7	GND	8	P9V
9	GND	10	P9V

J2: Board to Board 0.8mm Connector 2x40-Pin



PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	GND	41	L_AD0	2	GND	42	PLTRST_BUF_N
3	USB_P2_DN	43	L_FRAME_N	4	PCIE_RX2_DN	44	WAKE_N
5	USB_P2_DP	45	SER_IRQ	6	PCIE_RX2_DP	46	SIO_GP00
7	GND	47	P5VS	8	GND	48	SIO_GP01
9	USB_P3_DN	49	P5VS	10	PCIE_TX2_C_DN	50	COM2_RTS#
11	USB_P3_DP	51	P5VS	12	PCIE_TX2_C_DP	52	COM2_TXD#
13	GND	53	P5VS	14	GND	54	P1_RT_1
15	LATCH_EN_GPH	55	P5VS	16	PCIE_RX3_DN	56	COM2_RXD#
17	LATCH_DIS_GPL	57	WDTO_OUT#	18	PCIE_RX3_DP	58	COM3_RTS#
19	GND	59	P3V3S	20	GND	60	COM3_TXD#
21	SMB_CLK_RESUME _IO	61	P3V3S	22	PCIE_TX3_C_DN	62	P1_S0_1
23	SMB_DATA_RESUM E_IO	63	P3V3S	24	PCIE_TX3_C_DP	64	COM3_RXD#
25	GND	65	P3V3S	26	GND	66	COM4_RTS#
27	USB_OC_N23	67	P3V3S	28	CLK_MULTI_IO_ DN	68	COM4_TXD#
29	GPIO_BYPASS_EN	69	P3V3S	30	CLK_MULTI_IO_ DP	70	P1_S0_2
31	GND	71	SIO_GP54	32	GND	72	COM4_RXD#
33	CLK_33M_TPM	73	P1V5	34	CLK_MINIPICIE_ DN	74	COM5_RTS#
35	L_AD3	75	P1V5	36	CLK_MINIPICIE_ DP	76	COM5_TXD#
37	L_AD2	77	P1V5	38	GND	78	LAN34GND
39	L_AD1	79	P1V5	40	GND	80	COM5_RXD#

Chapter 4: Hardware Setup

Preparing the Hardware Installation

To access some components and perform certain service procedures, you must perform the following procedures first.

WARNING:

- To reduce the risk of personal injury, electric shock, or damage to the equipment, please remove all power sources.
- Please wear ESD protected gloves before conducting the following steps.
- Do NOT pile items on top of the system to prevent damages due to this improper use. Lanner is not liable for damages caused by improper use of the product.

1. Power off LEC-6032 and remove the power cord.
2. Remove the screws from the sides and the rear, as circled in the image below.

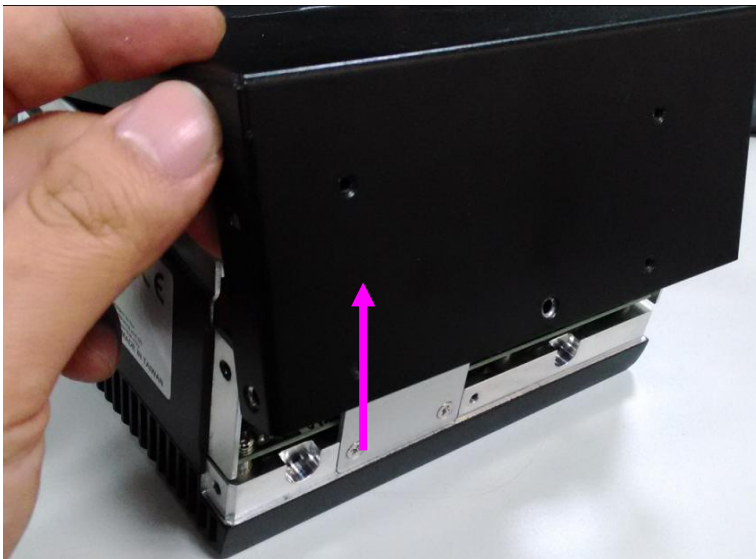
Notes: you have to remove the DIN Rail mounting bracket first if it is pre-installed on the system.



Industrial Communication Platform



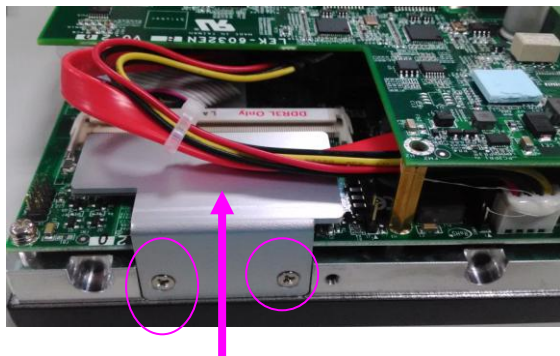
3. Open the bottom and the side compartments as shown below.



Installing SO-DIMM Memory

The system is designed with a SO-DIMM socket supporting up to 4GB DDR3L SDRAM. Please follow the steps below for proper installations.

1. Locate the SO-DIMM socket on the motherboard.
2. Remove the heat sink by removing the two screws circled in the image below.



3. Align the memory module's key with the SO-DIMM socket's key.
4. Insert the SO-DIMM module.



5. Press the module down until it is locked by the two clips at each side.



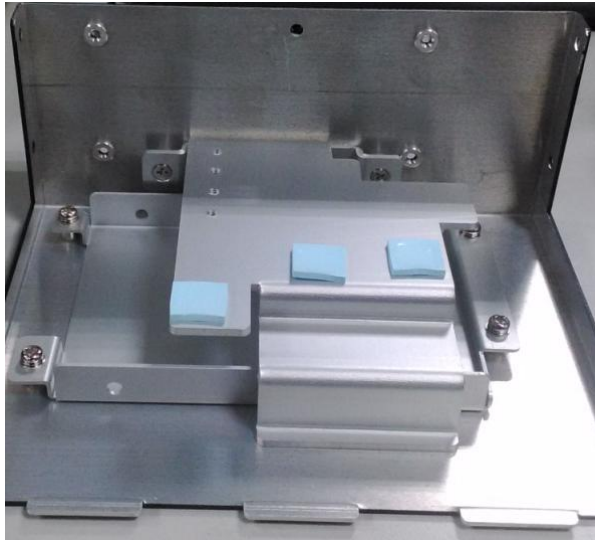
6. Place the heat sink back on and apply two screws.



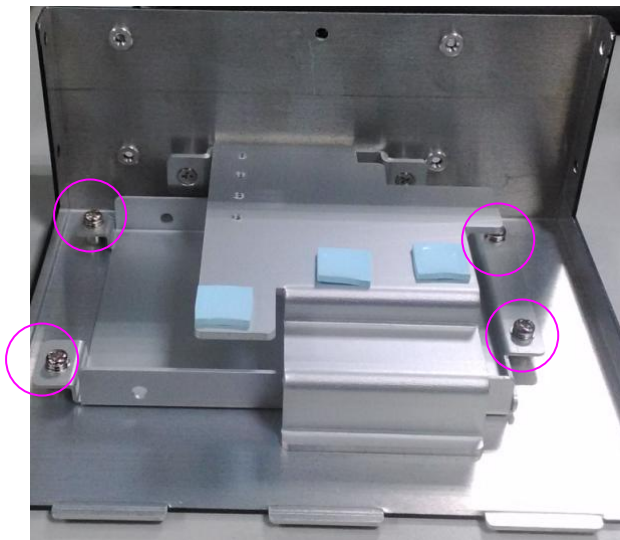
Installing a Disk Drive

The system can accommodate one 2.5" SATA disk drive. Please follow the steps below.

1. Locate the SATA drive tray on the inner side of the bottom compartment.



2. Take the 2.5" drive tray out by removing the 4 screws that fix the tray.



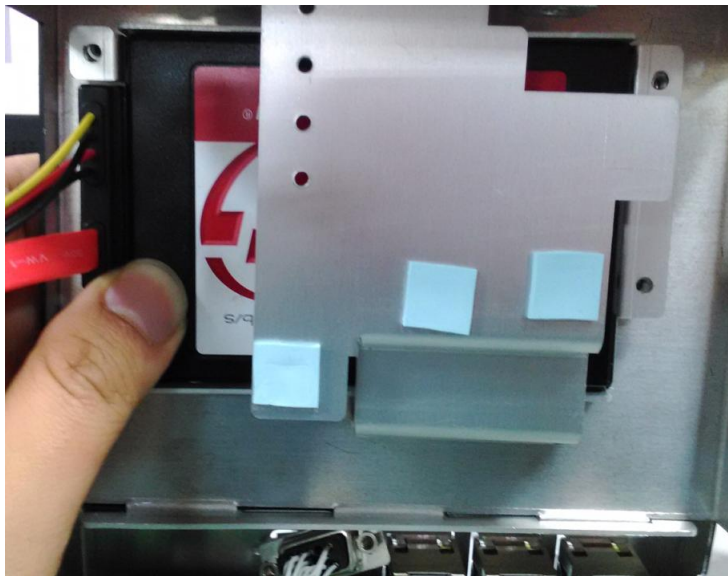
Industrial Communication Platform

3. Place the SATA disk drive and apply 4 screws as circled below.

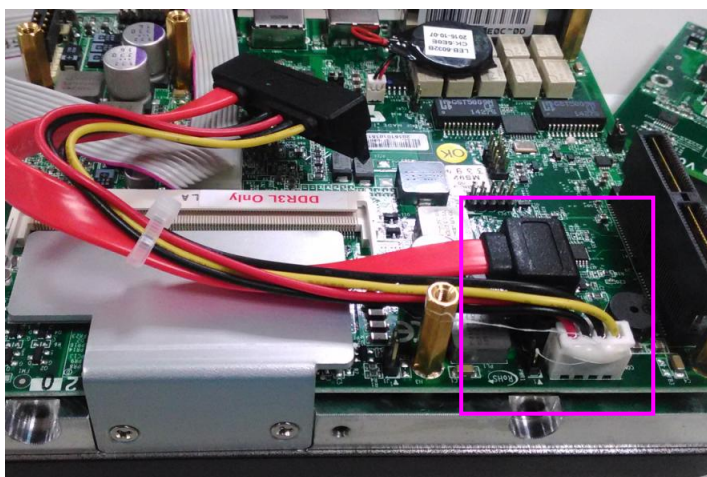


4. Place the disk drive tray back to its original place and fix it with 4 screws.

5. Connect the supplied SATA cable. Plug the 7-pin and the 4-pin SATA signal and power pair into its corresponding SATA signal and power connectors on the motherboard.



Notes: you have to remove the add-on card first to conveniently access the SATA connectors.



Mounting LEC-6032 by DIN Rail

All models of the LEC-6032 series are designed with a DIN Rail mounting bracket at the rear of the product.



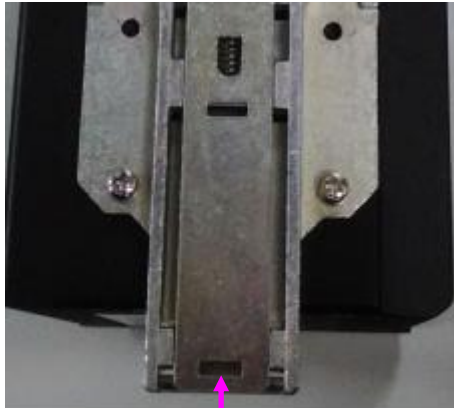
Hang the device onto a rail and push inwards until it firmly attaches.



Apply force and push this way

Industrial Communication Platform

To remove the system from the DIN Rail, simply use a flathead screwdriver to poke the hole circled in the mounting clip image below.



Apply force and poke this hole

Chapter 5: BIOS Setup

To enter the BIOS setup utility, simply follow the steps below:

1. Boot up the system.
2. Press <Delete> during the boot-up. Your system should be running POST (Power-On-Self-Test) upon booting up.
3. Then you will be directed to the BIOS main screen.
4. Instructions of BIOS navigations:

[<-] [>-]: select a setup screen, for instance, [Main], [Advanced], [IntelRCSetup], [Boot], [Security], and [Save & Exit]

[↑] [↓]: select an item/option on a setup screen

Enter: select an item/option or enter a sub-menu

ESC: exit the current screen

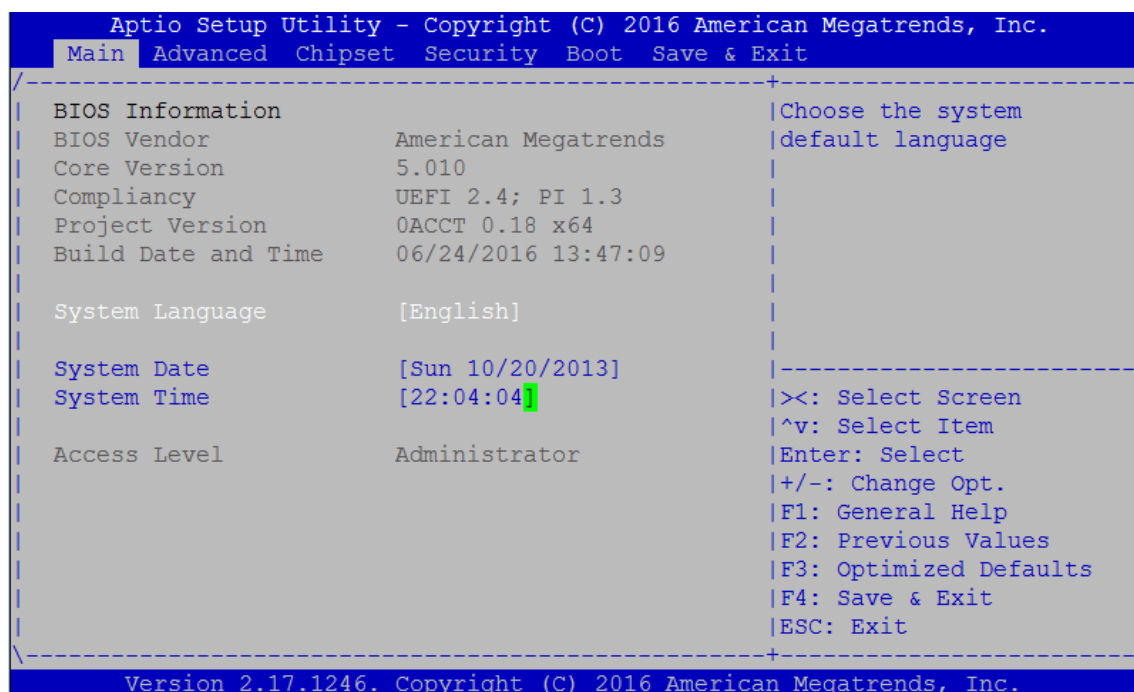
+/- = to adjust values for the selected setup item/option

F1 = to display General Help screen

F2 = to retrieve previous values, such as the parameters configured the last time you had entered BIOS.

F3 = to load optimized default values

F4: Save settings and exit



Notes: the images in the following section are for reference only.

Main

The [Main] is the first setup screen when you enter BIOS. The [Main] displays general system and BIOS information and you may configure “System Date”, and “System Time”.

BIOS Information

BIOS Vendor

Core Version

Compliancy

Project Version: displays version information

Build Date and Time: displays the date and time the BIOS was built.

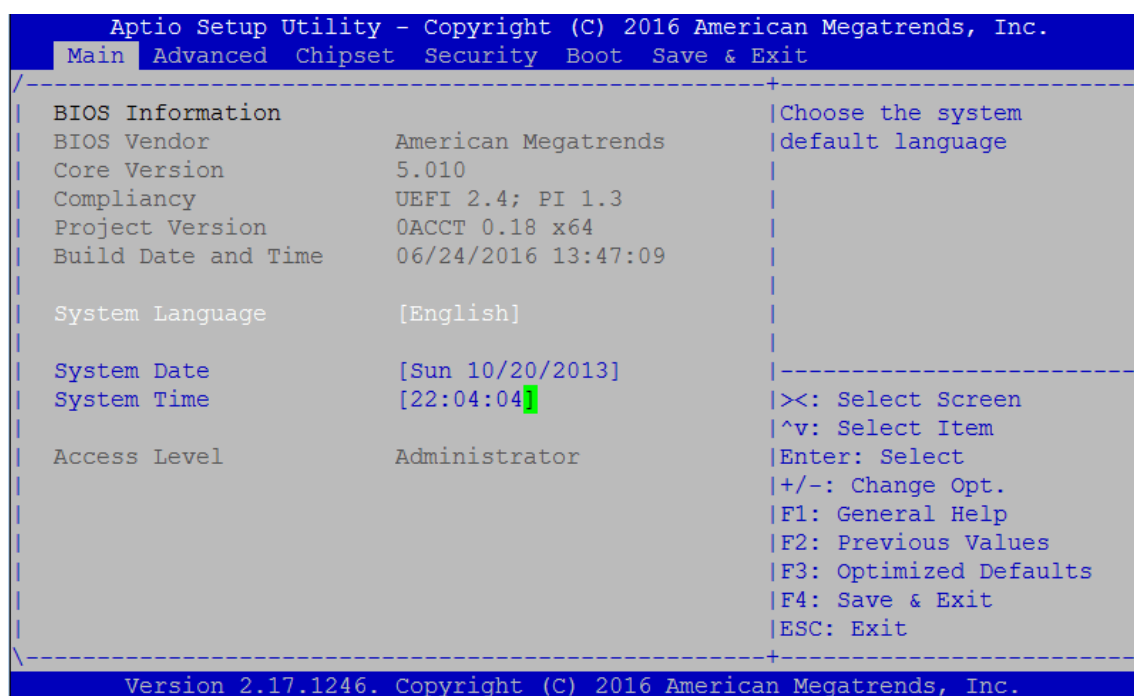
Press “Enter” if you want to configure “System Language”, “System Date”, and “System Time”.

System Language

System Date: Day/Month/Year

System time: Hour/Minutes/Seconds

Access Level: Administrator by default



Advanced

Use [←] / [→] to select [Advanced] setup screen. Under this screen, you may use [↑] [↓] to select an item you wish to configure.

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main  Advanced  Chipset  Security  Boot  Save & Exit

|> F81865 Super IO Configuration      |System Super IO Chip
|> Hardware Monitor                  |Parameters.
|> Serial Port Console Redirection   |
|> CPU Configuration                |
|> IDE Configuration                |
|> USB Configuration                |
|> LAN Boot Configuration            |
|                                   |
|                                   |
|                                   |
|                                   |
|                                   |
|                                   |
|>: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit

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```

F81865 Super IO Configuration

Press “Enter” to access configuration sub-menu for super IO chip parameters. You may access settings for Serial Port1.

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Advanced

F81865 Super IO Configuration      |Set Parameters of
Super IO Chip      F81865          |Serial Port 1 (COMA)
> Serial Port 1 Configuration      |
|                                   |
|                                   |
|                                   |
|                                   |
|                                   |
|                                   |
|>: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit

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```

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Once you have entered “Serial Port 1 Configuration”, you may choose to enable or disable the serial port.

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
/-----+-----
Serial Port 1 Configuration |Enable or Disable
                             |Serial Port (COM)
Serial Port                  | [Enabled]
Device Settings              |IO=3F8h; IRQ=4;
                             |
                             |
                             |
                             |-----+-----
                             |>X: Select Screen
                             |^v: Select Item
                             |Enter: Select
                             |+/-: Change Opt.
                             |F1: General Help
                             |F2: Previous Values
                             |F3: Optimized Defaults
                             |F4: Save & Exit
                             |ESC: Exit
/-----+-----
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.

```

Hardware Monitor

This option allows you to view hardware health status. you may use [↑] [↓] to select “Hardware Monitor” and press “Enter”.

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main  Advanced  Chipset  Security  Boot  Save & Exit
-----
> F81865 Super IO Configuration
> Hardware Monitor
> Serial Port Console Redirection
> CPU Configuration
> IDE Configuration
> USB Configuration
> LAN Boot Configuration

-----
|><: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit
-----
Version 2.17.1246 Copyright (C) 2016 American Megatrends, Inc.

```

Industrial Communication Platform

```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
-----+-----
Pc Health Status
Cpu temperature      : +31 C
System temperature   : +32 C
Vcore                : +0.856 V
5V                   : +5.003 V
DCIN                 : +9.240 V
VCC3V                : +3.312 V
VSB3V               : +3.312 V
VBAT                 : +3.216 V
-----+-----
|>: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit
-----+-----
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
```

Serial Port Console Redirection

This option allows you to configure parameters about serial port console redirection. Press “Enter” to access the submenu.

Console Redirection: select “Enabled” or “Disable” for an available COM port to set up the console redirection. Then you may use [↑] [↓] to enter “Console Redirection Settings”. Notably, the “Console Redirection Settings” is only available for COM0.

```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main  Advanced  Chipset  Security  Boot  Save & Exit
-----+-----
|> F81865 Super IO Configuration
|> Hardware Monitor
|> Serial Port Console Redirection
|> CPU Configuration
|> IDE Configuration
|> USB Configuration
|> LAN Boot Configuration
-----+-----
|>: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit
-----+-----
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
```

Industrial Communication Platform

```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
/-----+-----+
| COM0                                         | Console Redirection | | |
| Console Redirection      [Enabled]          | Enable or Disable.  |
|> Console Redirection Settings              |                     |
|                                             |                     |
|                                     | /--- Console Redirection ---\ |
|                                     | | Disabled                    | |
|                                     | | Enabled                      | |
|                                     | \-----/                     | |
|                                     |                                     | |
|                                     | Select Screen                    | |
|                                     | Select Item                      | |
|                                     | Enter: Select                    | |
|                                     | +/-: Change Opt.                 | |
|                                     | F1: General Help                  | |
|                                     | F2: Previous Values              | |
|                                     | F3: Optimized Defaults            | |
|                                     | F4: Save & Exit                   | |
|                                     | ESC: Exit                        | |
|-----+-----+
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
```

COM Console Redirection Settings

Terminal Type: the emulation configuration. Select "VT100", "VT100+", "VT-UTF8" or "ANSI".

VT100: ASCII character set

VT100+: extends VT100 to support color function keys

VT-UTF8: uses UTF8 encoding to map Unicode characters onto 1 or more

ANSI: Extended ASCII character set

```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
/-----+-----+
| COM0                                         | The settings specify |
| Console Redirection      [Enabled]          | how the host computer |
|> Console Redirection Settings              | and the remote computer |
|                                             | (which the user is    |
|                                             | using) will exchange  |
|                                             | data. Both computers  |
|                                             | should have the same or |
|                                             | compatible settings.  |
|                                             |
|                                     | -----| | |
|                                     | |>: Select Screen      | |
|                                     | |^v: Select Item      | |
|                                     | |Enter: Select        | |
|                                     | | +/-: Change Opt.    | |
|                                     | | F1: General Help    | |
|                                     | | F2: Previous Values | |
|                                     | | F3: Optimized Defaults | |
|                                     | | F4: Save & Exit     | |
|                                     | | ESC: Exit          | |
|-----+-----+
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
```

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```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
-----+-----
COM0
Console Redirection Settings
Terminal Type          [VT100+]
Bits per second        [115200]
Data Bits              [8]
Parity                 [None]
Stop Bits              [1]
Flow Control           [None]
VT-UTF8 Combo Key Sup  [Enabled]
Recorder Mode          [Disabled]
Resolution 100x31      [Disabled]
Legacy OS Redirection  [80x24]
Putty KeyPad           [VT100]
Redirection After BIO  [Always Enable]

Emulation: ANSI:
Extended ASCII char
set. VT100: ASCII char
set. VT100+: Extends
VT100 to support color,
function keys, etc.
VT-UTF8: Uses UTF8
encoding to map Unicode
chars onto 1 or more
-----+-----
|>=: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit
-----+-----
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.

```

Bits per second: select “9600”, “19200”, “38400”, “57600”, or “115200” for bits per second. The Bps will determine serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds

```

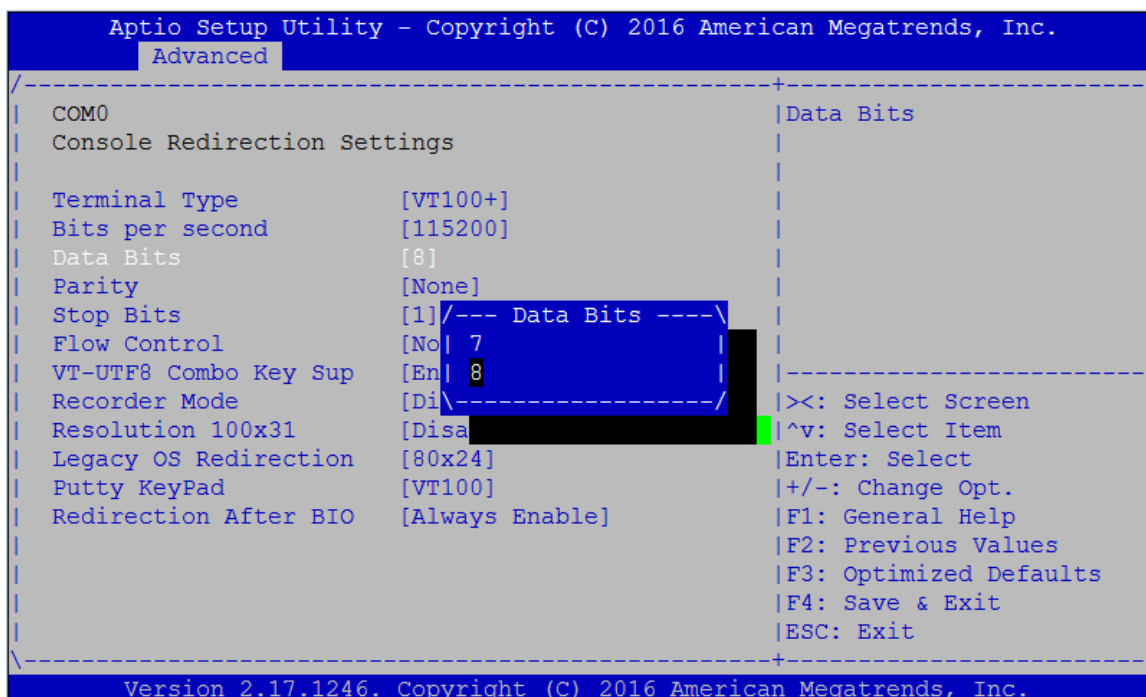
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
-----+-----
COM0
Console Redirection Settings
Terminal Type          [VT100+]
Bits per second        [115200]
Data Bits              [8]
Parity                 [None]
Stop Bits              [1]
Flow Control           [None]
VT-UTF8 Combo Key Sup  [Enabled]
Recorder Mode          [Disabled]
Resolution 100x31      [Disabled]
Legacy OS Redirection  [80x24]
Putty KeyPad           [VT100]
Redirection After BIO  [Always Enable]

Selects serial port
transmission speed. The
speed must be matched
on the other side. Long
or noisy lines may
require lower speeds.
-----+-----
|<: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit
-----+-----
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.

```

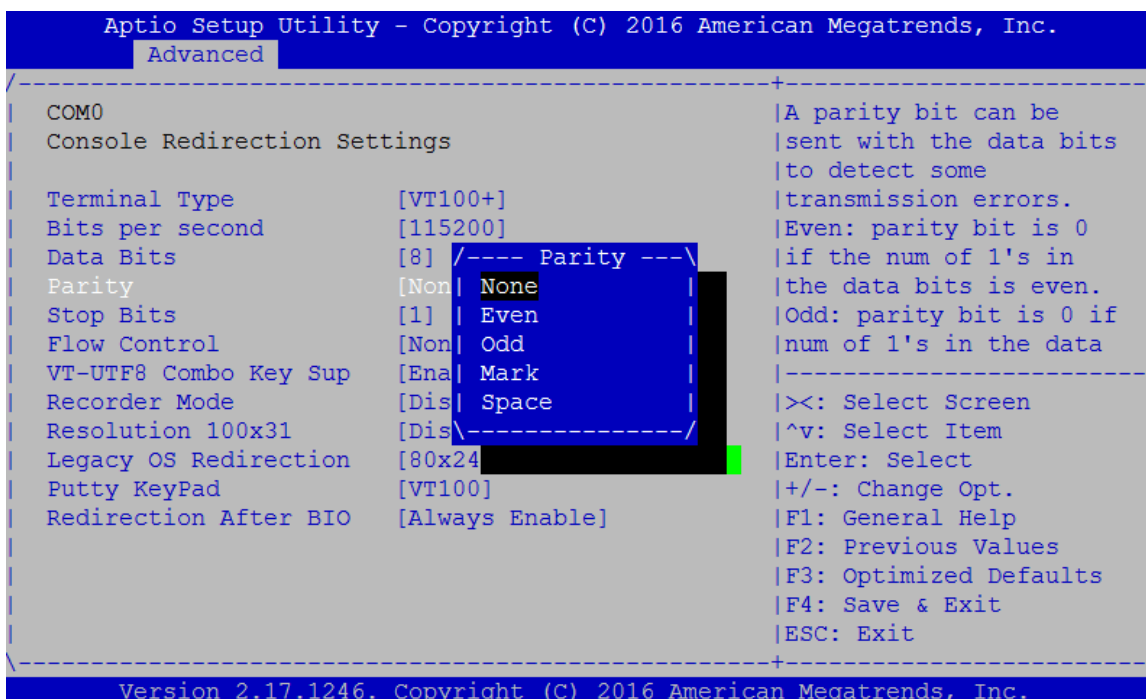
Industrial Communication Platform

Data Bits: select the value for data bits. In this case, “7” or “8”.



Parity Bits: a parity bit can be sent with the data bits to detect some transmission errors.

Select “None”, “Even”, “Odd”, “Mark” or “Space”.



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Stop Bits: stop bits indicate the end of a serial data packet. The standard is 1 stop bit.

Communication with slow devices may require more than

```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Advanced
-----+-----
COM0
Console Redirection Settings
Terminal Type          [VT100+]
Bits per second        [115200]
Data Bits              [8]
Parity                 [None]
Stop Bits              [1] /--- Stop Bits ---\
Flow Control           [No] 1
VT-UTF8 Combo Key Sup  [En] 2
Recorder Mode          [Di]
Resolution 100x31      [Disa]
Legacy OS Redirection  [80x24]
Putty KeyPad           [VT100]
Redirection After BIO  [Always Enable]
-----+-----
|Stop bits indicate the
|end of a serial data
|packet. (A start bit
|indicates the
|beginning). The
|standard setting is 1
|stop bit. Communication
|with slow devices may
|require more than 1
|-----+-----
|>: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit
|-----+-----
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
```

Flow Control: flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. You may select “None” or “Hardware RTS/CTS”, depending on the circumstances.

```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Advanced
-----+-----
COM0
Console Redirection Settings
Terminal Type          [VT100+]
Bits per second        [115200]
Data Bits              [8]
Parity                 [None]
Stop Bits              [/--- Flow Control ---\
Flow Control           [None]
VT-UTF8 Combo Key Sup  [Hardware RTS/CTS]
Recorder Mode          [Di]
Resolution 100x31      [Disa]
Legacy OS Redirection  [80x24]
Putty KeyPad           [VT100]
Redirection After BIO  [Always Enable]
-----+-----
|Flow control can
|prevent data loss from
|buffer overflow. When
|sending data, if the
|receiving buffers are
|full, a 'stop' signal
|can be sent to stop the
|data flow. Once the
|buffers are empty, a
|-----+-----
|>: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit
|-----+-----
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
```

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VT-UTF8 Combo Key Support: this option enables/disables VT-UTF8 combination key support for ANSI/VT100 terminals.

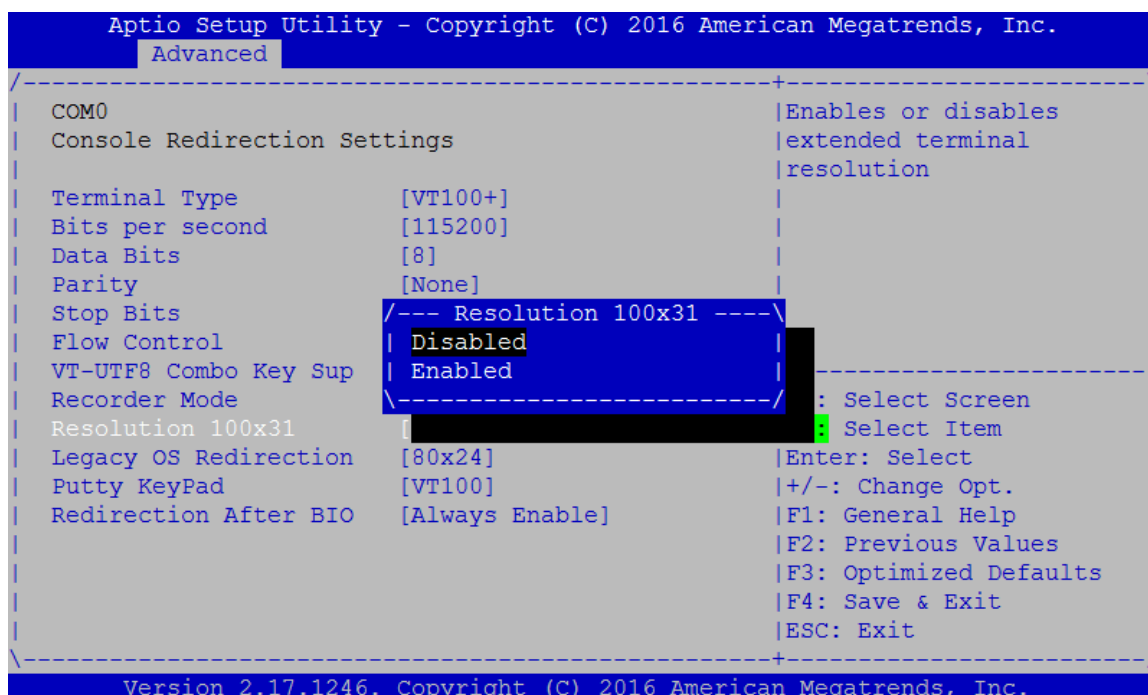
```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
-----+-----
COM0                                         |Enable VT-UTF8
Console Redirection Settings                |Combination Key Support
                                           |for ANSI/VT100 terminals
Terminal Type                             [VT100+]
Bits per second                           [115200]
Data Bits                                  [8]
Parity                                     [None]
Stop Bits                                  /--- VT-UTF8 Combo Key Support ---\
Flow Control                              | Disabled
VT-UTF8 Combo Key Support                  | Enabled
Recorder Mode                             \-----/
Resolution 100x31                          |
Legacy OS Redirection [80x24]               |Enter: Select
Putty KeyPad [VT100]                       |+/-: Change Opt.
Redirection After BIO [Always Enable]       |F1: General Help
                                           |F2: Previous Values
                                           |F3: Optimized Defaults
                                           |F4: Save & Exit
                                           |ESC: Exit
-----+-----
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
```

Recorder Mode: on this mode, when “Enabled”, only text will be sent. This is to capture terminal data.

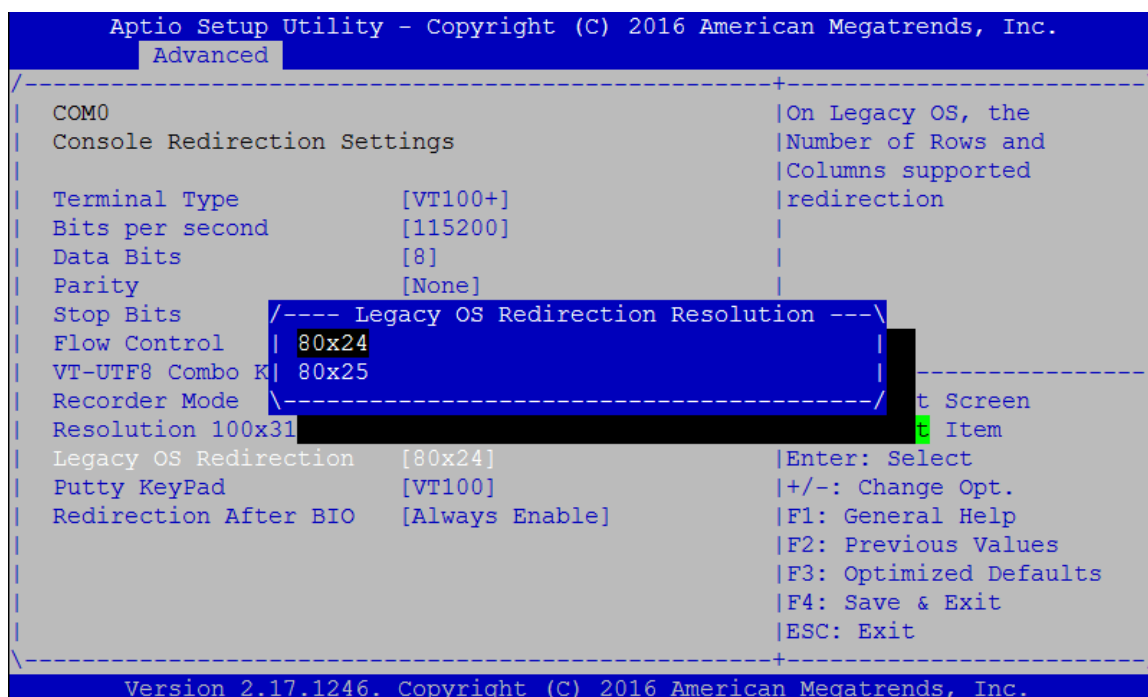
```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
-----+-----
COM0                                         |With this mode enabled
Console Redirection Settings                |only text will be sent.
                                           |This is to capture
                                           |Terminal data.
Terminal Type                             [VT100+]
Bits per second                           [115200]
Data Bits                                  [8]
Parity                                     [None]
Stop Bits                                  /--- Recorder Mode ---\
Flow Control                              | Disabled
VT-UTF8 Combo Key Sup                     | Enabled
Recorder Mode                             \-----/
Resolution 100x31                          |
Legacy OS Redirection [80x24]               |Enter: Select
Putty KeyPad [VT100]                       |+/-: Change Opt.
Redirection After BIO [Always Enable]       |F1: General Help
                                           |F2: Previous Values
                                           |F3: Optimized Defaults
                                           |F4: Save & Exit
                                           |ESC: Exit
-----+-----
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
```

Industrial Communication Platform

Resolution 100 x 31: select “Enabled” or “Disabled” for extended terminal resolution.

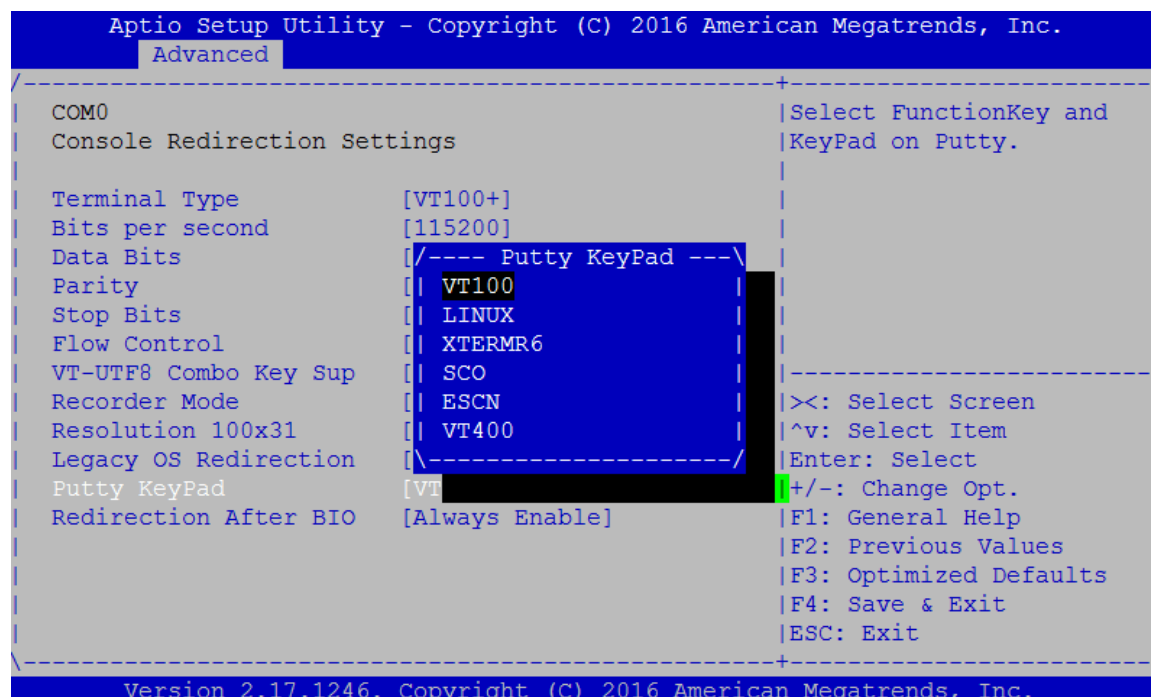


Legacy OS Redirection Resolution: select “80x24” or “80x25”. The default for this case is “80x24”.

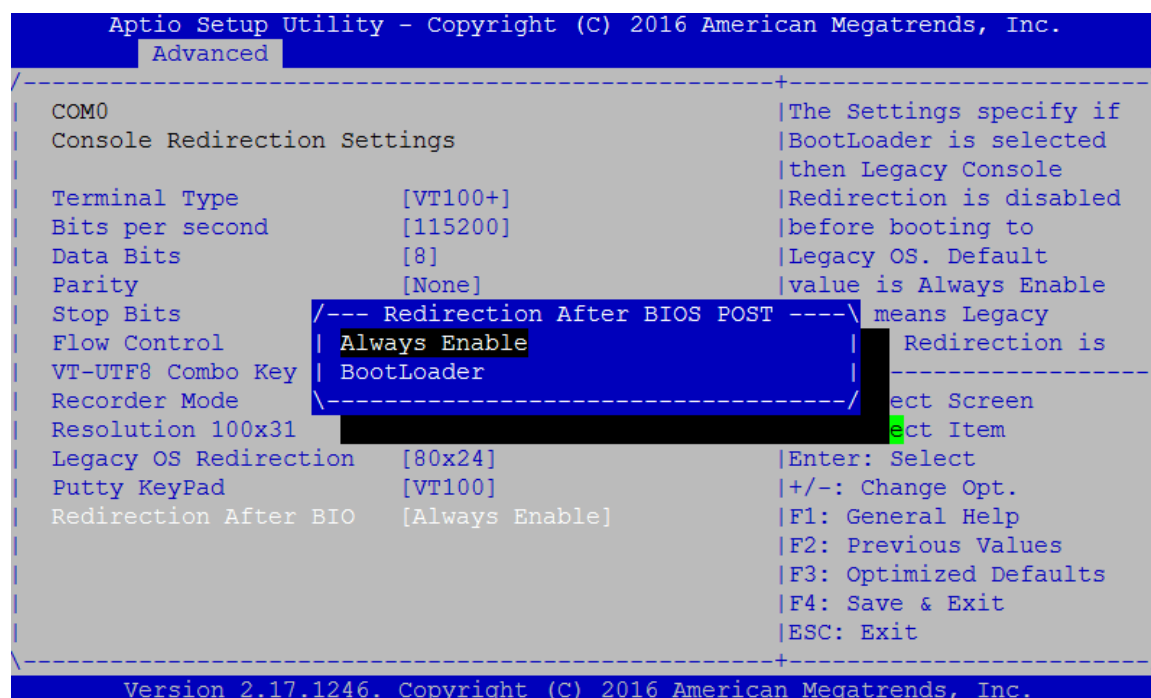


Industrial Communication Platform

Putty KeyPad: select Function Key and Key Pad on Putty. You may select “VT100”, “LINUX”, “XTERMR6”, “SCO”, “ESCN”, or VT400”.



Redirection After BIOS POST: The settings specify if BootLoader is selected than Legacy console redirection is disabled before booting to Legacy OS. Default value is “Always Enable” which means Legacy OS console redirection is always enabled after BIOS.



CPU Configurations

This option allows you to configure CPU parameters.

```
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main Advanced Chipset Security Boot Save & Exit
-----
|> F81865 Super IO Configuration          |CPU Configuration
|> Hardware Monitor                      |Parameters
|> Serial Port Console Redirection       |
|> CPU Configuration                    |
|> IDE Configuration                   |
|> USB Configuration                   |
|> LAN Boot Configuration               |
|                                       |
|                                       |
|                                       |
|                                       |
|                                       |
|><: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit
|
-----
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
```

Socket 0 CPU Information: enter to check socket specific CPU info.

Limit CPUID Maximum: When “Enabled”, the CPU will limit its maximum CPUID input value to 3 when the processor is queried. When “Disabled”, the CPU will function with its actual maximum CPUID values. For this case, leave it as “Disabled”.

Execute Disable Bit: an Intel hardware-based protection against malicious code. It will detect the memory in which a code can be executed or not. When enabled, it will prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS. When disabled, it forces the XD feature flag to always return 0.

Intel Virtualization: Enables or disables Intel Virtualization Technology. On a server or firewall/UTM/IPS operating mode, it is recommended to enable this feature so that multiple operating systems and applications will run in independent.

Industrial Communication Platform

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
-----+-----
| CPU Configuration | Socket specific CPU |
|                   | Information         |
|> Socket 0 CPU Information |
|                   |
| CPU Speed          | 1918 MHz           |
| 64-bit             | Supported           |
|                   |
| Limit CPUID Maximum | [Disabled]         | |
| Execute Disable Bit | [Enabled]          |
| Intel Virtualization | [Enabled]          |
|                   | -----+----- |
|                   | |><: Select Screen |
|                   | |^v: Select Item  |
|                   | |Enter: Select    |
|                   | |+/-: Change Opt. |
|                   | |F1: General Help |
|                   | |F2: Previous Values |
|                   | |F3: Optimized Defaults |
|                   | |F4: Save & Exit   |
|                   | |ESC: Exit        |
|                   | -----+----- |
|                   |
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
  
```

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
-----+-----
| Socket 0 CPU Information |
|
| Intel(R) Atom(TM) CPU E3845 @ 1.91GHz
| CPU Signature           | 30679              | |
| Microcode Patch         | 901                 |
| Max CPU Speed           | 1910 MHz           |
| Min CPU Speed           | 500 MHz            |
| Processor Cores         | 4                   |
| Intel HT Technology      | Not Supported       |
| Intel VT-x Technology   | Supported           |
|                   | -----+----- |
|                   | |><: Select Screen |
|                   | |^v: Select Item  |
|                   | |Enter: Select    |
|                   | |+/-: Change Opt. |
|                   | |F1: General Help |
|                   | |F2: Previous Values |
|                   | |F3: Optimized Defaults |
|                   | |F4: Save & Exit   |
|                   | |ESC: Exit        |
|                   | -----+----- |
|                   |
| L1 Data Cache          | 24 kB x 4          |
| L1 Code Cache          | 32 kB x 4          |
| L2 Cache               | 1024 kB x 2        |
| L3 Cache               | Not Present         |
|                   |
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```

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```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
+-----+
| CPU Configuration | Disabled for Windows XP |
+-----+
| > Socket 0 CPU Information |
+-----+
| CPU Speed          | 1918 MHz |
| 64-bit             | Supported |
+-----+
| Limit CPUID Maximum | /--- Limit CPUID Maximum ---\
| Execute Disable Bit | Disabled |
| Intel Virtualization | Enabled  |
+-----+
|                                     | Select Screen |
|                                     | Select Item   |
|                                     | Enter: Select |
|                                     | +/-: Change Opt. |
|                                     | F1: General Help |
|                                     | F2: Previous Values |
|                                     | F3: Optimized Defaults |
|                                     | F4: Save & Exit  |
|                                     | ESC: Exit       |
+-----+
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```

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
+-----+
| CPU Configuration | When enabled, a VMM can |
|                   | utilize the additional |
|                   | hardware capabilities |
|                   | provided by Vanderpool |
|                   | Technology             |
+-----+
| > Socket 0 CPU Information |
+-----+
| CPU Speed          | 1918 MHz |
| 64-bit             | Supported |
+-----+
| Limit CPUID Maxi | /--- Intel Virtualization Technology ---\
| Execute Disable | Disabled |
| Intel Virtualiza | Enabled  |
+-----+
|                                     | Select Screen |
|                                     | Select Item   |
|                                     | Enter: Select |
|                                     | +/-: Change Opt. |
|                                     | F1: General Help |
|                                     | F2: Previous Values |
|                                     | F3: Optimized Defaults |
|                                     | F4: Save & Exit  |
|                                     | ESC: Exit       |
+-----+
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```

IDE Configuration

Press Enter to access items for SATA devices and settings.

Serial-ATA (SATA): enable or disable SATA function

SATA Speed Support: select SATA speed based on the generations defined by SATA specifications.

SATA Mode: the selection to determine the SATA mode for your storage devices. You may select "IDE" or "AHCI" mode.

Serial-ATA Port 0/1: enable or disable the SATA0/1 port

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main  Advanced  Chipset  Security  Boot  Save & Exit

|> F81865 Super IO Configuration      |IDE Devices
|> Hardware Monitor                  |Configuration
|> Serial Port Console Redirection    |
|> CPU Configuration                 |
|> IDE Configuration                 |
|> USB Configuration                 |
|> LAN Boot Configuration            |

|                                     |-----|
|                                     |><: Select Screen
|                                     |^v: Select Item
|                                     |Enter: Select
|                                     |+/-: Change Opt.
|                                     |F1: General Help
|                                     |F2: Previous Values
|                                     |F3: Optimized Defaults
|                                     |F4: Save & Exit
|                                     |ESC: Exit
|                                     |
|-----|
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```

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Advanced

| IDE Configuration                  |Enable / Disable Serial
|                                   |ATA
| Serial-ATA (SATA)                  |[Enabled]
|                                   |
| SATA Speed Support                  |[Gen2]
| SATA Mode                          |[AHCI Mode]
|                                   |
| Serial-ATA Port 0                  |[Enabled]
|                                   |
| Serial-ATA Port 1                  |[Enabled]
|                                   |-----|
| SATA Port0                         |><: Select Screen
| Not Present                       |^v: Select Item
|                                   |Enter: Select
|                                   |+/-: Change Opt.
| SATA Port1                         |F1: General Help
| Not Present                       |F2: Previous Values
|                                   |F3: Optimized Defaults
|                                   |F4: Save & Exit
|                                   |ESC: Exit
|                                   |
|-----|
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```

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```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
+-----+
| IDE Configuration | Enable / Disable Serial |
|                   | ATA                     |
| Serial-ATA (SATA)  | [Enabled]               |
|                   |                         |
| SATA Speed Support | [Gen2]                  |
| SATA Mode          | [AHCI Mode]             |
|                   |                         |
| Serial-ATA Port 0  | /--- Serial-ATA (SATA) ---\
|                   | Enabled                 |
| Serial-ATA Port 1  | Disabled                 |
|                   |                         |
| SATA Port0         |                           |
| Not Present        |                           |
|                   | : Select Screen         |
|                   | : Select Item           |
|                   | Enter: Select           |
|                   | +/-: Change Opt.        |
|                   | F1: General Help        |
|                   | F2: Previous Values     |
|                   | F3: Optimized Defaults  |
|                   | F4: Save & Exit         |
|                   | ESC: Exit               |
+-----+
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```

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
+-----+
| IDE Configuration | SATA Speed Support Gen1 |
|                   | or Gen2                 |
| Serial-ATA (SATA)  | [Enabled]               |
|                   |                         |
| SATA Speed Support | [Gen2]                  |
| SATA Mode          | [AHCI Mode]             |
|                   |                         |
| Serial-ATA Port 0  | [Enabled]               |
| Serial-ATA Port 1  | [Enabled]               |
|                   |                         |
| SATA Port0         |                           |
| Not Present        |                           |
|                   | ><: Select Screen       |
|                   | ^v: Select Item         |
|                   | Enter: Select           |
|                   | +/-: Change Opt.        |
|                   | F1: General Help        |
|                   | F2: Previous Values     |
|                   | F3: Optimized Defaults  |
|                   | F4: Save & Exit         |
|                   | ESC: Exit               |
+-----+
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```

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```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
+-----+
| IDE Configuration | SATA Speed Support Gen1 |
|                   | or Gen2                 |
| Serial-ATA (SATA)  | [Enabled]               |
|                   |                         |
| SATA Speed Support | [Gen2]                  |
| SATA Mode          | [AHCI Mode]             |
|                   |                         |
| Serial-ATA Port 0  | /---- SATA Speed Support ----\
|                   | | Gen1                    |
| Serial-ATA Port 1  | | Gen2                    |
|                   | \-----/               |
| SATA Port0         | : Select Screen          |
| Not Present        | : Select Item            |
|                   | Enter: Select           |
|                   | +/-: Change Opt.        |
| SATA Port1         | F1: General Help         |
| Not Present        | F2: Previous Values      |
|                   | F3: Optimized Defaults   |
|                   | F4: Save & Exit          |
|                   | ESC: Exit                |
+-----+
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```

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
+-----+
| IDE Configuration | Select IDE / AHCI       |
|                   |                         |
| Serial-ATA (SATA)  | [Enabled]               |
|                   |                         |
| SATA Speed Support | [Gen2]                  |
| SATA Mode          | [AHCI Mode]             |
|                   |                         |
| Serial-ATA Port 0  | [En] /--- SATA Mode ---\
|                   | | IDE Mode              |
| Serial-ATA Port 1  | [En] | AHCI Mode        |
|                   | \-----/               |
| SATA Port0         | ><: Select Screen        |
| Not Present        | ^v: Select Item         |
|                   | Enter: Select           |
|                   | +/-: Change Opt.        |
| SATA Port1         | F1: General Help         |
| Not Present        | F2: Previous Values      |
|                   | F3: Optimized Defaults   |
|                   | F4: Save & Exit          |
|                   | ESC: Exit                |
+-----+
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```

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```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
/-----+-----+
| IDE Configuration                                | Enable / Disable Serial |
|                                                    | ATA Port 0              |
| Serial-ATA (SATA)          [Enabled]              |                        |
| SATA Speed Support         [Gen2]                  |                        |
| SATA Mode                   [AHCI Mode]             |                        |
| Serial-ATA Port 0          /--- Serial-ATA Port 0 ---\ |
| | Enabled                  |                          |
| Serial-ATA Port 1          | Disabled                |
| |                          |                          |
| SATA Port0                  |                          | : Select Screen
| Not Present                 |                          | : Select Item
|                               |                          |
| SATA Port1                  |                          | Enter: Select
| Not Present                 |                          | +/-: Change Opt.
|                               |                          | F1: General Help
|                               |                          | F2: Previous Values
|                               |                          | F3: Optimized Defaults
|                               |                          | F4: Save & Exit
|                               |                          | ESC: Exit
|                               |                          |
+-----+-----+
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```

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
/-----+-----+
| IDE Configuration                                | Enable / Disable Serial |
|                                                    | ATA Port 1              |
| Serial-ATA (SATA)          [Enabled]              |                        |
| SATA Speed Support         [Gen2]                  |                        |
| SATA Mode                   [AHCI Mode]             |                        |
| Serial-ATA Port 0          /--- Serial-ATA Port 1 ---\ |
| | Enabled                  |                          |
| Serial-ATA Port 1          | Disabled                |
| |                          |                          |
| SATA Port0                  |                          | : Select Screen
| Not Present                 |                          | : Select Item
|                               |                          |
| SATA Port1                  |                          | Enter: Select
| Not Present                 |                          | +/-: Change Opt.
|                               |                          | F1: General Help
|                               |                          | F2: Previous Values
|                               |                          | F3: Optimized Defaults
|                               |                          | F4: Save & Exit
|                               |                          | ESC: Exit
|                               |                          |
+-----+-----+
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```

USB Configuration

This option allows you to configure USB device Settings.

```

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Main  Advanced  Chipset  Security  Boot  Save & Exit

|> F81865 Super IO Configuration      |USB Configuration
|> Hardware Monitor                  |Parameters
|> Serial Port Console Redirection   |
|> CPU Configuration                |
|> IDE Configuration                |
|> USB Configuration                |
|> LAN Boot Configuration            |

|                                     |
|                                     |
|                                     |
|                                     |
|                                     |
|                                     |
|                                     |
|                                     |
|                                     |
|                                     |
|>: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit

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```

USB Module Version: displays information about USB module version

USB Devices: displays USB devices

Legacy USB Support: this function enables or disables legacy USB support. Auto option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications. You may select “Enabled”, “Disabled” or “Auto”.

EHCI Hand-off: enables or disables EHCI Hand-off function. This is a workaround for operating systems without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

USB Mass Storage Driv: this option allows you to enable or disable USB mass storage driver. The default is “Enabled”.

USB transfer time-out: set USB time-out value (1, 5, 10 or 20 seconds) for Control, Bulk and Interrupt transfers.

Device reset time-out: set USB mass storage device Start Unit command time-out (10, 20, 30 or 40 seconds).

Device power-up delay: set the maximum time the device will take before it properly reports itself to the Host Controller. “Auto” uses default value. For example, it is 100ms as a root port.

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```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
-----+-----
USB Configuration                                | Enables Legacy USB
                                                | support. AUTO option
USB Module Version      8.11.02                  | disables legacy support
                                                | if no USB devices are
USB Devices:                                       | connected. DISABLE
    1 Keyboard, 1 Hub                             | option will keep USB
                                                | devices available only
Legacy USB Support    /---- Legacy USB Support ----\ | for EFI applications.
    Enabled           |
EHCI Hand-off         | Disabled
USB Mass Storage Driv | Auto
                      \-----/
USB delays time:      |
USB transfer time-out [20 sec] | Enter: Select
Device reset time-out [20 sec] | +/-: Change Opt.
Device power-up delay [Auto]   | F1: General Help
                                | F2: Previous Values
                                | F3: Optimized Defaults
                                | F4: Save & Exit
                                | ESC: Exit
-----+-----
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```

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
-----+-----
USB Configuration                                | Enable/Disable USB Mass
                                                | Storage Driver Support.
USB Module Version      8.11.02
USB Devices:
    1 Keyboard, 1 Hub
Legacy USB Support /--- USB Mass Storage Driver Support ---\
EHCI Hand-off     | Disabled
USB Mass Storage  | Enabled
                  \-----/
USB delays time:  |
USB transfer time-out [20 sec] | Enter: Select
Device reset time-out [20 sec] | +/-: Change Opt.
Device power-up delay [Auto]   | F1: General Help
                                | F2: Previous Values
                                | F3: Optimized Defaults
                                | F4: Save & Exit
                                | ESC: Exit
-----+-----
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```

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```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
-----+-----
USB Configuration                                |The time-out value for
USB Module Version      8.11.02                  |Control, Bulk, and
                                                    |Interrupt transfers.
USB Devices:                                     |
  1 Keyboard, 1 Hub                               |
                                                    |
  /--- USB transfer time-out ---\
  | 1 sec
  | 5 sec
  | 10 sec
  | 20 sec
  \-----/
USB delays time:
USB transfer time-out [20 sec]
Device reset time-out [20 sec]
Device power-up delay [Auto]

Select Screen
Select Item
F: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
-----+-----
USB Configuration                                |USB mass storage device
USB Module Version      8.11.02                  |Start Unit command
                                                    |time-out.
USB Devices:                                     |
  1 Keyboard, 1 Hub                               |
                                                    |
  /--- Device reset time-out ---\
  | 10 sec
  | 20 sec
  | 30 sec
  | 40 sec
  \-----/
USB delays time:
USB transfer time-out [20 sec]
Device reset time-out [20 sec]
Device power-up delay [Auto]

Select Screen
Select Item
F: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```

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```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
  Advanced
+-----+
| USB Configuration |Maximum time the device |
|                   |will take before it    |
| USB Module Version 8.11.02 |properly reports itself |
|                   |to the Host Controller. |
| USB Devices:      |'Auto' uses default    |
|   1 Keyboard, 1 Hub |value: for a Root port |
|                   |it is 100 ms, for a Hub |
| Legacy USB Support /--- Device power-up delay ---\rt the delay is taken |
| EHCI Hand-off      | Auto | Hub descriptor. |
| USB Mass Storage Driv| Manual |
|                   |-----|
| USB delays time:   |Select Screen
|                   |Select Item
| USB transfer time-out [20 sec] |Enter: Select
| Device reset time-out [20 sec] |+/-: Change Opt.
| Device power-up delay [Auto]   |F1: General Help
|                               |F2: Previous Values
|                               |F3: Optimized Defaults
|                               |F4: Save & Exit
|                               |ESC: Exit
+-----+
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```

LAN Boot Configuration

Select onboard LAN for enabled PXE Boot.

```

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Main Advanced Chipset Security Boot Save & Exit

> F81865 Super IO Configuration
> Hardware Monitor
> Serial Port Console Redirection
> CPU Configuration
> IDE Configuration
> USB Configuration
> LAN Boot Configuration

Select one of on board
lan to enabled PXE boot

-----
|><: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit
-----

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```

```

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Advanced

LAN Boot Configuration
LAN Boot Configuratio [Disabled]

Select On Board LAN for
enabled PXE Boot

----- LAN Boot Configuration -----
| Disabled
| LAN1
| LAN2
|-----|

Select Screen
Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```

Chipset

Use [←] / [→] to select [Chipset] setup screen. Under this screen, you may use [↑] [↓] to select “North Bridge” or “South Bridge” to configure the parameters.

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main  Advanced  Chipset  Security  Boot  Save & Exit
-----
|> North Bridge                                     |North Bridge Parameters
|> South Bridge                                     |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|                                                    |
|<: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit
-----
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```

North Bridge

Memory Information

Total Memory: displays total memory

Max TOLUD: set the maximum value of TOLUD.

```

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Chipset
-----+-----
Memory Information                                     Maximum Value of TOLUD.

Total Memory              8192 MB (DDR3L)

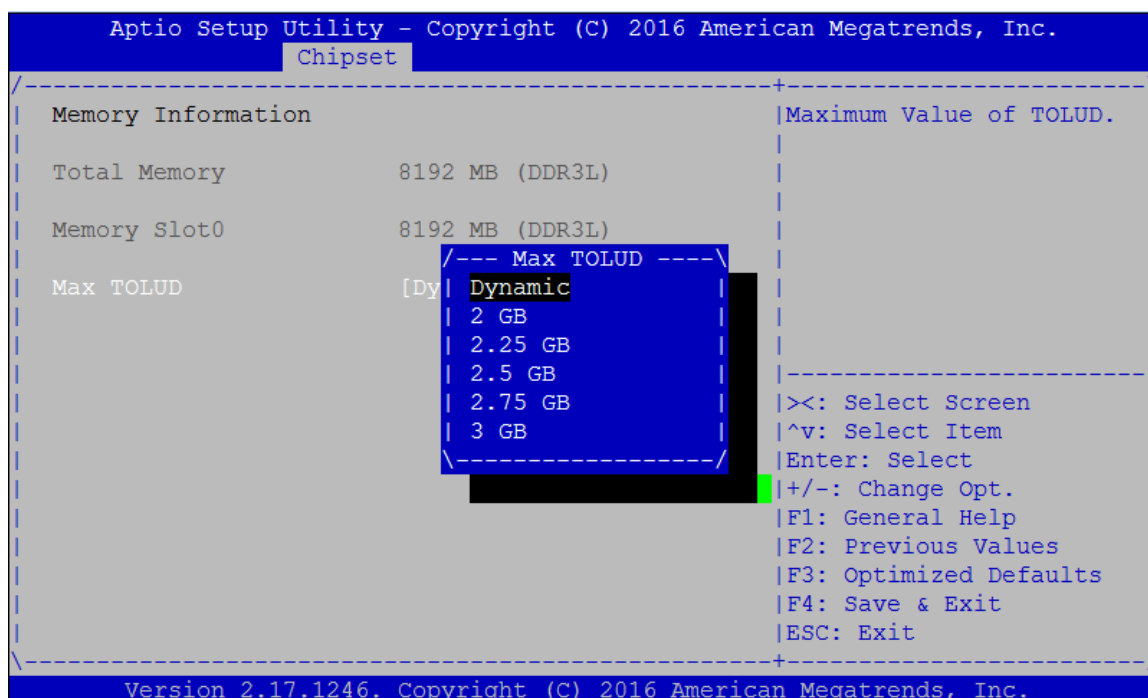
Memory Slot0              8192 MB (DDR3L)

Max TOLUD                 [Dynamic]

-----+-----
|>: Select Screen
|^v: Select Item
|Enter: Select
|+/-: Change Opt.
|F1: General Help
|F2: Previous Values
|F3: Optimized Defaults
|F4: Save & Exit
|ESC: Exit
-----+-----
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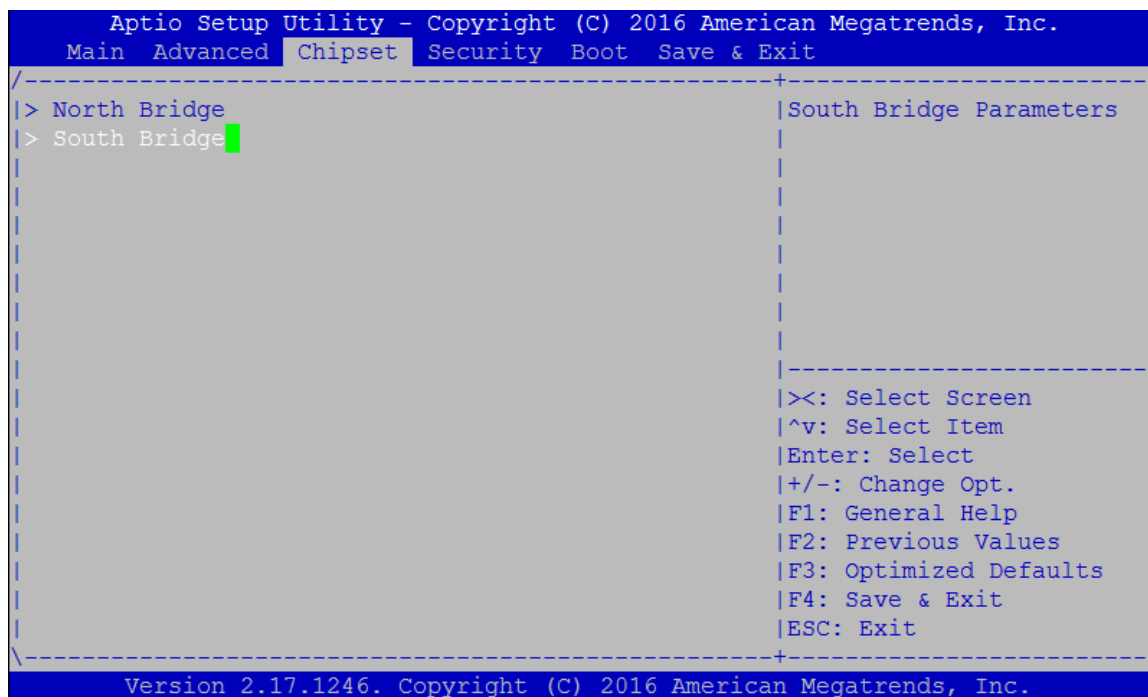
```

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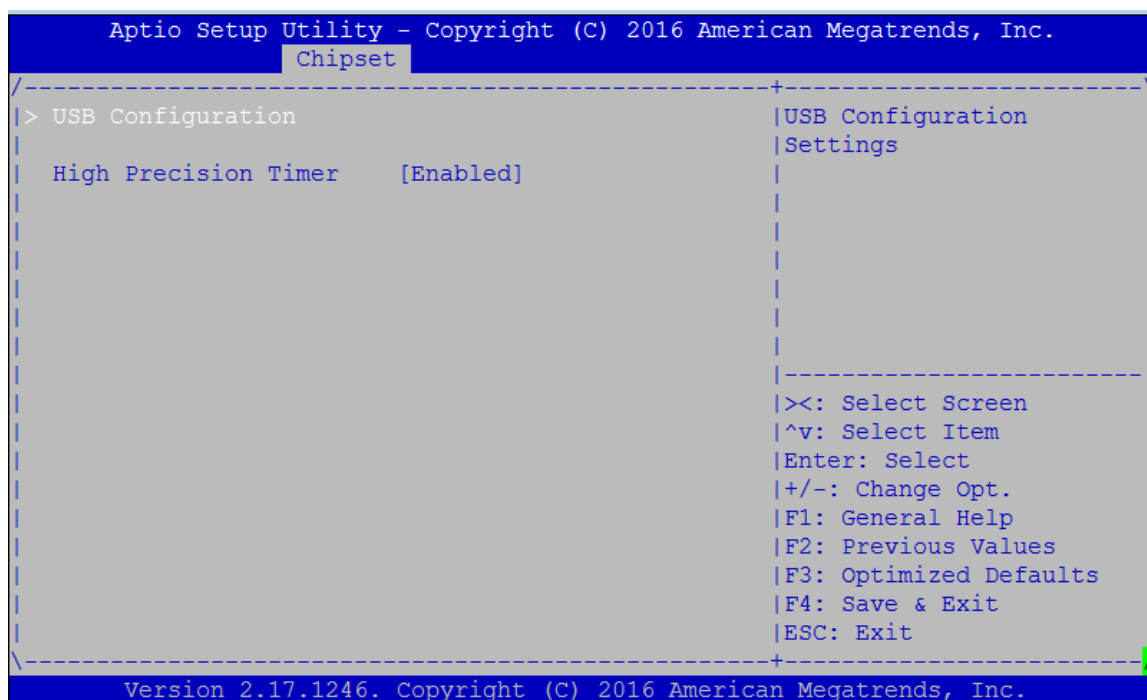


South Bridge

Once entered South Bridge setting, you may configure USB, and high precision timer.



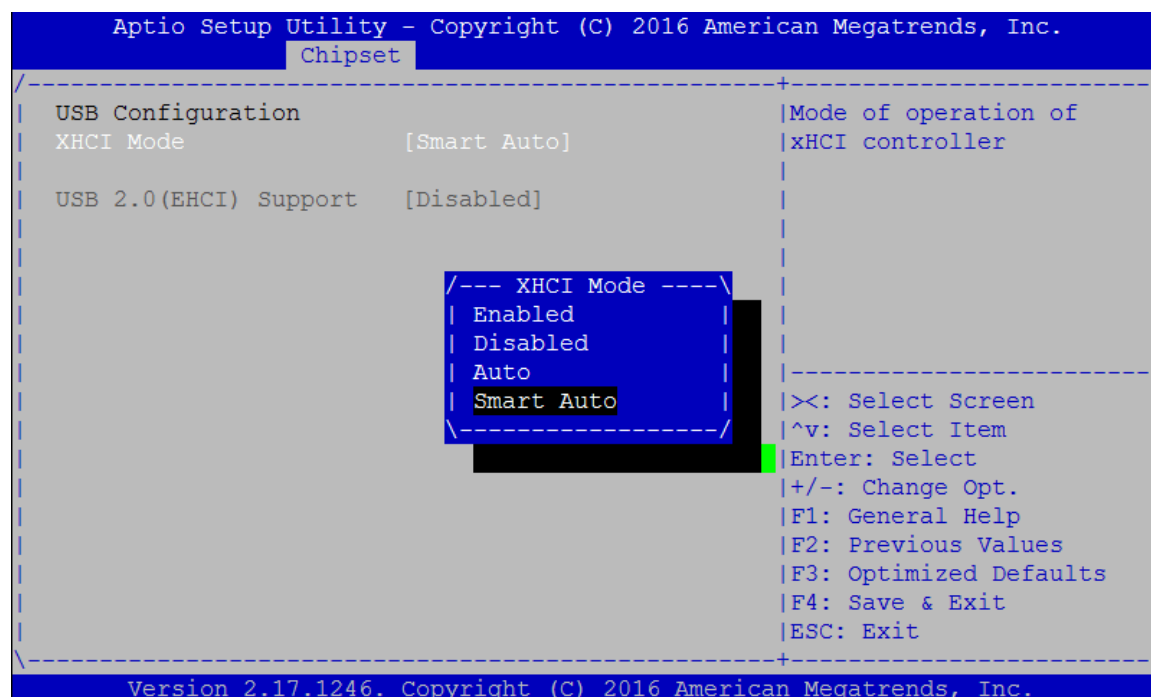
Industrial Communication Platform



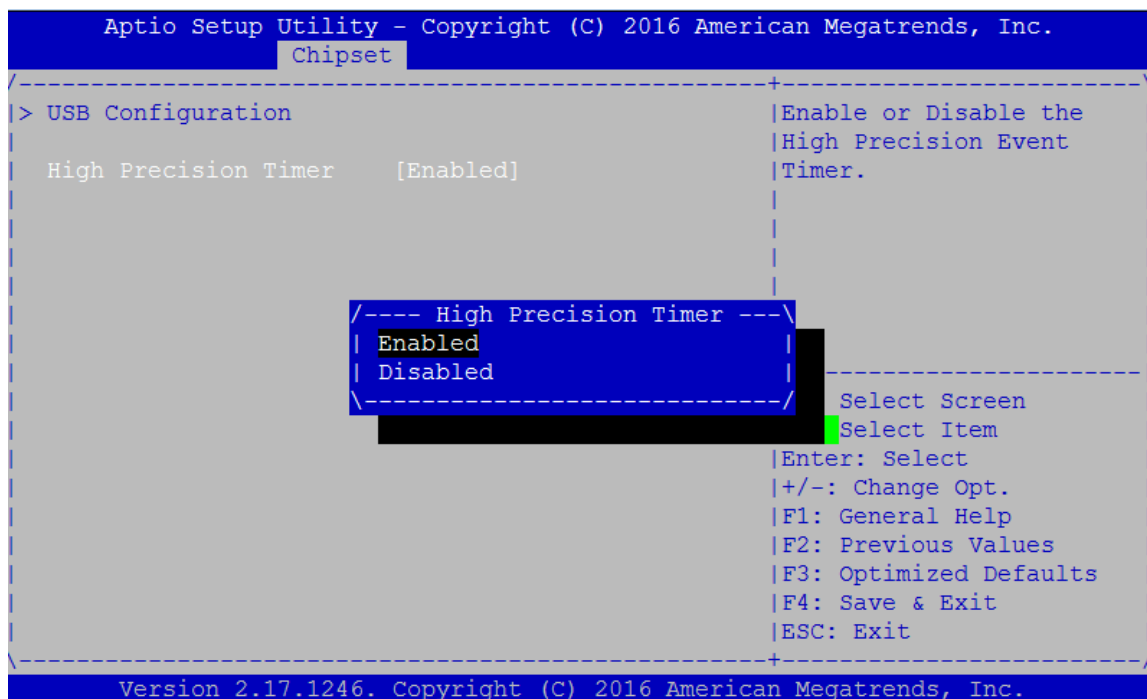
USB Configuration

XHCI Mode: select the mode of XHCI controller.

USB 2.0 (EHCI) Support: control the USB EHCI (USB2.0) functions. One EHCI controller must always be enabled.



Industrial Communication Platform



Security

Use [**<**] / [**>**] to select [Security] setup screen. Under this screen, you may use [**↑**] [**↓**] to select an item you want to configure.

Administrator Password: set administrator password. Once set, then this only limits access to Setup and is only asked for when entering Setup.

Notes: please make sure the password range follow this BIOS definition. For instance, the minimum length of a password is ‘ 3 ’ , while the maximum length is ‘ 20 ’ .

```

Apdio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main  Advanced  Chipset  Security  Boot  Save & Exit
-----
Password Description                                |Set Administrator
                                                    |Password
If ONLY the Administrator's password is set,      |
then this only limits access to Setup and is      |
only asked for when entering Setup.              |
If ONLY the User's password is set, then this    |
is a power on password and must be entered to    |
boot or enter Setup. In Setup the User will      |
have Administrator rights.                       |
The password length must be                      |
in the following range:                          |-----
Minimum length          3                        |><: Select Screen
Maximum length          20                       |^v: Select Item
                                                    |Enter: Select
                                                    |+/-: Change Opt.
                                                    |F1: General Help
Administrator Password                            |F2: Previous Values
                                                    |F3: Optimized Defaults
                                                    |F4: Save & Exit
                                                    |ESC: Exit
-----
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```

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main Advanced Chipset Security Boot Save & Exit
-----+-----
Password Description                               |Set Administrator
                                                    |Password
If ONLY the Administrator's password is set,      |
then this only limits access to Setup and is      |
only asked for when entering Setup.              |
If ONLY the User's password is set, then this    |
is a power on password and must be entered to    |
boot or enter Setup. In S/ Create New Password -\ |
have Administrator rights|
The password length must \-----/
in the following range:
Minimum length          3
Maximum length          20
Administrator Password

                                                    |<: Select Screen
                                                    |^v: Select Item
                                                    |Enter: Select
                                                    |+/-: Change Opt.
                                                    |F1: General Help
                                                    |F2: Previous Values
                                                    |F3: Optimized Defaults
                                                    |F4: Save & Exit
                                                    |ESC: Exit
-----+-----
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```

Boot

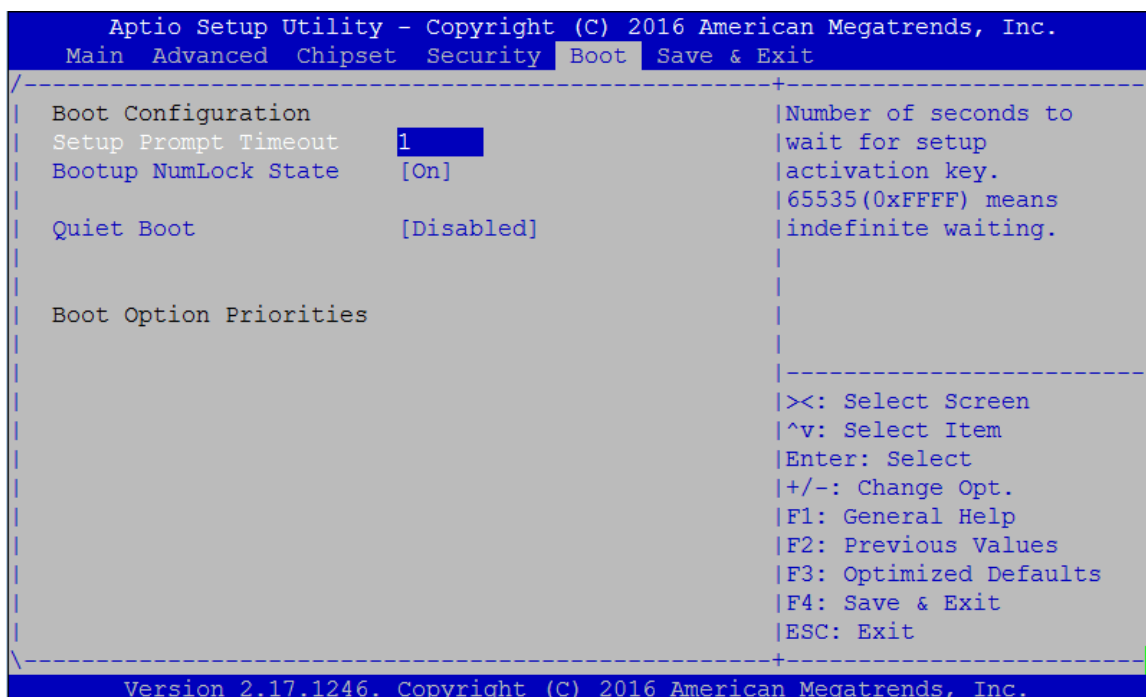
Use [←] / [→] to select [Boot] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

Setup Prompt Timeout: set the number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Bootup NumLock State: select “On/Off” for the keyboard NumLock state.

Quiet Boot: enable or disable “Quiet Boot” option.

Boot Option #1: determine the device to be the device boot priority



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Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.		
Main	Advanced	Chipset
Security	Boot	Save & Exit
Boot Configuration Setup Prompt Timeout 1 Bootup NumLock State [On] Quiet Boot [Disabled]		Select the keyboard NumLock state
Boot Option Priorities		Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
/----- Bootup NumLock State -----\ On Off \-----/		Select Screen Select Item
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Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.		
Main	Advanced	Chipset
Security	Boot	Save & Exit
Boot Configuration Setup Prompt Timeout 1 Bootup NumLock State [On] Quiet Boot [Disabled]		Enables or disables Quiet Boot option
Boot Option Priorities		><: Select Screen ^v: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
/----- Quiet Boot -----\ Disabled Enabled \-----/		
Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.		

Save & Exit

Use [←] / [→] to select [Save & Exit] setup screen. Under this screen, you may use [↑] [↓] to select an item you want to configure.

Save Changes and Exit: exit system setup after saving the configuration changes

Discard Changes and Exit: exit system setup without saving the configuration changes

Restore Defaults: restore to factory default setting

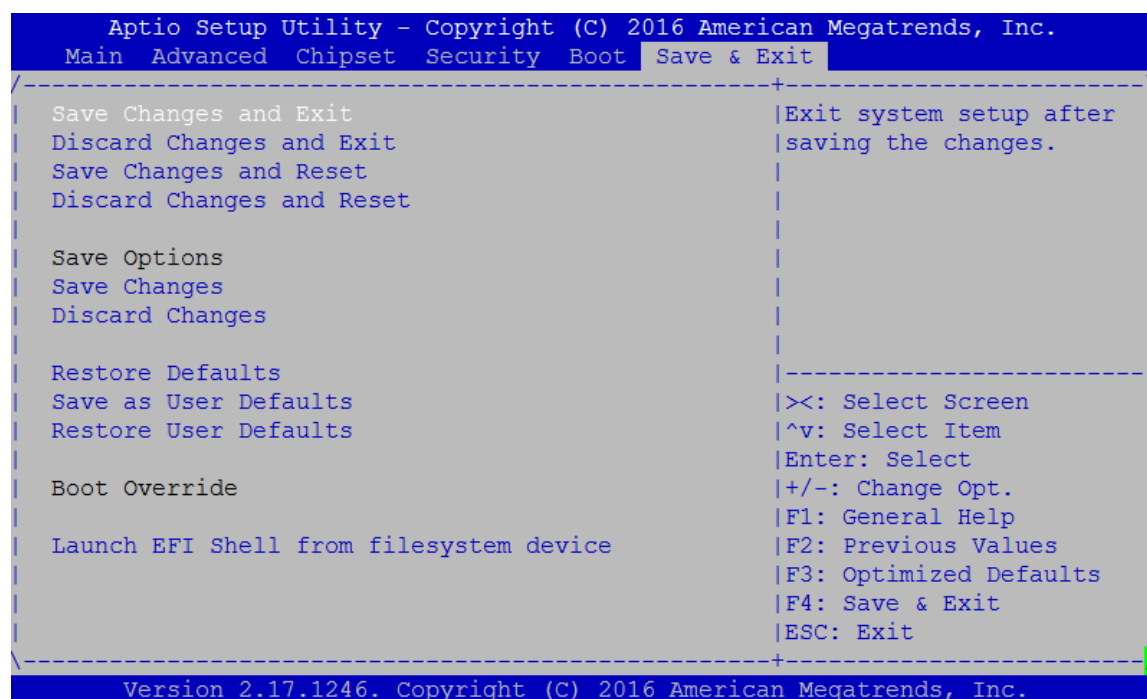
Save Changes and Exit: exit system setup after saving the configuration changes

Discard Changes and Exit: exit system setup without saving the configuration changes

Restore Defaults: restore/load factory default setting for all setup parameters.

Save as User Defaults: save changes as user default

Restore User Defaults: restore the existing user default



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```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main Advanced Chipset Security Boot Save & Exit

Save Changes and Exit      |Exit system setup after
Discard Changes and Exit   |saving the changes.
Save Changes and Reset
Discard Changes and Reset

Save Options               |/----- Save & Exit Setup -----\
Save Changes               | | Save configuration and exit? | |
Discard Changes            | |                               | |
                            | |-----| |
Restore Defaults           | |                               | |
Save as User Defaults      | |                               | |
Restore User Defaults      | |                               | |
                            | |-----| |
Boot Override              | |                               | |
Launch EFI Shell from filesystem device

                            |+/-: Change Opt.
                            |F1: General Help
                            |F2: Previous Values
                            |F3: Optimized Defaults
                            |F4: Save & Exit
                            |ESC: Exit

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```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main Advanced Chipset Security Boot Save & Exit

Save Changes and Exit      |Exit system setup
Discard Changes and Exit   |without saving any
Save Changes and Reset     |changes.
Discard Changes and Reset

Save Options               |/ Exit Without Saving -\
Save Changes               | | Quit without saving? | |
Discard Changes            | |                               | |
                            | |-----| |
Restore Defaults           | |                               | |
Save as User Defaults      | |                               | |
Restore User Defaults      | |                               | |
                            | |-----| |
Boot Override              | |                               | |
Launch EFI Shell from filesystem device

                            |><: Select Screen
                            |^v: Select Item
                            |Enter: Select
                            |+/-: Change Opt.
                            |F1: General Help
                            |F2: Previous Values
                            |F3: Optimized Defaults
                            |F4: Save & Exit
                            |ESC: Exit

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```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main Advanced Chipset Security Boot Save & Exit

Save Changes and Exit
Discard Changes and Exit
Save Changes and Reset
Discard Changes and Reset

Save Options
Save Changes
Discard Changes

Restore Defaults
Save as User Defaults
Restore User Defaults

Boot Override

Launch EFI Shell from filesystem device

Reset system setup
without saving any
changes.

Reset without saving?

Yes No

><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```

```

Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main Advanced Chipset Security Boot Save & Exit

Save Changes and Exit
Discard Changes and Exit
Save Changes and Reset
Discard Changes and Reset

Save Options
Save Changes
Discard Changes

Restore Defaults
Save as User Defaults
Restore User Defaults

Boot Override

Launch EFI Shell from filesystem device

Save Setup Values -
Save configuration?

Yes No

><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```

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```

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Main  Advanced  Chipset  Security  Boot  Save & Exit

-----+-----
| Save Changes and Exit          | Discard Changes done so far to any of the setup | | |
| Discard Changes and Exit      | options.                                         |
| Save Changes and Reset        |                                                  |
| Discard Changes and Reset      |                                                  |
|                               |                                                  |
| Save Options                  | /- Load Previous Values \                    |
| Save Changes                  | | Load Previous Values? |                    |
| Discard Changes                | |                          |                    |
|                               | |-----|                    |
| Restore Defaults              | | Yes   No |                    |
| Save as User Defaults         | \-----/                    |
| Restore User Defaults         | |                          |                    |
|                               | |                          |                    |
| Boot Override                 | |><: Select Screen |
|                               | |^v: Select Item  |
|                               | |Enter: Select    |
|                               | |+/ -: Change Opt.|
|                               | |F1: General Help |
|                               | |F2: Previous Values |
|                               | |F3: Optimized Defaults |
|                               | |F4: Save & Exit   |
|                               | |ESC: Exit        |
|                               | |                |
| Launch EFI Shell from filesystem device |
|                               |
-----+-----

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```

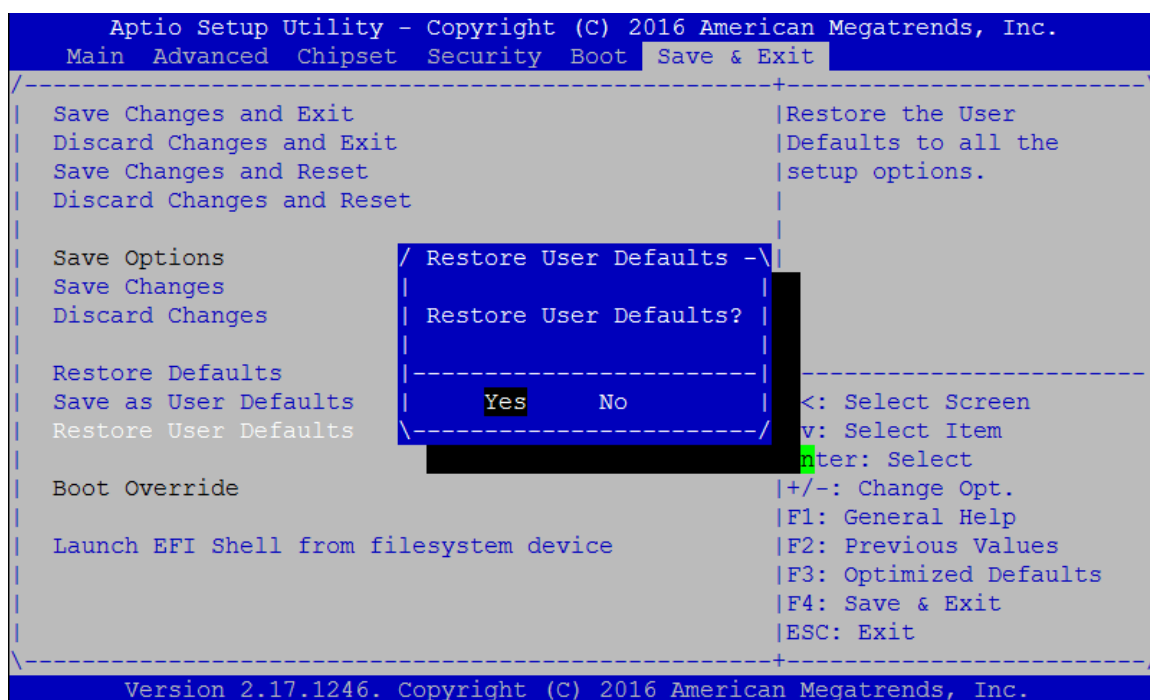
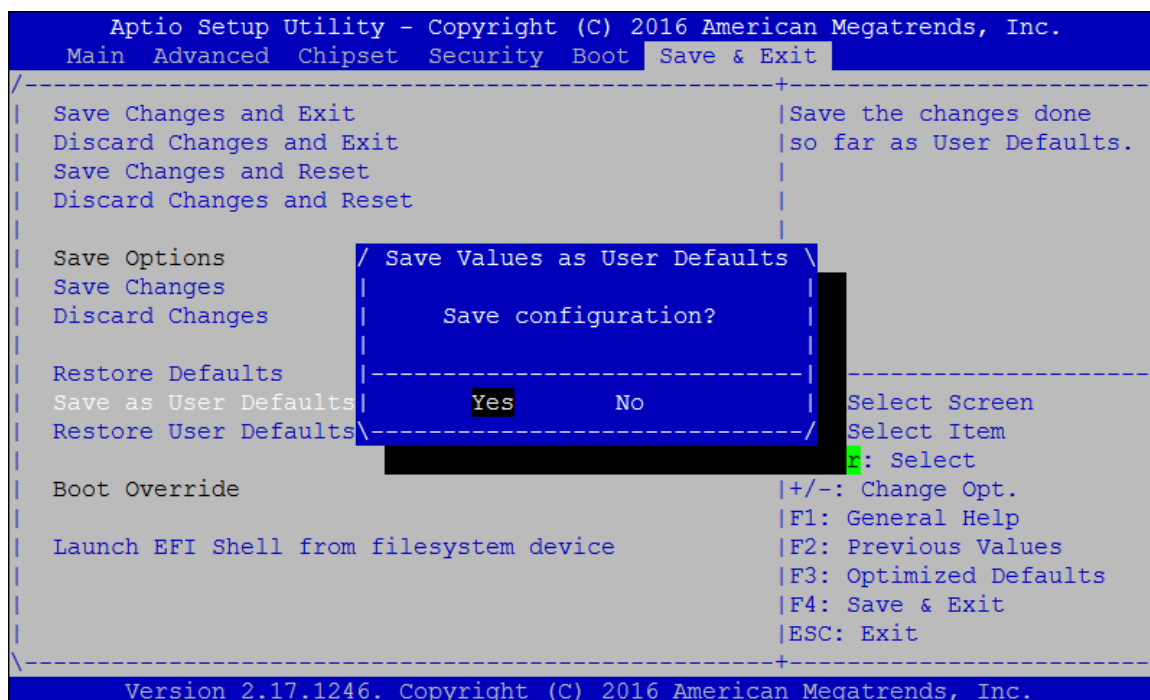
Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
Main  Advanced  Chipset  Security  Boot  Save & Exit

-----+-----
| Save Changes and Exit          | Restore/Load Default values for all the setup options. | | |
| Discard Changes and Exit      |                                                  |
| Save Changes and Reset        |                                                  |
| Discard Changes and Reset      |                                                  |
|                               |                                                  |
| Save Options                  | / Load Optimized Defaults -\                  |
| Save Changes                  | | Load Optimized Defaults? |                  |
| Discard Changes                | |                          |                  |
|                               | |-----|                  |
| Restore Defaults              | | Yes   No |                  |
| Save as User Defaults         | \-----/                  |
| Restore User Defaults         | |                          |                  |
|                               | |                          |                  |
| Boot Override                 | |>: Select Screen |
|                               | |v: Select Item  |
|                               | |Enter: Select   |
|                               | |+/ -: Change Opt.|
|                               | |F1: General Help |
|                               | |F2: Previous Values |
|                               | |F3: Optimized Defaults |
|                               | |F4: Save & Exit   |
|                               | |ESC: Exit        |
|                               | |                |
| Launch EFI Shell from filesystem device |
|                               |
-----+-----

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```

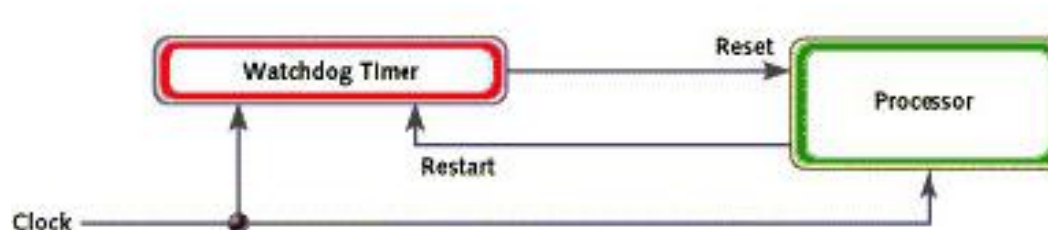
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Appendix 1: Programming Watchdog Timer

A watchdog timer is a piece of hardware that can be used to automatically detect system anomalies and reset the processor in case there are any problems. Generally speaking, a watchdog timer is based on a counter that counts down from an initial value to zero. The software selects the counter's initial value and periodically restarts it. Should the counter reach zero before the software restarts it, the software is presumed to be malfunctioning and the processor's reset signal is asserted. Thus, the processor will be restarted as if a human operator had cycled the power.

For sample watchdog code, see *watchdog* folder on the *Driver and Manual CD*

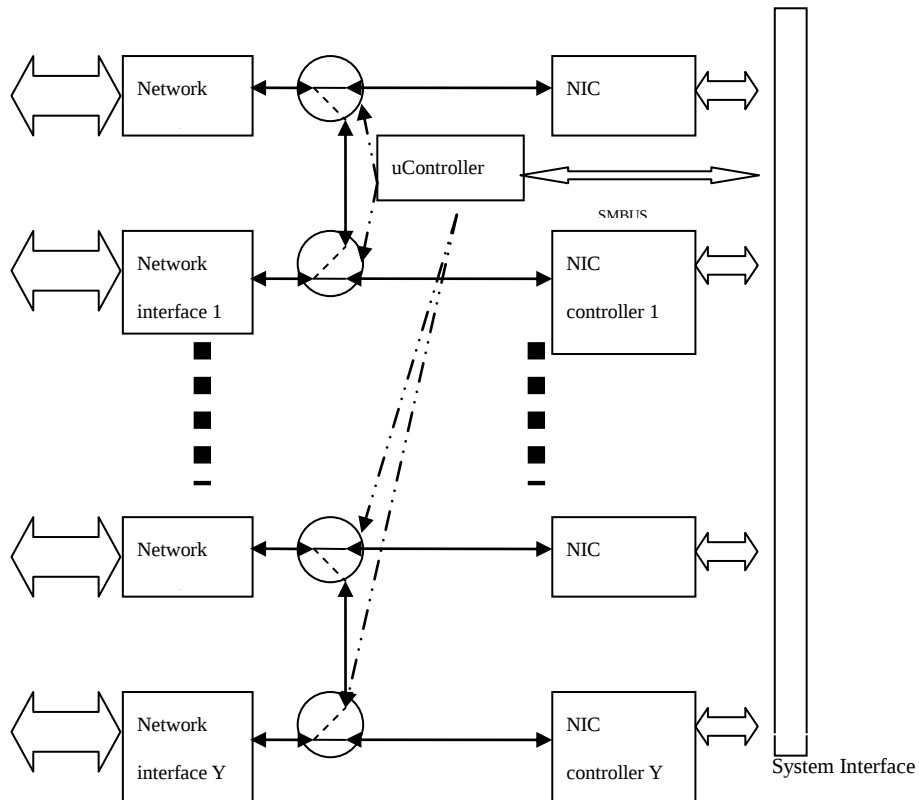


Appendix 2: Lanner's Generation 3 Bypass

Lanner Bypass has evolved to Generation 3 which has much advancement over the previous two generations. It offers more flexibility and richer configuration of bypass setting by adopting the uController. With the uController and its onboard Non-volatile random-access memory (NVRAM), it can store the configuration of the bypass settings as well as manage the bypass status accurately regardless of the system's operating state. It also eliminates the brief moment in which the bypassed cannot be managed during the instance of power-on (Just-on state), which could possibly result in packet loss happened in Generation 2. Moreover, up to 3 dedicated watchdogs for controlling bypass status of different pairs is designed to accommodate the versatility of LAN configuration in your network environment. For instance, you might have two connections for differentiated services like VOIP or media streaming, and using the dedicated watchdog timer for different pairs of bypassed ports can help manage the bypass function differently on port basis.

The following diagram depicts the role and function of the uControllers in Generation 3 Bypass. The interface between the system and uController is SMBUS (I2C). The uController can control up to 4* pairs of bypass.

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¹ The number of bypass pairs varies depending on the models of the system.

Appendix 3: P-Fail Relay for Dual Power Supply

A **Dual Power Supply** is the supply of direct current to a device from two outlets, which means if either supply fails, the device will keep operating as usual, and hence guarantees a constant power source for the system. To ensure your power solution fulfills conditions where uninterrupted power is critical, the P-fail relay allows you to take precautions against potential power failures.

The P-Fail, Port Failure or Power Failure, is a relay that detects the abnormal status of a power source. Connected to an alarm device such as a buzzer or an LED indicator, its relay circuit can be triggered as **Closed** or **Open** whenever the power fails. Upon being notified by the alarm, you can immediately address the power issue before it eventually cripples your system.



As LEC-6032C comes with dual power and P-fail relay features, the P-Fail relay will have the signaling device triggered as the power supply fails. LEC-6032C's relay circuit is set to be **Open** by default and **Closed** when either or neither of the powers is detected; the **Closed** (or **Short**) circuit then allows the Alarm Device to be activated.

PWR1	PWR2	Circuit Status	Alarm Device
Detected	Detected	Open (Normal)	Off
Not Detected	Detected	Closed	Activated
Detected	Not Detected	Closed	Activated
Not Detected	Not Detected	Closed	Activated

Connecting the Alarm Device

Connect the device to the system through **Pin3** and **Pin4** on the 6-pin terminal block and make sure the voltage rating of the external power supply that energizes the signaling device is compatible with the relay output. For details on this relay ([AXICOM IM02GR](#))'s specifications, please visit the manufacturer's official website for latest documentation. For the pin assignment information of this power connector (**CN1: Power Connector**), please refer to Jumper Settings & Connector Pinout (LEK-6032FA).

