User Manual

R1s / E1s

CYBERNET

www.cybernet.us

IPC-R1s / IPC-E1s
User Manual

Declaration of Conformity

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 require to correct the interference at his own expense.

Notice 1 The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

Trademarks

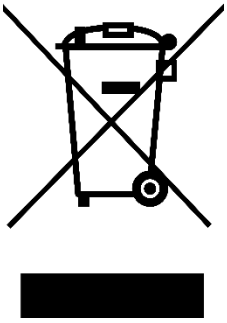
WEEE Statement

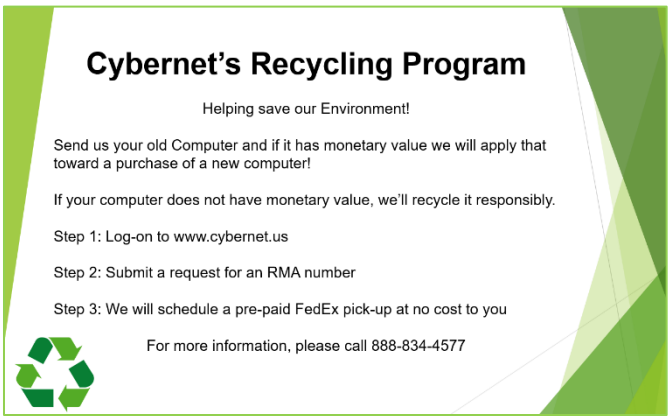
(Waste Electrical and Electronic Equipment)

The WEEE directive places an obligation on EU-based manufacturers, distributors, retailers and importers to take-back electronics products at the end of their useful life. A sister Directive, ROHS (Restriction of Hazardous Substances) compliments the WEEE Directive by banning the presence of specific hazardous substances in the products at the design phase. The WEEE Directive covers products imported into the EU as of August 13, 2005. EU-based manufacturers, distributors, retailers and importers are obliged to finance the costs of recovery from municipal collection points, reuse, and recycling of specified percentages per the WEEE requirements.

Instructions for disposal of WEEE by Users in the European Union

The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.





Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this equipment away from humidity.
3. Lay this equipment on a reliable flat surface before setting it up.
4. Confirm the voltage of the power source and adjust accordingly to 110/220V before connecting the equipment to the power inlet.
5. Place the power cord in such a way that it cannot be stepped on. Do not place anything over the power cord.
6. Always unplug the Power Cord before inserting any add-on card or module.
7. All cautions and warnings on the equipment should be noted.
8. Never pour any liquid into the opening. This will cause damage and/or electrical shock.
9. Do not disable the protective grounding pin from the plug. The equipment must be connected to a grounded main socket/outlet.
10. If any of the following situations arise, have the equipment checked by authorized service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment has not worked well or you cannot get it working according to the User's Guide.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.
11. Do not attempt to remove or upgrade any components by yourself, any installation or modification should be conducted by service personnel.

DO NOT LEAVE THIS EQUIPMENT IN AN UNCONDITIONED ENVIRONMENT WITH A STORAGE TEMPERATURE ABOVE 85° C (185°F). IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

Table of Contents

Declaration of Conformity **1**

Trademarks **1**

WEEE Statement **2**

Safety Instructions **3**

Introduction **5**

IPC R1S & IPC E1S Specifications **6**

IPC-R1s & IPC-E1s Overview **8**

IPC-R1s Dimension 8

IPC-E1s Dimension 8

IPC-R1s & IPC-E1s Front I/O View 9

IPC-R1s & IPC-E1s Back I/O View 15

Ignition Control 21

Adjusting Ignition Control Modes 21

Ignition Control Wiring 24

Power Management **25**

Waking the System Up 27

IPC-R1s / IPC-E1s BIOS introduction **28**

Appendices **29**

A - Isolated DIO Guide 30

B - Cybernet's Recycling Program 33

C - Getting Help 33

Caution:

Warning, electricity

Direct current

Operating Instructions

Alternating current

Ready to use

Introduction

Congratulations on your purchase of the IPC-R1s / IPC-E1s. We are confident the IPC-R / IPC-E Series is the premier Slim Rugged PC line on the market. With their sleek design and small form factor, these units can be quickly deployed anywhere they are needed and their easy-to-use, feature-packed interfaces offer an unparalelled user experience. If you have any questions about your new IPC-R1s / IPC-E1s, please do not hesitate to contact us using any of the support numbers provided at the end of this User Manual

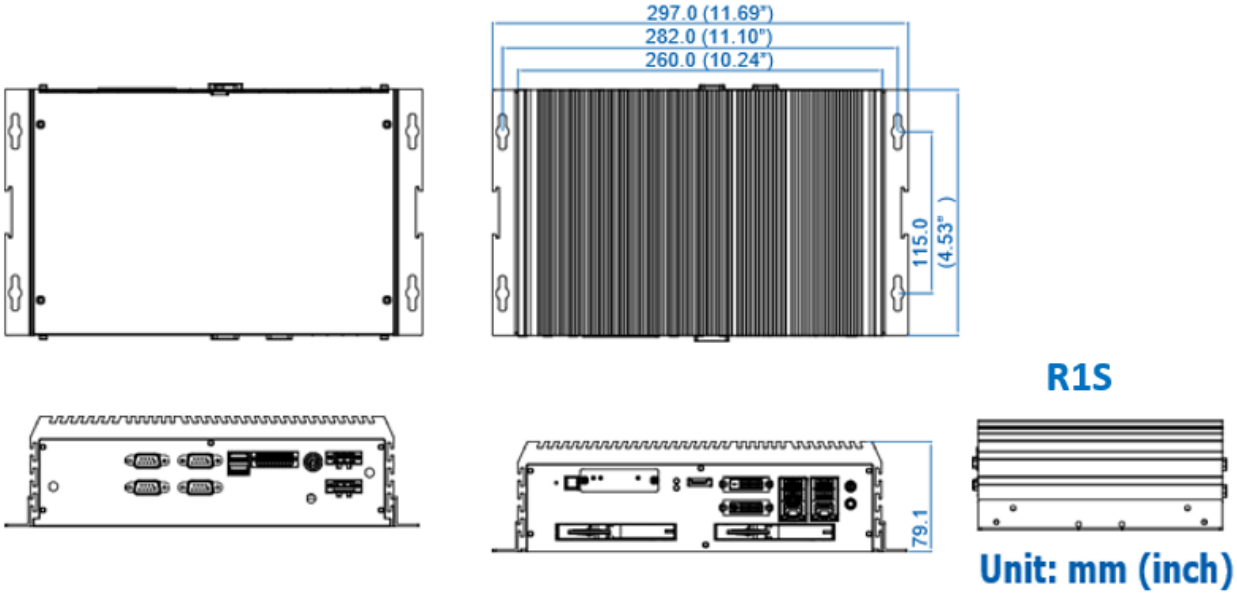
IPC R1s & IPC E1s Specifications

CPU	Supports Intel Skylake & Kabylake 6th & 7th Generation Processor, Socket LGA 1151
Memory	2 x DDR4 SO-DIMM sockets, up to 64GB combined
	Supports memory data transfer rates of 2133MHz/2400 MHz for DDR4, un-buffered non-ECC DDR4 SO-DIMMs
Storage	Serial ATA controller facilitates high-speed transfers up to 6Gbps
	Maximum 2 x 2.5” HDD or SSD
Video & Graphics	Skylake: Integrated Intel® HD Graphics 530
	Kabylake: Integrated Intel® HD Graphics 630
Front I/O Ports	1x Display Port, up to 4096 x 2304 @ 60Hz
	1x DVI-D, up to 1920x1200 @ 60Hz
	1x DVI-I, up to 1920x1200 @ 60Hz
	4x USB3.0
	2x RJ45 Gigabit (Gbe) LAN
	1x Line-out
	3x SIM Card Sockets
	1x CFast Slot
	IPC E1S: 4x 802.3at PoE+, RJ45 Gigabit (Gbe) LAN
Rear I/O Ports	1 x DC-IN Power Connector (6-36V)
	1x DC-IN Terminal Block Connector
	1x Remote On/Off & Ignition Terminal Block
	4 x COM RS232/422/485
	2 x USB3.0
	IPC-R1s: 16x GPIO
	IPC-E1s: 16x Isolated DIO (8 DI, 8 DO)
Power Input	**IPC-R1s**: 19V / 6.32A Power Adapter, 120W, AC Input: 100-240V AC / 2.0-1.0A / 50-60Hz
	IPC-E1s: 19.5V / 9.23A Power Adapter, 180W, AC Input: 100-240V AC 2.0-1.0A / 50-60Hz
Wireless Communications	Intel AC7260 support IEEE802.11ac + BT4.0 (Optional)
Operating System	Windows 10 / IoT / Pro
	Linux
Operating Environment	Ambient Temperature: -20°C ~ 70°C (operating)
Relative Humidity	10% ~ 95% (non-condensing)
Vibration	5 Grms @5-500 Hz according to IEC60068-2-64
Shock	Operating, 50 Grms, Half-sine 11ms duration according to IEC60068-2-27
Dimensions	10.2” x 6.9” x 3.1” (L,W,D)

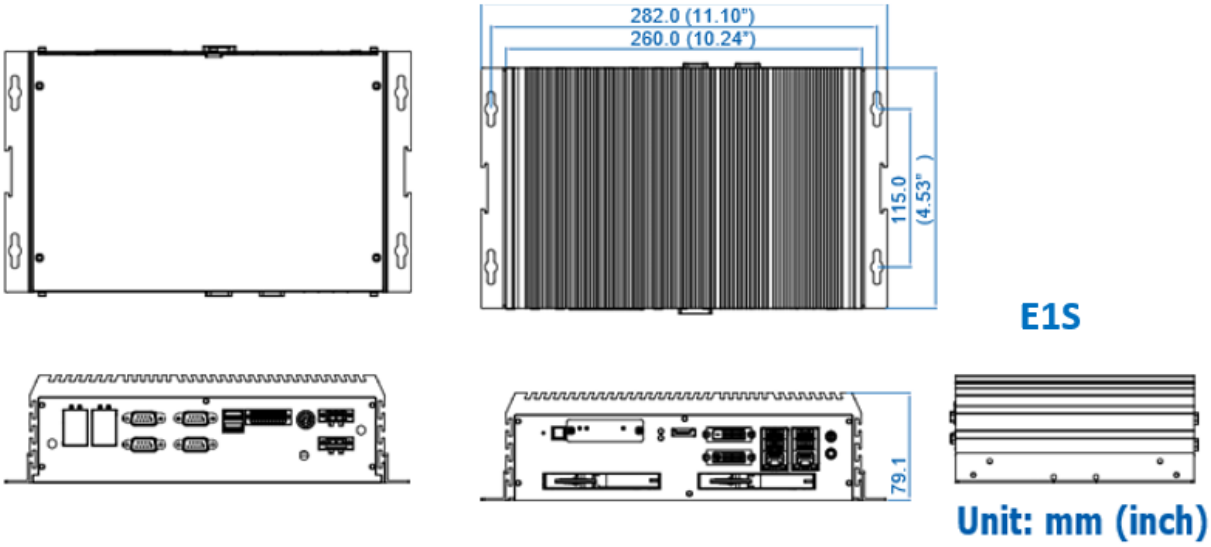
Weight	8.4 lbs
System BIOS	AMI Flash BIOS supports ACPI, API, DMI, Plug & Play, and security password.
BIOS Security	BIOS System POST and BIOS setup password protection. TPM version 2.0 Support.
TPM	1 x Trusted Platform Module (TPM) Infineon SLB9665
Certifications	FCC Class A / CE
	EN50155
	EN50121-3-2
	E13

IPC-R1s & IPC-E1s Overview

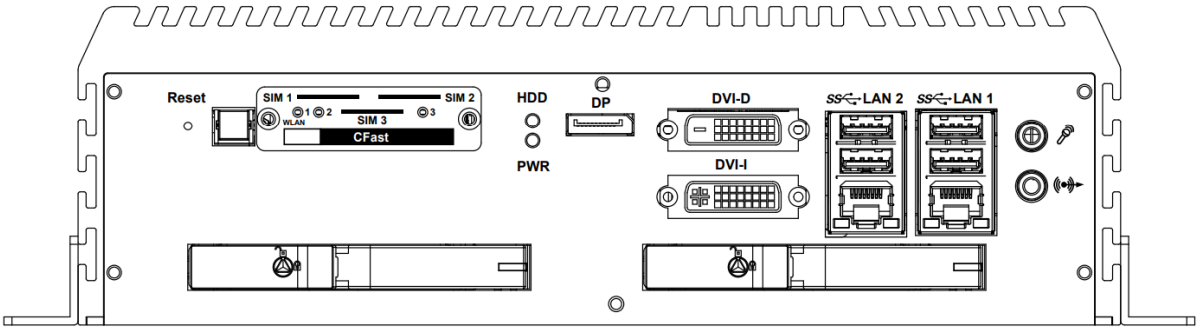
IPC-R1s Dimension



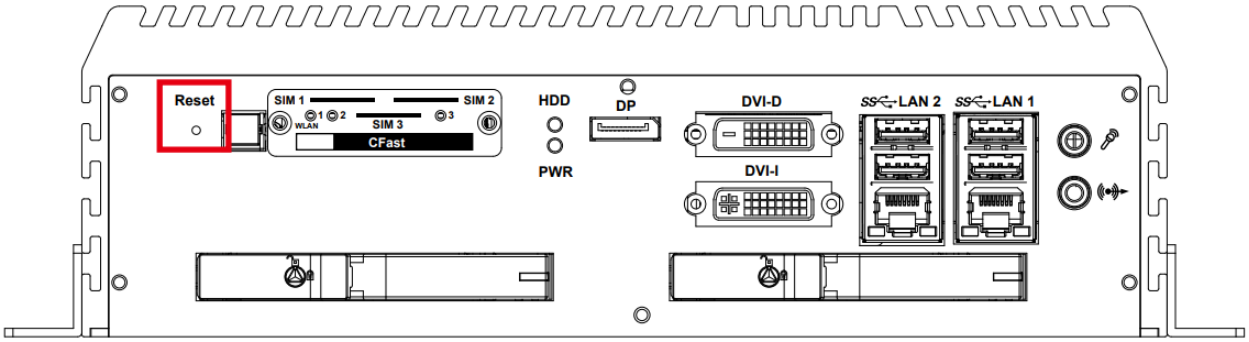
IPC-E1s Dimension



IPC-R1s & IPC-E1s Front I/O View

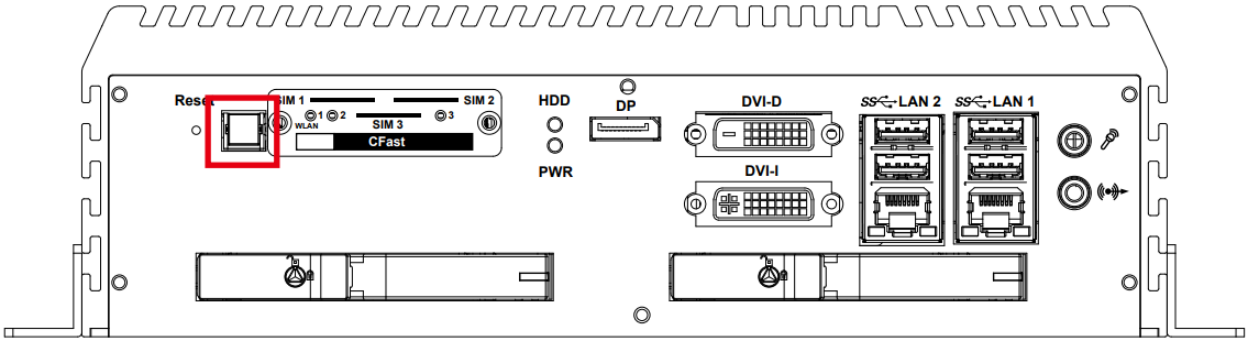


Reset Tact Switch



This is a hardware reset switch used to reset the system without powering off the system.

Power Button

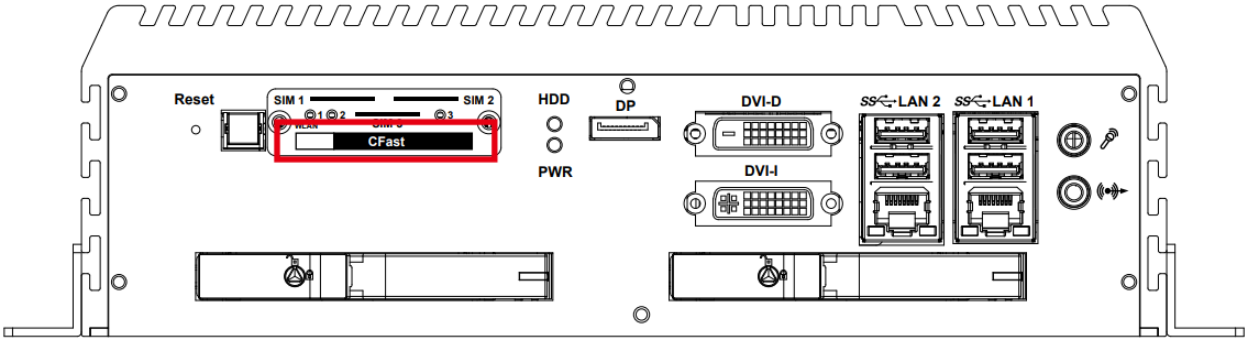


The Power Button is a momentary switch with dual color LED indicators.

LED Color	Power Status	System Status
Solid Blue	S0	Working state
Solid Orange	S3, S5	Suspend to RAM, System off with standby power

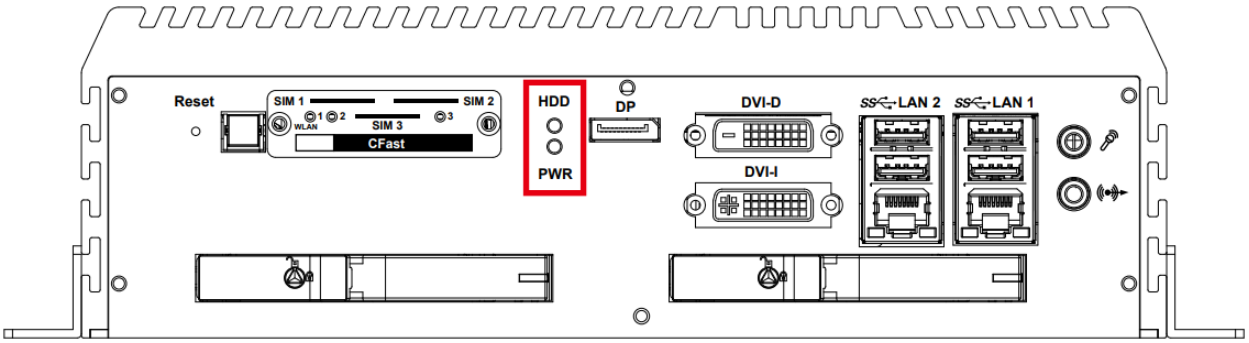
Press the power button to turn on the system. To force a shutdown, press and hold the power button for 4-seconds.

Cfast Card



Supports Type-I/II Compact Flash card. Be sure to disconnect the power source and unscrew the Cfast socket cover before installing a Cfast card. The R1S/E1S does not support hot-swapping and PnP (Plug and Play) functions. The Cfast card must be installed when the system is powered off.

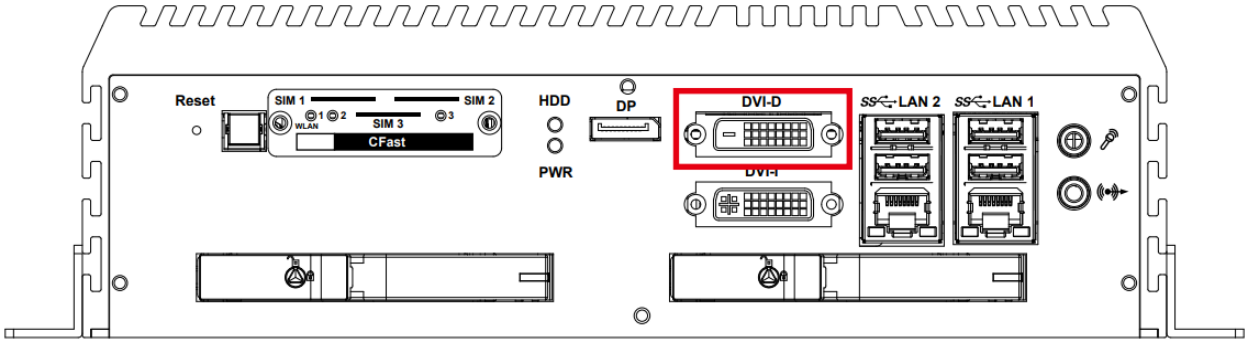
PWR and HDD LED Indicator



The HDD and PWR LED indicators will indicate the HDD and power status, as shown in the table below.

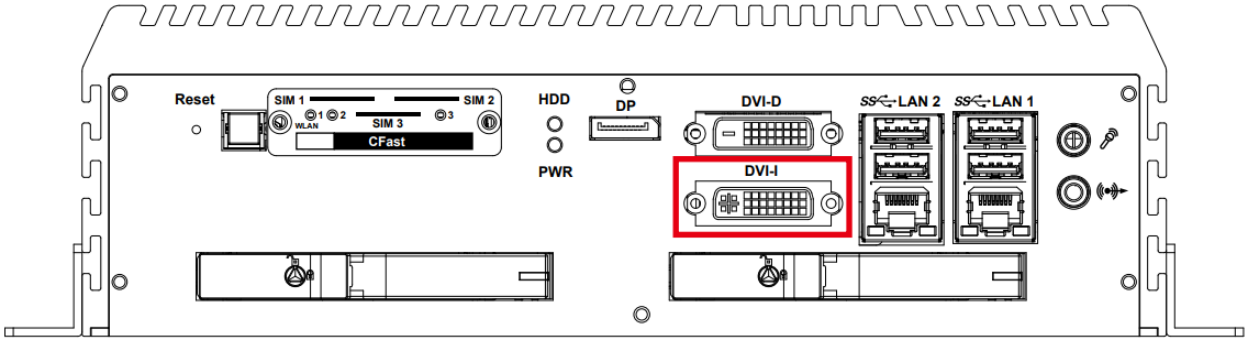
LED Color	Power Status	System Status
Yellow	HDD/CFast	On: Storage functioning. Blinking: Data transferring.
Green	Power	System power status (On/Off)

DVI-D Connector



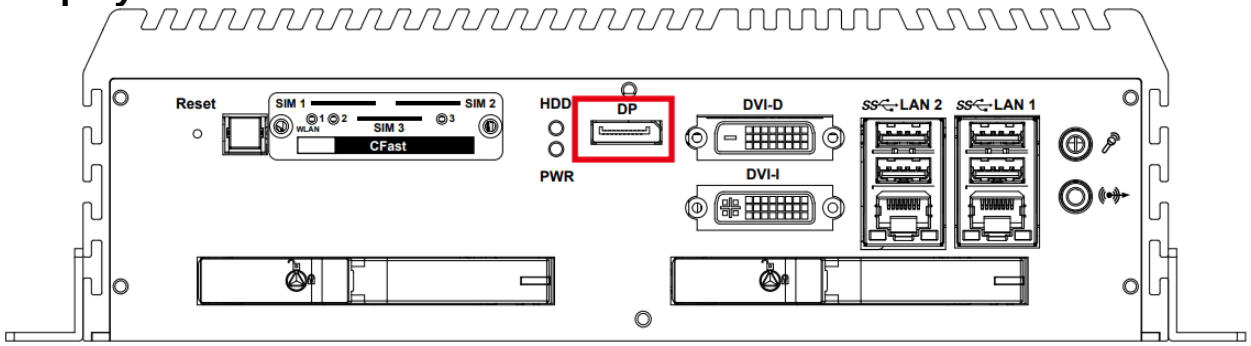
This DVI output supports up to 1920x1200 resolution. Please ensure a DVI-D cable is used when connecting to this port.

DVI-I Connector



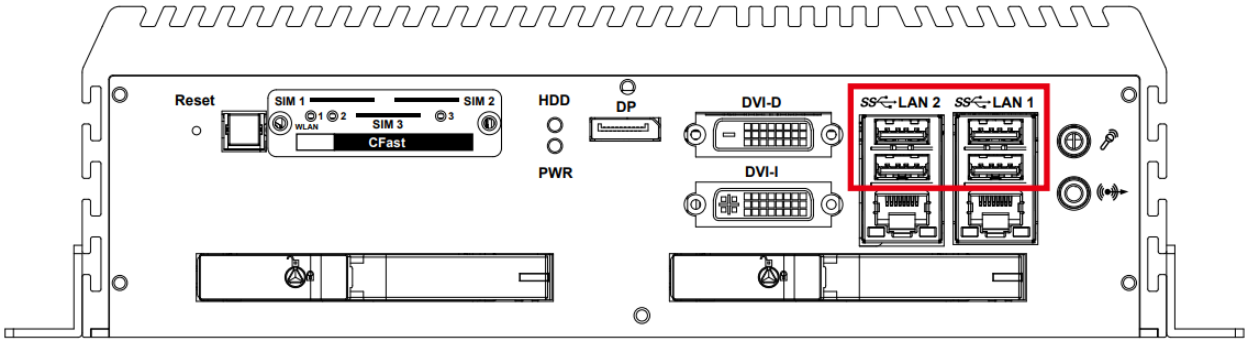
The DVI-I connector supports both DVI and VGA display modes. The DVI output supports up to 1920x1200 resolution. A DVI-I to VGA adapter will need to be used in order to display VGA.

Display Port



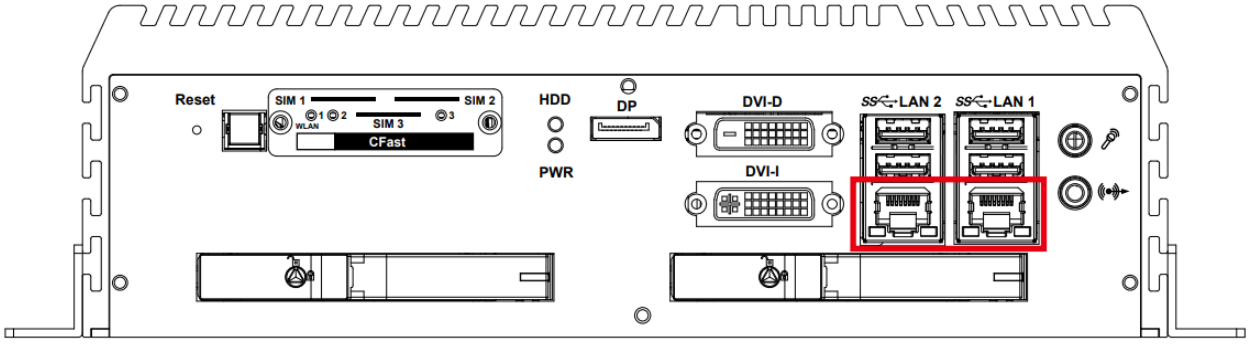
DP supports up to 4096x2304 resolution at 60Hz.

USB3.0



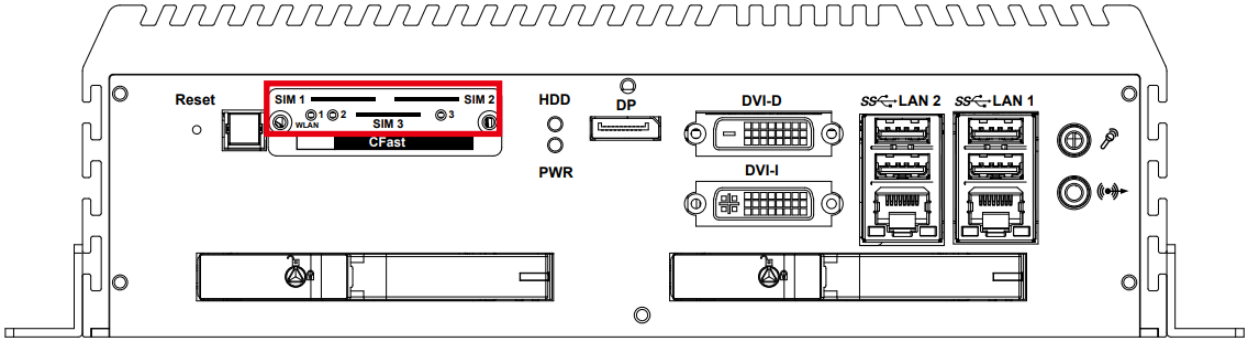
There are 4x USB3.0 connections available, which supports up to 5Gbps data rate. These USB ports are also compliant with Super Speed (SS), High Speed (HS), Full Speed (FS), and Low Speed (LS).

Ethernet Port



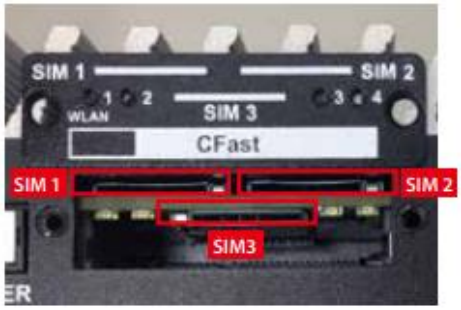
LAN1: Intel I219LM 10/100/Gigabit LAN, supports Wake on LAN, PXE boot and vPro technology.
LAN2: Intel I210 10/100/Gigabit LAN, supports Wake on LAN, PXE boot and vPro technology.

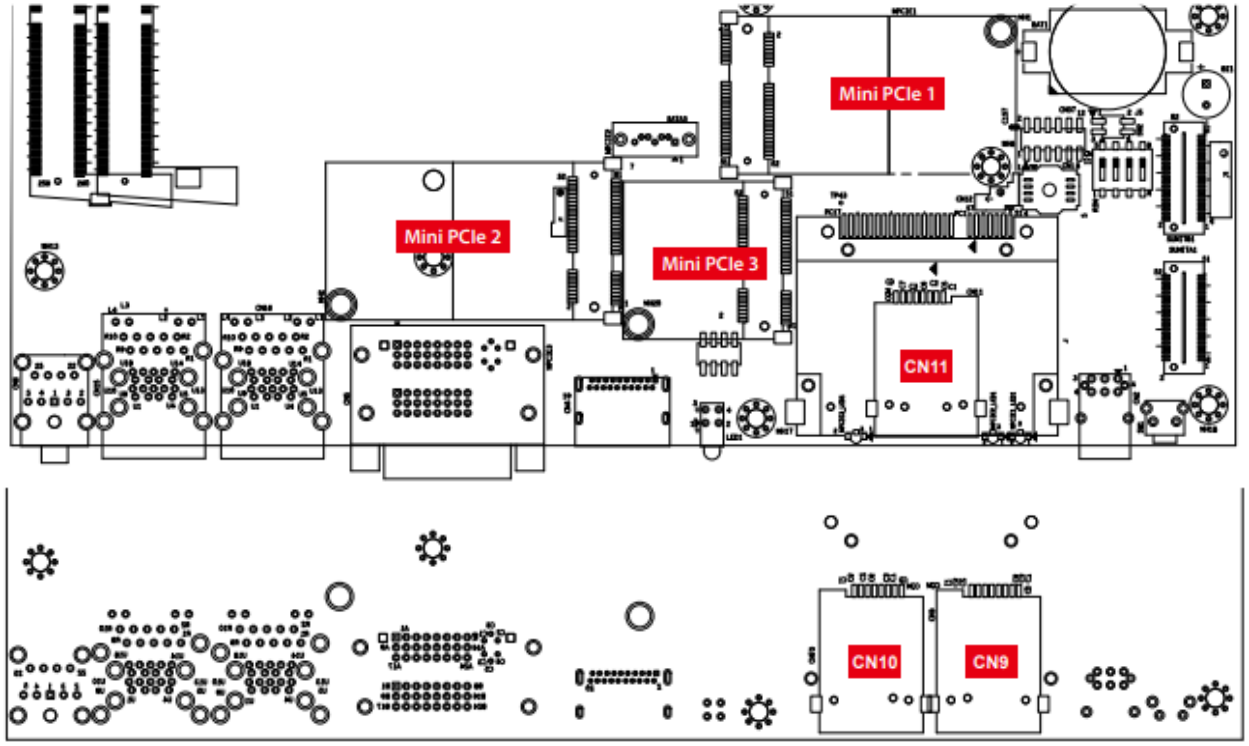
SIM Card Slots



MiniPCIe Slot/SIM Slot/WLAN LED Mapping Table:

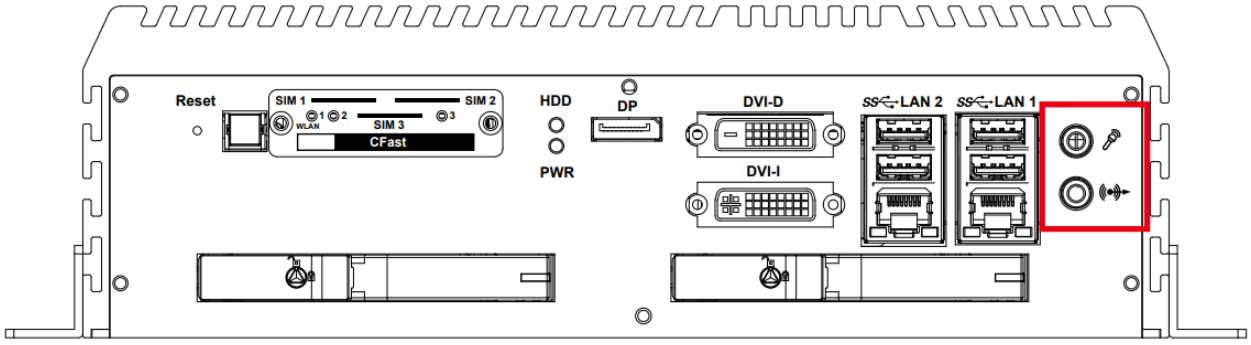
Mini PCIe	SIM	LED
Mini PCIe 1	SIM 1 (CN9)	1
Mini PCIe 2	SIM 2 (CN10)	2
Mini PCIe 3	SIM 3 (CN11)	3





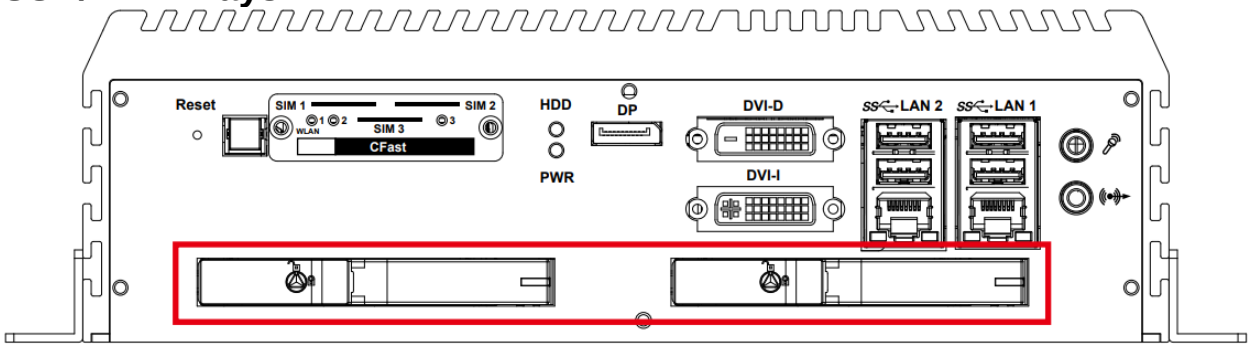
Note: The SIM card slots do not support hot-plug functionality. Please make sure to unplug system power before inserting the SIM card(s).

Audio Jacks



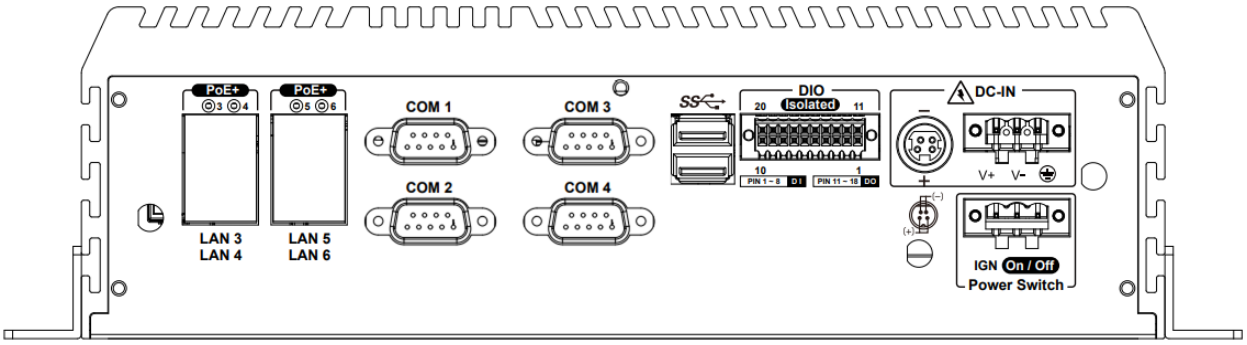
There is 1x Microphone jack and 1x Line-out jack. Onboard Realtek ALC897 audio codec supports 5.1 channel HD audio and complies with Intel® High Definition Audio (Azalia) specifications. To utilize the audio function in Windows platform, install corresponding drivers for both Intel CM236 chipset and Realtek ALC897 codec.

SSD/HDD Trays

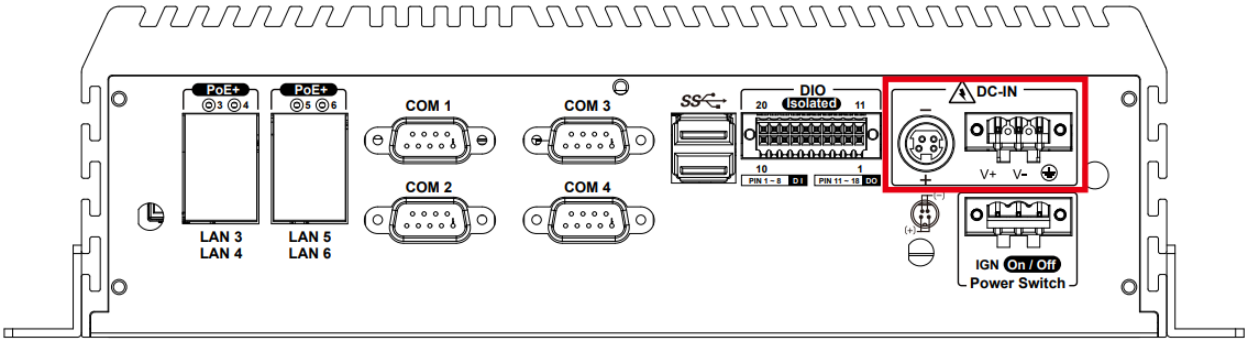


There are 2x front-accessible 2.5” SSD/HDD locking trays.

IPC-R1s & IPC-E1s Back I/O View



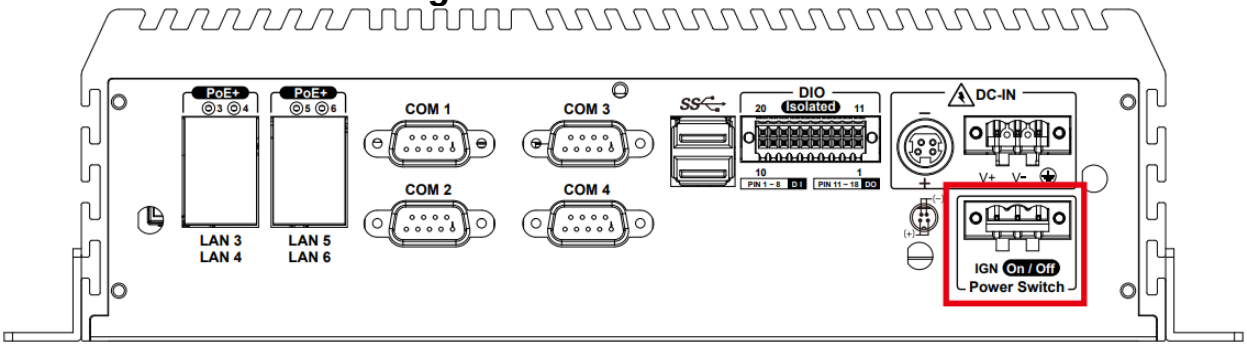
Power Terminal Block



The system supports 6V to 36V DC power input by terminal block.

Pin No.	Definition
1	V+
2	V-
3	Chassis Ground

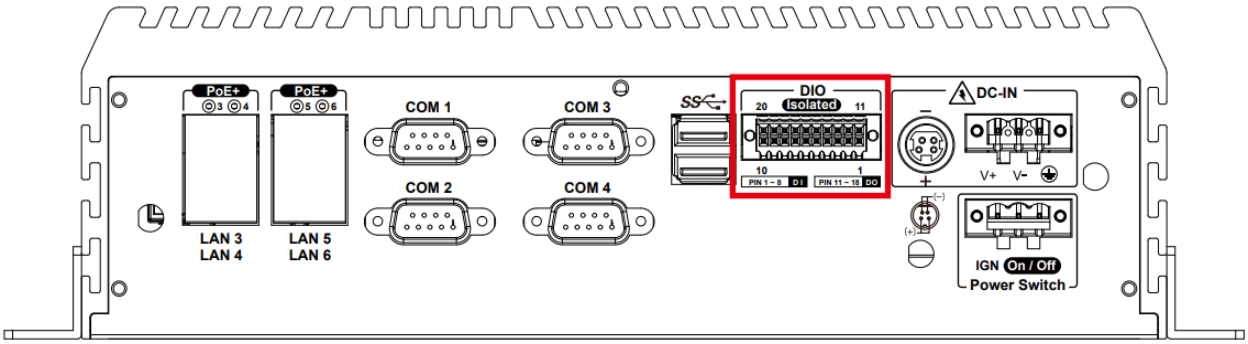
Power On/Off Switch & Ignition



This terminal block supports a 2-pin power on/off switch or ignition switch.

Pin No.	Definition
1	Ignition
2	External Power Button V+
3	External Power Button V-

GPIO (IPC-R1s only)

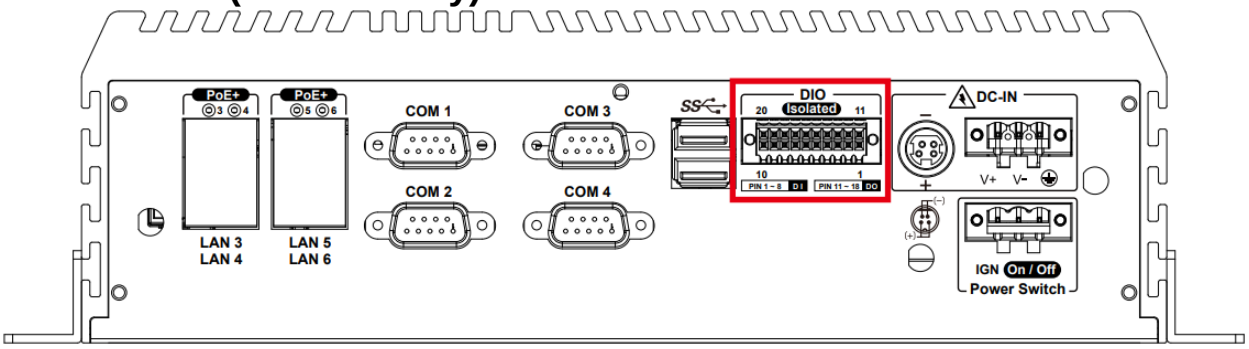


The system offers sixteen programmable I/O. If the GPIO is logic high, it indicates that the mapping SIO GPIO pin is logic high level. If the GPIO is logic low, it indicates that the mapping SIO GPIO pin is logic low level. GPIO Connectors pin assignments are shown below.

Pin No.	Definition	Pin No.	Definition
1	SIO_GPI70	11	SIO_GPO80
2	SIO_GPI71	12	SIO_GPO81
3	SIO_GPI72	13	SIO_GPO82
4	SIO_GPI73	14	SIO_GPO83
5	SIO_GPI74	15	SIO_GPO84

6	SIO_GPI75	16	SIO_GPO85
7	SIO_GPI76	17	SIO_GPO86
8	SIO_GPI77	18	SIO_GPO87
9	----------	19	----------
10	----------	20	----------

Isolated DIO (IPC-E1s only)



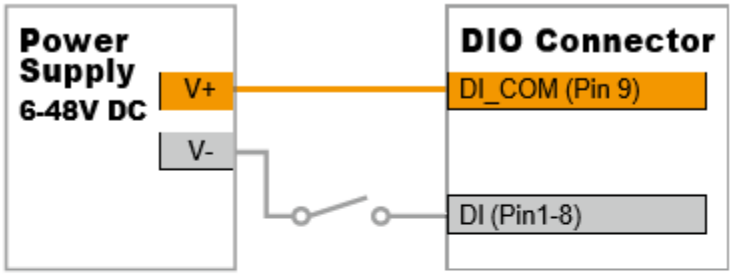
There is a 16-bit (8-bit DI, 8-bit DO) DIO connector. The DI/DIO supports NPN (Sink) and PNP (Source) mode. Each DI channel is equipped with a photocoupler for isolated protection. Each DO has an isolator chip, configured by a jumper for each DIO connector. DO Safety-Related Certifications:

- 4242-VPK Basic Isolation per DIN V VDE V 0884-10and DIN EN 61010-1
- 3-KVRMS Isolation for 1 minute per UL 1577
- CSA Component Acceptance Notice 5A, IEC 60950-1 and IEC 61010-1 End Equipment Standards
- GB4943.1-2011 CQC Certified

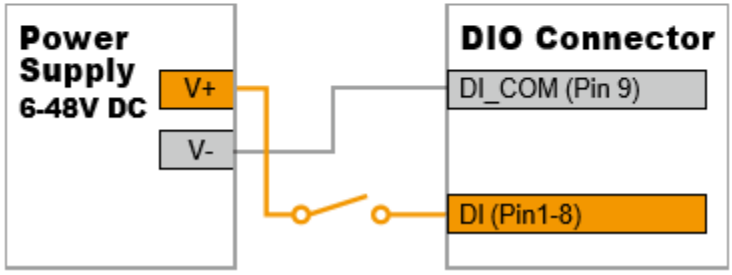
DIO connectors pin out:

DIO	Pin No.	Definition	Function
DIO	1	INPUT 0	SIO_GPI80
	2	INPUT 1	SIO_GPI81
	3	INPUT 2	SIO_GPI82
	4	INPUT 3	SIO_GPI83
	5	INPUT 4	SIO_GPI84
	6	INPUT 5	SIO_GPI85
	7	INPUT 6	SIO_GPI86
	8	INPUT 7	SIO_GPI87
	9	DI1_COM	-
	10	DIO1_GND	-
	11	OUTPUT 0	SIO_GPO70
	12	OUTPUT 1	SIO_GPO71
	13	OUTPUT 2	SIO_GPO72
	14	OUTPUT 3	SIO_GPO73
	15	OUTPUT 4	SIO_GPO74
	16	OUTPUT 5	SIO_GPO75
	17	OUTPUT 6	SIO_GPO76
	18	OUTPUT 7	SIO_GPO77
	19	DIO1_GND	-
	20	DIO1_VDC (6~48V Input)	-

Sink Mode (NPN)

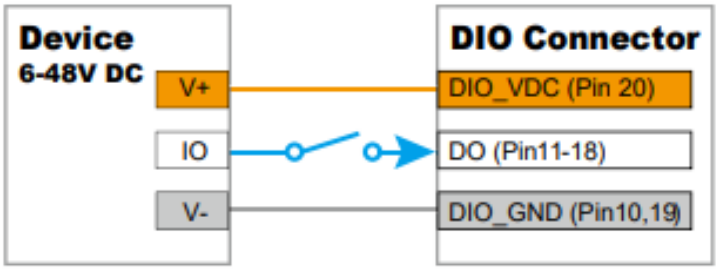


Source Mode (PNP)

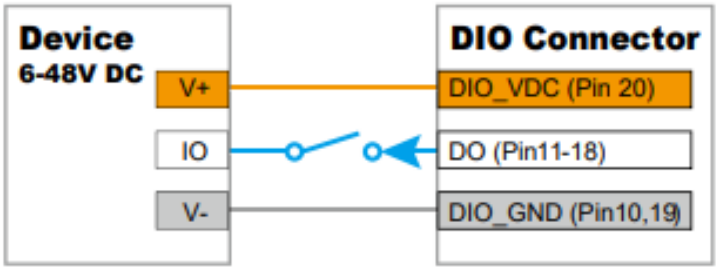


DO Reference Circuit:

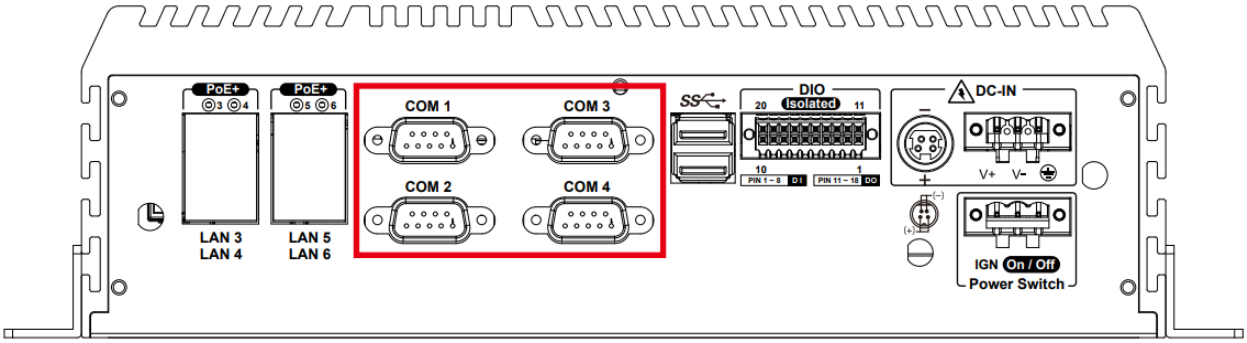
Sink Mode
(NPN, Default)



Source Mode
(PNP)



Serial Ports



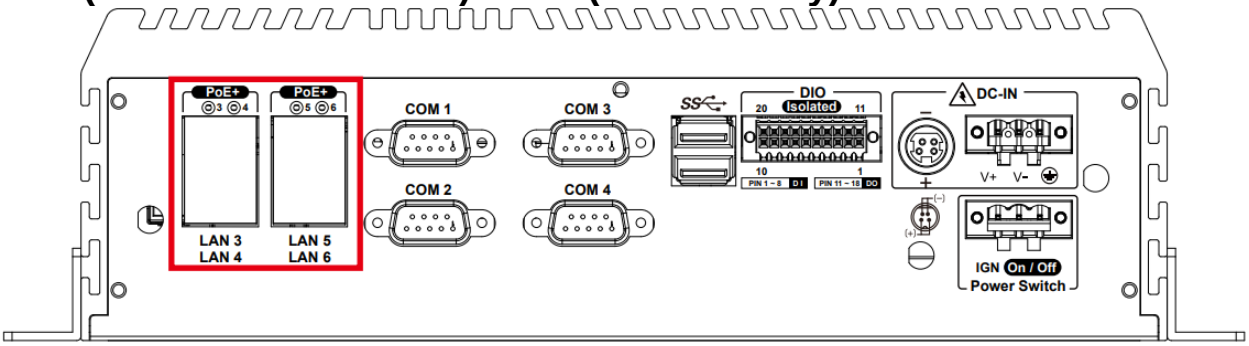
Serial port 1 through 4 can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM1 and COM2 is RS-232, which can be configured in the BIOS.

BIOS Setting	Function
COM 1 COM 2 COM 3 COM 4	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed below:

Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
1 to 4	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	----------
	4	DTR	RXD-	RXD-	----------
	5	GND	GND	GND	GND
	6	DSR	----------	RTS-	----------
	7	RTS	----------	RTS+	----------
	8	CTS	----------	CTS+	----------
	9	RI	----------	CTS-	----------

PoE (Power over Ethernet) Ports (IPC-E1s only)



There are 4x Ethernet ports on the IPC-E1s that supports IEEE 802.3at (PoE+) Power over Ethernet connection, delivering up to 37W / 54V per port and 1000BASE-T GbE data signals over standard Ethernet Cat 5/6 cable. Each PoE connection is powered by Intel® i210 GbE Ethernet controller and independent PCI express interface to connect with multi-core processor for network and data transmit optimization.
Recommendation: When using PoE, make sure DC-IN to the system is over 12V.

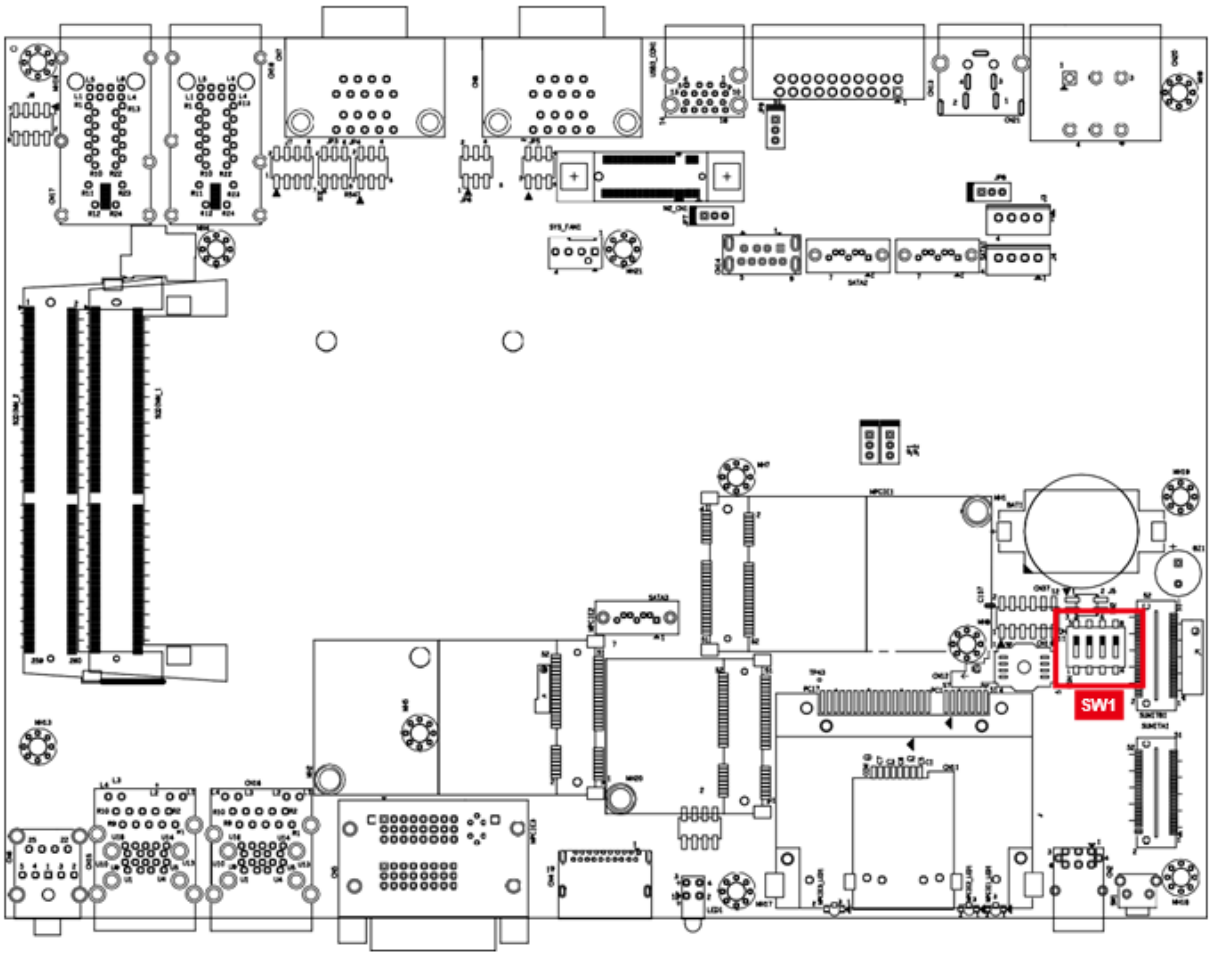
PoE LED	LED Color	PoE Status
LED 3 - 6	Solid Green	PoE On

Ignition Control

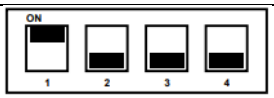
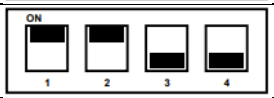
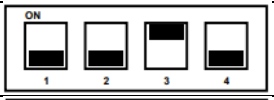
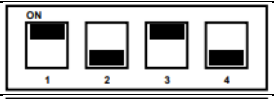
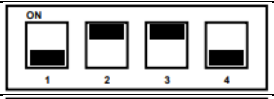
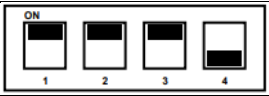
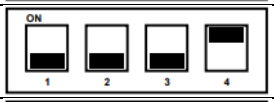
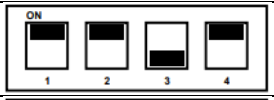
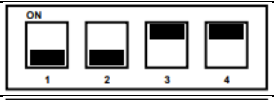
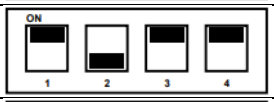
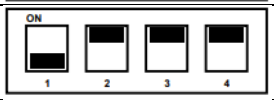
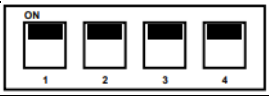
The IPC-R1s / IPC-E1s features an ignition power control for in-vehicle applications. The built-in MCU monitors the ignition signal and turns on/off the system according to pre-defined on/off delay periods.

Adjusting Ignition Control Modes

The system provides 16 modes for multiple power on/off delay periods that are adjustable with the SW5 DIP switch. The default DIP switch position is set to 0, which is ATX/AT power mode.


SW1

The delay modes are listed below:

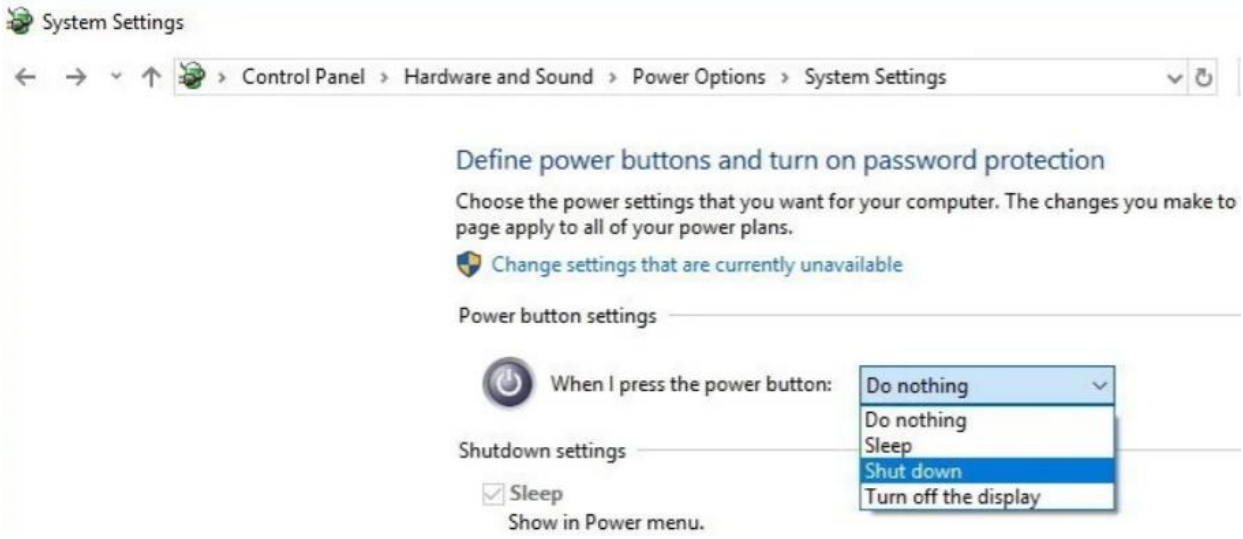
Mode	Power On Delay	Power Off Delay	Switch Position
0	ATX mode		
1	No Delay	No Delay	
2	No Delay	5 Seconds	
3	No Delay	10 Seconds	
4	No Delay	20 Seconds	
5	5 Seconds	30 Seconds	
6	5 Seconds	60 Seconds	
7	5 Seconds	90 Seconds	
8	5 Seconds	30 Minutes	
9	5 Seconds	1 Hour	
A	10 Seconds	2 Hours	
B	10 Seconds	4 Hours	
C	10 Seconds	6 Hours	
D	10 Seconds	8 Hours	
E	10 Seconds	12 Hours	
F	10 Seconds	24 Hours	

Ignition Control Wiring

To activate ignition control, you will need to provide IGN signal through the terminal blocks located on the rear IO. Please see below example.

Note:

- DC Power source and IGN share the same ground.
- The system supports 6V to 36V wide range DC power input while in ATX/AT mode. When in Ignition mode, the input voltage is fixed to 12V or 24V for car battery scenario.
- For proper ignition control, the power button setting in Windows should be set to “Shut down”.

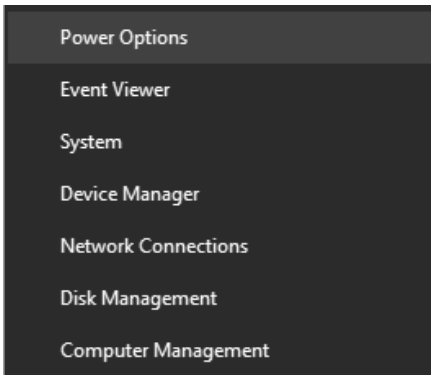


Power Management

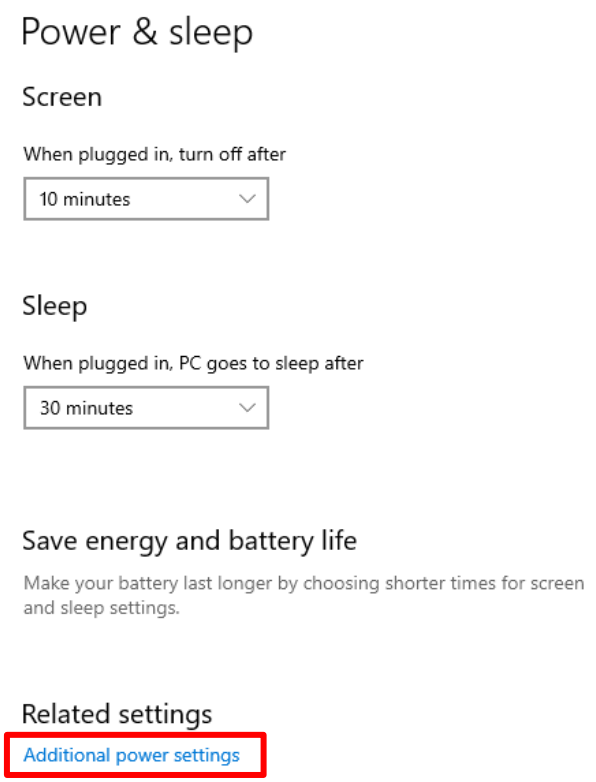
Taking advantage of the power management options available on Windows OS can save you significant amounts of electricity and also provide environmental benefits.For better energy efficiency, turn off your display or set your PC to sleep mode after prolonged periods of user inactivity.

Power Management in Windows OS

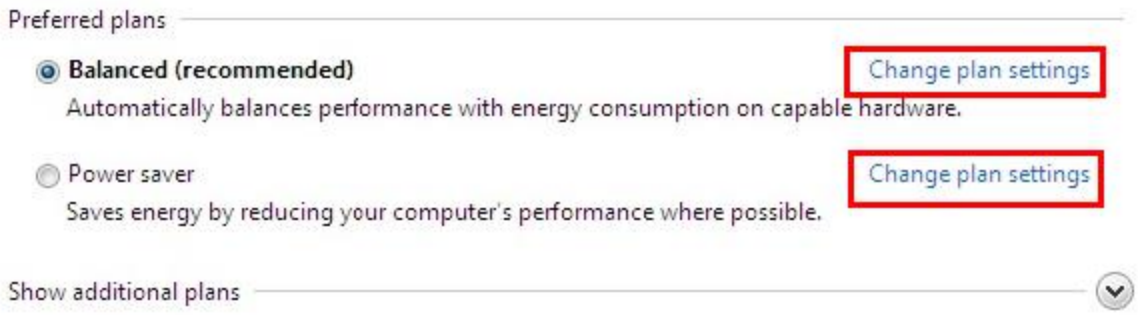
Right click the start button, and select [Power Options].



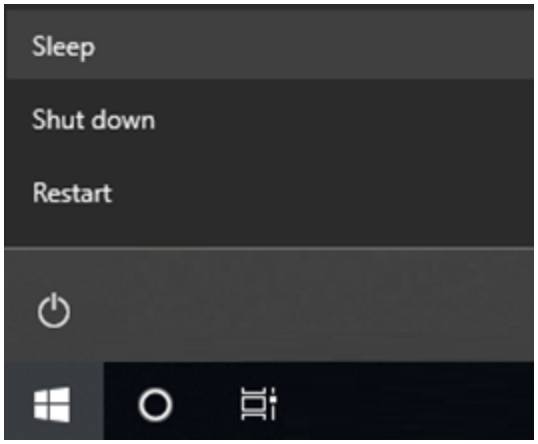
Then click [Additional power settings].



Select a power plan that suits your personal needs. You may also fine-tune the settings by clicking [Change plan settings].



For quick and convenient management of system power, the Shut Down Menu provides options for Sleep (S3) and Shut Down (S5).



Power Management through ENERGY STAR qualified monitors (Not supplied with the IPC-R1s / IPC-E1s)
The power management feature allows the IPC-R1s / IPC-E1s to initiate a low-power or “Sleep” mode after a period of user inactivity. When used with an external ENERGY STAR qualified mnitor, this functionality also supports similar power management features for the display. To take advantage of these potential energy savings, the power management feature can be set to behave in the following ways when the system is operating on AC power:

- Turn off the display after 15 minutes.
- Initiate Sleep after 30 minutes.

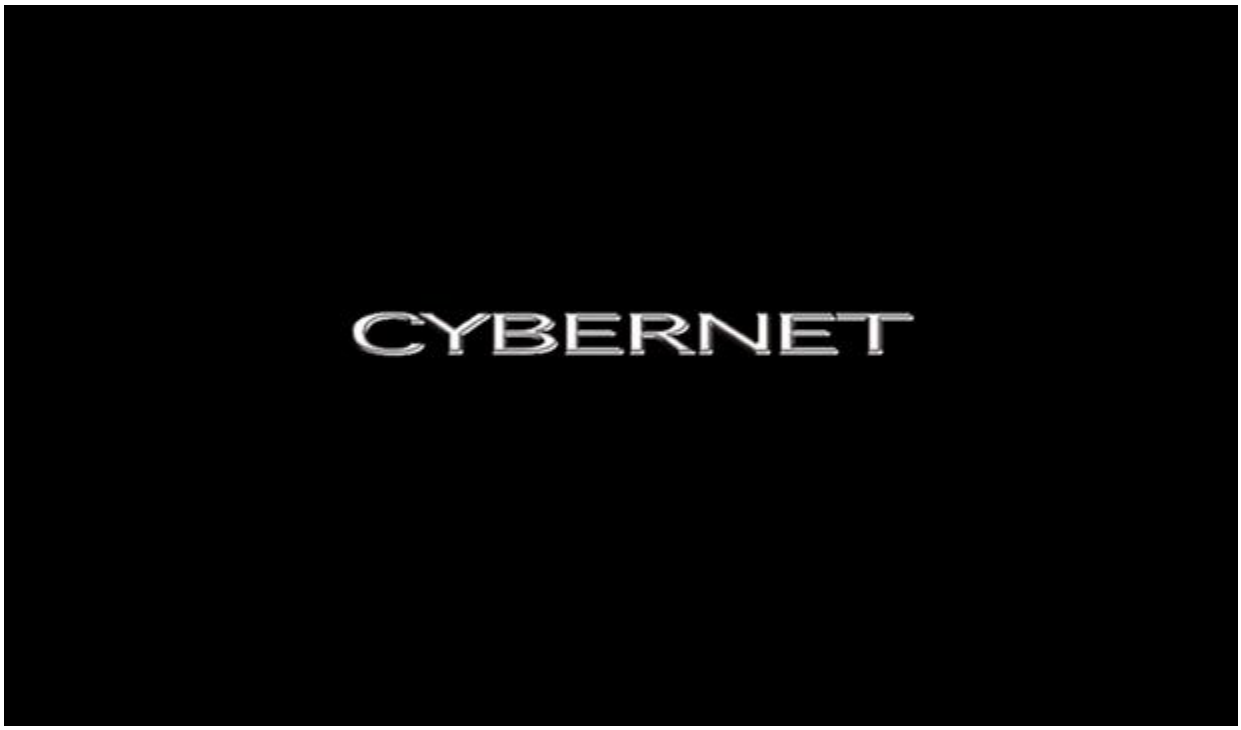
Waking the System Up

The IPC-R1s / IPC-E1s can wake up from power saving mode in response to a command from any of the following:

- the power button,
- the network (Wake on LAN)
- the mouse
- the keyboard

IPC-R1s / IPC-E1s BIOS introduction

The AMI BIOS provides a Setup utility program for specifying system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the AMI BIOS is immediately activated. Pressing the <F2> or <DEL> key allows you to enter the Setup utility. If you are a little bit late pressing the <F2> or <DEL> key, POST (Power On Self-Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the “Reset” button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. Pressing the <F11> key during bootup allows you to enter the Boot menu. The following message will appear on the screen:

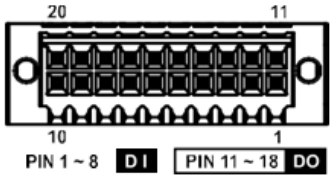


Appendices

A - Isolated DIO Guide

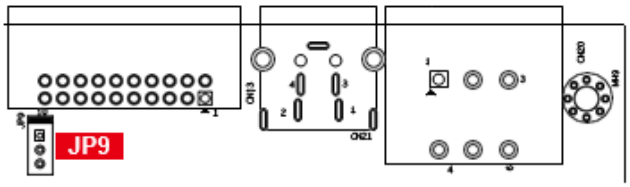
The E1S offers a 16-bit DIO (Isolated/Non-Isolated) 20-pin terminal block connector, a watchdog timer, and a 4-port PoE.

Isolated DIO pins are fix by Hardware design that cannot change in/out direction in runtime process. DIO definition is shown below:



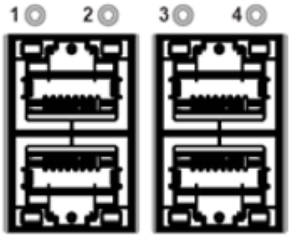
Pin No.	Isolated DIO Definition	Non Isolated DIO Definition	Pin No.	Isolated DIO Definition	Non Isolated DIO Definition
1	DI0	DIO0	11	DO0	DIO8
2	DI1	DIO1	12	DO1	DIO9
3	DI2	DIO2	13	DO2	DIO10
4	DI3	DIO3	14	DO3	DIO11
5	DI4	DIO4	15	DO4	DIO12
6	DI5	DIO5	16	DO5	DIO13
7	DI6	DIO6	17	DO6	DIO14
8	DI7	DIO7	18	DO7	DIO15
9	DI COM	NC	19	DIO GND	DIO GND
10	DIO GND	DIO GND	20	External VDC	NC

Isolated DIO jumper setting is shown below:



DIO	Jumper	Setting	Status
DIO1	JP9	1-2	NPN (Sink)
		2-3	PNP (Source)

PoE definition is shown below:



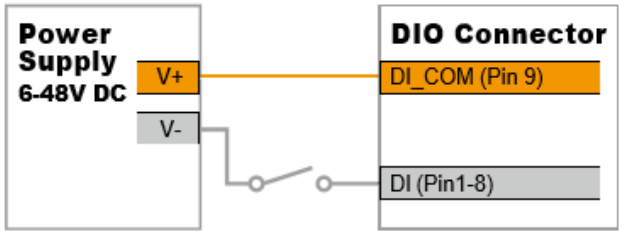
Port No.	Definition	Port No.	Definition
1	PoE 0	3	PoE 2
2	PoE 1	4	PoE 3

Do NOT use these functions in below:
1. PE-2000: DIO1 (ID = 0), PoE
2. PE-3000: PoE
3. UE-1000: USB (ID = 0)

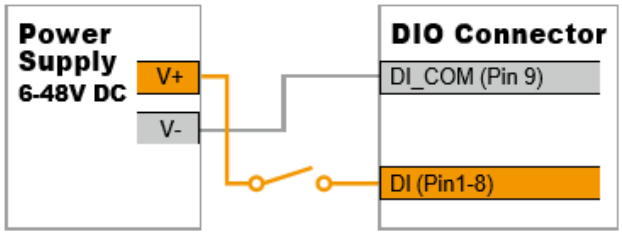
Isolated DIO Signal Circuit:

DI Reference Circuit:

Sink Mode (NPN)

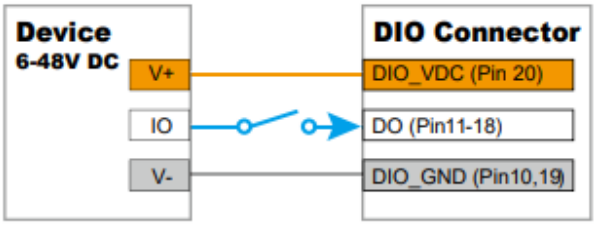


Source Mode (PNP)

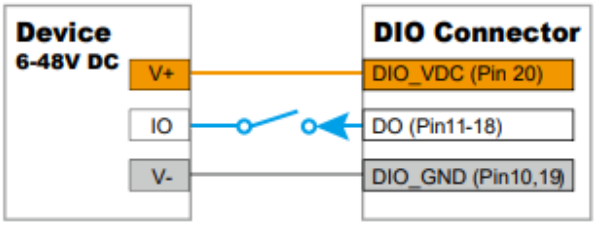


DO Reference Circuit:

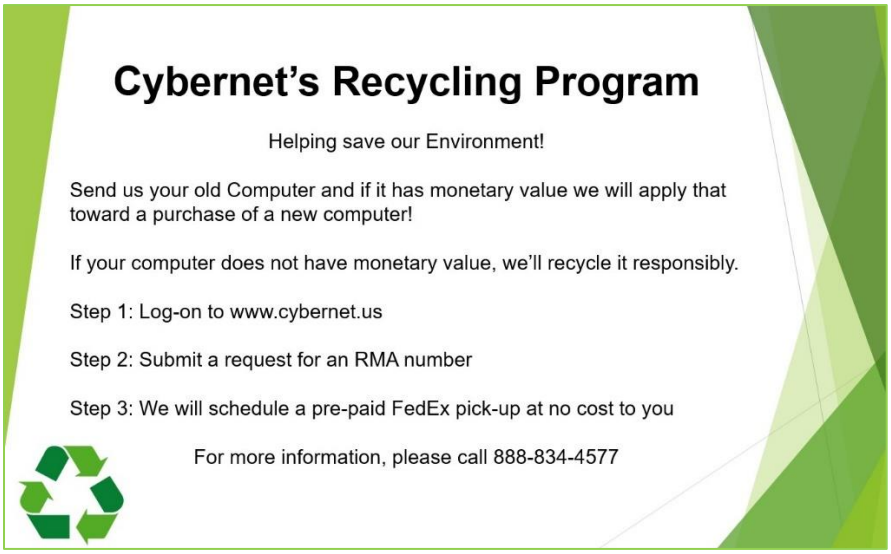
Sink Mode
(NPN, Default)



Source Mode
(PNP)



B - Cybernet's Recycling Program



C - Getting Help

Corporate Headquarters

Cybernet Manufacturing
5 Holland
Irvine, California 92618
Free: (888) 834-4577
Phone: (949) 600-8000
Fax: (949) 600-8013
www.cybernet.us
sales@cybernet.us

UK & European Inquiries

Cybernet Europe
#6, Groveland Business Centre
Boundary Way
Hemel Hempstead, HP2 7TE
United Kingdom
Phone: +44.845.539.1200
Fax: +44.0845.539.1201
www.cyberneteurope.co.uk
sales@cyberneteurope.com

Asia & Middle East Inquiries

Cybernet Asia Co., Ltd.
6F.-11, No. 54, Sec. 4, Minsheng E. Rd.,
Songshan Dist., Taipei City 105,
Taiwan (R.O.C.)
Phone: (02) 7742-2318
Fax: (02) 2793-3172
www.cybernet.com.tw
sales@cybernet.com.tw

Australia Support Center

Cybernet Australia, PTY Ltd.
9A/38 Bridge Street
Eltham Victoria 3095, Australia
Phone: +61.3.9431.4557
au.cybernet@cybernet.us