Gitissoft®

IoTEDGE3100M
Fanless
Embedded
System

Hardware User's Manual

Revision 1.0

Contents

Chapter 1

General Introduction

This chapter includes:

- ✓ Overview
- ✓ System Features
- ✓ System Specification
- ✓ Power Specification
- ✓ Supported CPU List
- ✓ Packing List
- ✓ Ordering Information

1.1 Overview

Eagle Eyes series IoTEDGE3100M embedded PC is a high-performance. Fanless Embedded Systems deliver outstanding performance, power productivity and flexible manageability for performance-driven embedded computing applications. The
all-in-one design is fanless embedded PC provide outstanding performance, versatile I/O functions, flexible expansion features, and rugged reliability for embedded applications such as Machine Vision, Rolling Stock, Intelligent Surveillance, Smart Manufacturing, ITS, Intelligent Automation, Vehicle Computing, and any Industry 4.0 performance-driven real-time embedded computing applications.

IoTEDGE3100M

1.2 System Specifications

IoTEDGE3100M Series

Model Name		IoTEDGE3100M		
System Core	Intel® Platform	Skylake U (default) / Kaby lake U (by request)		
	CPU	Core™ i7-6600U/ i7-7600U Core™ i5-6300U/ i5-7300U Core™ i3-6100U/ i3-7100U Celeron® 3955U/ 3965U		
	Graphics	Intel® HD Graphics 510/520; Intel® HD Graphics 610/620		
	Max. Memory	32GB		
	BIOS	AMI 128Mbit SPI BIOS		
	Operating System	Windows / Linux		
	TPM	SLB9665 (TPM 2.0) / SLB9635 (TPM 1.2 optional)		
Enbik Ekits	AI Controller	Non-volatile user data storage, manufacturing and board information, board statistics, hardware monitoring, fan control, I2C bus, Power loss control, Multi-stage watchdog		
	DDM	0.96-inch LCM display module for warning & status display		
	API Library	DDMI & DMCI		
Power	DC input	9~36V, max. 10A		
	Surge Protection	80V/1ms		
	Power-in Protection	Reverse-Voltage, Under-Voltage, Over-Current/Voltage		
	Remote Control	Yes		
	Ignition Control	Yes		
	Power Mode	AT/ATX (BIOS setting)		
External I/O	Triple Display Mode	2x DP (4K) + 1x VGA		
	Giga Ethernet	4x Giga LAN (RJ45)	2x Giga LAN (RJ45)	4x Giga LAN (M12)
	Giga Ethernet with PoE	Optional (IEEE 802.3at, 30W)		
	USB 3.0	4x		
	USB 2.0	NA		
	UART (serial port)	2x RS-232/422/485		
	DIO	16-bit (programmable)		
	Isolated DIO	Optional (8-bit DI & 8-bit DIO)		
	Audio	Mic in, Line-out		

Model Name		IoTEDGE3100M
Storage	Internal 2.5” Drive Bay	1x
	mSATA	1x (mixed with Mini-PCIe)
	M.2 (SATA)	1x (M Key 2242)
	Removable Drive Bay	NA
	RAID Mode	NA
Expansion	Mini-PCIe	2x
	PCI Express	NA
	PCI	NA
	IOM	NA
	Internal USB 2.0 Dongle	1x
Mechanical	Antenna Opening	4x
	Dimensions	72(W) x 150(D) x 192(H) mm (2.83" x 5.91" x 7.56")
	Mounting	Desk bracket / wall-mount
Environment	Operating Temperature	-20℃ ~ 50℃ (-4°F ~ 122°F)
	Extended Operating Temperature*	-25℃ ~ 70℃ (-13°F ~ 158°F)
	Storage Temperature	-40℃ ~ 85℃
	Relative Humidity	95% @ 40°C (non-condensing)
Certification	EMC	CE / FCC

***** For more information, please contact Enbik

3. Power Specifications

- ✓ DC Voltage Input: 9V~36V
- ✓ DC power Connector: 3-pin terminal block, 5.08mm pitch
- ✓ Power Input Protection: Reverse-Voltage, Over-Voltage, Under-Voltage, Over-Current
- ✓ Surge Protection: 80V/1ms

4. Supported CPUs

IoTEDGE3100M embedded PCs support the 7th/6th Generation Intel® Core™ i7/i5/i3 processor (Platform: Kaby Lake-U/Skylake-U). You may select from the processors listed below according to your cost and performance requirements.

Intel® 6th Sky Lake U:
Core™ i7-6600U Processor (2 cores/4 threads, 2.6 GHz/3.4 GHz, 4MB cache, 15W TDP)
Core™ i5-6300U Processor (2 cores/4 threads, 2.4 GHz/3.0 GHz, 3MB cache, 15W TDP)
Core™ i3-6100U Processor (2 cores/4 threads, 2.3 GHz, 3MB cache, 15W TDP)
Celeron® G3955U Processor (2 cores/2 threads, 2.0 GHz, 2MB cache, 15W TDP)

Intel® 7th Kaby Lake U:
Core™ i7-7600U Processor (2 cores/4 threads, 2.8GHz/3.9 GHz, 4MB cache, 15W TDP)
Core™ i5-7300U Processor (2 cores/4 threads, 2.6 GHz/3.5 GHz, 3MB cache, 15W TDP)
Core™ i3-7100UProcessor (2 cores/2 threads, 2.2 GHz, 3MB cache, 15W TDP)

1.5 Packing List

When you open the IoTEDGE3100M package, check immediately if the package contains all the items listed in the following table. If any items are missing or damaged, please contact your local dealer or Enbik for further assistance.

Item	Description	Qty
1	Eagle Eyes IoTEDGE3100M Series Embedded Box PC	1
2	Rubber Foot x4 with M2.5x6 screws x4	1

1.6 Ordering information

Additional Accessories

Model Name	Description
CBL-S01	SATA (Data + Power) cable x1
TBP5-S03	3-pin, 5.08mm pitch Female Terminal Block Plug for DC input x1
TBP3-S05	5-pin, 3.81mm pitch Female Terminal Block Plug for Remote Connector x1
TBP3-D20	2x10-pin, 3.5mm pitch Female Terminal Block Plug for DIO Connector x1
WBK-IoTEDGE3100M	Wall Mount Bracket x2 with M2.5x6 screws x4

Memory

Model Name	Description
DDR4-2400-4G-SO	SO-DIMM DDR4-2400 4GB memory module
DDR4-2400-8G-SO	SO-DIMM DDR4-2400 8GB memory module
DDR4-2400-16G-SO	SO-DIMM DDR4-2400 16GB memory module
DDR4-2400-4G-SO-i	SO-DIMM DDR4-2400 4GB memory module (Wide Temp.)
DDR4-2400-8G-SO-i	SO-DIMM DDR4-2400 8GB memory module (Wide Temp.)
DDR4-2400-16G-SO-i	SO-DIMM DDR4-2400 16GB memory module (Wide Temp.)

Storage

Model Name	Description
M2-2242-SATA-32G	M.2 M-key 2242 32GB SATA disk
M2-2242-SATA-64G	M.2 M-key 2242 64GB SATA disk
M2-2242-SATA-128G	M.2 M-key 2242 128GB SATA disk
M2-2242-SATA-256G	M.2 M-key 2242 256GB SATA disk
M2-2242-SATA-32G-i	M.2 M-key 2242 32GB SATA disk (Wide Temp.)
M2-2242-SATA-64G-i	M.2 M-key 2242 64GB SATA disk (Wide Temp.)
M2-2242-SATA-128G-i	M.2 M-key 2242 128GB SATA disk (Wide Temp.)
M2-2242-SATA-256G-i	M.2 M-key 2242 256GB SATA disk (Wide Temp.)
mSATA-32G	mSATA 32GB SATA disk
mSATA-64G	mSATA 64GB SATA disk
mSATA-128G	mSATA 128GB SATA disk
mSATA-256G	mSATA 256GB SATA disk
mSATA-32G-i	mSATA 32GB SATA disk (Wide Temp.)
mSATA-64G-i	mSATA 64GB SATA disk (Wide Temp.)
mSATA-128G-i	mSATA 128GB SATA disk (Wide Temp.)
mSATA-256G-i	mSATA 256GB SATA disk (Wide Temp.)
SSD2.5-250G	2.5" SSD 250GB Disk
SSD2.5-500G	2.5" SSD 500GB Disk
SSD2.5-1T	2.5" SSD 1TB Disk
SSD2.5-250G-i	2.5" SSD 250GB Disk (Wide Temp.)
SSD2.5-500G-i	2.5" SSD 500GB Disk (Wide Temp.)
SSD2.5-1T-i	2.5" SSD 1TB Disk (Wide Temp.)
HDD2.5-500G	2.5" HDD 500GB Disk
HDD2.5-1T	2.5" HDD 1TB Disk
HDD2.5-2T	2.5" HDD 2TB Disk
HDD2.5-3T	2.5" HDD 3TB Disk
HDD2.5-4T	2.5" HDD 4TB Disk
HDD2.5-5T	2.5" HDD 5TB Disk

AC-DC Power Adapter

Model Name	Description
ADT-24V90-T3A	24V/60W AC-DC power adapter with pitch 5.08mm 3-pin terminal block plug
ADT-24V120-T3A	24V/120W AC-DC power adapter with pitch 5.08mm 3-pin terminal block plug
ADT-24V160-T3A	24V/160W AC-DC power adapter with pitch 5.08mm 3-pin terminal block plug
ADT-24V280-T3A	24V/280W AC-DC power adapter with pitch 5.08mm 3-pin terminal block plug

For more information, please contact Enbik.

Chapter 2

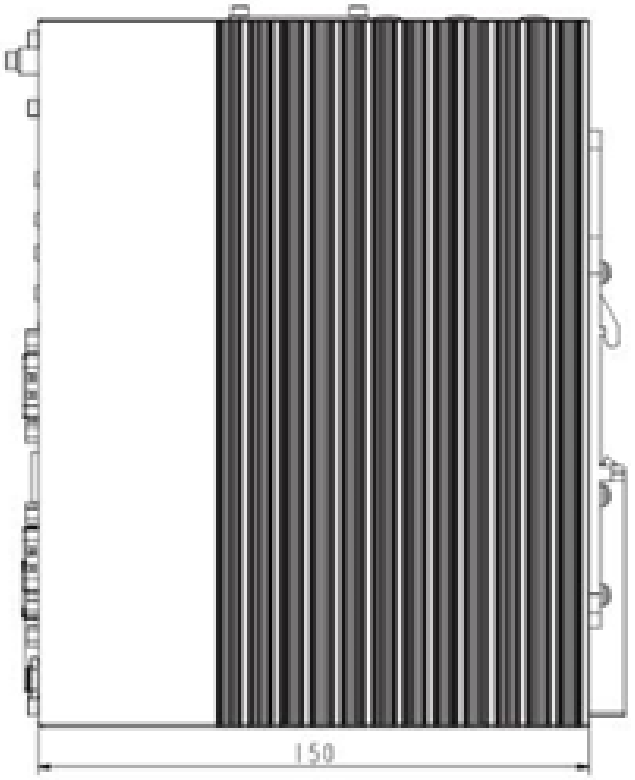
Mechanical Dimensions

This chapter views of the dimensions, including:

- ✓ Top View
- ✓ Front View
- ✓ Rear View
- ✓ Left-Side View
- ✓ Right-Side View
- ✓ Bottom View

2.1 Top View

Unit: mm



IoTEDGE3100M

2.2 Front View

Unit: mm

IoTEDGE3100M

Chapter 3

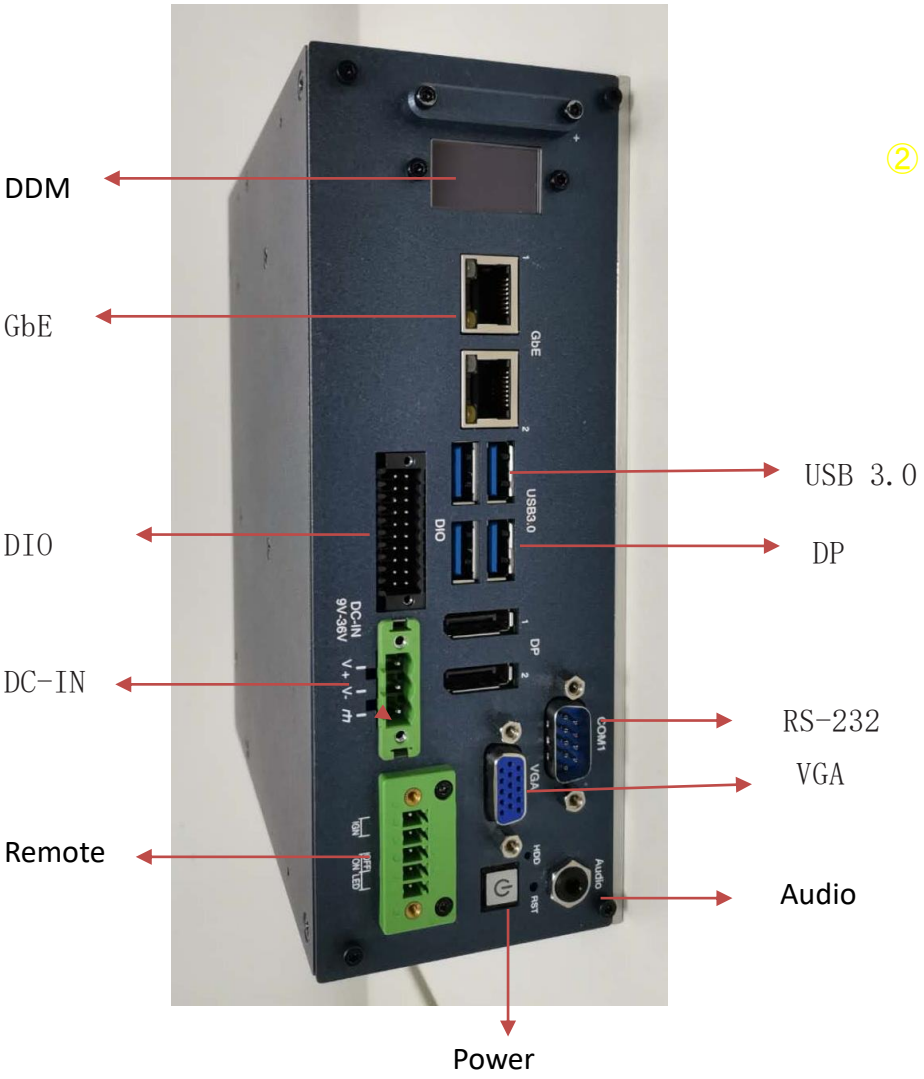
Hardware Function Description

This chapter includes:

- ✓ I/O Layout
- ✓ Front Panel I/O Functions
- ✓ Rear Panel I/O Functions
- ✓ Right-Side Panel I/O Functions
- ✓ Internal I/O Functions

3.1 I/O Layout

Front I/O – IoTEDGE3100M

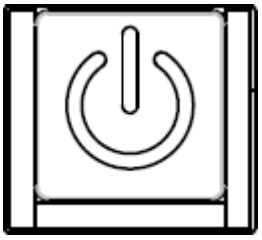


3.2 Front Panel I/O Functions

Most common computer I/O functions are placed on the front panel. This section describes each I/O function on the front panel.

3.2.1 Power Button with Power LED

The Power Button is a non-latched switch with dual color LED indicator. It indicates power status: S0, S3 and S5.



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

More detailed LED indications are listed as follows:

Power Mode	Power On	Power Off	Suspend to RAM, Hibernate
ATX Mode	Solid Blue	Solid Orange	Solid Orange
AT Mode	Solid Blue	-	-
Ignition Mode	Solid Blue	-	-

Note

ATX Mode:

Press the power button to power on the system. The blue LED will turnon. When the system is powered off, the orange LED will turn on. In case of system error, press the power button for at least 4 seconds to shut down the system directly.

AT Mode:

Plug in the DC input power, the system will auto power on and the blue LED will turn on. When the system is powered off, the system will turn-off the LED. In case of system error, you can just press the power button for at least 4 seconds to shut down the system directly

Ignition Mode:

External ignition switch turn-on, the system will power on and the blue LED will turn on. Then plug in the DC input power. External ignition switch turn-off, the system will turn off and the LED will turn off. The powerbutton will be not function at ignition.

3.2.2 Reset Button

The hardware Reset Button is used to reset the system without power off the system. Press the Reset Button for a few seconds to reset the system.

3.2.3 HDD LED

If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activity.

HDD LED	LED Status
Storage Active	Flash Green

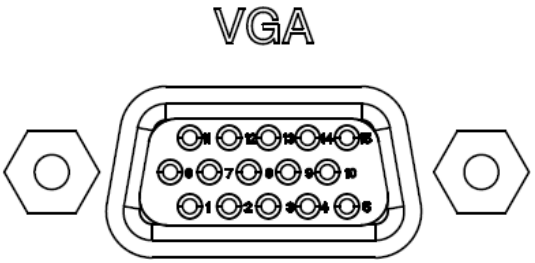
4. Dynamic Display Module (DDM)

The Dynamic Display Module (DDM) is a 0.96" LCM module, it displays the following information:

- ✓ Customer's information
- ✓ Logo
- ✓ Part Number
- ✓ CPU temperature
- ✓ Power consumption
- ✓ RTC battery voltage
- ✓ DC in voltage
- ✓ Warning message
- ✓ PoE status
- ✓ POST code
- ✓ Hardware healthy status
- ✓ Customized information

3.2.5 VGA Connector

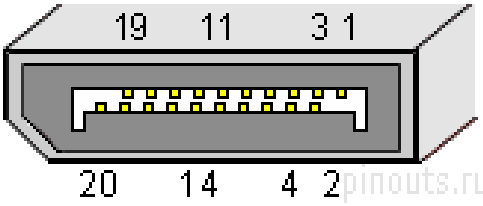
There is a high-resolution VGA display output on the front panel. It supports display resolutions up to 1920x1080.



Pin	Name	Description
1	RED	Red Video (75-ohm, 0.7 V p-p)
2	GREEN	Green Video (75-ohm, 0.7 V p-p)
3	BLUE	Blue Video (75-ohm, 0.7 V p-p)
4	RES/NC	Reserved
5	GND	Ground
6	RGND	Red Ground
7	GGND	Green Ground
8	BGND	Blue Ground
9	DDC +5V	+5 VDC
10	SGND	Sync Ground
11	ID0	Monitor ID Bit 0 (optional)
12	SDA	DDC Serial Data Line
13	HSYNC or CSYNC	Horizontal Sync (or Composite Sync)
14	VSYNC	Vertical Sync
15	SCL	DDC Data Clock Line

3.2.6 DisplayPort Connectors

The system provides 2 high resolution DisplayPort (DP) outputs on the front panel. It supports display resolutions up to 4096x2304@60Hz.



Pin	Name	Description
1	ML_Lane 0 (p)	Lane 0 (positive)
2	GND	Ground
3	ML_Lane 0 (n)	Lane 0 (negative)
4	ML_Lane 1 (p)	Lane 1 (positive)
5	GND	Ground
6	ML_Lane 1 (n)	Lane 1 (negative)
7	ML_Lane 2 (p)	Lane 2 (positive)
8	GND	Ground
9	ML_Lane 2 (n)	Lane 2 (negative)
10	ML_Lane 3 (p)	Lane 3 (positive)
11	GND	Ground
12	ML_Lane 3 (n)	Lane 3 (negative)
13	CONFIG1	Connected to Ground. Pins 13 and 14 may either be directly connected to ground or connected to ground through a pulldown device.
14	CONFIG2	connected to Ground
15	AUX CH (p)	Auxiliary Channel (positive)
16	GND	Ground
17	AUX CH (n)	Auxiliary Channel (negative)
18	Hot Plug	Hot Plug Detect
19	Return	Return for Power
20	DP_PWR	Power for connector (3.3 V 500 mA)

IoTEDGE3100M also supports Multi-Stream Transport (MST) as shown in the following MST Display Resolutions Table:

Multi-Stream Transport Display	Max. Resolution
One panel Display	4096x2304@60Hz
Two panel Displays concurrently	2880x1800@60Hz
Three panel Displays concurrently	2304x1440@60Hz

To achieve optimal DP output resolution in Windows, you need to install the corresponding graphics driver.

3.2.7 Audio Line-out and Mic-in Audio Jacks

Audio functions provided using Intel® High Definition Audio and Realtek ALC892 codecs. There is one 3.5mm audio jack on the front panel with Line-out (Left/Right stereo) and Mic-in (Mono) signals.

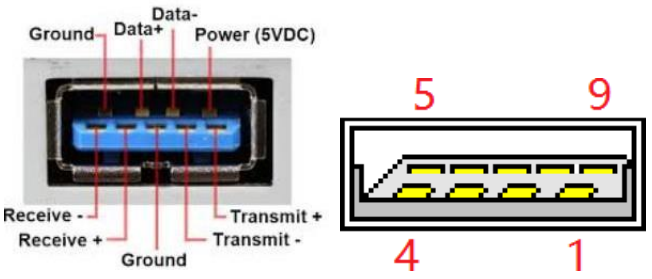
Line-out and Mic-in Connector

Pin	Name	Description
1	Mic-In	Microphone input signal
2	Audio_R	Right Audio out signal
3	Audio_L	Left Audio out signal
4	GND	Audio Ground

3.2.8 USB 3.0 Connectors

There are four USB 3.0 Type A connectors with signals directly connected to the Intel® XHCI controller, each port supporting up to 5GBs and 5V/0.9A power. They are compliant with Super Speed, High Speed, Full Speed and Low Speed USB signalling rates. Each port can be powered on/off by BIOS or Enbik Application Program.

USB 3.0 Connector



Pin	Name	Description
1	VBus	+5V Power
2	USB D-	USB 2.0 data
3	USB D+	
4	GND	Ground for power return
5	StdA_SSRX-	SuperSpeed receiver
6	StdA_SSRX+	SuperSpeed receiver
7	GND_DRAIN	Ground for signal return
8	StdA_SSTX-	SuperSpeed transmitter
9	StdA_SSTX+	SuperSpeed transmitter

3.2.9 GPIO/Isolated DIO

16-bit digital programmable general-purpose input and output (GPIO) is standard. Isolated 8-bit DI & 8-bit DO is optional. The GPIO support 3.3V or 5V signal and are configurable by BIOS or Application Program.

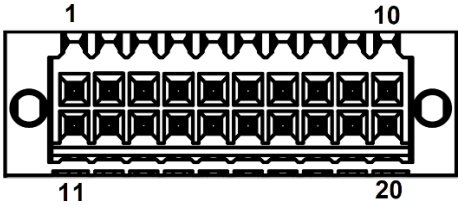
DI/DO Safety-Related Certifications:

DI	DO
2500-V **PART NUMBER PACKAGE BODY SIZE (NOM)** RMS Isolation for 1 minute per UL 1577	2500-V **PART NUMBER PACKAGE BODY SIZE (NOM)** RMS Isolation for 1 minute per UL 1577
Approved by VDE, DIN EN60747-5-2(_) (as an option), file No. 40009162 (as model No. **PC3H4**)	4242-V ISO7131CC PK Isolation per DIN V VDE V 0884-10 (VDE V 0884-10):2006-12, 566 V ISO7140CC PK Working Voltage
UL flammability grade (94V-0)	CSA Component Acceptance Notice 5A, IEC ISO7141CC 60950-1 and IEC 61010-1 End Equipment ISO7141FCC Standards
	CQC Certification per GB 4943.1-2011

DI/DO Operation Characteristics:

Parameter	DI	DO
Operation Voltage	5 ~ 48V DC	Source Mode:5 ~ 48V DC Sink Mode: 5~40V DC
Input/Output Current Limit	25 uS	100mA
Turn On Delay Time (Max.)	25 uS	Source Mode: 15 uS Sink Mode: 60uS
Turn Off Delay Time (Max.)	25 uS	Source Mode: 15 uS Sink Mode: 60uS

GPIO/Isolated DIO Terminal Block



Programmable DIO

Pin	Description	Pin No.	Description
1	GPIO10 (Default GPI bit0)	11	GPIO0 (Default GPO bit0)
2	GPIO11 (Default GPI bit1)	12	GPIO1 (Default GPO bit1)
3	GPIO12 (Default GPI bit2)	13	GPIO2 (Default GPO bit2)
4	GPIO13 (Default GPI bit3)	14	GPIO3 (Default GPO bit3)
5	GPIO14 (Default GPI bit4)	15	GPIO4 (Default GPO bit4)
6	GPIO15 (Default GPI bit5)	16	GPIO5 (Default GPO bit5)
7	GPIO16 (Default GPI bit6)	17	GPIO6 (Default GPO bit6)
8	GPIO17 (Default GPI bit7)	18	GPIO7 (Default GPO bit7)
9	Digital Input COM	19	GND
10	GND	20	VCC

Isolated DIO

Pin	Description	Pin No.	Description
1	Isolated DI bit0	11	Isolated DO bit0
2	Isolated DI bit1	12	Isolated DO bit1
3	Isolated DI bit2	13	Isolated DO bit2
4	Isolated DI bit3	14	Isolated DO bit3
5	Isolated DI bit4	15	Isolated DO bit4
6	Isolated DI bit5	16	Isolated DO bit5
7	Isolated DI bit6	17	Isolated DO bit6
8	Isolated DI bit7	18	Isolated DO bit7
9	Digital Input COM	19	Isolated GND
10	Isolated GND	20	Isolated VCC

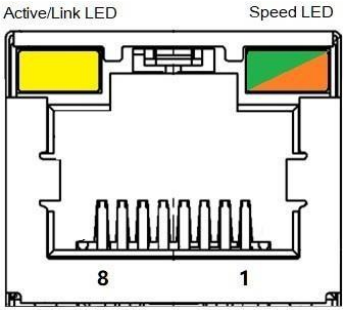
3.2.10 PoE/Gigabit Ethernet Port

The GbE ports are located on front panel. Ethernet Port 1 is powered by Intel I219 Ethernet controller, supporting 10/100/1000 Mbps, PXE , Wake on LAN and iAMT11. Connector is RJ45 with LED indicators or M12 A code connector depending on the model.

Ethernet Ports 2~4 are powered by Intel I210 Ethernet controller, supporting 10/100/1000 Mbps, PXE , Wake on LAN and IEEE-1588 header. Connector is RJ45 with LED indicators or M12 A-code connector depending on the model.

Each port optional supports IEEE 802.3at (PoE+) Power over Ethernet connection delivering up to 25.5W/54V per port and 1000BASE-T GigE data signals over standard Ethernet Cat 5/Cat 6 cable.

RJ45 Connector



Pin No	10 / 100 Mbps	1000 Mbps	Description	PoE (optional)
1	TX+	BI_DA+	Bi-directional pair A +	PoE+
2	TX-	BI_DA-	Bi-directional pair A -	PoE+
3	RX+	BI_DB+	Bi-directional pair B +	PoE-
4	-	BI_DC+	Bi-directional pair C +	-
5	-	BI_DC-	Bi-directional pair C -	-
6	RX-	BI_DB-	Bi-directional pair B -	PoE-
7	-	BI_DD+	Bi-directional pair D +	-
8	-	BI_DD-	Bi-directional pair D -	-

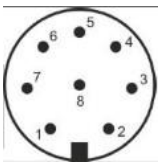
Ethernet Active/Link LEDs

Active/Link LED (left)	Status
Off	Disconnected
Solid Yellow	Connected, no data transmission
Flashing Yellow	Connected, data transmitting/receiving

Ethernet Speed LED

Right Top Link LED	Status
Off	10 Mbps Link
Solid Green	100 Mbps Link
Solid Orange	1000 Mbps Like

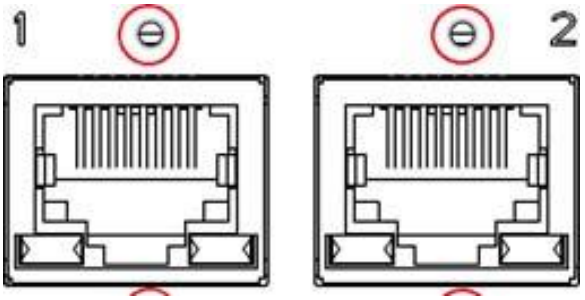
M12 A-code Connector



Pin No	10 / 100 Mbps	1000 Mbps	Description	PoE (optional)
1	-	BI_DC+	Bi-directional pair C +	-
2	-	BI_DD+	Bi-directional pair D +	-
3	-	BI_DD-	Bi-directional pair D -	-
4	TX-	BI_DA-	Bi-directional pair A -	PoE+
5	RX+	BI_DB+	Bi-directional pair B +	PoE-
6	TX+	BI_DA+	Bi-directional pair A +	PoE+
7	-	BI_DC-	Bi-directional pair C -	-
8	RX-	BI_DB-	Bi-directional pair B -	PoE-

3.2.11 PoE LEDs

4 LEDs indicate the PoE status. The LED will light when the PoE port links to PoE PD of each device.



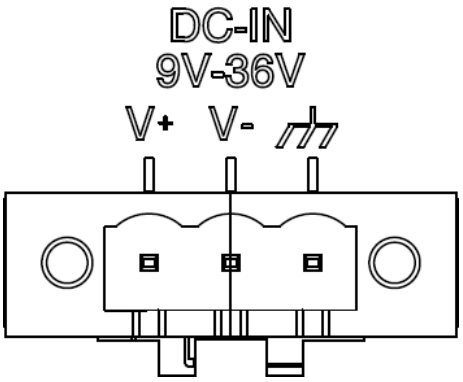
Note **The photo is only IoTEDGE3100M.**

3.3 Rear Panel I/O Functions

To fit more general application requirements, IoTEDGE3100M offers more I/O functions on its rear panel. In this section, we'll illustrate each I/O function on the rear panel.

3.3.1 3-Pin Euro type Terminal Block for System DC Input

Eagle Eyes AI allows a wide range of DC power input from 9V to 36Vdc. It offers a 3-pin, pitch 5.08mm Euro Type pluggable terminal block. The 3-pin power connector is used to connect the power plug of an AC/DC adapter. It's convenient for indoor usage where AC power is usually available. Since there is no specific rule of pin definition for this type of connector, please always confirm the polarity of the power connector in prior to plug it into IoTEDGE3100M if you're not using the power adapter provided by Enbik.

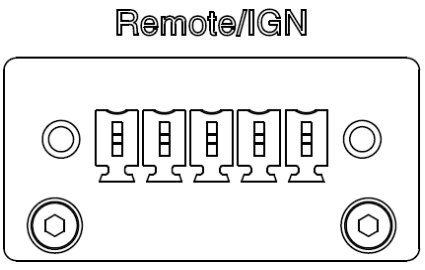


Pin	Name	Description
1	DC V+	DC INPUT +
2	DC V-	DC INPUT -
3	Ground	Earth Ground or Chassis Ground

Caution!

1. **Make sure the polarity of the power plug is correct before plugging it into the system.**
2. Please make sure the voltage of DC power supply is correct before you connect it to the IoTEDGE3100M system. Supplying a voltage over 36V will damage the system.

3.3.2 5-Pin Euro type Terminal Block for Power Remote & Ignition Control



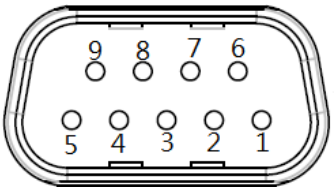
Pin	Name	Description
1	Remote +	Remote control +
2	PLED+	Power LED+
3	Remote GND	Remote control Ground
4	IGN+	Ignition control+
5	IGN-	Ignition control-

3.3.3 UART Ports

Two RS-232/422/485 ports and two RS-232 ports on the rear panel for communicating with external devices. COM1~COM4 are located on the rear panel via 9-pin D-Sub male connectors. COM 1/2 can be configured for full RS-232, RS-422 or RS-485 with auto flow control communication. Mode selection is by BIOS, the default definition is RS-232.

Each of the serial ports individually contains a programmable baud rate generator which is capable of dividing the input clock by a number ranging from 1 to 65535. The data rate of each serial port can be programmed from 115.2K baud (COM1 baud rate up to 912.6Kbit/s) and down to 50 baud. The character options are programmable for 1 start bit; 1, 1.5 or 2 stop bits; even, odd, stick or no parity; and privileged interrupts. Each port supports 128 bytes RX FIFO depths and 16 bytes TX FIFO depths.

All transmitter outputs and receiver inputs feature robust electrostatic discharge (ESD) protection to ±15kV Human Body Model (HBM) and ±8kV IEC- 61000-4-2 Contact. Each receiver output has full fail-safe protection to avoid system lockup, oscillation, or indeterminate states by defaulting to logic-high output level when the inputs are open, shorted, or terminated but undriven.



The following table describes the pin definition of UART ports.

COM1, COM2:

UART mode		RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
D-Sub 9 Male **COM1, COM2**	Pin 1	DCD#	TxD-	TxD-	Data-
	Pin 2	RxD	TxD+	TxD+	Data+
	Pin 3	TxD	RxD+	RxD+	-
	Pin 4	DTR#	RxD-	RxD-	-
	Pin 5	GND	GND	GND	GND
	Pin 6	DSR	-	RTS-	-
	Pin 7	RTS#	-	RTS+	-
	Pin 8	CTS#	-	CTS+	-
	Pin 9	RI#	-	CTS-	-

COM3, COM4:

UART mode		RS-232	Description
D-Sub 9 Male **COM3, COM4**	Pin 1	DCD#	Data Carrier Detect
	Pin 2	RxD	Receive Data
	Pin 3	TxD	Transmit Data
	Pin 4	DTR#	Data Terminal Ready

	Pin 5	GND	System Ground
	Pin 6	DSR	Data Set Ready
	Pin 7	RTS#	Request to Send
	Pin 8	CTS#	Clear to Send
	Pin 9	RI#	Ring Indicator

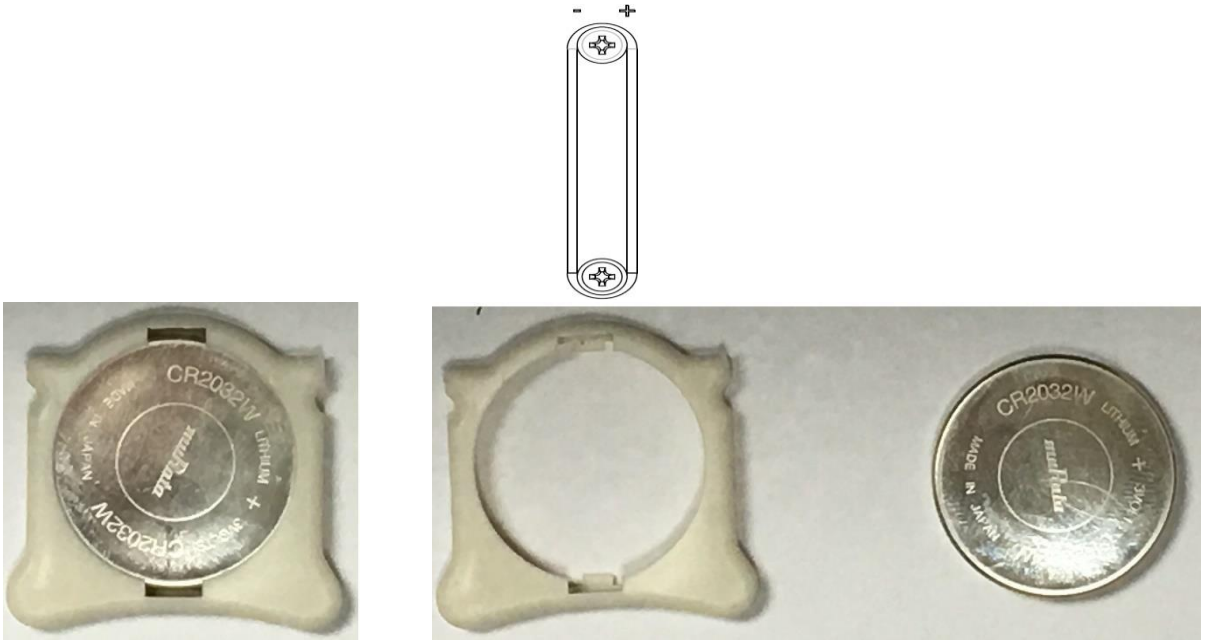
3.3.4 Wireless module LED for Mini-PCIe

2 ports Mini-PCIe sockets , it can support any WWAN/WLAN/WPAN Mini-PCIe wireless module, such as Wi-Fi . When a Mini-PCIe wireless module is installed and activited, the corresponding LED will light as described below.

Mini Card LED	LED Status
WWAN Linked	Solid Green
WWAN Active	Flash Green
WLAN Linked	Solid Green
WLAN Active	Flash Green
WPAN Linked	Solid Green
WPAN Active	Flash Green

3.3.5 RTC CMOS Battery Tray

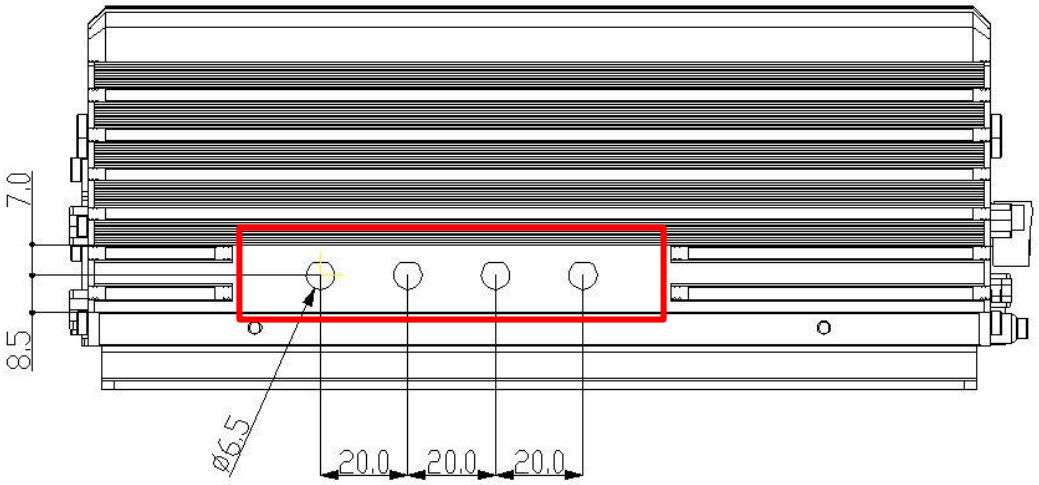
Swappable RTC CMOS battery tray.



Caution! Risk of explosion if battery is replaced with an incorrect type. Dispose of used batteries accordingly.

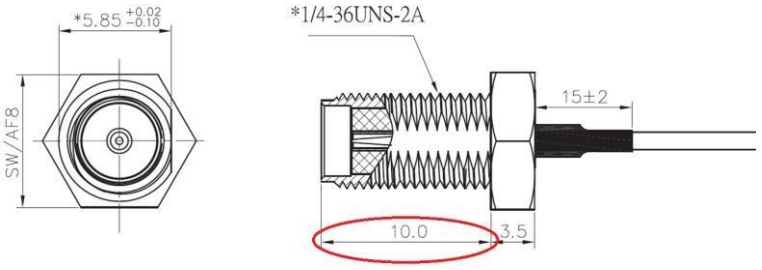
3.4 Antenna Holes

4 antenna holes on its left-side panel

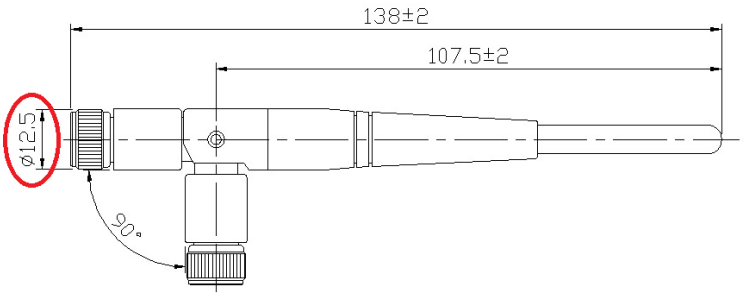


Caution!

1. Proposed SMA connector SPEC:
   SMA screw length "***minimum 10mm***"



2. Proposed Antenna connector SPEC:
   Antenna screw size "***maximum 15mm***"



3.5 Internal I/O Functions

In addition to I/O connectors on the front/rear panel, the IoTEDGE3100M system provides other useful features via its on-board connectors, such as mSATA socket, Mini-PCIe sockets. This section describes these internal I/O functions.

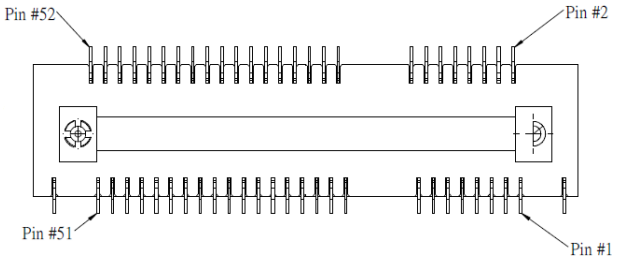
There are two on-board full-length Mini PCI Express slots . Many off-the-shelf Mini-PCIe modules with versatile capabilities are available. By installing a Mini-PCIe module, your system can have expanded features such as Wi-Fi

3.5.1 DDR4 SO-DIMM Socket

One Channel DDR4 SO-DIMM slot supports DDR4 2133 (Skylake) or DDR4 2400 (Kaby Lake), up to 32GB (ECC/Non-ECC) memory.

3.5.2 Mini PCI Express/mSATA Socket 1

Full-length Mini PCI Express Socket supports Mini-PCIe/mSATA mode select by BIOS setup, USB 2.0. SIM card slot supports +3.3V Power On/Off control by Enbik Application Program, and one Card Detection LED (WWAN, WLAN & WPAN) on the front panel. This slot allows your system to connect to the Internet through available telecom operator's For WIF communications, the IoTEDGE3100M system provides multiple SMA antenna apertures on the left panel for multi-antenna configuration.

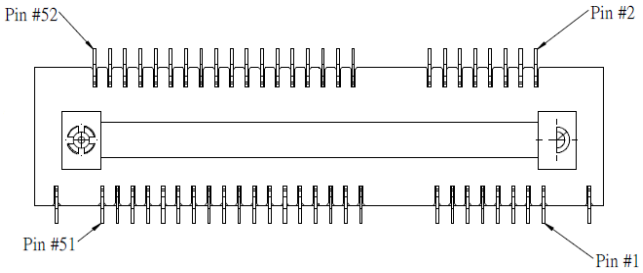


Top Side		Bottom Side	
1	PCIe_Wake#	2	3.3V
3	Reserved	4	GND
5	Reserved	6	1.5V
7	PCIe_CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DATA
11	PCIe_REFCLK-	12	UIM_CLK
13	PCIe_REFCLK+	14	UIM_RESET
15	GND	16	UIM_VPP
Mechanical key			
17	Reserved (UIM_C8)	18	GND
19	Reserved (UIM_C4)	20	Reserved
21	GND	22	PCIe_RST#
23	PCIe_PERn0/SATA-Tx+	24	+3.3V_SB
25	PCIe_PERp0/SATA-TX-	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK

Top Side		Bottom Side	
31	PCIe_PETn0/SATA-RX-	32	SMB_DATA
33	PCIe_PETp0/SATA-RX+	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3V	40	GND
41	+3.3V	42	LED_WWAN#
43	GND	44	LED_WLAN#
45	Reserved	46	LED_WPAN#
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	+3.3V

3.5.3 Mini PCI Express Socket 2

Full-length Mini PCI Express Socket supports Full Length Mini-PCIe, USB 2.0. This slot allows your system to connect to the Internet through available telecom operator's network. For WIF communication, the IoTEDGE3100M system provides multiple SMA antenna apertures on the left panel for multi-antenna configuration.



Top Side		Bottom Side	
1	PCIe_Wake#	2	3.3V
3	Reserved	4	GND
5	Reserved	6	1.5V
7	PCIe_CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DATA
11	PCIe_REFCLK-	12	UIM_CLK
13	PCIe_REFCLK+	14	UIM_RESET
15	GND	16	UIM_VPP

Top Side		Bottom Side	
Mechanical key			
17	Reserved (UIM_C8)	18	GND
19	Reserved (UIM_C4)	20	Reserved
21	GND	22	PCIe_RST#
23	PCIe_PERn0	24	+3.3V_SB
25	PCIe_PERp0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIe_PETn0	32	SMB_DATA
33	PCIe_PETp0	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3V	40	GND
41	+3.3V	42	LED_WWAN#
43	GND	44	LED_WLAN#
45	Reserved	46	LED_WPAN#
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	+3.3V

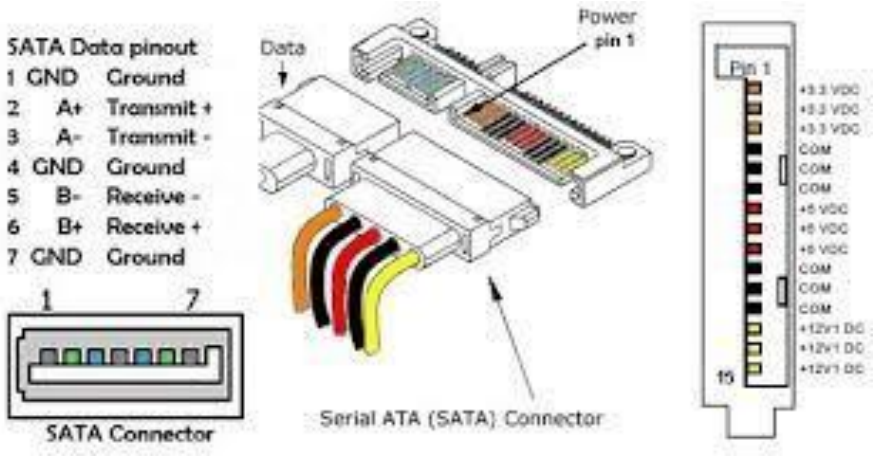
3.5.4 M.2 Socket

One M.2 M Key Slot supporting 2242 PCIe x1 or SATA, mode selection by BIOS setup.

Pin	Description	Pin	Description
1	Ground	2	VCC 3.3V
3	Ground	4	VCC 3.3V
5	-	6	-
7	-	8	-
9	Ground	10	LED#
11	-	12	VCC 3.3V
13	-	14	VCC 3.3V
15	Ground	16	VCC 3.3V
17	-	18	VCC 3.3V
19	-	20	-
21	Ground	22	-
23	-	24	-
25	-	26	-
27	Ground	28	-
29	-	30	-
31	-	32	-
33	Ground	34	-
35	-	36	-
37	-	38	DEVSLP
39	Ground	40	-
41	PCIE RX N0 / SATA B+	42	-
43	PCIE RX P0 / SATA B-	44	-
45	Ground	46	-
47	PCIE TX N0 / SATA A-	48	-
49	PCIE TX P0 / SATA A+	50	Reset#
51	Ground	52	Clock Request#
53	PCIE Clock N	54	Wake#
55	PCIE Clock P	56	-
57	Ground	58	-
Mechanical Key			
67	Ground	68	-
69	-	70	Ground
71	Ground	72	Ground
73	Ground	74	Ground

3.5.5 Internal SATA and SATA Power Connector

One internal SATA and SATA power connector. The SATA Power Header supports +5V power at 2A for SSD devices.



SATA Data Pinout

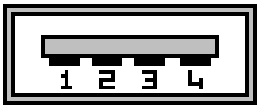
Pin	Name	Function
1	GND	Ground
2	A+	Transmit+
3	A-	Transmit-
4	GND	Ground
5	B-	Receive-
6	B+	Receive+
7	GND	Ground

SATA Power Pinout

Pin	Name	Function
1	NC	N
2	NC	3.3V Power
3	NC	3.3V Power, Pre-charge, 2nd mate
4	Ground	1st Mate
5	Ground	2nd Mate
6	Ground	3rd Mate
7	V5	5V Power, pre-charge, 2nd mate
8	V5	5V Power
9	V5	5V Power
10	Ground	2nd Mate
11	Reserved	-
12	Ground	1st Mate
13	NC	12V Power, Pre-charge, 2nd mate
14	NC	12V Power
15	NC	12V Power

3.5.6 Internal USB 2.0 Ports

One internal USB 2.0 Type A connector. The internal USB port is designed to allow users to attach a protection dongle inside the chassis.



Pin	Name	Description
1	VCC	+5 VDC
2	D-	Data -
3	D+	Data +
4	GND	Ground

Chapter 4

Hardware Installation

This chapter describes how to install parts, including:

- ✓ SO-DIMM Memory Installation
- ✓ M.2 SSD Installation
- ✓ MSATA SSD Installation
- ✓ Mini-PCIE 1 Module Installation
- ✓ Mini-PCIE 2 Module Installation
- ✓ 2.5” SATA HDD/SSD Installation
- ✓ Replace CMOS RTC Battery
- ✓ Mounting Bracket Installation

4.1 SO-DIMM Memory Installation SO-DIMM Memory Installation

1. Remove the bottom four M2.5*5mm screws to remove the bottom cover.

2. Open the bottom cover and unplug the cable connected to the board on the inside of the bottom cover.

3. Insert the SO-DIMM memory module into the SO-DIMM socket.

4. Confirm that the SO-DIMM is securely inserted into the socket.

5. Reconnect the cable to the board on the inside of the bottom cover.

6. Replace the bottom cover and secure with four M2.5*5mm screws.

3. Insert the SO-DIMM memory module into the SO-DIMM socket.

4. Confirm that the SO-DIMM is securely inserted into the socket.

5. Reconnect the cable to the board on the inside of the bottom cover.

6. Replace the bottom cover and secure with four M2.5*5mm screws.

4.2 M.2 SSD Installation

1. Remove the bottom four M2.5*5mm screws to remove the bottom cover.

2. Open the bottom cover and unplug the cable connected to the board on the inside of the bottom cover.

3. Remove the two M2.5*6mm screws securing the DIO module and remove the DIO module.

4. Insert the M.2 SSD module into the M.2 socket and secure with the M2*4mm screws.

5. Insert the DIO module and secure with two M2.5*6mm screws.

6. Reconnect the cable to the board on the inside of the bottom cover.

7. Replace the bottom cover and secure with four M2.5*5mm screws.

4.3 mSATA SSD Installation (mini-PCIe 1)

1. Remove the bottom four M2.5*5mm screws to remove the bottom cover.

2. Open the bottom cover and unplug the cable connected to the board on the inside of the bottom cover.

3. Remove the two M2.5*6mm screws securing the DIO module and remove the DIO module.

4. Remove the M2.5*8mm screw to securing the IOM-2RG module and remove the IOM-2RG module.

5. Remove the Plastic Pillars.

6. Insert the mSATA module into the mini-PCIe1 socket and secure with M2.5*6mm screw.

7. Install the Plastic Pillars.

8. Insert the IOM-2RG module and secure with M2.5*8mm screw.

9. Insert the DIO module and secure with two M2.5*6mm screws.

10. Reconnect the cable to the board on the inside of the bottom cover.

11. Replace the bottom cover and secure with four M2.5*5mm screws.

4.4 Mini-PCIe 1 Module Installation

1. Remove the bottom four M2.5*5mm screws to remove the bottom cover.

2. Open the bottom cover and unplug the cable connected to the board on the inside of the bottom cover.

3. Remove the two M2.5*6mm screws securing the DIO module and remove the DIO module.

4. Remove the M2.5*8mm screw to securing the IOM-2RG module and remove the IOM-2RG module.

5. Remove the Plastic Pillars.

6. Insert the mini-PCIe card module into the mini-PCIe1 socket and secure with M2.5*6mm screw.

7. Install the Plastic Pillars.

8. Insert the IOM-2RG module and secure with M2.5*8mm screw.

9. Insert the DIO module and secure with two M2.5*6mm screws.

10. Reconnect the cable to the board on the inside of the bottom cover.

11. Replace the bottom cover and secure with four M2.5*5mm screws.

4.5 Mini-PCIe 2 module installation

1. Remove the bottom four M2.5*5mm screws to remove the bottom cover.

2. Open the bottom cover and unplug the cable connected to the board on the inside of the bottom cover.

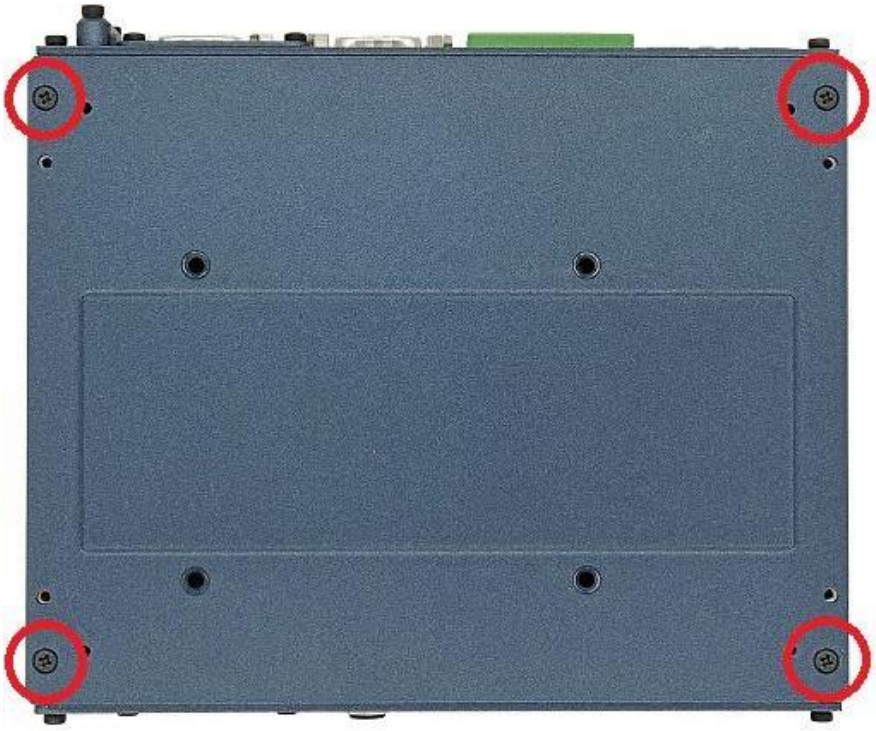
3. Remove the two M2.5*6mm screws securing the DIO module and remove the DIO module.

4. Insert the Mini-PCIe module into the Mini-PCIe Socket 2 and secure with M2.5*6mm screw.

5. Insert the DIO module and secure with two M2.5*6mm screws.

6. Reconnect the cable to the board on the inside of the bottom cover.

7. Replace the bottom cover and secure with four M2.5*5mm screws.



4.6 2.5” SATA HDD/SSD Installation

1. Remove the bottom four M2.5*5mm screws to remove the bottom cover.

2. Open the bottom cover and unplug the cable connected to the board on the inside of the bottom cover.

3. Remove the two M2.5*6mm screws securing the DIO module and remove the DIO module.

4. Remove the M2.5*8mm screw to securing the IOM-2RG module and remove the IOM-2RG module.

5. Remove the Plastic Pillars.

6. Remove the IOM-POEAT4 module.

7. Plug the SATA power cable into the SATA power wafer connector on the board. Then plug the SATA cable (without lock) into the SATA connector on the board.

8. Install the IOM-POEAT4 module and secure with M2.5*6mm screw.

9. Install the Plastic Pillars.

10. Insert the IOM-2RG module and secure with M2.5*8mm screw.

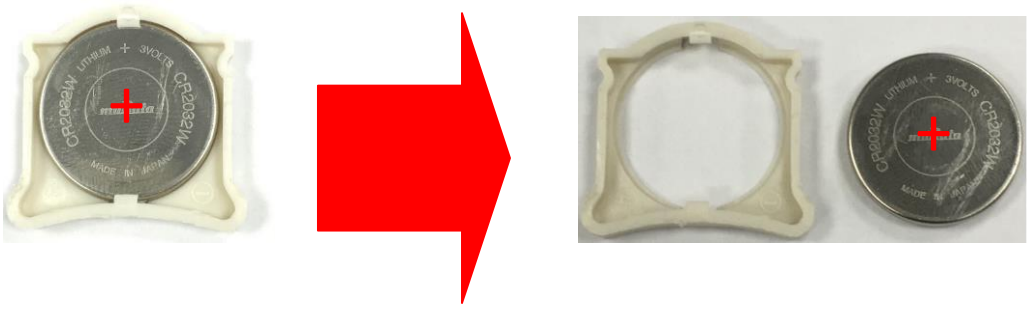
11. Install the 2.5” SATA disk drive to the bottom cover with 4 M3x4mm screws and insert the SATA cable (with lock) and SATA power cable into the 2.5” SATA disk drive.

4.7 Replace CMOS RTC Battery

1. Remove the two M2.5*8mm screws securing the rear panel battery cover.

2. Open the battery cover and pull out the white battery tray holder.

3. Remove the CR2032 button battery from the white battery tray holder and replace it with a new one.



Caution!

1. When changing the battery, make note of the polarity of the battery.

2. When the battery tray holder is inserted back into the battery slot, make sure that positive (+) is facing up.

4. Insert the battery tray holder into the battery holder and secure the rear panel battery cover with 2 M2.5 screws.

4.8 Mounting Bracket Installation

1. Secure 2 brackets to the bottom cover with 2 M2.5x5 screws.

Chapter 5

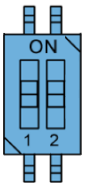
Function Settings

This chapter includes:

- ✓ Clear CMOS/ME Switch (SW1)

5.1 Clear CMOS/ME Switch (SW1)

You can use Switch SW1 to clear CMOS and Intel® Management Engine settings.



Switch 1	Description (Clear CMOS)
On	Clear
Off	(Default)
Switch 2	**Description (Clear ME)**
On	Clear
Off	(Default)

1

Chapter 6

Function Settings

This chapter includes:

- ✓ **Wifi module model**

Wifi module model

BCM943224HMPx P201

Wifi module model

Quick Details

Place of Origin:	China
Brand Name:	Broadcom
Model Number:	BCM943224HMP
Type:	Wireless
Interface Type:	Mini Pcie
Transmission Rate:	300Mbps
Application:	Laptop
Kind:	Internal
Products Status:	Stock
Spare Part Number:	593837-001
Application:	This item do not compatible with Hp and Lenovo
Support OS:	Mac Hackintosh and Windows xp/win7/8/8.1/vista/Linux
Frequency Range:	Dual Band
Condition:	Original,Tested,Working
Single package size:	15X10X5 cm
Single gross weight:	0.2KG
Package Type:	Carton Box

Wifi module model

Product Description

Wireless BCM943224HMP 593837-001 Dual Band 300M Mini Pcie Wifi Card

Spare Part Number:	593837-001
Manufacturer:	Broadcom
Model:	BCM943224HMP
Interface:	Mini pci-e
Speed Up to:	300Mbps
Standard:	IEEE802.11 b/g/n

Suppot: Mac Hackintosh and Windows xp/win7/8/8.1/vista/Linux,DO NOT compatible with Hp and Lenovo.

Appendices

This section includes:

- ✓ Appendix A: DisplayPort MultiStream Transport (MST) Capabilities
- ✓ Appendix B: How To Use GPIO

Appendix A: DisplayPort Multi-Stream Transport (MST) Capabilities

The IoTEDGE3100M system DisplayPorts support Multi-Stream Transport (MST).

MST	Max. Resolution	Pixel Clock	One Display Bandwidth [Gbps]	Total Bandwidth for all display [Gbps]
1 display	3840x2160 @60Hz	533.25	16	16
	4096x2304 @60Hz	605.0	18.5	18.15
2 concurrent	2880x1800 @60Hz	337.75	10.13	20.26

Note

1.Multi-Stream Transport (MST) enables multiple monitors via a single DisplayPort* connector.

2.Total bandwidth for all displays must be lower than the Max theoretical bandwidth of 5.4x4 = 21.6 [Gbps].

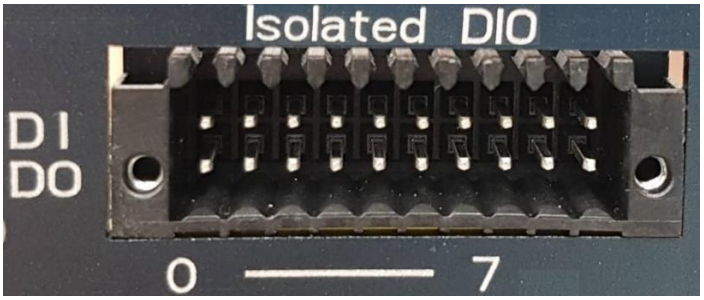
3. Additional cooling is required.

Appendix B: How to use GPIO

Functional Description

GPIO signals are accessed via a 2.54mm 2x10-pin terminal block, including Isolated DI 8 bit, DO 8 bit, DI Com, Power and GND.

DI/DO supports NPN (Sink) and PNPO (Source) mode.



DI mode is selected by external H/W connection. DO mode is selected by BIOS setting or Application Program.

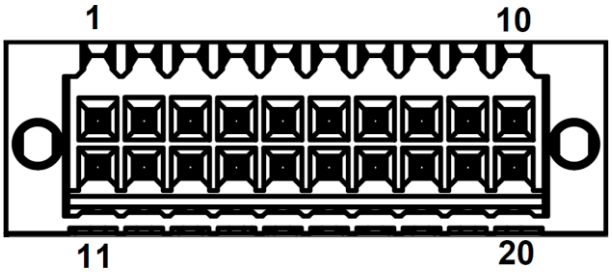
DI/DO Safety-Related Certifications:

DI	DO
2500-V PART NUMBER PACKAGE BODY SIZE (NOM) RMS Isolation for 1 minute per UL 1577	2500-V PART NUMBER PACKAGE BODY SIZE (NOM) RMS Isolation for 1 minute per UL 1577
Approved by VDE, DIN EN60747-5-2(_) (as an option), file No. 40009162 (as model No. PC3H4)	4242-V ISO7131CC PK Isolation per DIN V VDE V 0884-10 (VDE V 0884-10):2006-12, 566 V ISO7140CC PK Working Voltage
UL flammability grade (94V-0)	CSA Component Acceptance Notice 5A, IEC ISO7141CC 60950-1 and IEC 61010-1 End Equipment ISO7141FCC Standards
	CQC Certification per GB 4943.1-2011

DI/DO Operation Characteristics:

Parameter	DI	DO
Operation Voltage	5 ~ 48V DC	Source Mode:5 ~ 48V DC Sink Mode: 5~40V DC
Input/Output Current Limit	25 uS	100mA
Turn On Delay Time (Max.)	25 uS	Source Mode: 15 uS Sink Mode: 60uS
Turn Off Delay Time (Max.)	25 uS	Source Mode: 15 uS Sink Mode: 60uS

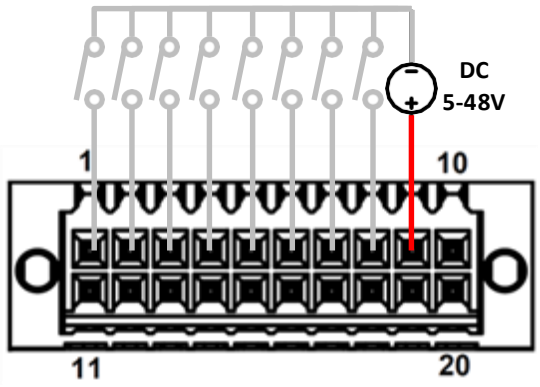
Pin Define



Pin	Description	Pin	Description
1	Isolated DI bit0	11	Isolated DO bit0
2	Isolated DI bit1	12	Isolated DO bit1
3	Isolated DI bit2	13	Isolated DO bit2
4	Isolated DI bit3	14	Isolated DO bit3
5	Isolated DI bit4	15	Isolated DO bit4
6	Isolated DI bit5	16	Isolated DO bit5
7	Isolated DI bit6	17	Isolated DO bit6
8	Isolated DI bit7	18	Isolated DO bit7
9	Digital Input COM	19	Isolated GND
10	Isolated GND	20	Isolated VCC

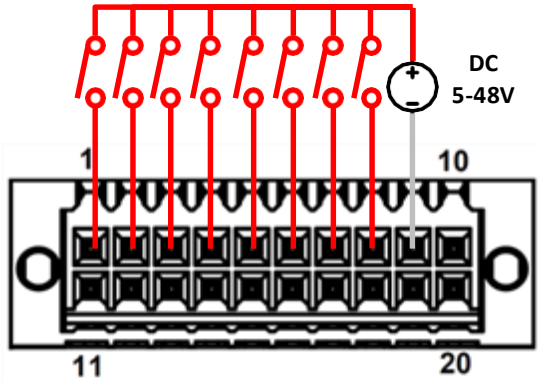
Isolation Digital Input Connection Method

Digital Input Sink Mode Connection Method
Pin 9 digital input COM pin connection to V+. Input pin (Pins 1-8) control by V-.



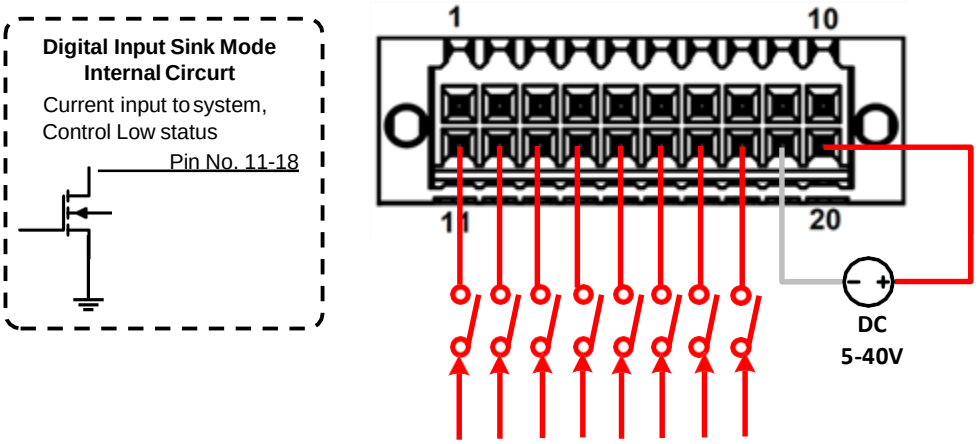
Digital Input Source Mode Connection Method

Pin 9 digital input COM pin connection to V-. Input pin (Pins 1-8) control by V+.

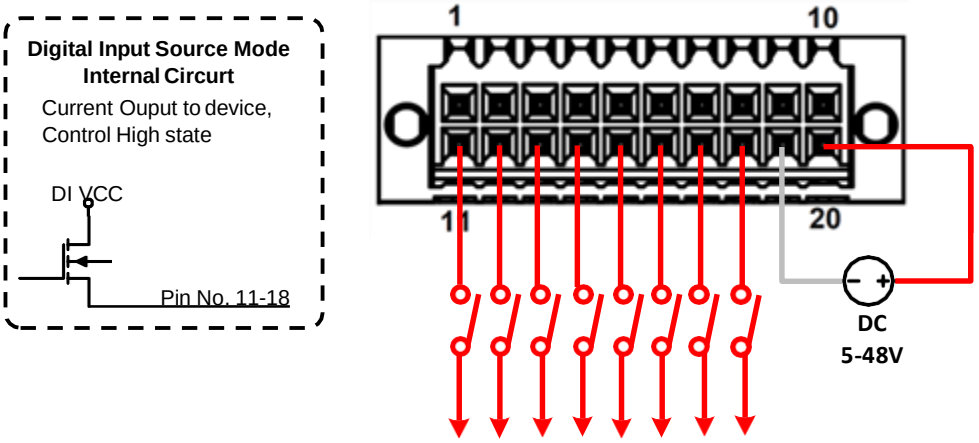


Isolation Digital Output Connection Method

Digital Output Sink Mode Connection Method



Digital Output Source Mode Connection Method



Warning：

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.
NOTE: This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter

RF Exposure Statement

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance of 20Cm the radiator your body. This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter