

EXPC-1519 Series Hardware User's Manual

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MOXA[®]

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EXPC-1519 Series Hardware User's Manual

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Introduction

Thank you for purchasing the Moxa EXPC-1519 series x86 industrial panel computer.

This manual introduces the hardware installation, connector interfaces, and BIOS setup of the EXPC-1519. For software configuration and management, please refer to the user's manual for your operating system.

The following topics are covered in this chapter:

- **Overview**
- **Model Descriptions and Package Checklist**
- **Appearance**
- **Features**
- **Hardware Specifications**
- **LED Indicators and Buttons**
 - Description of OSD Buttons

Overview

The EXPC-1519 series Zone 2 panel computers feature advanced 3rd generation Intel® Core™ processors—i7-3555LE and Celeron 1047UE—with 4 GB of system memory expandable to 16 GB, delivering a reliable, high-performance platform of wide versatility for use in the harsh oil and gas environments.

Model Descriptions and Package Checklist

The EXPC-1519 Series includes the following models:

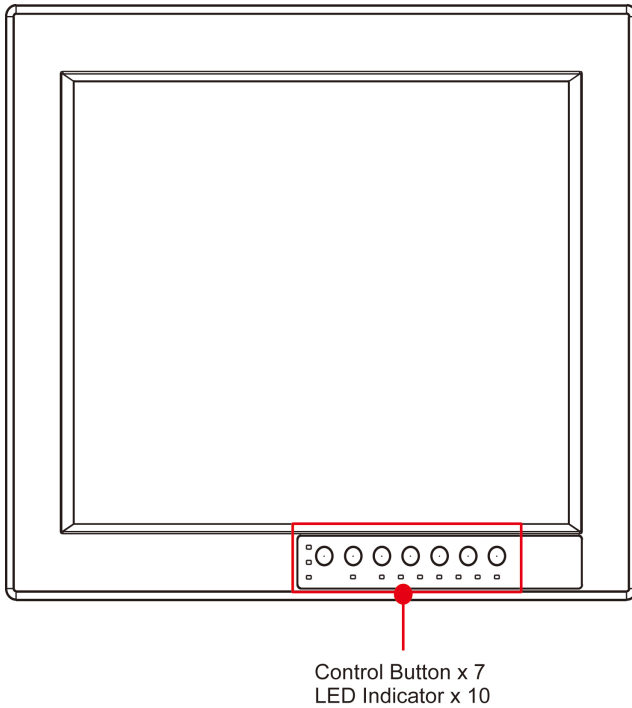
- **EXPC-1519-C1-S1-T:** Fanless, Zone 2 19-inch 1000 nits LCD panel computer, Intel® Celeron® Processor 1047UE 1.4GHz, cable gland with standard I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5" SSD tray and CFast slot
- **EXPC-1519-C1-S2-T:** Fanless, Zone 2 19-inch 1000 nits LCD panel computer, Intel® Celeron® Processor 1047UE 1.4GHz, cable gland with terminal block I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5" SSD tray and CFast slot
- **EXPC-1519-C1-S3-T:** Fanless, Zone 2 19-inch 1000 nits LCD panel computer, Intel® Celeron® Processor 1047UE 1.4GHz, harsh environment I/O connector, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5" SSD tray and CFast slot
- **EXPC-1519-C7-S1-T:** Fanless, Zone 2 19-inch 1000 nits LCD panel computer, Intel® Core™ i7-3555LE Processor 2.5GHz, cable gland with standard I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5" SSD tray and CFast slot
- **EXPC-1519-C7-S2-T:** Fanless, Zone 2 19-inch 1000 nits LCD panel computer, Intel® Core™ i7-3555LE Processor 2.5GHz, cable gland with terminal block I/O design, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5" SSD tray and CFast slot
- **EXPC-1519-C7-S3-T:** Fanless, Zone 2 19-inch 1000 nits LCD panel computer, Intel® Core™ i7-3555LE Processor 2.5GHz, harsh environment I/O connector, projected capacitive touch screen, IP66, -40 to 70°C operating temperature, 2.5" SSD tray and CFast slot

Each model is shipped with following standard items:

| Model | Package Checklist |
|--|--|
| EXPC-1519-C1-S1-T EXPC-1519-C7-S1-T EXPC-1519-C1-S2-T EXPC-1519-C7-S2-T | <ul style="list-style-type: none"> • 1 EXPC-1519 panel computer • HDD/SSD installation kit • 1 2-pin terminal block for DC power input • 1 3-pin terminal block for AC power input • Quick installation guide • Documentation & software DVD • Warranty card |
| EXPC-1519-C1-S3-T EXPC-1519-C7-S3-T | <ul style="list-style-type: none"> • 1 EXPC-1519 panel computer • HDD/SSD installation kit • USB female connector installation kit • RJ45 female connector installation kit • DC power installation kit • AC power installation kit • Quick installation guide • Documentation & software DVD • Warranty card |

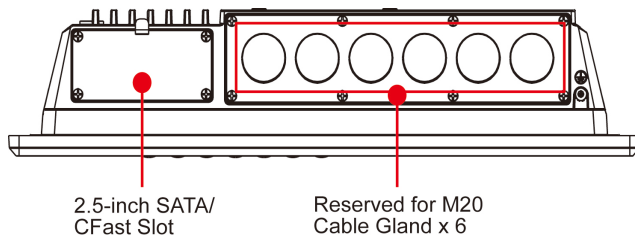
Appearance

Front View

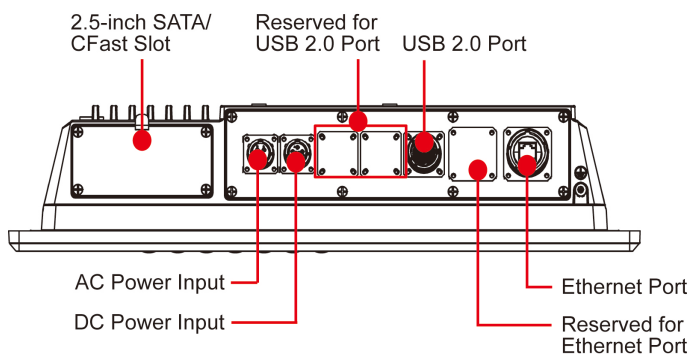


Bottom View

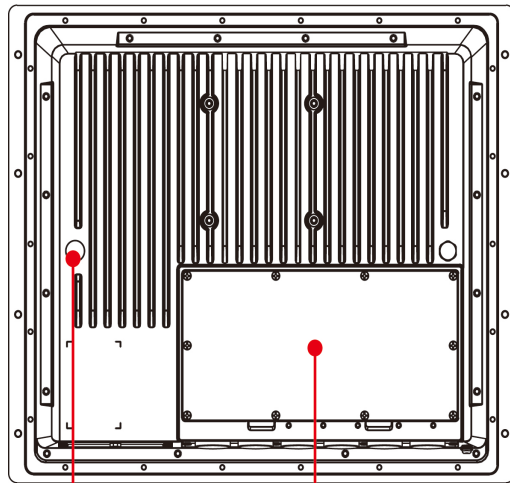
(EXPC-1519-C1-S1-T, EXPC-1519-C7-S1-T, EXPC-1519-C1-S2-T, EXPC-1519-C7-S2-T)



Bottom View (EXPC-1519-C1-S3-T, EXPC-1519-C7-S3-T)

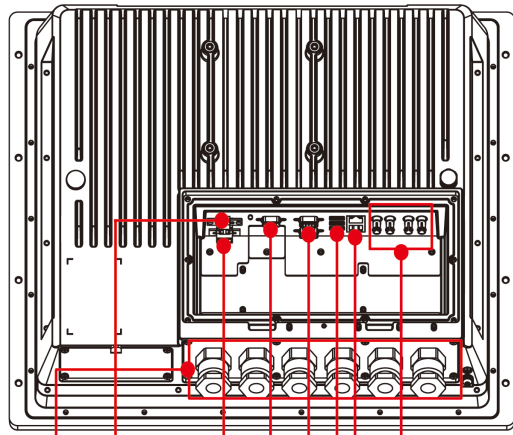


Rear View (EXPC-1519-C1-S1-T, EXPC-1519-C7-S1-T)



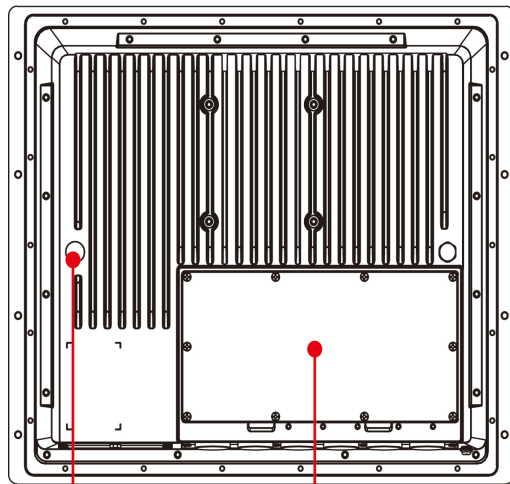
Optional Antenna Port (N type) Connector Panel

*Viewed at a 5-degree angle



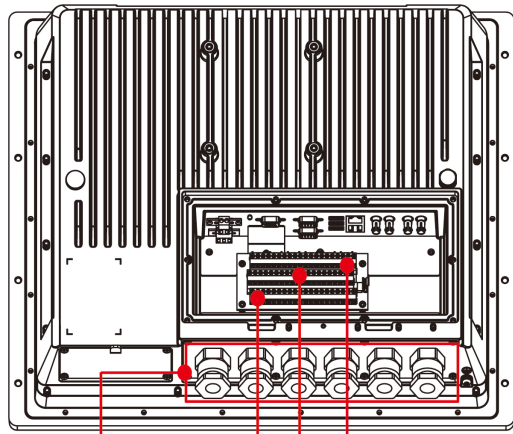
DC Input AC Input Fiber Port x2 Ethernet Port x 2
Optional M20 Cable Glands VGA Port Serial Port x 2 USB 2.0 x 3

Rear View (EXPC-1519-C1-S2-T, EXPC-1519-C7-S2-T)



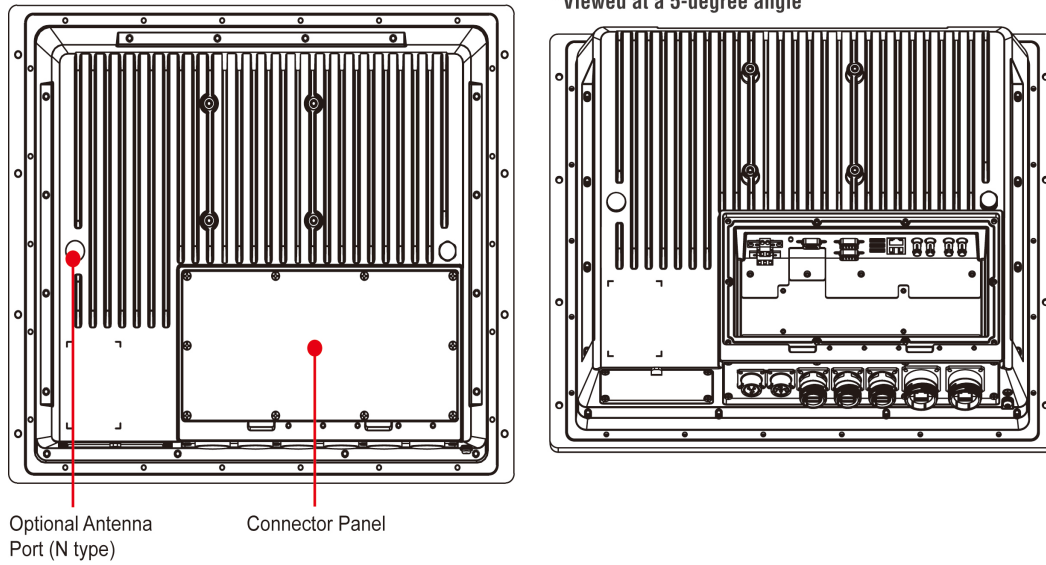
Optional Antenna Port (N type) Connector Panel

*Viewed at a 5-degree angle

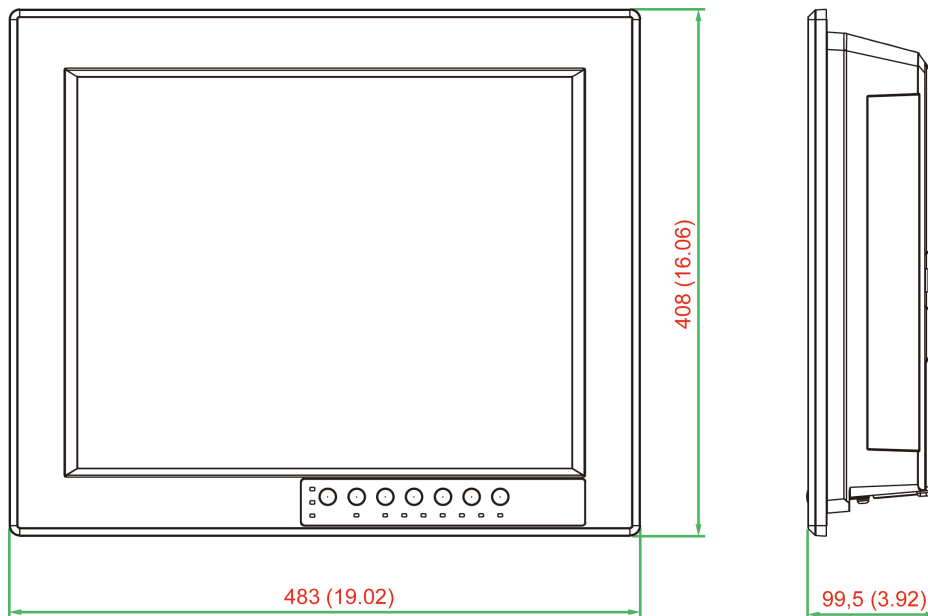


Optional M20 Cable Glands Serial Port x 2 USB 2.0 x 4 Ethernet Port x 2

Rear View (EXPC-1519-C1-S3-T, EXPC-1519-C7-S3-T)



Dimensions



Features

- Anti-scratch, 19-inch sunlight viewable, 1000 nits LCD panel
- High performance Intel® 3rd generation Core™ i7-3555LE or Celeron 1047UE CPU
- Fanless design with highly efficient heat dissipation
- -40 to 70°C extended operation temperature
- Multi-touch with glove-friendly touch screen interface
- Options of cable gland and standard USB Type A/RJ-45 connectors
- Totally sealed IP66 / NEMA 4X enclosure
- Class 1 Division 2, ATEX Zone 2, and IECEx certified
- Dual AC/DC power supply
- Optional WLAN, 100M Fiber optic connection

Hardware Specifications

Computer

CPU: Intel® Core™ i7-3555LE 2.5GHz or Intel® Celeron® 1047UE 1.4GHz Processor

Supported OS: Windows Embedded Standard 7 32/64-bit, Windows 7 Professional 32/64-bit

System Chipset: Intel® QM77 Express Chipset (Intel® BD82QM77 PCH)

BIOS: 64 Mbit SPI Flash

Graphics Controller: Intel® HD Graphics 4000

System Memory: 2 SO-DIMM slot, DDR3/DDR3L support, 4 GB pre-installed, maximum 16 GB capacity

Expansion Bus: 1 mini PCIe socket (wireless module must be ordered separately)

Touchscreen: Projected capacitive touch, 7H surface hardness, anti-reflection treatment, glove-friendly

Storage

SSD/HDD Support: 2.5" SATA, 7 or 9.5 mm in height, access externally

CFast : Push-push type, access externally

Display

Panel Size: 19-inch SXGA, 1000 nits LED backlit LCD

Aspect Ratio: 5:4

Response Time: 5 ms

Contrast Ratio: 1000:1

Viewing Angles:

- Horizontal: 170° (left to right)
- Vertical: 160° (up to down)

Max Colors: 16.7 M colors

Resolution:

- VGA: 640 x 480
- SVGA: 800 x 600
- XGA: 1024 x 768
- SXGA: 1280 x 1024

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF

Baudrate: 50 bps to 115.2 Kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

Interface (EXPC-1519-C1-S1/EXPC-1519-C7-S1)

Connector type: On motherboard via cable glands

USB: 3 USB 2.0 hosts, Type A connectors

VGA: 15-pin D-Sub connector (DB15 female), with resolution up to 2048x1536 pixels with 32-bit color at 75 Hz

Serial Port: 2 RS-232/422/485 ports, software-selectable (DB9 male)

Ethernet: 2 auto-sensing 10/100/1000 Mbps ports (RJ45)

Optical Fiber: 2 multimode 100M fiber optic ports

AC: 100 to 240 VAC (3-pin terminal block)

DC: 24 VDC (2-pin terminal block)

Interface (EXPC-1519-C1-S2/EXPC-1519-C7-S2)

Connector Type: On terminal block via cable glands

USB: 4 USB 2.0 hosts, terminal block

Serial Port: 2 RS-232/422/485 ports (terminal block), software-selectable

Ethernet: 2 auto-sensing 10/100/1000 Mbps ports (terminal block)

Optical Fiber : 2 multimode 100M fiber optic ports

AC: 100 to 240 VAC (3-pin terminal block)

DC: 24 VDC (2-pin terminal block)

Interface (EXPC-1519-C1-S3/EXPC-1519-C7-S3)

Connector Type: On bottom panel

USB: 1 USB 2.0 hosts, Type A connector

Ethernet: 1 auto-sensing 10/100/1000 Mbps port (RJ45)

AC: 100 to 240 VAC (3-pin terminal block)

DC: 24 VDC (2-pin terminal block)

LEDs and Buttons

System LEDs: Power, Fiber1, Fiber2, LAN1, LAN2, Touch, Info, DAY, Dusk, Night

LAN LEDs: 100M/Link, 1000M/Link (on each RJ-45 connector)

Buttons: Power, Brightness +/-, Fn, Touch, Info, Brightness mode

Physical Characteristics

Housing: Aluminum

Weight: 10.7 kg

Dimensions: 483 x 408 x 99.5 mm (19.02 x 16.06 x 3.92 in)

Mounting: VESA mounting (100 x 100 mm), desktop mounting, yoke mounting, wall mounting, and panel mounting

Environmental Limits

Operating Temperature: -40 to 70°C (-40 to 158°F)

Storage Temperature: -40 to 70°C (-40 to 158°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-Vibration: 2 g rms, 5-500 Hz frequency, compliant with IEC 60068-2-6 standard

Anti-Shock: 20 g rms, half sine wave under system operating, 11 ms duration, compliant with IEC 60068-2-27 standard

Power Requirements

Input Voltage:

- DC: 24 VDC (with tolerance from 18 to 32 VDC, 2-pin terminal block)
- AC: 100 to 240 VAC

Power Consumption: Less than 120 W, 2.5 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, IEC 60950-1

Hazardous Environments: Class 1 Division 2, ATEX Zone 2, IECEx

EMC: EN 55032/24

EMI:

CISPR 32, FCC Part 15B Class A

EMS:

- IEC 61000-4-2 ESD: Contact 4 kV; Air 8 kV
- IEC 61000-4-3 RS: 10 V/m (80 MHz to 1 GHz)
- IEC 61000-4-4 EFT: Power 2 kV; Signal 1 kV
- IEC 61000-4-5 Surge: Power 2 kV; Signal 1 kV
- IEC 61000-4-6 CS: 10 V
- IEC 61000-4-8, IEC 61000-4-11

Ingress Protection Rating: IP66 / NEMA 4X

Green Product: RoHS, cRoHS, WEEE

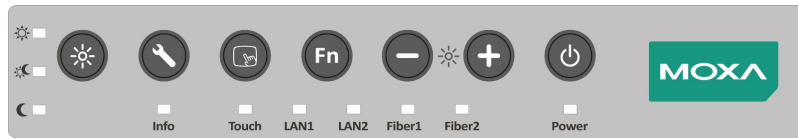
Warranty

Warranty Period: 3 years for computer system, 1 year for LCD panel

Details: See www.moxa.com/warranty

LED Indicators and Buttons

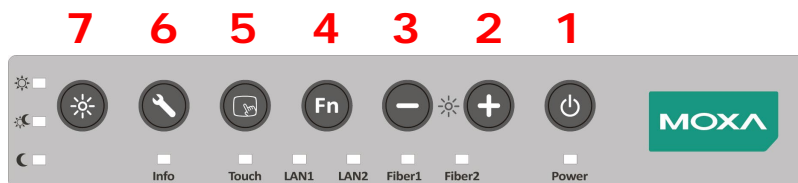
The EXPC-1519 comes with six LED indicators and five control buttons on the bottom of the front panel.



| Button | Name | Description |
|--------|-----------------|---|
| | Power | Press to power on or wake up. Press and hold for 4 seconds to power off. |
| | Brightness | Press to adjust the brightness level. |
| | Fn | Press to display function menu. |
| | Touch | Touch to enable the touchscreen function. Touch again to disable. |
| | Info | Press to display system information. |
| | Brightness mode | Press to switch between display modes. |

| LED | Color | Description |
|------------------|-------|---------------------------------------|
| Power | Green | Power is on and functioning normally. |
| | Off | Power is off. |
| Fiber 1/ Fiber 2 | Green | Fiber port is connected. |
| | Off | Fiber port is not connected. |
| LAN 1/ LAN 2 | Green | LAN port is connected. |
| | Off | LAN port is not connected. |
| Touch | Green | Panel touch mode is enabled. |
| | Off | Panel touch mode is disabled. |
| Info | Red | System error. |
| | Off | System is functioning properly. |
| Display mode | Green | Displays the brightness mode. |
| | Off | Not in brightness mode range. |

Description of OSD Buttons



1. Power button

The power button is used to power the system on or off. When the system is off, pressing the power button will power on the system. When the system is on, you should usually shut down the system, or put the system in sleep mode, from within the operating system. To forcibly power off the system, hold down the power button until the system shuts down (about 4 seconds).

2. Brightness +

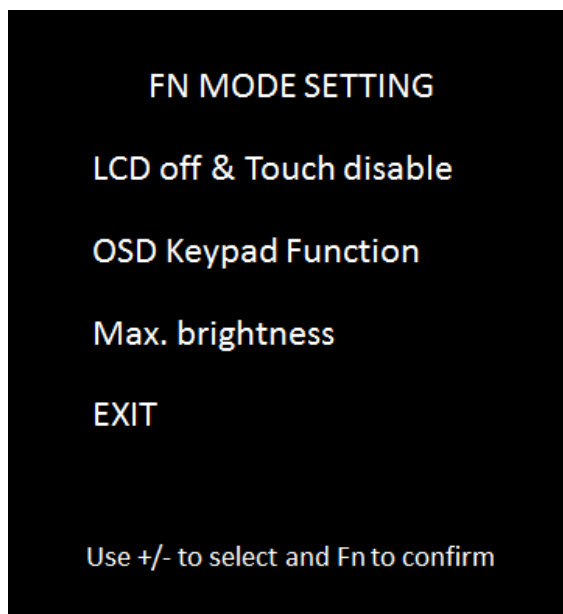
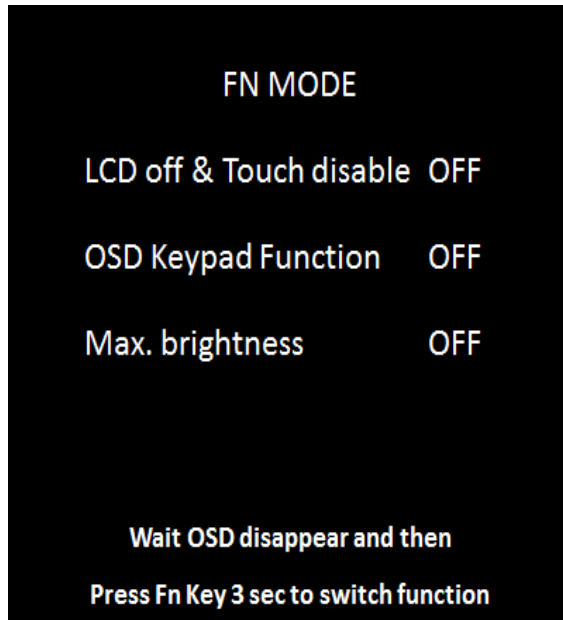
Press this button to increase the brightness level. In total, there are 256 (0 to 255) brightness levels.

3. Brightness –

Press this button to decrease the brightness level. In total, there are 256 (0 to 255) brightness levels.

4. Fn button

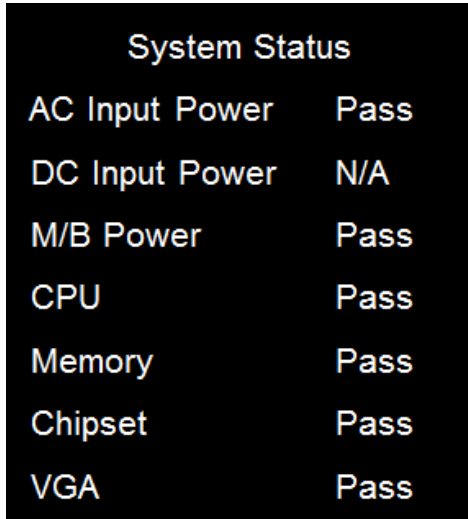
Use this button to cycle between three different function modes: (1) LCD off & Touch disable, (2) OSD Keypad Function, and (3) Max. Brightness. To select a mode, press and hold the button until the mode is selected (approximately 3 seconds).

**5. Touch button**

Use the Touch button is to switch enable or disable the touch function. The Touch function is enabled when the Touch LED is green.

6. Info. button

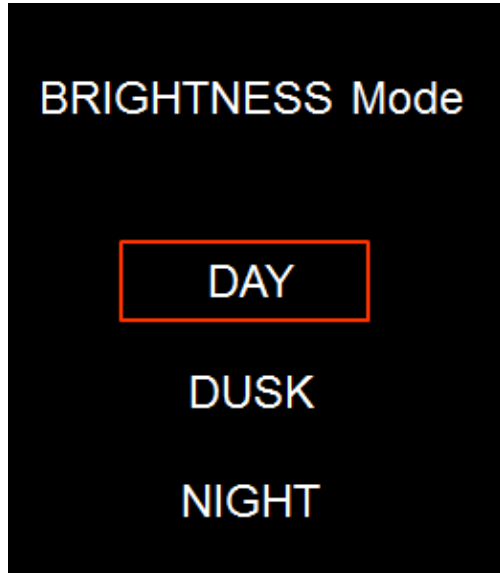
Use this button to check the hardware status. Items that can be checked include **AC Input Power**, **DC Input Power**, **M/B Power**, **CPU**, **Memory**, **Chipset**, and **VGA**. When the panel computer is working as intended, the status of each item will be indicated as **Pass** or **N/A**. An error message will be shown when the system is not working properly. CPU, memory, chipset, and VGA components are detected only in the boot stage. AC/DC and motherboard Power are continuously monitored beginning with the system boot phase. When the panel computer is connected to both AC and DC power sources, the system power will be provided by the AC connection, in which case the DC status will be indicated as **N/A**.



| System Status | |
|----------------|------|
| AC Input Power | Pass |
| DC Input Power | N/A |
| M/B Power | Pass |
| CPU | Pass |
| Memory | Pass |
| Chipset | Pass |
| VGA | Pass |

7. Brightness mode

The Brightness Mode button can be used to make quick brightness adjustments; the options are **DAY**, **DUSK**, and **NIGHT**.



Hardware Installation

In this chapter, we describe the hardware installation and interfaces of EXPC-1519 panel computers.

The following topics are covered in this chapter:

❑ **Mounting the EXPC-1519**

- VESA Mounting
- Panel Mounting
- Yoke Mounting

❑ **Wiring Requirements**

❑ **Connecting the Power Supply**

❑ **Connecting the Interfaces**

❑ **Installing the SATA Storage Drive**

❑ **Installing a CFast Card**

❑ **Connector Pin Assignment**

- Serial Ports
- Ethernet Ports
- Terminal block of EXPC-1519-C1-S2-T / EXPC-1519-C7-S2-T

❑ **Grounding the unit**

❑ **Powering on the EXPC-1519**

- Real Time Clock

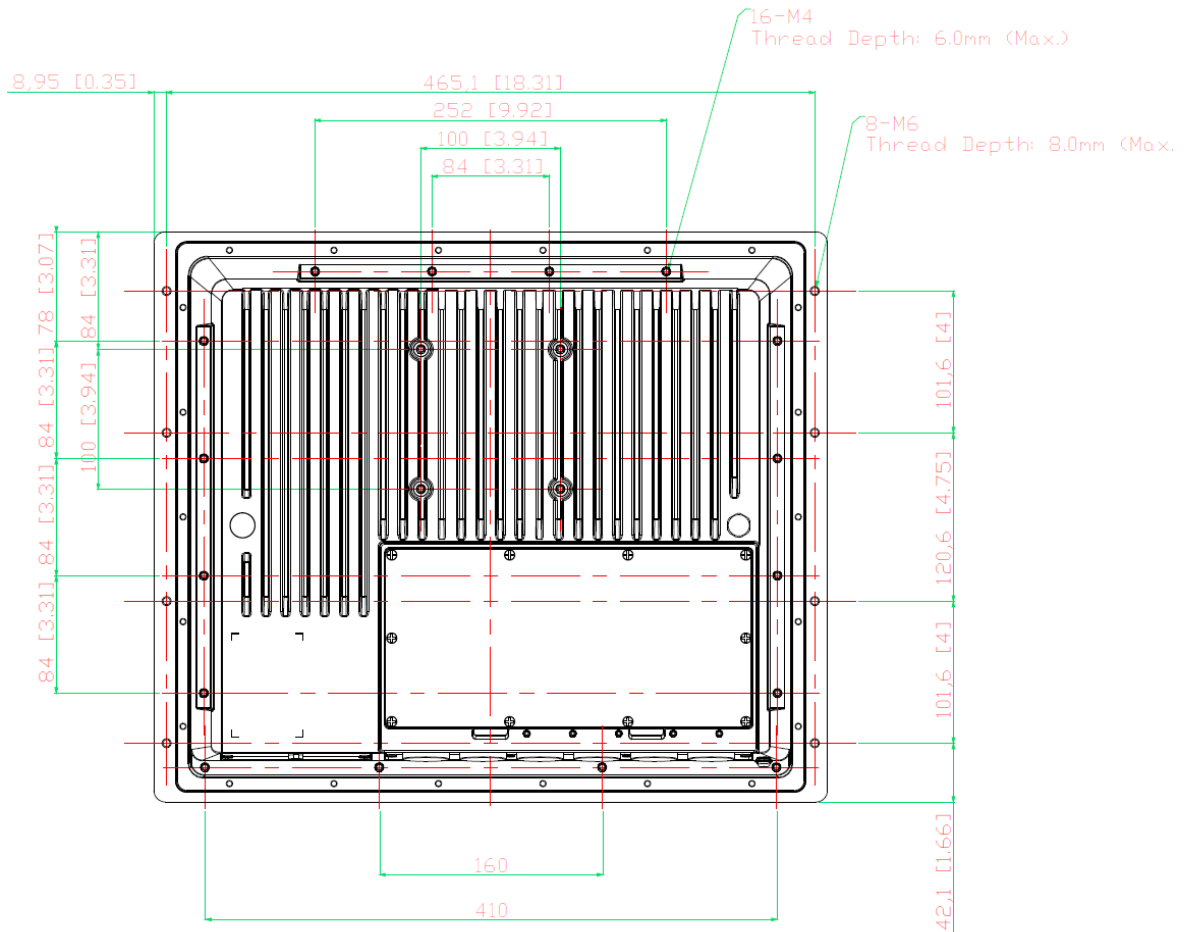
Mounting the EXPC-1519



ATTENTION

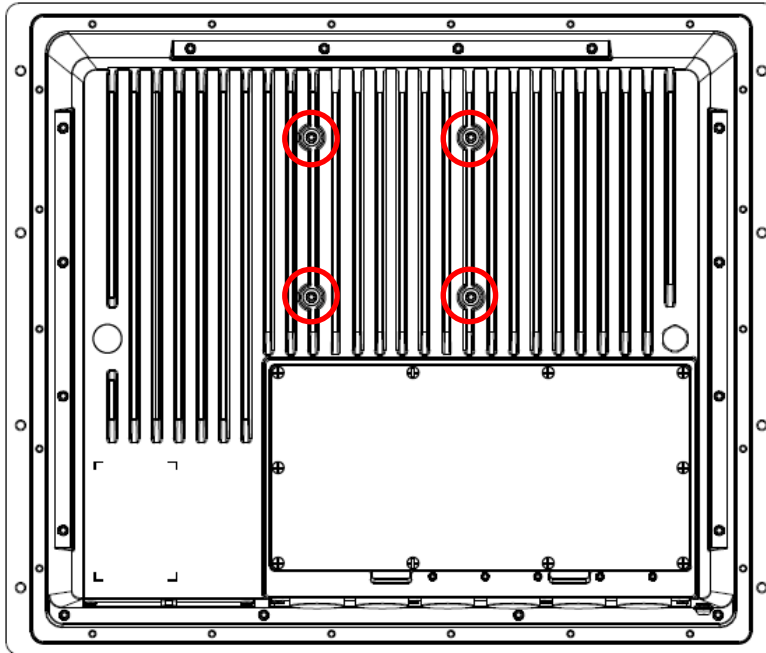
For maximum safety, at least two persons should work together to lift, place, and fasten the computer to its mounting point. Before you lift or move the computer, first verify both it and any power to the system is turned off. In addition, make sure you have prepared the correct screws for a wall mounting.

The EXPC-1519 supports a variety of mounting methods for different field sites. Before mounting, refer to the following figure for the dimensions of the screw holes used for different mounting methods.



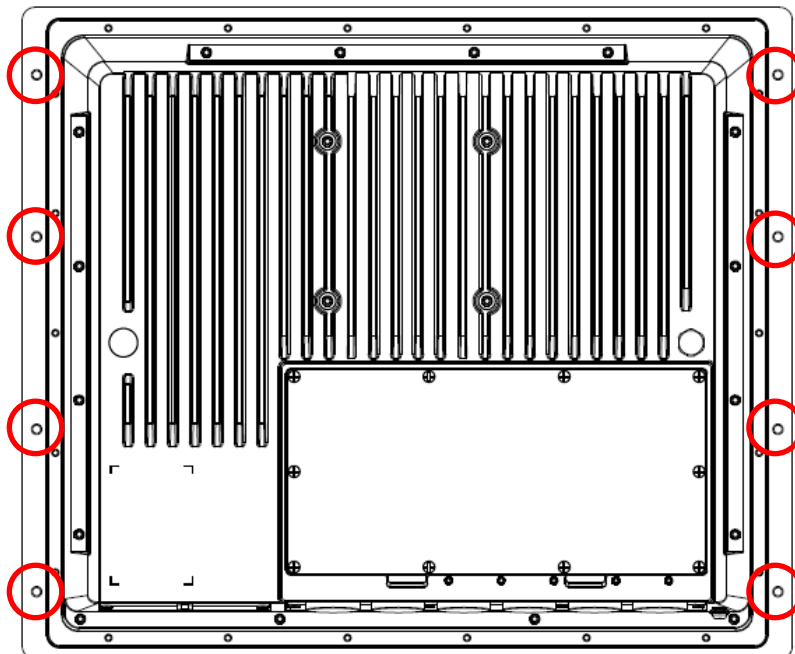
VESA Mounting

The EXPC-1519 has 100 x 100 mm screw holes for VESA mounting; M4 screws are recommended.



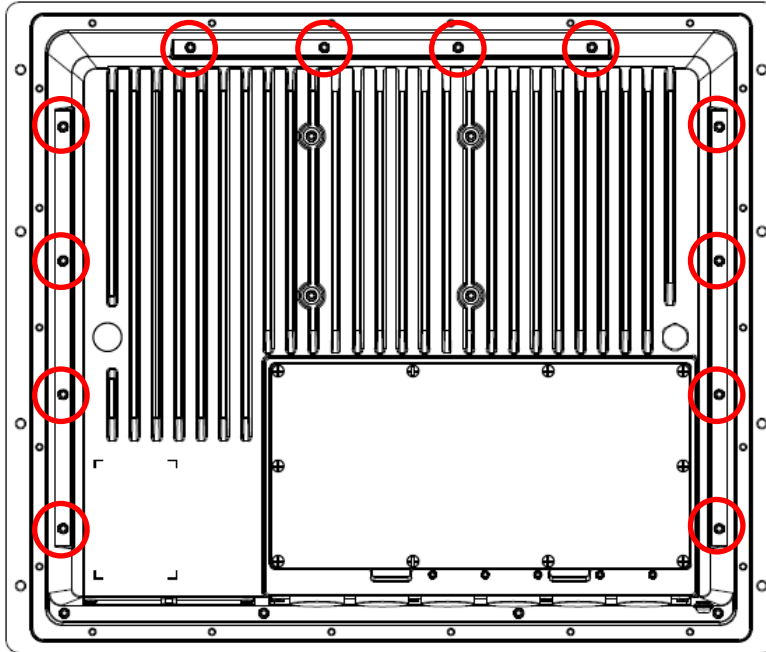
Panel Mounting

The EXPC-1519 has 8 screw holes for panel mounting. You can mount the EXPC-1519 in a cabinet using M6 size screws.



Yoke Mounting

The EXPC-1519 comes with 12 screw holes for a yoke mount; you can design the yoke mount kit based on what you need for your particular application. The screw holes are M4 size. Place the panel on the mounting kit and fasten the computer using these holes.



Wiring Requirements

The following common safety precautions should be observed before installing any electronic device:

- Strive to use separate, non-intersecting paths to route power and networking wires. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.
- Keep the wires separated according to interface. The rule of thumb is that wiring that shares similar electrical characteristics may be bundled together.
- Do not bundle input wiring with output wiring. Keep them separate.
- When necessary, it is strongly advised that you label wiring to all devices in the system.



ATTENTION

Do not run signal or communication wiring and power wiring in the same conduit. To avoid interference, wires with different signal characteristics (i.e., different interfaces) should be routed separately.



ATTENTION

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your device.

Caution! High Electrical Current!

Verify the maximum possible current for each wire gauge, especially for the power cords. Observe all electrical codes dictating the maximum current allowable for each wire gauge.

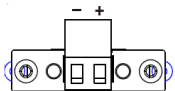
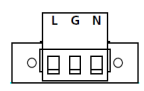
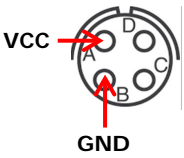
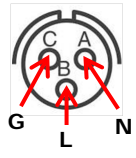
If the current goes above the maximum ratings (120 W), the wiring could overheat, causing serious damage to your equipment.

Caution! High Temperatures!

Be careful when handling the unit. When the unit is plugged in, the internal components generate a lot of heat which may leave the outer casing too hot to touch.

Connecting the Power Supply

The power connector is located at the far left of the bottom panel. When wiring the machine for power, refer to the following figure for the pinout of the power connector. Please take care to guarantee your power cable uses the correct pinout.

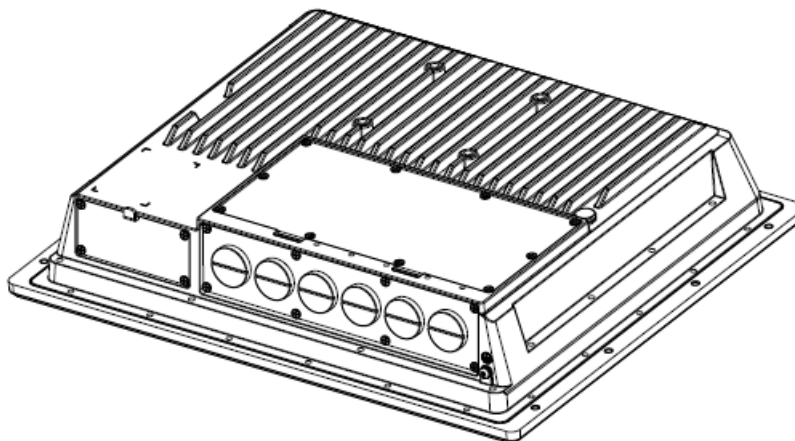
| Model | Power connector pin assignment | |
|--|--|--|
| EXPC-1519-C1-S1-T EXPC-1519-C7-S1-T EXPC-1519-C1-S2-T EXPC-1519-C7-S2-T | DC Power (DC 24 V)  | AC Power (AC 110-240 V)  |
| EXPC-1519-C1-S3-T EXPC-1519-C7-S3-T | AC Power  | DC Power  |

When power has been connected, press the power button on the front panel to turn on the computer.

Connecting the Interfaces

The EXPC-1519 comes with various interfaces located on the bottom panel.

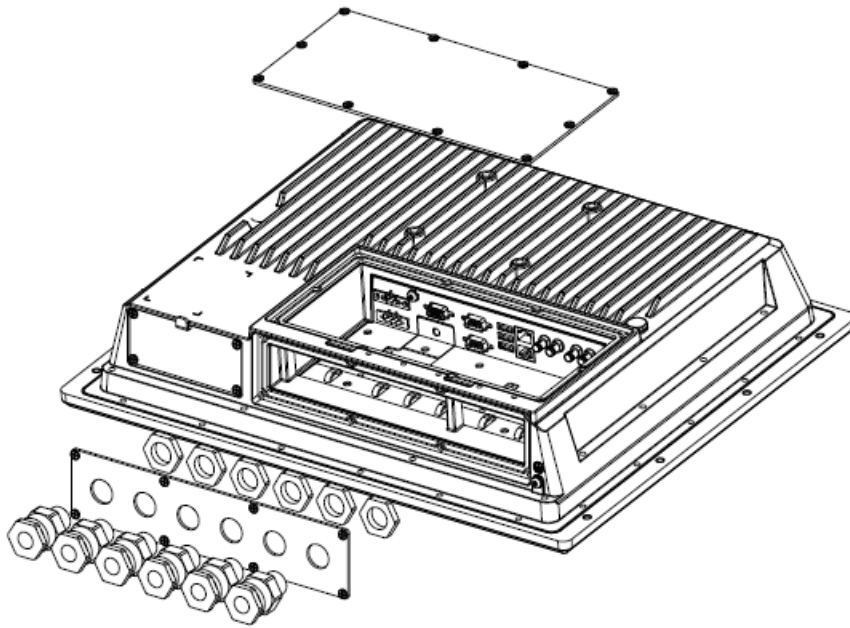
EXPC-1519-C1-S1-T / EXPC-1519-C7-S1-T



Before you use this model, you need to install your own cable gland connector. For water proofing purposes, use the recommended cable gland connector and cable.

Step 1: Remove connector panel on the rear cover.

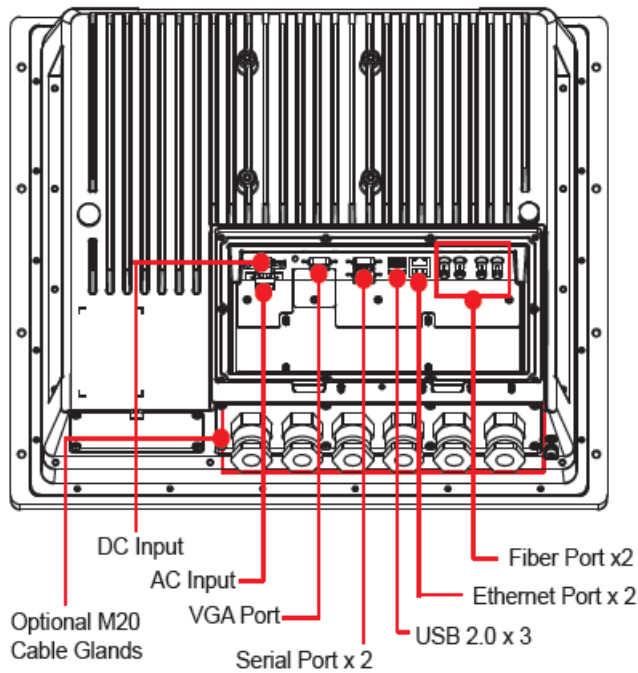
Step 2: Remove the I/O bracket and install the M20 cable gland.



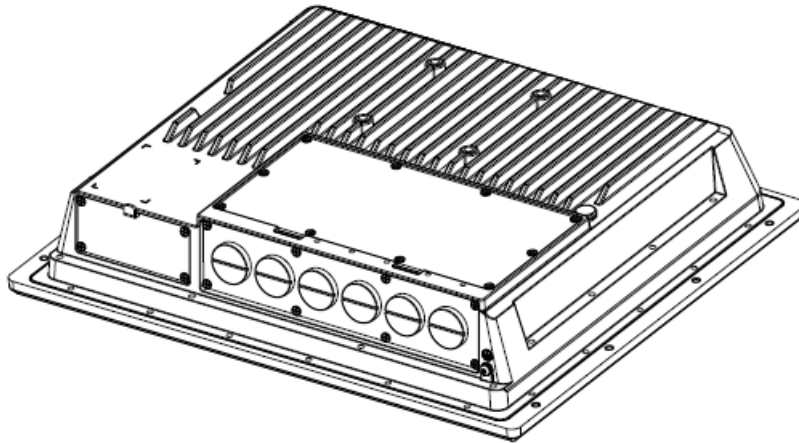
Step 3: Insert a suitable cable through the cable gland connector to extend the I/O you want to use.

Step 4: Fasten the cable gland mechanism tightly.

***Viewed at a 5-degree angle**



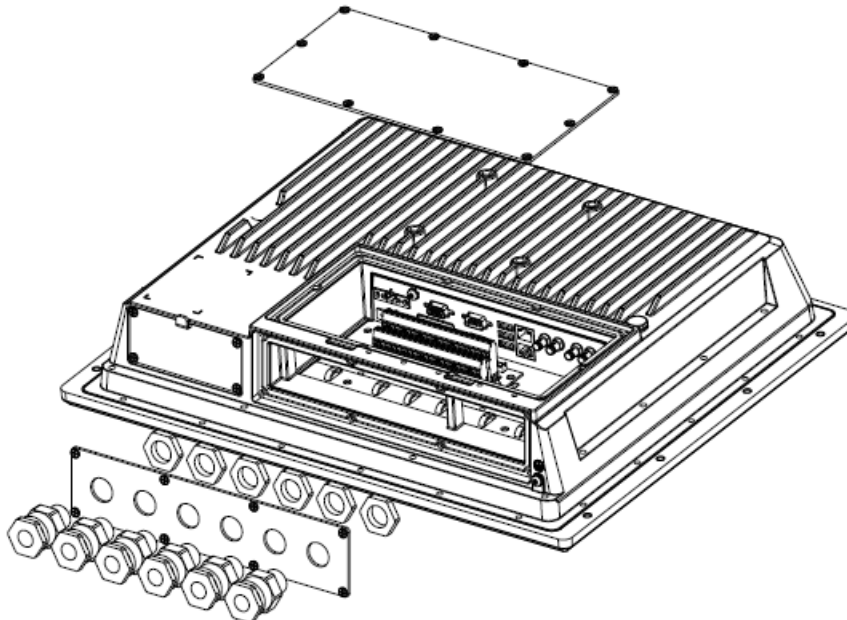
EXPC-1519-C1-S2-T/EXPC-1519-C7-S2-T



Before you use this model, you need to install your own cable gland connector. For water proof purposes, use the cable gland connector and cable as recommended.

Step 1: Remove the connector panel on the rear cover.

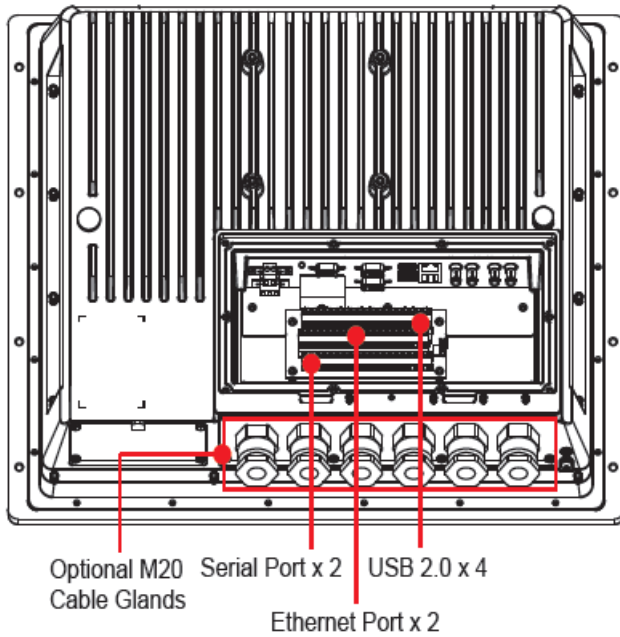
Step 2: Remove the I/O bracket and install the M20 cable gland.



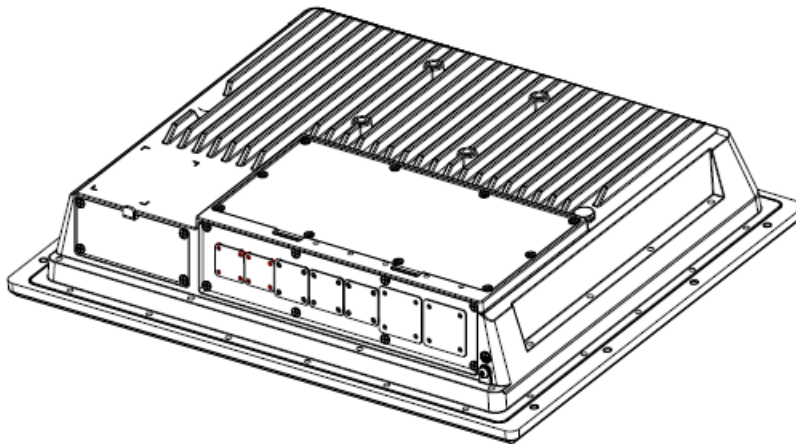
Step 3: Insert a suitable cable through the cable gland connector to extend the I/O you want to use on the terminal block.

Step 4: Fasten the cable gland mechanism tightly.

***Viewed at a 5-degree angle**



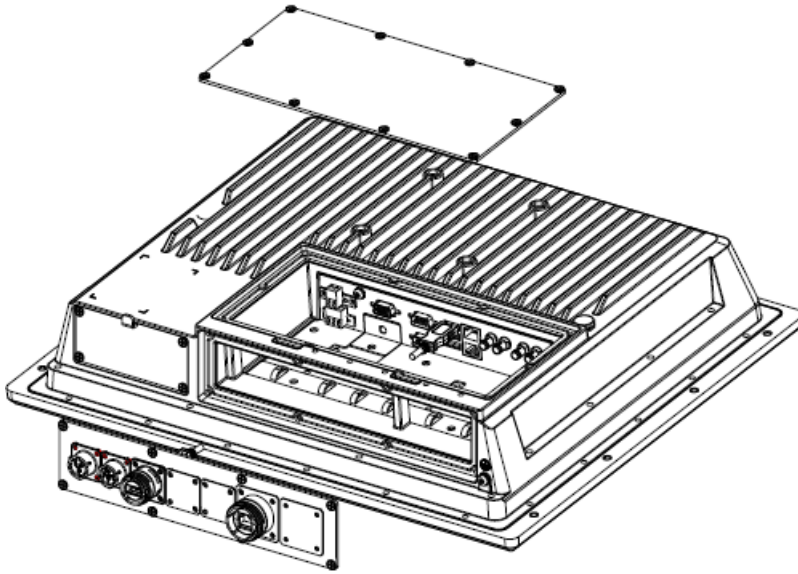
EXPC-1519-C1-S3-T/EXPC-1519-C7-S3-T



Before you use this model, you need to install the IP68 connector included in the accessories package. The connector includes an AC power port, DC power port, USB port, and RJ45 port.

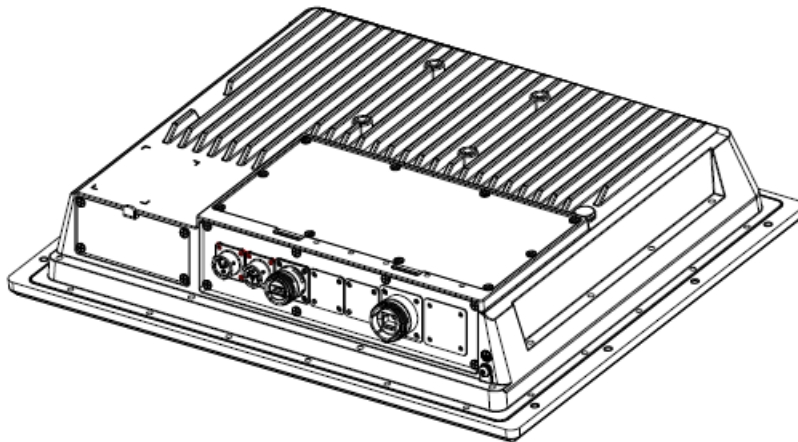
Step 1: Remove the connector panel on the rear cover.

Step 2: Remove the I/O bracket and install the AC power, DC power, USB, and RJ45 connectors from the accessories package.



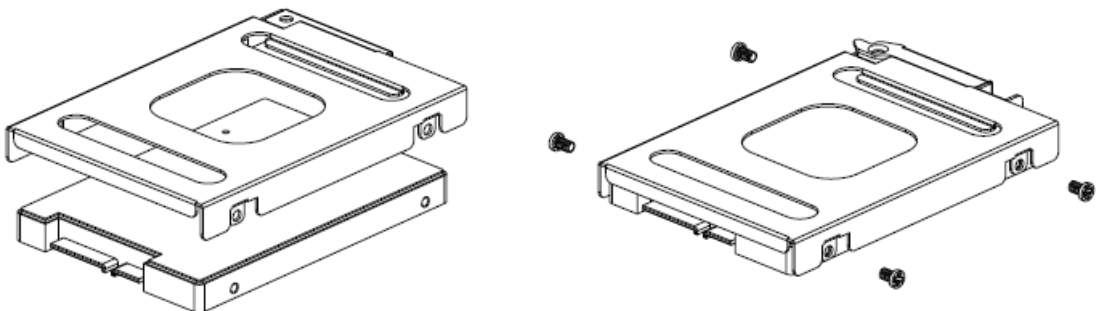
Step 3: Connect the cable to the connector inside the device, and to the the IP68 connector on the front cover.

Step 4: Put a cap on each connector to protect the connector.

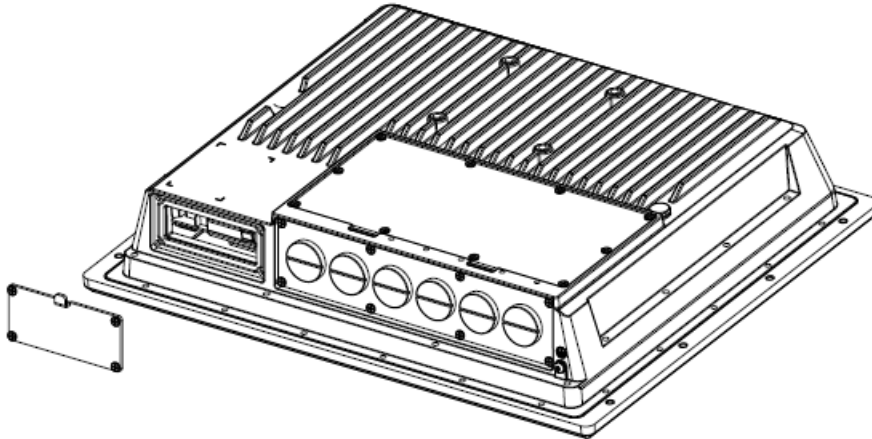


Installing the SATA Storage Drive

Step 1: Use the screws provided to secure a 2.5-inch SATA storage drive in the storage drive bracket.

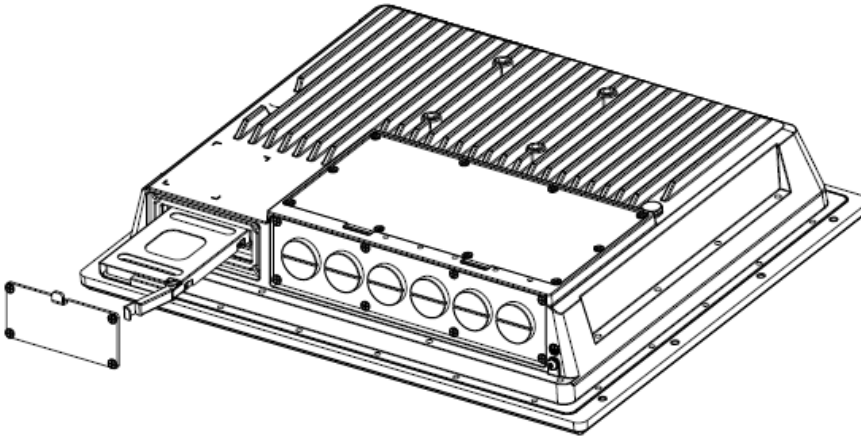


Step 2: Loosen the screws to remove the slot cover on the bottom panel.



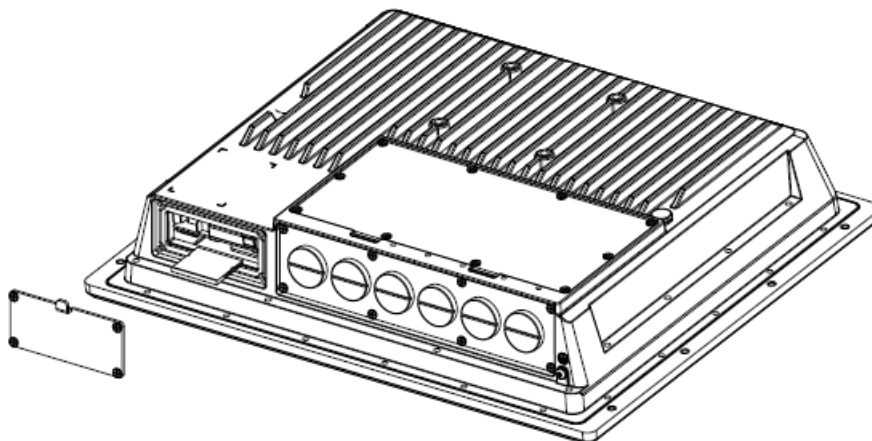
Step 3: Install the bracket with the storage drive into the slot.

Step 4: Replace the slot cover.



Installing a CFast Card

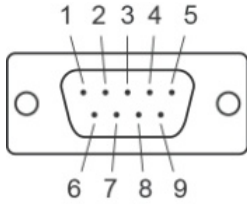
Remove the slot cover on the bottom panel and push a CFast card into the slot, and then replace the slot cover.



Connector Pin Assignment

Serial Ports

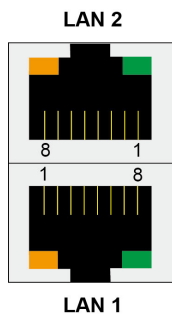
The EXPC-1519 series features two software-selectable RS-232/422/485 serial ports, using a DB9 connector.



| Pin | RS-232 | RS-422 | RS-485 (4-wire) | RS-485 (2-wire) |
|-----|--------|---------|--------------------|--------------------|
| 1 | DCD | TxDA(-) | TxDA(-) | - |
| 2 | RxD | TxDB(+) | TxDB(+) | - |
| 3 | TxD | RxDB(+) | RxDB(+) | DataB(+) |
| 4 | DTR | RxDA(-) | RxDA(-) | DataA(-) |
| 5 | GND | GND | GND | GND |
| 6 | DSR | - | - | - |
| 7 | RTS | - | - | - |
| 8 | CTS | - | - | - |

Ethernet Ports

The following table shows the pin assignments for the Fast Ethernet 100/1000 Mbps RJ45 ports.

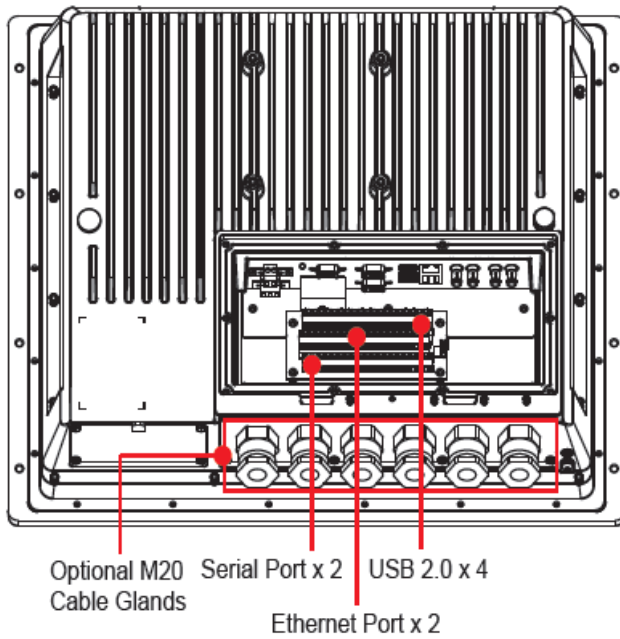


| Pin | 100 Mbps | 1000 Mbps |
|-----|----------|-----------|
| 1 | ETx+ | TRD(0)+ |
| 2 | ETx- | TRD(0)- |
| 3 | ERx+ | TRD(1)+ |
| 4 | - | TRD(2)+ |
| 5 | - | TRD(2)- |
| 6 | ERx- | TRD(1)- |
| 7 | - | TRD(3)+ |
| 8 | - | TRD(3)- |

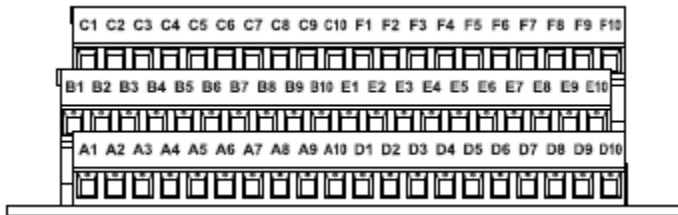
Refer to the following table for LAN LED indicator descriptions.

| | | |
|---------------------|--------|-------------------------------------|
| LAN (on connectors) | Green | 100 Mbps Ethernet mode |
| | Yellow | 1000 Mbps (Gigabit) Ethernet mode |
| | Off | No activity / 10 Mbps Ethernet mode |

Terminal block of EXPC-1519-C1-S2-T / EXPC-1519-C7-S2-T



The EXPC-1519-C1-S2-T and EXPC-1519-C7-S2-T SKU function through the terminal block. Follow the pin assignments shown below.

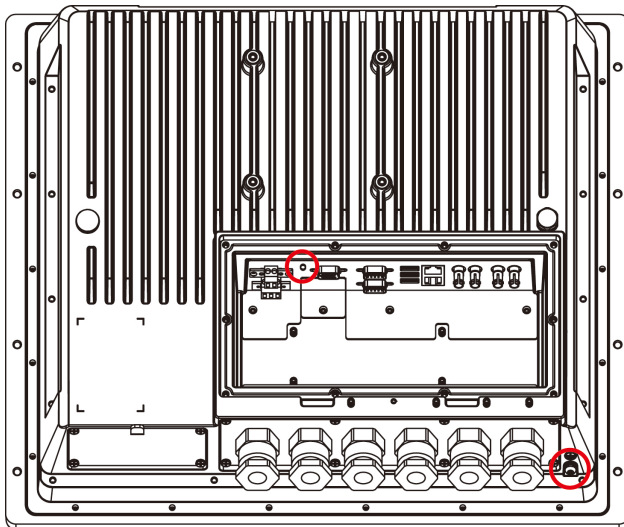


| Function | PIN definition | | | | | | | | | |
|-----------------------|----------------|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| USB1/ USB2 | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 |
| | GND | VCC | USB1- DATA- | USB1- DATA+ | USB2- DATA- | USB2- DATA+ | N/A | N/A | N/A | N/A |
| USB3/ USB4 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | B9 | B10 |
| | GND | VCC | USB3- DATA- | USB3- DATA+ | USB4- DATA- | USB4- DATA+ | - | - | - | - |
| LAN1 | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 |
| | N/A | N/A | LAN1_ MDINO | LAN1_ MDIPO | LAN1_ MDIN1 | LAN1_ MDIP1 | LAN1_ MDIN2 | LAN1_ MDIP2 | LAN1_ MDIN3 | LAN1_ MDIP3 |
| LAN2 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 |
| | N/A | N/A | LAN2_ MDINO | LAN2_ MDIPO | LAN2_ MDIN1 | LAN2_ MDIP1 | LAN2_ MDIN2 | LAN2_ MDIP2 | LAN2_ MDIN3 | LAN2_ MDIP3 |

| Function | PIN definition | | | | | | | | | |
|------------------------|----------------|-----------|-------------|-----------|-------------|-----------|------------|-----------|------------|------------|
| Serial port 1 | E1 | E2 | E3 | E4 | E5 | E6 | E7 | E8 | E9 | E10 |
| RS-232 | GND | N/A | P1_DTR | N/A | P1_TXD | P1_CTS | P1_RXD | P1_RTS | P1_DCD | P1_DSR |
| RS-422 | GND | N/A | P1_RxDA(-) | N/A | P1_RxDB(+) | N/A | P1_TxDB(+) | N/A | P1_TxDA(-) | N/A |
| RS-485 (4-wire) | GND | N/A | P1_RxDA(-) | N/A | P1_RxDB(+) | N/A | P1_TxDB(+) | N/A | P1_TxDA(-) | N/A |
| RS-485 (2-wire) | GND | N/A | P1_DataA(-) | N/A | P1_DataB(+) | N/A | N/A | N/A | N/A | N/A |
| Serial port 2 | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 |
| RS-232 | GND | N/A | P2_DTR | N/A | P2_TXD | P2_CTS | P2_RXD | P2_RTS | P2_DCD | P2_DSR |
| RS-422 | GND | N/A | P2_RxDA(-) | N/A | P2_RxDB(+) | N/A | P2_TxDB(+) | N/A | P2_TxDA(-) | N/A |
| RS-485 (4-wire) | GND | N/A | P2_RxDA(-) | N/A | P2_RxDB(+) | N/A | P2_TxDB(+) | N/A | P2_TxDA(-) | N/A |
| RS-485 (2-wire) | GND | N/A | P2_DataA(-) | N/A | P2_DataB(+) | N/A | N/A | N/A | N/A | N/A |

Grounding the unit

The EXPC-1519 has two grounding pins, circled below in red. You should ground the device before powering it up.



Powering on the EXPC-1519

To turn on the EXPC-1519, connect the EXPC-1519 to an AC or DC power source and press the Power button on the front panel. It takes about 30 seconds for the system to boot up. Once the system is ready, the Power LED turns on.

To power off the EXPC-1519 series, we recommend using the power off procedure for the OS you are using. If the system does not power off properly, you can press the Power button for about 4 seconds to force the power to turn off.

Real Time Clock

The EXPC-1519's real time clock (RTC) is powered by a lithium battery. We strongly recommend that you do NOT replace the lithium battery without help from a qualified Moxa support engineer. If you need to change the battery, contact the Moxa RMA service team at http://www.moxa.com/rma/about_rma.aspx.

This chapter describes the BIOS settings of the EXPC-1519 computer. The BIOS is a set of input/output control routines for peripherals. The BIOS is used to initialize basic peripherals and helps boot the operating system before the operating system is loaded. The BIOS setup allows the user to modify the system configurations of these basic input/output peripherals. All of the configurations will be stored in the battery backed up in CMOS RAM, which retains the system information after system reboots or the power is removed.

The following topics are covered in this chapter:

❑ Entering the BIOS Setup Utility

- Main Information
- Advanced Settings
- Boot Configuration
- HDC Configuration: Storage Device BIOS Settings
- Video Configuration
- Chipset Configuration
- Active Management Technology Support
- Hardware Monitor

❑ Security Settings

- Set Supervisor Password

❑ Power Settings

❑ Boot Settings

- Boot Type
- PXE Boot to LAN
- Add Boot Options
- USB Boot
- EFI Device First
- Boot Delay Time
- Legacy

❑ Exit Settings

- Exit Saving Changes
- Save Change Without Exit
- Exit Discarding Changes
- Load Optimal Defaults
- Load Custom Defaults
- Save Custom Defaults
- Discard Changes

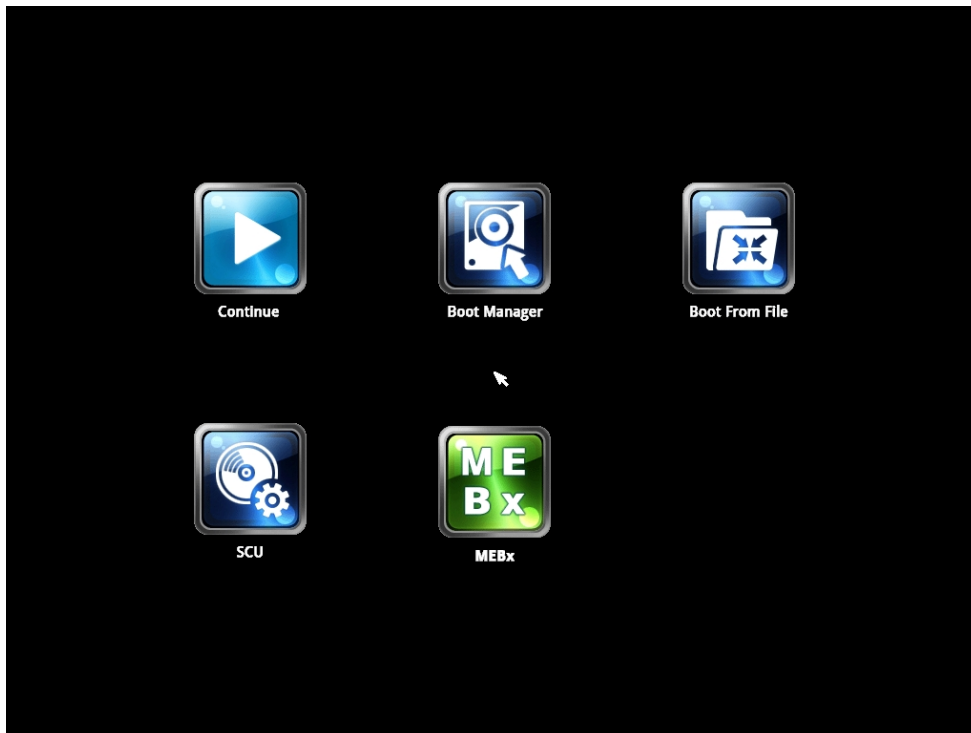
❑ Upgrading the BIOS

Entering the BIOS Setup Utility

To enter the BIOS setup utility, press the "F2" key while the system is booting up. The main **BIOS Setup** screen will appear. Five options will be available:

- **Continue:** Continue to boot up
- **Boot Manager:** Select the device for booting up
- **Boot From File:** Select the UEFI boot up file
- **SCU:** Enter the BIOS configuration menu
- **MEBx:** Enter the AMT configuration menu

Select **SCU** to enter the **BIOS configuration**.



When you enter SCU, a basic description of each function key is listed at the bottom of the screen. Refer to these descriptions to learn how to use them.

F1: General Help

F5/ F6: Change Values

F9: Setup Defaults

F10 : Save and Exit

↑ ↓ : Select Item

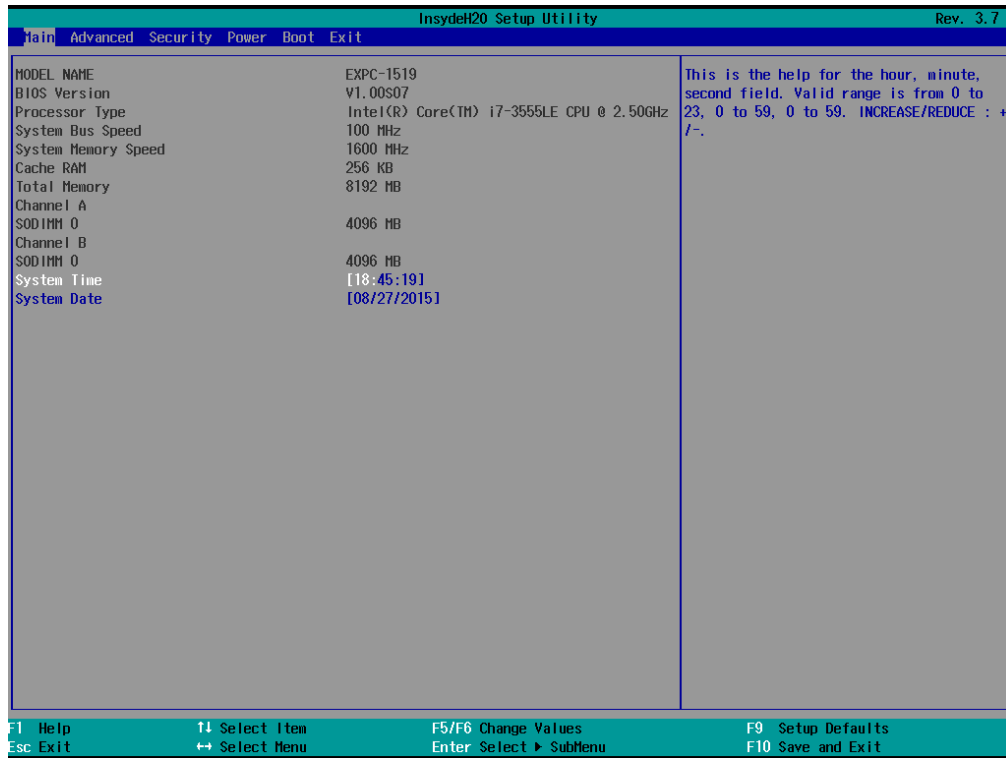
← → : Select Menu

ESC: Exit

ENTER: Select or go to Submenu.

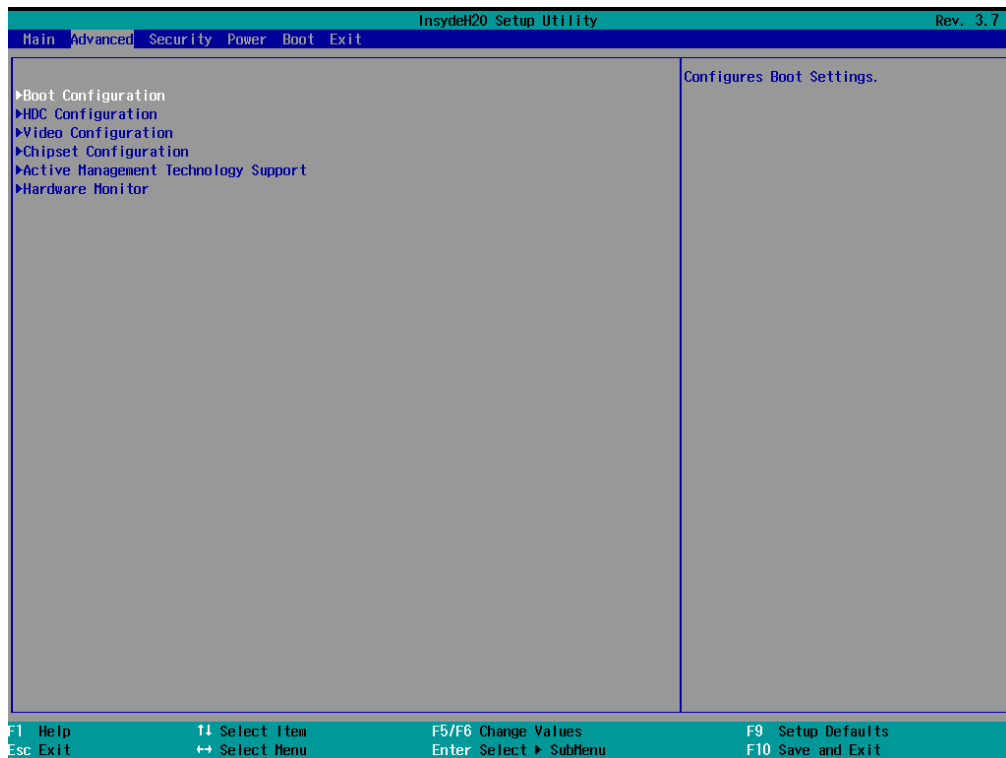
Main Information

The Main screen provides system information, including the model name, BIOS version, and CPU type. You can view basic system hardware information on this page.



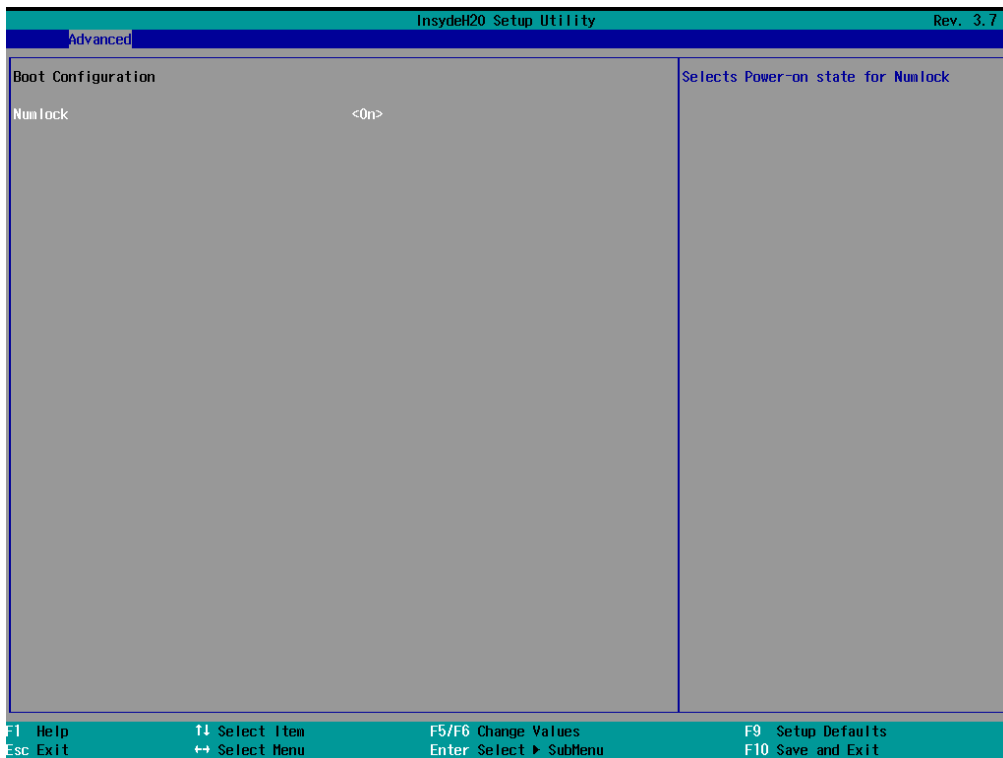
Advanced Settings

Use the Advanced screen to configure advanced device settings (for example, boot settings).



Boot Configuration

This screen allows you to configure the Numlock state.



Option: On (default), Off.

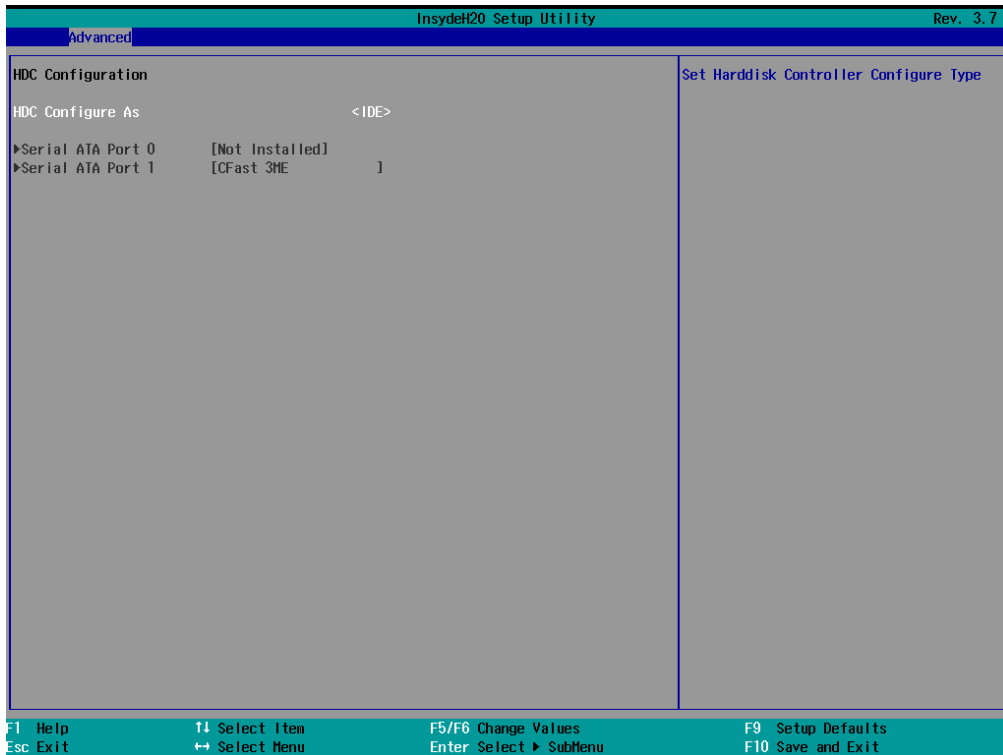
HDC Configuration: Storage Device BIOS Settings

The HDC configuration section is where the BIOS settings for all storage devices are configured. There are three basic operation modes for storage drives: IDE, AHCI, and RAID. Most current systems will use AHCI or RAID mode.

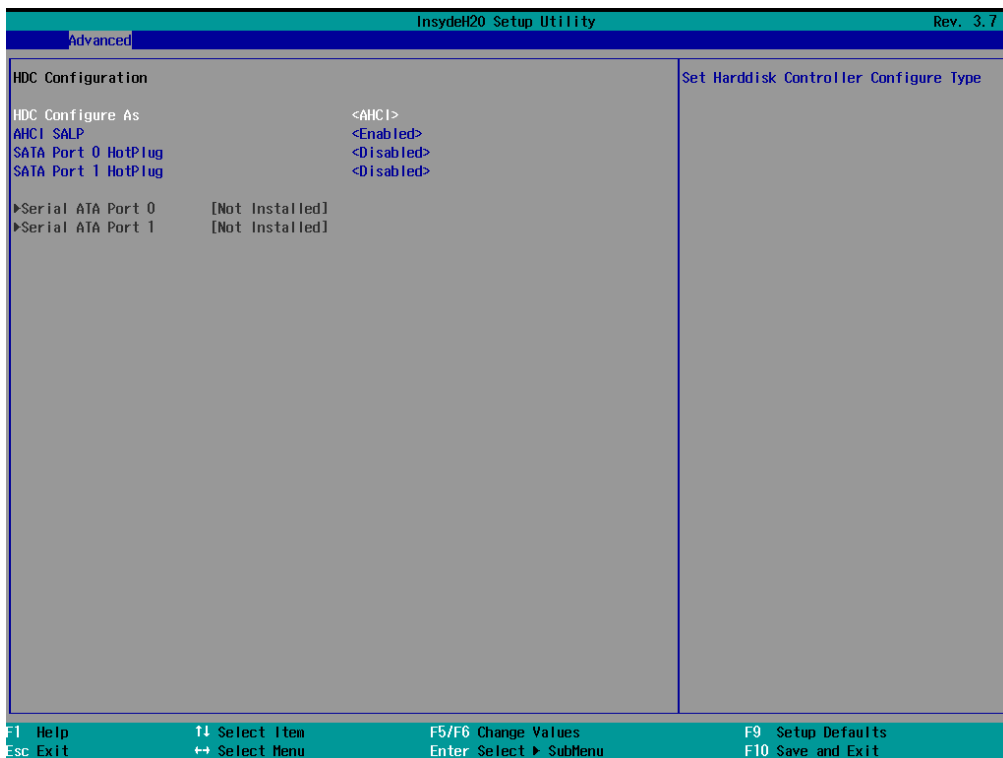
IDE mode is configured by default; it is included for legacy operating systems that do not support SATA. AHCI is available for systems that want to use full SATA capabilities, but with only a single drive, or dual independent drives. RAID mode is available for systems that wish to configure two or more SATA drives in a RAID array.

HDC Configure As: Host Drive Controller Configuration

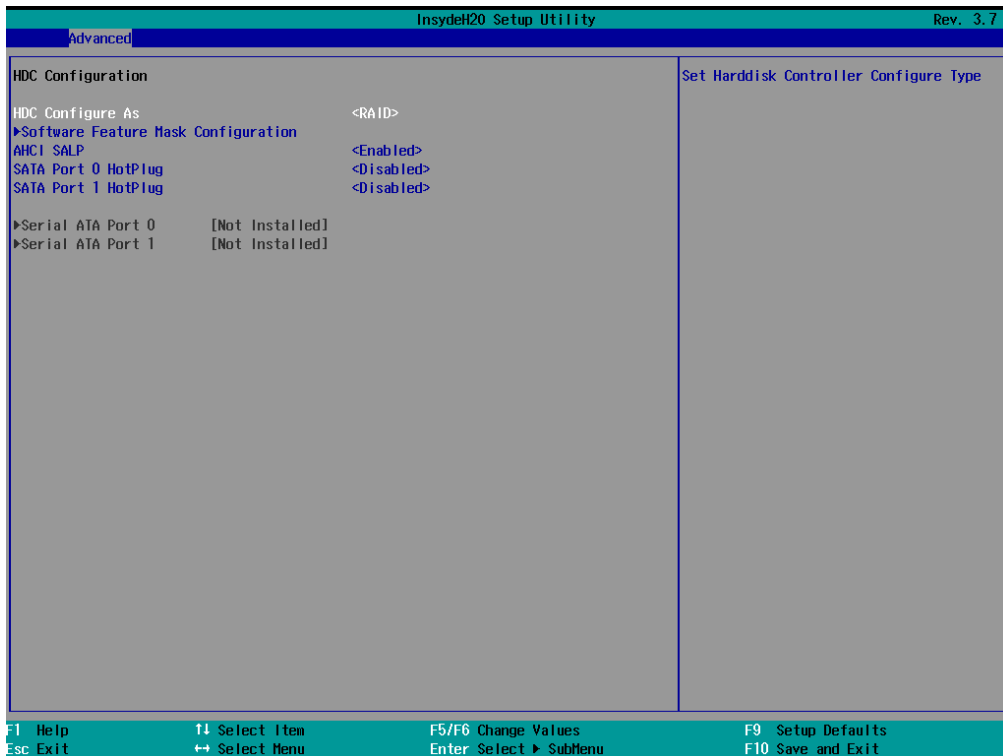
The host drive controller can be configured for IDE (legacy default), AHCI, or RAID mode (Options: IDE (default), AHCI, RAID). When the legacy IDE mode is selected, the following screen will appear.



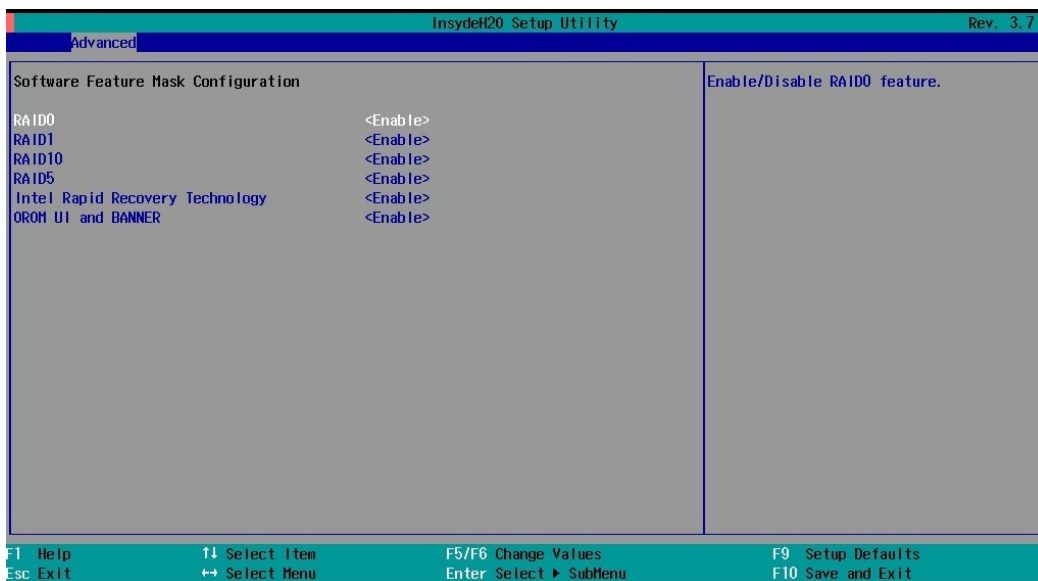
For normal SATA functionality, select AHCI. When this option is selected, AHCI SALP (Support Aggressive Link Power Management) may be enabled. The four SATA interfaces (0–1) will be highlighted; only the first two SATA ports are enabled by default, with port 0 enabling the removable drive tray on the front panel, and port 1 enabling the drive expansion slot accessed through the bottom panel. The figure below displays the AHCI configuration screen:



To enable a RAID array, two SATA storage drives must be installed on the first two ports. AHCI SALP may also be enabled from the RAID screen.



The **Software Feature Mask Configuration** will appear as below.



RAID 0 is a simple striping of information across two drives. It offers marginal improvements in access times for substantial sacrifices in system reliability.

RAID 1 offers full data redundancy across two drives, providing significant improvements in data security and system reliability.

RAID 10 offers the best of both **RAID 0** and **RAID 1**, using four drives to give moderate improvements in disk access times, but with full mirroring of each drive on two more backup drives to provide full data redundancy and backup.

RAID 5 is a three-disk-or-more array where data is striped and parity is distributed and reduplicated across all drives. This enables the array to sustain the failure of one of the drives without the loss of any data, and without the array going down. However, with the loss of any single drive the array performance will decrease. Also, when configuring a **RAID 5** architecture, be aware of the potential for encountering the RAID 5 write hole problem, and take precautions against it.

AHCI SALP

This item allows you to enable aggressive "Supports Aggressive Link Power" (SALP) management in AHCI. SALP enables the host bus adapter to conserve power by directly detecting when a SATA drive is no longer processing information and then immediately shifting it into suspended or sleep modes without waiting for software processes to initiate power-down processes.

Options: Enabled (default), Disabled

SATA Ports 0 to 1—HotPlug

This item allows you to enable/disable hotplug functionality (the ability to remove the drive while the computer is running) of installed storage drives.

Options: Disable (default), Enabled

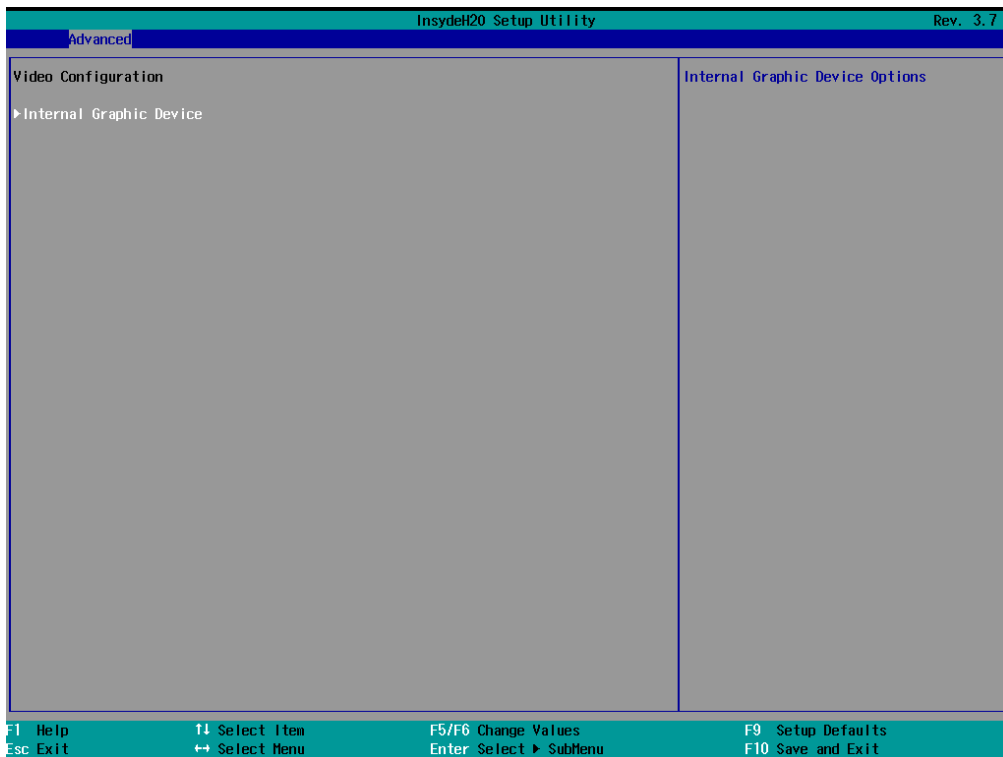
Serial ATA Port 0 to 3

This setting allows you to configure the type of the storage drive installed in the computer. Only the first two ports (ports 0 and 1) will be available for use: port 0 represents the removable drive tray on the front panel, while port 1 represents the drive expansion slot accessed from the bottom panel.

Options: Auto (default), User Defined

Video Configuration

This item allows you to configure the integrated graphics device (IGD) for things like memory allocation (DVMT) and monitor types (“Boot Type”).



IGD—DVMT Pre-Allocated

Options: 64 MB (default), 32 MB, 96 MB, 128 MB, 256 MB, 512 MB

From Intel: DVMT is a BIOS solution where “the optimum amount of memory is dynamically allocated and de-allocated as needed for balanced graphics and system performance, through Intel® Direct AGP and a highly efficient memory utilization scheme. DVMT ensures the most efficient use of available system memory resources for maximum 2D/3D graphics performance.”

This item allows you to configure pre-allocated memory capacity for the IGD. Pre-allocated graphics memory is invisible to the operating system.

IGD—DVMT Size

This item allows you to configure the maximum amount of memory DVMT will use when allocating additional memory for the internal graphics device.

Options: 256 MB (default), 128 MB, Max.

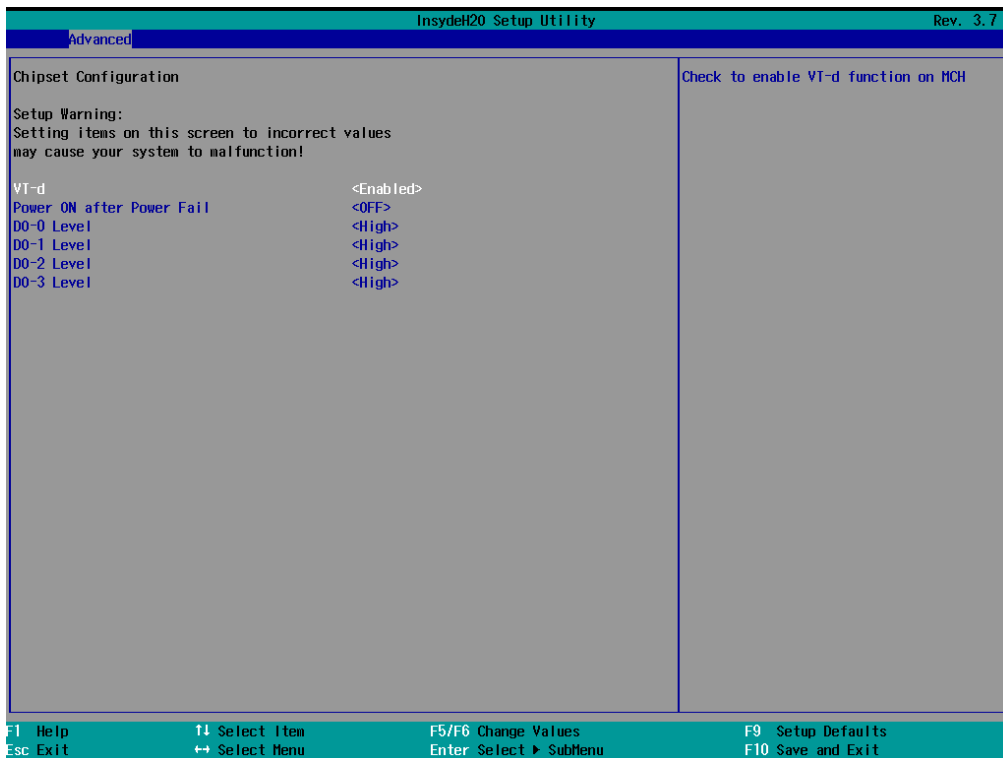
IGD—Boot Type

This item allows you to select the video device that will be activated during POST.

Options: VBIOS Default (default), VGA, and Integrated Panel

Chipset Configuration

This item allows you to configure the chipset settings.



VT-d

This item allows you to enable/disable the **VT-d** function.

Options: Enable (default), Disable

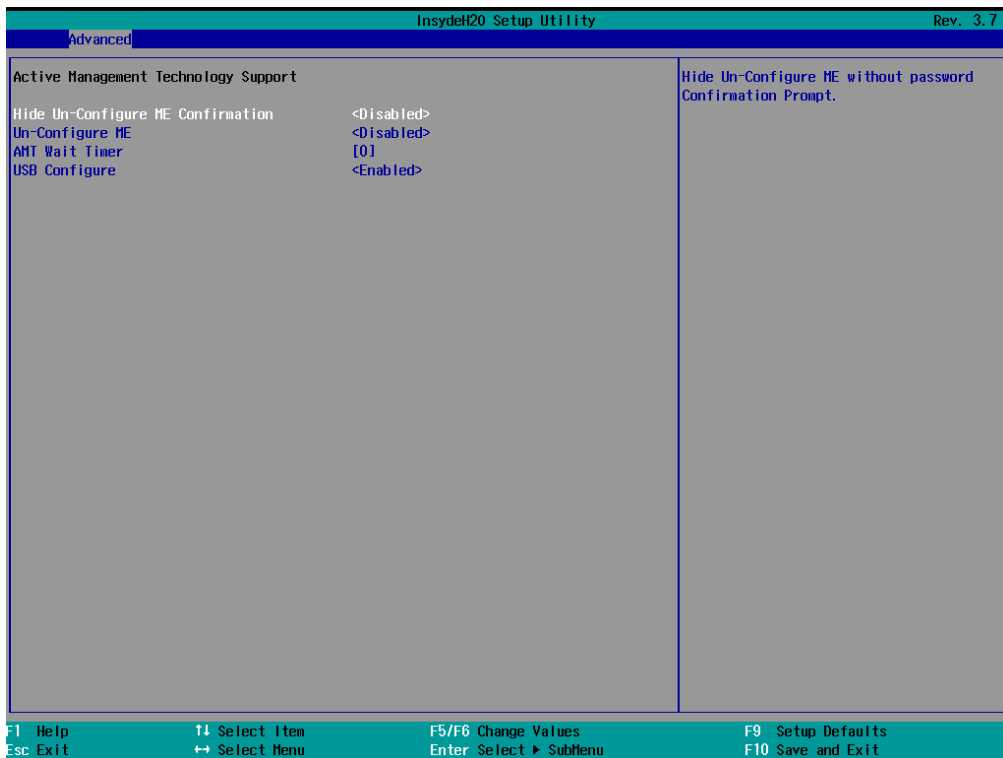
Power ON after Power Fail

This item allows you to enable/disable power to automatically powering up after a system crash.

Options: ON (default), OFF, Last State

Active Management Technology Support

This item allows you to configure the Intel® Active Management Technology.



Hide Un-Configure ME Confirmation

This item allows you to enable/disable hide un-configure ME without password confirmation prompt.

Options: Disabled (default), Enabled

Un-Configure ME

This item allows you to enable/disable hide un-configure ME without password.

Options: Disabled (default), Enabled

AMT Wait Timer

This item allows you to set how many seconds the timer waits before sending ASF_GET_BOOT_OPTIONS.

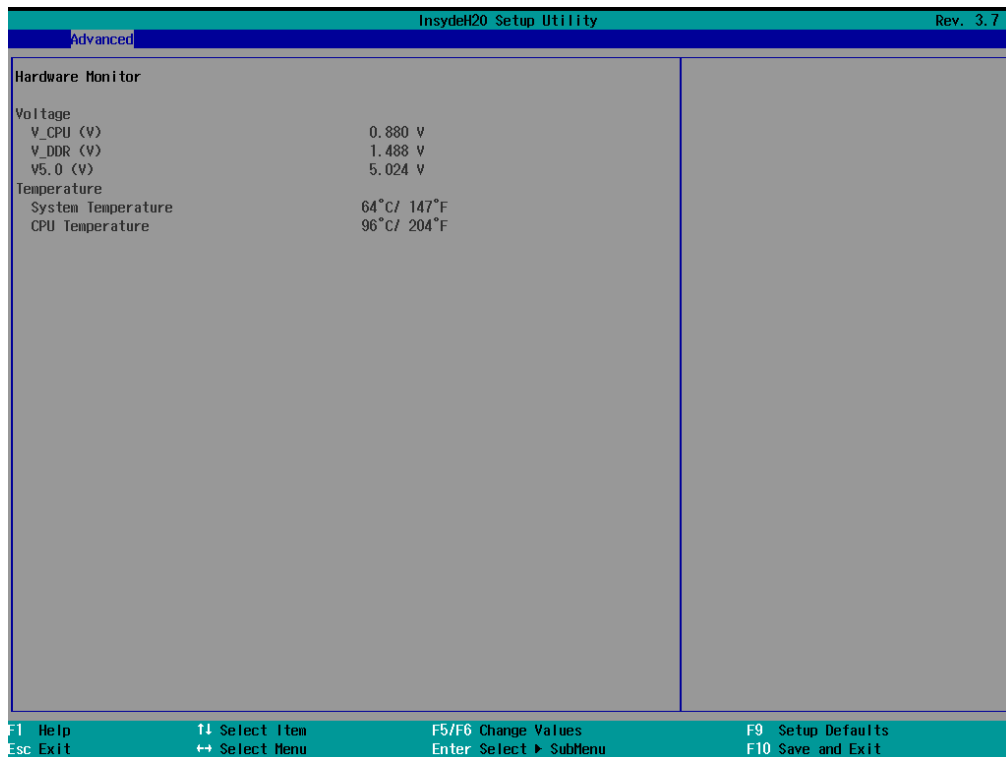
USB Configure

This item allows you to enable/disable the USB configure function.

Options: Enabled (default), Disabled

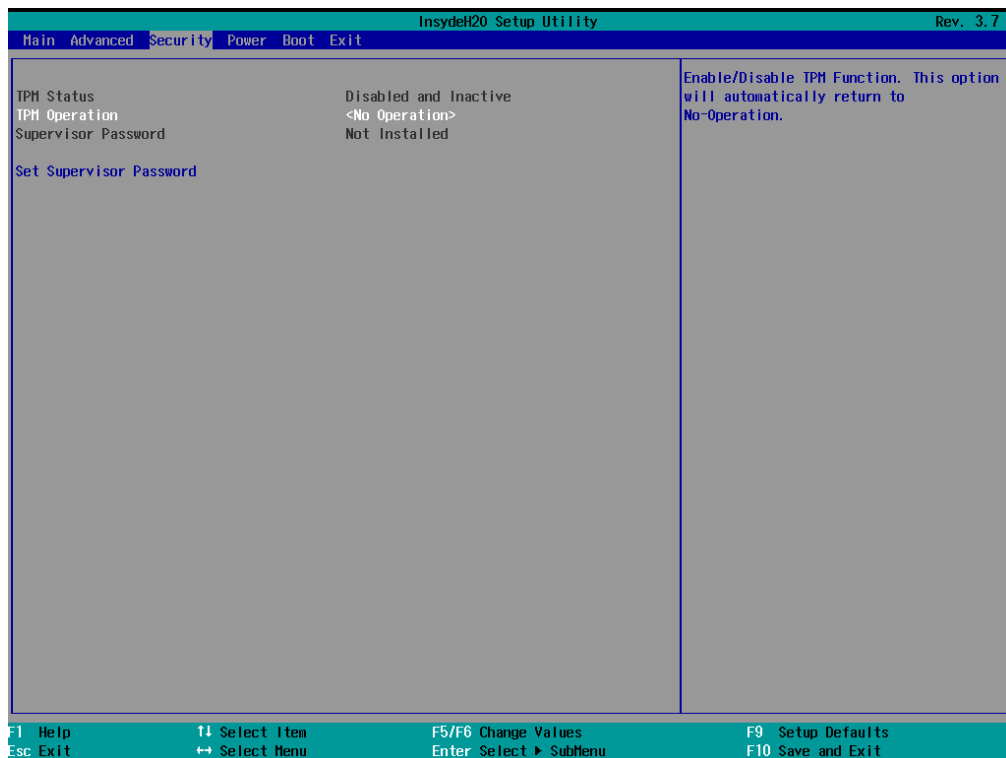
Hardware Monitor

This item allows you to view stats like CPU and system temperature, voltage levels, and other chipset information.



Security Settings

The section allows users to configure security settings with supervisor password and user password.



TPM Status

This item allows you to view the status of current TPM settings.

TPM Operation

This item allows you enable/disable the TPM. When an operation is completed, this item will be reset to No Operation. The change will be executed after the next reboot.

Options: No Operation (default), Disable and Deactivate, Enabled and Activate

TPM Force Clear

This item allows the user to clear the TPM password. Use this option when you forget the password. Note that data protected by TPM will not be accessible.

Options: Disabled (default), Enabled

NOTE This option will be displayed when the TPM operation is **Enable and Activate**.

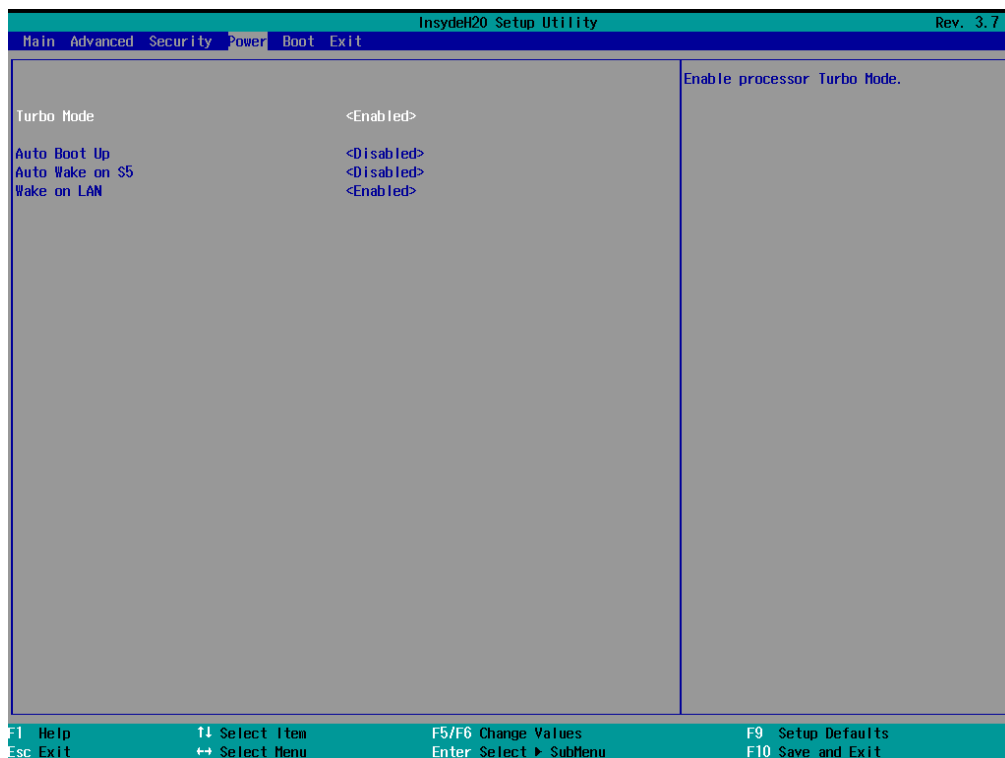
Set Supervisor Password

This item allows you set the supervisor password. Select and then enter the password, and then confirm the password again.

To cancel the password, enter Set Supervisor Password item, and then enter the old password. Leave the new password fields blank, and then press enter.

Power Settings

The section allows users to configure power settings.



Auto Boot Up

Enabling this function will cause the system to boot up automatically after the system has entered S5 for 1 minute.

Options: Disabled (Default), Enable

Auto Wake on S5

Sets the RTC time to wake up the system.

Options: Disabled (Default), By Every Day, By Day of Month

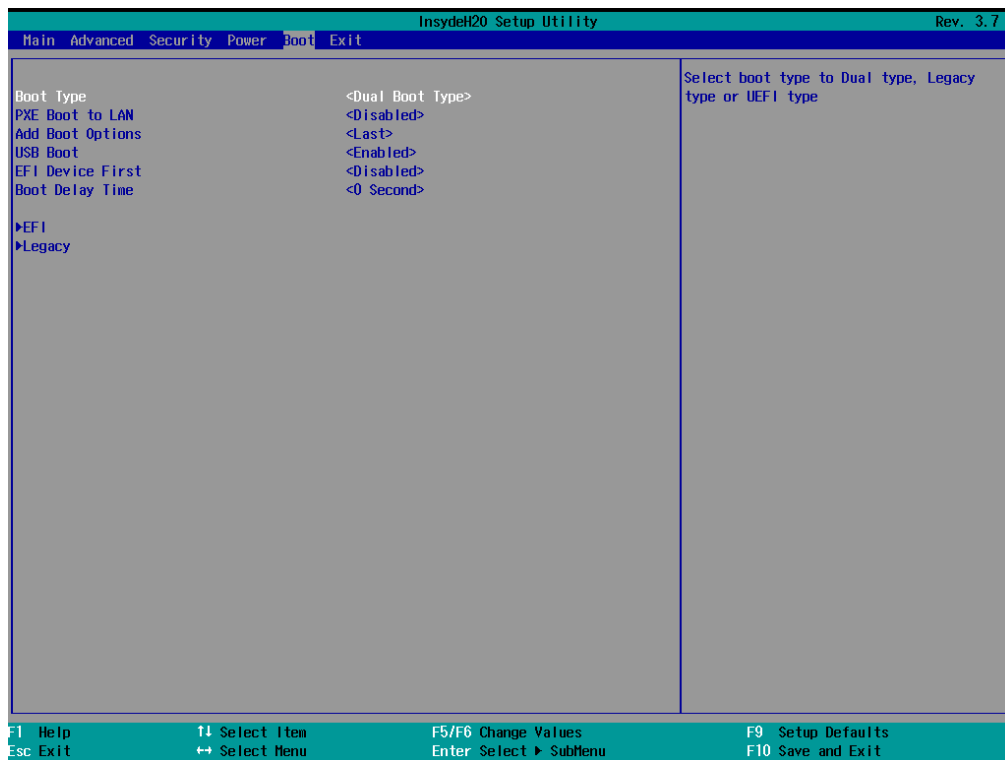
Wake on LAN

Enables remote wake up by LAN magic-packet.

Options: Disabled, Enable (Default)

Boot Settings

The section allows users to configure boot settings.



Boot Type

This function sets the system OS to boot from EFI or Legacy.

Options: Dual Boot Type (Default), Legacy Boot Type, UEFI Boot Type

PXE Boot to LAN

This item allows you to enable/disable the PXE boot to LAN function.

Options: Disabled (default), Enabled

Add Boot Options

This item allows you to add a boot entry when system detects a new boot device.

Options: Last (default), First

USB Boot

This item allows you to enable/disable USB boot function.

Options: Enabled (default), Disabled

EFI Device First

Sets the EFI device boot priority.

Options: Disabled (default)

Boot Delay Time

Sets the BIOS boot delay time for information checking.

Options: 0 sec (default), 3 sec, 5 sec, 10 sec

Legacy

Normal Boot Menu

This item allows you to configure the boot menu.

Options: Normal (default), Advance

Boot Type Order

This item allows you to select the boot order. Use F5/F6 to change values.

Options: Hard Disk Drive (default), CD/DVD-ROM Drive, USB, and Others

Hard Disk Drive

This item allows you to view the hard disk drive installed in the computer.

Exit Settings

The section allows users to exit the BIOS environment.



Exit Saving Changes

This item allows you to exit the BIOS environment and save the values you have just configured.

Options: Yes (default), No

Save Change Without Exit

This item allows you to save changes without exiting the BIOS environment.

Options: Yes (default), No

Exit Discarding Changes

This item allows you to exit without saving any changes that might have been made to the BIOS.

Options: Yes (default), No

Load Optimal Defaults

This item allows you to revert to the factory default BIOS values.

Options: Yes (default), No

Load Custom Defaults

This item allows you to load custom default values for the BIOS settings.

Options: Yes (default), No

Save Custom Defaults

This item allows you to save the current BIOS values as a “custom default” that can be reverted to at any time with the “load custom defaults” selection just above.

Options: Yes (default), No

Discard Changes

This item allows you to discard all settings you have just configured.

Options: Yes (default), No

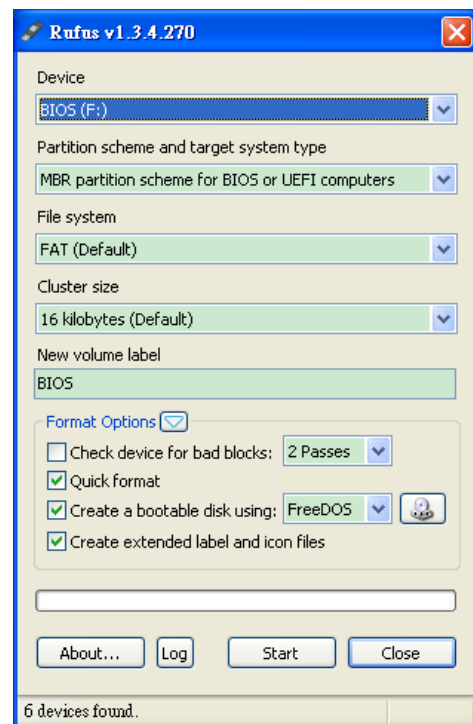
Upgrading the BIOS

This section describes how to upgrade the BIOS. However, please note that it is easy to permanently damage the computer when upgrading the BIOS. We strongly recommend that you contact Moxa’s technical support staff for assistance in order to obtain all necessary tools and the most current advice before attempting to upgrade the BIOS on any Moxa device.

Step 1: Create a Bootable USB Disk

Before upgrading the BIOS every user should first create a bootable USB RAM drive as a system rescue device. A useful software suite for building USB RAM drives can be found by searching for Rufus, which can then be downloaded and used to create a bootable RAM drive. Take the following steps to create a bootable USB disk by using Rufus.

1. Start Rufus and select the USB device that you want to use as a bootable disk from the Device drop-down list.
2. Select **MBR partition scheme for BIOS or UEFI computers** to boot from a legacy BIOS or UEFI.
3. Select **FAT (Default)** from File system drop-down list.
4. Select **16 kilobytes (Default)** for Cluster size.
5. Enter a drive name under **New volume label**.
6. Check **Quick format**, **Create a bootable disk using FreeDOS**, and **Create extended label and icon files**.
7. Click **Start** to format and create the bootable USB drive.



ATTENTION

We suggest you use a USB drive with under 2 GB in disk space, as larger USB drives may not support the FAT file format and consequently fail to boot.

Step 2: Prepare the Upgrade File

You must use the BIOS upgrade installation file to upgrade the BIOS. Contact Moxa's technical support department for assistance.

1. Get the BIOS upgrade installation file. The file name should have the following format: **1519xxSxx.exe** (xx refers to version numbers).
2. Copy the file to the Bootable USB Disk.

Step 3: Run the upgrade program on the EXPC-1519 Computer

1. Reboot the computer, and press **F2** during the startup process and select the Boot Manager
2. Select USB Disk as the first boot source, and then press Enter to continue.



3. When the computer finishes booting up, a DOS screen will appear. Go to the directory where the upgrade file is located. For example, if the upgrade file is stored in the EXPC-1519 folder, type `cd EXPC-1519`.

```
C:\>cd EXPC-1519
```

4. Run the upgrade program by typing `151910S7.exe`. The upgrade filename may vary depending on the version.

```
C:\EXPC-1519>151910S7.exe
```

5. The upgrade program will run automatically. Please wait patiently until the procedure finishes.

```
C:\>70010s06
Reading file...
Flash package mode.
Option: -BIOS -C -Desc -ME
```

Please do not remove the AC power!

Insyde Flash Utility for InsydeH20
Version 1.5t

Initializing

```
Current BIOS Model name: MC-7000
New      BIOS Model name: MC-7000
```

```
Current BIOS version: V1.00S06
New      BIOS version: V1.00S06
```

Updating Block at FFDE0000

- When the upgrade is complete, the computer will automatically reboot. You may check the BIOS version on the Main page of the BIOS Setup. The following figure shows an example. (Note: The actual BIOS version depends on which version you used.)

| | |
|----------------|---|
| MODEL NAME | EXPC-1519 |
| BIOS Version | V1.00S07 |
| Processor Type | Intel(R) Core(TM) i7 CPU 3555LE @2.40GHz |

**ATTENTION**

Do NOT switch off the power supply during the BIOS upgrade, since doing so may cause the system to crash.

Safety Installation Instructions

A. RTC Battery Warning

Subjective devices can only utilize the Lithium Carbon-mono-fluoride (BR) Coin Cells battery-BR2032, rated 3 V, 195 mAh, manufactured by RAYOVAC Corp.

Caution:

1. Batteries must only be changed in an area known to be non-hazardous.
2. Batteries must be installed with the positive (+) side facing as upper to avoid risk of shorting battery, fire or explosion.

B. Fuse Warning

CAUTION: For continued protection against fire, replace only with same type and rating of fuse.

C. High Temperature Warning

(1) This equipment is intended to be used in a **Restricted Access** location like a locked computer room. Access to this equipment should only be granted to AUTHORIZED SERVICE PERSONNEL or to users who have been instructed about the the potential heat hazard posed by the metal chassis. This computer can become so hot that after a long period of operations users and service personnel must take special care to wear protective clothing before touching it. Only AUTHORIZED PROFESSIONALS should be allowed direct access to an operating device.

(2) External metal parts can get dangerously hot!! Before touching it, give special attention to device temperature! Protective wear will likely be necessary!

