NexAIoT Co., Ltd.

IoT Automation Solutions Business Group
Passenger Information Panel PC
TPPC 2201
User Manual

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PREFACE

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Acknowledgements

TPPC 2201 is a trademark of NexAIoT Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

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

CE

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

RoHS Compliance

NexAIoT RoHS Environmental Policy and Status Update

NexAIoT is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NexAIoT has established an engineering and manufacturing task force to implement the introduction of green products. The task force will ensure that we follow the standard NexAIoT development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NexAIoT are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NexAIoT RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2013 will be RoHS compliant. They will use the usual NexAIoT naming convention.

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Warranty and RMA

NexAIoT Warranty Period

1. NexAIoT makes products in accordance with the Industry standard and, NexAIoT warrants that all its Industry-grade IPC and System products will be free from defect in neither material nor workmanship for twenty-four (24) months from the day of invoice issued.

2. For NexAIoT Panel PC product lines (the APPC, MPPC series), they are also guaranteed against defect in materials and workmanship for the period of twenty-four (24) months in their motherboard design. For 3rd party parts, it follows with original suppliers' standard: 12 months for battery pack and LCD, 24 months for adaptor / add on modules (including GSM module, RFID module, and antenna).

3. If NexAIoT determines customer's warranty claim is valid, NexAIoT will repair or replace product(s) without additional charge for parts and labor. An extended Warranty Program will extend the warranty period of the product accordingly.

Warranty Coverage

The warranty applies only to products manufactured or distributed by NexAIoT and its subsidiaries. This warranty covers all the products/shipments except for:

1. Any claimed defect, products that have been repaired or modified by persons who have not been authorized by NexAIoT or, products which have been subjected to misuse, abuse, accident, improper installation, or usage not in accordance with the product instruction. NexAIoT assumes no liability as a consequence of such events under the term of this warranty.

One example is the replacement of Tablet's or Hand-held's LCD display due to scratching stains or other degradation; these will not be covered under this warranty.

2. Damages caused by customers' delivery/shipping of the product or, product failure resulted from electrical power/voltage shock, or, installation of parts/components which are not supplied/approved by NexAIoT in advance.

3. Third-party products:

   a. Software, such as the device drivers,

   b. External devices such as HDD, printer, scanner, mouse, LCD panel, battery, and so on,

   c. Accessory/parts that were not approved by NexAIoT and,

   d. Accessory/parts were added to products after they were shipped from NexAIoT.

Product will be treated as "Out of Warranty " if:

a. It expires the warranted 24 months period from the day it was purchased.

b. It had been altered by persons other than an authorized NexAIoT service person or, which have been subjected to misuse, abuse, accident, or improper installation.

c. It doesn't have the original NexAIoT Serial Number labeling for NexAIoT's warranty period identification or, tracking.

RMA that NexAIoT has determined not to be covered by the warranty will be charged the NexAIoT Standard Repair Fee for the repairing. If a RMA is determined to be not repairable, customer will be notified and product(s) may be returned to customer at their request; a minimum service fee may be charged however.

NexAIoT Return Merchandise Authorization (RMA) Procedure

For the RMA (Return Merchandise Authorization) shipment, customer is responsible for packaging and shipping the product to the designated NexAIoT service sites, with shipping charges prepaid by the customer. The original NexAIoT shipping box should be used whenever possible. NexAIoT shall pay for the return of the product to the customer's location. In case of expedited shipping request, an extra service charge shall be assessed and the customer is responsible for this extra return shipping charge.

1. Customers should enclose the "NexAIoT RMA Service Form" with the returned products.

2. Customers need to write down all the information related to the problem on the " NexAIoT RMA Service Form " when applying for the RMA service; information will help to understand the problem, including the fault description, on-screen messages, and pictures if possible.

3. Customers could send back the faulty product with or without the accessories and key parts such as the CPU and DIMM. If the key parts are included, please be noted clearly within the return form. NexAIoT takes no responsibility for the parts which are not listed in the return form.

4. Customers hold the responsibility to ensure that the packing of defective products is durable enough to be resistant against further damage due to the transportation; damage caused by transportation is treated as " Out of Warranty " under our Warranty specification.

5. RMA product(s) returned by NexAIoT to any location other than the customer registered delivery address will incur an extra shipping charge, the customer is responsible for paying the extra shipping charges, duties, and taxes of this shipment.

Product Repairing

1. NexAIoT will repair defective products covered under this limited warranty that are returned to NexAIoT; if products do prove to be defective, they will be repaired during their warranty period unless other warranty terms have been specified.

2. NexAIoT owns all parts removed from repaired products.

3. NexAIoT will use parts made by various manufacturers in performing the repair.

4. The repaired products will be warranted subjected to the original warranty coverage and period only.

5. For products returned as defective but, proved to be no defect/fault after the RMA process, NexAIoT reserves the right to claim for a NDF (No Defect Found) Service Charge.

6. NexAIoT will issue RMA Report which included Repair Detailed Information to the customer when the defective products were repaired and returned.

7. In addition to the above, NexAIoT may authorize Independent/Third-party suppliers to repair the defective products for NexAIoT.

Out Of Warranty Service

There will be a service charge from NexAIoT for the "Out Of Warranty" product service; they are the Basic Diagnostic Service Fee and the Advanced Component Replacement Fee respectively. And, if the product can not be repaired, NexAIoT will either return the product to the customer or, just scrap it, followed by customer's instruction.

1. Testing and Parts Replacement

   NexAIoT will have the following Handling Charges for those OoW products that returned:

   a. Basic Labor Cost and Testing Fee: as Table listed.

   b. Parts Fee: NexAIoT will charge for main IC chipsets such as the N.B., S.B., Super-IO, LAN, Sound, Memory, and so on.

   c. 3rd-party Device Fee: products replacement for CPU, DIMM, HDD, Chassis, and UPS.

2. Out of Warranty product will have a three months warranty for the fixed issues. If the product failed with different problem within 3 months, they will still incur the service charge of "Out of Warranty".

3. Out of Warranty "products will not be repaired without a signed PI from the customer, the agreement of the repair process.

   Add-on card, 3rd Party Device and board level repair cost higher than new product prices, customer can abandon to sign PI to repair and, please contact with sales to buy new products.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.

- Do not place the unit on an unstable surface, cart, or stand.

- Follow all warnings and cautions in this manual.

- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.

- Avoid using the system near water, in direct sunlight, or near a heating device.

- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.

- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver

- A flat-tipped screwdriver

- A grounding strap

- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.

7. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.

15. Do not place heavy objects on the equipment.

16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

17. CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

Technical Support and Assistance

1. For the most updated information of NexAIoT products, visit NexAIoT's website at www.nexaiot.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   – Product name and serial number
   – Detailed information of the peripheral devices
   – Detailed information of the installed software (operating system, version, application software, etc.)
   – A complete description of the problem
   – The exact wordings of the error messages

Warning!
1. Handling the unit: carry the unit with both hands and handle it with care.

2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

3. CFast: Turn off the unit's power before inserting or removing a CFast storage card.

Conventions Used in this Manual

Warning:
Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.

Caution:
Information to avoid damaging components or losing data.

Note:
Provides additional information to complete a task easily.

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Package Contents

Before continuing, verify that the package you received is complete. Your package should have all the items listed in the table.

Item	Name	Qty
1	I Head Screw	3
2	PE Zipper Bag #3	1
3	Driver DVD	1

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Ordering Information

The following information below provides ordering information for the Passenger Information Panel PC.

Barebone

- **TPPC 2201 (P/N: 10ID0220100X1)**
  21.5" TFT-LCD FHD 16:9 Passenger Information Panel PC,
  Intel Atom® x5-E3930

CHAPTER 1: PRODUCT INTRODUCTION

TPPC 2201

Overview

Key Features

- 21.5" TFT-LCD FHD 16:9 fanless panel computer

- Powered by Intel Atom® x5-E3930 processor, 1.3GHz

- Wide-range DC input of 9V to 36V DC

- Support ignition control for power on/off delay timing management

- Compliant with IP54 on the front panel

- Tempered glass, surface hardness 6H

- 1 x DDR3L up to 8GB, M.2 2242 Key B SSD for storage device

- 1 x mini-PCIe expansion available for wireless communication

- CE/FCC/E/e-Mark

Specifications

LCD Panel

- LCD size: AUO 21.5,16:9
- Resolution: Full-HD, 1920 x 1080
- Luminance: 500 nits cd/m^2
- Contrast ratio: 1,000
- LCD color: 16.7M
- View angle: 178 (H), 178 (V)
- Backlight: LED

System

- Intel Atom® x5-E3930 processor, 1.3GHz (burst mode: 1.8GHz)

System Interface-Front

- 1 x Ambient light sensor

Main Memory

- 1 x 204-pin DDR3L SO-DIMM socket, up to 8GB. Support up to 1866 MHz, non-ECC and unbuffered memory

Rear I/O

- 1 x Power input connector, 6-pin (9V-36V DC & Ignition control)
- 1 x DB9 COM port for RS232/422/485
- 2 x RJ45 Intel® I210-AT gigabit LAN ports
- 4 x USB 3.0, support USB 2.0
- 1 x HDMI 1.4b (support 4K x 2K @30Hz)
- 1 x Line-in, Line-out with 16Ω Amplifier

Audio

- Realtek ALC886 audio codec

Storage Device

- 1 x M.2 (2242) B-key SSD, up to 256GB max.
- 1 x 2.5" SATA SSD reserved

Expansion

- 1 x mini-PCIe full-size connector on board (support PCIe/USB)

Power Management

- 9V to 36V DC input (UPS: 12V, 24V and 36V)
- Ignition on/off control & programmable on/off delay timing

Environment

- Vibration
  - IEC60068-2-64
  - Operating: 1G, random, 5-500Hz, 1hr/axis (w/ storage)
- Drop
  - IEC60068-2-32
  - ISTA-2A STD
  - 10.1kg (packing weight) & 97cm (falling height)

Temperature

- Operating temperature: 0~50°C
- Storage temperatures: 0~70°C
- Damp heat test per EN60068-2-30, 45~55°C, 95%, 48hrs, non-condensing

Operating System Support

- Windows 10 IoT Enterprise 64-bit
- Linux Yocto 4.14

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Mechanical Information

- Color: black
- VESA mount (100mm x 100mm; 200mm x 200mm)
- Dimension: 530.46mm (W) x 323mm (D) x 58.5mm (H)
- System weight (N.W): 9.5kg, 20.94lb
- Package weight (G.W): 10.1kg, 22.27lb

Certifications

- CE (EN55024, EN55032, EN55035)
- FCC Class A (Part 15B)
- E-Mark: E-13, 12/24V

Knowing Your TPPC 2201

Rear Bottom
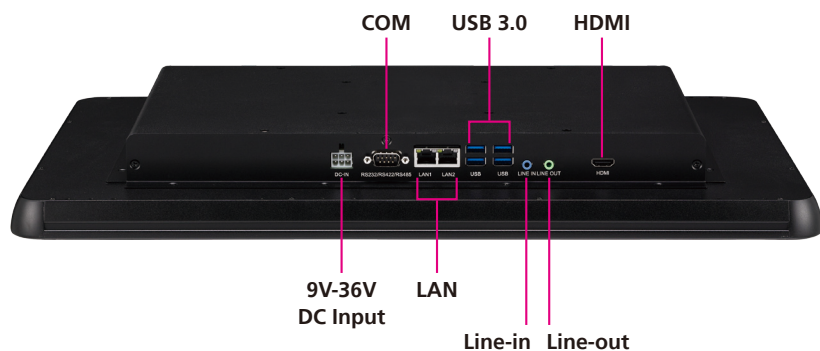
9V-36V DC Input
Used to plug a DC power cord.

COM Port
DB9 port used to connect RS232/422/485 compatible devices.

LAN Ports
Used to connect the system to a local area network.

USB 3.0 Ports
USB 3.0 ports to connect the system with USB 3.0/2.0 devices.

Line-in
Used to connect an audio device as sound source.

Line-out
Used to connect a headphone or a speaker.

HDMI
Used to connect an HDMI interface display.

Mechanical Dimensions
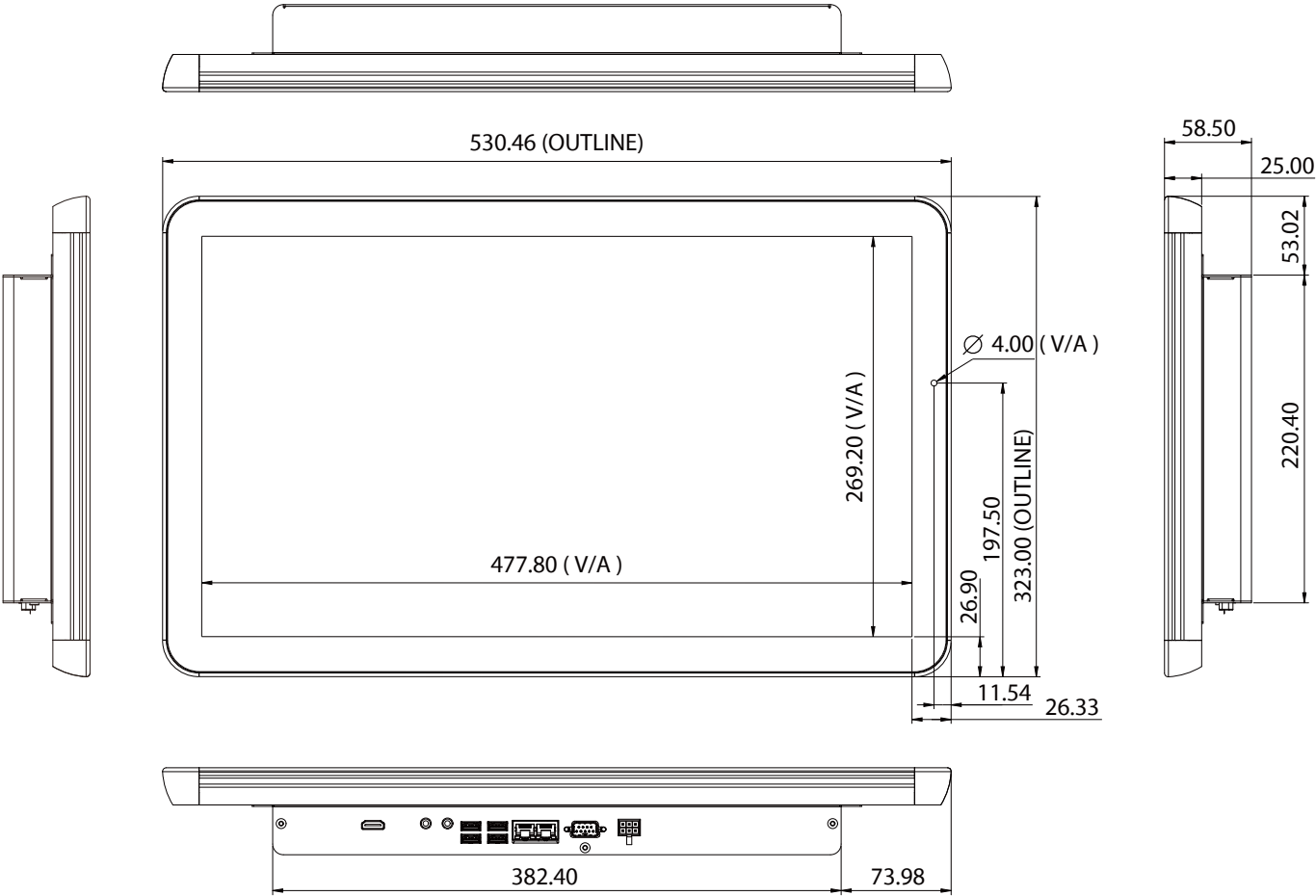
CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the TPPC 2201 motherboard.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers screwdrivers
  - A grounding strap
  - An anti-static pad

- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:
- Always disconnect the unit from the power outlet whenever you are working inside the case.

- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.

- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.

- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.

- Use correct screws and do not over tighten screws.

Jumper Settings

A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is open.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)
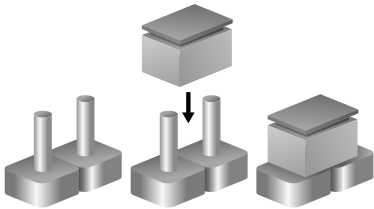
Three-Pin Jumpers: Pins 1 and 2 are Short
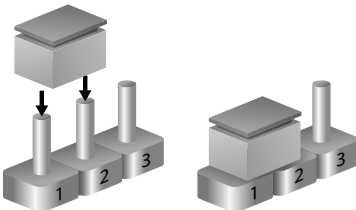
Locations of the Jumpers and Connectors for the Main Board

The figure below is the top view of the main board used in TPPC 2201. It shows the locations of the jumpers and connectors.

Top View
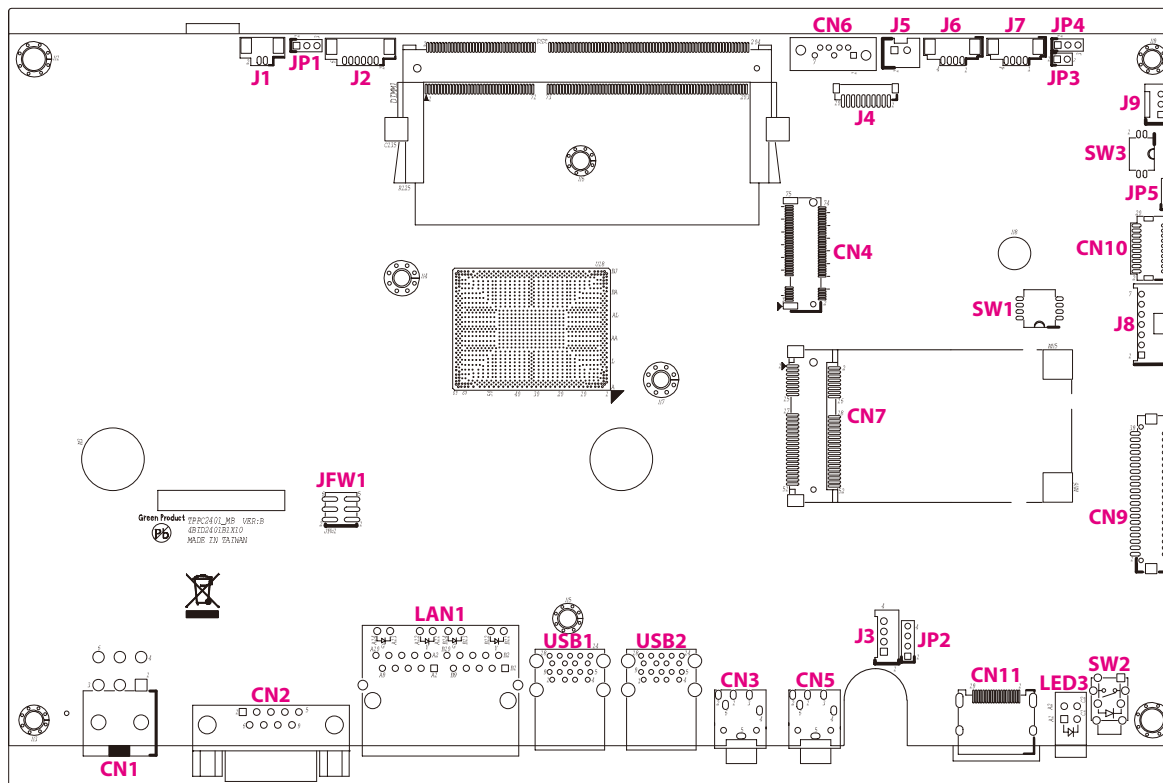
Bottom View
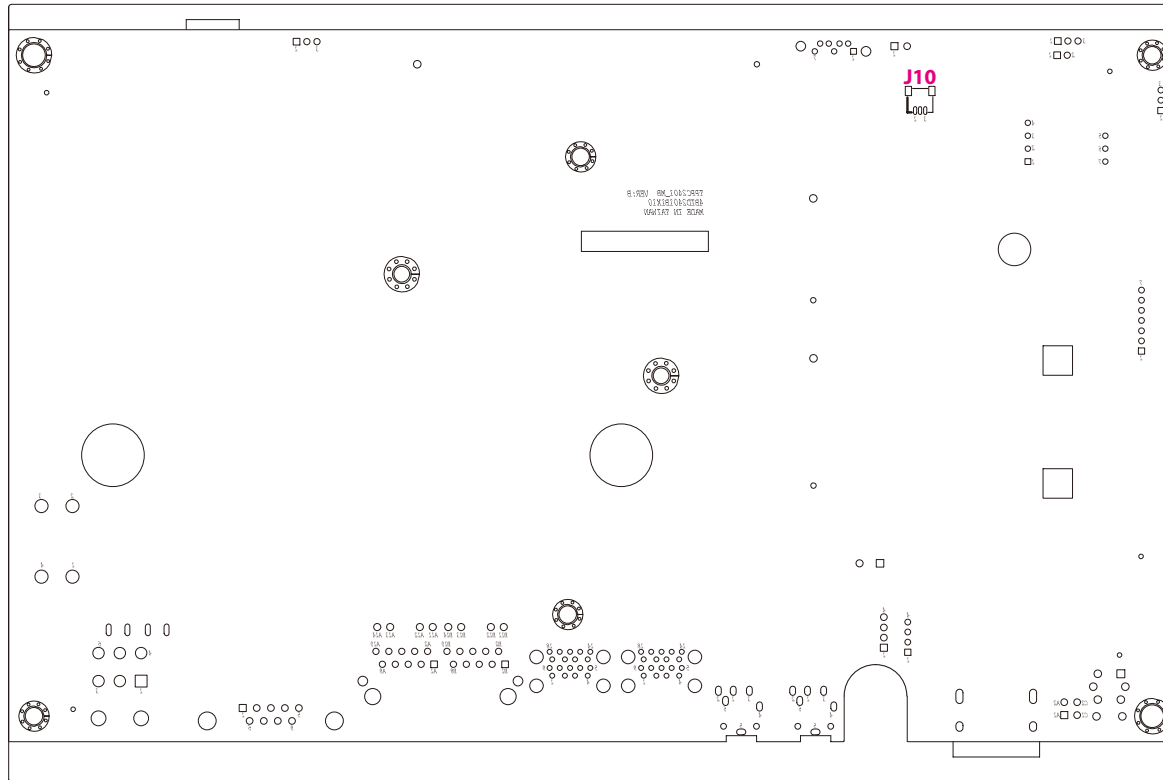
Jumpers

RTC Reset Pin Header

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: JP1

1 □ ○ ○ 3

Pin	Settings
1-2 On	N/A
2-3 On	RTC Reset

1-2 On: default

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Connector Pin Definitions

External I/O Interfaces

DC Power Input

Connector type: 2x3 6-pin terminal block connector
Connector location: CN1

COM Connector

Connector type: DB-9 port, 9-pin D-Sub
Connector location: CN2
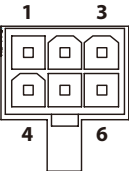
Pin	Definition	Pin	Definition
1	VIN	2	VIN
3	IGNITION	4	GND
5	GND	6	GND
NH1	NC	NH2	NC
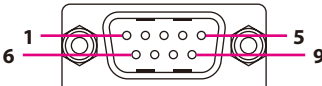
Pin	Definition	Pin	Definition
1	DCD#	2	RXD
3	TXD	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI#		
MH1	GND	MH2	GND

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LAN 1 Port

Connector type: RJ45 with LEDs
Connector location: LAN1A
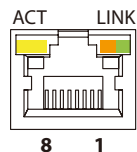
Act	Status
Flashing Yellow	Data activity
Off	No activity

Link	Status
Steady Green	1G network link
Steady Orange	100Mbps network link
Off	10Mbps or no link

Pin	Definition	Pin	Definition
1	LAN1_MDI0P	2	LAN1_MID0N
3	LAN1_MDI1P	4	LAN1_MDI1N
5	LAN1_VCC	6	LAN1_GND
7	LAN1_MDI2P	8	LAN1_MDI2N
9	LAN1_MDI3P	10	LAN1_MDI3N
11	LAN1_LINK1000	12	LAN1_LINK100
13	LAN1_ACT	14	LAN1_LEDPWR

LAN 2 Port

Connector type: RJ45 with LEDs
Connector location: LAN1B
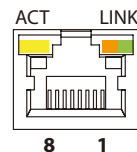
Act	Status
Flashing Yellow	Data activity
Off	No activity

Link	Status
Steady Green	1G network link
Steady Orange	100Mbps network link
Off	10Mbps or no link

Pin	Definition	Pin	Definition
1	LAN2_MDI0P	2	LAN2_MID0N
3	LAN2_MDI1P	4	LAN2_MDI1N
5	LAN2_VCC	6	LAN2_GND
7	LAN2_MDI2P	8	LAN2_MDI2N
9	LAN2_MDI3P	10	LAN2_MDI3N
11	LAN2_LINK1000	12	LAN2_LINK100
13	LAN2_ACT	14	LAN2_LEDPWR

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USB 3.0 Ports

Connector type: Dual USB 3.0 ports
Connector location: USB1
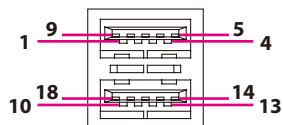
Pin	Definition	Pin	Definition
1	VCC5	2	USB2_DN1
3	USB2_DP1	4	GND
5	USB3_RXN1	6	USB3_RXP1
7	GND	8	USB3_TXN1
9	USB3_TXP1	10	VCC5
11	USB2_DN2	12	USB2_DP2
13	GND	14	USB3_RXN2
15	USB3_RXP2	16	GND
17	USB3_TXN2	18	USB3_TXP2

USB 3.0 Ports

Connector type: Dual USB 3.0 ports
Connector location: USB2
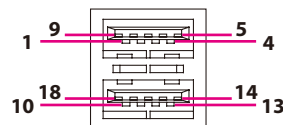
Pin	Definition	Pin	Definition
1	VCC5	2	USB2_DN3
3	USB2_DP3	4	GND
5	USB3_RXN3	6	USB3_RXP3
7	GND	8	USB3_TXN3
9	USB3_TXP3	10	VCC5
11	USB2_DN4	12	USB2_DNP4
13	GND	14	USB3_RXN4
15	USB3_RXP4	16	GND
17	USB3_TXN4	18	USB3_TXP4

Line-in Connector

Connector type: 1x 3.5mm audio jack
Connector location: CN3

Pin	Definition	Pin	Definition
1	LINE_IN_R	2	LINE_JD
3	AGND	4	LINE_IN_L
5	AGND	6	AGND

Line-out Connector

Connector type: 1x 3.5mm audio jack
Connector location: CN5
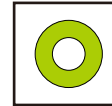
Pin	Definition	Pin	Definition
1	HP_OUT_R	2	LINE2_JD
3	AGND	4	HP_OUT_L
5	AGND	6	AGND

HDMI

Connector type: HDMI port
Connector location: CN11
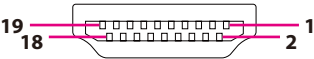
Pin	Definition	Pin	Definition
1	HDMI_TX2P	2	GND
3	HDMI_TX2N	4	HDMI_TX1P
5	GND	6	HDMI_TX1N
7	HDMI_TX0P	8	GND
9	HDMI_TX0N	10	HDMI_CLKP
11	GND	12	HDMI_CLKN
13	NC	14	NC
15	HDMI_DDCCLK	16	HDMI_DDCDATA
17	GND	18	VCC5
19	HDMI_HPD		
MH1	CHASSIS_GND	MH2	CHASSIS_GND

Internal Connectors

Debug Port

Connector type: 1x10 10-pin header, 1.0mm pitch
Connector location: J4

Battery Connector

Connector type: 1x2 2-pin header, 1.25mm pitch
Connector location: J1

Pin	Definition	Pin	Definition
1	GND	2	PLTRST#
3	LPC_CLK	4	LPC_FRAME#
5	LPC_AD3	6	LPC_AD2
7	LPC_AD1	8	LPC_AD0
9	VCC3	10	VCC3

Pin	Definition
1	VCC
2	GND

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EC Debug Connector

Connector type: 1x3 3-pin header, 1.0mm pitch
Connector location: J10
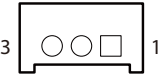
Pin	Definition
1	SMBCLK
2	SMBDATA
3	GND

Light Sensor Connector

Connector type: 1x6 6-pin header, 1.25mm pitch
Connector location: J2
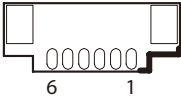
Pin	Definition	Pin	Definition
1	NC	2	VCC3
3	GND	4	I2CDATA
5	I2CCLK	6	INT

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SATA Connector

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)
Connector location: CN6

SATA Power Connector

Connector type: 1x2 2-pin header, 2.5mm pitch
Connector location: J5
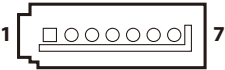
Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP
3	SATA_TXN	4	GND
5	SATA_RXN	6	SATA_RXP
7	GND		
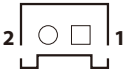
Pin	Definition
1	VCC5
2	GND

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SPI ROM Pin Header

Connector type: 2x3 6-pin header, 2.0mm pitch
Connector location: JFW1

USB2 JST Connector

Connector type: 1x4 4-pin header, 1.25mm pitch
Connector location: J6
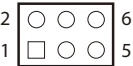
Pin	Definition	Pin	Definition
1	VCC	2	GND
3	SPI_CS#	4	SPI_CLK
5	SPI_SO	6	SPI_SI
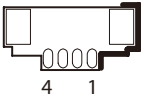
Pin	Definition	Pin	Definition
1	VCC5	2	USB2_DN5
3	USB2_DP5	4	GND

USB2 JST Connector

Connector type: 1x4 4-pin header, 1.25mm pitch
Connector location: J7

UART Pin Header

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: JP4
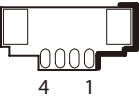
Pin	Definition	Pin	Definition
1	VCC5	2	USB2_DN6
3	USB2_DP6	4	GND

Pin	Definition
1	COM_TX
2	COM_RX
3	GND

MCU Boot Pin Header

Connector type: 1x2 2-pin header, 2.0mm pitch
Connector location: JP3

Pin	Definition
1	MCU_BOOT
3	GND

CANbus Connector

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: J9

Pin	Definition
1	CAN_H
2	CAN_L
3	CANISO_GND

LVDS PWM Mode

Connector type: 1x3 3-pin header, 2.0mm pitch
Connector location: JP5

Pin	Definition
1	VCC3
2	BKLTCTRL
3	VCC5

eDP Connector

Connector type: 2x10 20-pin header, 1.0mm pitch
Connector location: CN10
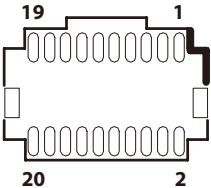
Pin	Definition	Pin	Definition
1	VCC5	2	VCC12
3	VCC5	4	VCC12
5	EDP_TXP0	6	GND
7	EDP_TXN0	8	VCC3
9	GND	10	VCC3
11	EDP_TXP1	12	GND
13	EDP_TXN1	14	BKLTCTRL
15	GND	16	EDP_HPD
17	EDP_AUXP	18	GND
19	EDP_AUXN	20	BKLTEN

LVDS Inverter Connector

Connector type: 1x7 7-pin header, 2.0mm pitch
Connector location: J8
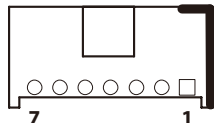
Pin	Definition	Pin	Definition
1	VCC5	2	VCC12
3	VCC12	4	BKLTCTRL
5	GND	6	GND
7	BKLTEN		

LVDS Connector

Connector type: 2x20 40-pin header, 1.25mm pitch
Connector location: CN9

Pin	Definition	Pin	Definition
1	LVDS_TP3	2	LVDS_TP7
3	LVDS_TN3	4	LVDS_TN7
5	GND	6	GND
7	LVDS_CLKP1	8	LVDS_CLKP2
9	LVDS_CLKN1	10	LVDS_CLKN2
11	GND	12	GND
13	LVDS_TP2	14	LVDS_TP6
15	LVDS_TN2	16	LVDS_TN6
17	GND	18	GND
19	LVDS_TP1	20	LVDS_TP5
21	LVDS_TN1	22	LVDS_TN5
23	GND	24	GND
25	LVDS_TP0	26	LVDS_TP4
27	LVDS_TN0	28	LVDS_TN4
29	GND	30	GND
31	VCC3	32	VCC5
33	VCC3	34	VCC5
35	VCC3	36	VCC5
37	VCC3	38	VCC5
39	VCC12	40	VCC12

Mic-in Pin Header

Connector type: 1x4 4-pin header, 2.0mm pitch
Connector location: JP2

1 ▢ ○ ○ ○ 4

Pin	Definition	Pin	Definition
1	MIC_L	2	AGND
3	MIC_JD	4	MIC_R

Speaker-out Connector

Connector type: 1x4 4-pin header, 2.0mm pitch
Connector location: J3

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Pin	Definition	Pin	Definition
1	ROUT_P	2	ROUT_N
3	LOUT_P	4	LOUT_N

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Mini-PCIe Connector

Connector location: CN7
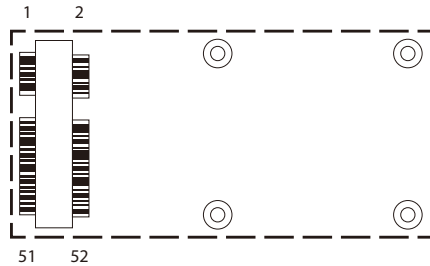
Pin	Definition	Pin	Definition
1	PCIE_WAKE#	2	3VSB
3	NC	4	GND
5	NC	6	1.5V
7	CLKREQ#	8	NC
9	GND	10	NC
11	PCIE_CLK#	12	NC
13	PCIE_CLK	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	DISABLE#
21	GND	22	PCIE_RESET#
23	PCIE_RXN	24	3VSB
25	PCIE_RXP	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1.5V
29	GND	30	SMB_CLK
31	PCIE_TXN	32	SMB_DATA
33	PCIE_TXP	34	GND
35	GND	36	USB_N
37	GND	38	USB_P
39	3VSB	40	GND
41	3VSB	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	1.5V
49	NC	50	GND
51	NC	52	3VSB

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TPPC 2201 User Manual

M.2 Connector

Connector location: CN4
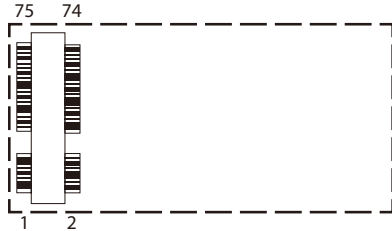
Pin	Definition	Pin	Definition
1	M2_CFG3	2	VCC3
3	GND	4	VCC3
5	GND	6	NC
7	USB2_DP8	8	NC
9	USB2_DN8	10	M2_DSS#
11	NC	12	NC
13	M2_CFG0	14	NC
15	NC	16	NC
17	NC	18	NC
19	GND	20	NC
21	NC	22	NC
23	NC	24	NC
25	GND	26	NC
27	NC	28	NC
29	NC	30	M2_DEVSLP
31	USB3_RX2P	32	UIM_CLK1
33	GND	34	UIM_DATA1
35	USB3_TX2N_1	36	UIM_PWR1
37	USB3_TX2P_1	38	NC

Pin	Definition	Pin	Definition
39	GND	40	NC
41	SATA_RXP	42	NC
43	SATA_RXN	44	NC
45	GND	46	NC
47	SATA_TXN	48	NC
49	SATA_TXP	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	NC
69	M2_CFG1	70	VCC3
71	GND	72	VCC3
73	GND	74	VCC3
75	M2_CFG2		

CHAPTER 3: SYSTEM SETUP

Removing the Chassis Cover

CAUTION! Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

1. Locate the 22 screws on the bottom side of the chassis cover.
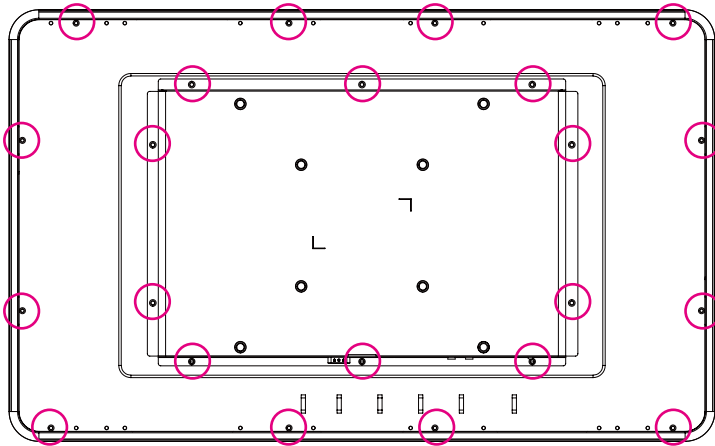
2. Remove the 22 screws and then remove the chassis cover.

Installing a SO-DIMM Memory Module

1. With the chassis cover removed, locate the SO-DIMM socket and insert the module into the socket at an approximately 30 degrees angle. Push the module down until the clips on both sides of the socket lock into position. The clips at the ends of the socket will automatically snap into the locked position to hold the module in place.
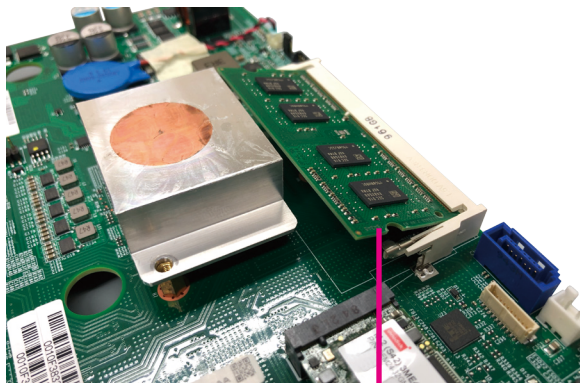
Memory Module

Installing an M.2 Module

1. With the chassis cover removed, locate the M.2 socket and insert the module into the socket at an approximately 45 degrees angle until the gold-plated connector on the edge of the module completely disappears into the slot.
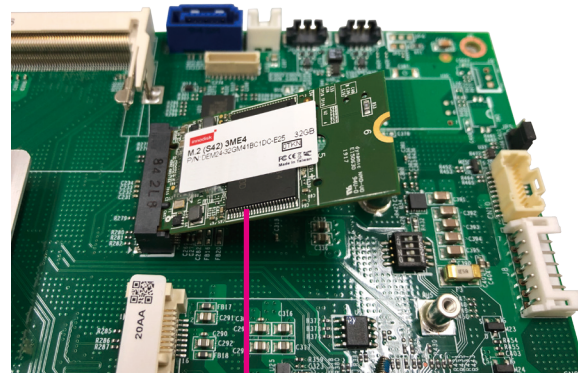
M.2 Module

2. Push the module down and secure it with a screw.
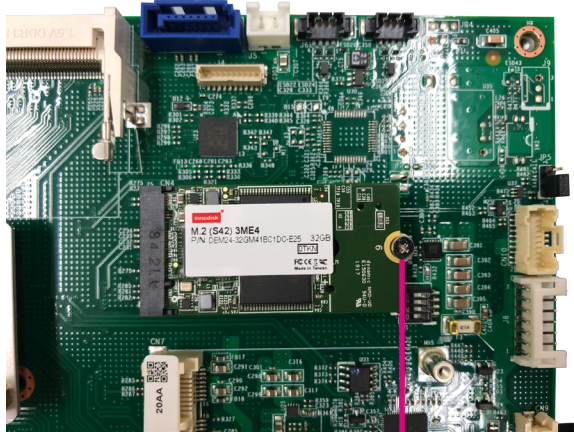
Mounting Screw

CHAPTER 4: BIOS SETUP

This chapter describes how to use the BIOS setup program for TPPC 2201. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NexAIoT website at www.nexaiot.com.

About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure items such as:
- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

- This program should be executed under the following conditions:
- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.

- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <Del> allows you to enter Setup.

Press the Del key to enter Setup:

Legends

Key	Function
← →	Moves the highlight left or right to select a menu.
↑ ↓	Moves the highlight up or down between sub-menus or fields.
Esc	Exits the BIOS Setup Utility.
+	Scrolls forward through the values or options of the highlighted field.
−	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
F1	Displays General Help.
F2	Load previous values.
F3	Load optimized default values.
F4	Saves and exits the Setup program.
Enter	Press <Enter> to enter the highlighted sub-menu

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press Enter .

BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from several setup functions and one exit. Use arrow keys to select among the items and press Enter, to accept or enter the submenu.

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.
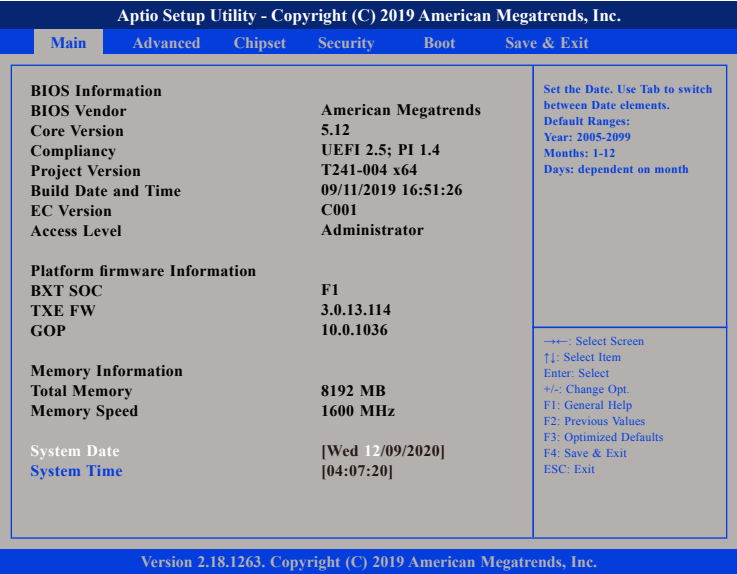
System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Monday to Sunday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 2005 to 2099.

System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

```
Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
  Main      Advanced    Chipset    Security     Boot     Save & Exit

  BIOS Information                                        Set the Date. Use Tab to switch
  BIOS Vendor              American Megatrends            between Date elements.
  Core Version             5.12                           Default Ranges:
  Compliancy               UEFI 2.5; PI 1.4               Year: 2005-2099
  Project Version          T241-004 x64                   Months: 1-12
  Build Date and Time      09/11/2019 16:51:26            Days: dependent on month
  EC Version               C001
  Access Level             Administrator

  Platform firmware Information
  BXT SOC                  F1
  TXE FW                   3.0.13.114
  GOP                      10.0.1036

                                                          →←: Select Screen
  Memory Information                                      ↑↓: Select Item
  Total Memory             8192 MB                        Enter: Select
  Memory Speed             1600 MHz                       +/-: Change Opt.
                                                          F1: General Help
  System Date              [Wed 12/09/2020]               F2: Previous Values
  System Time              [04:07:20]                     F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

           Version 2.18.1263. Copyright (C) 2019 American Megatrends, Inc.
```

Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

> ⚠️ Setting incorrect field values may cause the system to malfunction.

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.					
Main	Advanced	Chipset	Security	Boot	Save & Exit

▶ ACPI Settings
▶ IT8528 Super IO Configuration
▶ IT8528 H/W Monitor
▶ Power Management Configuration
▶ CPU Configuration
▶ USB Configuration

System ACPI Parameters.

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

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ACPI Settings

This section is used to configure ACPI settings.

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
Advanced

ACPI Settings

Enable Hibernation   [Enabled]
ACPI Sleep State   [S3 (Suspend to RAM)]

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

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

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Enable Hibernation

Enables or disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the suspend button is pressed. The options are Suspend Disabled and S3 (Suspend to RAM).

IT8528 Super IO Configuration

This section is used to configure the serial ports of the IT8528 Super IO.

```
Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
  Advanced

  IT8528 Super IO Configuration                          Set Parameters of Serial Port
                                                          1 (COMA)
  Super IO Chip                      IT8528
▶ Serial Port 1 Configuration




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

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```

Super IO Chip
Displays the Super I/O chip used on the board.

Serial Port 1 Configuration

This section is used to configure serial port 1.

```
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  Advanced

  Serial Port 1 Configuration                            Enable or Disable Serial Port
                                                          (COM)
  Serial Port                        [Enabled]
  Device Settings                    IO=3F8h; IRQ=4;

  Device Mode                        [RS232]
  Terminal resistor                  [Disabled]




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

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```

Serial Port
Enables or disables the serial port.

IT8528 H/W Monitor

This section is used to monitor hardware status such as temperature, fan speed and voltages.

```
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   Advanced

   PC Health Status

   CPU temperature(DTS)         : +43 °c
   System temperature           : +57 °c
   VCore                        : +0.82 V
   VCC12                        : +11.99 V
   VCC3.3                       : +3.30 V
   VCC5                         : +5.08 V

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

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```

CPU temperature(DTS)
Detects and displays the current CPU temperature.

System temperature
Detects and displays the current system temperature.

VCore to VCC5
Detects and displays the output voltages.

Power Management Configuration

This section is used to configure the power delay settings.

```
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   Advanced

   Power Management Configuration settings              Power On Delay Setting.

   Input Voltage                9~36V

   Delay Time Setting
   Power On Delay               [Disable]
   Power Off Delay              [Disable]

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

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```

Power On Delay
Enables or disables the Power On Delay function.

Power Off Delay
Enables or disables the Power Off Delay function.

CPU Configuration

This section is used to configure the CPU.

```
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  Advanced

  CPU Configuration                                      Socket specific CPU Information
► Socket 0 CPU Information

  CPU Speed                    1300 MHz
  64-bit                       Supported

► CPU Power Management
  Active Processor Cores       [Disabled]
  Intel Virtualization Technology  [Disabled]
  VT-d                         [Disabled]

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

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```

Socket 0 CPU Information
The submenu that displays information on the CPU installed on socket 0.

CPU Power Management
The submenu for configuring CPU power management settings.

Active Processors Cores
Select the number of cores to enable in each processor package.

Intel® Virtualization Technology
Enables or disables Intel Virtualization technology.

VT-d
Enables or disables the VT-d function.

USB Configuration

This section is used to configure the USB.

```
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  Advanced

  USB Configuration                                      This is a workaround for OSes
                                                         without XHCI hand-off support.
  USB Module Version           17                        The XHCI ownership change
                                                         should be claimed by XHCI
  USB Controllers:                                       driver.
      1 XHCI
  USB Devices:
      1 Keyboard, 1 Mouse

  XHCI Hand-off                [Enabled]
  USB Mass Storage Driver Support  [Enabled]

  USB hardware delays and time-outs:
  USB transfer time-out        [20 sec]                  →←: Select Screen
  Device reset time-out        [20 sec]                  ↑↓: Select Item
  Device power-up delay        [Auto]                    Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

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```

XHCI Hand-off
This is a workaround for OSs that does not support XHCI hand-off. The XHCI ownership change should be claimed by the XHCI driver respectively.

USB Mass Storage Driver Support
Enables or disables USB mass storage driver support.

USB transfer time-out
The time-out value for control, bulk, and Interrupt transfers.

Device reset time-out
Selects the USB mass storage device's start unit command timeout.

Device power-up delay
Maximum time the value will take before it properly reports itself to the Host Controller. "Auto" uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.

South Bridge
Enters the South Bridge submenu.

South Cluster Configuration
Enters the South Cluster Configuration submenu.

South Bridge

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Chipset

	Enable/Disable SMBus Support
SMBus Support [Enabled]	
	→←: Select Screen
	↑↓: Select Item
	Enter: Select
	+/-: Change Opt.
	F1: General Help
	F2: Previous Values
	F3: Optimized Defaults
	F4: Save & Exit
	ESC: Exit

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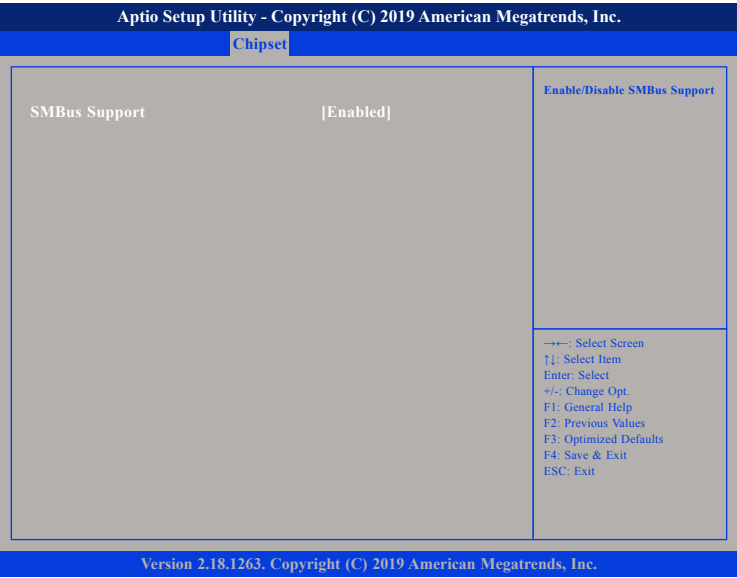
SMBus Support

Enables or disables SMBus support.

South Cluster Configuration

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Chipset

	HD-Audio Configuration Settings
► **HD-Audio Configuration**	
► **SATA Drives**	
► **USB Configuration**	
	→←: Select Screen
	↑↓: Select Item
	Enter: Select
	+/-: Change Opt.
	F1: General Help
	F2: Previous Values
	F3: Optimized Defaults
	F4: Save & Exit
	ESC: Exit

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HD-Audio Configuration

Enters the HD-Audio Configuration submenu.

SATA Drives

Enters the SATA Drives submenu.

USB Configuration

Enters the USB Configuration submenu.

HD-Audio Configuration

```
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                    Chipset

  HD-Audio Configuration                                    Enable/Disable HD-Audio Support
  HD-Audio Support                  [Enable]




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


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```

HD-Audio Support
Enables or disables HD-Audio support.

SATA Drives

```
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                    Chipset

  SATA Drives                                               Enables or Disables the
                                                            Chipset SATA Controller. The
  Chipset-SATA Controller Configuration                     Chipset SATA controller
  Chipset SATA                      [Enable]                supports the 2 black internal
                                                            SATA ports (up to 3Gb/s
    SATA Port 0            TS32GSSD420K (32.0GB)            supported per port).
    Port 0                          [Enabled]

    SATA Port 1                     [Not Installed]
    Port 1                          [Enabled]


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


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```

Chipset SATA
Enables or disables the chipset SATA controller.

Port 0 and Port 1
Enables or disables SATA port 0 and SATA port 1.

USB Configuration

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Chipset

xHCI Mode	[Enable]	Once enabled, XHCI controller would be function disabled, none of the USB devices are detectable and usable during boot and in OS. Do not disable it unless for debug purpose.

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

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xHCI Mode
Enables or disables XHCI mode. When enabled, XHCI controller would be disabled and none of the USB devices are detectable and usable during boot and in OS. Do not disable it unless for debugging purposes.

Security

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Main   Advanced   Chipset   Security   Boot   Save & Exit

Password Description

If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password length must be in the following range:

Minimum length	3
Maximum length	20

Setup Administrator Password
User Password

Set Administrator Password

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

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Setup Administrator Password
Select this to reconfigure the administrator's password.

User Password
Select this to reconfigure the user's password.

Boot

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Main	**Advanced**	**Chipset**	**Security**	**Boot**	**Save & Exit**

```
Boot Configuration                                         Select the keyboard NumLock
Bootup NumLock State             [On]                       state
Quiet Boot                       [Disabled]

Boot Option Priorities
Boot Option #1                   [Windows Boot Manage. . .]
Boot Option #2                   [UEFI: JetFlashTrans. . .]
Boot Option #3                   [UEFI: Built-in EFI . . .]
Fast Boot                        [Disable]




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




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```

Bootup NumLock State

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Quiet Boot

Enabled	Displays OEM logo instead of the POST messages.
Disabled	Displays normal POST messages.

Boot Option Priorities

Adjust the boot sequence of the system. Boot Option #1 is the first boot device that the system will boot from, next will be #2 and so forth.

Fast Boot

When enabled, the BIOS will shorten or skip some check items during POST. This will decrease the time needed to boot the system.

Save & Exit

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Main      Advanced     Chipset     Security      Boot     Save & Exit

     Save Options                                    Reset the system after saving
     Save Changes and Reset                          the changes.
     Discard Changes and Reset

     Default Options
     Restore Defaults




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


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```

Save Changes and Reset
To save the changes and reset, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Discard Changes and Reset
To exit the Setup utility and reset without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting.

Restore Defaults
To restore the BIOS to default settings, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.