



NEXCOM International Co., Ltd.

Mobile Computing Solutions
Vehicle Telematics Computer
VTC 7260

User Manual

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PREFACE

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Acknowledgements

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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



NEXCOM RoHS Environmental Policy and Status Update

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

How to recognize NEXCOM 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 NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the “NEXCOM RMA Service Form” with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the “NEXCOM RMA Service Form” for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as “Out of Warranty.”
- Any products returned by NEXCOM to other locations besides the customers’ site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

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 needlenose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

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. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash storage card.
4. SIM: Do not insert or remove the SIM card when the **system is powered** on. Always **power** off the **system** before inserting or removing the SIM card.

Safety Precautions

- Read these safety instructions carefully.
- Keep this User Manual for later reference.
- Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
- Keep this equipment away from humidity.
- Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.
- Do not leave this equipment in either an unconditioned environment or in a above 40°C storage temperature as this may damage the equipment.
- The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- 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.
- All cautions and warnings on the equipment should be noted.
- If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
- Never pour any liquid into an opening. This may cause fire or electrical shock.
- Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
- 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.
- Do not place heavy objects on the equipment.
- 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.
- 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 NEXCOM products, visit NEXCOM's website at www.nexcom.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.

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, please verify the VTC 7260 package that you received is complete. Your VTC 7260 package should have all the items listed in the following table.

Item	P/N	Name	Description
1	4NCPM00302X00	Terminal Blocks 3P	Terminal Blocks 3P Phoenix Contact:1777992 5.08mm Male Dip Green
2	6030000498X00	Multi-port adapter cable	Multi Cable For VTC7260 Series ST:MD-5110076 DB15/M To DB9/F Open L=150mm



Note: For the multi-port adapter cable, refer to Appendix I for details.
For the 9~36Vdc-in wire cable, please refer to Appendix A for details.

VTC 7260 Product SKUs

There's two series of VTC 7260. One is the product without PoE function, the other is the product with 4 PoE function built-in.

1. The SKU with PoE function, you can order:

- VTC 7260-5C4 (P/N: tbd): Intel® Tiger-lake UP3 Core i5-1145GRE, 4 x 2.5GigE PoE +1 x GbE
- VTC 7260-7C4(P/N: tbd): Intel® Tiger-lake UP3 Core i7-1185GRE, 4 x 2.5GigE PoE +1 x GbE

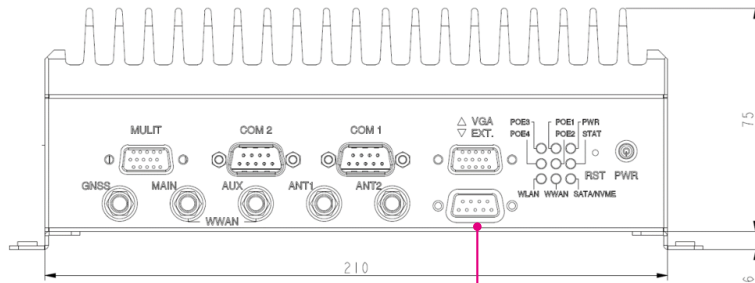
2. The SKU without PoE function, you can order:

- VTC 7260-5(P/N: tbd): Intel® Tiger-lake UP3 Core i5-1145GRE, 2x 2.5GigE + 1 x GbE,
- VTC 7260-7(P/N: tbd): Intel® Tiger-lake UP3 Core i7-1185GRE, 2x 2.5GigE + 1 x GbE

CHAPTER 1: PRODUCT INTRODUCTION

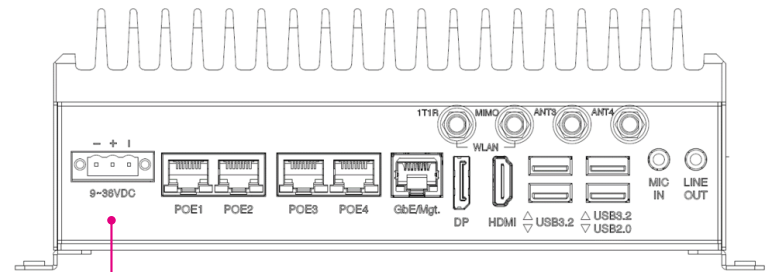
Physical Features

VTC 7260-xC4 Front View



EXT. port is reserved for optional I/Os function if needed.

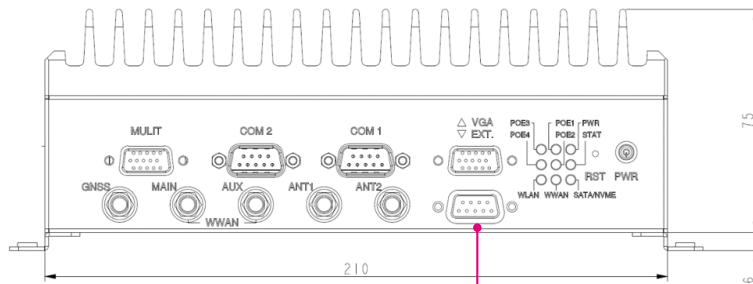
VTC 7260-xC4 Rear View



Symbol "I" means Ignition that is connected to the car's IGN. To power up the machine, the Ignition (I) must be kept on HIGH-level.

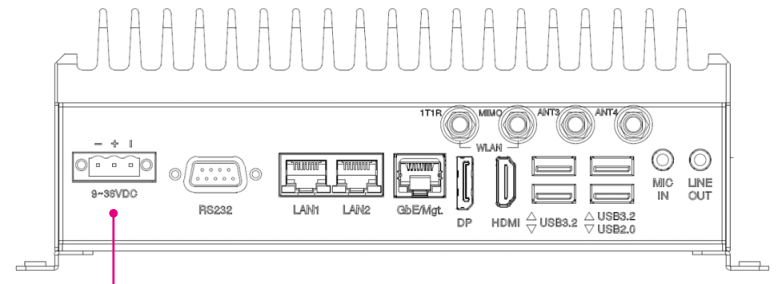
Physical Features

VTC 7260-x Front View



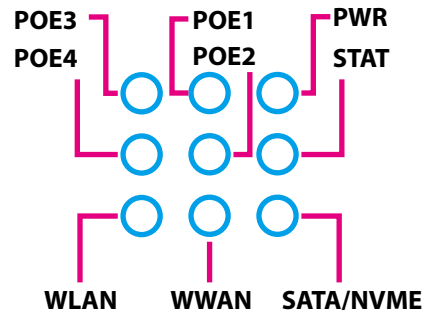
EXT. port is reserved for optional I/Os function if needed.

VTC 7260-x Rear View



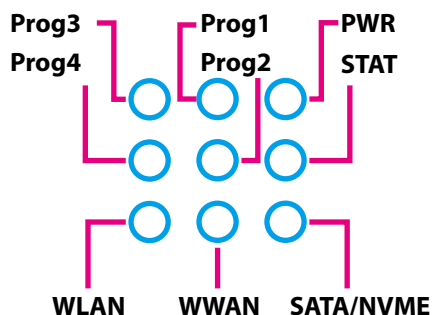
Symbol "I" means Ignition that is connected to the car's IGN. To power up the machine, the Ignition (I) must be kept on HIGH-level.

VTC 7260-xC4 LED Description



LED	Description	LED Behavior
WWAN	WWAN signal/service indicator	<ul style="list-style-type: none"> ▪ Solid green: Link active ▪ Blinking green: Data transmission
WLAN	WLAN signal/service indicator	<ul style="list-style-type: none"> ▪ Solid green: Link active ▪ Blink green: Data transmission
STAT	System status indicator	<ul style="list-style-type: none"> ▪ Off: System power off ▪ Blinking green: System booting (BIOS post) ▪ Solid green: System ready ▪ 2Hz blinking red: System stalled (Power is on, but system is not running.) ▪ Solid red: A fatal error occurred
PWR	Power feed indicator	<ul style="list-style-type: none"> ▪ Solid green: Power active ▪ Solid red: Power failure ▪ Off: Power off
SATA/NVMe	SATA/NVMe SSD Indicator	<ul style="list-style-type: none"> ▪ Off: No storage installed ▪ Solid green: Powered on and ready ▪ Blinking green (10Hz): Reading/writing data ▪ Solid red: A fatal error occurred
POE1	POE1-port power indicator	<ul style="list-style-type: none"> ▪ Off: No power-feed to PD node ▪ Solid green: Power feed to PD node
POE2	POE2-port power indicator	<ul style="list-style-type: none"> ▪ Off: No power-feed to PD node ▪ Solid green: Power feed to PD node
POE3	POE3-port power indicator	<ul style="list-style-type: none"> ▪ Off: No power-feed to PD node ▪ Solid green: Power feed to PD node
POE4	POE4-port power indicator	<ul style="list-style-type: none"> ▪ Off: No power-feed to PD node ▪ Solid green: Power feed to PD node

VTC 7260-x LED Description



LED	Description	LED Behavior
WWAN	WWAN signal/service indicator	<ul style="list-style-type: none"> Solid green: Link active Blinking green: Data transmission
WLAN	WLAN signal/service indicator	<ul style="list-style-type: none"> Solid green: Link active Blink green: Data transmission
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PWR	Power feed indicator	<ul style="list-style-type: none"> Solid green: Power active Solid red: Power failure Off: Power off
SATA/NVMe	SATA/NVMe SSD Indicator	<ul style="list-style-type: none"> Off: No storage installed Solid green: Powered on and ready Blinking green (10Hz): Reading/writing data Soild red: A fatal error occurred
Prog. 1~4	User programmed indicator	<ul style="list-style-type: none"> Please refer to ATC8110 Commands list at ST_SYSTEM_GET_33_02_PROGRAM_LED_STATUS for Linux

VTC 7260-xC4 Overview

VTC 7260-xC4 is an in-vehicle AI-aided telematics computer designed with Intel 11th Gen. Tiger Lake UP3 to perform 25% more computing power than the former generation. Moreover, its 10-year product lifespan can satisfy with the long-term support suitable for any from in-vehicle applications. With the compact, rugged, and fanless design, VTC 7260-xC4 can widely and easily be installed in any limited cabinet space, and reduce the maintenance efforts while operating 24/7 services. Besides, VTC 7260-xC4 features with diverse peripherals, such as 2.5GbE, PoE+, USB 3.2, isolation CANBus, serial ports, ultra-speed NVMe storage, triple displays, audio in/out, DI/DO and 9~36VDC with IGN control, make it a sophisticated in-vehicle computer.

To work as the edge AI, the user can install LTE/5G/Wi-Fi 5/6 modules along with Hailo AI accelerator (26TOPS) to deploy AI services, provided from cloud SaaS. To consider the harsh environment applications, VTC 7260-xC4 can be operated at the temperature range of -40°C~70°C and is compliant with MILSTD-810G military standard for anti-vibration/shock. For the regulation, VTC 7260-xC4 is compliant with CE/FCC classA, UKCA and EMARK (E13)

Key Features

- Intel® 11th Gen, Tiger Lake UP3, cost-efficient performance
- Compact, rugged and fanless design
- Rich I/Os, 4 x PoE+, GbE, 4 x USB 3.2/2.0 & 2 x RS232/422/485
- 1 x 2.5" SSD, 1 x mSATA and 1 x NVMe SSD for data integrity
- Up to 3 combinations of LTE/5G, Wi-Fi 5/6 for mobile router function
- Triple display, VGA, HDMI and DP for multi video-out
- 9~36V DC-IN with ignition control & OCP/OVP
- Wide range operating temperature of -40°C~70°C
- Military standard of anti-vibration/shock for OHV applications
- CE/FCC, UKCA, Emark Certified



Note:

There are two types of Hailo AI card can be installed, one is KeyE form factor that can be installed on the Key E 2230 slot on VTC7260, the other is KeyM form factor that can be installed on Key M 2242/2280 slot on VTC7260. To purchase, please contact NEXCOM sales.

Hardware Specifications

CPU

- Intel® Core™ 11th Gen. Tiger Lake UP3
- Core i5-1145GRE, base frequency 1.5GHz/ 2.6GHz, 4c, 8 MB Intel® Smart Cache (VTC 7260-5C4)
- Core i7-1185GRE, base frequency 1.8GHz/ 2.8GHz, 4c, 12 MB Intel® Smart Cache (VTC 7260-7C4)
- Graphics:
 - Intel® Iris® Xe graphics, 1.3GHz
 - Max resolution: 4096 x 2304@60Hz (HDMI)
 - DirectX: 12.1, OpenGL: 4.6

Memory

- 2 x SO-DIMM, DDR4-3200MHz
- 4GB+4GB in default, 64GB in max.
- ECC (in-band ECC), dual- channel support

Storage

- 1 x 2.5" SSD (15mm height)
- 1 x mPCIe for mSATA (SATA 3.0)
- 1 x M.2 2242/2280 Key M NVMe SSD (PCIe 4.0 x4), Hailo AI card in option

Expansion

- 1 x mPCIe socket (PCIe 3.0 + USB 2.0/ USB 3.2), 2 x micro SIMs supported
- 1 x M.2 3042/3050/3052 Key B socket (USB 3.2), 2 x micro SIMs supported
- 1 x M.2 2230 Key E socket (PCIe 3.0 x2 & USB 2.0), Wi-Fi or Hailo AI card in option

Display

- 1 x HDMI 2.0a/b, up to 3840 x 2160@60Hz
- 1 x VGA, up to 2560 x 1600@60Hz
- 1 x DP, 4096 x 2304@60Hz

PoE+

- 4-port independent 2.5GbE, RJ45 connector
 - IEEE 802.3 af/at, total 60W
 - 9K byte jumbo frame
 - PTP (IEEE 1588) support
 - Controller: Intel® I225-IT

GbE

- 1-port independent GbE, RJ45 connector
 - vPro (iAMT) support
 - 9K byte jumbo frame
 - PTP (IEEE 1588) support
 - Wake-up function (WoL)
 - Boot from PXE (Legacy & UEFI)

USB

- 1 x USB 3.2 Gen2 & 2 x USB 3.2 Gen1:
 - Host type-A connector
 - 5V@900mA each
 - Up to 10Gbit/s link speed & compliance with USB 2.0 (LS/FS/HS link speed)
- 1 x USB 2.0, host type-A connector

Serial Port

- 2 x full RS232/422/485, selectable
- 2 x full RS232 reserved for option (wafer connector)
 - RS232 working voltage, +- 9V, baud rate up to 115.2kb/s

Security

- TPM 2.0: Infineon SLB9665TT2.0FW5.62

Audio

- Line-out, unbalance stereo, left & right channel
- MIC-in, stereo
- Line-in reserved (wafer connector)

MEMS Sensor

- 3D accelerometer and 3D gyroscope
- Controller: ST LSM6DSLTR

DI/DO

- 4-bit input
 - Source: 9~36VDC (12V@1.1mA/24V@2.2mA)
 - External: 0~33VDC pull-high, high-level, 3.3 - 33 VDC; low-level, 0 - 2 VDC
- 4-bit output
 - Source: 9~36VDC (nominal 35mA@24V):
 - External: 5~27VDC pull-high, sink current w/ 220mA for each bit, 500mA max (@25C)
- Source or external can be selected by DIP switch (default: source type)

CAN Bus

- 1 x CAN 2.0A/ 2.0B
- IEC 61000-4-2 Electrostatic Discharge (ESD): $\pm 8\text{KV}/15\text{KV}$ (contact/air)
- 2.5KV isolated

GNSS

- U-blox NEO-M9N GNSS module for GPS/GLONESS/QZSS/Galileo/Beidou
- Optional DR (Dead Reckoning) function, NEO-M8U/M8L

Power Supply

- Nominal voltage: 9~36V
- Cranking voltage: 6V~9V (less than 20 sec)
- OCP & UVP (shut down once exceeding 37V)
- Ignition on/off control & programmable on/off delay timer
- Optional for remote power on/off control

I/O ports, Front-plate

- ATX power button, Reset button
- 9 x LED Indicators, 1 x VGA (DB15), 2 x COM (DB9, RS232/422/485), 1 x Multi-port (DB15, 4xDI, 4xDO, CAN, DR signal), 1 x Ext. (DB15, reserved), 1 x PR-SMA for GNSS, 4 x SMA for WWAN

I/O ports, Rear-plate

- 2 x Audio jack (Line-out & MIC-in)
- 3 x USB 3.2 type A, 1 x USB 2.0 type A
- 1 x HDMI, 1 x DP, 4 x PoE+ (2.5GbE, RJ45), 1 x GbE, 9~36VDC (3-pin Phoenix), 4 x PR-SMA for WLAN

I/O ports, side-plate

- 2 x SIM slots (SIM1-1, SIM2-1)

Dimensions & Weight

- 210.0mm x 173.0mm x 75.0mm (w/o mount brackets)
- 234.0mm x 173.0mm x 81.0mm (w/ mount brackets)
- Weight: 3.5kg

Environment

- Operating temperatures: $-40^{\circ}\text{C}\sim 70^{\circ}\text{C}$ (12W TDP base)
- Storage temperatures: $-40^{\circ}\text{C}\sim 85^{\circ}\text{C}$
- Relative humidity: 10%~95% (non-condensing)

Vibration & Shock

- Vibration in operating:
 - MIL-STD-810H, 514.8C Procedure 6, Category 4
 - IEC 60068-2-64: 2.0g@5~500Hz
- Vibration in storage:
 - MIL-STD-810G, 514.6E Procedure 1, Category 24, 7.7g
- Shock:
 - MIL-STD-810G, 516.6 Procedure I, trucks and semi-trailers=40g
 - Crash hazard: Procedure V, ground equipment=75g

Certifications

- CE approval, FCC Class A, UKCA, E13 Certified

Operating System

- Windows 10 64-bit/Windows 10 IOT 64-bit, Windows 11
- Linux (Ubuntu 18.04)

External Cable

- DB15 multi-port adapter cable, 20cm

VTC 7260-x Overview

VTC 7260-x is an in-vehicle AI-aided telematics computer designed with Intel 11th Gen. Tiger Lake UP3 to perform 25% more computing power than the former generation. Moreover, its 10-year product life-cycle policy can satisfy with the long-term support suitable for any from in-vehicle applications. With the compact, rugged, and fanless design, VTC 7260-x can widely and easily be installed in any limited cabinet space, and reduce the maintenance efforts while operating 24/7 services. Besides, VTC 7260-x features with diverse peripherals, such as 2.5GbE, USB 3.2, isolation CANBus, serial ports, ultra-speed NVMe storage, triple displays, audio in/out, DI/DO and 9~36VDC with IGN control, make it a sophisticated in-vehicle computer.

To work as the edge AI, the user can install LTE/5G/Wi-Fi 5/6 modules along with Hailo AI accelerator (26TOPS) to deploy AI services, provided from cloud SaaS. To consider the harsh environment applications, VTC 7260-x can be operated at the temperature range of -40°C~70°C and is compliant with MILSTD-810G military standard for anti-vibration/shock. For the regulation, VTC 7260-x is compliant with CE/FCC classA, UKCA and EMARK (E13).

Key Features

- Intel® 11th Gen, Tiger Lake UP3, cost-efficient performance
- Compact, rugged and fanless design
- Rich I/Os, 4 x PoE+, GbE, 4 x USB 3.2/2.0 & 2 x RS232/422/485
- 1 x 2.5" SSD, 1 x mSATA and 1 x NVMe SSD for data integrity
- Up to 3 combinations of LTE/5G, Wi-Fi 5/6 for mobile router function
- Triple display, VGA, HDMI and DP for multi video-out
- 9~36V DC-IN with ignition control & OCP/OVP
- Wide range operating temperature of -40°C~70°C
- Military standard of anti-vibration/shock for OHV applications
- CE/FCC, UKCA, Emark Certified



Note:

There are two types of Hailo AI card that can be installed, one is KeyE form factor that can be installed on the Key E 2230 slot on VTC7260, the other is KeyM form factor that can be installed on Key M 2242/2280 slot on VTC7260. To purchase, please contact NEXCOM sales.

Hardware Specifications

CPU

- Intel® Core™ 11th Gen. Tiger Lake UP3
- Core i5-1145GRE, base frequency 1.5GHz/ 2.6GHz, 4c, 8 MB Intel® Smart Cache (VTC 7260-5C)
- Core i7-1185GRE, base frequency 1.8GHz/ 2.8GHz, 4c, 12 MB Intel® Smart Cache (VTC 7260-7)
- Graphics:
 - Intel® Iris® Xe graphics, 1.3GHz
 - Max resolution: 4096 x 2304@60Hz (HDMI)
 - DirectX: 12.1, OpenGL: 4.6

Memory

- 2 x SO-DIMM, DDR4-3200MHz
- 4GB+4GB in default, 64GB in max.
- ECC (in-band ECC), dual- channel support

Storage

- 1 x 2.5" SSD (15mm height)
- 1 x mPCIe for mSATA (SATA 3.0)
- 1 x M.2 2242/2280 Key M NVMe SSD (PCIe 4.0 x4), Hailo AI card in option

Expansion

- 1 x mPCIe socket (PCIe 3.0 + USB 2.0/ USB 3.2), 2 x micro SIMs supported
- 1 x M.2 3042/3050/3052 Key B socket (USB 3.2), 2 x micro SIMs supported
- 1 x M.2 2230 Key E socket (PCIe 3.0 x2 & USB 2.0), Wi-Fi or Hailo AI card in option

Display

- 1 x HDMI 2.0a/b, up to 3840 x 2160@60Hz
- 1 x VGA, up to 2560 x 1600@60Hz
- 1 x DP, 4096 x 2304@60Hz

2.5GbE

- 2-port independent 2.5GbE, RJ45 connector
 - 9K byte jumbo frame
 - PTP (IEEE 1588) support
 - Controller: Intel® I225-IT

GbE

- 1-port independent GbE, RJ45 connector
 - vPro (iAMT) support
 - 9K byte jumbo frame
 - PTP (IEEE 1588) support
 - Wake-up function (WoL)
 - Boot from PXE (Legacy & UEFI)

USB

- 1 x USB 3.2 Gen2 & 2 x USB 3.2 Gen1:
 - Host type-A connector
 - 5V@900mA each
 - Up to 10Gbit/s link speed & compliance with USB 2.0 (LS/FS/HS link speed)
- 1 x USB 2.0, host type-A connector

Serial Port

- 2 x full RS232/422/485, selectable

- 2 x full RS232 reserved for option (wafer connector)
 - RS232 working voltage, +- 9V, baud rate up to 115.2kb/s

Security

- TPM 2.0: Infineon SLB9665TT2.0FW5.62

Audio

- Line-out, unbalance stereo, left & right channel
- MIC-in, stereo
- Line-in reserved (wafer connector)

MEMS Sensor

- 3D accelerometer and 3D gyroscope
- Controller: ST LSM6DSLTR

DI/DO

- 4-bit input
 - Source: 9~36VDC (12V@1.1mA/24V@2.2mA)
 - External: 0~33VDC pull-high, high-level, 3.3 - 33 VDC; low-level, 0 - 2 VDC
- 4-bit output
 - Source: 9~36VDC (nominal 35mA@24V):
 - External: 5~27VDC pull-high, sink current w/ 220mA for each bit, 500mA max (@25C)
- Source or external can be selected by DIP switch (default: source type)

CAN Bus

- 1 x CAN 2.0A/ 2.0B
- IEC 61000-4-2 Electrostatic Discharge (ESD): $\pm 8KV/15KV$ (contact/air)
- 2.5KV isolated

GNSS

- U-blox NEO-M9N GNSS module for GPS/GLONESS/QZSS/Galileo/Beidou
- Optional DR (Dead Reckoning) function, NEO-M8U/M8L

Power Supply

- Nominal voltage: 9~36V
- Cranking voltage: 6V~9V (less than 20 sec)
- OCP & UVP (shut down once exceeding 37V)
- Ignition on/off control & programmable on/off delay timer
- Optional for remote power on/off control

I/O ports, Front-plate

- ATX power button, Reset button
- 9 x LED Indicators, 1 x VGA (DB15), 2 x COM (DB9, RS232/422/485), 1 x Multi-port (DB15, 4xDI, 4xDO, CAN, DR signal), 1 x Ext. (DB15, reserved), 1 x PR-SMA for GNSS, 4 x SMA for WWAN

I/O ports, Rear-plate

- 2 x Audio jack (Line-out & MIC-in)
- 3 x USB 3.2 type A, 1 x USB 2.0 type A
- 1 x HDMI, 1 x DP, 4 x PoE+ (2.5GbE, RJ45), 1 x GbE, 9~36VDC (3-pin Phoenix), 4 x PR-SMA for WLAN

I/O ports, side-plate

- 2 x SIM slots (SIM1-1, SIM2-1)

Dimensions & Weight

- 210.0mm x 173.0mm x 75.0mm (w/o mount brackets)
- 234.0mm x 173.0mm x 81.0mm (w/ mount brackets)
- Weight: 3.5kg

Environment

- Operating temperatures: -40°C~70°C (12W TDP base)
- Storage temperatures: -40°C~85°C
- Relative humidity: 10%~95% (non-condensing)

Vibration & Shock

- Vibration in operating:
 - MIL-STD-810H, 514.8C Procedure 6, Category 4
 - IEC 60068-2-64: 2.0g@5~500Hz
- Vibration in storage:
 - MIL-STD-810G, 514.6E Procedure 1, Category 24, 7.7g
- Shock:
 - MIL-STD-810G, 516.6 Procedure I, trucks and semi-trailers=40g
 - Crash hazard: Procedure V, ground equipment=75g

Certifications

- CE approval, FCC Class A, UKCA, E13 Certified

Operating System

- Windows 10 64-bit/Windows 10 IOT 64-bit, Windows 11
- Linux (Ubuntu 18.04)

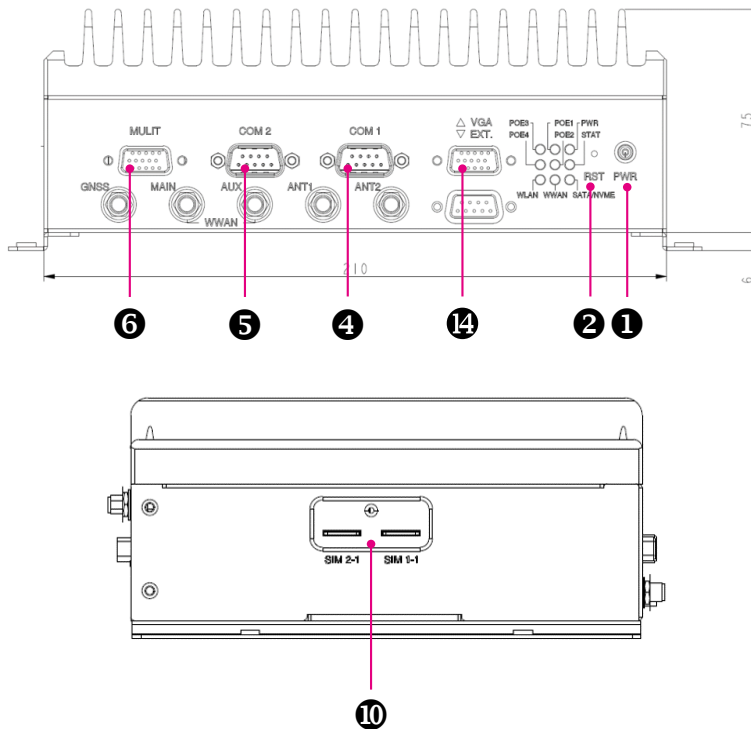
External Cable

- DB15 multi-port adapter cable, 20cm

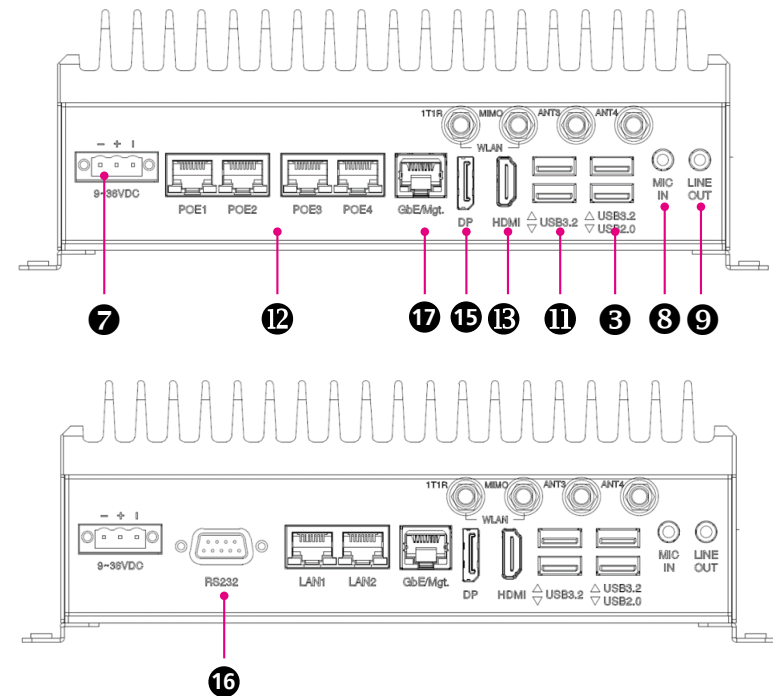
Connector Numbering

The following diagrams indicate the numbers of the connectors. Use these numbers to locate the connectors' respective pinout assignments on chapter 2 of the manual.

VTC 7260 Front View



VTC 7260 Rear View



CHAPTER 2: EXTERNAL CONNECTORS PINOUT DESCRIPTION

Power Button

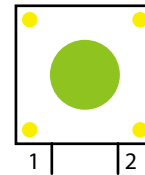
Connector number: 1



Pin	Definition	Pin	Definition
1	GND	2	HW_BT#
3	HW_BT#	4	GND
A1	PWRLED_A	C1	PWRLED_C

Reset Button

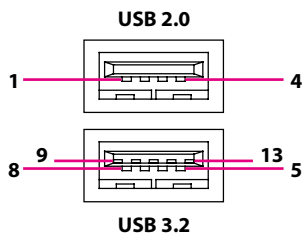
Connector number: 2



Pin	Definition
1	GND
2	RST_BTN#

USB 2.0 and USB 3.2 Port

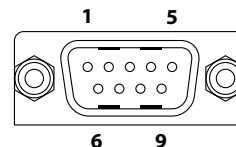
Connector number: 3



Pin	Definition	Pin	Definition
1	VCC	2	USB_1N
3	USB_1P	4	GND
5	VCC	6	USB0_N
7	USB0_P	8	GND
9	USB3_RXN	10	USB3_RXP
11	GND	12	USB3_TXN
13	USB3_TXP	14	

COM1 to COM2 RS-232/RS422/RS485 Connector

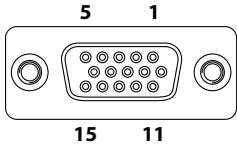
Connector number: 4 and 5



Pin	Definition	Pin	Definition
1	RS232 DCD#/RS422 TX-/ RS485 DATA-	2	RS232 RX/RS422 TX+/ RS485 DATA+
3	RS232 TX/RS422 RX+	4	RS232 DTR#/RS422 RX-
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI		

Multiport Connector

Connector number: 6



Pin	Definition	Pin	Definition
1	CAN_L	2	GPO1
3	GPO2	4	GPO3
5	GPO4	6	CAN_H
7	GPI1	8	GPI2
9	GPI3	10	GPI4
11	CAN_ISOGND	12	GPIO_GND
13	GND	14	DR_ODOM
15	DR_DIRECTION		

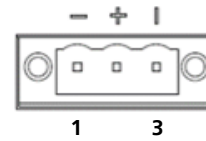


Note:

You need to connect the multi-port DB15 adapter cable to access GPI, GPO, CAN2.0B and DR signal. Please refer to Appendix I for details.

9V-36V DC Power Input

Connector number: 7



Pin	Definition
1	GND
2	VIN
3	Ignition

Mic-in Connector

Connector number: 8



Pin	Definition	Pin	Definition
1	GND	2	MIC RIGHT
3	GND	4	MIC DETECT
5	MIC LIFT		

Line-out Connector

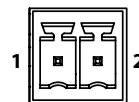
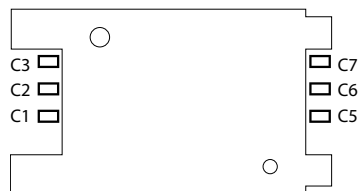
Connector number: 9



Pin	Definition	Pin	Definition
22	FRONT OUT RIGHT	23	GND
24	FRONT OUT DETECT	25	FRONT LIFT

SIM1-1 and SIM2-1 Socket

Connector number: 10



SIM1-1

Pin	Definition	Pin	Definition
C1	UIM_PWR	C5	NC
C2	UIM_RST	C6	UIM_DAT
C3	UIM_CLK	C7	NC

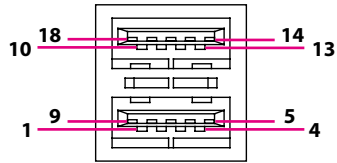
Pin	Definition
1	12V
2	Ground

SIM2-1

Pin	Definition	Pin	Definition
C1	UIM_PWR	C5	NC
C2	UIM_RST	C6	UIM_DAT
C3	UIM_CLK	C7	SIM SELECT

Two Dual USB 3.2 Port

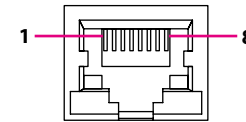
Connector number: 11



Pin	Definition	Pin	Definition
1	5V	2	USB_5N
3	USB_5P	4	GND
5	USB3_RX5N	6	USB3_RX5P
7	GND	8	USB3_TX5N
9	USB3_TX5P	10	5V
11	USB_6N	12	USB_6P
13	GND	14	USB3_RX6N
15	USB3_RX6P	16	GND
17	USB3_TX6N	18	USB3_TX6P

4x 2.5GbE (PoE) LAN Port

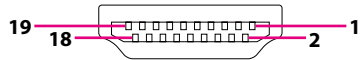
Connector number: 12



Pin	Definition	Pin	Definition
1	LAN_MDI_0P_R	2	LAN_MDI_0N_R
3	LAN_MDI_1P_R	4	LAN_MDI_1N_R
5	LAN_MDI_2P_R	6	LAN_MDI_2N_R
7	LAN_MDI_3P_R	8	LAN_MDI_3N_R

HDMI Connector

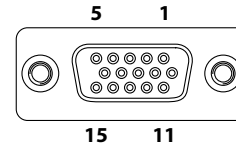
Connector number: 13



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_CLK_P
11	GND	12	HDMI_CLK_N
13	NC	14	NC
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	HDMI_P5V
19	HDMI_HPD		

VGA Connector

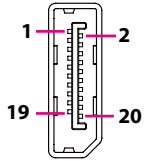
Connector number: 14



Pin	Definition	Pin	Definition
1	VGA_RED	2	VGA_GREEN
3	VGA_BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	NC	12	VGA_DATA
13	VGA_HS	14	VGA_VS
15	VGA_CLK		

DP Connector

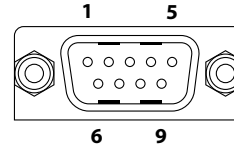
Connector number: 15



Pin	Definition	Pin	Definition
1	DDIA_0_DP	2	GND
3	DDIA_0_DN	4	DDIA_1_DP
5	GND	6	DDIA_1_DN
7	DDIA_2_DP	8	GND
9	DDIA_2_DN	10	DDIA_3_DP
11	GND	12	DDIA_3_DN
13	DDIA_CONFIG1	14	DDIA_CONFIG2
15	DDIA_AUXP	16	GND
17	DDIA_AUXN	18	DDIA_HPD
19	GND	20	DP_VCC3

RS232 Connector (VTC 7260-x non-PoE Version)

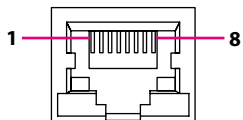
Connector number: 16



Pin	Definition	Pin	Definition
1	RS232 DCD#	2	RS232 RX
3	RS232 TX	4	RS232 DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI		

GbE/Mgt. Connector

Connector number: 17



Pin	Definition	Pin	Definition
1	LAN_MDI_0P_R	2	LAN_MDI_0N_R
3	LAN_MDI_1P_R	4	LAN_MDI_1N_R
5	LAN_MDI_2P_R	6	LAN_MDI_2N_R
7	LAN_MDI_3P_R	8	LAN_MDI_3N_R

CHAPTER 3: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the VTC 7260 series motherboard and backplane board.

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 environment 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 the 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:

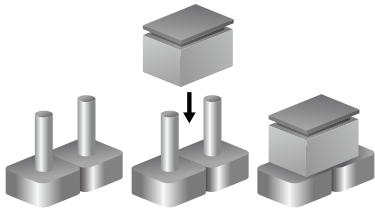
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal 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

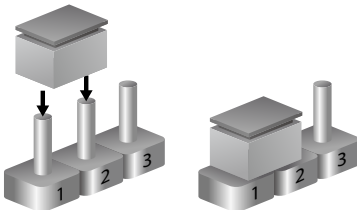
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

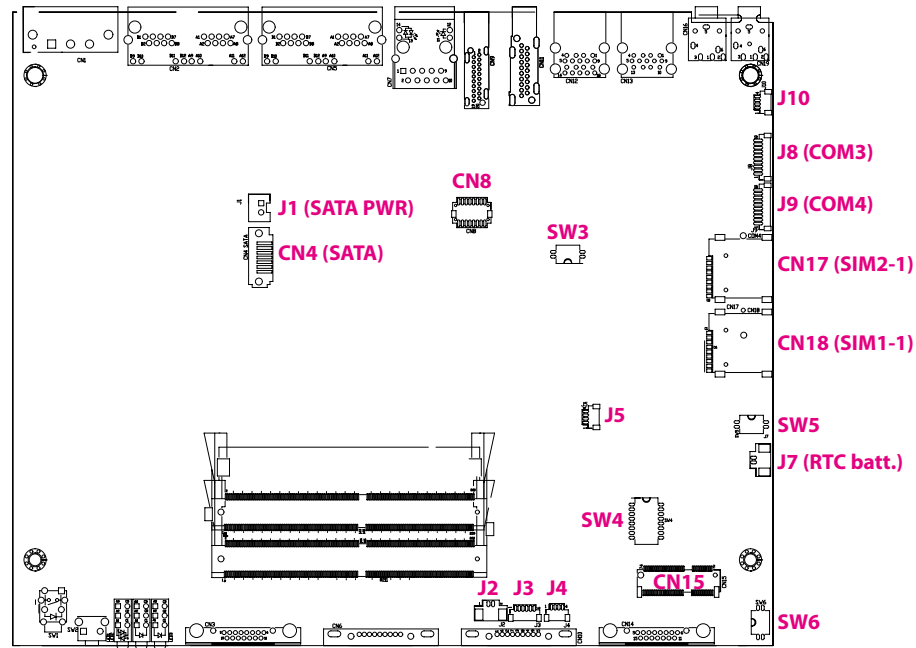


VTC 7260-x/VTC 7260-xC4 Jumper/Switch/Expand slot on PCBA

This chapter describes the location and pinout assignment of the jumpers, slots, switched on VTC 7260 PCBA. The user can find out the slots designed to be installed with the Wi-Fi modules, LTE/5G modules or Hailo AI card, etc.

Locations of the Jumpers and Connectors for the Motherboard

Top View

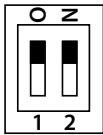


Jumper and DIP Switch Settings

RTC Clear Selection

Connector type: 2-pin DIP switch

Connector location: SW5



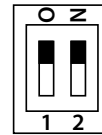
SW	RTC	SRTC/ME
OFF (pin1 & pin2)	Normal	Normal
ON (pin1 & pin2)	Clear CMOS	Clear ME

Default Setting: Pin1 and Pin2 are set to ON.

Input Voltage Setup Selection

Connector type: 2-pin DIP switch

Connector location: SW3



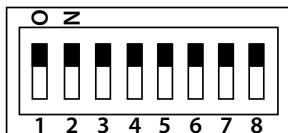
POWERSW (Pin1)	12V24V (Pin2)	Result
OFF	OFF	12V
OFF	ON	24V
ON	ON	9~36V

Default Setting: Pin1 and Pin2 are set to ON and the DC power input is 9~36V DC.

GPIO Pull High Selection Switch

Connector type: 2x8 16-pin DIP switch

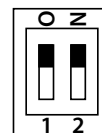
Connector location: SW4



Pin	Definition
1-4 ON	GP1-4 Pull High Voltage by Vin (Default)
1-4 OFF	GPI-4 Float
5-8 ON	GPO1-4 Pull High Voltage by Vin (Default)
5-8 OFF	GPO1-4 Float

CAN Terminator Resistor Selection Switch

Connector location: SW6

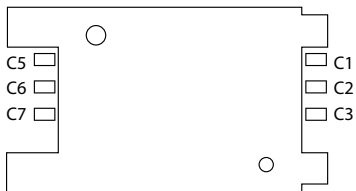


Pin	Definition
1 ON 2 ON	CAN Terminator Resistor (Default)
1 OFF 2 OFF	CAN None Terminator Resistor

Internal Connectors

Micro SIM Slot For LTE Slot

Connector location: CN17/CN25



CN17 Connector Pin Definition

Pin	Definition	Pin	Definition
C1	UIM1 POWER	C2	UIM1 RESET
C3	UIM1 CLK	C4	N.C
C5	GND	C6	N.C
C7	UIM1 DATA	C8	N.C
CD	SIM1_DET		

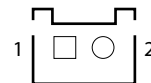
CN25 Connector Pin Definition

Pin	Definition	Pin	Definition
C1	UIM2 POWER	C2	UIM2 RESET
C3	UIM2 CLK	C4	N.C
C5	GND	C6	N.C
C7	UIM2 DATA	C8	N.C

RTC Battery Connector

Connector type: 1x2 2-pin header

Connector location: J7

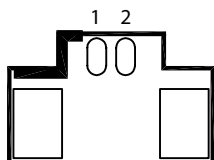


Pin	Definition
1	GND
2	VBAT

GPS Battery Connector

Connector type: 1x2 2-pin header

Connector location: J2



Pin	Definition
1	GND
2	GPS_RTC

GPS Module Connector

Connector type: 1x6 6-pin header

Connector location: J3

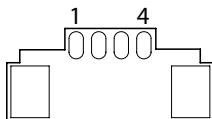


Pin	Definition	Pin	Definition
1	GPS_BAT	2	VCC3_GPS
3	GPS_TXD	4	GPS_RXD
5	GND	6	VCC3_GPS

GPS DR Connector

Connector type: 1x4 4-pin header

Connector location: J4

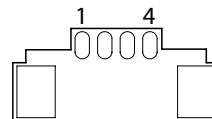


Pin	Definition	Pin	Definition
1	GND	2	1PPS
3	ODOMETER	4	DIRECTION

Internal USB2.0 Connector

Connector type: 1x4 4-pin header

Connector location: J5/J11

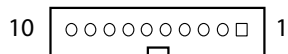


Pin	Definition	Pin	Definition
1	GND	2	USB2_DP
3	USB2_DN	4	USB_5V

COM3/COM4 Connector

Connector type: 1x10 10-pin header

Connector location: J8/J9

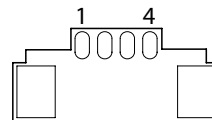


Pin	Definition	Pin	Definition
1	GND	2	GND
3	COM(3/4)_CTS	4	COM(3/4)_DSR
5	COM(3/4)_DTR	6	COM(3/4)_RXD
7	COM(3/4)_RI#	8	COM(3/4)_RTS
9	COM(3/4)_TXD	10	COM(3/4)_DCD

Audio Jack (Line-in)

Connector type: 1x4 4-pin header

Connector location: J10

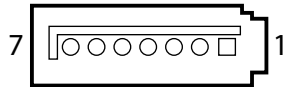


Pin	Definition	Pin	Definition
1	LINE_IN_R	2	LINE_IN_JD
3	LINE_IN_L	4	GND

SATA Connector

Connector type: SATA

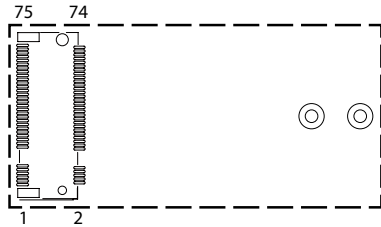
Connector location: CN4



Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP0
3	SATA_TXN0	4	GND
5	SATA_RXN0	6	SATA_RXP0
7	GND		

M.2 2230 E-Key Connector (PCIe3.0 x2 + USB2.0 interface) for Wi-Fi Module or Hailo AI Card

Connector location: CN15

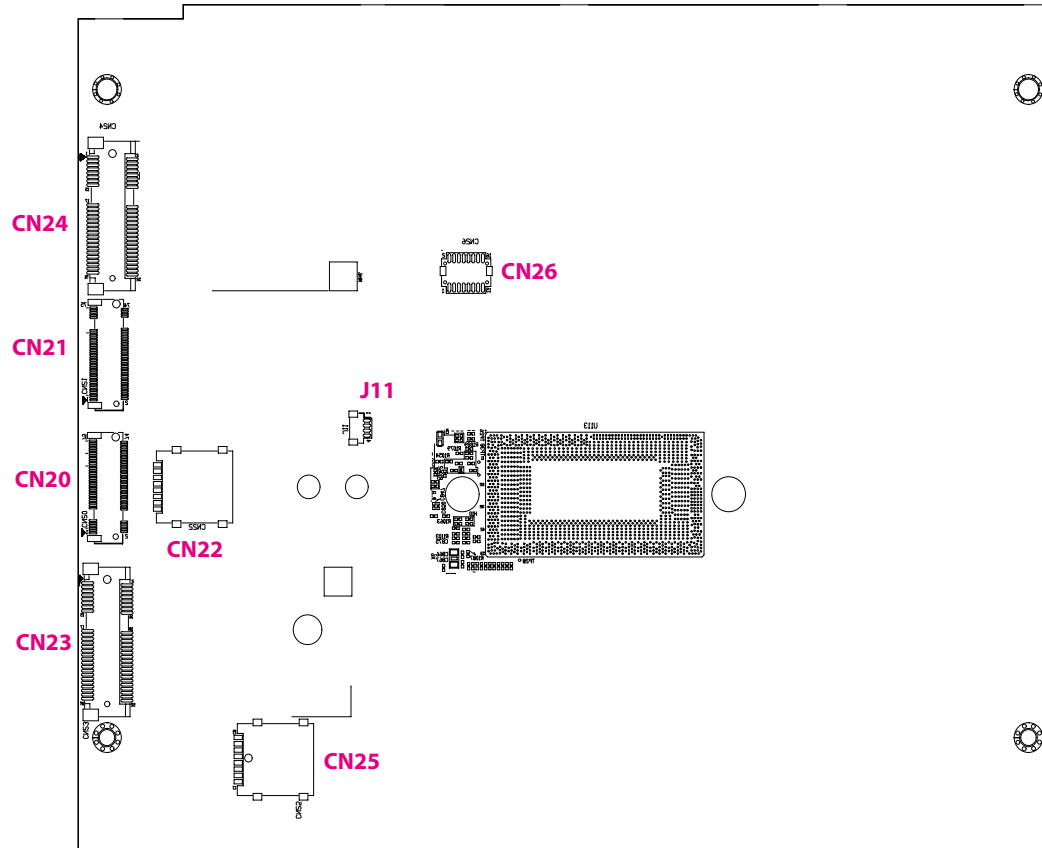


Pin	Definition	Pin	Definition
1	GND	2	VDD_3V3
3	M2_USB_DP	4	VDD_3V3
5	M2_USB_DN	6	WLAN_LED#
7	GND	8	N.C
9	N.C	10	N.C
11	N.C	12	N.C
13	N.C	14	N.C
15	N.C	16	N.C
17	N.C	18	GND
19	N.C	20	N.C
21	N.C	22	N.C
23	N.C	24	KEY(Notch location)
25	KEY(Notch location)	26	KEY(Notch location)
27	KEY(Notch location)	28	KEY(Notch location)
29	KEY(Notch location)	30	KEY(Notch location)
31	KEY(Notch location)	32	N.C
33	GND	34	N.C
35	M2_PCIE0_TXP	36	N.C
37	M2_PCIE0_TXN	38	N.C
39	GND	40	N.C

Pin	Definition	Pin	Definition
41	M2_PCIE0_RXP	42	N.C
43	M2_PCIE0_RXN	44	N.C
45	GND	46	N.C
47	M2_PCIE0_CLKP	48	N.C
49	M2_PCIE0_CLKN	50	M2_32.768K
51	GND	52	PCIE_RESET0#
53	M2_PCIE_CLKREQ0	54	BT_DISABLE#
55	M2_PCIE0_WAKE#	56	WIFI_DISABLE#
57	GND	58	M2_I2C_SDA
59	M2_PCIE1_TXP	60	M2_I2C_SCL
61	M2_PCIE1_TXN	62	N.C
63	GND	64	N.C
65	M2_PCIE1_RXP	66	PCIE_RESET1#
67	M2_PCIE1_RXN	68	M2_PCIE_CLKREQ1
69	GND	70	N.C
71	M2_PCIE1_CLKP	72	VDD_3V3
73	M2_PCIE1_CLKN	74	VDD_3V3
75	GND		

Locations of the Jumpers and Connectors for the VTC 7260

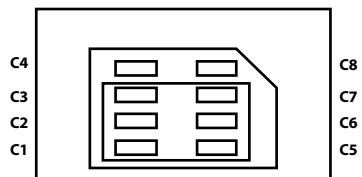
Bottom View



Internal Connectors

CAN Terminator Resistor Selection Switch

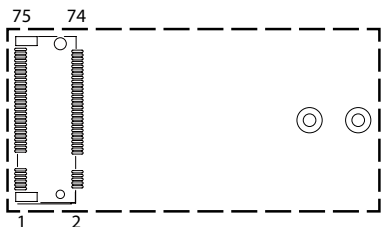
Connector location: CN22/CN25



Pin	Definition	Pin	Definition
C1	UIMA POWER	C2	UIMB RESET
C3	UIMA CLK	C4	N.C
C5	GND	C6	N.C
C7	UIMA DATA	C8	N.C
CD	SIMA_DET		

M.2 2280 M-Key Connector (PCIe4.0 x4 Interface) for NVMe storage

Connector location: CN21

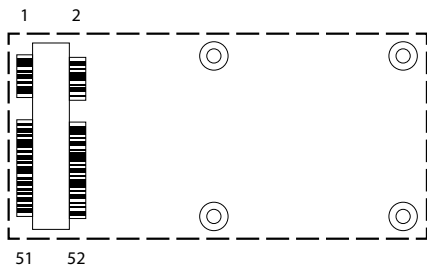


Pin	Definition	Pin	Definition
1	GND	2	VDD_3V3
3	GND	4	VDD_3V3
5	M2_PCIE3_RXN	6	NC
7	M2_PCIE3_RXP	8	NC
9	GND	10	M2_SSD_LED#
11	M2_PCIE3_TXN	12	VDD_3V3
13	M2_PCIE3_TXP	14	VDD_3V3
15	GND	16	VDD_3V3
17	M2_PCIE2_RXN	18	VDD_3V3
19	M2_PCIE2_RXP	20	NC
21	GND	22	NC
23	M2_PCIE2_TXN	24	NC
25	M2_PCIE2_TXP	26	NC
27	GND	28	NC
29	M2_PCIE1_RXN	30	NC
31	M2_PCIE1_RXP	32	NC
33	GND	34	NC
35	M2_PCIE1_TXN	36	NC
37	M2_PCIE1_TXP	38	NC
39	GND	40	NC

Pin	Definition	Pin	Definition
41	M2_PCIE0_RXN	42	NC
43	M2_PCIE0_RXP	44	NC
45	GND	46	NC
47	M2_PCIE0_TXN	48	NC
49	M2_PCIE0_TXP	50	M2_PCIE_RST#
51	GND	52	M2_PCIE_CLKREQ
53	M2_PCIE0_CLKN	54	NC
55	M2_PCIE0_CLKP	56	NC
57	GND	58	NC
59	KEY(Notch location)	60	KEY(Notch location)
61	KEY(Notch location)	62	KEY(Notch location)
63	KEY(Notch location)	64	KEY(Notch location)
65	KEY(Notch location)	66	SIM1_SELECT
67	NC	68	NC
69	PEDET	70	VDD_3V3
71	GND	72	VDD_3V3
73	GND	74	VDD_3V3
75	GND		

Mini-PCIe Connector (PCIe3.0 + USB3.2/2.0 Interface) for LTE Modules

Connector location: CN23

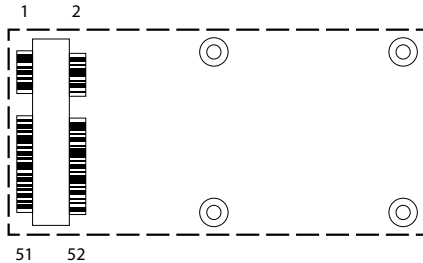


Pin	Definition	Pin	Definition
1	NC	2	V3.5G_P_A (+3.3V)
3	NC	4	GND
5	NC	6	NC/1.5V
7	PCIE_CLKREQ#	8	UIM1_PWR
9	GND	10	UIM1_DATA
11	BUF_PCIE_CLKN	12	UIM1_CLK
13	BUF_PCIE_CLKP	14	UIM1_RESET
15	GND	16	NC
17	NC	18	GND
19	NC	20	3.5G_DIS#_A
21	GND	22	3.5G_RST#_A
23	USB3.0_RX1N/PCIE_RXN	24	V3.5G_P_A (+3.3V)
25	USB3.0_RX1P/PIE_RXP	26	GND

Pin	Definition	Pin	Definition
27	GND	28	NC/1.5V
29	GND	30	NC
31	USB3.0_TX1N/PCIE_TXN	32	NC
33	USB3.0_TX1P/PCIE_TXP	34	GND
35	GND	36	USB_ON
37	GND	38	USB_OP
39	V3.5G_P_A(+3.3V)	40	GND
41	V3.5G_P_A(+3.3V)	42	LTE_LED#
43	GND	44	NC
45	NC	46	NC
47	NC	48	NC/1.5V
49	NC	50	GND
51	NC	52	V3.5G_P_A (+3.3V)

Mini-PCIe Connector (SATA 3.0 interface) for mSATA

Connector location: CN24



Pin	Definition	Pin	Definition
1	N.C	2	+V3.3_MINI (+3.3V)
3	N.C	4	GND
5	N.C	6	N.C
7	N.C	8	N.C
9	GND	10	N.C
11	N.C	12	N.C
13	N.C	14	N.C
15	GND	16	N.C
17	N.C	18	GND
19	N.C	20	N.C
21	GND	22	N.C
23	SATA1_RXP	24	+V3.3_MINI (+3.3V)
25	SATA1_RXN	26	GND

Pin	Definition	Pin	Definition
27	GND	28	N.C
29	GND	30	N.C
31	SATA1_TXN	32	N.C
33	SATA1_TXP	34	GND
35	GND	36	N.C
37	GND	38	N.C
39	+V3.3_MINI (+3.3V)	40	GND
41	+V3.3_MINI (+3.3V)	42	N.C
43	GND	44	N.C
45	N.C	46	N.C
47	N.C	48	N.C
49	N.C	50	N.C
51	N.C	52	+V3.3_MINI (+3.3V)

CHAPTER 4: SYSTEM SETUP

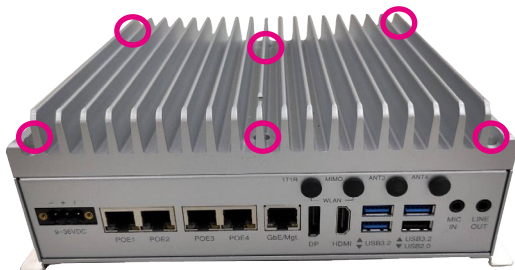
Installing expansion slots on the top and bottom side of VTC 7260 M/B



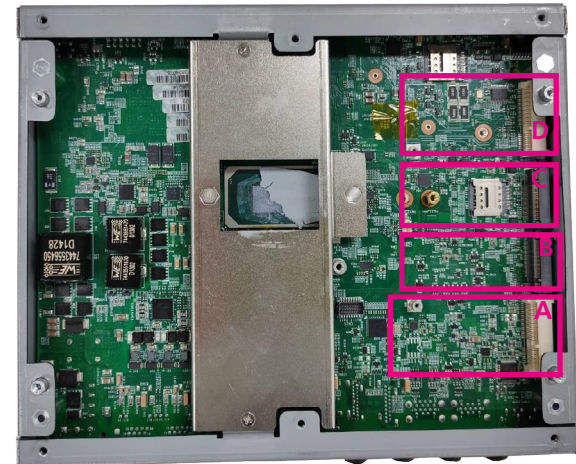
Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

1. To install the expansion slots on the top side of VTC 7260 M/B.


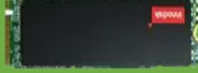




- Open the top case by losing the 6 screws as shown below.



- The user can find 4 expansion slots, marked with A, B, C and D on the M/B after removing the top case.



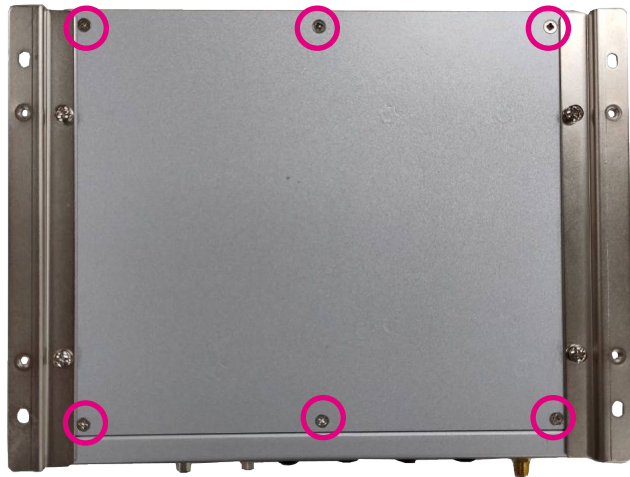
- The user can install what the modules per below the rule table.

mPCIe socket (SATA3.0)	 mSATA	
M.2 2280 keyM (PCIe4.0 x4)	 NVMe SSD	 Hailo AI card (PCIe x4)
M.2 3042/50/52 KeyB (USB3.2/USB2.0)	 LTE (cat4~cat16)	 5G NR
mPCIe socket (PCIe3.0, USB3.2/2.0)	 Wi-Fi / LTE module	

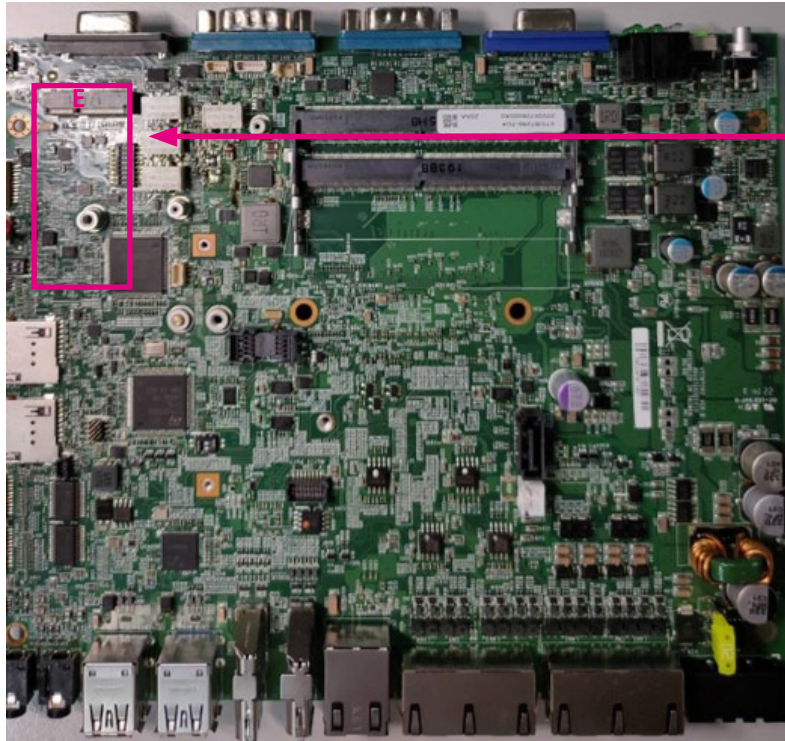
2. To install the expansion slots on the bottom side of VTC 7260 M/B.

- Open the bottom case by losing the 6 screws as shown below.

- The user can find one expansion slot, marked with E on the M/B after removing the bottom case.



- The user can install the modules per below the rule table.



M.2 2230 KeyE
(PCIe3.0 x2, USB2.0)



Wi-Fi 5/6 module



Hailo AI card (PCIe x2)

Install the Micro-SIM card

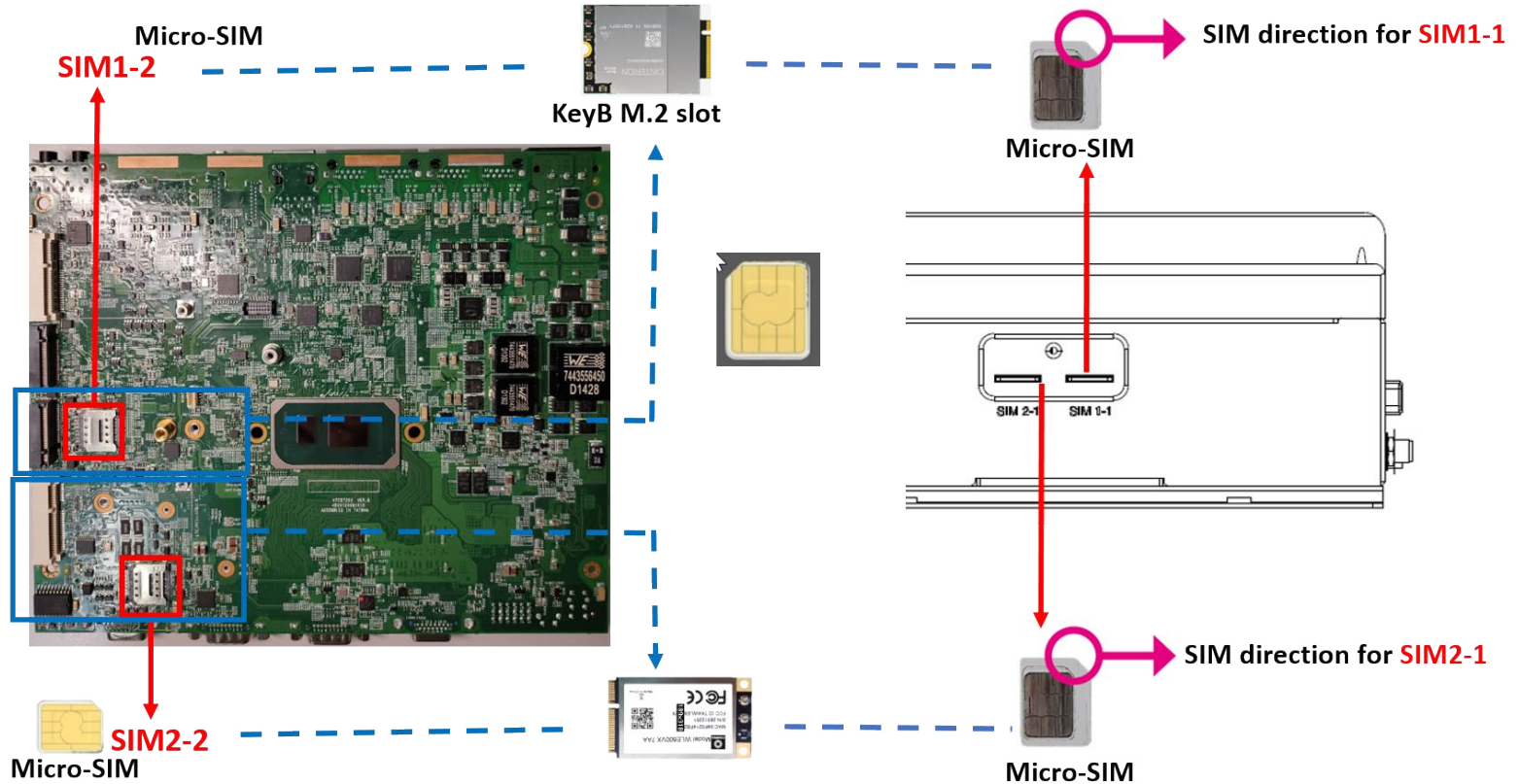
1. The SIM slots are on the side of the device. Please loosen the screw to remove the SIM door.
2. The user can see two Micro-SIM slots, one is named SIM1-1, the other is SIM2-1, after the SIM door is removed.
3. Please screw tight to cover the SIM slots after the SIM cards are installed.



SIM door

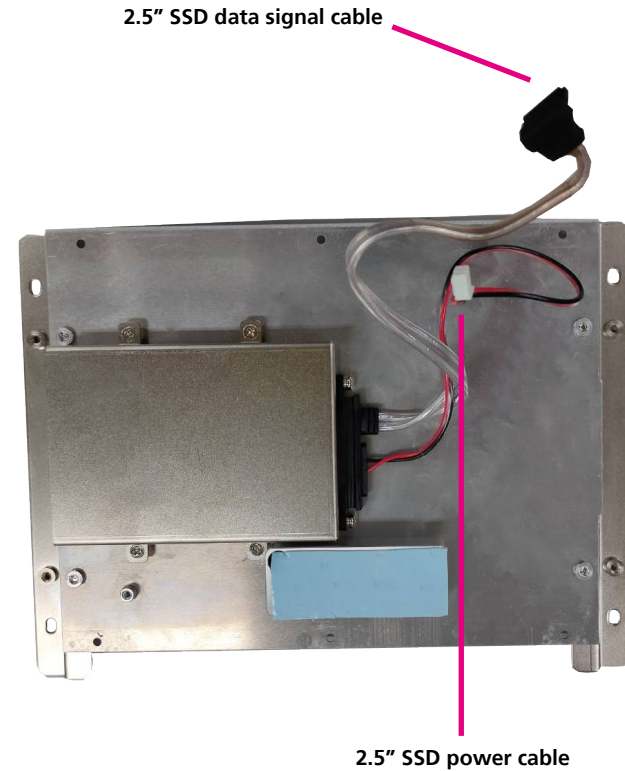


4. Please see the following diagram to install the SIM cards for each of those two LTE/5G modules. SIM1-1 & SIM1-2 are connected to LTE/5G module installed on KeyB M.2 slot; SIM2-1 & SIM2-2 are connected to LTE/5G module installed on mPCIe slot.

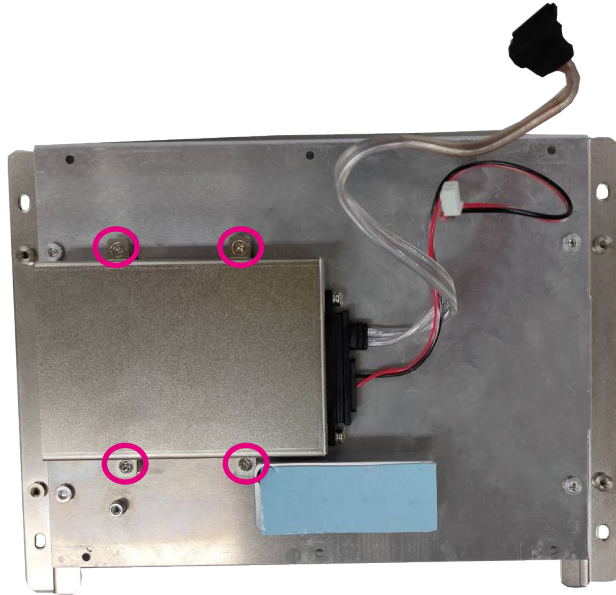


Installing a 2.5" SSD Storage

1. Open the bottom case to see a 2.5" SSD bay installed on the back.
Remove the 2.5" SSD power & data signal cable as shown.



2. To take out the 2.5" SSD kit, loosen the four screws as shown.

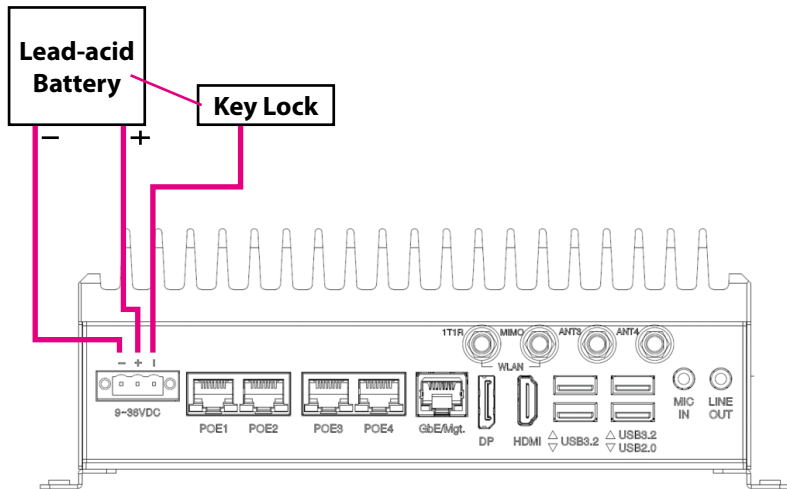


3. To take out the 2.5" SSD body, loosen the four screws as shown.

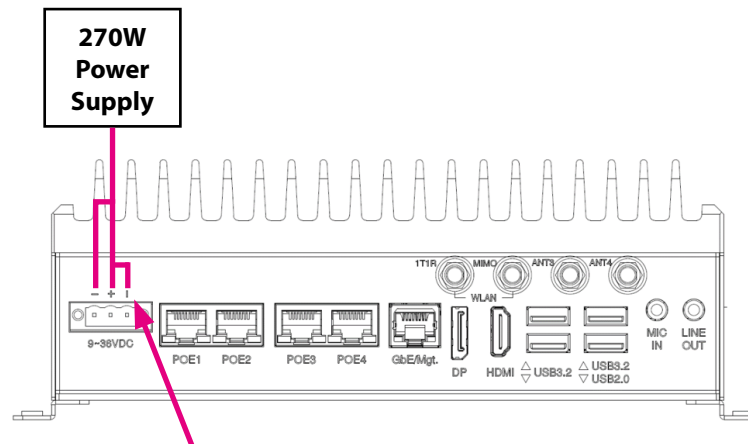


APPENDIX A: POWER CONNECTION

Scenario A: Power from the car (Lead-acid Battery)



Scenario B: Power from the power adapter (150W or above recommended)



Short the IGN pin to the power "+" to keep IGN always on high voltage level



Note: It is strongly recommended that an AWG#18 or above for the power connection.

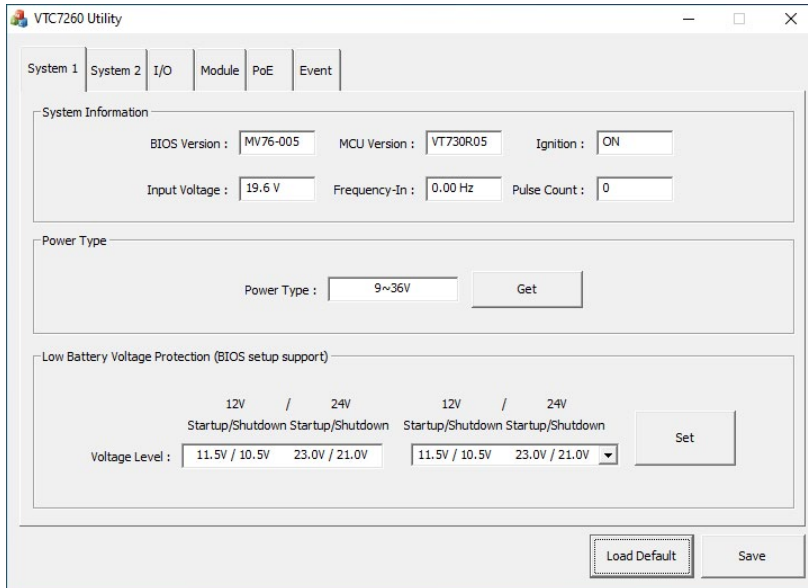


Note: Optional power adapter of 270W P/N, 740027002X00

APPENDIX B: SOFTWARE DEMO UTILITY FOR I/O PORTS OF FUNCTION CONTROL

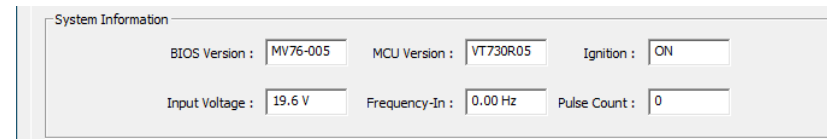
Menu Screen

1. System 1



1.1 System Information


Displays basic information of the system.



1.2 Power Type

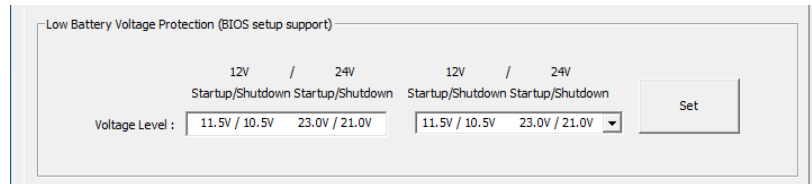
Shows one of the following power types for input voltage:

- 12VDC
- 24VDC
- 9~36VDC



1.3 Low Battery Voltage Protection

Enables or disables low battery voltage protection function. Once it is enabled, a total of 4 voltage level types can be selected.

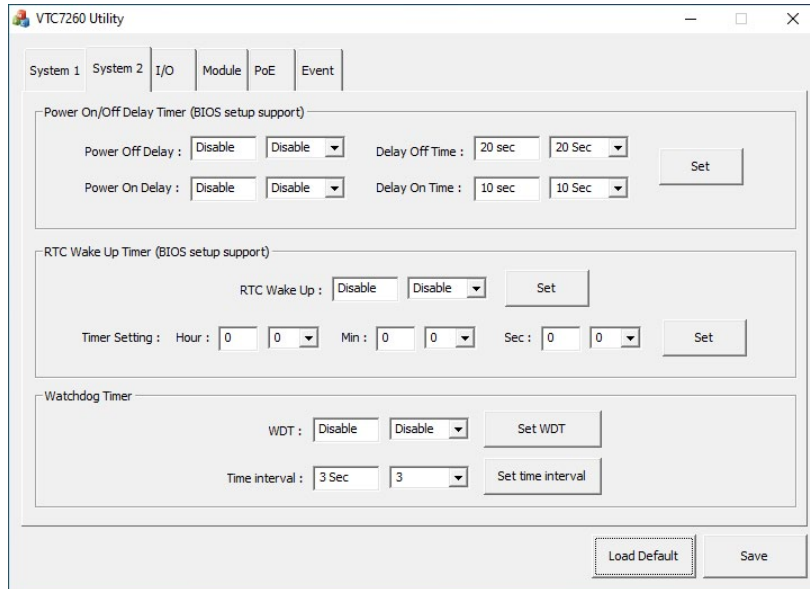


Low Battery Voltage Protection (BIOS setup support)

	12V	/	24V		12V	/	24V
	Startup/Shutdown		Startup/Shutdown		Startup/Shutdown		Startup/Shutdown
Voltage Level :	11.5V / 10.5V		23.0V / 21.0V		11.5V / 10.5V		23.0V / 21.0V

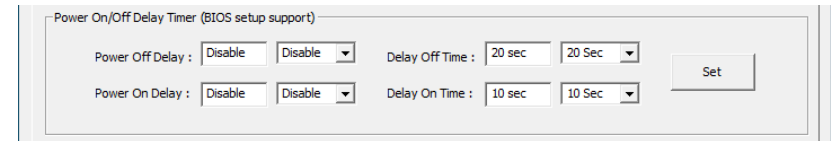
Set

2. System 2



2.1 Power On/Off Delay Timer

Enables or disables the Power On/Off Delay function. Once this function is enabled, the delay timer can be configured.



2.2 RTC Wake Up Timer

Enables or disables the RTC Wake Up function. Once this function is enabled, the timer can be configured.

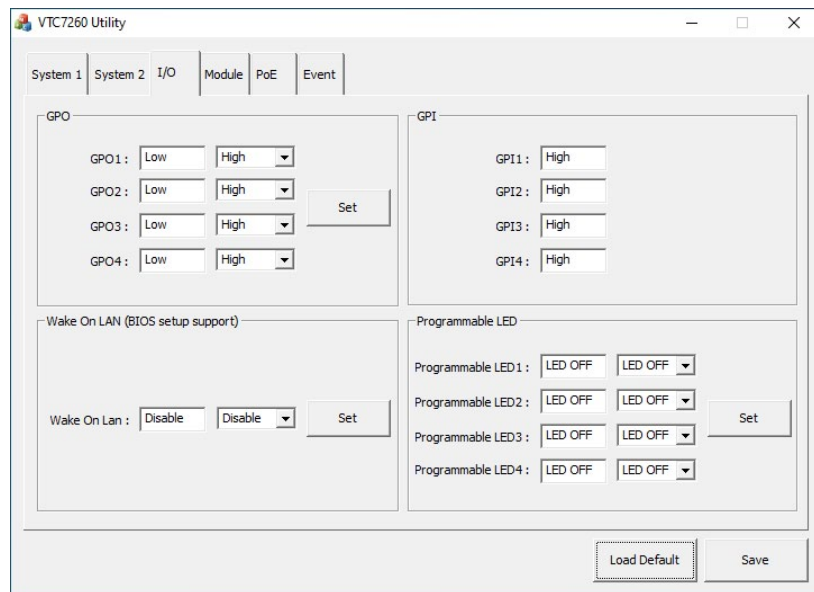


2.3 Watchdog Timer

Enables or disables the watchdog function. WDT timeout timer can be configured.

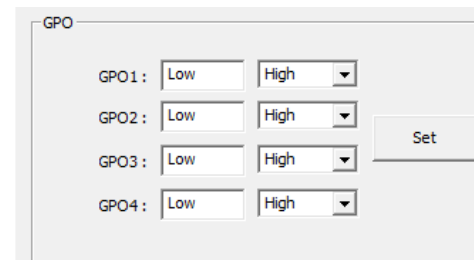


3. I/O



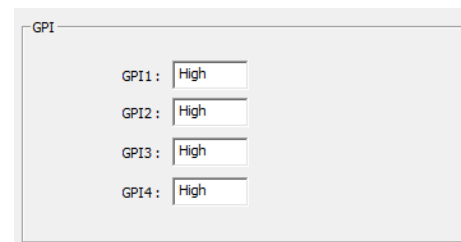
3.1 GPO

Configures GPO as high voltage level or low voltage level.



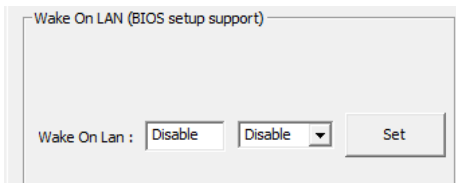
3.2 GPI

Reads the status (voltage level) of GPI.



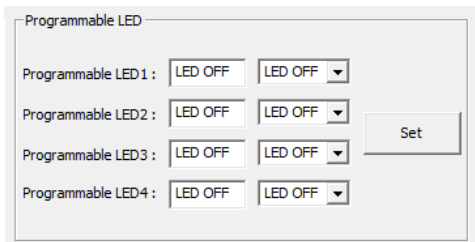
3.3 Wake on LAN

Enables or disables the Wake On LAN function on LAN.

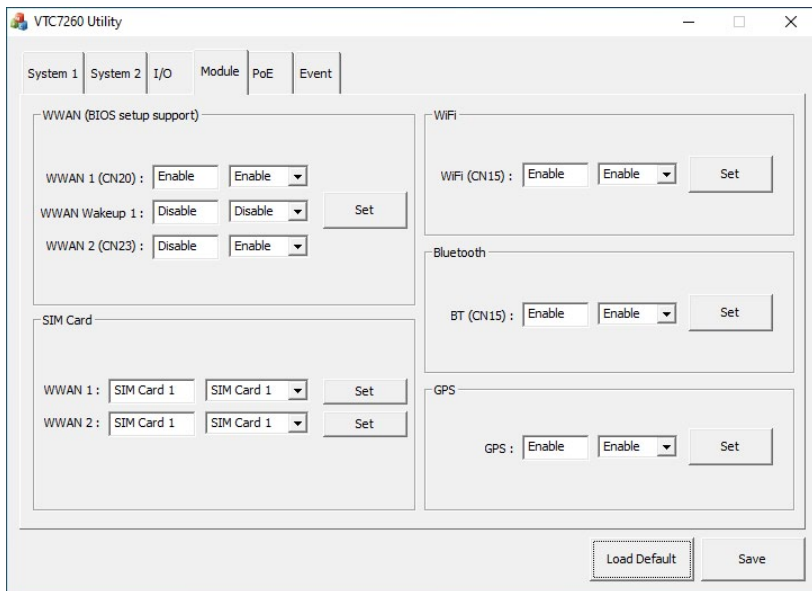


3.4 Programmable LED

Turns the LED light on or off.

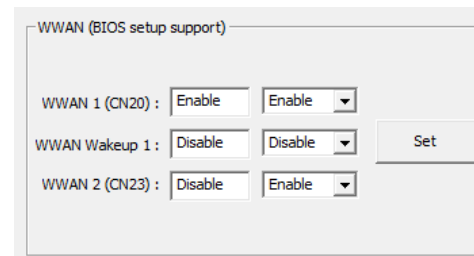


4. Module



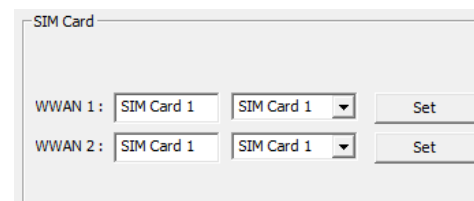
4.1 WWAN

Enables or disables the WWAN function and the wake-up function.



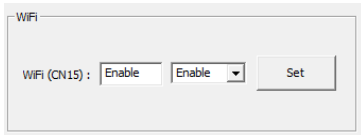
4.2 SIM Cards

Selects the SIM card for WWAN.



4.3 Wi-Fi

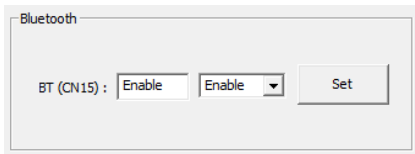
Enables or disables the Wi-Fi function.



The screenshot shows a window titled "WiFi". Inside the window, the text "WiFi (CN15) :" is followed by a text input field containing "Enable", a dropdown menu also displaying "Enable", and a "Set" button.

4.4 Bluetooth

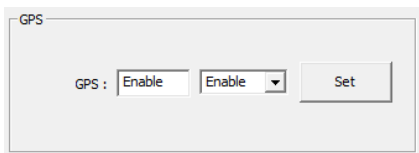
Enables or disables the Bluetooth function.



The screenshot shows a window titled "Bluetooth". Inside the window, the text "BT (CN15) :" is followed by a text input field containing "Enable", a dropdown menu also displaying "Enable", and a "Set" button.

4.5 GPS

Enables or disables the GPS function.



The screenshot shows a window titled "GPS". Inside the window, the text "GPS :" is followed by a text input field containing "Enable", a dropdown menu also displaying "Enable", and a "Set" button.

5. G-Sensor

The screenshot shows the LSM6DSL I2C0 V1.0 software interface. It has sections for Accelerometer and Gyroscope settings, and a Register Index section.

Accelerometer Settings:
 Output data rate: 6.66 kHz (dropdown), Full-scale: ±2 g (dropdown), Set button.
 X: -165, Y: 50, Z: -16141

Gyroscope Settings:
 Output data rate: 6.66 kHz (dropdown), Full-scale: 245 dps (dropdown), Set button.
 X: 279, Y: -77, Z: 429

Register Index:
 Reg Index (Hex): 0F, Data (Hex): 00, Read, Write buttons.

Register Table:

Num	Name	Type	Value	Description
00	RESERVED	-	00	Reserved
01	FUNC_CFG_ACCESS	r/w	00	Embedded functions configuration register
02	RESERVED	-	00	Reserved
03	RESERVED	-	00	Reserved
04	SENSOR_SYNC_TI...	r/w	00	Sensor sync configuration register
05	SENSOR_SYNC_RE...	r/w	00	Sensor sync configuration register
06	FIFO_CTRL1	r/w	00	FIFO configuration registers
07	FIFO_CTRL2	r/w	00	FIFO configuration registers
08	FIFO_CTRL3	r/w	00	FIFO configuration registers
09	FIFO_CTRL4	r/w	00	FIFO configuration registers

5.1 G-Sensor Registers

Selects the registers inside G-Sensor to read or write the data.

Reg Index (Hex): 0F, Data (Hex): 00, Read, Write buttons.

5.2 Register Table

Shows the value of all registers in G-Sensor, once the Refresh button is pressed.

Reg Index (Hex): 0F, Data (Hex): 00, Read, Write buttons.

Refresh button.

Num	Name	Type	Value	Description
00	RESERVED	-	00	Reserved
01	FUNC_CFG_ACCESS	r/w	00	Embedded functions configuration register
02	RESERVED	-	00	Reserved
03	RESERVED	-	00	Reserved
04	SENSOR_SYNC_TI...	r/w	00	Sensor sync configuration register
05	SENSOR_SYNC_RE...	r/w	00	Sensor sync configuration register
06	FIFO_CTRL1	r/w	00	FIFO configuration registers
07	FIFO_CTRL2	r/w	00	FIFO configuration registers
08	FIFO_CTRL3	r/w	00	FIFO configuration registers
09	FIFO_CTRL4	r/w	00	FIFO configuration registers

6. PoE

The screenshot shows the VTC7260 Utility window with the PoE tab selected. The interface includes a table for port configuration and a total output field.

	Output (Watt)	Link Status	Power
Port 1 :	0	Unknow, Unknow	Power off
Port 2 :	0	Unknow, Unknow	Power off
Port 3 :	0	Unknow, Unknow	Power off
Port 4 :	0	Unknow, Unknow	Power off

Total Output (W) : 0

Buttons: Load Default, Save

Fan Mode (BIOS setup support)

Fan Mode : Smart Smart Set

Fan PWM (BIOS setup support)

CPU Fan : 30

Top Fan : 100 Set

Fan Kit : 100

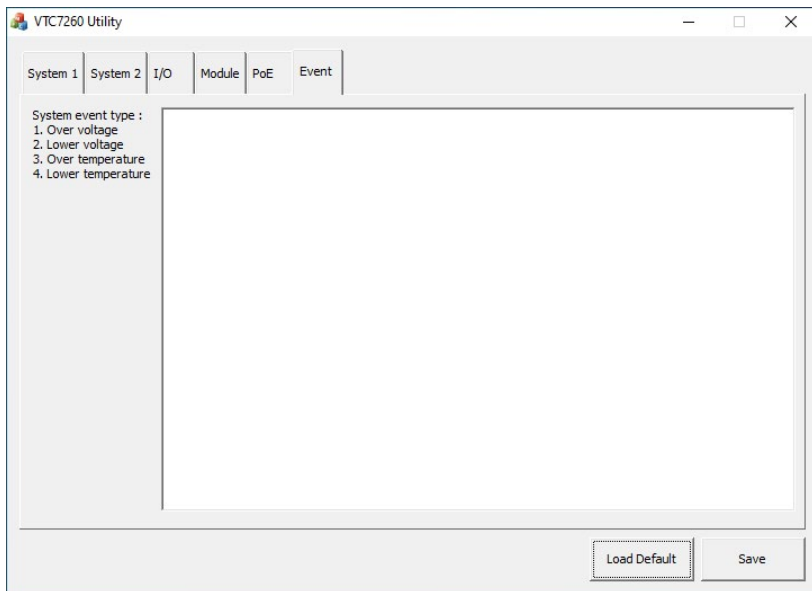
Fan monitor

CPU Fan : 0 rpm

Top Fan : 0 rpm

Fan Kit : 1834 rpm

7. Event



The Event tab shows the following alarm messages:

1. Over voltage alarm
2. Lower voltage alarm
3. Over temperature alarm
4. Lower temperature alarm
5. Fan error alarm

APPENDIX C: GPS FEATURE

uBlox-NEO M8 Overview

The NEO-M8 series of standalone concurrent GNSS modules is built on the exceptional performance of the u-blox M8 GNSS (GPS, GLONASS, Galileo, BeiDou, QZSS and SBAS) engine in the industry proven NEO form factor.

The NEO-M8 series provides high sensitivity and minimal acquisition times while maintaining low system power. The NEO-M8M is optimized for cost sensitive applications, while NEO-M8N and NEO-M8Q provide best performance and easier RF integration. The NEO form factor allows easy migration from previous NEO generations. Sophisticated RF-architecture and interference suppression ensure maximum performance even in GNSS-hostile environments.

The NEO-M8 combines a high level of robustness and integration capability with flexible connectivity options. The future-proof NEO-M8N includes an internal Flash that allows simple firmware upgrades for supporting additional GNSS systems. This makes NEO-M8 perfectly suited to industrial and automotive applications.

The DDC (I²C compliant) interface provides connectivity and enables synergies with most u-blox cellular modules. For RF optimization the NEO-M8N/Q features an additional front-end LNA for easier antenna integration and a front-end SAW filter for increased jamming immunity.

u-blox M8 modules use GNSS chips qualified according to AEC-Q100, are manufactured in ISO/TS 16949 certified sites, and fully tested on a system level. Qualification tests are performed as stipulated in the ISO16750 standard: “Road vehicles – Environmental conditions and testing for electrical and electronic equipment”.

Technical Specifications

Features

Receiver type	72-channel u-blox M8 engine GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B1 SBAS L1 C/A: WAAS, EGNOS, MSAS Galileo-ready E1B/C (NEO-M8N)		
Nav. update rate¹	Single GNSS: up to 18 Hz Concurrent GNSS: up to 10 Hz		
Position accuracy	2.0 m CEP		
		NEO-M8N/Q	NEO-M8M
Acquisition	Cold starts:	26 s	27 s
	Aided starts:	2 s	4 s
	Reacquisition:	1 s	1 s
Sensitivity	Tracking & Nav:	-167 dBm	-164 dBm
	Cold starts:	-148 dBm	-147 dBm
	Hot starts:	-156 dBm	-156 dBm
Assistance	AssistNow GNSS Online AssistNow GNSS Offline (up to 35 days) AssistNow Autonomous (up to 6 days) OMA SUPL & 3GPP compliant		
Oscillator	TCXO (NEO-M8N/Q), Crystal (NEO-M8M)		
RTC crystal	Built-in		
Noise figure	On-chip LNA (NEO-M8M). Extra LNA for lowest noise figure (NEO-M8N/Q)		

Features cont.

Anti jamming	Active CW detection and removal. Extra onboard SAW band pass filter (NEO-M8N/Q)
Memory	ROM (NEO-M8M/Q) or Flash (NEO-M8N)
Supported antennas	Active and passive
Odometer	Travelled distance
Data-logger	For position, velocity, and time (NEO-M8N)

¹ For NEO-M8M/Q

Electrical data

Supply voltage	1.65 V to 3.6 V (NEO-M8M) 2.7 V to 3.6 V (NEO-M8N/Q)
Power consumption²	23 mA @ 3.0 V (continuous) 5 mA @ 3.0 V Power Save Mode (1 Hz, GPS only)
Backup Supply	1.4 to 3.6 V

² NEO-M8M

Interfaces

Serial interfaces	1 UART 1 USBV2.0 full speed 12 Mbit/s 1 SPI (optional) 1 DDC (I ² C compliant)
Digital I/O	Configurable timepulse 1 EXTINT input for Wakeup
Timepulse	Configurable 0.25 Hz to 10 MHz
Protocols	NMEA, UBX binary, RTCM

VIOB-GPS-02 Module Connector Pin Definitions



J2 (GPS Side)



J9 (PC Side)

J2 Pin Definition

Pin	Definition	Pin	Definition
1	GPS_3V3	2	GND
3	GPS_TXD_M	4	GPS_RXD_M
5	NC	6	+V3.3ALW

J9 Pin Definition

Pin	Definition	Pin	Definition
1	GPS_BAT	2	GPS_LED#
3	GPS_TX	4	GPS_RX
5	GND	6	VCC3_GPS

COM Port for GPS: COM 4
Baud Rate: 9600

uBlox-NEO M9N Overview

The NEO-M9N-00B GNSS receiver features the u-blox M9 standard precision GNSS platform, and provides exceptional sensitivity and acquisition times for all L1 GNSS systems. u-blox M9 receivers are available in different variants to serve automotive and industrial tracking applications, such as navigation, telematics and UAVs.

The u-blox M9 standard precision GNSS platform, which delivers meter-level accuracy, succeeds the well-known u-blox M8 product range.

u-blox M9 receivers support concurrent reception of four GNSS. The high number of visible satellites allows the receiver to select the best signals. This maximizes the position accuracy, in particular under challenging conditions such as deep urban canyons.

u-blox M9 receivers detect jamming and spoofing events and report them to the host, which allows the system to react to such events. Advanced filtering algorithms mitigate the impact of RF interference and jamming, thus enabling the product to operate as intended.

The receiver also provides higher navigation rate and improved security features compared to previous u-blox GNSS generations.

The NEO-M9N-00B module is available in the 12.2 x 16.0 mm NEO form factor LCC package.

Technical Specifications

Features

Receiver type	92-channel u-blox M9 engine GPS L1 C/A, QZSS L1 C/A/S, GLONASS L10F BeiDou B1I, Galileo E1B/C SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN	
Nav. update rate	Up to 25 Hz (4 concurrent GNSS)	
Horizontal position accuracy	1.5 m CEP (with SBAS) 2.0 m CEP (without SBAS)	
Acquisition¹	Cold starts:	24 s
	Aided starts:	2 s
	Hot start:	2 s
Sensitivity¹	Tracking & Nav:	-167 dBm
	Reacquisition:	-160 dBm
	Cold start:	-148 dBm
	Hot start:	-159 dBm

Tracking features

Power save modes	On/off, cyclic
Data batching	Autonomous tracking up to 5 minutes
Data-logger	Position, velocity, time, and odometer data
Geofencing	Up to 5 circular areas; Software message or GPIO for waking up the host CPU

Security features

Signal integrity	RF interference & jamming detection and reporting Active GNSS in-band filtering Spoofing detection and reporting
Device integrity	Secure boot of firmware downloaded from host or flash Receiver configuration lock by command
Secure interference	Signed UBX messages (SHA-256) JTAG port locked

Electrical data

Power supply	2.7V to 3.6V
Power Consumption¹	36 mA at 3.0 V (4 GNSS continuous) 32 mA at 3.0 V (2 GNSS continuous) 28 mA at 3.0 V (1 GNSS continuous)
Backup Supply	1.65 V to 3.6 V

Package

24 pin LCC (Leadless Chip Carrier): 12.2 x 16.0 x 2.4 mm, 1.6 g

Environmental data, quality & reliability

Operating temp.	-40°C to +85°C
Storage temp.	-40°C to +85°C
Environmental grade	2015/863/EU RoHS-3
EMC	2014/53/EU RED
Environmental testing	ISO 16750
Quality management	Manufactured and fully tested in IATF 16949 certified production sites

Interfaces

Signal integrity	1 UART 1 USB (NEO-M9N) 1 SPI (optional) 1 DDC (I2C compliant)
Digital I/O	Configurable timepulse 1 EXTINT input for Wakeup
Raw Data output	Code phase data
Timepulse	Configurable: 0.25 Hz to 10 MHz
Supported antennas	Active and passive
Protocols	NMEA 4.10, UBX binary, RTCM 3.3

Services

Assistance GNSS	AssistNow Online AssistNow Offline (up to 35 days) AssistNow Autonomous (up to 6 days) OMA SUPL & 3GPP compliant
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Supported products

XPLR-M9	u-blox M9 GNSS Explorer Kit with easy-to-use software for first product evaluation
EVK-M91	u-blox M9 GNSS Evaluation Kit with UBX-M9140 chip and I/O interface

Product variants

NEO-M9N	u-blox M9 concurrent GNSS LCC module, upgradeable firmware in flash, USB interface, flash memory, SAW filter, LNA
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APPENDIX D: GPS WITH DEAD RECKONING FEATURE

uBlox-NEO M8L Overview

The NEO-M8L standalone concurrent GNSS module with 3D dead-reckoning (DR) is built on the exceptional performance of the u-blox M8 concurrent GNSS (GPS, GLONASS, Galileo-ready¹, BeiDou, QZSS and SBAS) engine in the compact and industry proven NEO form factor.

The NEO-M8L delivers a complete, self-contained solution for road-vehicle Automotive Dead Reckoning (ADR) applications in an exceptionally compact 16 x 12 mm form-factor. The module combines information from GNSS, on-board 3-Dimensional inertial sensors, and speed data from the vehicle to deliver continuous navigation in road-vehicle applications. Its size and features make it suitable for aftermarket and first-fit navigation and Telematics applications. Position measurement rates of up to 2 Hz are available with optional extrapolation (based on vehicle dynamics) extending reporting rates to 20 Hz. Inertial sensor measurements are available to external applications at rates up to 10 Hz.

For ease of application, both hardware and message interfaces are supported for vehicle speed. u-blox' ADR and GNSS technologies deliver continuous and accurate positioning throughout the journey. u-blox' tightly-coupled navigation solution delivers significant improvements in navigation accuracy, especially in difficult urban environments. Dead reckoning sensors in conjunction with speed information from the vehicle also provide navigation before GNSS signals are acquired and during periods of complete signal loss. The introduction of three dimensional sensing and signal processing (for both acceleration and direction) extend accurate navigation to urban multi-level highways and car-parks as well as extending dead-reckoned range in tunnels and urban canyons. 3D sensing also enables flexibility in orientation of the receiver with respect to the vehicle frame.

The NEO form factor allows easy migration from previous NEO generations. Sophisticated RF architecture and interference suppression ensure maximum performance even in GNSS-hostile environments. The NEO-M8L module includes an internal Flash that allows simple firmware upgrades. These features make the NEO-M8L perfectly suited to industrial and automotive applications. UART, SPI and DDC (I²C compatible) interfaces provide connectivity and enable synergies with most u-blox cellular modules.

u-blox M8 modules use GNSS chips qualified according to AEC-Q100, and are manufactured in ISO/TS 16949 certified sites. Qualification tests are performed as stipulated in the ISO16750 standard: "Road vehicles - Environmental conditions and testing for electrical and electronic equipment".

u-blox' AssistNow Assistance services supply aiding information, such as ephemeris, almanac and time, reducing the time to first fix significantly and improving acquisition sensitivity. The u-blox M8 generation extends validities of AssistNow Offline data (up to 35 days) and AssistNow Autonomous data (up to 6 days), providing the benefits of faster acquisition for longer durations since last use.

¹ With future flash firmware update.

Technical Specifications

Parameter	Specification			
Receiver type	72-channel u-blox M8 engine GPS L1C/A, SBAS L1C/A, QZSS L1C/A GLONASS L1OF, BeiDou B1, Galileo E1B/C ²			
GNSS	GPS & GLONASS	GPS & BeiDou	GPS	
Time-To-First-Fix³	Cold start	27 s	28 s	30 s
	Hot start	1.5 s	1.5 s	1.5 s
	Aided starts ⁴	4 s	6 s ⁵	3 s
Sensitivity⁶	Tracking & Navigation ⁷	-160 dBm	-160 dBm	-160 dBm
	Reacquisition	-159 dBm	-159 dBm	-159 dBm
	Cold start	-147 dBm	-147 dBm	-147 dBm
	Hot start	-156 dBm	-156 dBm	-156 dBm
Navigation	GPS & GLONASS	GPS & BeiDou	GPS	
Horizontal Position accuracy⁸	Autonomous	2.5 m	2.5 m	2.5 m
	SBAS	2.0 m	2.0 m	2.0 m
Velocity accuracy⁹		0.05 m/s	0.05 m/s	0.05 m/s
Heading accuracy⁹		0.3 degree	0.3 degree	0.3 degree
ADR position error¹⁰	Gyro + speed pulse + accelerometer		typ. 3 % of distance travelled without GNSS	
Frequency of time pulse signal			0.25 Hz ... 10 MHz	
Maximum navigation rate (High Rate output)¹¹			20 Hz	

Navigation	GPS & GLONASS	GPS & BeiDou	GPS	
Maximum navigation rate (Measurement rate)		2 Hz		
Navigation latency¹²		300 ms nominal		
Maximum sensor measurement message output rate		10 Hz		
Sensor measurement message output bandwidth¹³		nominal 50% of output rate		
Accuracy of time pulse signal	RMS 99%	30 ns 60 ns	30 ns 60 ns	30 ns 60 ns
Operational limits	Dynamics		≤ 4G	
	Altitude		50,000m	
	Velocity		500 m/s	

² Ready to support Galileo E1B/C when available with a flash firmware update

³ All signals at -130 dBm

⁴ Dependent on aiding data connection speed and latency

⁵ BeiDou assisted acquisition is not available

⁶ Demonstrated with a good external LNA

⁷ Optimized for best navigation performance with dead-reckoning

⁸ GNSS fix available, CEP, 50%, 24 hours static, -130dBm, > 6 SVs

⁹ GNSS fix available, 50% @ 30 m/s

¹⁰ Typical road and vehicle conditions

¹¹ For update rates > 2 Hz, extrapolation techniques are applied.

¹² Dependent on signal conditions but measurements are delivered with time-stamp corresponding to measurement time

¹³ Higher bandwidths are used for navigation

¹⁴ Assuming Airborne < 4 g platform

VIOB-GPS-DR02/VTK-GPS-DR02 Module Connector Pin Definitions



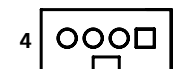
J2 (GPS Side)



J9 (PC Side)



J3 (GPS Side)



J8 (PC Side)

J2 Pin Definition

Pin	Definition	Pin	Definition
1	GPS_3V3	2	GND
3	GPS_TXD_M	4	GPS_RXD_M
5	NC	6	+V3.3ALW

J9 Pin Definition

Pin	Definition	Pin	Definition
1	GPS_BAT	2	GPS_LED#
3	GPS_TX	4	GPS_RX
5	GND	6	VCC3_GPS

COM Port for GPS: COM 4
Baud Rate: 9600

J3 Pin Definition

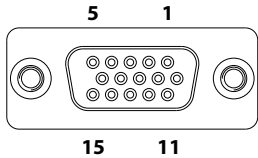
Pin	Definition	Pin	Definition
1	DR_DIRECTIO_M_R	2	DR_ODOMETER_M_R
3	1PPS_R	4	GND

J8 Pin Definition

Pin	Definition	Pin	Definition
1	GND	2	1PPS
3	DR_ODOMETER_M	4	DR_DIRECTIO_M

APPENDIX E: SIGNAL CONNECTION OF DI/DO

GPIO Pinout Description



Pin	Definition	Pin	Definition
1		2	
3	GPO3	4	GPI1
5	GPO0	6	
7		8	
9	GPI2	10	GPO1
11		12	
13	GPI3	14	GPO2
15	GPI0		

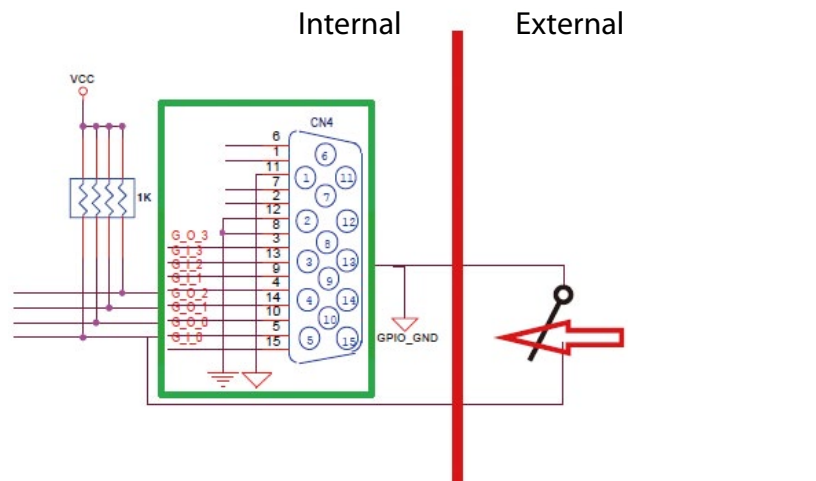
Digital Input

CN12 connector for GPI signal (digital signal input). The CN12 connector has 4 digital input channels by default.

Wet Contact (default)

The SW2 switch needs to switch to “ON” state. The GPI signals have a pull up resistor to Vin Voltage internally.

The figure below shows how to connect an external source to one of the input channels.

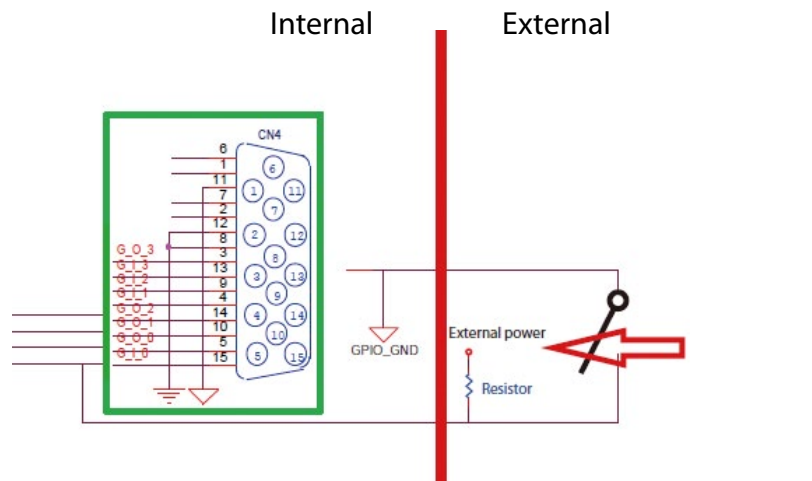


External Switch	Port	GPI Register
ON (Short)	GND	0
OFF (Open)	OPEN	1

Dry Contact:

The SW2 switch needs to switch to “Low” state. The GPI signal will not have a pull up resistor internally.

The figure below shows how to connect an external source to one of the input channels.



External Switch	Port	GPI Register
ON (Short)	GND	0
OFF (Open)	HIGH	1

Digital Output

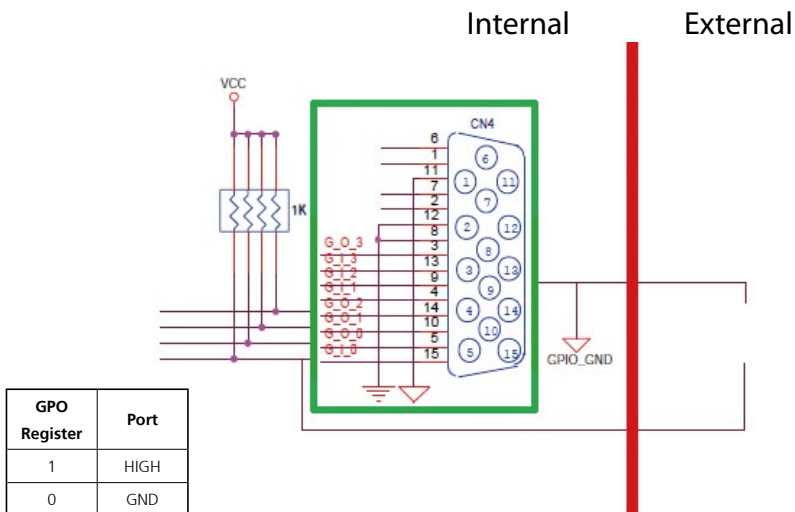
CN12 connector for GPO signal (digital signal output). The CN12 connector has 4 digital output channels by default.

The signal connection of CN12 supports two connected methods for output signal type. One is Low level (driven to 0V from GPO signal) other is High level (high voltage is provided from external device).

Wet Contact (default)

The SW2 switch needs to switch to “ON” state. The GPO signal will have a pull up resistor to Vin Voltage internally.

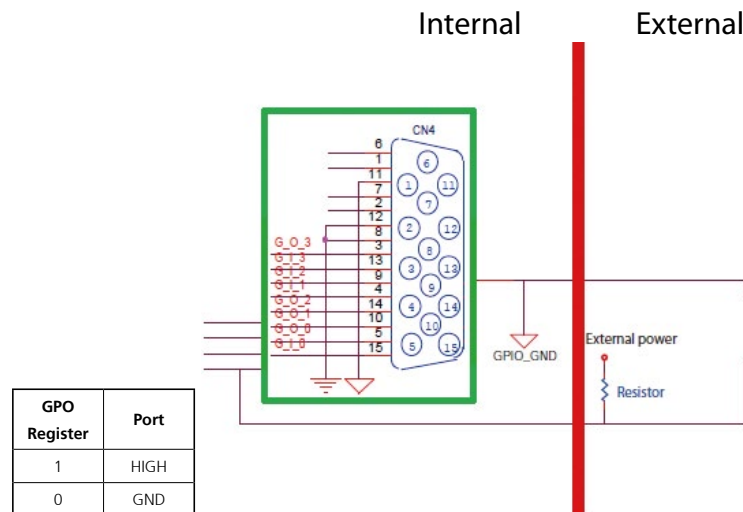
The figure below shows how to connect an external source to one of the output channels.



Dry Contact

The SW2 switch needs to switch to “Low” state. The GPO signal will not have a pull up resistor internally.

The figure below shows how to connect an external source to one of the output channels.



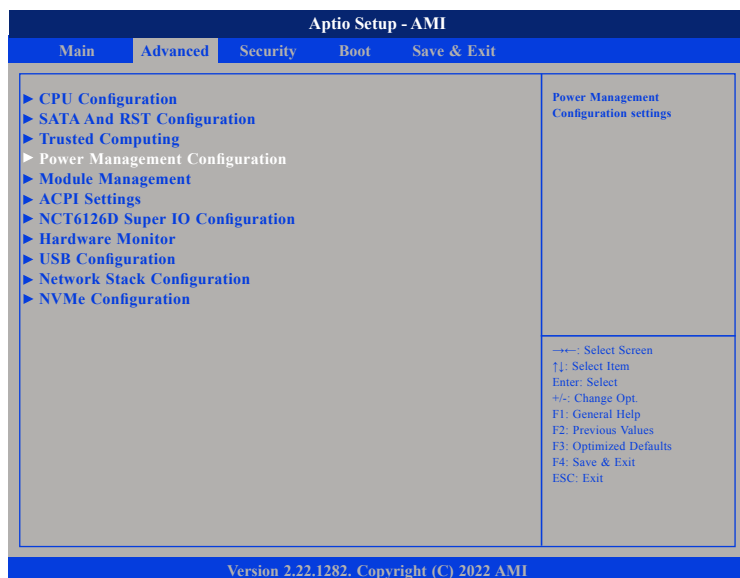
APPENDIX F: VEHICLE POWER MANAGEMENT SETUP

Startup and Shutdown Voltage Setting

Set the startup voltage to 11.5V or 23V and the shutdown voltage to 10.5V or 21V

If the input voltage is 12V: the startup voltage to 11.5V and the shutdown voltage to 10.5V.

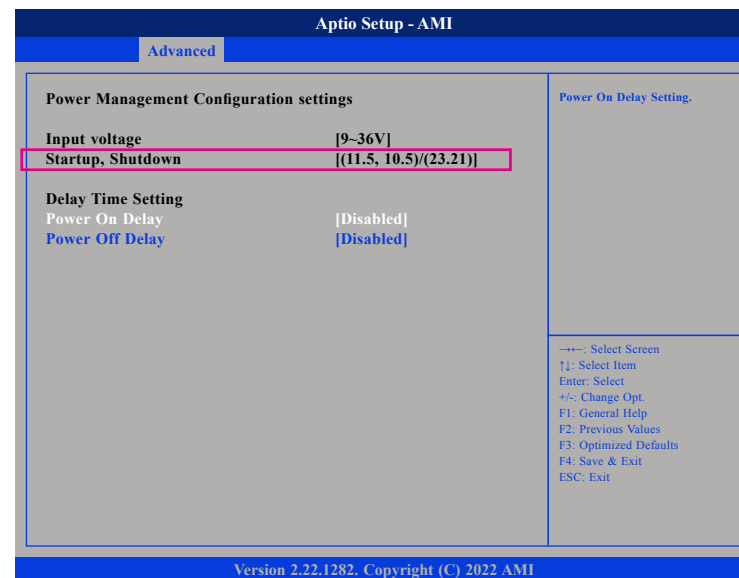
If the input voltage is 24V: the startup voltage to 23V and the shutdown voltage to 21V.



Set the startup voltage to 12.0V or 24V and the shutdown voltage to 11.0V or 22V

If the input voltage is 12V: the startup voltage to 12V and the shutdown voltage to 11V.

If the input voltage is 24V: the startup voltage to 24V and the shutdown voltage to 22V.



Set the startup voltage to 12.5V or 25V and the shutdown voltage to 11.0V or 22V

If the input voltage is 12V: the startup voltage to 12.5V and the shutdown voltage to 11V.

If the input voltage is 24V: the startup voltage to 25V and the shutdown voltage to 22V.

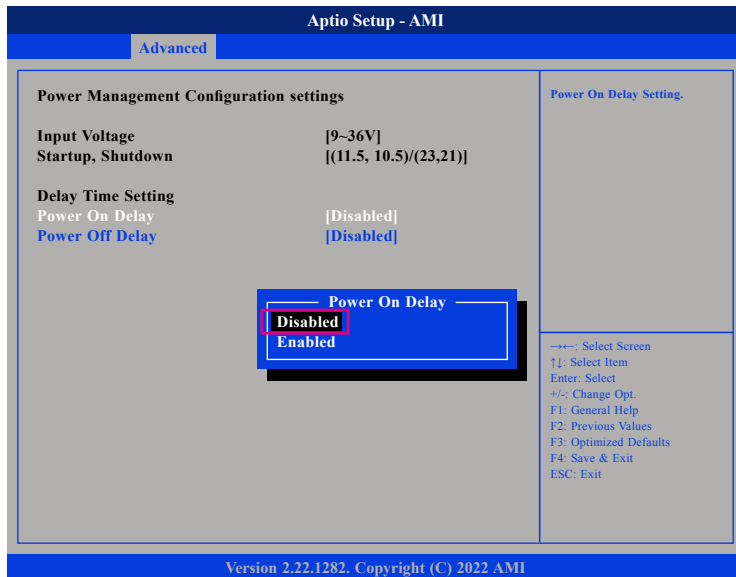
Set the startup voltage to 12.5V or 25V and the shutdown voltage to 11.0V or 22V

If the input voltage is 12V: the startup voltage to 12.5V and the shutdown voltage to 11.5V.

If the input voltage is 24V: the startup voltage to 25V and the shutdown voltage to 23V.

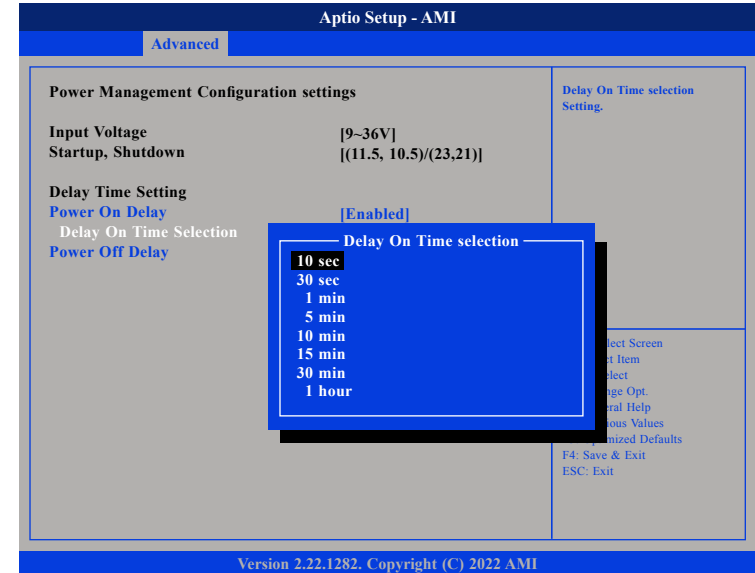
Power-on Delay Setting

Disable Power-on Delay



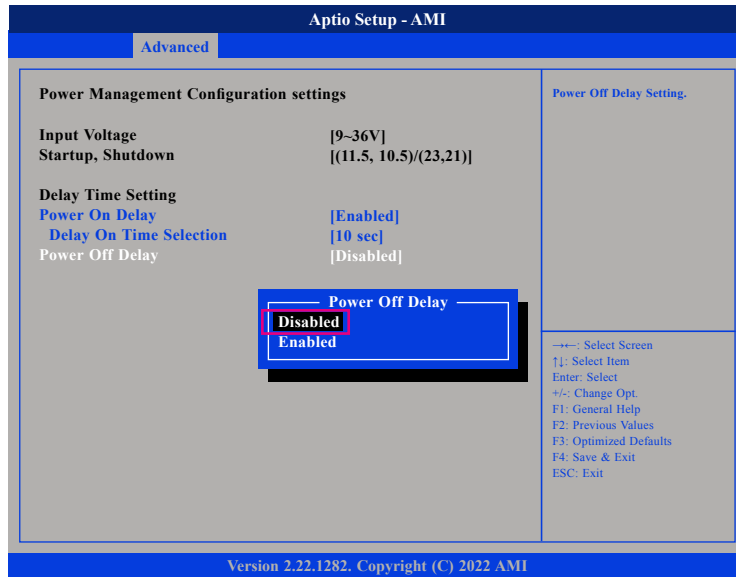
Enable Power-on Delay

Delay time can be set at 10sec/30sec/1min./5min./10min./15min./30min./1hour.



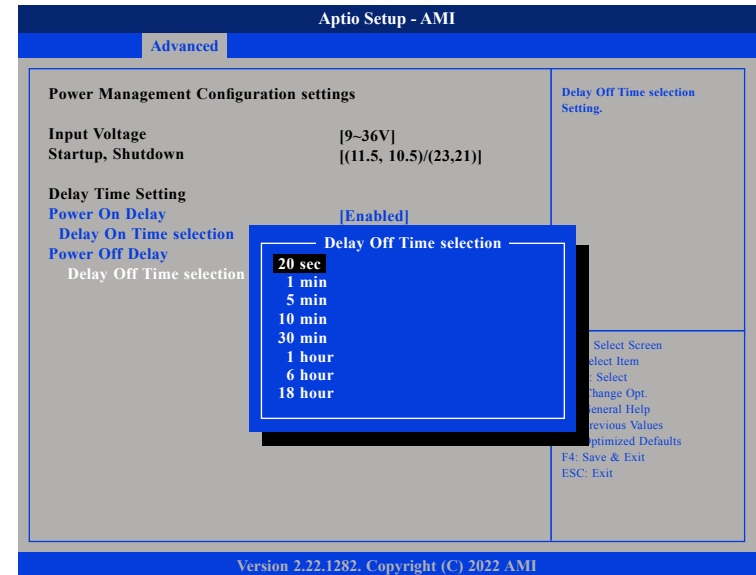
Power-off Delay Setting

Disable Power-off Delay



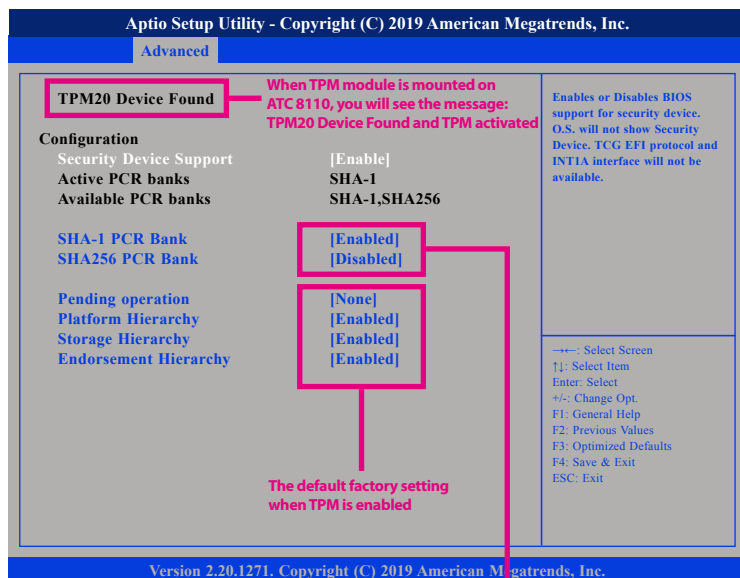
Enable Power-off Delay

Delay time can be set at 20sec/1min./5min./10min./30min./1hour/6hour/18hour.



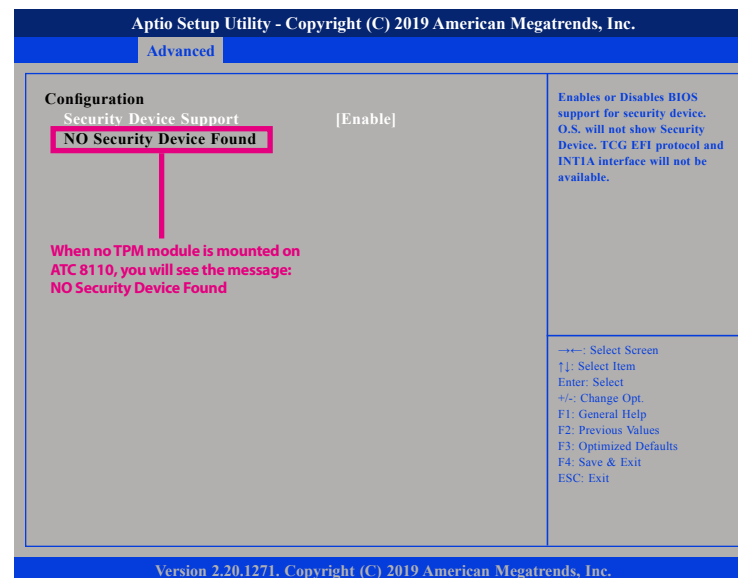
APPENDIX G: TPM SETUP

BIOS Screen with TPM Module



The user can select SHA-1 or SHA256 as the encryption method used by the TPM module

BIOS Screen with No TPM Module



APPENDIX H: POWER CONSUMPTION

OS: Windows 10

Burn-in Software:

Test Condition: Room temperature

Test Procedure: Idle, Full, Full+load and IGN OFF

Device: VTC 7260

Idle: Into OS + Display x2 + keyboard & mouse + audio + Audio + All Storage (Storage x1 Total 7w + mSATA)

Full State: Idle State, Module (RM500Q + AX210), Mini Card Dummy Load (4.36w+3.3w), Burn In 100% (CPU+2D+3D+Disk+Sound+RAM+Video Playback+GPU), play video, COM trans (COM1+COM2), GPS link

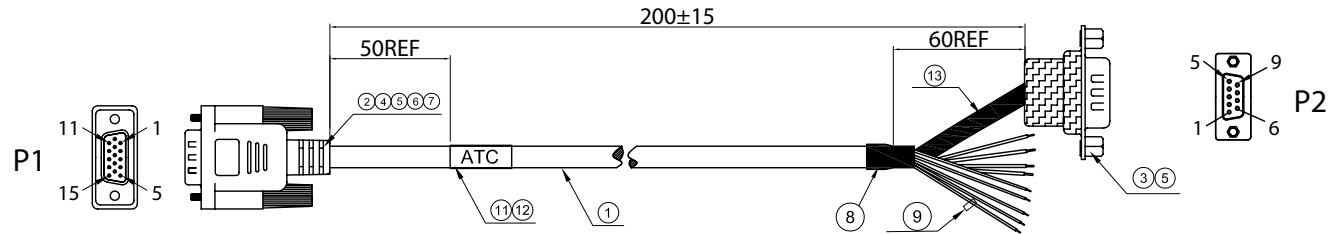
Full State + Loading: Full state + USB Load: USB 3.0 (5V/1A x3) / USB 2.0 (5V/1A x1) + PoE (60W)

Item	Device	Test Case		Result			
				Average		Maximum	
				Current(A)	Watt(W)	Current(A)	Watt(W)
1	S0 State Core i7-1185GRE (2.8GHz) 28W	Idle state	12V	1.56	18.72	3.02	36.24
			24V	0.79	18.96	1.47	35.28
			36V	0.54	19.44	1.04	37.44
		Full-run state (Burn-In)	12V	3.02	36.24	3.21	38.52
			24V	1.48	35.52	1.59	38.16
			36V	1.03	37.08	1.11	39.96
		Full-run state + loading	12V	4.36	52.32	4.55	54.6
			24V	2.17	52.08	2.27	54.48
			36V	1.53	55.08	1.62	58.32
		Full-run state + loading (PoE w/ 60W)	12V	10.67	128.04	11.1	133.2
			24V	4.82	115.68	4.95	118.8

Item	Device	Test Case		Result			
				Average		Maximum	
				Current(A)	Watt(W)	Current(A)	Watt(W)
2	S0 State Core i3-115GRE 28W	Idle state	12V	1.52	18.24	3.21	38.52
			24V	0.85	20.4	1.75	42
			36V	0.7	25.2	1.28	46.08
		Full-run state (Burn-In)	12V	3.25	39	3.82	45.84
			24V	1.74	41.76	2.09	50.16
			36V	1.32	47.52	1.52	54.72
		Full-run state + loading	12V	4.41	52.92	4.93	59.16
			24V	2.33	55.92	2.52	60.48
			36V	1.71	61.56	1.88	67.68
	Full-run state + loading (PoE w/ 60W)	12V	9.95	119.4	10.45	125.4	
		24V	4.77	114.48	5.08	121.92	
		36V	3.21	115.56	3.37	121.32	
3	S3 State	Full state Sleep mode	12V	0.23	2.75	N/A	N/A
			12V wake up WWAN	0.23	2.76	N/A	N/A
4	IGN OFF	Full state IGNITION OFF	12V	0.009	0.108	N/A	N/A
			12V wake up WWAN	0.055	0.66	N/A	N/A
			24V	0.008	0.192	N/A	N/A
			24V wake up WWAN	0.035	0.84	N/A	N/A
			36V	0.008	0.288	N/A	N/A
			36V wake up WWAN	0.028	1.008	N/A	N/A

APPENDIX I: CABLE INFORMATION

Multi-port DB15 External Cable



Pin Assignment

P1	Label Description	P2
2	Red	ODOMETER
3	YELLOW	GO3
4	BLUE	G11
5	PURPLE	GO0
7	GRAY	DIRECTION
8	WHITE	GND
9	PINK	G12
10	LIGHT/GREEN	GO1
12	LIGHT/BLUE	GND
13	RED/WHITE	G13
14	BROWN/WHITE	GO2
15	GREEN	GO10
1	Black	3(CAN_H)
6	Brown	5(CAN_L)
11	Orange	2(CANISO GND)