



NEXCOM International Co., Ltd.

Mobile Computing Solutions

Vehicle Telematics Computer

VTC 1911

User Manual

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PREFACE

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Disclaimer

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Acknowledgements

VTC 1911 is a trademark of NEXCOM International 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



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. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

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.
- The computer is provided with CD drives that comply with the appropriate safety standards including IEC 60825.

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.
3. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash 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.

Battery - Safety Measures

Caution

- Risk of explosion if battery is replaced by an incorrect type.
- Dispose of used batteries according to the instructions.

Safety Warning



This equipment is intended for installation in a Restricted Access Location only.

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Package Contents

Before continuing, verify that the VTC 1911 package that you received is complete. Your VTC 1911 package should have all the items listed in the following table.

Item	P/N	Name	Specification	Qty
1	602DCD1544X00	VTC1911-IPK Series DVD Driver VER:1.0	JCL	1
2	603POW0242X00	Power Cable ST:MD-5105266	Waterproof M12 A Cord 5-pin Open L=300mm	1
3	50333P0027X00	Washer for SMA CONN KANG YANG:TW-181	13x1.8mm Nylon 66 Natural	4
4	50333P0028X00	Washer for SMA CONN KANG YANG:WS6-0.8(B)	12.8x6.4x0.8mm PC Black	4
5	5061200061X00	SMA Washer Twin Adhesive for IP65 VER:A S.W.	Φ13xΦ8.5mm 0.15T VHB 3M4914	4
6	5061200103X00	SMA Twin Adhesive IP67 VER:A S.W.	Φ9xΦ3.5mm 0.4T VHB 3M4920	4
7	60111A0551X00	Inner Carton for VTC 1911-IPK VER:A YI GIA	267x248x159mm B FLUTE	1
8	60111A0552X00	Outside Carton for VTC 1911-IPK VER:A YI GIA	515x345x291mm AB FLUTE	1/4
9	6013301081X00	EPE for VTC 1911-IPK VER:A SENTENEL	243x148x100mm	2
10	6012200049X00	ASG110 PE Bag PE: 24x38cm	240x380x0.08mm	1
11	6012200052X00	PE Zipper Bag #8	170x240mm, w/China RoHS Symbol	1
12	6012200053X00	PE Zipper Bag #3	100x70mm, w/China RoHS Symbol	1
13	50311F0100X00	Round Head Screw w/Spring+Flat Washer Long Fei:P3x6L	P3x6 iso/SW6x0.5 NI	4
14	603ANT0115X00	GPS/Glonass Antenna SANAV:SM-76G	SMA Male L=5000mm	1

Ordering Information

The following provides ordering information for VTC 1911.

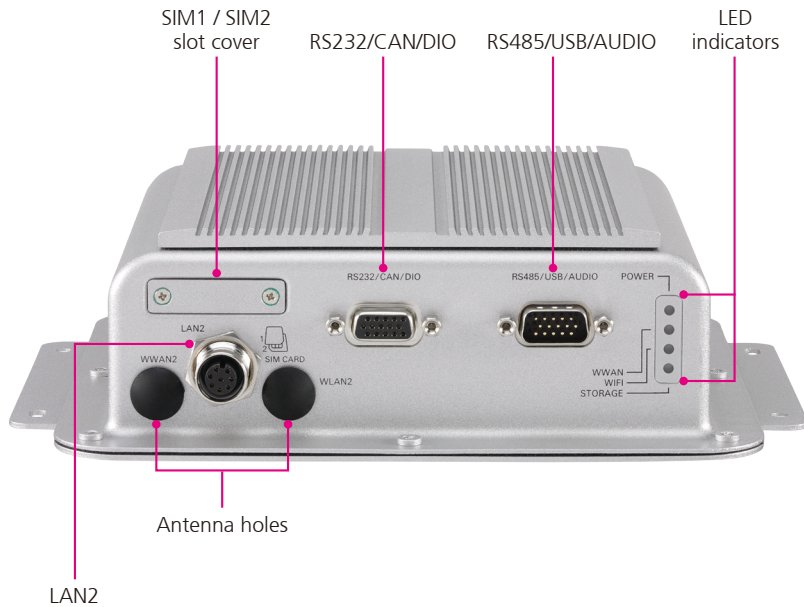
- **VTC 1911-IPK (P/N: 10V00191100X0)**

Intel Atom® processor Bay Trail E3815, 1.46GHz with 2GB DDR3L SO-DIMM, U-blox M8N GPS on board, VGA output, 2 x LAN, 2 x RS-232 (Tx/Rx), 1 x RS-485 (Tx/Rx), 1 x CAN 2.0B, 3 x DI, 3 x DO, 1 x USB 2.0, 1 x Line-out/Mic-in

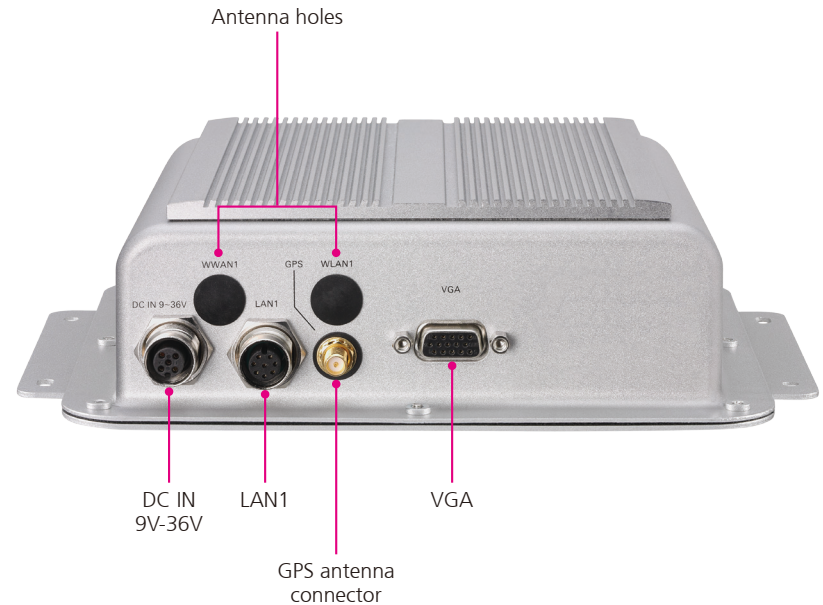
CHAPTER 1: PRODUCT INTRODUCTION

Physical Features

Front View



Rear View



Overview

VTC 1911-IPK, a waterproof entry-level vehicle computer with Intel Atom® processor E3815 (1.46GHz), is designed for the wet, dirty and harsh environment. The precision design to resist water and dust to IP67 (enclosure is immersed in water depth 1 meter for 20 minutes). It allows to comply with stringent MIL-STD-810G military standard in rugged, fanless and compact mechanism. Because of the lightweight design, it is especially for the vehicles with limited space to locate the computer system, but without compromising with its space to sacrifice its features.

VTC 1911-IPK has onboard CAN 2.0B and optional OBD interface (SAE J1939/J1708) for vehicle diagnostics and driver behavior management. An advanced GPS receiver supports GPS/Glonass/QZSS/Galileo/Beidou. VTC 1911-IPK features WLAN and WWAN wireless data and voice connectivity. With 2 external SIM sockets which can support a better connectivity quality by software. VTC 1911-IPK keeps the flexibility to meet different demands for telematics applications, such as IoT gateway infotainment, fleet management and dispatching system.

Key Features

- IP67 precision design to resist water and dust
- Built-in CAN 2.0B. Optional OBDII function (SAE J1939/J1708)
- U-blox NEO-M8N on board
- Dual SIM cards for WWAN modules
- Additional waterproof HDMI connector (by request)
- Smart power management with ignition on/off delay via software control and low voltage protection
- Wide range DC input from 9V~36V
- Wide operating temperature -40°C~70°C
- Certified by CE/FCC/E13 mark

Hardware Specifications

CPU

- Intel Atom® processor Bay Trail E3815, 1.46GHz

Memory

- 1 x 204-pin DDR3L SO-DIMM socket supports 1066MHz/1333MHz up to 8GB. Default 2GB

Storage

- 1 x mSATA
- 1 x SATA DOM or 1 x 2.5" SSD

Expansion

- 1 x Full size mini-PCIe socket (USB 2.0)
- 1 x Full size mini-PCIe socket (mSATA + USB 2.0 + PCIe)

Function

- 1 x u-blox NEO-M8N on board (support GPS/Glonass/QZSS/Galileo/BeiDou)
- Built-in G-sensor
- TPM 2.0

I/O Interface-Front

- 4 x LEDs for power, WWAN, Wi-Fi, storage
- 2 x SIM sockets (micro type) with cover
- 1 x M12 (A-code) connector for 10/100/1000Mbps Ethernet
- 1 x (Male) 15-pin waterproof D-SUB connector
 - 1 x RS485 (TX+/TX-)
 - 1 x USB 2.0
 - 1 x Mic-in (L/R)
 - 1 x Line-out (L/R)
 - 1 x Optional VIOB-CAN-05/06 or 2 x video input

- 1 x (Female) 15-pin waterproof D-SUB connector
 - 2 x RS-232 (TX/RX)
 - 1 x CAN 2.0B (w/ isolation)
 - 3 x DI, 3 x DO
- 2 x Antenna holes for WWAN/WLAN

I/O Interface-Rear

- 1 x M12 5-pin circular power connector (ignition, power, GND)
- 1 x M12 (A-code) connector for 10/100/1000Mbps Ethernet
- 1 x 15-Pin waterproof D-SUB connector for VGA output
- 1 x Waterproof HDMI connector (by request)
- 3 x Antenna holes for WWAN/WLAN/GPS

Operating System

- Windows 7, WES7
- Windows 8, WES8
- Windows 10
- Linux (by request)

Dimensions

- 185 x 167 x 56.5 (W x D x H) (mm) (7.28" x 6.57" x 2.22")
- Weight: 1.1kg (2.42lbs)

Environment

- Temperature
 - Operating temperatures: -40°C to 70°C
 - Storage temperatures: -45°C to 85°C
 - Damp heat test per EN60068-2-30
- Humidity
 - IEC60068-2-3, damp heat steady state test, 40°C, 95%, 48Hrs

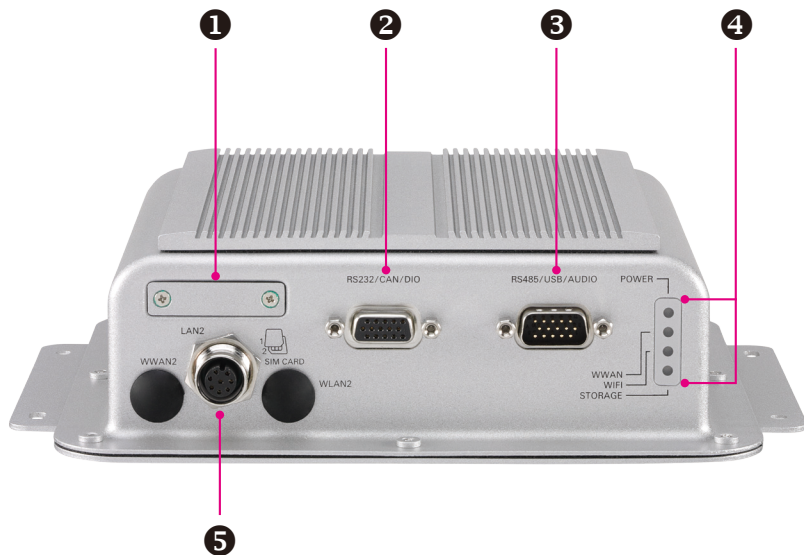
- Vibration
 - IEC 60068-2-64, 2G
 - Operating: MIL-STD-810G, 514.6C Procedure 1, Category 4
 - Storage: MIL-STD-810G, 514.6E Procedure 1, Category 24
- Shock
 - MIL-STD-810G, 516.6 Procedure I, trucks and semi-trailers=40g
 - Crash hazard: Procedure V, ground equipment=75g

Certifications

- CE
- FCC Class A
- E13

Connector Numbering

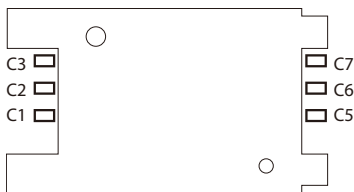
The following diagrams indicate the numbers of the connectors. Use these numbers to locate the connectors' respective pinout assignments on chapter 2 of the manual.



CHAPTER 2: EXTERNAL CONNECTORS PINOUT DESCRIPTION

SIM1 and SIM2 Slots

Connector Number: 1



SIM1

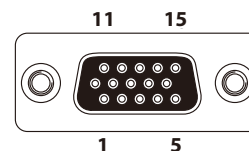
Pin	Definition	Pin	Definition
C1	UIM1 POWER	C5	GND
C2	UIM1 RST	C6	NC
C3	UIM1 CLK	C7	UIM1 DATA

SIM2

Pin	Definition	Pin	Definition
C1	UIM2 POWER	C5	GND
C2	UIM2 RST	C6	NC
C3	UIM2 CLK	C7	UIM2 DATA

RS232/CAN/DIO Connector

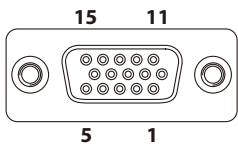
Connector Number: 2



Pin	Definition	Pin	Definition
1	RS232_RXD1	2	G_IN1
3	G_OUT_1	4	GND
5	ISO_CAN1_L	6	RS232_TXD1
7	RS232_RXD2	8	G_IN3
9	G_OUT3	10	ISO_CAN1_H
11	RS232_TXD2	12	G_IN2
13	G_OUT2	14	GND
15	ISO_GND		

RS485/USB/Audio Connector

Connector Number: 3



Pin	Definition	Pin	Definition
1	USB-	2	USB VCC
3	MCU_485_TX-	4	SPK_OUT_R
5	MIC_R_IN	6	USB+
7	GND	8	MCU_485_TX+
9	SPK_OUT_L	10	MIC_L_IN
11	DATA_L	12	DATA_H
13	DATA_GND	14	GND
15	Audio_GND		

LED Indicators (Power/WWAN/WIFI/STORAGE)

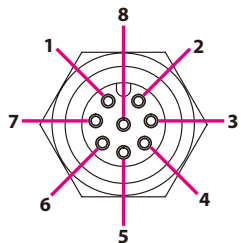
Connector Number: 4

- POWER
- WWAN
- WIFI
- STORAGE

LED	LED Behavior
POWER	Power On: Green
WWAN	Blinking: Active
WIFI	Blinking: Active
STORAGE	Light On: Storage Active

M12 LAN Ports: LAN1/LAN2

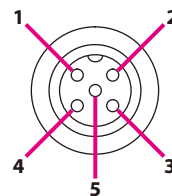
Connector number: 5



Pin	Definition	Pin	Definition
1	LAN_MDI_OP_R	2	LAN_MDI_ON_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

Power Connector

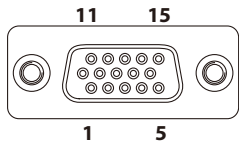
Connector number: 6



Pin	Definition	Pin	Definition
1	VIN	2	VIN
3	GND	4	GND
5	IGNITION		

VGA Port

Connector Number: 7



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

HDMI (By Request)



Pin	Definition	Pin	Definition
1	HDMI_TX2P_L	2	GND
3	HDMI_TX2N_L	4	HDMI_TX1P_L
5	GND	6	HDMI_TX1N_L
7	HDMI_TX0P_L	8	GND
9	HDMI_TX0N_L	10	HDMI_CLK_P_L
11	GND	12	HDMI_CLK_N_L
13	NC	14	NC
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	HDMI_P5V
19	HDMI_HPD		

CHAPTER 3: JUMPERS AND SWITCHES

This chapter describes how to set the jumpers on the VTC 1911 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 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:

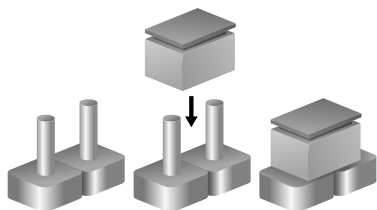
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

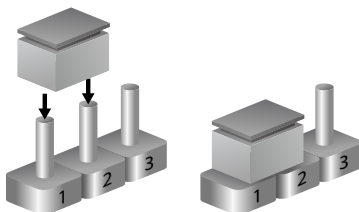
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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



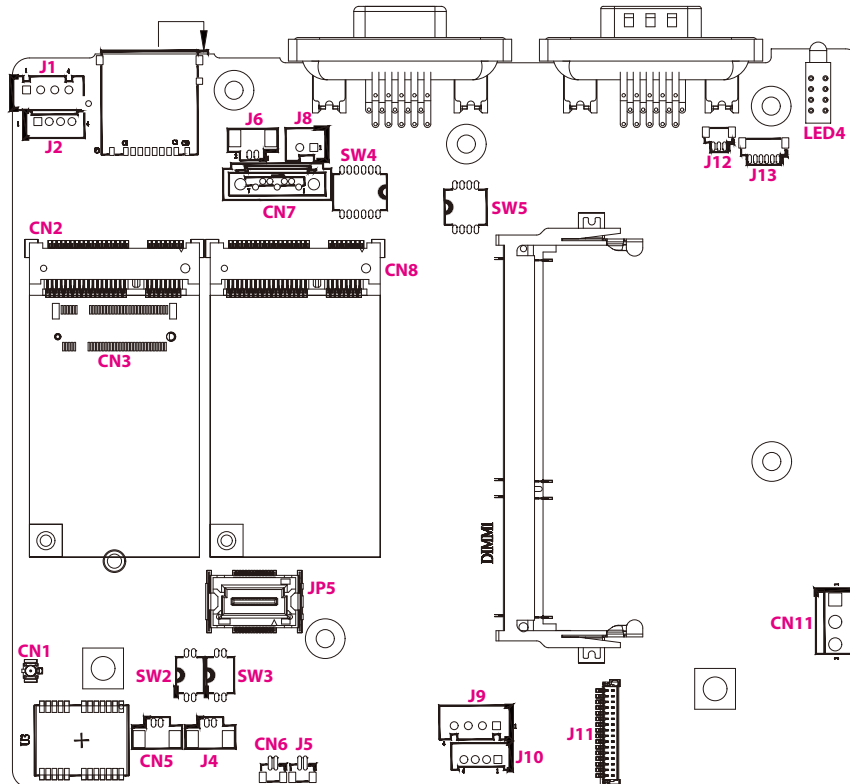
Three-Pin Jumpers: Pins 1 and 2 are Short



VTC 1911 Connector Specification & Jumper Setting

VTC 1911 carrier board placement

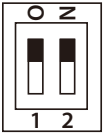
The figure below is the carrier board used in the VTC 1911 system. It shows the locations of the jumpers and connectors.



DIP Switch Settings

Function Selection Switch

Connector location: SW2



Input Voltage Control

Pin	Definition
1 OFF, 2 OFF	12V
1 OFF, 2 ON	24V
1 ON, 2 ON	9-36V (Default)

RTC Clear CMOS

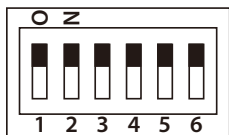
Connector location: SW3



Pin	Definition
1 OFF, 2 OFF	RTC Normal (Default) ME Normal (Default)
1 ON, 2 ON	RTC Clear CMOS ME Clear

GPIO Pull High Enable

Connector location: SW4

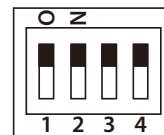


Pin	Function	Definition	Definition
1	GPI1	On: enable pull high	Off: dis pull high
2	GPI2	On: enable pull high	Off: dis pull high
3	GPI3	On: enable pull high	Off: dis pull high
4	GPO1	On: enable pull high	Off: dis pull high
5	GPO2	On: enable pull high	Off: dis pull high
6	GPO3	On: enable pull high	Off: dis pull high

(Default enable pull high)

CAN1/2 Terminator Resistor Selection Switch

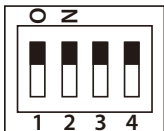
Connector location: SW5



Pin	Definition
1 ON, 2 ON	CAN1 Terminator Resistor (Default)
1 OFF, 2 OFF	CAN1 None Terminator Resistor
3 ON, 4 ON	CAN2 Terminator Resistor (Default)
3 OFF, 4 OFF	CAN2 None Terminator Resistor

WWAN I2S TX/RX Mapping Selection Switch

Connector location: SW1



Pin	Definition	Pin	Definition
1	PCM_TX	2	PCM_RX
3	PCM_TX	4	PCM_RX
5	PCM_RX_SW	6	PCM_RX_SW
7	PCM_TX_SW	8	PCM_TX_SW

(Default 1/4: on, 2/3: off)

Connectors

LAN1

Connector size: 1 x 4 = 4-pin header (J9, 2.5mm; J10, 2.0mm)

Connector location: J9 and J10



J9

Pin	Definition	Pin	Definition
1	LAN1_MDI_OP_R	2	LAN1_MDI_ON_R
3	LAN1_MDI_1P_R	4	LAN1_MDI_1N_R

J10

Pin	Definition	Pin	Definition
1	LAN1_MDI_2P_R	2	LAN1_MDI_2N_R
3	LAN1_MDI_3P_R	4	LAN1_MDI_3N_R

LAN2

Connector size: 1 x 4 = 4-pin header (J1, 2.5mm; J2, 2.0mm)

Connector location: J1 and J2



J1

Pin	Definition	Pin	Definition
1	LAN2_MDI_OP_R	2	LAN2_MDI_ON_R
3	LAN2_MDI_1P_R	4	LAN2_MDI_1N_R

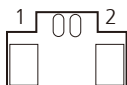
J2

Pin	Definition	Pin	Definition
1	LAN2_MDI_2P_R	2	LAN2_MDI_2N_R
3	LAN2_MDI_3P_R	4	LAN2_MDI_3N_R

Battery Connector

Connector size: 1 x 2 = 2-pin header (1.25mm)

Connector location: J4



Pin	Definition
1	GND
2	RTC_BAT

Reset Button

Connector size: 1 x 2 = 2-pin header

Connector location: J5

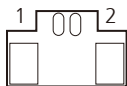


Pin	Definition
1	GND
2	RESET

SATA Power Connector

Connector size: 1 x 2 = 2-pin header (J6, 1.25mm; J8, 2.5mm)

Connector location: J6 and J8



J6



J8

J6

Pin	Definition
1	GND
2	VCC5

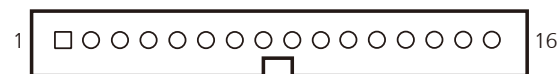
J8

Pin	Definition
1	VCC5
2	GND

VGA

Connector size: 1 x 16 = 16-pin header (1.0mm)

Connector location: J11



Pin	Definition	Pin	Definition
1	GND	2	VGA_+5V
3	VGA_CLK	4	VGA_DATA
5	VGA_VS	6	VGA_HS
7	GND	8	GND
9	GND	10	VGA_GND
11	VGA_BLUE	12	VGA_GND
13	VGA_GREEN	14	VGA_GND
15	VGA_RED	16	VGA_GND

Add-on Card Cable

Connector size: 1 x 3 = 3-pin header (1.0mm)

Connector location: J12



Pin	Definition
1	GND
2	DATA_H1
3	DATA_L2

Internal USB Connector for WLAN/CAN05/06 Capture Module

Connector size: 1 x 16 = 16-pin header (1.0mm)

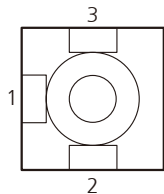
Connector location: J13



Pin	Definition	Pin	Definition
1	USB_5V	2	USB_3N
3	USB_3P	4	GND
5	WLAN_LED#	6	WLAN_DIS#

GPS Antenna Connector

Connector location: CN1

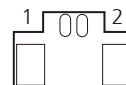


Pin	Definition
1	RF_IN
2	GND
3	GND

GPS Battery Connector

Connector size: 1 x 2 = 2-pin header (1.25mm)

Connector location: CN5

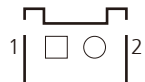


Pin	Definition
1	GND
2	BACKUP_VOT (3.3V)

Power On/Off Button

Connector size: 1 x 2 = 2-pin header (1.0mm)

Connector location: CN6

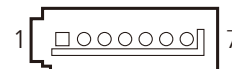


Pin	Definition
1	PWRBT_IN#
2	GND

SATA Connector

Connector size: 1 x 7 = 7-pin header (1.27mm)

Connector location: CN7



Pin	Definition	Pin	Definition
1	GND	2	SATA_TXPO
3	SATA_TXNO	4	GND
5	SATA_RXNO	6	SATA_RXPO
7	GND		

LED

Connector location: LED4

POWER

WWAN

WIFI

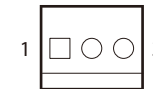
STORAGE

Pin	Definition	Pin	Definition	Function
A1	LED_A1 (BLUE)	C1	LED_C1 (RED)	Power LED
A2	WWAN_LED (GREEN)	C2	WWAN_LED_C	WWAN LED
A3	WLED_LED (GREEN)	C3	W_LED_C	WLAN LED
A4	SATA_LED_C	C4	SATA_LED (YELLOW)	SATA LED

Power-in Connector

Connector size: 1 x 3 = 3-pin header (3.5mm)

Connector location: CN11

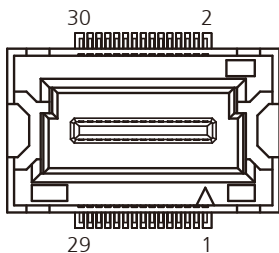


Pin	Definition
1	GND
2	VIN
3	IGNITION

HDMI BD to BD

Connector size: 2 x 15 = 30-pin header

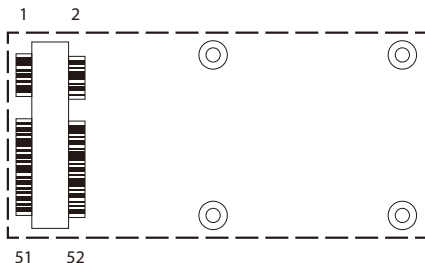
Connector location: JP5



Pin	Definition	Pin	Definition
1	GND	2	HDMI_HPD
3	DPC0_LANE0_P_C	4	GND
5	DPC0_LANE0_N_C	6	GND
7	GND	8	GND
9	DPC0_LANE1_P_C	10	GND
11	DPC0_LANE1_N_C	12	GND
13	GND	14	GND
15	DPC0_LANE2_P_C	16	GND
17	DPC0_LANE2_N_C	18	GND
19	GND	20	GND
21	DPC0_LANE3_P_C	22	GND
23	DPC0_LANE3_N_C	24	VCC3
25	GND	26	VCC3
27	HDMI_DATA	28	VCC5
29	HDMI_CLK	30	VCC5

Mini-PCle Slot (WWAN Connector)

Connector location: CN2



Pin	Definition	Pin	Definition
1	910WAKE# / MIC_P	2	+V3.3_MINI
3	GND	4	GND
5	MINI_SPK_P	6	NC
7	NC / GND	8	UIM_PWR
9	NC / GND	10	UIM_DAT
11	VREF_PCIE	12	UIM_CLK
13	NC	14	UIM_RST
15	GND	16	NC
17	NC / PCM_DATA	18	GND
19	NC / PCM_CLK	20	3.5G_DIS#
21	GND	22	3.5G_RST#
23	U3_RX1_N	24	+V3.3_MINI
25	U3_RX1_P	26	GND

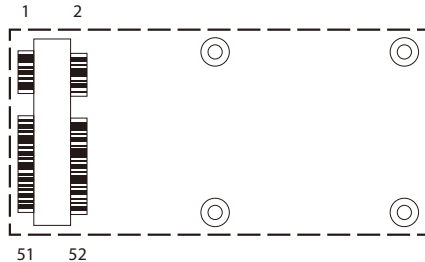
Pin	Definition	Pin	Definition
27	GND	28	NC
29	GND	30	NC
31	U3_TX1_N_C	32	CM8K_WAKE#
33	U3_TX1_P_C/UMT_RST#	34	GND
35	GND	36	USB_2N
37	GND	38	USB_2P
39	+V3.3_MINI	40	GND
41	+V3.3_MINI	42	3.5G_LED#
43	GND	44	NC
45	PCM_CLK	46	NC
47	PCM_RX_SW	48	NC
49	PCM_TX_SW	50	GND
51	PCM_SYNC	52	+V3.3_MINI

* When it is supporting VIOB-DA-01, Pin1 => MIC_P; Pin3, 7 => GND; Pin5 => SPK_P; Pin17 => PCM_DATA; Pin 19 => PCM_CLK.

* When it is not supporting VIOB-DA-01, Pin1 => Wake#; Pin3, 5, 7, 17, 19 => NC.

Mini-PCIe Slot

Connector location: CN8



Pin	Definition	Pin	Definition
1	NC	2	+V3.3_MINI_2
3	NC	4	GND
5	NC	6	+V1.5S_MINI_2
7	PCIE_CLKREQ#	8	NC
9	GND	10	NC
11	PCIE_CLKN1	12	NC
13	PCIE_CLKP1	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	PCIE_DISABLE#
21	GND	22	PCIE_RST#
23	PCIE_RXN1 / SATA_RXN1	24	+V3.3_MINI_2
25	PCIE_RXP1 / SATA_RXP1	26	GND

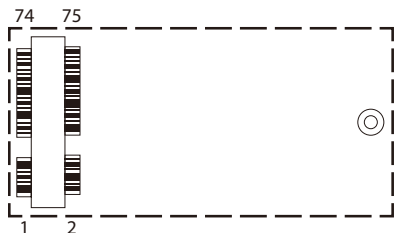
Pin	Definition	Pin	Definition
27	GND	28	+V1.5S_MINI_2
29	GND	30	NC
31	PCIE_TXN1 / SATA_TXN1	32	NC
33	PCIE_TXP1 / SATA_TXP1	34	GND
35	GND	36	NC
37	GND	38	NC
39	+V3.3_MINI_2	40	GND
41	+V3.3_MINI_2	42	3.5G_LED#
43	GND	44	NC
45	NC	46	NC
47	NC	48	+V1.5S_MINI_2
49	NC	50	GND
51	CTRL0	52	+V3.3_MINI_2

* When CTRL=0, CN6 is mSATA.

* When CTRL=1, CN6 is PCIe devices.

M.2 Connector

Connector location: CN3



Pin	Definition	Pin	Definition
1	CONFIG_3	2	3.3V
3	GND	4	3.3V
5	GND	6	POWER_OFF#
7	USB_OP_M	8	W_DISABLE1#
9	USB_ON_M	10	3.5G_LED_PH
11	GND	20	PCM_CLK
21	CONFIG_0	22	PCM_RX_SW
23	SMS_RI_3.5G_R	24	PCM_TX_SW
25	NC	26	W_DISABLE2#
27	GND	28	PCM_SYNC
29	U3_RXN_M	30	UIM1_RST_R
31	U3_RXP_M	32	UIM1_CLK_R
33	GND	34	UIM1_DAT_R
35	U3_TXN_M	36	UIM1_PWR_R
37	U3_TXP_M	38	NC
31	USB3.0_RXP	32	UIM1_CLK
33	GND	34	UIM_DATA
35	USB3.0_TXN	36	UIM1_PWR
37	USB3.0_TXP	38	NC

Pin	Definition	Pin	Definition
39	GND	40	SIM2_SELECT
41	NC	42	UIM2_DAT_R
43	NC	44	UIM2_CLK_R
45	GND	46	UIM2_RST_R
47	NC	48	UIM2_PWR_R
49	NC	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	SIM_SELECT1
67	W_RESET_#_R	68	NC
69	CONFIG_1	70	GND
71	GND	72	GND
73	GND	74	GND
75	CONFIG_2		

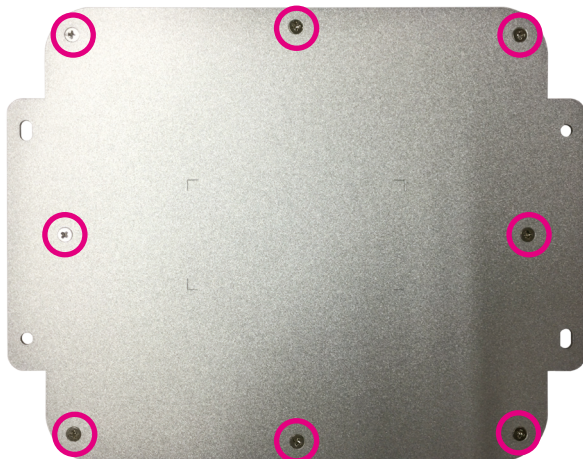
CHAPTER 4: SYSTEM SETUP

Removing the Chassis Cover



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. The screws circled on the bottom are used to secure the chassis. Remove these screws and put them in a safe place for later use.



Bottom View

Installing a WLAN Module

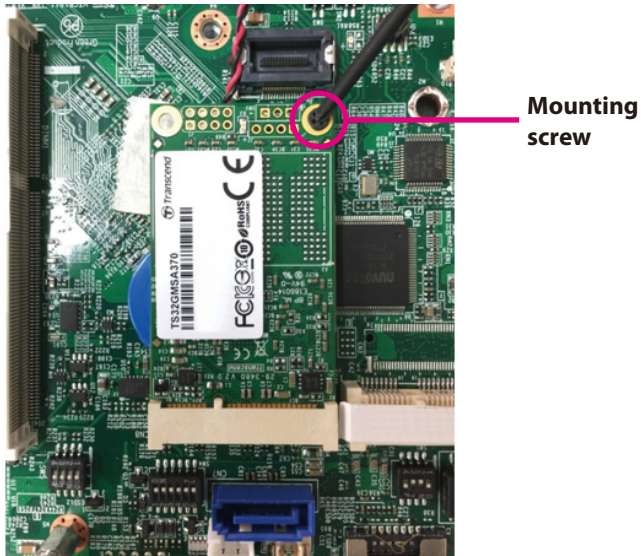
1. Locate the WLAN Mini PCI Express slot (CN8). Insert the module into the Mini PCI Express slot at a 45 degrees angle until the gold-plated connector on the edge of the module completely disappears inside the slot. Then fasten a screw into the mounting hole to secure the module.



Mounting screw

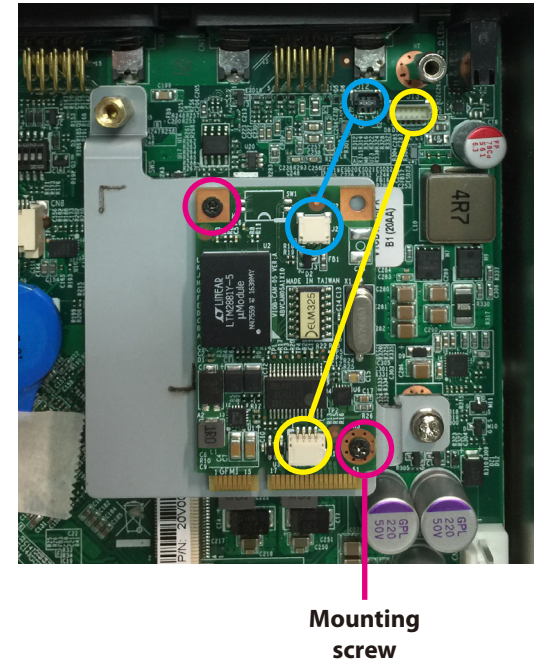
Installing an mSATA Module

1. Locate the mSATA slot (CN8). Insert the module into the mSATA slot at a 45 degrees angle until the gold-plated connector on the edge of the module completely disappears inside the slot. Then fasten a screw into the mounting hole to secure the module.



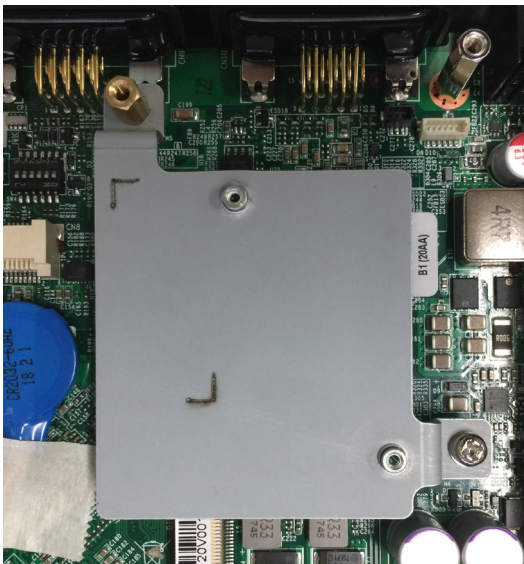
Installing a J1708/J1939 Module on Bracket

1. Locate the bracket above the RAM slot. Place the module on the bracket then fasten screws into the mounting holes to secure the module.



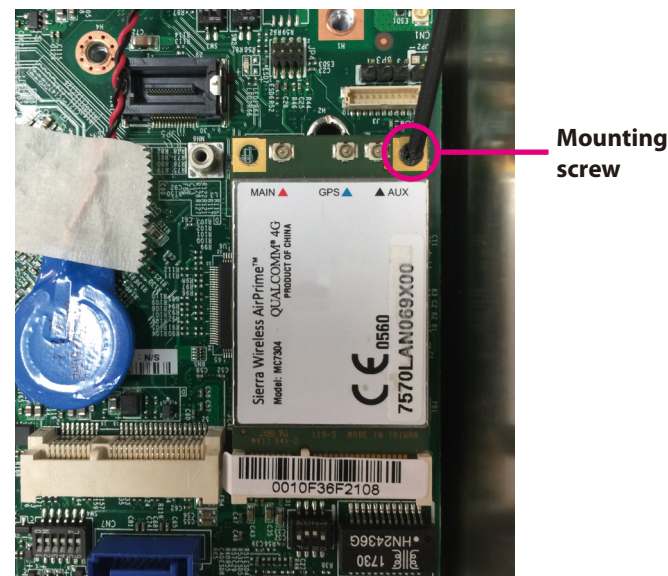
Installing a WLAN Module on Bracket

1. Locate the bracket above the RAM slot. Place the module on the bracket then fasten screws into the mounting holes to secure the module.



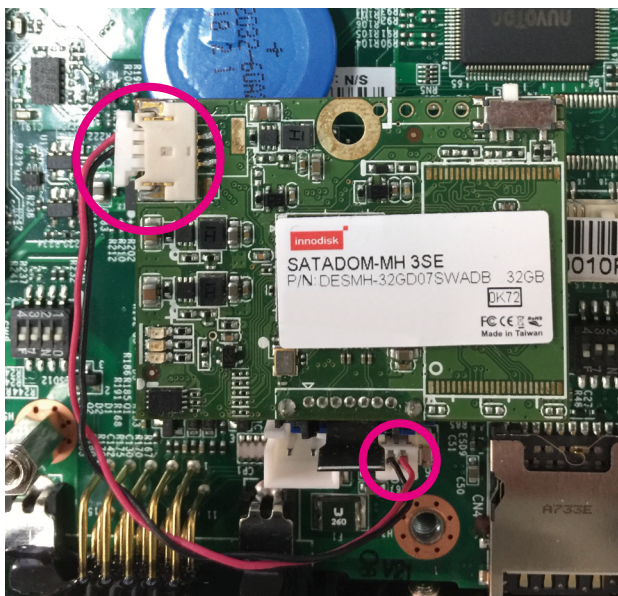
Installing a WWAN Module

1. Locate the WWAN Mini PCI Express slot (CN2). Insert the module into the Mini PCI Express slot at a 45 degrees angle until the gold-plated connector on the edge of the module completely disappears inside the slot. Then fasten a screw into the mounting hole to secure the module.



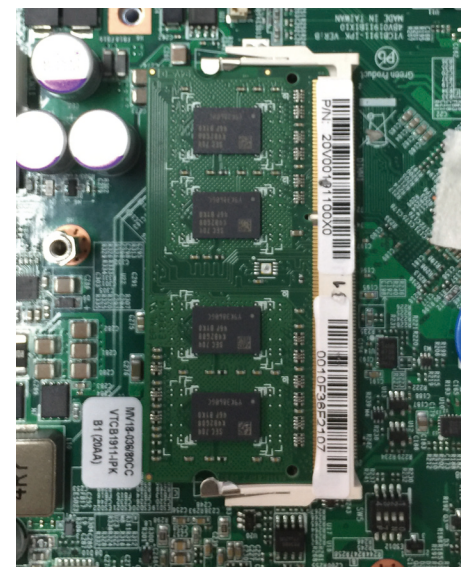
Installing a SATA DOM Module

1. Locate the SATA slot (CN4). Insert the SATA DOM module into the SATA slot at a 90 degrees angle until the SATA connector completely fits inside the slot.



Installing a SO-DIMM

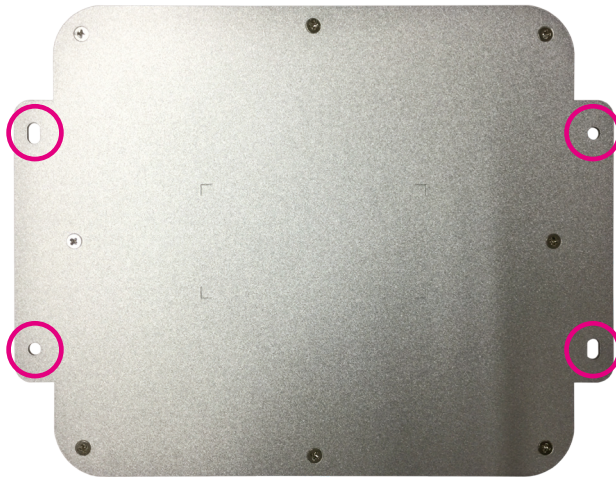
1. Push the ejector tabs which are at the ends of the socket outward. Then insert the module into the socket at an approximately 30 degrees angle. Apply firm even pressure to each end of the module until it slips down into the socket. The contact fingers on the edge of the module will almost completely disappear inside the socket.



Rackmount Brackets

The rackmount brackets provide a convenient and economical way of mounting the system.

1. The mounting holes are located at the bottom of the system. Please mount the system by fastening screws through the mounting holes.



Fasten screws to
mount the system

Inserting the SIM Card

1. Remove the SIM card cover on the front panel and insert two SIM cards. Please note the SIM card installation direction as printed on the chassis.



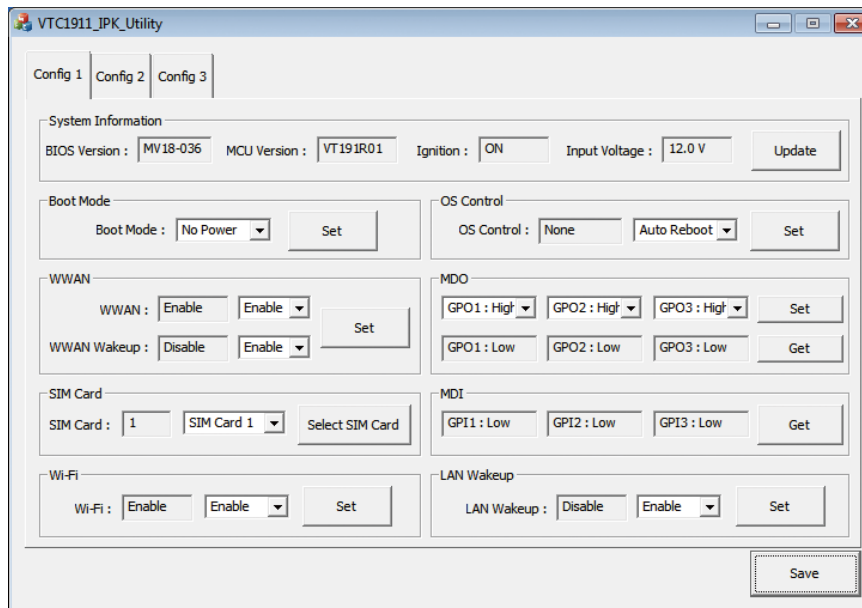
APPENDIX A:

SOFTWARE DEMO UTILITY FOR I/O PORTS OF FUNCTION CONTROL

NEXCOM developed a software demo utility to let users test and control different I/O port functions on VTC 1911. This document shows how to use the utility.

There are also source code files of the utility in the CD. Users can refer to the source codes to develop their applications.

1. Menu Screen - Config 1

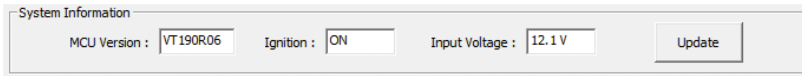


The screenshot displays the VTC1911_IJK_Utility application window. At the top, there are three tabs: Config 1 (selected), Config 2, and Config 3. The main area is divided into several sections:

- System Information:** BIOS Version: MV18-036, MCU Version: VT191R01, Ignition: ON, Input Voltage: 12.0 V. An Update button is present.
- Boot Mode:** Boot Mode: No Power (dropdown), Set button.
- OS Control:** OS Control: None, Auto Reboot (dropdown), Set button.
- WWAN:** WWAN: Enable (dropdown), Set button. WWAN Wakeup: Disable, Enable (dropdown).
- MDO:** GPO1: High (dropdown), GPO2: High (dropdown), GPO3: High (dropdown), Set button. GPO1: Low, GPO2: Low, GPO3: Low, Get button.
- SIM Card:** SIM Card: 1, SIM Card 1 (dropdown), Select SIM Card button.
- MDI:** GPI1: Low, GPI2: Low, GPI3: Low, Get button.
- Wi-Fi:** Wi-Fi: Enable (dropdown), Set button.
- LAN Wakeup:** LAN Wakeup: Disable, Enable (dropdown), Set button.

A Save button is located at the bottom right of the window.

1.1 System Information

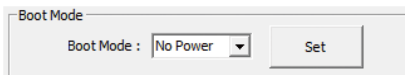


System Information

MCU Version : VT190R06 Ignition : ON Input Voltage : 12.1 V Update

Press the Update button of System Information to view the MCU Version, Ignition and Input Voltage information.

1.2 Boot Mode

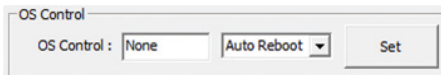


Boot Mode

Boot Mode : No Power Set

Press the Set button of Boot Mode to set up the Boot Mode.

1.3 OS Control

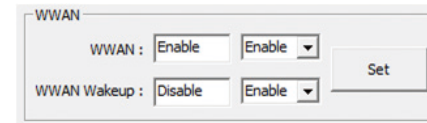


OS Control

OS Control : None Auto Reboot Set

Press the Set button of OS Control to set up the OS Control.

1.4 WWAN



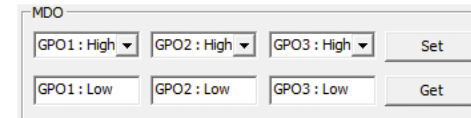
WWAN

WWAN : Enable Enable Set

WWAN Wakeup : Disable Enable Set

Press the Set button of WWAN to enable or disable the WWAN or WWAN wakeup feature.

1.5 MDO



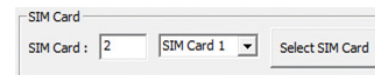
MDO

GPO1 : High GPO2 : High GPO3 : High Set

GPO1 : Low GPO2 : Low GPO3 : Low Get

Press the Set button of MDO to set up GPO1/GPO2/GPO3 as High or Low. Press the Get button of MDO to get the GPO1/GPO2/GPO3 High or Low status.

1.6 SIM Card

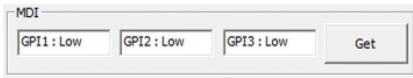


SIM Card

SIM Card : 2 SIM Card 1 Select SIM Card

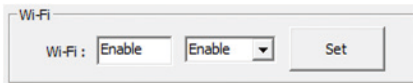
Press the Select SIM Card button to set up the default SIM card.

1.7 MDI



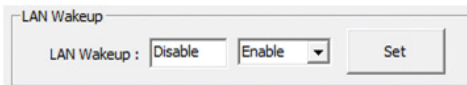
Press the Get button of MDI to show the GPI1/GPI2/GPI3 High or Low status.

1.8 Wi-Fi



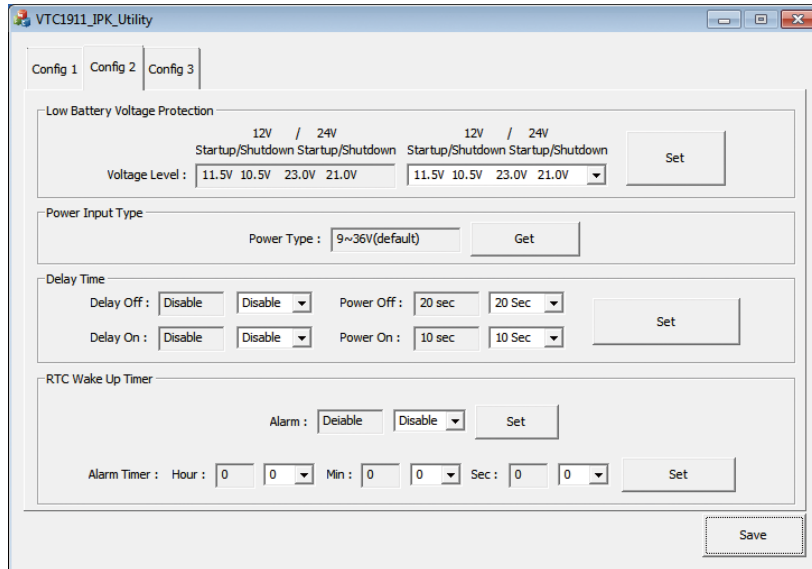
Press the Set button of Wi-Fi to enable or disable the Wi-Fi.

1.9 LAN Wakeup

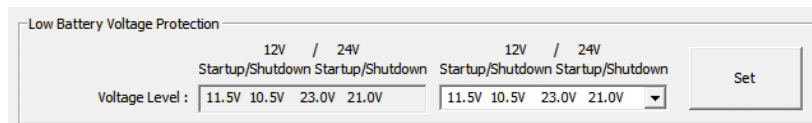


Press the Set button of LAN Wakeup to enable or disable the wakeup function.

2. Config 2

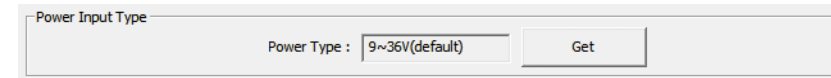


2.1 Low Battery Voltage Protection



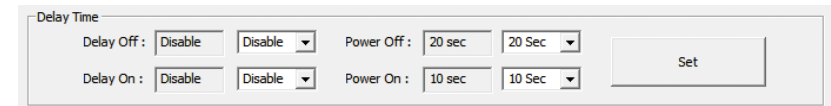
Press the Set button of Low Battery Voltage Protection to set up the 12V/24V startup/shutdown startup/shutdown voltage.

2.2 Power Input Type



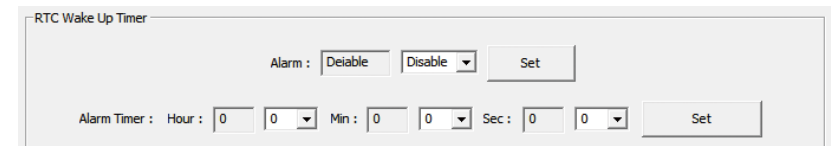
Press the Get button of Power Input Type to show the power type.

2.3 Delay Time



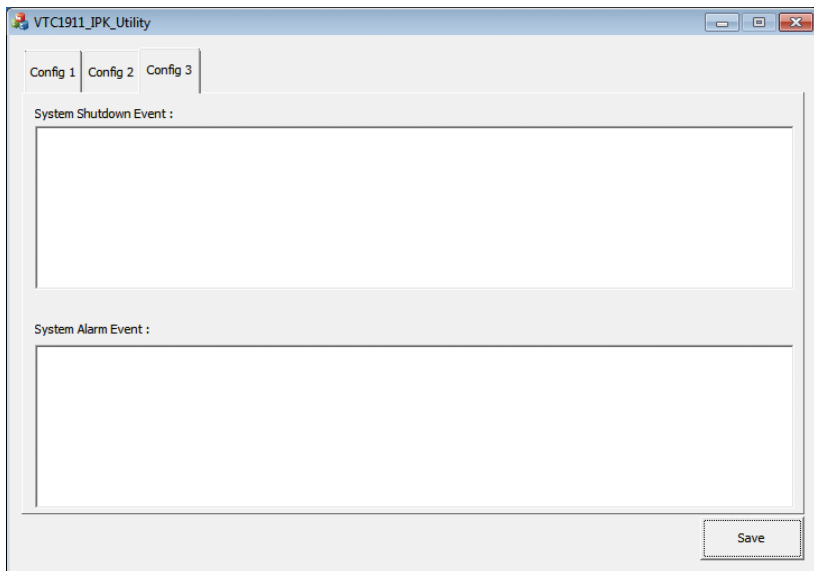
Press the Set button of Delay Time to enable or disable the Delay Off/Delay On as well as set up the time of Power Off/Power On.

2.4 RTC Wake Up Timer



Press the Set button of Alarm to enable or disable the RTC wake up function. Press the Set button of Alarm timer to set up the timer of RTC wake up.

3. Config 3



3.1 System Shutdown Event



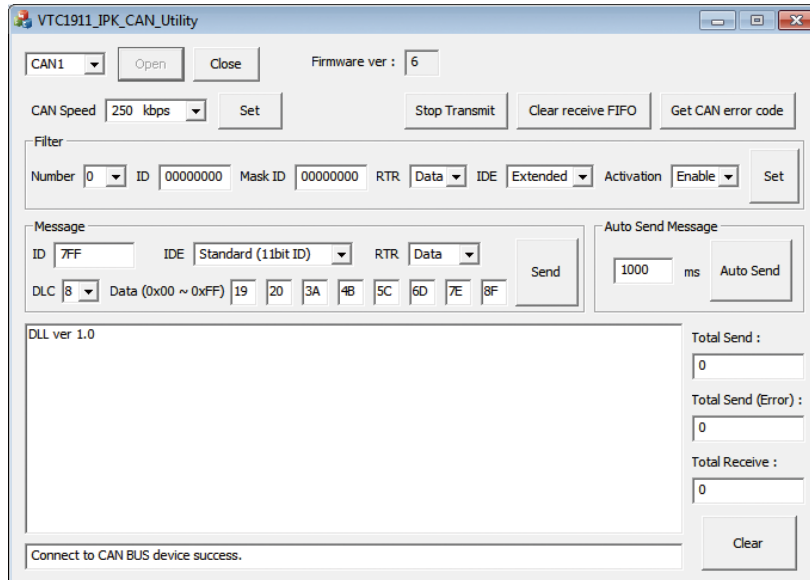
You can read the related System Shutdown Event information.

3.2 System Alarm Event



You can read the related System Alarm Event information.

4. CAN_Utility

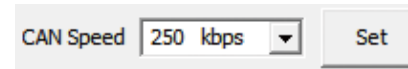


4.1 Select CAN and Device



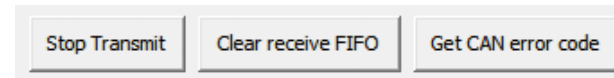
Click the drop-down list to choose the CAN of the corresponding system and press the Open button to apply the setting.

4.2 CAN Speed



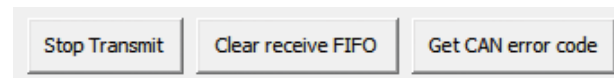
Press the Set button to set up the CAN Speed.

4.3 Stop Transmit



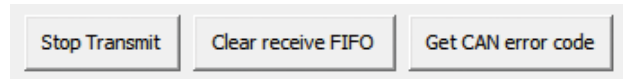
This function is used to stop CAN message transmit.

4.4 Clear receive FIFO



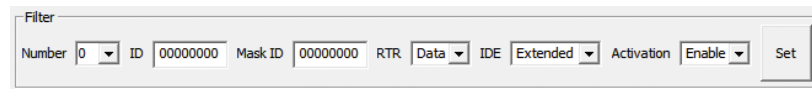
This function is used to clear receive FIFO.

4.5 Get CAN error code



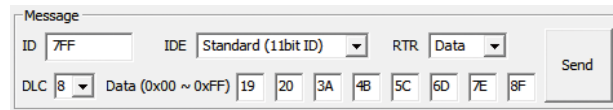
This function is used to get CAN bus error code.

4.6 Filter



Press the Set button in the Filter section to set up the Filter information.

4.7 Message



Click the drop-down list to set up Message then press the Send button to send those CAN information.

4.8 Auto Send Message



Set the time interval in the textbox and press the Auto Send button to send Message automatically or you can press Stop Send to stop the operation.

4.9 Information



Displays all CAN utility information, and you can press the Clear button to erase all the information.

APPENDIX B: 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

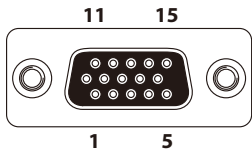
J9 Pin Definition

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

APPENDIX C: SIGNAL CONNECTION OF MCU DI/DO

MCU DIO Pinout Description

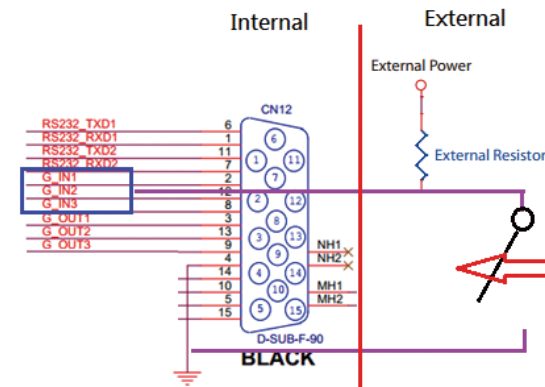


Pin	Definition	Pin	Definition
1		2	G_IN1
3	G_OUT_1	4	
5		6	
7		8	G_IN3
9	G_OUT3	10	
11		12	G_IN2
13	G_OUT2	14	
15			

DIO can be programmed by S/W.
Please refer to the source code in utility.

Digital Input

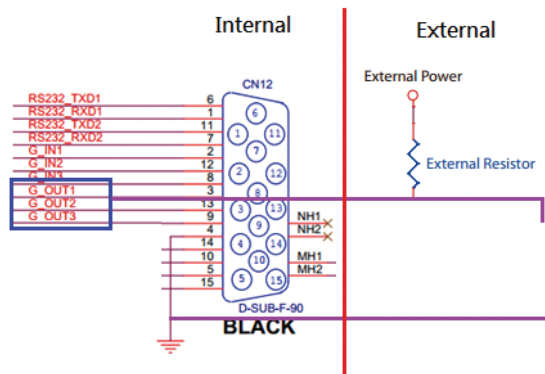
The figure below shows how to connect an external output source to one of the input channel.



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

Digital Output

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



DO Register	Port
1	OPEN
0	GND

APPENDIX D: 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

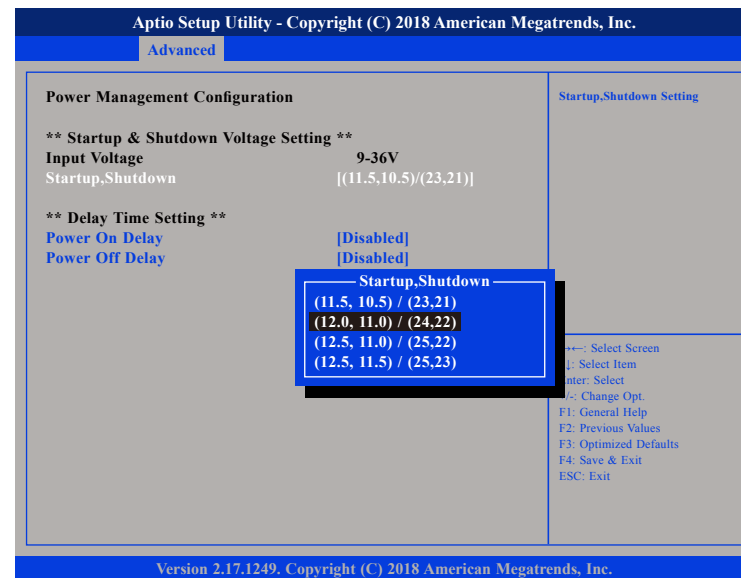
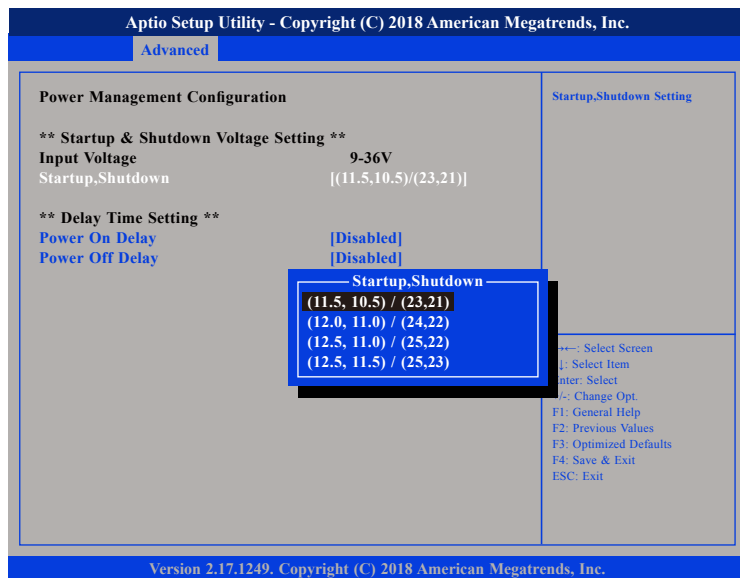
If the input voltage is 12V: the startup voltage to 11.5V and the shutdown voltage to 10.5V.

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

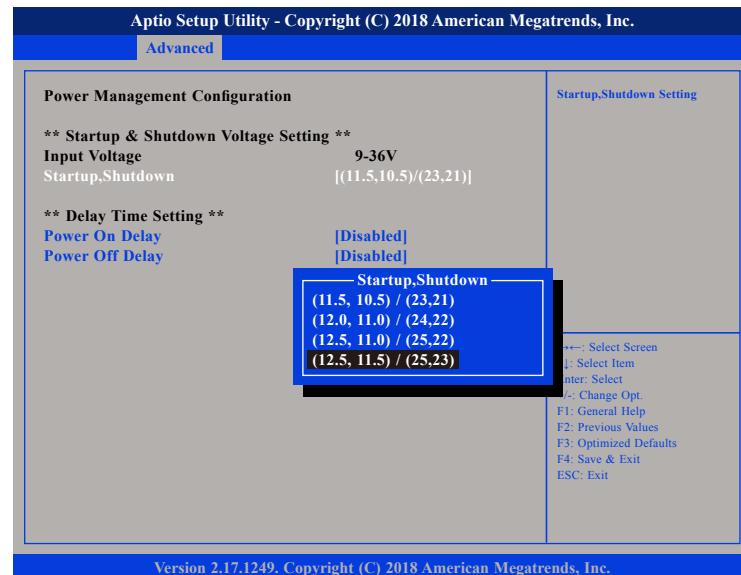
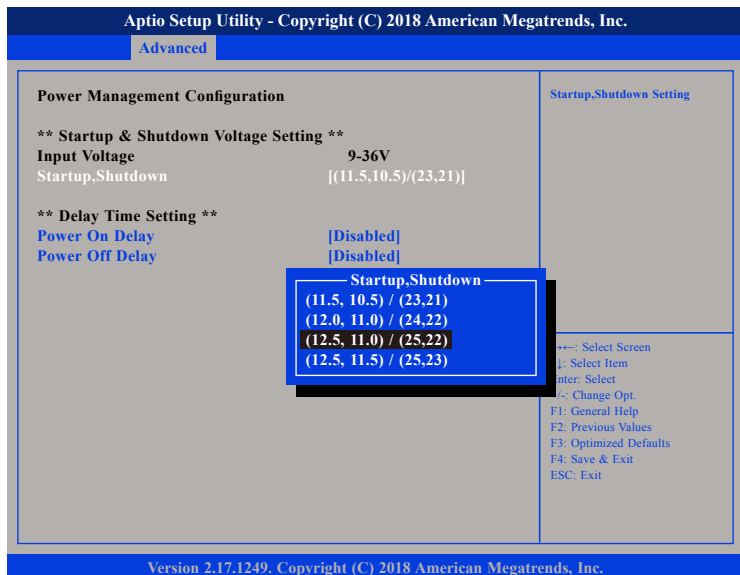
If the input voltage is 12V: the startup voltage to 12.5V and the shutdown voltage to 11V.

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

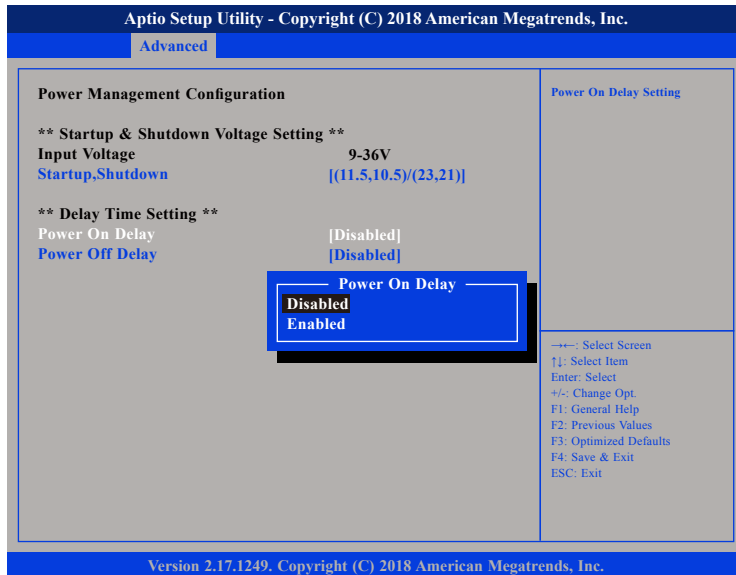
If the input voltage is 12V: the startup voltage to 12.5V and the shutdown voltage to 11.5V.

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



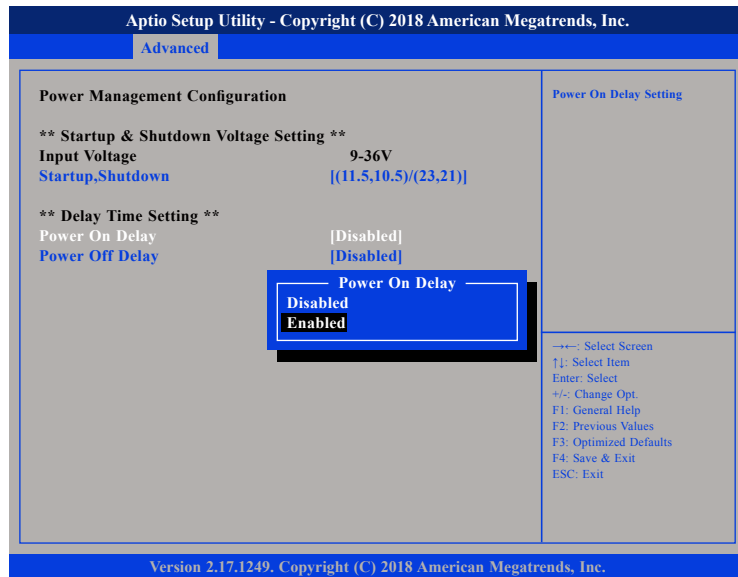
Power-on Delay Setting

Disable Power-on Delay



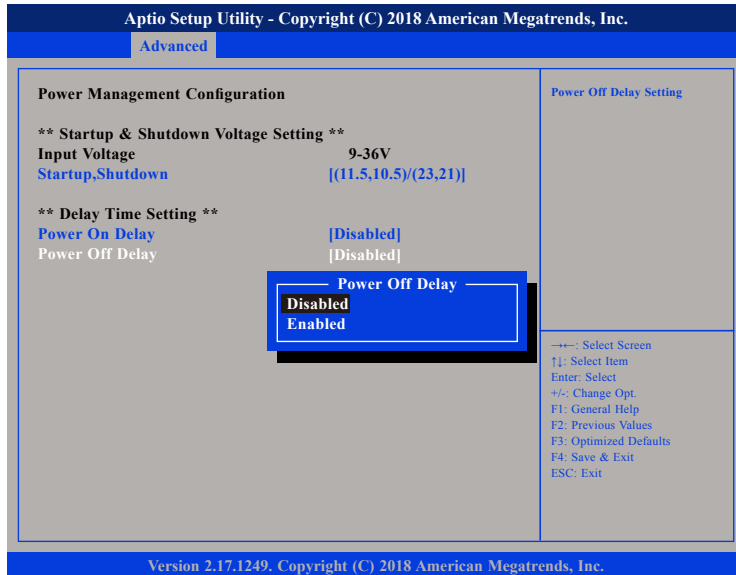
Enable Power-on Delay

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



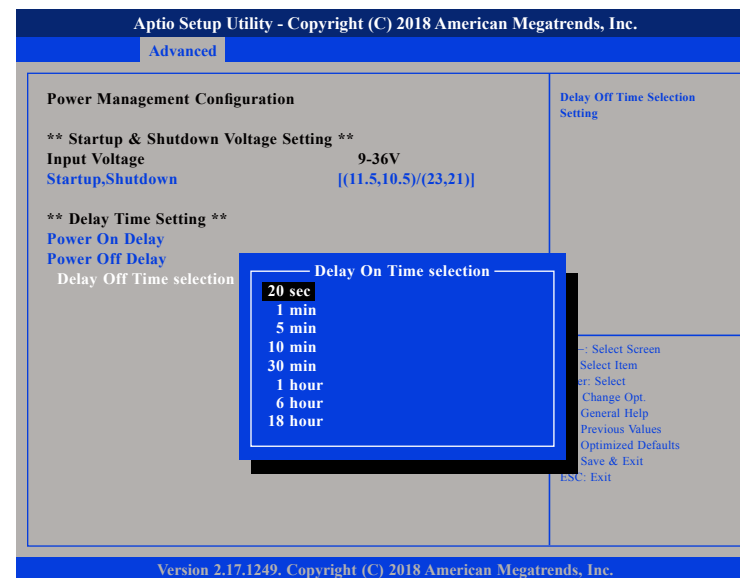
Power-off Delay Setting

Disable Power-off Delay



Enable Power-off Delay

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



APPENDIX E: POWER CONSUMPTION

OS: Windows 10

Burn-in Software:

Device:

Idle: Into OS (SSD) + Display + All modules don't link and don't transmit.

Full: Into OS (SSD) + Display + 3G link player video + GPS link + mSATA (transmit) + USB device trans + Run BURN-IN (100%)

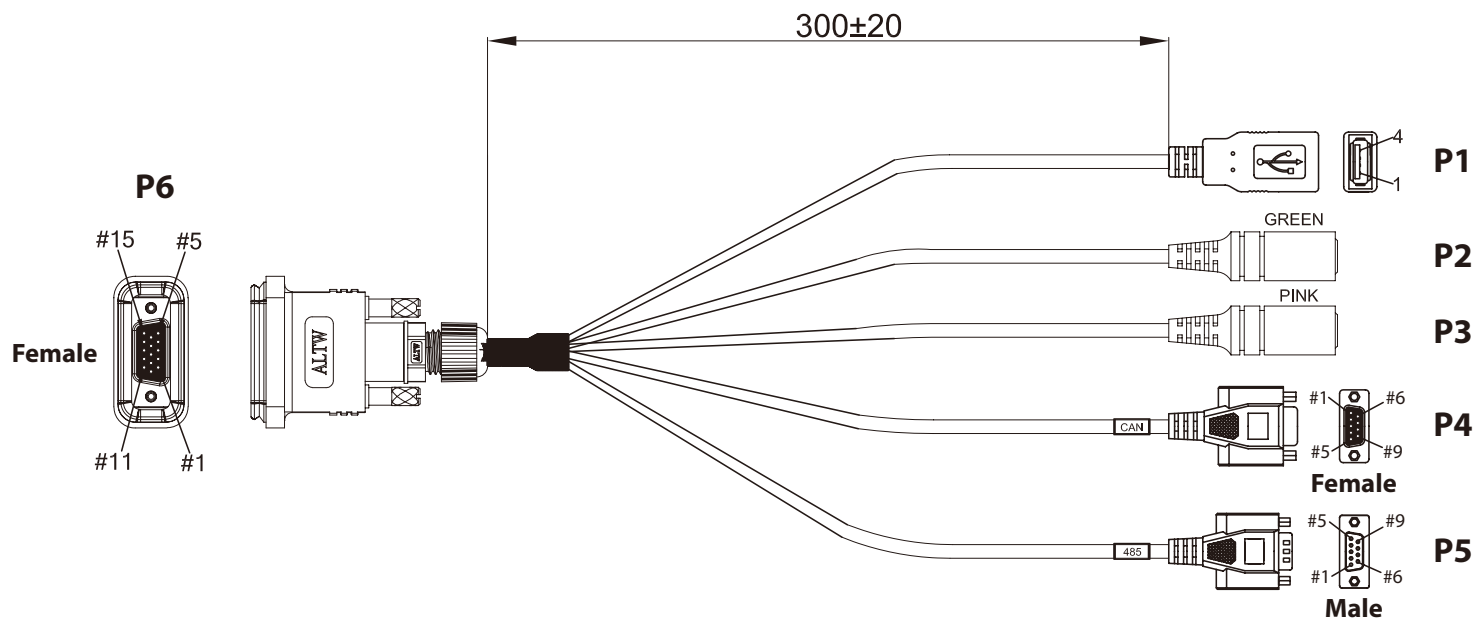
Full + Load: Full status + USB load (5V/0.5A)

Item	Device	Test Case		Result	
				Current(A)	Watt(W)
1	S0 state	Idle State	12V	0.506	6.072
			24V	0.258	6.192
			36V	0.202	7.272
		Full State	12V	0.9	10.8
			24V	0.483	11.592
			36V	0.326	11.736
		Full State + Loading	12V	1.125	13.5
			24V	0.595	14.28
			36V	0.418	15.048
2	IGN OFF	Full state	12V	7mA	
		IGNITION OFF	24V	9mA	

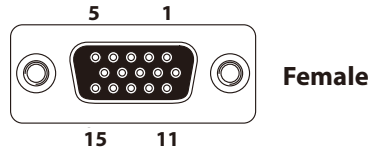
APPENDIX F: PIN DEFINITION FOR THE MULTIPOINT CABLES

Multiport (Female)

The multiport consists of a 15-pin female connector and multiple output connectors. The following tables list the pin signals of the P6 connector and its corresponding pin signals to the output connectors.



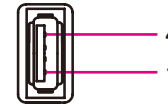
P6 Connector Pinout



Pin	Definition	Pin	Definition
1	USB-	2	USB VCC
3	MCU_485_TX-	4	SPK_OUT_R
5	MIC_R_IN	6	USB+
7	GND	8	MCU_485_TX+
9	SPK_OUT_L	10	MIC_L_IN
11	DATA_L	12	DATA_H
13	DATA_GND	14	GND
15	Audio_GND		

P1 to P5 Connector Pinouts USB 2.0 Connector

Connector location: P1



P6 Pin	P1 Pin	Definition
2	1	USB VCC
1	2	USB-
6	3	USB+
7	4	GND

Green (Line_out) Connector

Connector location: P2



P6 Pin	P2 Pin	Definition
15	1	Audio_GND
9	2	SPK_OUT_L
4	4	SPK_OUT_R

Pink (Mic_in) Connector

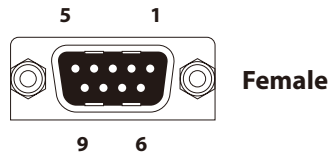
Connector location: P3



P6 Pin	P3 Pin	Definition
14	1	SPK_OUT_R
10	2	MIC_L_IN
5	4	MIC_R_IN

Data (Reserved) Connector

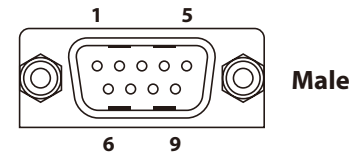
Connector location: P4



P6 Pin	P4 Pin	Definition
13	1	DATA_GND
12	3	DATA_H
11	4	DATA_L

RS-485 Connector

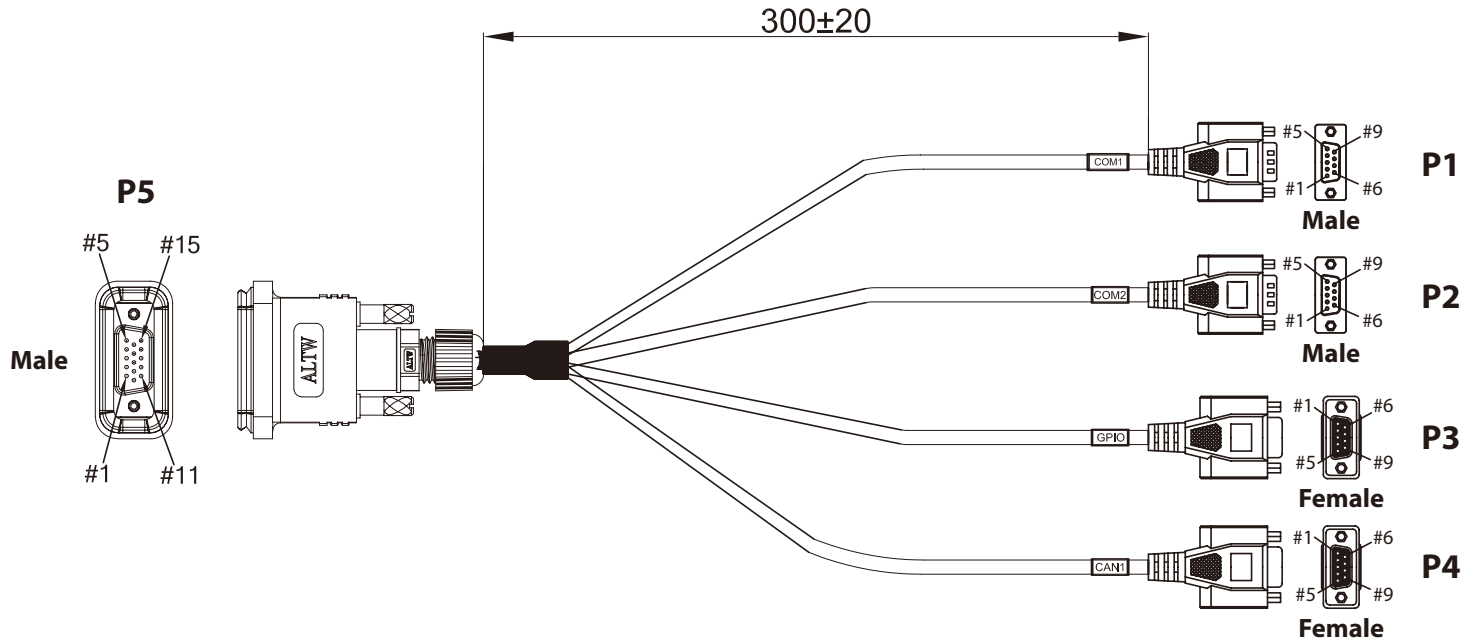
Connector location: P5



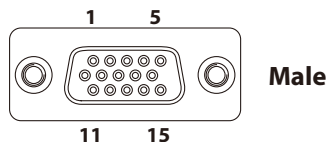
P6 Pin	P5 Pin	Definition
3	1	MCU_485_TX-
8	2	MCU_485_TX+
14	5	GND

Multiport (Male)

The multiport consists of a 15-pin male connector and multiple output connectors. The following tables list the pin signals of the P5 connector and its corresponding pin signals to the output connectors.



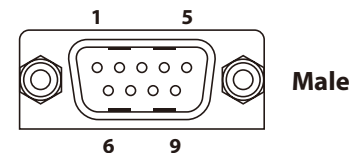
P5 Connector Pinout



Pin	Definition	Pin	Definition
1	RS232_RXD1	2	G_IN1
3	G_OUT_1	4	GND
5	ISO_CAN1_L	6	RS232_TXD1
7	RS232_RXD2	8	G_IN3
9	G_OUT3	10	ISO_CAN1_H
11	RS232_TXD2	12	G_IN2
13	G_OUT2	14	GND
15	ISO_GND		

P1 to P4 Connector Pinouts COM1 (RS232 Tx/Rx) Connector

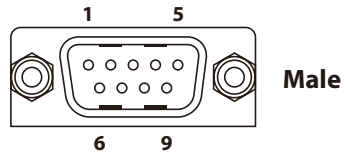
Connector location: P1



P5 Pin	P1 Pin	Definition
1	2	RS232_RXD1
6	3	RS232_TXD1
4	5	GND

COM2 (RS232 Tx/Rx) Connector

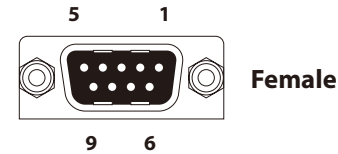
Connector location: P2



P5 Pin	P2 Pin	Definition
7	2	RS232_RXD2
11	3	RS232_TXD2
4	5	GND

GPIO Connector

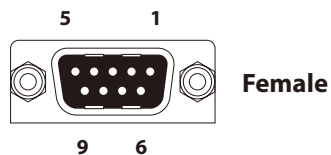
Connector location: P3



P5 Pin	P3 Pin	Definition
2	2	G_IN1
12	3	G_IN2
8	4	G_IN3
3	5	G_OUT_1
13	7	G_OUT2
9	8	G_OUT3
4	9	GND

CAN1 Connector

Connector location: P4



P5 Pin	P4 Pin	Definition
15	2	ISO_GND
10	3	ISO_CAN1_H
5	5	ISO_CAN1_L