NEXCOM

NEXCOM International Co., Ltd.

Mobile Computing Solutions
Vehicle Telematics Computer
VTC 1011 Series
User Manual

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PREFACE

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Acknowledgements

The VTC 1011 series 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 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.

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

How to recognize 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 needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

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

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

5. Keep this equipment away from humidity.

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

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

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

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

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

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

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

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

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

15. Do not place heavy objects on the equipment.

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

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

Technical Support and Assistance

1. For the most updated information of 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, verify that the package that you received is complete. Your package should have all the items listed in the following table.

Item	P/N	Name	Specification	Qty
1	6012200053X00	PE Zipper Bag #3	100x70mm, w/China RoHS Symbol	1
2	50333P0027X00	Washer for SMA CONN	13x1.8mm Nylon 66 Natural	6
3	50333P0028X00	Washer for SMA CONN	12.8x6.4x0.8mm PC Black	6
4	602DCD1538X00	VTC 1011 Series DVD Driver VER:1.0	JCL	1
5	603POW0234X00	Power Cable 8-pin to 6-pin 12V DC OUT	ATX 2x4 PIT:3.0mm to ATX 2x3 PIT:4.2mm UL1007 22AWG L=200mm	1
6	50311F0100X00	Round Head Screw w/Spring+Flat Washer Long Fei:P3x6L	P3x6 iso/SW6x0.5 NI	4
7	603ANT0115X00	GPS/GLONASS Antenna	SMA Male L=5000mm	1
8	4NCPM00302X00	Terminal Blocks 3P Phoenix Contact:1777992	5.08mm MALE DIP Green	1
9	60111A0477X00	Inner Carton for VTC 1011	267x224x171mm B Flute	1
10	60111A0478X00	Outside Carton for VTC 1011	470x282x370mm AB Flute	1
11	6013301009X00	EPE for VTC 1011	260x160x74mm	2
12	6012200119X00	PE Bag for SECUI MF2-50	PE Bag 330x320x0.08mm	1
13	5061100212X00	Wi-Fi Module Sponge for VTC 1011	32.3x15mm 1.8T EPDM E4308 1.5T+3M9888T Black	1
14	6030000286X00	Multi Cable for VTC 1011	DB15 to DB9Fx2/DB9Mx1 L=300mm	1

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Ordering Information

The following information below provides ordering information for VTC 1011.

VTC 1011-C2K (P/N: 10V00101102X0)
Intel Atom® processor bay trail E3825, 1.33 GHz with 2GB DDR3L SO-DIMM, U-blox M8N GPS module, VGA/HDMI output, 2 x PoE, 2 x RS-232 & 1 x (RS-232 (Tx/Rx)/RS-422/485), 1 x CAN 2.0B, 4 x DI & 4 x DO, 2 x USB 2.0, 1 x Line-out, 1 x Mic-in

VTC 1011-C2VK (P/N: 10V00101101X0)
Intel Atom® processor bay trail E3825, 1.33 GHz with 2GB DDR3L SO-DIMM, U-blox M8N GPS module, VGA/HDMI Output, 2 x PoE, 2 x RS-232 & 1 x (RS-232 (Tx/Rx)/RS-422/485), ultraONE+ technology support, 1 x CAN 2.0B, 4 x DI & 4 x DO, 2 x USB 2.0, 1 x Line-out, 1 x Mic-in

CHAPTER 1: PRODUCT INTRODUCTION

Physical Features

VTC 1011-C2K Front View

Power
SIM Slot
USB 2.0 Ports
Reset
PoE Ports

COM2
HDMI
PoE Status LEDs
Antenna Holes
LED Indicators

VTC 1011-C2K Rear View

DC Input
Multi Port
COM1
VGA
Mic-in

DC Output
Antenna Holes
Antenna Connector
Line-out
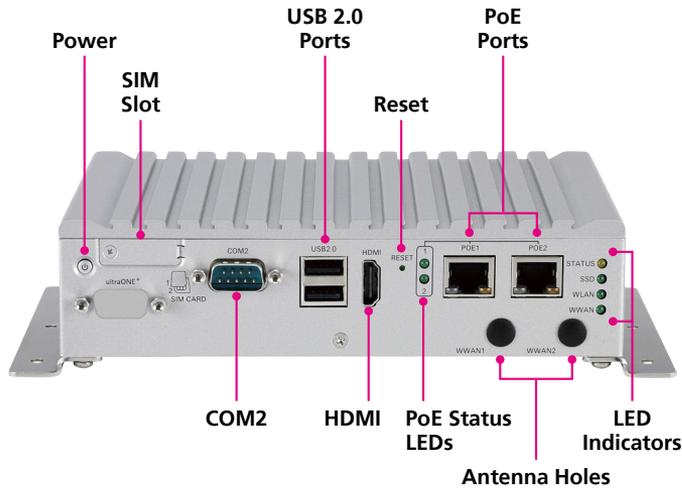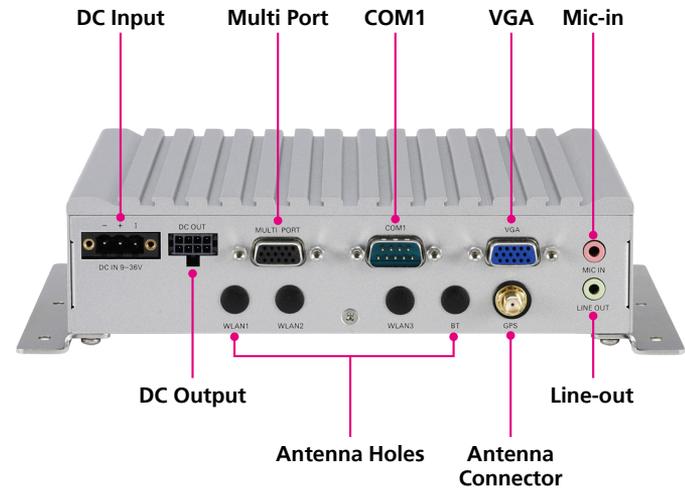
Physical Features

VTC 1011-C2VK Front View

Power
SIM Slot
USB 2.0 Ports
Reset
PoE Ports

ultraONE+
COM2
HDMI
PoE Status LEDs
Antenna Holes
LED Indicators

VTC 1011-C2VK Rear View

DC Input
Multi Port
COM1
VGA
Mic-in

DC Output
Antenna Holes
Antenna Connector
Line-out
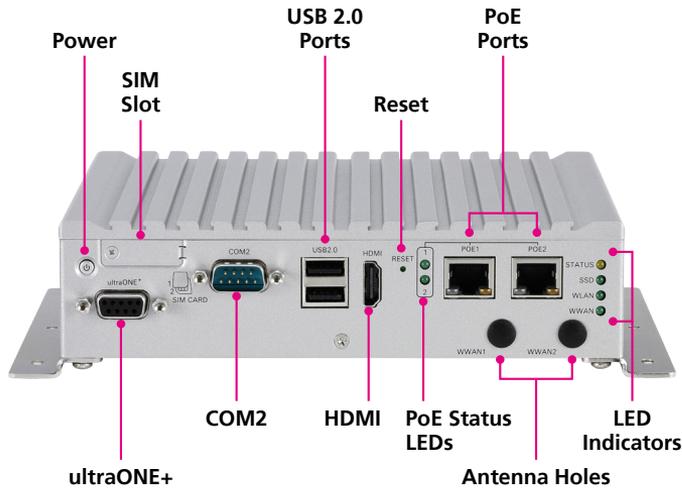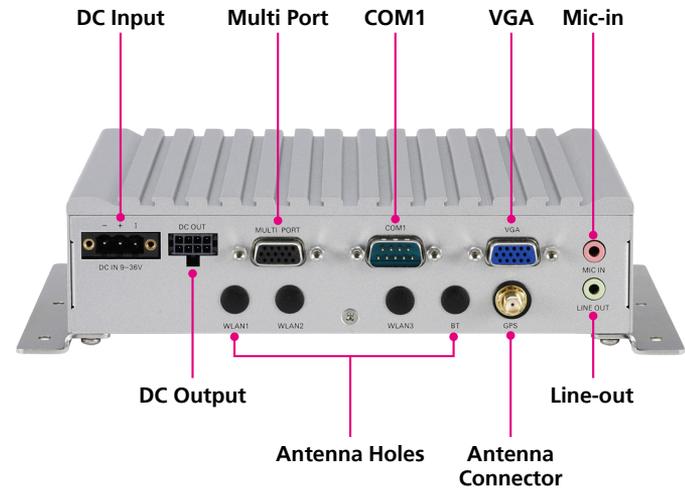
VTC 1011 Series Overview

VTC 1011, a compact, rugged and entry-level vehicle computer with Intel Atom® E3825 processor dual core 1.33GHz, is designed for the harsh in-vehicle environment. Because of the compact 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 1011 has onboard CAN 2.0B and optional OBD interface (SAE J1939/1708) for vehicle diagnostics and driver behavior management. An advanced GPS receiver supports GPS/Glonass/QZSS/Galileo/Beidou. VTC 1011 features WLAN and WWAN wireless data and 3G voice connectivity. With external SIM socket, it allows user to access SIM card conveniently. Advanced ultraONE+ technology support 10M Video transmission, collocate with VMD 2003 (VTC 1011-C2VK only). VTC 1011 always keeps the flexibility to meet different demands for telematics applications, such as infotainment, fleet management and patching system.

VTC 1011 Series Key Features

- Compact and fanless design

- Intel Atom® processor bay trail E3825 (1.33GHz)

- Built-in 1 x CAN 2.0B, optional SAE J1939/1708 module

- Dual SIM cards with cover for WWAN modules

- Smart power management with Ignition on/off delay via software control and low voltage protection

- 2 x PoE support, total 30W

- ultraONE+ technology support 10M video transmission, collocate with VMD 2003 (VTC 1011-C2VK only)

- Wide range DC input from 9~36V

- Wide operating temperature -40°C~70°C

- Certified by CE/FCC/E13

Hardware Specifications

CPU

- Intel Atom® processor bay trail E3825, 1.33GHz

Memory

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

Storage

- 1 x 2.5" SSD SATA 2.0
- 1 x mSATA

Expansion

- 1 x Full size mini-PCIe socket (USB 2.0 or USB 3.0 (option))
- 1 x Full size mini-PCIe socket (mSATA + PCIe + USB 2.0)

Function

- 1 x u-blox NEO-M8N module (support GPS/Glonass/QZSS/Galileo/Beidou)
- Built-in G-sensor
- TPM 2.0 (BOM Option)

I/O Interface-Front

- 1 x Power button with LED
- 2 x SIM sockets (Micro type) with cover
- 1 x DB9 for RS232 Full
- 2 x Type A USB 2.0 compliant host, supporting system boot up
- 1 x HDMI
- 1 x Reset button
- 2 x LEDs for PoE status
- 2 x RJ45 PoE

- 4 x LED for STATUS, SSD, WLAN, WWAN
- 1 x DB9 for ultraONE+ technology support (VTC 1011-C2VK only)
- 2 x Antenna holes for WWAN

I/O Interface-Rear

- 1 x Phoenix connector for power/GND/Ignition input
- 1 x 4 x 2 connect for 12V/2A DC output, UART, power button
- 1 x DB15 multi-port for 1 x CAN 2.0B, 1 x RS232 (Tx/Rx)/RS422/RS485, 8 x DIO
- 1 x DB9 for RS232 full
- 1 x DB15 VGA
- 1 x Mic-in
- 1 x Line-out
- 5 x Antenna holes for WLAN/BT/GPS

Operating System

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

Dimensions

- 185mm (W) x 150.9mm (D) x 45mm (H) (7.28" x 5.94" x 1.77")
- Weight: 1.3kg (2.9lbs)

Environment

- Temperature:
  Operating temperatures:
  -40°C to 70°C (w/o PoE), -40°C to 60°C (w/ PoE)
  Storage temperatures: -45°C to 85°C
  Damp Heat Test per EN60068-2-30

- Humidity:
  IEC 60068-2-3, Damp Heat Steady State Test, 40C, 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

Standards/Certifications

- CE approval
- FCC Class A
- E13 mark

Mechanical Dimensions

VTC 1011-C2K
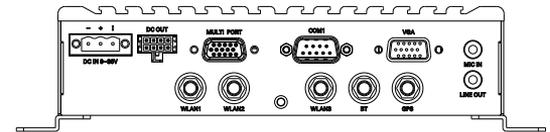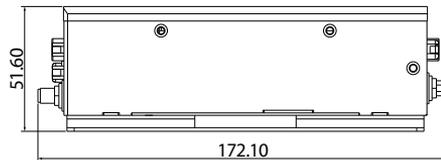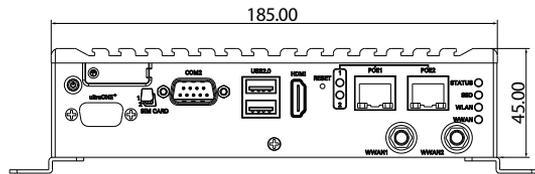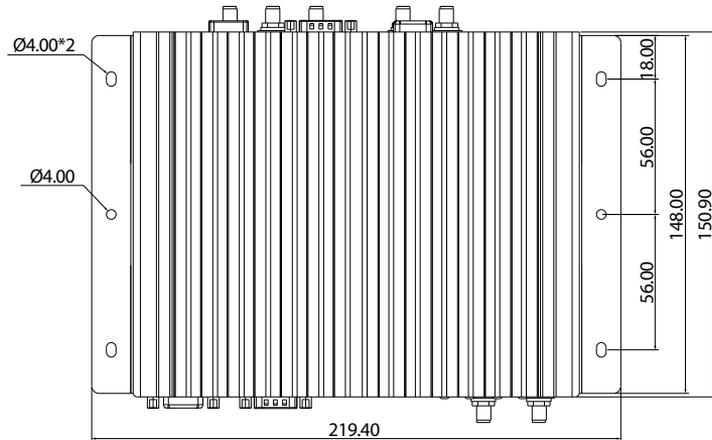
VTC 1011-C2VK

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 1011-C2K Front View
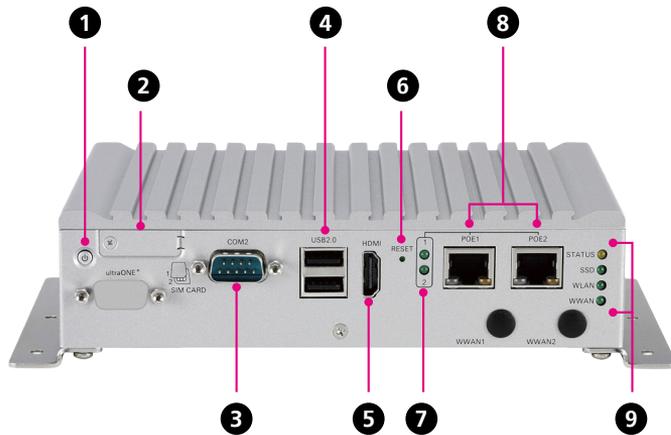
VTC 1011-C2K Rear View
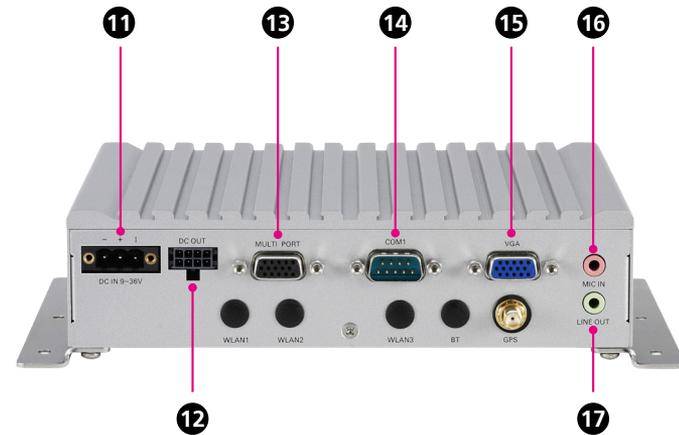
VTC 1011-C2VK Front View
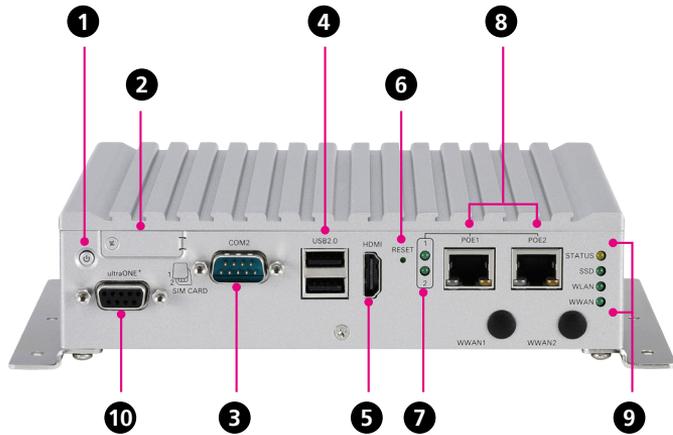
VTC 1011-C2VK Rear View
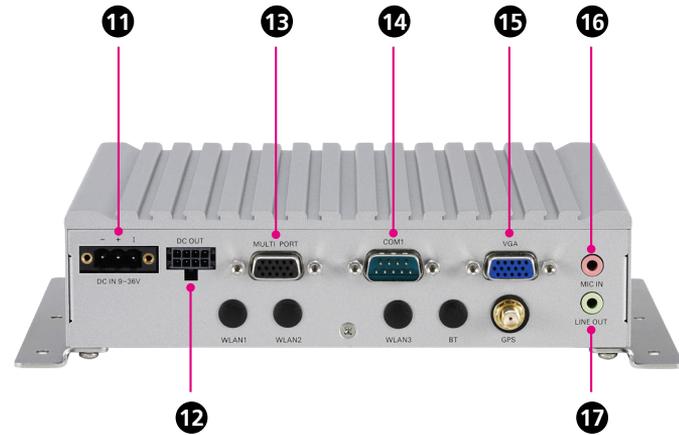
CHAPTER 2: EXTERNAL CONNECTORS PINOUT DESCRIPTION

Power Button

Connector number: 1

Pin	Definition	Pin	Definition
1	GND	2	PWRBT_IN#
3	PWRBT_IN#	4	GND
A1	LED_A	C1	LED_C

SIM1 and SIM2 Micro-SIM Slot

Connector number: 2
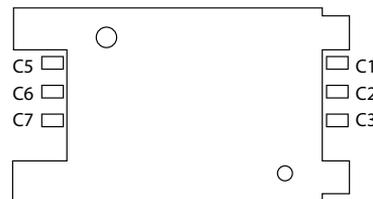
SIM1

Pin	Definition	Pin	Definition
C1	UIM1_PWR	C2	UIM1_RST
C3	UIM1_CLK	C4	NC
C5	GND	C6	NC
C7	UIM1_DAT		

SIM2

Pin	Definition	Pin	Definition
C1	UIM2_PWR	C2	UIM2_RST
C3	UIM2_CLK	C4	NC
C5	GND	C6	NC
C7	UIM2_DAT		

COM 2 Port

Connector number: 3
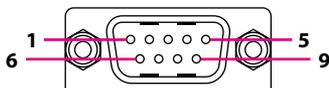
Pin	Definition	Pin	Definition
1	DCD_2	2	RXD_2
3	TXD_2	4	DTR_2
5	GND	6	DSR_2
7	RTS_2	8	CTS_2
9	RI/PW	10	NC

Dual USB 2.0 Port

Connector number: 4
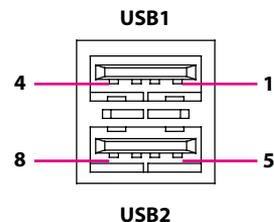
USB1 Pin Connector Definition

Pin	Definition	Pin	Definition
1	VCC	2	DATA1-
3	DATA1+	4	GND

USB2 Pin Connector Definition

Pin	Definition	Pin	Definition
5	VCC	6	DATA-
7	DATA+	8	GND

HDMI Connector

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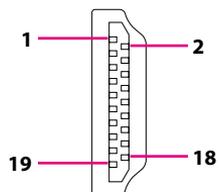
Pin	Definition	Pin	Definition
1	HDMI_TX2P_L	2	GND
3	HDMI_TX2N_L	4	HDMI_TX1P_L
5	GND	6	HDMI_TX1N_L
7	HDMI_TX0P_L	8	GND
9	HDMI_TX0N_L	10	HDMI_CLK_P_L
11	GND	12	HDMI_CLK_N_L
13	NC	14	NC
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	HDMI_P5V
19	HDMI_HPD		

Reset Button

Connector number: 6
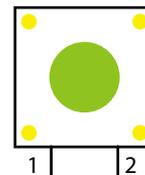
Pin	Definition
1	GND
2	RESET

PoE LED Indicators

Connector number: 7

1

2

LED	Description
PoE1	Light On: Active
PoE2	Light On: Active

PoE1 and PoE2 Ports

Connector number: 8

1 ——— 8

LINK   ACT
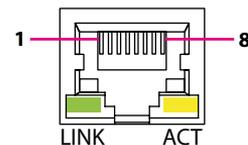
Pin	Definition	Pin	Definition
1	MDI0P	2	MDI0N
3	MDI1P	4	MDI2P
5	MDI2N	6	MDI1N
7	MDI3P	8	MDI3N
9	LED1-	10	LED1+
11	LED2-	12	LED2+

LED Indicators

Connector number: 9

STATUS ⬤

SSD ⬤

WLAN ⬤

WWAN ⬤

LED	Description
Status	Programmable. Power On: Green
SSD	Light On: HDD/SSD Active
WLAN	Blinking: Active
WWAN	Blinking: Active

ultraONE+ Connector (VTC 1011-C2VK Only)

Connector number: 10
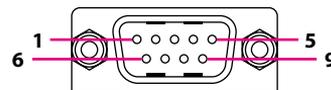
Pin	Definition	Pin	Definition
1	USB_DATA-	2	VMD_UGND
3	ultraONE-	4	LCD_PWR_BTN
5	24V_VM203	6	USB_DATA+
7	ultraONE+	8	NC
9	VM_GND		

DC Power Input

Connector number: 11

DC Out

Connector number: 12
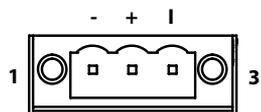
Pin	Definition
1	GND_IN
2	V_IN
3	IGNITION
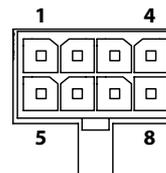
Pin	Definition	Pin	Definition
1	PUSH_BTN_RSTIN#	2	PUSH_BTN_SLEPIN#
3	GND	4	GND
5	**RS-232 TX	6	**RS-232 RX
7	PUSH_BTN_PWRIN#	8	+V12S

**Reserved for VTK62B in the future.

Multi Port

Connector number: 13
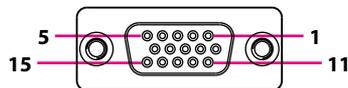
Pin	Definition	Pin	Definition
1	COM3_RX_TX+_R	2	GPI_0
3	GPI_3	4	GPO_2
5	MCU_CAN1_H	6	COM3_DCD#_TX-_R
7	COM3_DTR#_RX-_R	8	GPI_2
9	GPO_1	10	IOC_GND
11	COM3_TX_RX+_R	12	GPI_1
13	GPO_0	14	GPO_3
15	MCU_CAN1_L		

COM 1 Port

Connector number: 14
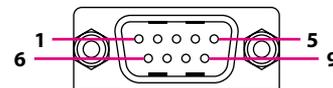
Pin	Definition	Pin	Definition
1	DCD_2	2	RXD_2
3	TXD_2	4	DTR_2
5	GND	6	DSR_2
7	RTS_2	8	CTS_2
9	RI/PW	10	NC

VGA Connector

Connector number: 15
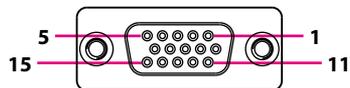
Pin	Definition	Pin	Definition
1	RED	2	GREEN
3	BLUE	4	CH7517_SPC
5	GND	6	M_DET
7	VGA_GND	8	VGA_GND
9	VGA_VCC	10	GND
11	CH7517_SPD	12	VGA_DAT
13	VGA_HS	14	VGA_VS
15	VGA_CLK		

Mic-in Connector

Connector number: 16
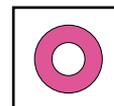
Pin	Definition	Pin	Definition
1	GND	2	Mic-in (Left Channel)
3	GND	4	Detect
5	NC		

Line-out Connector

Connector number: 17

Pin	Definition	Pin	Definition
22	Mic-in (Left Channel)	23	GND
24	Detect	25	Right Channel

18 VTC 1011 Series User Manual

Chapter 3: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the VTC 1011 series motherboard.

Before You Begin

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

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

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

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

Precautions

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

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

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

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

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

▪ Use correct screws and do not over tighten screws.

Jumper Settings

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

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

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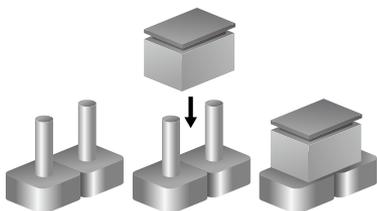
Three-Pin Jumpers: Pins 1 and 2 are Short
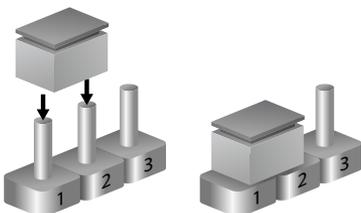
Locations of the Jumpers and Connectors

This chapter lists the location and pinout assignment of the jumpers and connectors on the VTC 1011 series motherboard.

Top View
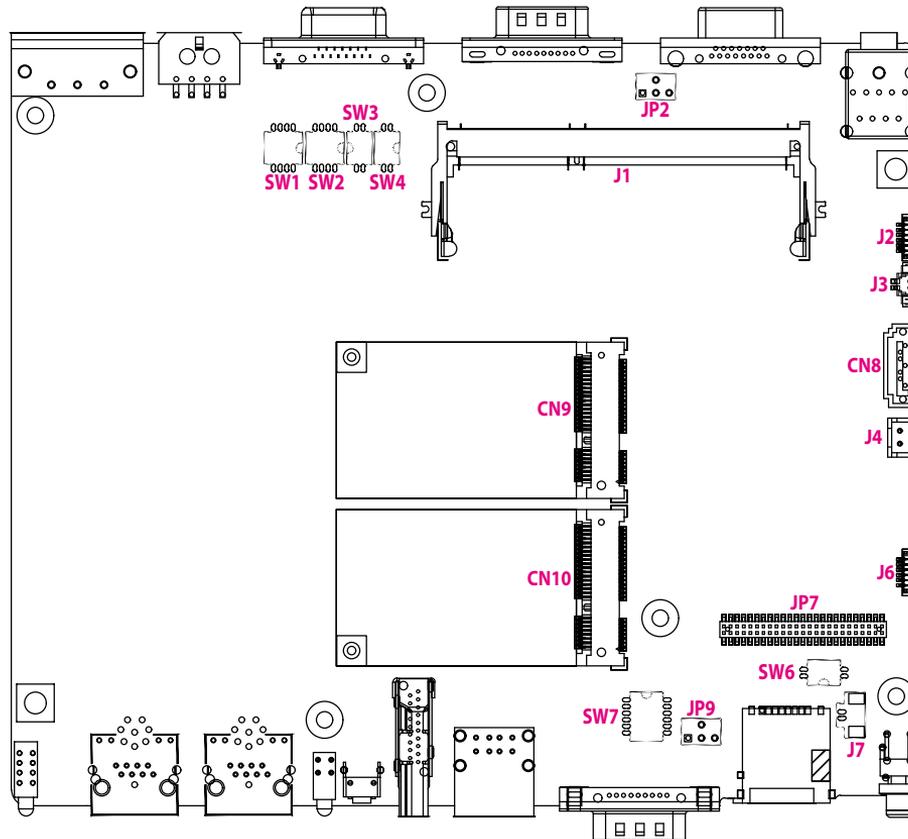
Connector Pin Definitions

GPI Function Select Switch

Connector type: DIP switch
Connector location: SW1

GPO Function Select Switch

Connector type: DIP switch
Connector location: SW2
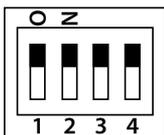
SW	On (Default)	Off
SW1.1	Pull up VCC	Don't Care
SW1.2	Pull up VCC	Don't Care
SW1.3	Pull up VCC	Don't Care
SW1.4	Pull up VCC	Don't Care
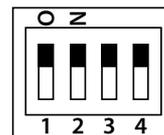
SW	On (Default)	Off
SW2.1	Pull up VCC	Don't Care
SW2.2	Pull up VCC	Don't Care
SW2.3	Pull up VCC	Don't Care
SW2.4	Pull up VCC	Don't Care

RS485 Pull High Switch

Connector type: DIP switch
Connector location: SW3
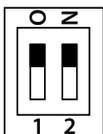
Pin	Definition
1 ~ 2 ON	RS485 Output Pull High
1 ~ 2 OFF	RS485 Output NC

CAN Bus Terminal Switch

Connector type: DIP switch
Connector location: SW4
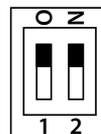
Pin	Definition
1 ~ 2 ON	CAN Bus with terminal
1 ~ 2 OFF	CAN Bus without terminal

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Clear CMOS

Connector type: DIP switch
Connector location: SW6
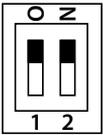
Pin	Definition
1 ~ 2 ON	Clear CMOS/ME
1 ~ 2 OFF	Normal

COM1 RI/Power Select

Connector type: 2x3 6-pin header
Connector location: JP2
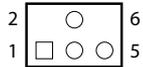
Pin	Definition
3 ~ 4 Short	Support UART RI
1 ~ 3 Short	Support +5V
3 ~ 5 Short	Support +12V

GPS Connector

Connector type: 1x6 6-pin header
Connector location: J2
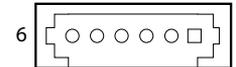
Pin	Definition	Pin	Definition
1	GPS_BAT	2	GPS_LED#
3	GPS_TX	4	GPS_RX
5	GND	6	VCC3_GPS

GPS Battery Connector

Connector type: 1x2 2-pin header
Connector location: J3
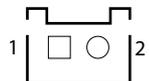
Pin	Definition
1	GND
2	RTC_BAT

SATA Connector

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)
Connector location: CN8
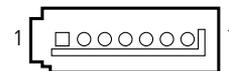
Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP0
3	SATA_TXN0	4	GND
5	SATA_RXN0	6	SATA_RXP0
7	GND		

SATA Power Connector

Connector type: 1x2 2-pin header
Connector location: J4
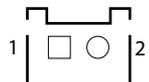
Pin	Definition
1	VCC5
2	GND

Internal USB Connector

Connector type: 1x6 6-pin header
Connector location: J6
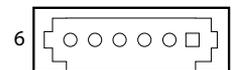
Pin	Definition	Pin	Definition
1	USB2_POWER	2	USBHUB_2N_C
3	USBHUB_2PC	4	GND
5	WLAN1_LED	6	WLAN1_DIS

ultraONE+ Internal IO Connector

Connector type: 2x25 50-pin header
Connector location: JP7
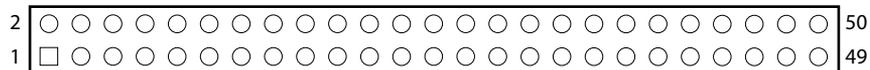
Pin	Definition	Pin	Definition
1	GND	2	GND
3	EDP_TX1P	4	USBHUB_4P_C
5	EDP_TX1N	6	USBHUB_4N_C
7	GND	8	GND
9	EDP_TX0P	10	NC
11	EDP_TX0N	12	NC
13	GND	14	GND
15	EDP_AUX_P	16	USBHUB_3P_C
17	EDP_AUX_N	18	USBHUB_3N_C
19	GND	20	GND
21	SMB_CLK	22	NC
23	SMB_DATA	24	GND
25	DPC1_HPD	26	GND

Pin	Definition	Pin	Definition
27	IO_HW_PWRBT	28	NC
29	BKLTCL_CH7511	30	NC
31	RST_CH7511	32	NC
33	DPC1_VDEN	34	NC
35	DPC1_BKLTEN	36	NC
37	GND	38	LVDS_DET#
39	LAN_MONITOR_DET	40	CH7511_GPIO3
41	CH7511_GPIO1	42	CH7511_GPIO2
43	CH7511_GPIO0	44	GND
45	GND	46	VCC3
47	12VSB	48	VCC5
49	12VSB	50	GND

RTC Battery Connector

Connector type: 1x2 2-pin header
Connector location: J7
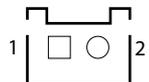
Pin	Definition
1	GND
2	RTC_BAT

COM2 RI/Power Select

Connector type: 2x3 6-pin header
Connector location: JP9

Pin	Definition
3 ~ 4 Short	Support UART RI
1 ~ 3 Short	Support +5V
3 ~ 5 Short	Support +12V

CN9 Wi-Fi LED Select & CN10 Audio PCM TX, RX Switch

Connector type: DIP switch
Connector location: SW7
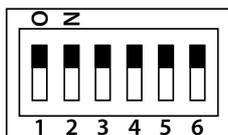
Pin	Definition
1, 4 ON 2, 3 OFF	Normal WWAN Module PCM (Default)
1, 4 OFF 2, 3 ON	Special WWAN Module PCM (MC7430)

Pin	Definition
5 ON 6 OFF	Normal Wi-Fi Module LED (Default)
5 OFF 6 ON	Special Wi-Fi Module LED (Inverse)

Mini-PCIe for PCIe/USB/mSATA

Connector location: CN9
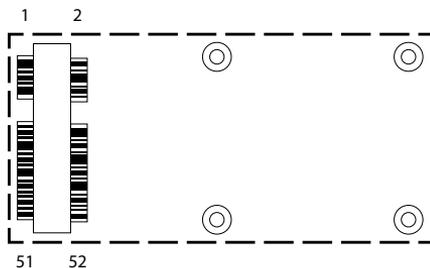
Pin	Definition	Pin	Definition
1	WAKE#	2	+V3.3_MINI_3
3	NC	4	GND
5	NC	6	+V1.5S_MINI_3
7	CLK_REQ	8	NC
9	GND	10	NC
11	REFCLK-	12	NC
13	REFCLK+	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD3_DIS#
21	GND	22	WLAN_RESET#
23	SATA_RXP0_C	24	+V3.3_MINI_3
25	SATA_RXN0_C	26	GND

Pin	Definition	Pin	Definition
27	GND	28	+V1.5S_MINI_3
29	GND	30	SMBCLK
31	SATA_TXN0_C	32	SMBDAT
33	SATA_TXP0_C	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+V3.3_MINI_3	40	GND
41	+V3.3_MINI_3	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+V1.5S_MINI_3
49	NC	50	GND
51	CTRL0	52	+V3.3_MINI_3

When CTRL=0, CN9 is mSATA.
When CTRL=1, CN9 is PCIe device.

Mini-PCIe for USB (WWAN)

Connector location: CN10
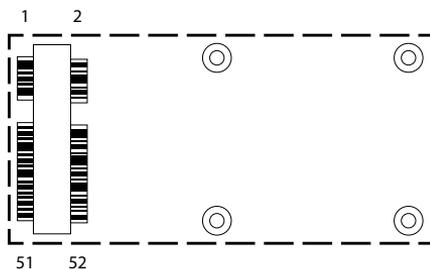
Pin	Definition	Pin	Definition
1	WAKE#	2	+V3.3_MINI1
3	NC	4	GND
5	NC	6	NC
7	GND	8	UIMB_PWR
9	GND	10	UIMB_DAT
11	VCC_MSM26_DIG	12	UIMB_CLK
13	NC	14	UIMB_RST
15	GND	16	NC
17	MCU_TX2	18	GND
19	MCU_RX2	20	3.5G_DIS#_L
21	GND	22	3.5G_RST#
23	USB3_RXN_R	24	+V3.3_MINI1
25	USB3_RXP_R	26	GND

Pin	Definition	Pin	Definition
27	GND	28	NC
29	GND	30	NC
31	USB3_TXN_R	32	NC
33	USB3_TXP_R	34	GND
35	GND	36	USB_0N_T
37	GND	38	USB_0P_T
39	+V3.3_MINI1	40	GND
41	+V3.3_MINI1	42	WWAN_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_MINI1

CHAPTER 4: SYSTEM SETUP

Removing the Chassis Cover

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

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

Right View

Left View

Front View

Rear View
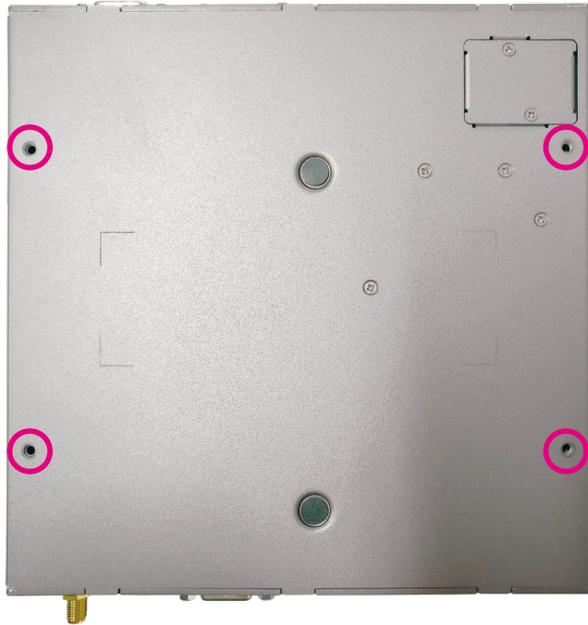
Bottom View

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.
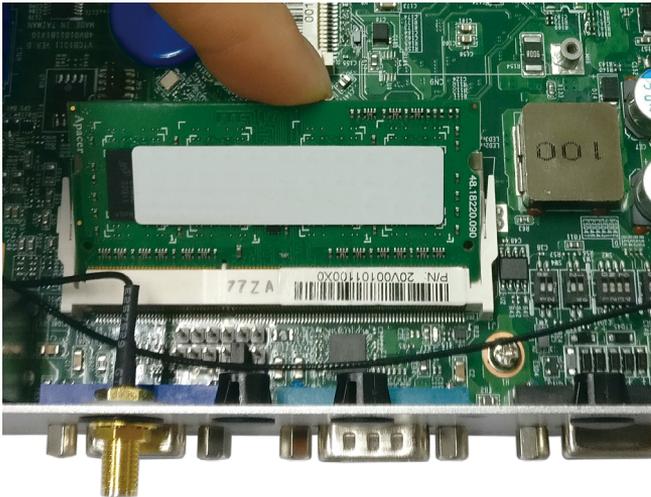
Installing a WWAN Module

1. Locate the WWAN Mini PCI Express slot (CN10). 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 screws into the mounting holes to secure the module.

Installing a WLAN Module (Full Mini-PCIe)

1. Locate the WLAN Mini PCI Express slot (CN9). 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 screws into the mounting holes to secure the module.
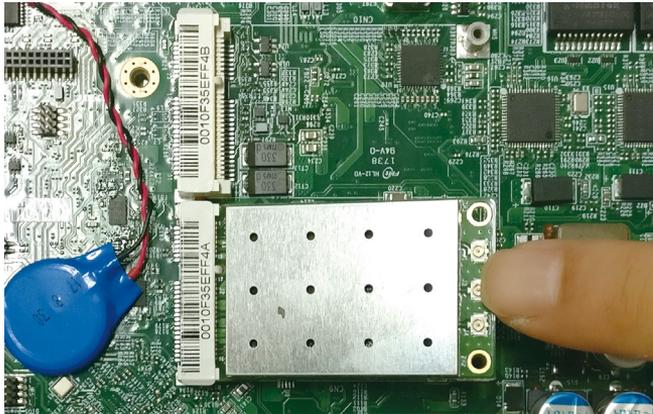
Installing a Wi-Fi Module (LR802URN2-01 Only)

1. Place the Wi-Fi module on the bottom case then fasten screws into the mounting holes to secure the module.

2. Connect the inner cable from the Wi-Fi module to the reserved USB wafer (J6) connector.

Installing a J1708/J1939 Module

1. Place the module on the bottom case then fasten screws into the mounting holes to secure the module.
2. Connect the inner cable from the module to the reserved USB wafer (J6) connector.
3. Please remove the ultraONE+ connector bracket and insert the DB9 connector for the module.
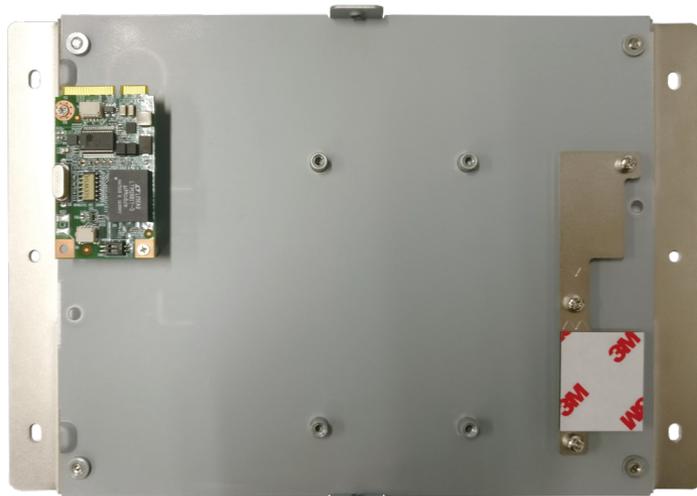
Installing a GPS Module

1. Place the GPS module on the bottom case then fasten screws into the mounting holes to secure the module.
2. Connect the inner cable from the GPS module to the GPS wafer (J2) connector.

Installing an SSD/HDD Drive

1. Loosen the screws on the SSD/HDD drive bay and take the drive bay out.

2. Insert the SSD/HDD into the drive bay with the SATA data and power connector facing towards the end. Align the SSD/HDD mounting holes with the mounting holes on the drive bay, and use the provided gaskets and screws to secure the hard drive in place.
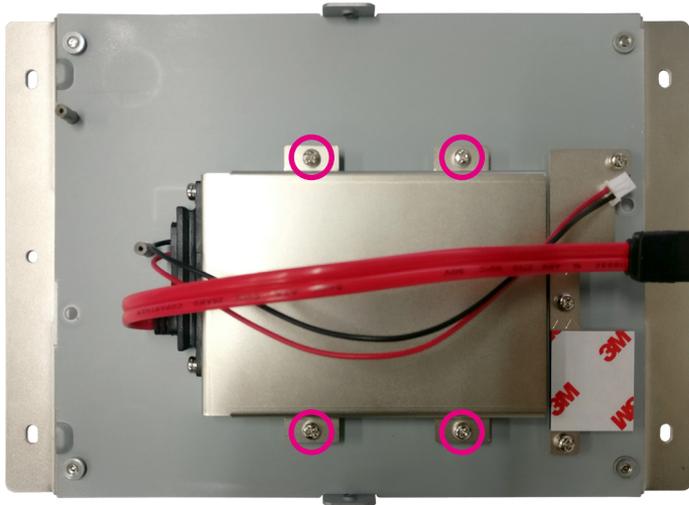
3. Insert the drive bay back in the SSD/HDD slot and tighten the screws to secure it in place.
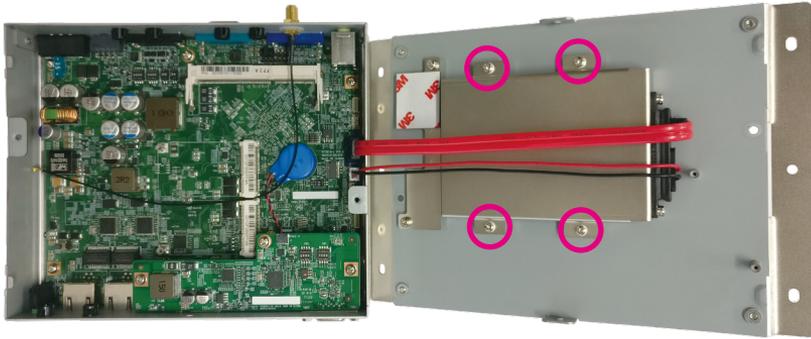
Inserting the SIM Card

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's software demo utility enables users to test and control different I/O port functions on the VTC 1011 series.
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.

Menu Screen

Config1

Config2
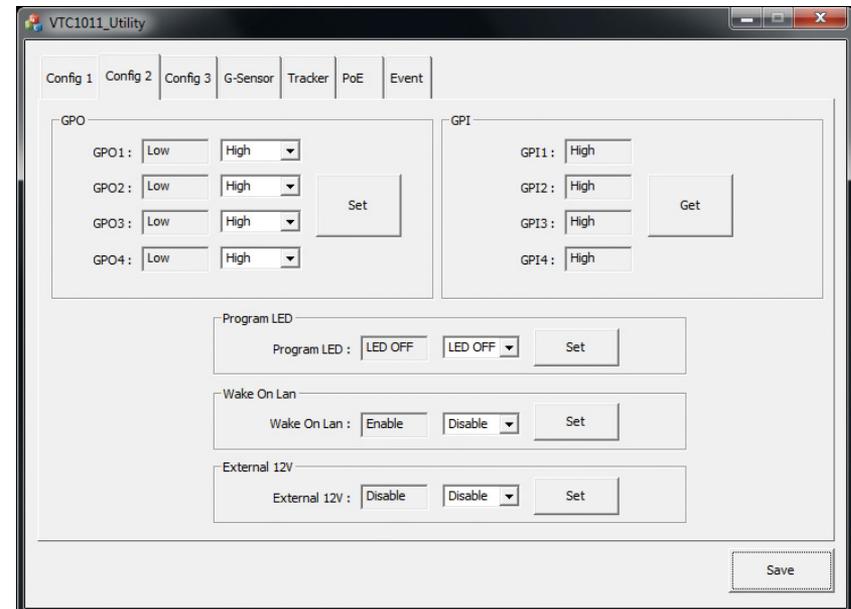
1. Config1

1.1 System Info

BIOS Version: Shows the BIOS Version.
MCU Version: Shows the MCU Version.
Hardware Version: Shows the HW Version.
Ignition: Shows the signal of ignition.
  – ON: Signal of ignition is high.
  – OFF: Signal of ignition is low.
Input Voltage: Shows the voltage level of power-in.

1.2 WWAN

Enables or disables the WWAN function on CN10 Mini-PCIe socket.
Enables or disables the WWAN wakeup function on CN10 Mini-PCIe socket.
The setting can also be cleared by the Set button.
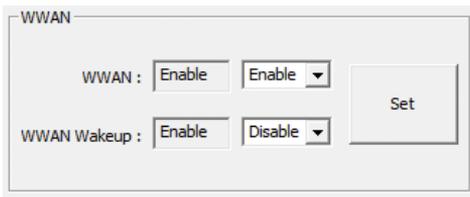
1.3 WiFi

Enables or disables the Wi-Fi module function on CN9 Mini-PCIe socket.
The setting can also be cleared by the Set button.
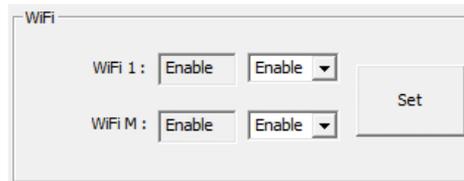
1.4 WDT

Enables or disables the WDT function. There are several selections of time.
The timer of WDT can also be cleared by the Set WDT Timeout button.

1.5 GPS

Enables or disables the GPS function.
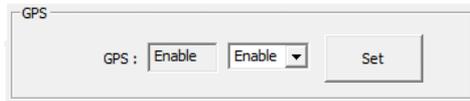
1.6 SIM Card

Selects SIM Card1 or SIM Card2 for SIM card configuration. The setting can also be cleared by the Set button.
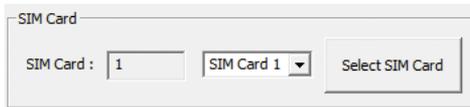
2. Config2

2.1 GPO

Defines GPO port as High or Low.

2.2 GPI

Defines GPI port as High or Low.
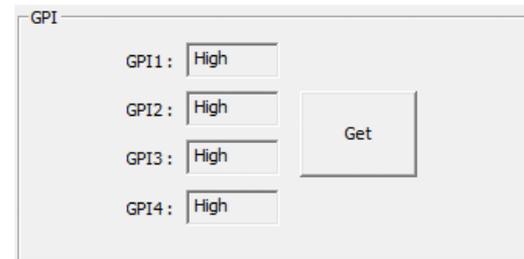
2.3 Program LED

Defines Program LED as ON or OFF.
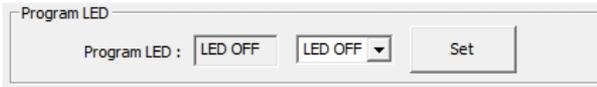
```
┌─Program LED─────────────────────────────────────────┐
│                                                      │
│   Program LED :   │LED OFF│   │LED OFF ▼│   │  Set  │ │
│                                                      │
└──────────────────────────────────────────────────────┘
```

2.4 Wake On LAN

Enables or disables the Wake On LAN function.
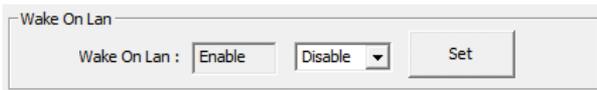
```
┌─Wake On Lan─────────────────────────────────────────┐
│                                                      │
│   Wake On Lan :   │Enable│   │Disable ▼│   │  Set  │  │
│                                                      │
└──────────────────────────────────────────────────────┘
```

2.5 External 12V

Enables or disables the External 12V function.

```
┌─External 12V────────────────────────────────────────┐
│                                                      │
│   External 12V :   │Disable│   │Disable ▼│   │  Set  ││
│                                                      │
└──────────────────────────────────────────────────────┘
```

3. Config3
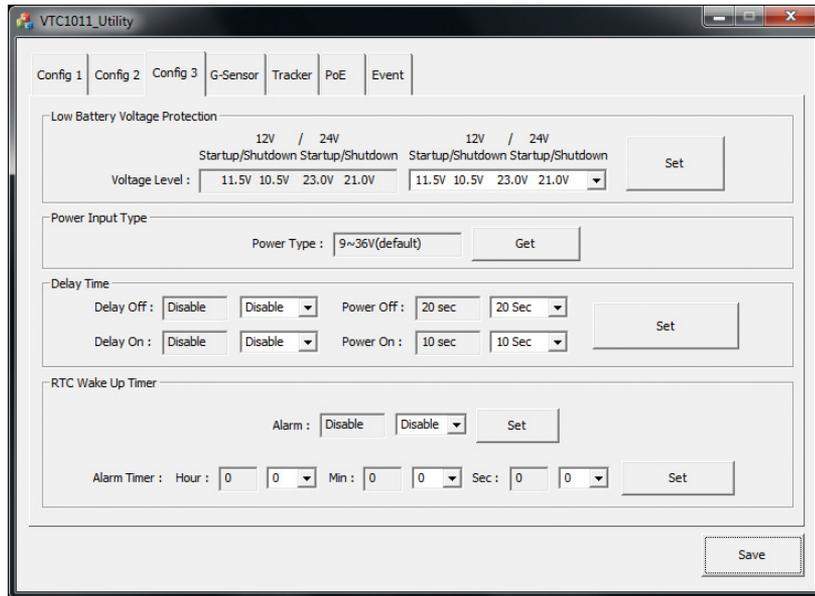
3.1 Low Battery Voltage Protection

Sets the Low Battery Voltage Protection Startup/Shutdown voltage level during 12V/24V.

3.2 Power Input Type

Shows the setting of input voltage in SW DIP switch.
If the setting is 12V: 12V is shown.
If the setting is 24V: 24V is shown.
If the setting is 9V~36V: 9V~36V is shown.

3.3 Delay Time

Enables or disables the delay time function. There are several selections of delay time.
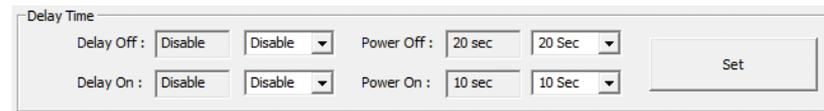
3.4 RTC Wake Up Timer

Enables or disables the Alarm wake up function. The timer setting of Alarm Timer can be configured.

4. G-Sensor
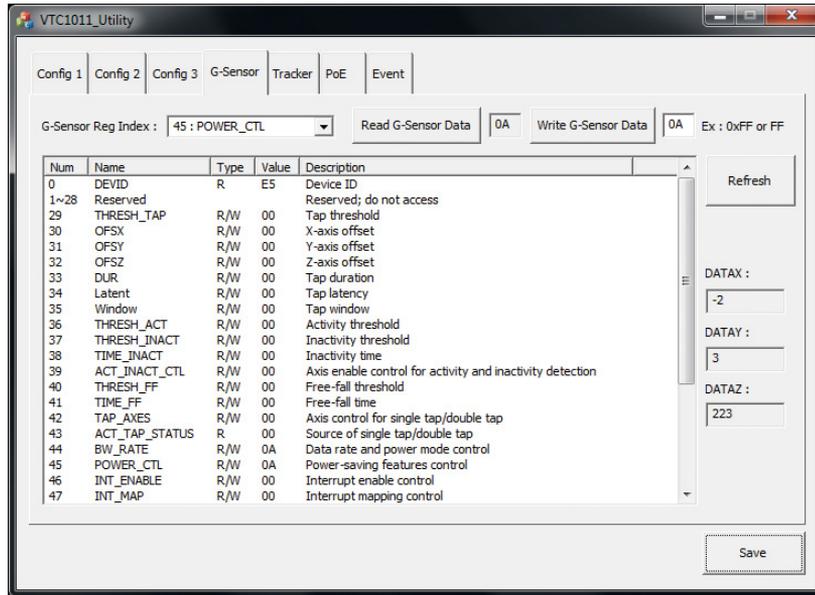
4.1 G-Sensor Register Index

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

4.2 Register Table

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

5. Tracker

5.1 Network Settings

Configures the network settings for the server.

APN: internet (default). It can be adjusted based on users' situation.
DNS1: 8.8.8.8 (default). It can be adjusted based on users' situation.
DNS2: 8.8.4.4 (default)
Server IP: 59.120.0.36 (default). It can be adjusted based on users' situation.
Server Port: 1200 (default). It can be adjusted based on users' situation.

Note:
This function is only supported by the VIOB-WWAN-HDA0 or VIOB-WWAN-HAA0 module.

5.2 SMS and Phone Number

Configures the SMS content and phone numbers for delivering SMS message.
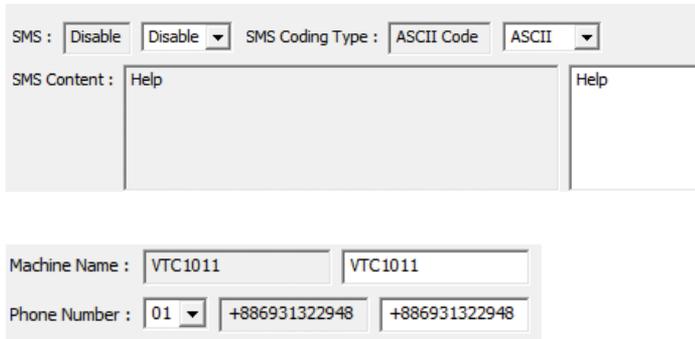
If SMS Control is enabled, once event is triggered (defined by Acceleration Force & Tilt Angle), SMS Message will be sent to the phone numbers that are registered automatically. There are up to 10 phone numbers that can be registered. SMS Content can be defined inside the text field.

5.3 Tracker Settings

Configures settings for the tracker.
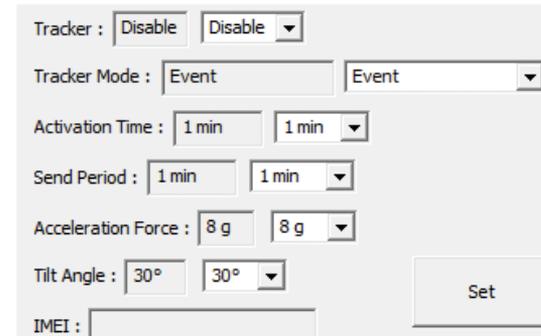
If Tracker function is "Enable" and Tracker Mode is "Event", once event is triggered (defined by Acceleration Force & Tilt Angle), following information will be sent to server.

If Tracker function is "Enable" and Tracker Mode is "Continue", following information will be sent to server, based on the interval time defined in Send Period.

(Information)
Date: YYMMDD
Time: HHMMSS
GPS Status: 0: Searching 1: Fixed
GPS Latitude
GPS Longitude
G Sensor X value: 0 ~ 65535
G Sensor Y value: 0 ~ 65535
G Sensor Z value: 0 ~ 65535

Activation Time: Define when tracker function starts after ignition signal becomes low.

Send Period: Define the interval time to send the information to server, when Tracker Mode is "Continue".

Acceleration Force: Define the value of G-sensor that triggers the event.

Tilt Angle: Define the value of tilt angle that triggers the event.

IMEI: IMEI of WWAN module will be shown.

Note:
It is required to press the Save Button for saving the settings made in the Utility.

6. PoE
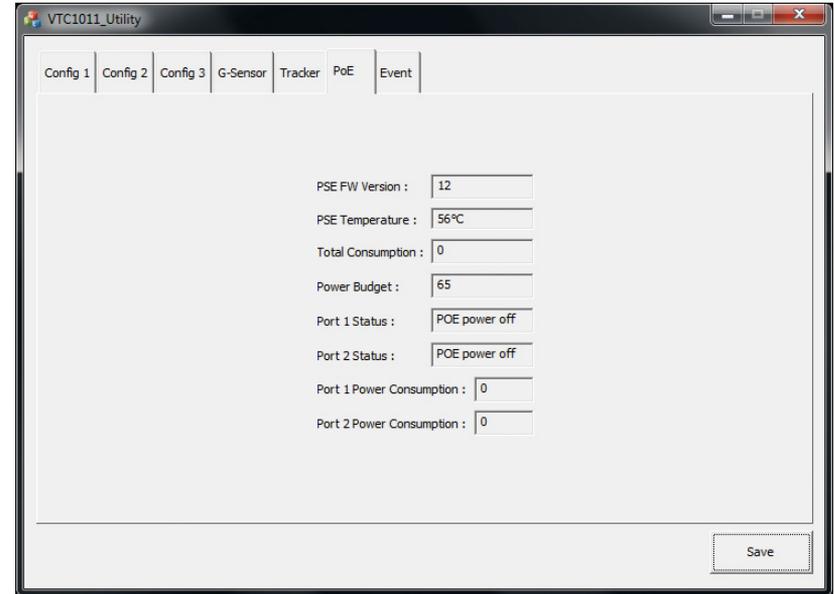
Press the Save button to show the PoE related information.

7. Event
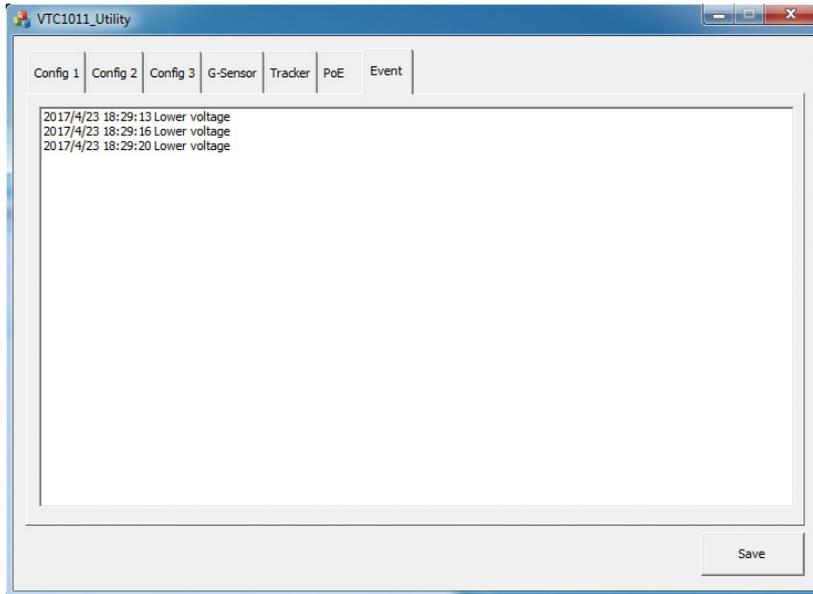
Shows the Event of VTC 1011, such as lower voltage event.

APPENDIX B: GPS FEATURE

uBlox-NEO M8N 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 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 (I^2C compliant) interface provides connectivity and enables synergies with most u-blox cellular modules. For RF optimization the NEO-M8N 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

	NEO-M8N/Q	NEO-M8M
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 rate[1]	Single GNSS: up to 18 Hz Concurrent GNSS: up to 10 Hz	
Position accuracy	2.0 m CEP	
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)	
RTC crystal	Built-in	
Noise figure	Extra LNA for lowest noise figure (NEO-M8N)	

Features cont.

Anti jamming	Active CW detection and removal. Extra onboard SAW band pass filter (NEO-M8N)
Memory	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	2.7 V to 3.6 V (NEO-M8N)
Power consumption[2]	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 (I²C 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

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APPENDIX D: SIGNAL CONNECTION OF GPI/GPO

Multi Port Pinout Description
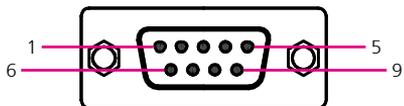
Pin	Definition	Pin	Definition
1	GPI_0	2	GPI_1
3	GPI_2	4	GPI_3
5	GPO_0	6	GPO_1
7	GPO_2	8	GPO_3
9	IOC_GND		

GPI Setting

Connector location: SW1
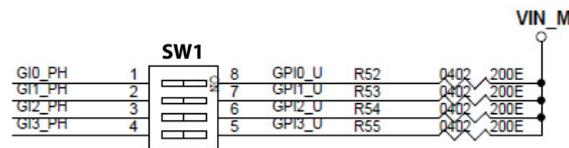
GPI (SW1)	
On	Pull up VCC
Off	Don't Care

Default Settings:

GPI (SW1)	
SW1.1 ~ SW1.4	Pull up VCC

GPO Setting

Connector location: SW2
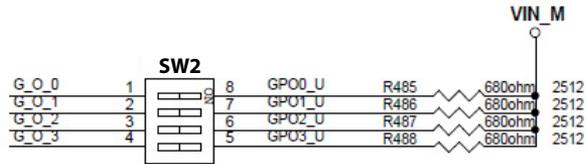
GPO (SW2)	
On	Pull up VCC
Off	Don't Care

Default Settings:

GPO (SW2)	
SW2.1 ~ SW2.4	Pull up VCC

Digital Input

Wet Contact (default)
SW1 connector for GPI signal (digital signal input).
The SW1 has 4 digital input channels by default.

The GPI signals have 9~36V-in (12V@1.1mA/ 24V@2.2mA) internally.

The figure below shows how to connect an external output source to one of the input channels.
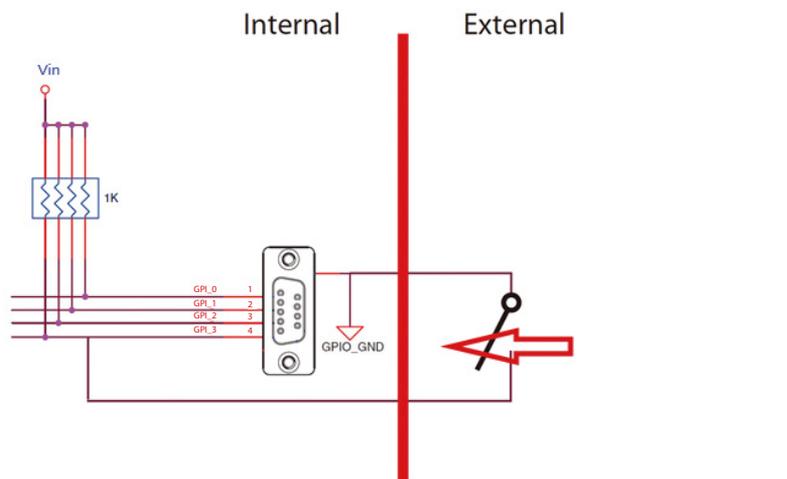
Dry Contact:
Each channel can accept 0~33Vdc voltage.

The GPI needs to switch to "OFF" state. The GPI signal will not have a pull up resistor internally when you switch "SW1" to "OFF" state.

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

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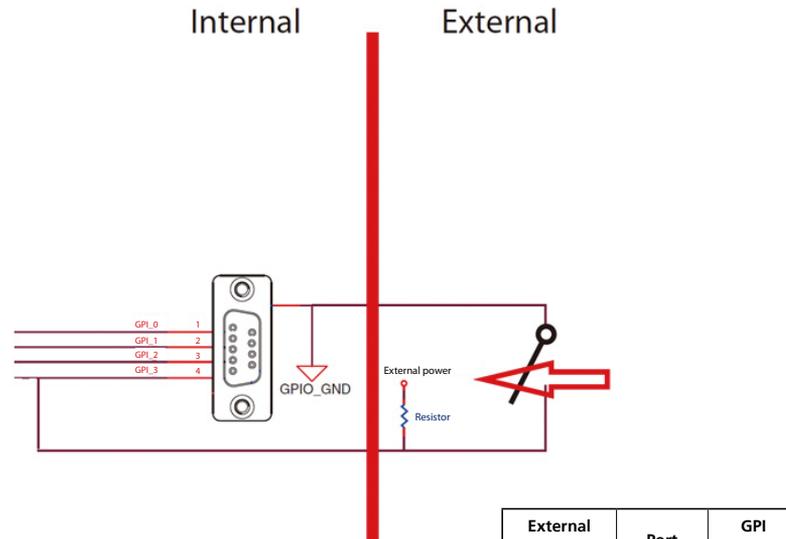
External Switch	Port	GPI Register
ON (Short)	GND	1
OFF (Open)	HIGH	0

Digital Output

SW2 connector for GPO signal (digital signal output)
The SW2 connector has 4 digital output channels by default. The signal connection of SW2 supports two connected methods for output signal type.

Wet Contact (default)
The SW2 needs to switch to "ON" state. The GPO signal will have a pull up 9~36V (nominal 40mA@24V) internally when you switch "SW2" to "ON" state.

The figure below shows how to connect an external input source to one of the output channels.
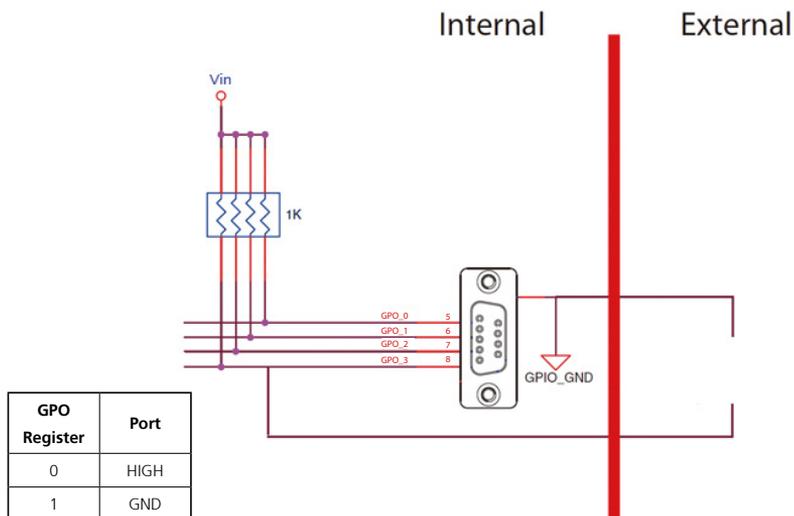
Dry Contact
Each channel can accept 5~27Vdc voltage.

The SW2 needs to switch to "OFF" state. The GPO signal will not have a pull up resistor internally when you switch "SW2" to "OFF" state.

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

GPO Register	Port
0	HIGH
1	GND

GPO Register	Port
0	OPEN
1	GND
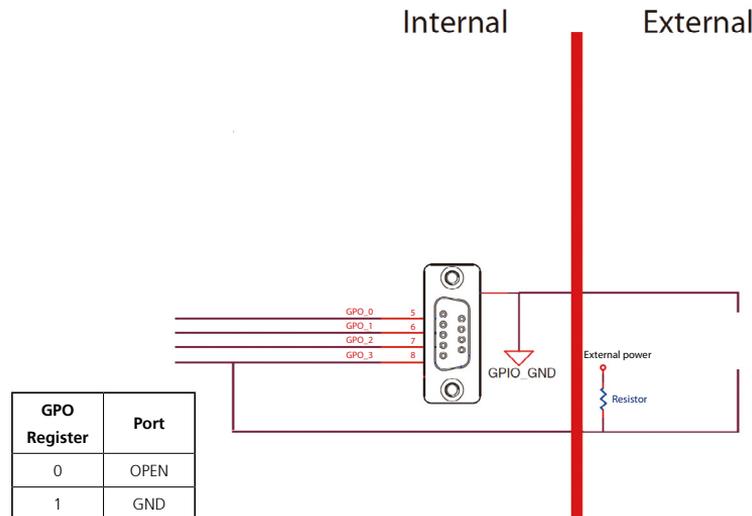
APPENDIX C: PIN DEFINITION FOR THE MULTIPORT CABLE

The multiport consists of a 15-pin connector and multiple output connectors. The tables in this appendix list the pin signals of the P1 connector and its corresponding pin signals to the output connectors.
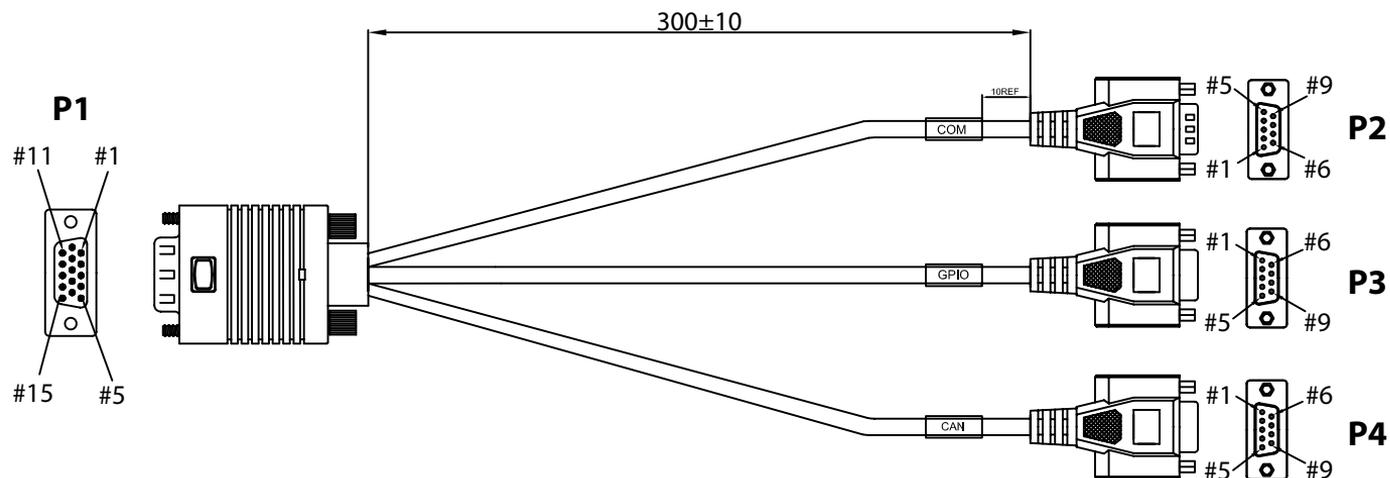
P1 Connector Pinout
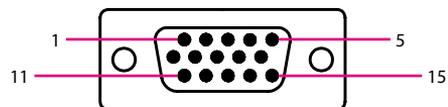
P2 to P4 Connector Pinouts
RS-232 (Tx/Rx) Connector
Connector location: P2

Pin	Definition	Pin	Definition
1	COM3_RX_TX+_R	2	GPI_0
3	GPI_3	4	GPO_2
5	MCU_CAN1_H	6	COM3_DCD#_TX-_R
7	COM3_DTR#_RX-_R	8	GPI_2
9	GPO_1	10	IOC_GND
11	COM3_TX_RX+_R	12	GPI_1
13	GPO_0	14	GPO_3
15	MCU_CAN1_L		
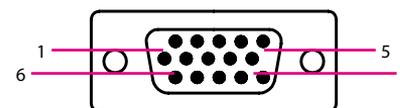
P1 Pin	P2 Pin	Definition
6	1	COM3_DCD#_TX-_R
1	2	COM3_RX_TX+_R
11	3	COM3_TX_RX+_R
7	4	COM3_DTR#_RX-_R
10	5	IOC_GND

GPIO Connector

Connector location: P3
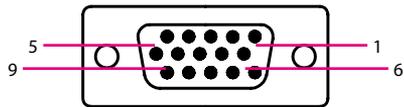
P1 Pin	P3 Pin	Definition
2	1	GPI_0
12	2	GPI_1
8	3	GPI_2
3	4	GPI_3
13	5	GPO_0
9	6	GPO_1
4	7	GPO_2
14	8	GPO_3
10	9	IOC_GND

CAN1 Connector

Connector location: P4
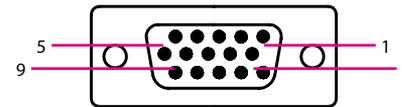
P1 Pin	P4 Pin	Definition
10	2	IOC_GND
5	3	MCU_CAN1_H
15	5	MCU_CAN1_L

APPENDIX E: VEHICLE POWER MANAGEMENT SETUP

Entering BIOS Menu

In the BIOS menu, go to **Advanced→Power Management Configuration**.

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.

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
  Main    Advanced    Security    Boot    Save & Exit

► Trusted Computing                              Power Management Configuration
► Power Management Configuration                 settings
► Module Management
► ACPI Settings
► NCT6106D Super IO Configuration
► NCT6106D HW Monitor
► CPU Configuration
► IDE Configuration
► Miscellaneous Configuration
► USB Configuration


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

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```

```
Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
          Advanced

  Power Management Configuration settings            Startup,Shutdown Setting.

  Input Voltage                  [9~36V]
  Startup,Shutdown               [(11.5,10.5)/(23,21)]

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

                    ┌──── Startup,Shutdown ────┐
                    │ (11.5, 10.5) / (23,21)   │
                    │ (12.0, 11.0) / (24,22)   │
                    │ (12.5, 11.0) / (25,22)   │         →←: Select Screen
                    │ (12.5, 11.5) / (25,23)   │         ↓: Select Item
                    └──────────────────────────┘         Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

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```

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.

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Advanced

Power Management Configuration settings

| Input Voltage | [9~36V] |
| Startup,Shutdown | [(11.5,10.5)/(23,21)] |

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

┌─────── Startup,Shutdown ───────┐
│ (11.5, 10.5) / (23,21) │
│ (12.0, 11.0) / (24,22) │
│ (12.5, 11.0) / (25,22) │
│ (12.5, 11.5) / (25,23) │
└────────────────────────────────┘

Startup,Shutdown Setting.

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

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Advanced

Power Management Configuration settings

| Input Voltage | [9~36V] |
| Startup,Shutdown | [(11.5,10.5)/(23,21)] |

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

┌─────── Startup,Shutdown ───────┐
│ (11.5, 10.5) / (23,21) │
│ (12.0, 11.0) / (24,22) │
│ (12.5, 11.0) / (25,22) │
│ (12.5, 11.5) / (25,23) │
└────────────────────────────────┘

Startup,Shutdown Setting.

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

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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

```
        Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
          Advanced

Power Management Configuration settings              Startup,Shutdown Setting.

Input Voltage                 [9-36V]
Startup,Shutdown              [(11.5,10.5)/(23,21)]

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

            ┌──── Startup,Shutdown ────┐
            │  (11.5, 10.5) / (23,21)   │
            │  (12.0, 11.0) / (24,22)   │
            │  (12.5, 11.0) / (25,22)   │
            │  (12.5, 11.5) / (25,23)   │      →←: Select Screen
            └───────────────────────────┘      ↓: Select Item
                                               Enter: Select
                                               +/-: Change Opt.
                                               F1: General Help
                                               F2: Previous Values
                                               F3: Optimized Defaults
                                               F4: Save & Exit
                                               ESC: Exit

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```

```
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          Advanced

Power Management Configuration settings              Power On Delay Setting.

Input Voltage                 [9-36V]
Startup,Shutdown              [(11.5,10.5)/(23,21)]

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

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

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```

Enable Power-on Delay

Delay on time can be set at 10sec/30sec/1min./5mins./10mins./15mins./30mins./1hour.
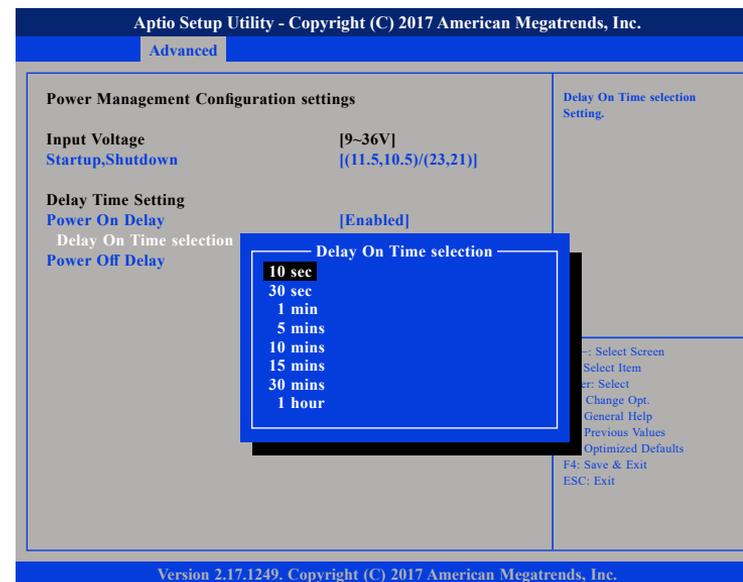
Power-off Delay Setting

Disable Power-off Delay

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Advanced

Power Management Configuration settings

Input Voltage   [9~36V]
Startup,Shutdown   [(11.5,10.5)/(23,21)]

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

Power Off Delay Setting.

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

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Enable Power-off Delay

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

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Advanced

Power Management Configuration settings

Input Voltage   [9~36V]
Startup,Shutdown   [(11.5,10.5)/(23,21)]

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

Power Off Delay Setting.

┌─── Power Off Delay ───┐
 Disabled
 Enabled
└──────────────┘

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

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Advanced

Power Management Configuration settings

Input Voltage	**[9~36V]**
Startup,Shutdown	**[(11.5,10.5)/(23,21)]**

Delay Time Setting
Power On Delay   **[Disabled]**
Power Off Delay
  Delay Off Time selection

Delay Off Time selection Setting.

┌─────── **Delay Off Time selection** ───────┐
│ **20 sec** │
│ **1 min** │
│ **5 mins** │
│ **10 mins** │
│ **30 mins** │
│ **1 hour** │
│ **6 hrs** │
│ **18 hrs** │
└──────────────────────────────────┘

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

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APPENDIX F: VEHICLE POE SETUP

Entering BIOS Menu

In the BIOS menu, go to **Advanced→Module Management**.

POE 54V Setting

Enable POE 54V

This will support 2 x POE, total 30W.
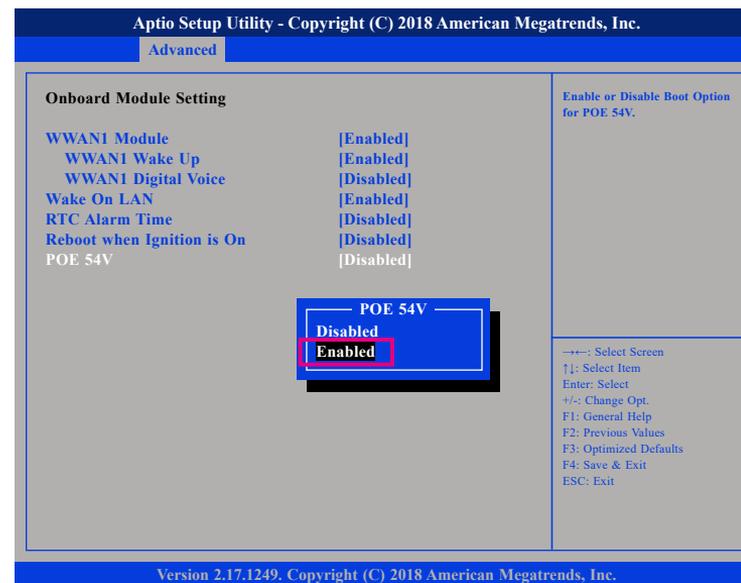
Disable POE 54V

In this selection the POE port will become normal LAN port.

```
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Onboard Module Setting                              Enable or Disable Boot Option
                                                    for POE 54V.
WWAN1 Module                    [Enabled]
   WWAN1 Wake Up                [Enabled]
   WWAN1 Digital Voice          [Disabled]
Wake On LAN                     [Enabled]
RTC Alarm Time                  [Disabled]
Reboot when Ignition is On      [Disabled]
POE 54V                         [Disabled]

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

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```

APPENDIX G: VEHICLE DISPLAY SETUP

Entering BIOS Menu

In the BIOS menu, go to **Advanced→Display Control**.

Display Control Setting

Set the Primary Display

If the Primary Display is Auto: BIOS or OS main screen will be displayed on the ONLY connected Display.

If the Primary Display is VGA/HDMI/ultraONE+: the BIOS or OS main screen will be displayed on the selected Display.

Set the Secondary Display

If the secondary Display is VGA/HDMI/ultraONE+, the OS secondary screen
will be displayed on the selected secondary Display.

```
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          Advanced

  Display Control                                       Select Secondary Display Device

  Primary Display                  [ultraONE+]
  Secondary Display                [Disabled]



                   ┌─── Secondary Display ───┐
                   │ Disabled                 │
                   │ VGA                      │
                   │ HDMI                     │
                   │ ultraONE+                │
                   └──────────────────────────┘     →←: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit


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```
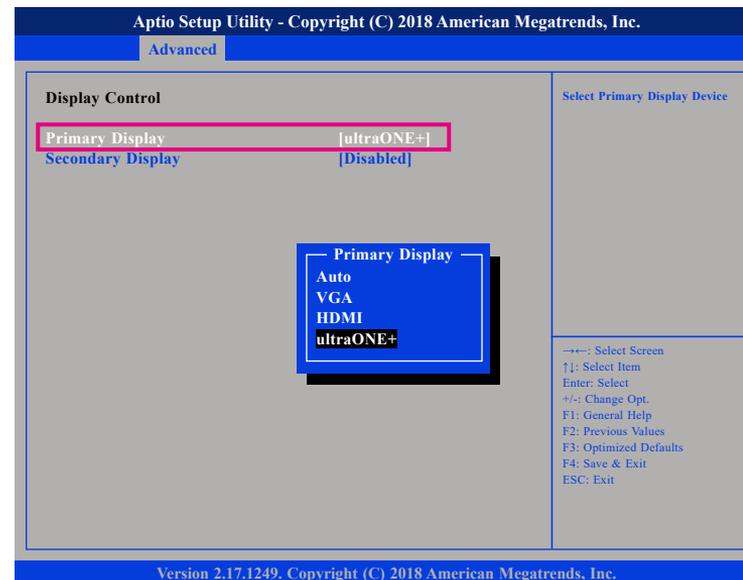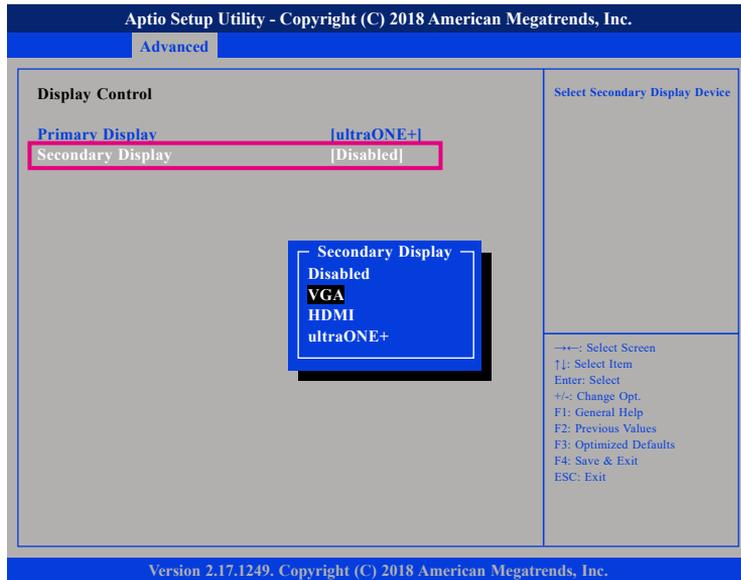
APPENDIX H: POWER CONSUMPTION

OS: Windows 7

Burn-in Software: Version 6.0

Device:

Idle: Into OS + VGA/HDMI/ultraONE+ display + Keyboard & Mouse + Speaker + mSATA

Full State: Run BURN-IN + VGA/HDMI/ultraONE+ display + Keyboard & Mouse + Speaker (Sound volume max) + 3G LINK (player Video) + mSATA (transfer) + COM loopback + GPIO LED x5

Full State + Loading: Full state + DC-out loading + USB loading + COM_PWR loading + PoE loading

Device	Test Case		Result	
			Current(A)	Watt(W)
S0 State	Idle State	12V	1.86	22.32
		24V	1.07	25.68
		36V	0.78	28.08
	Full State	12V	2.27	27.24
		24V	1.21	29.04
		36V	0.88	31.68
	Full State + Loading (PoE load x 2)	12V	11.77	141.24
		24V	5.09	122.16
		36V	3.42	123.12