



NEXCOM International Co., Ltd.

Mobile Computing Solutions
Vehicle Telematics Computer
VTC 1910-S
User Manual

CONTENTS

Preface

Copyright	v
Disclaimer	v
Acknowledgements	v
Regulatory Compliance Statements	v
Declaration of Conformity.....	v
RoHS Compliance	vi
Warranty and RMA	vii
Technical Support and Assistance.....	x
Conventions Used in this Manual.....	x
Global Service Contact Information.....	xi
Package Contents	xiii

Chapter 1: Product Introduction

Physical Features	1
Front View.....	1
Rear View.....	1
Overview	2
Key Features	2
Hardware Specifications.....	3
Connector Numbering	5

Chapter 2: External Connectors Pinout Description

Power Button	6
Reset Button.....	6

USB 2.0 Port.....	7
Line-out/Mic-in Jack.....	7
SIM1 and SIM2 Slots.....	8
LED Indicators (SSD/WLAN/WWAN)	8
J1708/J1939 Connector.....	9
DC Input 9V-36V	9
USB 3.0 Port.....	10
LAN Port.....	10
RS232/CAN/DIO Connector	11
VGA Port.....	11

Chapter 3: Jumpers and Switches

Before You Begin	12
Precautions	12
Jumper Settings	13
DIP Switch Settings	15
Input Voltage Setup Selection	15
RTC Clear CMOS.....	15
CAN1/2 Terminator Resistor Selection Switch.....	16
Internal USB Connector For WLAN Module.....	17
SATA Power Connector	17
MCU Debug Connector For NXP.....	18
RTC Battery Connector	18
MCU Download Pin Header	19
MCU Debug Pin Header For ST.....	19
SATA HDD Connector.....	20

GPS Battery Connector	20
Mini-PCIe (USB)	21
Mini-PCIe (PCIe + mSATA)	22

Chapter 4: System Setup

Removing the Chassis Cover	23
Installing a WLAN Mode	24
Installing an mSATA Module	24
Installing a J1708/J1939 Module	25
Installing a WWAN Mode	25
Installing a SATA DOM Module	26
Installing a SO-DIMM	26
Rackmount Brackets	27
Inserting the SIM Card	27

Appendix A: Software Demo Utility for I/O Ports of Function Control

1. Menu Screen - Config 1	28
1.1 System Information	29
1.2 Boot Mode	29
1.3 OS Control	29
1.4 WWAN	29
1.5 MDO	29
1.6 SIM Card	29
1.7 MDI	30
1.8 Wi-Fi	30
1.9 LAN Wakeup	30
2. Config 2	31
2.1 Low Battery Voltage Protection	31
2.2 Power Input Type	31
2.3 Delay Time	31

2.4 RTC Wake Up Timer	31
3. Config 3	32
3.1 System Shutdown Event	32
3.2 System Alarm Event	32
4. CAN_Utility	33
4.1 Select CAN and Device	33
4.2 CAN Speed	33
4.3 Stop Transmit	33
4.4 Clear receive FIFO	33
4.5 Get CAN error code	34
4.6 Filter	34
4.7 Message	34
4.8 Auto Send Message	34
4.9 Information	34

Appendix B: GPS Feature

uBlox-NEO M8 Overview	35
Technical Specifications	35

Appendix C: Signal Connection of MCU DI/DO

MCU DIO Pinout Description	37
Digital Input	37
Digital Output	38

Appendix D: Vehicle Power Management Setup

Startup and Shutdown Voltage Setting	39
Power-on Delay Setting	41
Power-off Delay Setting	43

Appendix E: Power Consumption



Appendix F: Pin Definition for the Multiport Cable

P0 Connector Pinout.....47

P1 to P5 Connector Pinouts47

 RS-232 (Tx/Rx) Connector47

 RS-232 (Tx/Rx) Connector48

 GPIO Connector48

 CAN1 Connector.....49

 RS-485 Connector.....49



PREFACE

Copyright

This publication, including all photographs, illustrations and software, is protected under international copyright laws, with all rights reserved. No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written consent from NEXCOM International Co., Ltd.

Disclaimer

The information in this document is subject to change without prior notice and does not represent commitment from NEXCOM International Co., Ltd. However, users may update their knowledge of any product in use by constantly checking its manual posted on our website: <http://www.nexcom.com>. NEXCOM shall not be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of any product, nor for any infringements upon the rights of third parties, which may result from such use. Any implied warranties of merchantability or fitness for any particular purpose is also disclaimed.

Acknowledgements

VTC 1910-S 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 B 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 B 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.
- 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.

Global Service Contact Information

Headquarters

NEXCOM International Co., Ltd.

9F, No. 920, Zhongzheng Rd.,
Zhonghe District, New Taipei City, 23586,
Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
www.nexcom.com

Asia

Taiwan

NexAIoT Headquarters

Industry 4.0 and Cloud Services

12F, No.922, Zhongzheng Rd.,
Zhonghe District, New Taipei City,
23586, Taiwan, R.O.C.
Tel: +886-2-8226-7796
Fax: +886-2-8226-7926
Email: sales@nexaiot.com
www.nexaiot.com

NexAIoT Co., Ltd.

Taichung Office

16F, No.250, Sec.2, Chongde Rd.,
Beitun District,
Taichung City, 406, Taiwan, R.O.C.
Tel: +886-4-2249-1179
Fax: +886-4-2249-1172
Email: jacobhuang@nexaiot.com
www.nexaiot.com

NexCOBOT Taiwan Co., Ltd.

13F, No.916, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7926
Email: jennyshern@nexcobot.com
www.nexcobot.com

GreenBase Technology Corp.

13F, No.922, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7900
Email: vivianlin@nexcom.com.tw
www.nexcom.com.tw

DivioTec Inc.

19F-1A, No.97, Sec.4, ChongXin Rd.,
Sanchong District,
New Taipei City, 24161, Taiwan, R.O.C.
Tel: +886-2-8976-3077
Email: sales@diviotec.com
www.diviotec.com

AIoT Cloud Corp.

13F, No.922, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
Email: alantsai@aiotcloud.net
www.aiotcloud.dev

EMBUX TECHNOLOGY CO., LTD.

13F, No.916, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
Email: info@embux.com
www.embux.com

TMR TECHNOLOGIES CO., LTD.

13F, No.916, Zhongzheng Rd.,
Zhonghe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
Email: services@tmrtek.com
www.tmrtek.com

China NEXSEC Incorporated

201, Floor 2, Unit 2, Building 15, Yard 3,
Gaolizhang Road, Haidian District,
Beijing, 100094, China
Tel: +86-10-5704-2680
Fax: +86-10-5704-2681
Email: marketing@nexsec.cn
www.nexsec.cn

NEXCOM Shanghai

Room 406-407, Building C, No 154, Lane 953,
Jianchuan Road, Minhang District,
Shanghai, 201108, China
Tel: +86-21-5278-5868
Fax: +86-21-3251-6358
Email: sales@nexcom.cn
www.nexcom.cn

NEXCOM Surveillance Technology Corp.

Floor 8, Building B3, Xiufeng Industrial Zone,
GanKeng Community, Buji Street,
LongGang District,
ShenZhen, 518112, China
Tel: +86-755-8364-7768
Fax: +86-755-8364-7738
Email: steveyang@nexcom.com.tw
www.nexcom.cn

NEXGOL Chongqing

1st Building No.999,
Star Boulevard, Yongchuan Dist,
Chongqing City, 402160, China
Tel: +86-23-4960-9080
Fax: +86-23-4966-5855
Email: sales@nexgol.com.cn
www.nexcobot.cn

Beijing NexGemo Technology Co.,Ltd.

Room 205, No.1, Fazhan Rd.,
Beijing International Information Industry Base,
Changping District,
Beijing, 102206, China
Tel: +86-10-8072-2025
Fax: +86-10-8072-2022
Email: sales@gemotech.cn
www.nexgemo.com

Japan

NEXCOM Japan

9F, Tamachi Hara Bldg.,
4-11-5, Shiba Minato-ku,
Tokyo, 108-0014, Japan
Tel: +81-3-5419-7830
Fax: +81-3-5419-7832
Email: sales@nexcom-jp.com
www.nexcom-jp.com

America

USA NEXCOM USA

46665 Fremont Blvd.,
Fremont CA 94538, USA
Tel: +1-510-656-2248
Fax: +1-510-656-2158
Email: sales@nexcom.com
www.nexcomusa.com

Europe

United Kingdom NEXCOM EUROPE

10 Vincent Avenue,
Crownhill Business Centre,
Milton Keynes, Buckinghamshire
MK8 0AB, United Kingdom
Tel: +44-1908-267121
Fax: +44-1908-262042
Email: sales.uk@nexcom.eu
www.nexcom.com

Package Contents

Before continuing, verify that the VTC 1910-S package that you received is complete. Your VTC 1910-S package should have all the items listed in the following table.

Item	P/N	Name	Specification	Qty
1	4NCPF00330X00	Terminal Blocks 3P DINKLE: EC350VM-03P 3.5mm FEMALE 180D ASSY Green	3.5mm Female 180D ASSY Green	1
2	50333P0027X00	Washer For SMA CONN KANG YANG: TW-181 13x1.8mm Nylon 66 Natural	13x1.8mm Nylon 66 Natural	2
3	50333P0028X00	Washer For SMA CONN KANG YANG: WS6-0.8(B) 12.8x6.4x0.8mm PC Black	12.8x6.4x0.8mm PC Black	2
4	60111A0402X00	Inner Carton For VTC 1910-S VER:A YI GIA 230x215x115mm B Flute	230x215x115mm B Flute	1
5	60111A0403X00	Outside Carton For VTC 1910-S VER:A YI GIA 451x245x258mm AB Flute	451x245x258mm AB Flute	1/4
6	6012200052X00	PE Zipper Bag #8	170x240mm, w/China RoHS Symbol	1
7	6012200053X00	PE Zipper Bag #3	100x70mm, w/China RoHS Symbol	1
8	6012200082X00	PE Bag For SA2i UMPC US Power Kit FU DING 220x280x0.07mm	220x280x0.07mm	1
9	6013300915X00	EPE For VTC 1910-S VER: A SENTENEL 210x75x92.5mm	210x75x92.5mm	2
10	6019900175X00	Paper Partition For VTC 1910-S VER:A YI GIA 220x200mm AB Flute	220x200mm AB Flute	1
11	602DCD1530X00	VTC 1910-S Series DVD Driver VER:1.2	JCL	1
12	603ANT0115X00	GPS/GLONASS Antenna SANAV:SM-76G	SMA Male L=5000mm	1
13	603POW0086X00	SATA-DOM Power Cable ST:MD-5703216	A1251 2P to A1254 3P L=70mm	1
14	5061100203X00	Wi-Fi Module Sponge For VTC 1910-S VER:A S.W.	34x15mm 1.8T EPDM E4308 1.5T+3M9888T Black	1
15	6030000231X00	Multi Cable For VTC 1910-S ST: MD-5106033	DB15 TO 2x DB9(M) 3x DB9(F) L:300mm	1

Ordering Information

The following provides ordering information for VTC 1910-S.

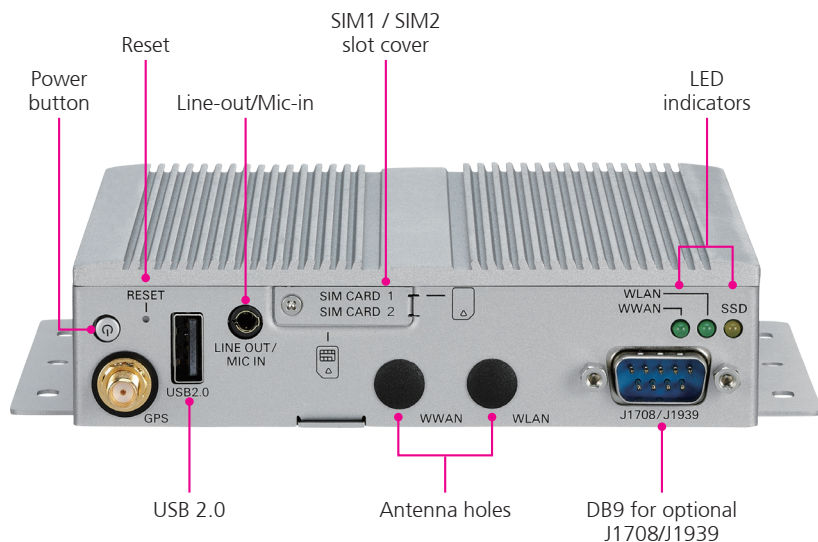
- **VTC 1910-S (P/N: 10V00191002X0)**

Intel Atom® processor Bay Trail E3815, 1.46GHz with 4GB DDR3L SO-DIMM,
U-blox M8N GPS module, VGA Output, 1 x LAN, 2 x RS-232, 1 x RS-485,
1 x CAN2.0B, 3 x DI, 3 x DO, 1 x USB 2.0, 1 x USB 3.0, 1 x Line-out/ Mic-in

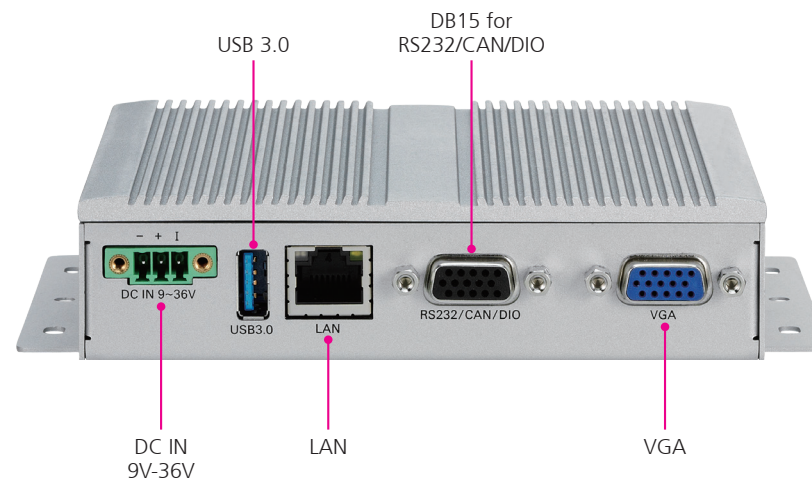
CHAPTER 1: PRODUCT INTRODUCTION

Physical Features

Front View



Rear View



Overview

VTC 1910-S, a super slim, rugged and entry-level vehicle computer with Intel Atom® processor E3815 (1.46GHz), is designed for the harsh in-vehicle environment. It allows to comply with stringent MIL-STD-810G military standard in rugged, fanless and compact mechanism. Because of the super slim 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 1910-S 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 1910-S features WLAN and WWAN wireless data and voice connectivity. With external 2 x SIM sockets which can support a better connectivity quality by software. VTC 1910-S keeps the flexibility to meet different demands for telematics applications, such as IoT Gateway infotainment, fleet management and dispatching system.

Key Features

- Super slim and ruggedized design
- Intel Atom® processor Bay Trail E3815 (1.46GHz)
- Built-in 1 x CAN 2.0B, optional SAE J1939/ J1708 module
- Smart power management with Ignition on/off delay via software control and low voltage protection
- Built-in U-blox M8N GPS
- Dual SIM cards for WWAN modules
- Wide range DC input from 9 ~ 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 4GB

Storage

- 1 x mSATA
- 1 x SATA DOM

Expansion

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

Function

- 1 x u-blox NEO-M8N on board (support GPS/Glonass/QZSS/Galileo/BeiDou)
- Built-in G-sensor
- TPM2.0

I/O Interface-Front

- 1 x Power button with LED
- 3 x LED for WWAN, WLAN, SSD
- 1 x Reset button
- 2 x SIM sockets (Micro Type) with cover
- 1 x DB9 connector for optional SAE J1939 and J1708 modules
- 1 x Line-out/Mic-in
- 1 x Type A USB 2.0 compliant host, supporting system boot up
- 3 x Antenna holes for GPS/WWAN/WLAN

I/O Interface-Rear

- 1 x Phoenix connector for Power/GND/Ignition input

- 1 x Type A USB 3.0 compliant host, supporting system boot up
- 1 x RJ45 10/100/1000 Fast Ethernet with LED
- 1 x DB15 VGA, resolution up to 2560 x 1600 @60Hz
- 1 x DB15 for 2 x RS232 (TX/RX), 1 x RS485 (TX/RX), 1 x CAN 2.0B,
3 x DI, 3 x DO

Operating System

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

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, 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

Dimensions

- 130mm (W) x 120mm (D) x 32mm (H) (5.12" x 4.72" x 1.26")
- Weight: 0.6 kg (1.3 lbs)

Certifications

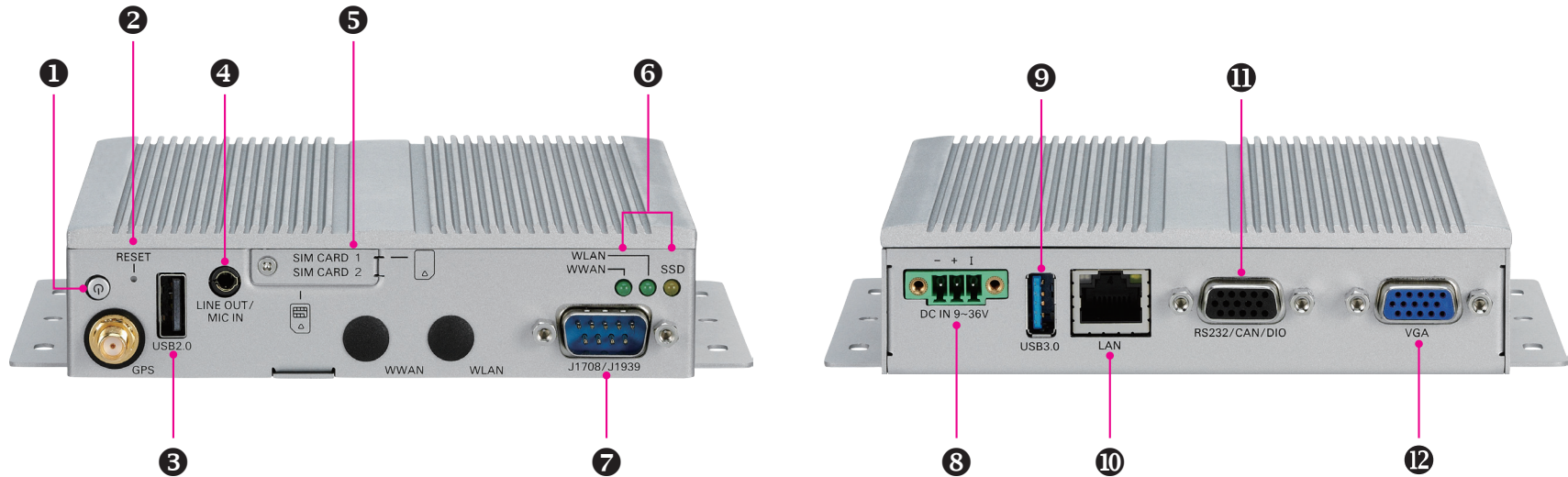
- CE approval
- FCC Class B
- E13 Mark

Power Management

- Selectable boot-up & shut-down voltage for low power protection by software
- Setting 8-level power on/off delay time by software
- Status of ignition and low voltage can be detected by software
- Support S3/S4 suspend mode

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

Power Button

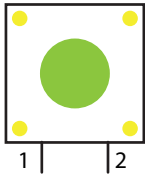
Connector Number: 1



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

Reset Button

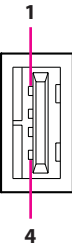
Connector Number: 2



Pin	Definition
1	GND
2	RESET

USB 2.0 Port

Connector Number: 3



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

Line-out/Mic-in Jack

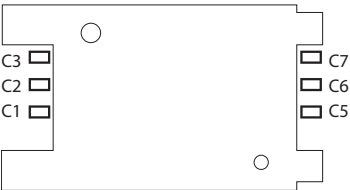
Connector Number: 4



Pin	Definition	Pin	Definition
1	MIC_IN (without WWAN voice communication)	2	LINE OUT_L
3	LINE OUT_R	4	GND
5	NC	6	GND
7	CON_DET		

SIM1 and SIM2 Slots

Connector Number: 5



SIM1

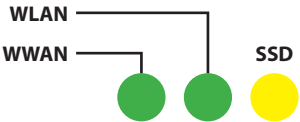
Pin	Definition	Pin	Definition
C 1	UIM1 POWER	C 5	GND
C 2	UIM1 RST	C 6	NC
C 3	UIM1 CLK	C 7	UIM1 DATA

SIM2

Pin	Definition	Pin	Definition
C 1	UIM2 POWER	C 5	GND
C 2	UIM2 RST	C 6	NC
C 3	UIM2 CLK	C 7	UIM2 DATA

LED Indicators (SSD/WLAN/WWAN)

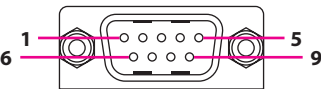
Connector Number: 6



LED	LED Behavior
SSD	Light On: HDD/SSD Active
WWAN	Blinking: Active
WLAN	Blinking: Active

J1708/J1939 Connector

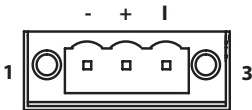
Connector Number: 7



Pin	Definition	Pin	Definition
1	GND	2	N/A
3	CAN_L	4	N/A
5	CAN_H	6	N/A
7	N/A	8	N/A
9	N/A		

DC Input 9V-36V

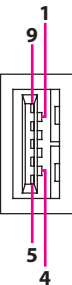
Connector Number: 8



Pin	Definition
1	GND_IN
2	V_IN
3	IGNITION

USB 3.0 Port

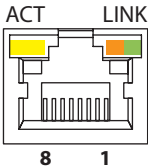
Connector Number: 9



Pin	Definition	Pin	Definition
1	5V	2	USB_N
3	USB_P	4	GND
5	USB3_RXN	6	USB3_RXP
7	GND	8	USB3_TXN
9	USB3_TXP		

LAN Port

Connector Number: 10



Act	Status
Steady Yellow	RJ45 plugged in
Flashing Yellow	Data activity
Off	No activity

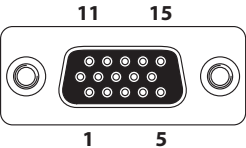
Link	Status
Steady Orange	1G network link
Steady Green	100Mbps network link
Off	10Mbps or no link

Pin	Definition	Pin	Definition
1	MDI0P	2	MDI0N
3	MDI1P	4	MDI2P
5	MDI2N	6	MDI1N
7	MDI3P	8	MDI3N
9	Yellow	10	Green/Orange



RS232/CAN/DIO Connector

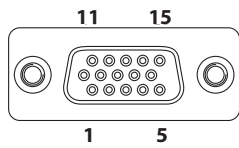
Connector Number: 11



Pin	Definition	Pin	Definition
1	RS232_RXD1	2	G_IN1
3	G_OUT1	4	GND
5	RS485_D-	6	RS232_TXD1
7	RS232_RXD2	8	G_IN3
9	G_OUT3	10	MCU_CAN_L
11	RS232_TXD2	12	G_IN2
13	G_OUT2	14	MCU_CAN_H
15	RS485_D+		

VGA Port

Connector Number: 12



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		



CHAPTER 3: JUMPERS AND SWITCHES

This chapter describes how to set the jumpers on the VTC 1910-S 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:

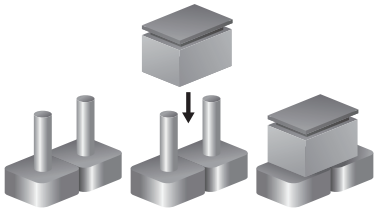
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

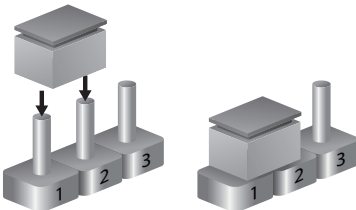
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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



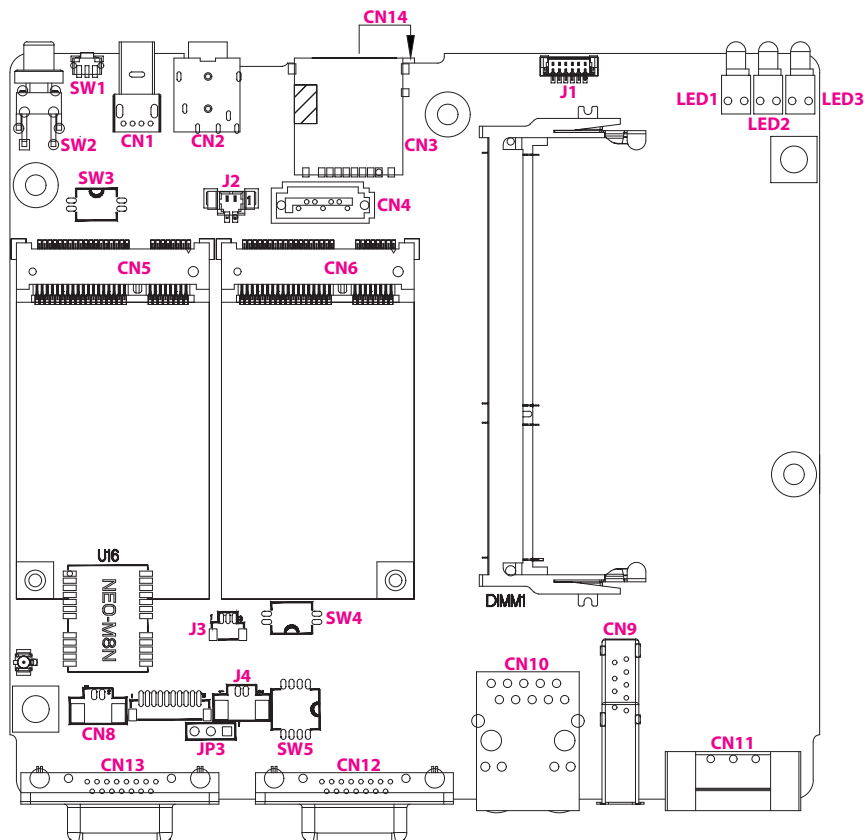
Three-Pin Jumpers: Pins 1 and 2 are Short



VTC 1910-S Connector Specification & Jumper Setting

VTC 1910-S carrier board placement

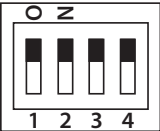
The figure below is the carrier board used in the VTC 1910-S system. It shows the locations of the jumpers and connectors.



DIP Switch Settings

Input Voltage Setup Selection

Connector location: SW3



Input Voltage Control

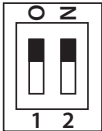
Pin	Definition
1 ON, 2 OFF	12V
1 OFF, 2 ON	24V
1 OFF, 2 OFF	9-36V (Default)

Input Voltage Control

Pin	Definition
3 ON, 4 OFF	For CM8K WAKE#
3 OFF, 4 ON	For 910 WAKE# (Default)

RTC Clear CMOS

Connector location: SW4

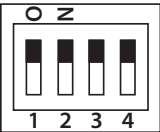


Pin	Definition
1 OFF, 2 OFF	RTC Normal (Default) ME Normal (Default)
1 ON, 2 ON	RTC Clear CMOS ME Clear



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





Connectors

Internal USB Connector For WLAN Module

Connector size: 1 x 6 = 6-pin header (1.0mm)
Connector location: J1



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

SATA Power Connector

Connector size: 1 x 2 = 2-pin header (1.25mm)
Connector location: J2



Pin	Definition
1	GND
2	VCC5





MCU Debug Connector For NXP

Connector size: 1 x 3 = 3-pin header (1.25mm)
Connector location: J3



Pin	Definition
1	COM_RX_MCU1
2	GND
3	COM_TX_MCU1

RTC Battery Connector

Connector size: 1 x 2 = 2-pin header (1.25mm)
Connector location: J4

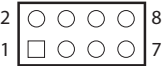


Pin	Definition
1	GND
2	RTC_BAT



MCU Download Pin Header

Connector size: 2 x 4 = 8-pin header (1.27mm)
Connector location: JP1



Pin	Definition	Pin	Definition
1	3V3ALW	2	MCU_RST#
3	NC	4	NC
5	SWCLK	6	SWDIO
7	NC	8	GND

MCU Debug Pin Header For ST

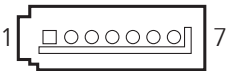
Connector size: 1 x 3 = 3-pin header (2.54mm)
Connector location: JP3



Pin	Definition
1	MCU_TXD
2	MCU_RXD
3	GND

SATA HDD Connector

Connector size: 1 x 7 = 7-pin header (1.27mm)
Connector location: CN4



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

GPS Battery Connector

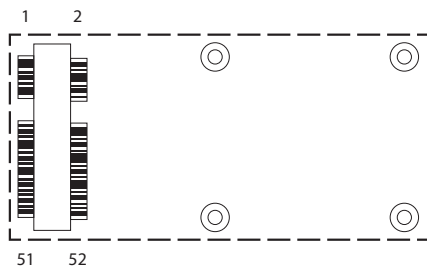
Connector size: 1 x 2 = 2-pin header (1.25mm)
Connector location: CN8



Pin	Definition
1	GND
2	BACKUP_Voltage (3.3V)

Mini-PCle (USB)

Connector location: CN5



Pin	Definition	Pin	Definition
1	910WAKE# / MIC_P	2	+V3.3_MINI
3	NC	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	NC	24	+V3.3_MINI
25	NC	26	GND

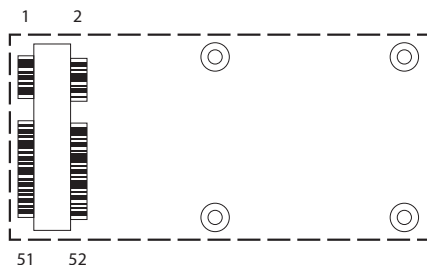
Pin	Definition	Pin	Definition
27	GND	28	NC
29	GND	30	NC
31	NC	32	CM8K_WAKE#
33	UMT_RSET#	34	GND
35	GND	36	USB_2N
37	GND	38	USB_2P
39	+V3.3_MINI	40	GND
41	+V3.3_MINI	42	3.5G_LED#
43	GND	44	NC
45	NC	46	NC
47	NC	48	NC
49	NC	50	GND
51	NC	52	+V3.3_MINI

* 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-PCle (PCIe + mSATA)

Connector location: CN6



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.

* It supports Wi-Fi module ONLY (No BT combo).

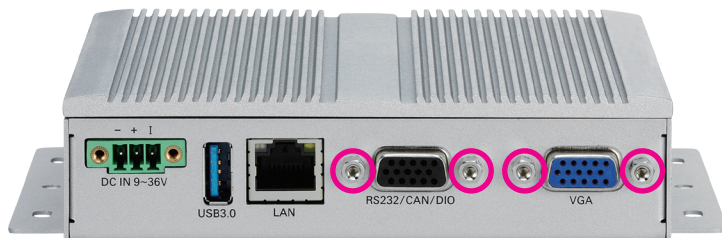
CHAPTER 4: SYSTEM SETUP

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



Rear View



Left Side View



Right Side View



Bottom View

Installing a WLAN Module

1. Locate the WLAN Mini PCI Express slot (CN6). 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.



**Mounting
screw**

Installing an mSATA Module

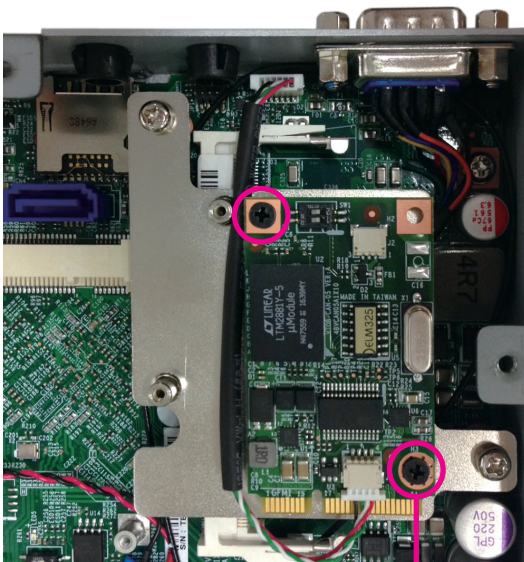
1. Locate the mSATA slot (CN6). Insert the module into the mSATA slot at a 45 degrees angle until the gold-plated connector on the edge of the module completely disappears inside the slot. Then fasten screws into the mounting holes to secure the module.



**Mounting
screw**

Installing a J1708/J1939 Module

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



Mounting
screw

Installing a WWAN Mode

1. Locate the WWAN Mini PCI Express slot (CN5). 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.



Mounting
screw

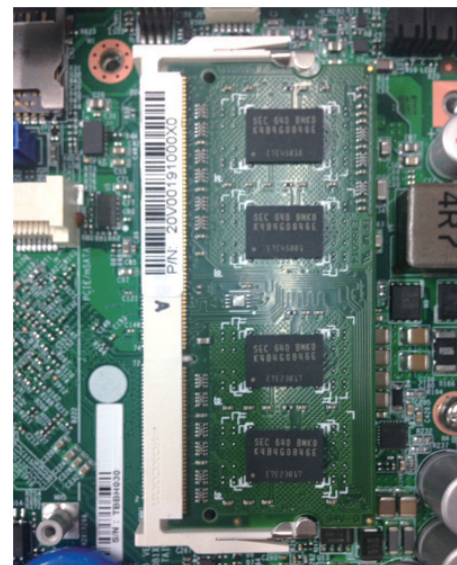
Installing a SATA DOM Module

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.

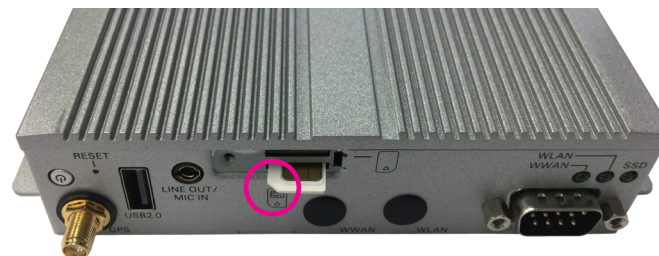
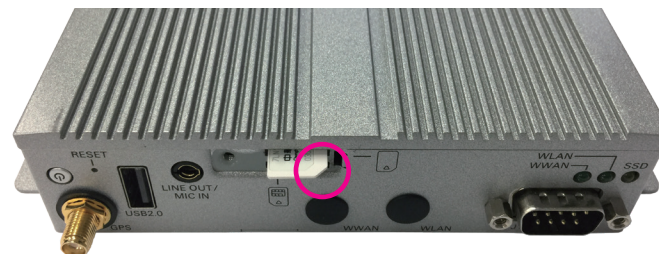
1. The mounting holes are located at the bottom of the system. Please mount the system by fastening screws through the mounting holes.



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.



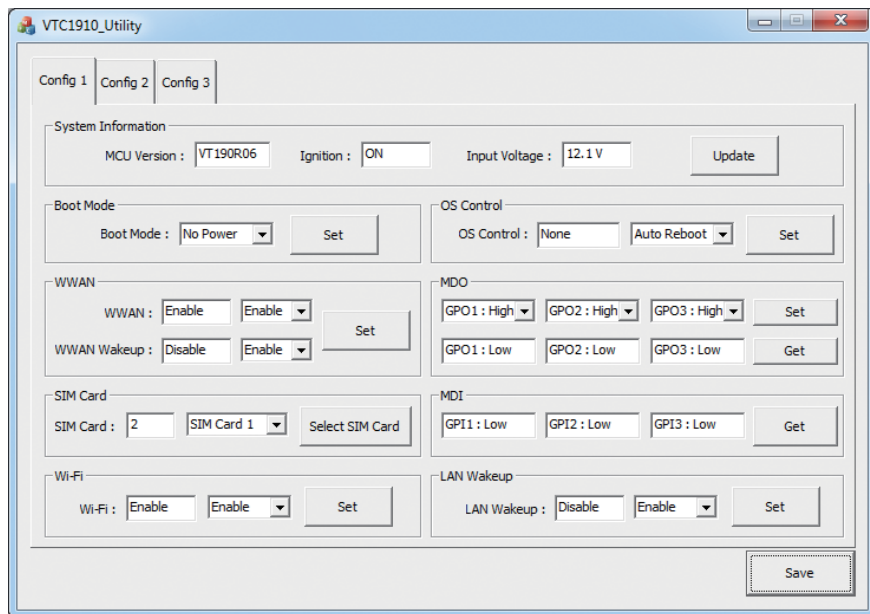
APPENDIX A:

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 1910-S. 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

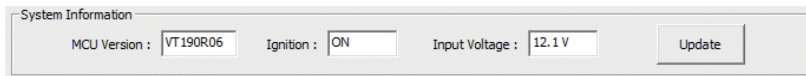


The screenshot shows the VTC1910_Utility application window with the 'Config 1' tab selected. The interface is organized into several sections with various controls:

- System Information:** Includes fields for 'MCU Version' (VT190R06), 'Ignition' (ON), and 'Input Voltage' (12.1 V), with an 'Update' button.
- Boot Mode:** Features a 'Boot Mode' dropdown set to 'No Power' and a 'Set' button.
- OS Control:** Includes an 'OS Control' dropdown set to 'None' and an 'Auto Reboot' dropdown, with a 'Set' button.
- WWAN:** Contains 'WWAN' and 'WWAN Wakeup' dropdowns (set to 'Enable' and 'Disable' respectively) and a 'Set' button.
- MDO:** Features three GPIO status dropdowns (GPO1, GPO2, GPO3) all set to 'High', with 'Set' and 'Get' buttons.
- SIM Card:** Includes a 'SIM Card' dropdown set to '2' and a 'Select SIM Card' button.
- MDI:** Features three GPIO status dropdowns (GPI1, GPI2, GPI3) all set to 'Low', with a 'Get' button.
- Wi-Fi:** Includes a 'Wi-Fi' dropdown set to 'Enable' and a 'Set' button.
- LAN Wakeup:** Includes a 'LAN Wakeup' dropdown set to 'Disable' and a 'Set' button.

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

1.1 System Information

The System Information UI is a light gray rectangular box. It contains three labels with corresponding input fields: 'MCU Version : VT190R06', 'Ignition : ON', and 'Input Voltage : 12.1 V'. To the right of these fields is a 'Update' button.

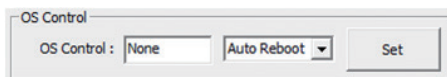
Press the Update button of System Information to view the MCU Version, Ignition and Input Voltage information.

1.2 Boot Mode

The Boot Mode UI is a light gray rectangular box. It contains a label 'Boot Mode :', a dropdown menu showing 'No Power', and a 'Set' button.

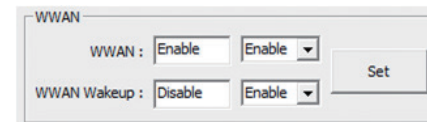
Press the Set button of Boot Mode to set up the Boot Mode.

1.3 OS Control

The OS Control UI is a light gray rectangular box. It contains a label 'OS Control :', a dropdown menu showing 'None', and a 'Set' button.

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

1.4 WWAN

The WWAN UI is a light gray rectangular box. It contains two rows of controls. The first row has 'WWAN :', a dropdown menu showing 'Enable', and a 'Set' button. The second row has 'WWAN Wakeup :', a dropdown menu showing 'Disable', and a 'Set' button.

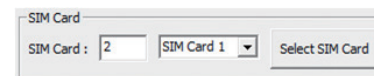
Press the Set button of WWAN to enable or disable the WWAN or WWAN wakeup feature.

1.5 MDO

The MDO UI is a light gray rectangular box. It contains two rows of controls. The first row has three dropdown menus: 'GPO1 : High', 'GPO2 : High', and 'GPO3 : High', followed by a 'Set' button. The second row has three dropdown menus: 'GPO1 : Low', 'GPO2 : Low', and 'GPO3 : Low', followed by a 'Get' button.

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

The SIM Card UI is a light gray rectangular box. It contains a label 'SIM Card :', a dropdown menu showing '2', and a 'Select SIM Card' button.

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

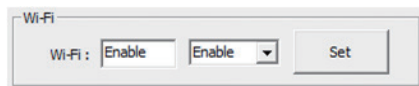
1.7 MDI



The MDI control panel features three input fields labeled 'GPI1 : Low', 'GPI2 : Low', and 'GPI3 : Low'. To the right of these fields is a button labeled 'Get'.

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

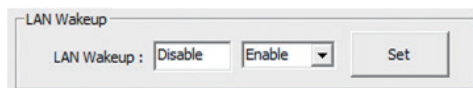
1.8 Wi-Fi



The Wi-Fi control panel includes a label 'Wi-Fi :', followed by a text box containing 'Enable', a dropdown menu also showing 'Enable', and a 'Set' button.

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

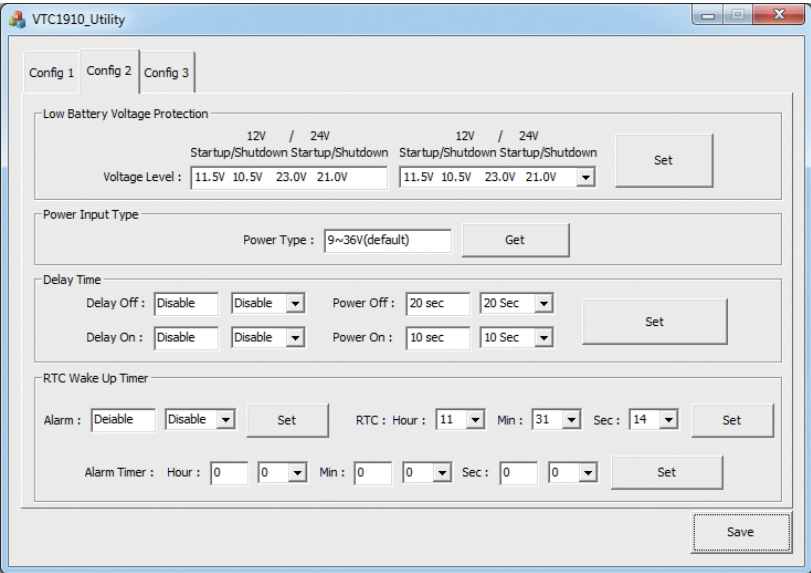
1.9 LAN Wakeup



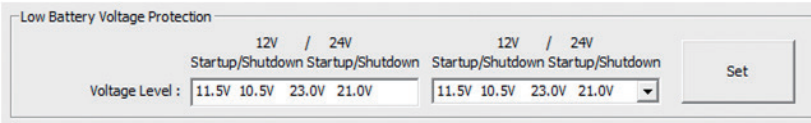
The LAN Wakeup control panel shows a label 'LAN Wakeup :', a text box with 'Disable', a dropdown menu with 'Enable', and a 'Set' button.

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

2. Config 2

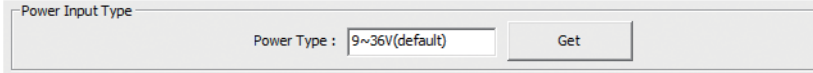


2.1 Low Battery Voltage Protection



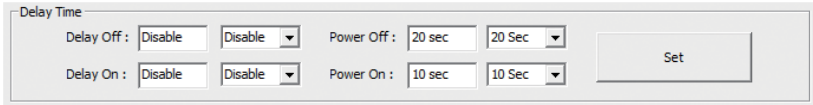
Press the Set button of Low Battery Voltage Protection to set up the 12V/24V startup/shutdown startup/shutdown voltage.

2.2 Power Input Type



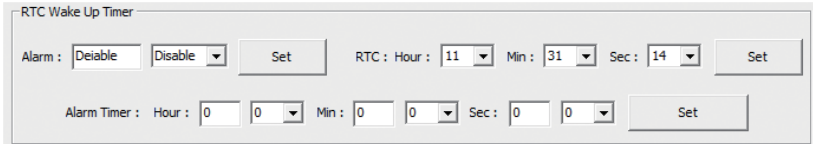
Press the Get button of Power Input Type to show the power type.

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.

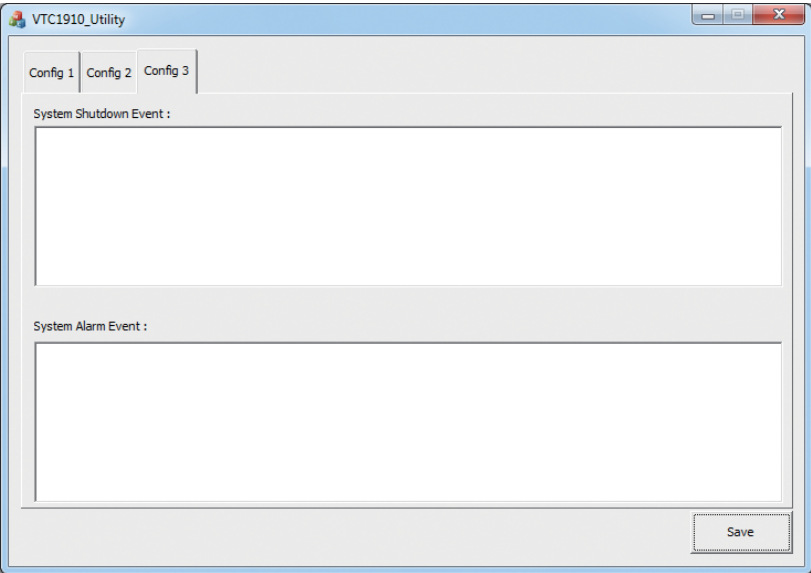
2.4 RTC Wake Up Timer



Press the Set button of Alarm to enable or disable the RTC wake up function. Press the Set button of RTC to set up the Location time for MCU. 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.

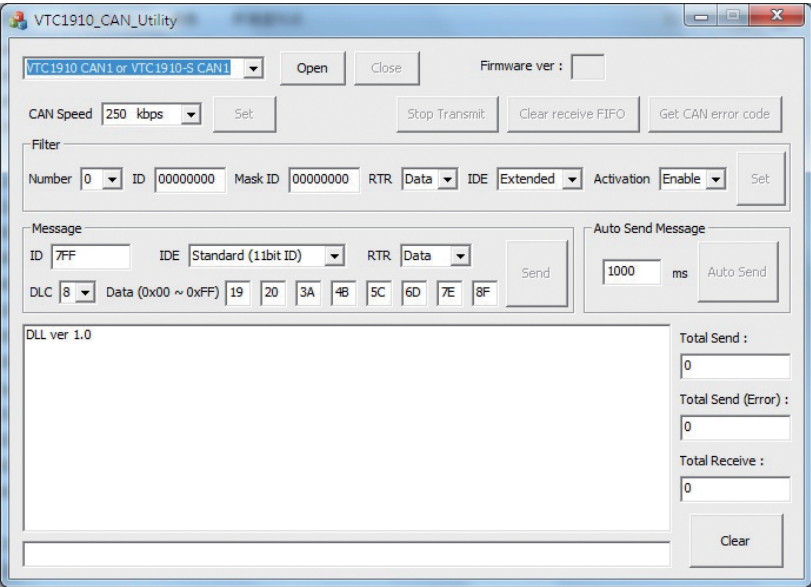
3.2 System Alarm Event



You can read the related System Alarm Event information.



4. CAN_Utility

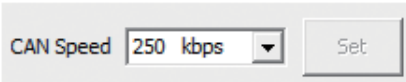


4.1 Select CAN and Device



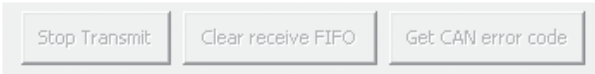
Click the drop-down list to choose the CAN of the corresponding system and press the Open button to apply the setting.

4.2 CAN Speed



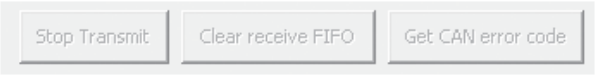
Press the Set button to set up the CAN Speed.

4.3 Stop Transmit



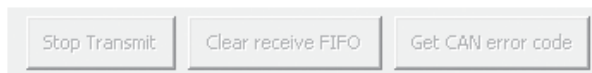
This function is used to stop CAN message transmit.

4.4 Clear receive FIFO



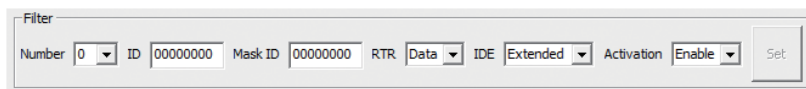
This function is used to clear receive FIFO.

4.5 Get CAN error code



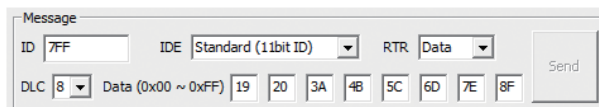
This function is used to get CAN bus error code.

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 rate ¹	Single GNSS: up to 18 Hz Concurrent GNSS: up to 10 Hz		
Position accuracy	2.0 m CEP		
Acquisition		NEO-M8N/Q	NEO-M8M
	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

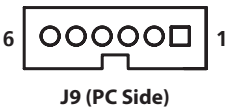
Supply voltage	1.65 V to 3.6 V (NEO-M8M) 2.7 V to 3.6 V (NEO-M8N/Q)
Power consumption ²	23 mA @ 3.0 V (continuous) 5 mA @ 3.0 V Power Save Mode (1 Hz, GPS only)
Backup Supply	1.4 to 3.6 V

² NEO-M8M

Interfaces

Serial interfaces	1 UART 1 USBV2.0 full speed 12 Mbit/s 1 SPI (optional) 1 DDC (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 Pin Definition

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

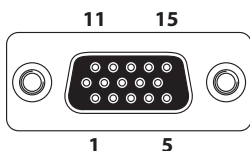
J9 Pin Definition

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

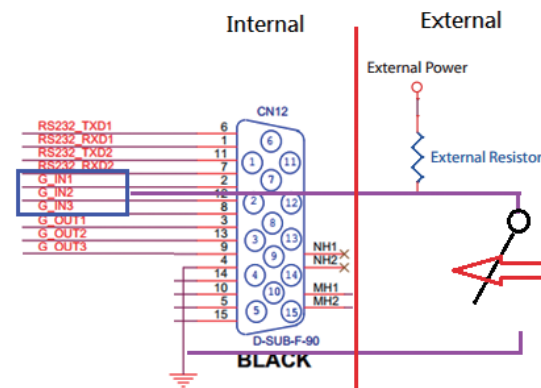


Pin	Definition	Pin	Definition
1		2	MCU-DI1
3	MCU-DO1	4	
5			
7		8	MCU-DI 3
9	MCU-DO3	10	
11		12	MCU-DI 2
13	MCU-DO2	14	
15			

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

Digital Input

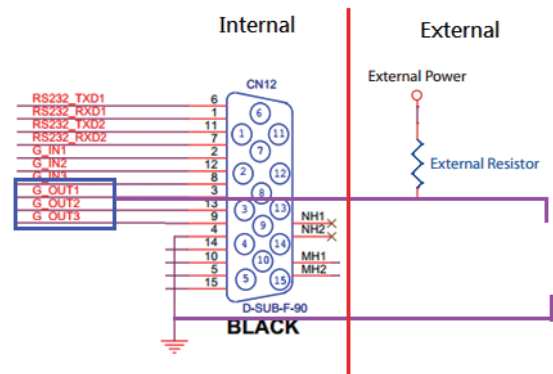
The figure below shows how to connect an external output source to one of the input channel.



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

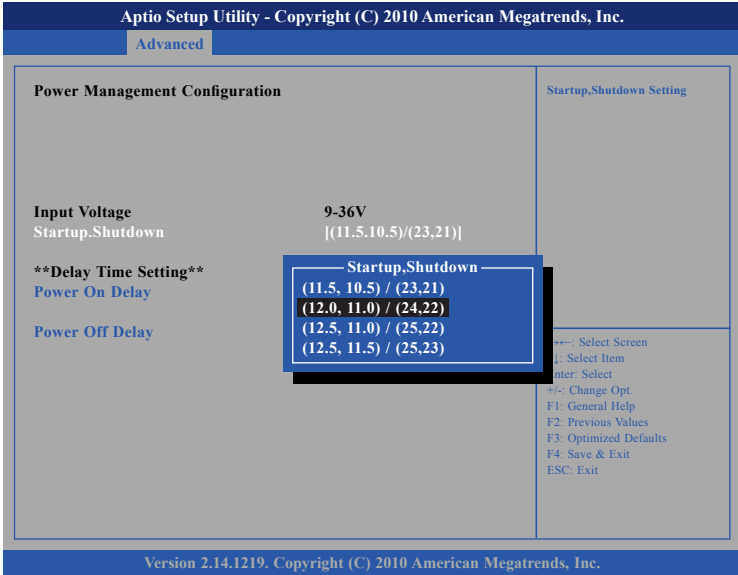
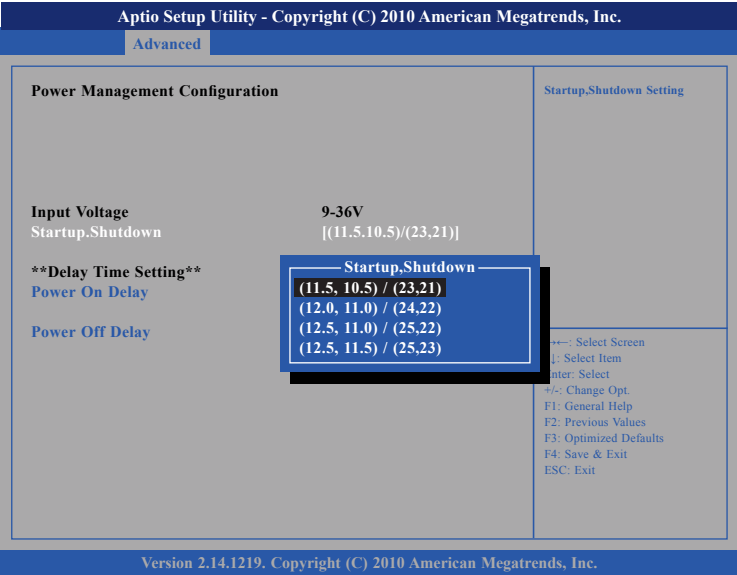
If the input voltage is 12V: the startup voltage to 11.5V and the shutdown voltage to 10.5V.

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.

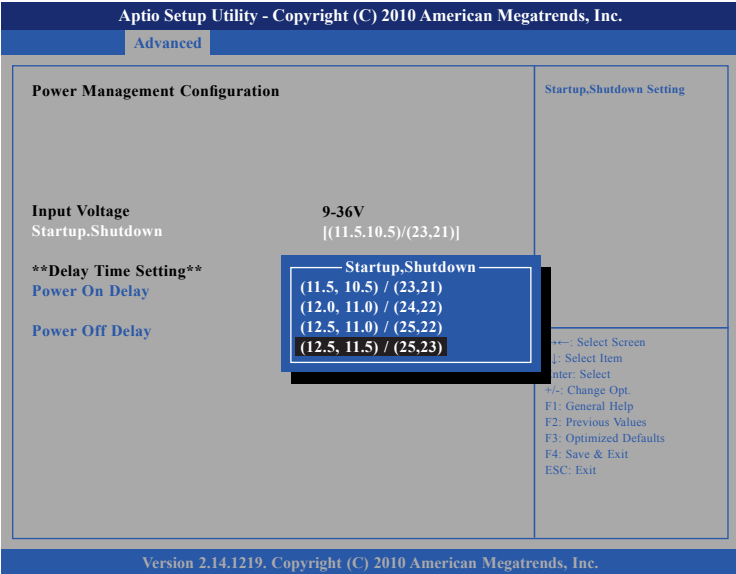
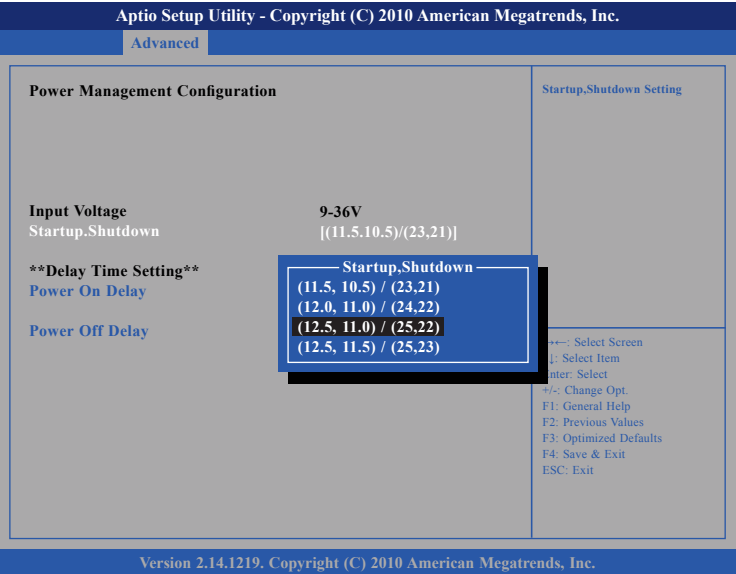


Set the startup voltage to 12.5V or 25V and the shutdown voltage to 11.0V or 22V

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.

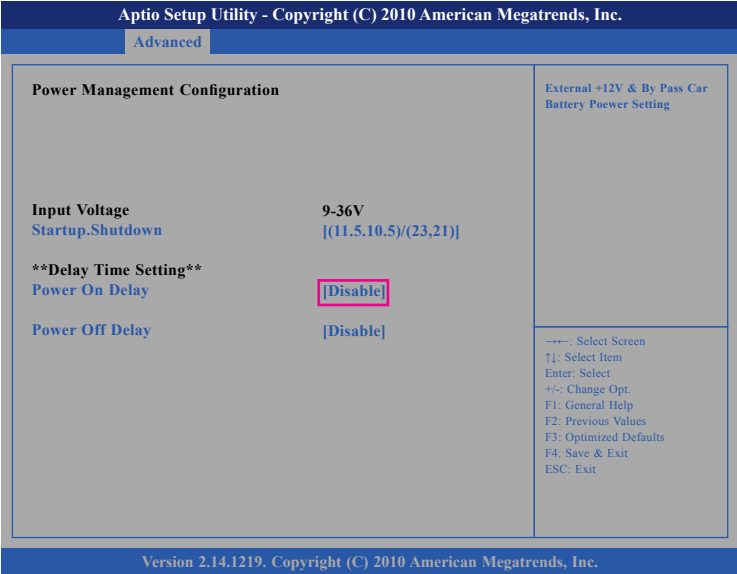
Set the startup voltage to 12.5V or 25V and the shutdown voltage to 11.0V or 22V

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.



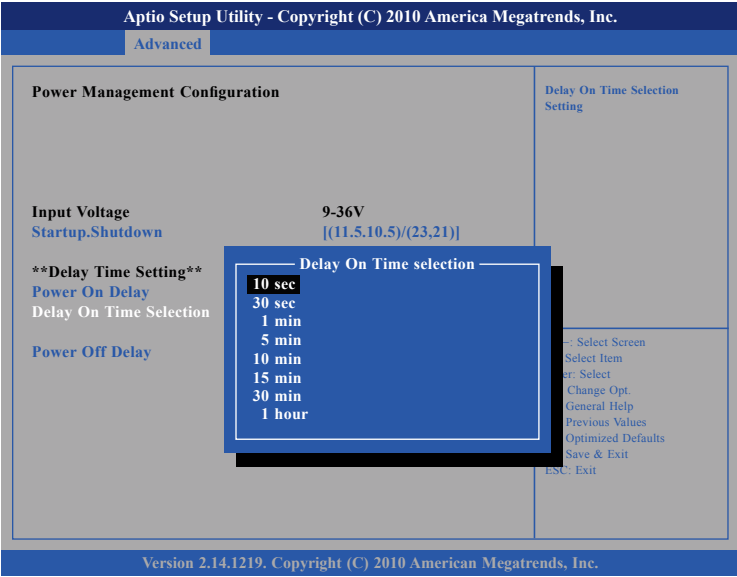
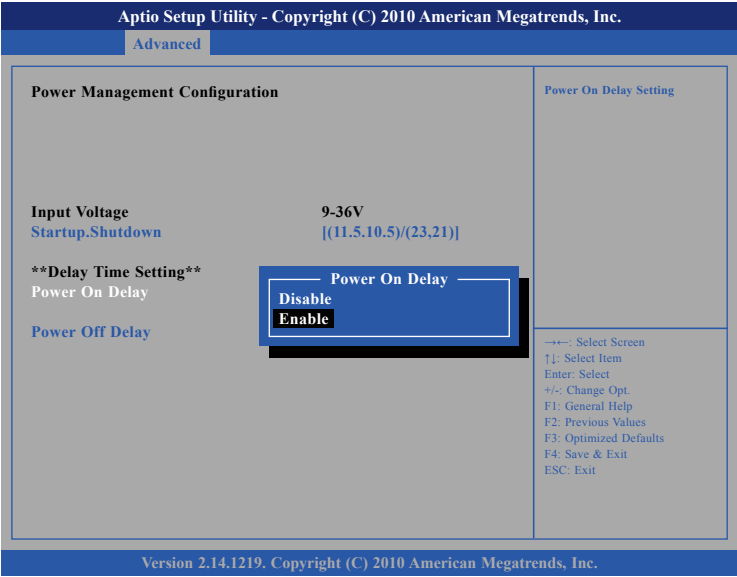
Power-on Delay Setting

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.



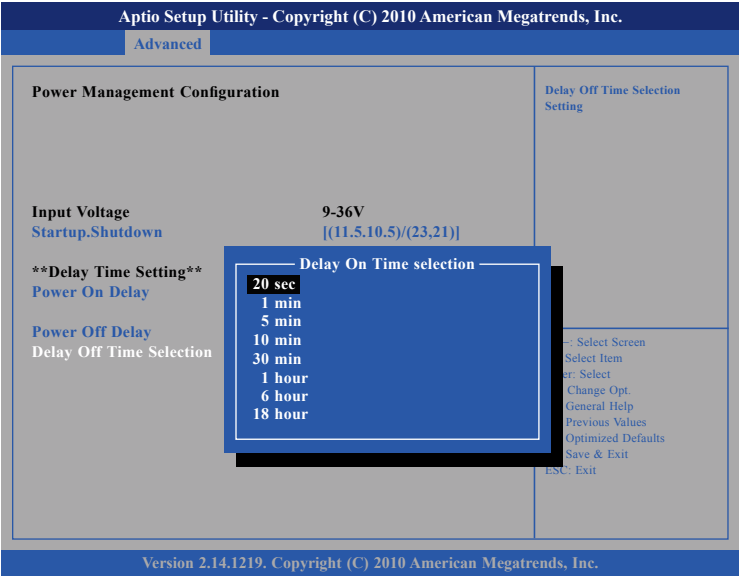
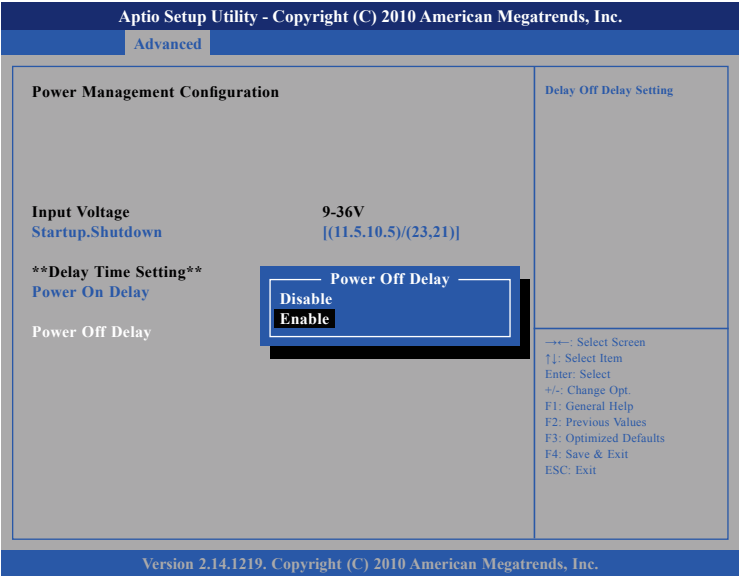
Power-off Delay Setting

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

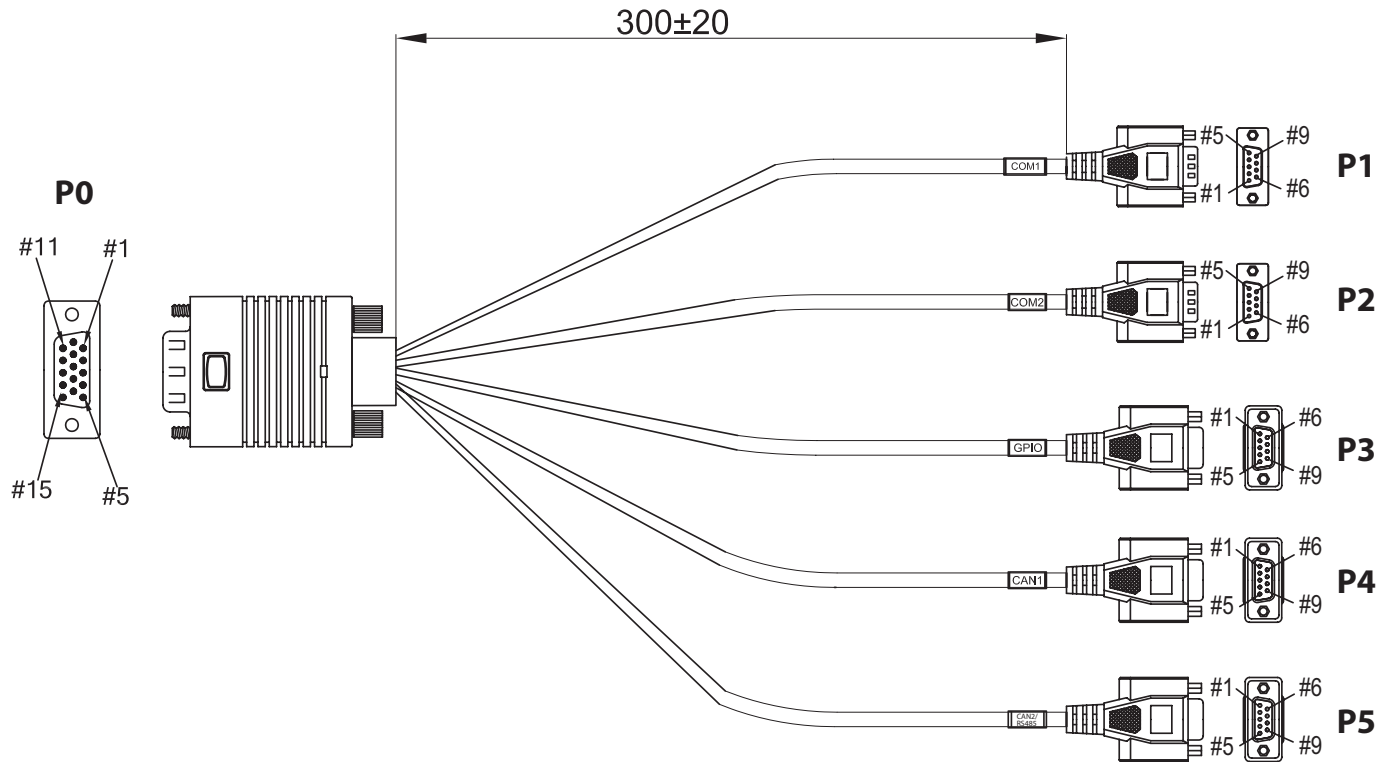
OS: Windows 10
Burn-in Software: Version 6.0
Device:

Idle: Into OS (mSATA) + Display (VGA) + All module not link and not transmit + SATA (SSD).
Full: Into OS (mSATA) + COM1/COM2 loopback (TX/RX) + 3G link player video + ping external net + GPS link + SATA (SSD) + USB device trans + Display (VGA) + Onboard CAN trans + Run BURN-IN

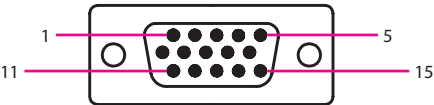
Item	Device	Test Case		Result	
				Current(A)	Watt(W)
1	Burn-in Mode	Idle State	12V	0.66	7.92
			24V	0.33	7.92
			36V	0.23	8.28
		Full State	12V	0.92	11.04
			24V	0.48	11.52
			36V	0.33	11.88
		Full State + Loading	12V	1.54	18.48
			24V	0.78	18.72
			36V	0.54	19.44

APPENDIX F: 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 P0 connector and its corresponding pin signals to the output connectors.



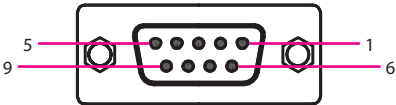
P0 Connector Pinout



Pin	Definition	Pin	Definition
1	RS232_RXD1	2	G_IN1
3	G_OUT1	4	GND
5	RS485_D-	6	RS232_TXD1
7	RS232_RXD2	8	G_IN3
9	G_OUT3	10	MCU_CAN_L
11	RS232_TXD2	12	G_IN2
13	G_OUT2	14	MCU_CAN_H
15	RS485_D+		

P1 to P5 Connector Pinouts
RS-232 (Tx/Rx) Connector

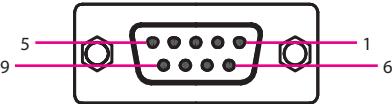
Connector location: P1



P0 Pin	P1 Pin	Definition
1	2	RS232_RXD1
6	3	RS232_TXD1

RS-232 (Tx/Rx) Connector

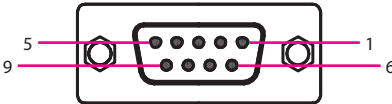
Connector location: P2



P0 Pin	P2 Pin	Definition
7	2	RS232_RXD2
11	3	RS232_TXD2

GPIO Connector

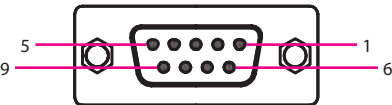
Connector location: P3



P0 Pin	P3 Pin	Definition
2	2	G_IN1
12	3	G_IN2
8	4	G_IN3
3	6	G_OUT1
13	7	G_OUT2
9	8	G_OUT3

CAN1 Connector

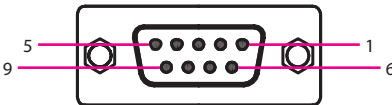
Connector location: P4



P0 Pin	P4 Pin	Definition
14	3	MCU_CAN1_H
10	5	MCU_CAN1_L
4	2	GND

RS-485 Connector

Connector location: P5



P0 Pin	P5 Pin	Definition
4	2	GND
5	3	485_TX-
15	5	485_TX+