

**Mobile Computing Solutions**  
**Modular Vehicle Computer System**  
**MVS 5200 / 5210 and MVS 5210-R Series**  
**PKBX5590 / 5591 / 5596 / 5596-1**

**User Manual**

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# PREFACE

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## Acknowledgements

MVS 2500, MVS 5210 and MVS 5210-R are trademark• of DELTA COMPONENTS GmbH. 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



### **DELTA COMPONENTS GmbH RoHS Environmental Policy and Status Update**

DELTA COMPONENTS GmbH 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, DELTA COMPONENTS GmbH 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 DELTA COMPONENTS GmbH development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which DELTA COMPONENTS GmbH 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 DELTA COMPONENTS GmbH 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 DELTA COMPONENTS GmbH naming convention.

# Warranty and RMA

## DELTA COMPONENTS GmbH Warranty Period

DELTA COMPONENTS GmbH manufactures products that are new or equivalent to new in accordance with industry standard. DELTA COMPONENTS GmbH warrants that products will be free from defect in material and workmanship for 12 months, beginning on the date of invoice by DELTA COMPONENTS GmbH.

## DELTA COMPONENTS Return Merchandise Authorization (RMA)

- Customers shall enclose the DELTA COMPONENTS GmbH 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 DELTA COMPONENTS GmbH 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, DELTA COMPONENTS GmbH 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 DELTA COMPONENTS GmbH 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

DELTA COMPONENTS GmbH 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: DELTA COMPONENTS GmbH 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 DELTA COMPONENTS GmbH 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, DELTA COMPONENTS GmbH will return it to the customer without any charge.

### Board Level

- Component fee: DELTA COMPONENTS GmbH 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, DELTA COMPONENTS GmbH 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.
- There must be a disconnect device in front of "MVS 5200/5210 and MVS 5210-R Series" to keep the worker or field side maintainer be cautious and aware to close the general power supply before they start to do maintenance. The disconnect device hereby means a 20A circuit-breaker. Power installation must be performed with qualified electrician and followed with National Electrical Code, ANSI/NFPA 70 and Canadian Electrical Code, Part I, CSA C22.1.
- The front of the equipment requires wiring terminals with the following specifications:  
Wire size: 30-12 AWG  
Wire Type: copper wire only  
Terminal Blocks Torque: 5 lb In.  
For supply connections, use wires suitable for at least 75°C.

## 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<sup>1</sup>

1. For the most updated information of DELTA COMPONENTS products, visit DELTA COMPONENTS website at [www.delta-components.de](http://www.delta-components.de)
2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
  - Product name and serial number
  - Detailed information of the peripheral devices
  - Detailed information of the installed software (operating system, version, application software, etc.)
  - A complete description of the problem
  - The exact wordings of the error messages

### Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.
2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.
3. CFast: Turn off the unit's power before inserting or removing a CFast storage card.

## Conventions Used in this Manual



### Warning:

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



### Caution:

Information to avoid damaging components or losing data.



### Note:

Provides additional information to complete a task easily.



## 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.

### MVS 5200/5210 Series

Item	Part Number	Description	Specification	Qty
1		Terminal Blocks 2P Phoenix Contact: 1777989	5.08mm Female DIP Green	1
2		Terminal Blocks 5P Phoenix Contact: 1778014	5.08mm Female DIP Green	1
3		Terminal Blocks 2x8 Anytek: KD161051A000G	3.5mm Male 16P 180D Plug Green	1
4		(H)Flat Head Screw Long Fei: F3x5ISO+NYLOK NIGP	F3x5 NI Nylok	8
5		(H)PE bag for MTK-DOCK-01 VER: A FULPAK	460 x 520 x 0.08mm	1
6		MVS 5200 EPE VER:A Sentenel	365 x 255 x 126mm	2
7		Power Cable for VTK33B SMBUS Signal EDI:356206060201-RS	ATX Power Connector 6P TO 6P Pitch: 4.2mm L: 200mm	1
8		GPS Antenna ARKNAV:A-130 GPS Antenna 5M SMA180P R1 L3	For VTC 5M/SMA180P	1
9		(N)MVS 5210 Series DVD Driver VER:1.0	JCL	1

### MVS 5210-R Series

Item	Part Number	Description	Specification	Qty
1		Terminal Blocks 2P Phoenix Contact: 1777989	5.08mm Female DIP Green	1
2		Terminal Blocks 2x8 Anytek: KD161051A000G	3.5mm Male 16P 180D Plug Green	1
3		GPS Antenna ARKNAV: A-130 GPS Antenna 5M SMA180P R1 L3	For VTC 5M/SMA180P	1
4		(H)PE Bag FOR MTK-DOCK-01 VER: A FULPAK	460 x 520 x 0.08mm	1
5		(H)Flat Head Screw Long Fei: F3 x 5ISO + NYLOK NIGP	F3x5 NI NYLOK	8
6		(N)MVS 5210 Series DVD Driver VER:1.0	JCL	1

## Ordering Information

The following information below provides ordering information for the MVS 5200/5210 and 5210-R series.

### **MVS 5200-BK (P/N: PKBX5590)**

5th generation Intel® Core™ dual core i3-5010U, 2.1GHz, 2GB DDR3L industrial grade SO-DIMM, 8x 10/100/1000 PoE, 2x 10/100/1000 Ethernet, VGA/LVDS output, 2x RS-232/422/485, 3x USB, 12VDC output, 1x CAN

### **MVS 5210-BK (P/N: PKBX5591)**

5th generation Intel® Core™ dual core i7-5650U, 2.2GHz, 2GB DDR3L industrial grade SO-DIMM, 8x 10/100/1000 PoE, 2x 10/100/1000 Ethernet, VGA/LVDS output, 2x RS-232/422/485, 3x USB, 12VDC output, 1 x CAN

### **MVS 5210-RA (P/N: PKBX5596)**

DC Input 24VDC, Dual-core Intel® Core™ i7-5650U, 2.2GHz, 2GB DDR3L industrial grade SO-DIMM, 8x 10/100/1000 PoE (M12 connector), 2x 10/100/1000 Ethernet (M12 connector), VGA/LVDS output, 2x RS232/422/485, 3x USB, 12VDC output, VMS software installed

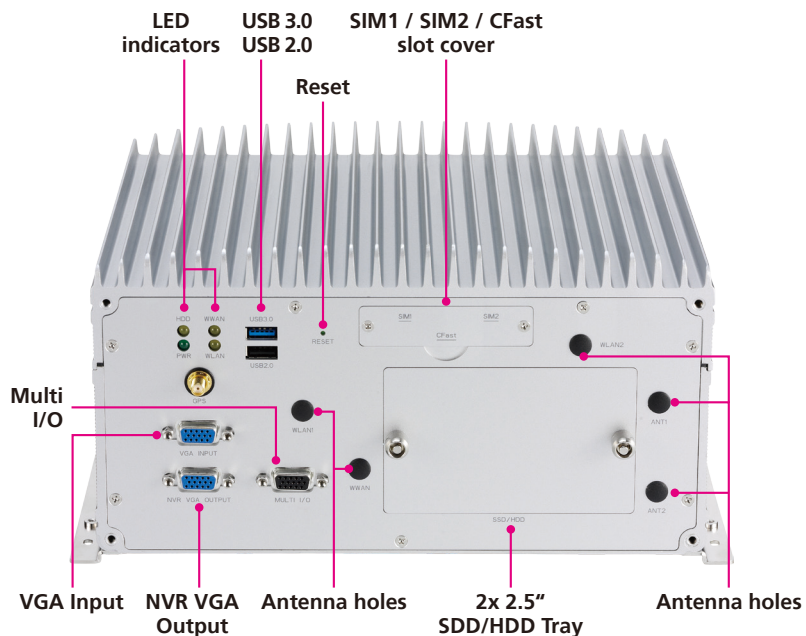
### **MVS 5210-RF (P/N: PKBX5596-1)**

DC Input isolated 110VDC, Dual-core Intel® Core™ i7-5650U, 2.2GHz, 2GB DDR3L industrial grade SO-DIMM, 8x 10/100/1000 PoE (M12 connector), 2x 10/100/1000 Ethernet (M12 connector), VGA/LVDS output, 2x RS232/422/485, 3x USB, 12VDC output, VMS software installed

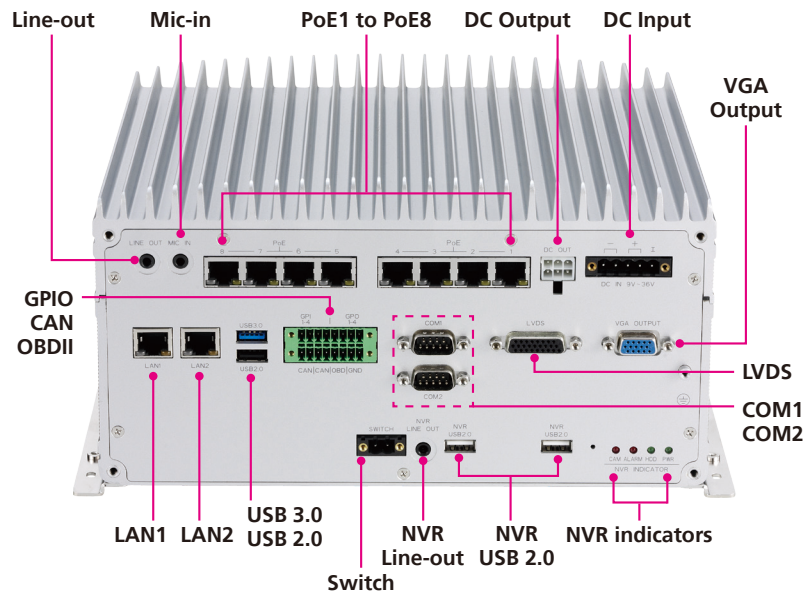
# CHAPTER 1: PRODUCT INTRODUCTION

## Physical Features

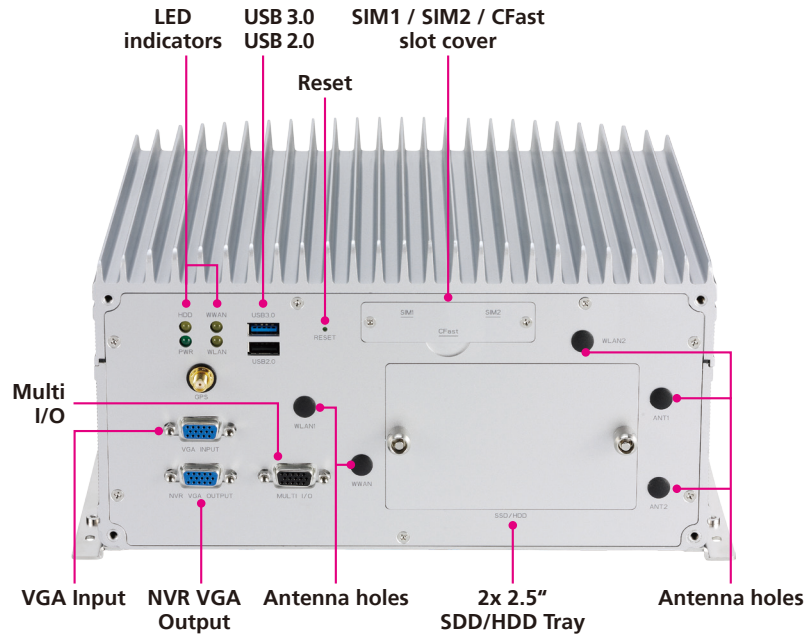
MVS 5200/5210 Front View



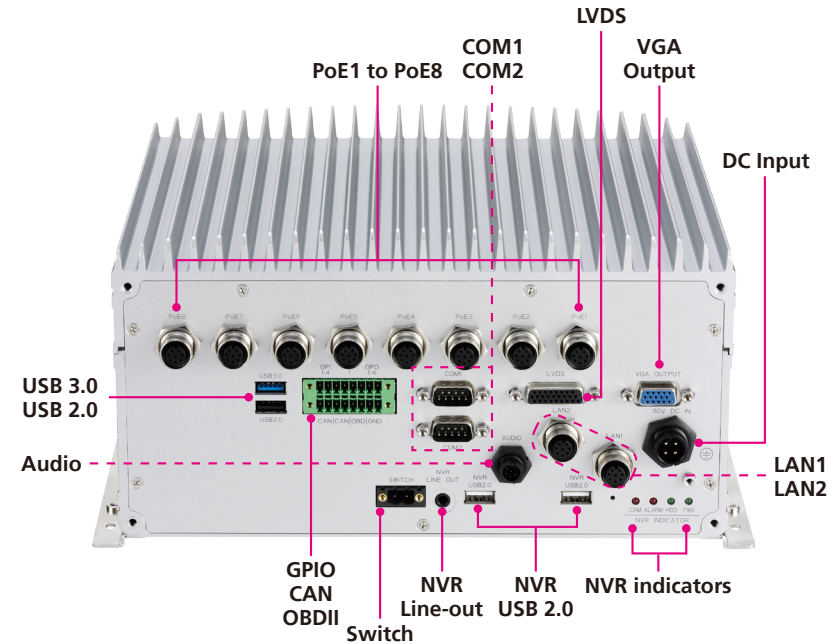
MVS 5200/5210 Rear View



## MVS 5210-R Front View



## MVS 5210-R Rear View



## Overview

The MVS 5200/5210 and MVS 5210-R series for mobile and railway applications respectively, perform 8-CH live view when keeping recording the video simultaneously without lags. The two series provide multitasking capability such as running video analytics software like people counting continuously while recording real-time videos.

The MVS 5200/5210 and MVS 5210-R network video recorders (NVR) promote increased safety and security for bus and railway passenger transportation with high video frame rates and 2 removable extensive storage HDD/SSD capacity. The NVRs connect up to 8 IP cameras + PoE function providing reliable and high quality video coverage around buses and trains. Vehicle and railway information stamp such as location, speed or other critical data can be recorded and shown in video.

Both series leverage wireless networks to simplify fleet management with capabilities such as remote, real-time video monitoring. This remote capability keeps transit fleets in service around the clock. The MVS 5200/5210 series also carries out vehicle data integration and diagnostics via CAN Bus and OBDII, and is certified for MIL-STD-810G for shock and vibration to operate in harsh environments. Similarly, the MVS 5210-R series complies to EMC and environmental test in EN 50155 to ensure reliable operation in railway environments.

For added physical security, the pre-alarm function on both series features 2 x DI, 2 x DO and GNSS that can operate in power-off state, ensuring vehicle and railway location, alarm and emergency notifications are constantly available at times of intrusion or urgent conditions. Optional back-up battery guards against any unexpected vehicle power failure or unstable vehicle power.

## Key Features

- Multitasking PC + NVR + tracker function
- Vehicle information stamp in video (MVS 5200/5210 Series)  
Train information stamp in video (MVS 5210-R Series)
- 8x RJ45 10/100/1000 Mbps 802.3af PoE ports  
8x M12 10/100/1000 Mbps 802.3af PoE ports
- Fanless design
- 5th generation Intel® Core™ dual core i3-5010U, 2.1GHz (MVS 5200)  
5th generation Intel® Core™ dual core i7-5650U, 2.2GHz (MVS 5210 and MVS 5210-R)
- Dual removable SATA 3.0 SSD/HDD
- 7/24 GNSS tracker function support even PC is off
- Built-in CAN 2.0B. Optional OBDII function (SAE J1939) (MVS 5200/5210 series)
- EN50155 Class TX conformity (MVS 5210-R series)
- 9~36VDC power input (MVS 5200/5210 series)
- 24VDC and 110VDC power input (MVS 5210-R series)

# Hardware Specifications

## NVR System

### Video Codec

- H.264

### Audio Codec

- G.726/G.711

### Live View Resolutions

- QVGA/VGA/SXGA/Full HD/3M/5M

### Recording Resolution

- QVGA~5M

### Live Preview

- Support 1/4/9 division, full-screen, snapshot

### Record

- Round the clock/motion record modes/event trigger

### Record Device

- 2x 2.5" SATA 2.0 removable HDD/SSD trays with lock

### Playback

- 1/4/9 division, full-screen/snapshot/display original ratio or fit window
- Search mode: Play/reverse/pause/seek/pre frame/next frame
- Speeds: 1/4, 1/2, 1, 2, 4, 8, 16, 32

## Video Stamp

- Capability to show and record vehicle and railway information in video  
\*AMTK camera is required

## Camera Setting

- Auto search, profile selectable, ONVIF support

## Disk Management

- Partition management, format partition, S.M.A.R.T status

## PC System

### CPU

- 5th generation Intel® Core™ dual core i3-5010U, 2.1GHz (MVS 5200)
- 5th generation Intel® Core™ dual core i7-5650U, 2.2GHz (MVS 5210 and MVS 5210-R)

### Memory

- 2-channel 204-pin DDR3L SO-DMIM socket support 1600MHz up to 16GB, default 2GB industrial grade memory

### Storage

- 1x CFast (externally accessible), 1x mSATA

### Expansion

- 1x full size Mini-PCIe socket (USB 2.0), 1x full size Mini-PCIe socket (USB 2.0 + PCIe), 1x full size Mini-PCIe socket (mSATA)

### GPS and Onboard Sensor

- 1x default U-blox NEO-M8N GNSS module for GPS/Gloness/QZSS/Galileo/Beidou

- Optional modules with Dead Reckoning available
- Built-in G-sensor

### Power over Ethernet

- 8-port RJ45 for 10/100/1000 Mbps PoE IEEE 802.3af conformity, total 60W (MVS 5200/5210 series)
- 8-port M12 for 10/100/1000 Mbps PoE IEEE 802.3af conformity, total 60W (MVS 5210-R series)

## I/O Interface-Front

### PC Function

- 4x LED indicators for power/storage/WLAN/WWAN
- 1x CFast socket with cover. 1x Reset button
- 2x dual USB type A connectors for 1x USB 3.0 + 1x USB 2.0 port
- 1x DB15 connector
  - MCU DIO (2x DI, 2x DO), 1x analog input, 1x speed frequency input, 1x iButton, 1x RS232 (only for RFID reader w/ 12VDC output), 1x direction signal for optional Dead Reckoning module
- 2x externally accessible SIM card sockets (selectable)
- 6x antenna holes for WWAN/WLAN/BT/GPS

### NVR Function

- 2x removable 2.5" HDD/SSD trays with lock
- 1x DB-15 VGA output for live view
- 1x DB-15 VGA input for PC VGA switch

## I/O Interface-Rear

### PC Function

- 8x RJ45 10/100/1000 Mbps PoE ports (MVS 5200/5210 series)
- 2x RJ45 10/100/1000 Intel® Fast Ethernet with LED (MVS 5200/5210 series)

- 8x M12 10/100/1000 Mbps PoE ports (MVS 5210-R series)
- 2x M12 10/100/1000 Intel® Fast Ethernet (MVS 5210-R series)
- 1x 9~36VDC input with ignition and 80W typical power consumption (MVS 5200/5210 series)
- 1x 24VDC/110VDC input in circular connector with ignition and 80W typical power consumption (MVS 5210-R series)
- 1x dual USB type A connector for USB 3.0 port + USB 2.0 port
- 2x phone jacks 3.5mm for 1x Mic-in and 1x Line-out (MVS 5200/5210 series)
- 1x M12 connector for 1x Mic-in and 1x Line-out (MVS 5210-R series)
- 1x DB-15 VGA, resolution up to 2560 x 1600 @ 60Hz
- 1x DB26 LVDS interface with 12V and USB 2.0
- 2x DB-9 RS-232/422/485 (w/ optional 3KV isolation protection)
- 1x 12VDC output (2A) + battery bypass DC output (2A) + SM Bus
- 1x 16-pin terminal block connector
  - 1x CAN Bus 2.0B (onboard)
  - 1x OBDII from optional VIOB-OBD-03 module (SAE J1939) (MVS 5200/5210 series)
  - 1x CAN Bus 2.0B from optional VIOB-CAN-03 module (MVS 5200/5210 series)
  - 8x GPIO
  - (4x Digital inputs, w/ optional 3KV isolation protection)  
Input voltage (internal type): 5VDC TTL (default)  
Input voltage (source type): 3 ~ 12VDC
  - (4x Digital outputs, w/ optional 3KV isolation protection)  
Digital output (sink type): 5VDC TTL (default), max current: 20mA  
Digital output (source type): 3 ~ 24VDC, max current: 150mA

### NVR Function

- 2x USB type A connectors, 1x Reset button
- 1x switch for VGA input selection (NVR or PC)

- 4x LED indicators for power/storage/storage alarm/camera
- 1x phone jack 3.5mm for 1x Line-out

### Power Management

- Selectable boot-up & shut-down voltage for low power protection by software. Setting 8-level power on/ off delay time by software. Support S3/S4 suspend mode
- Optional internal 1100mAh, Li-Polymer rechargeable battery (for 24VDC system only)

### Operating System

- Windows 7/WES7/Windows 8/WES8/Linux kernel 3.X

### Dimensions

- 260mm (W) x 206mm (D) x 137mm (H) (10.24" x 8.11" x 5.39")
- 3.3kg

### Environment

#### MVS 5200/5210 Series

- Operating temperatures (without internal battery):  
-30°C~50°C (w/ industrial SSD) with air flow
- Operating temperatures (with internal battery, discharging):  
-20°C~45°C (w/ industrial SSD) with air flow
- Storage temperatures: -40°C~80°C
- Relative humidity: 10% to 90% (non-condensing)
- Vibration (random):  
1.5g@5~500 Hz (in operation, HDD), 2g@5~500 Hz (in operation, SSD)
- Vibration (SSD/HDD):
  - Operating: MIL-STD-810G, Method 514.6, Category 4, common carrier US highway truck vibration exposure

- Storage: MIL-STD-810G, Method 514.6, Category 24, minimum integrity test
- Shock (SSD/HDD):
  - Operating: MIL-STD-810G, Method 516.6, Procedure I, functional shock=20g
  - Non-operating: MIL-STD-810G, Method 516.6, Procedure V, crash hazard shock test=75g

#### MVS 5210-R Series

- Operating temperatures:  
EN50155 Class TX (w/ industrial SSD) with air flow
- Storage temperatures: -40°C~80°C
- Relative humidity: 10% to 90% (non-condensing)
- Vibration (random):  
1.5g@5~500 Hz (in operation, HDD), 2g@5~500 Hz (in operation, SSD)
- Vibration (SSD/HDD):
  - Operating: MIL-STD-810G, Method 514.6, Category 4, common carrier US highway truck vibration exposure
  - Storage: MIL-STD-810G, Method 514.6, Category 24, minimum integrity test
- Shock (SSD/HDD):
  - Operating: MIL-STD-810G, Method 516.6, Procedure I, functional shock=20g
  - Non-operating: MIL-STD-810G, Method 516.6, Procedure V, crash hazard shock test=75g

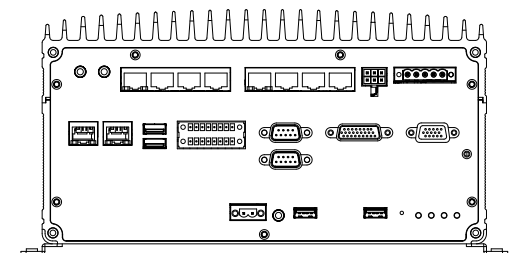
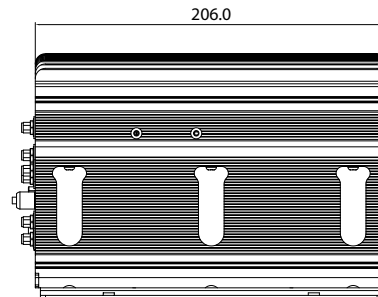
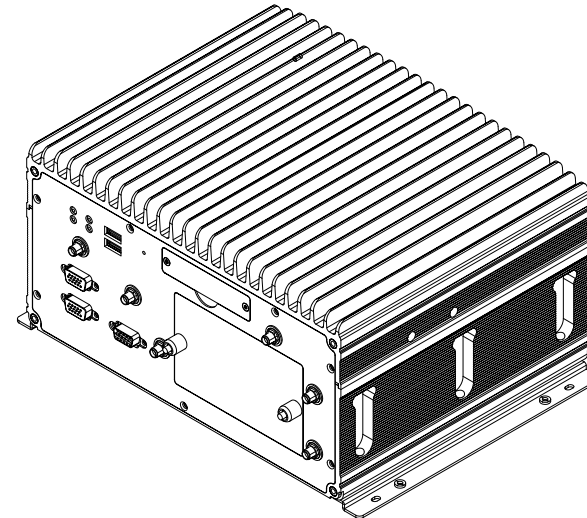
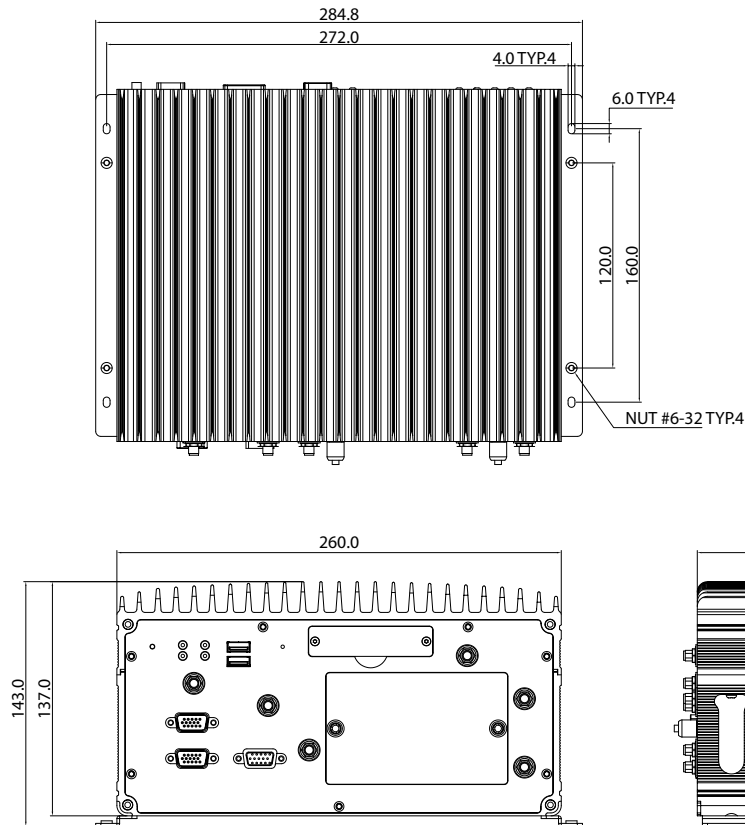
### Certifications

- CE approval, FCC Class A, E13 Mark (MVS 5200/5210 series), EN50155 Class TX (MVS 5210-R series)

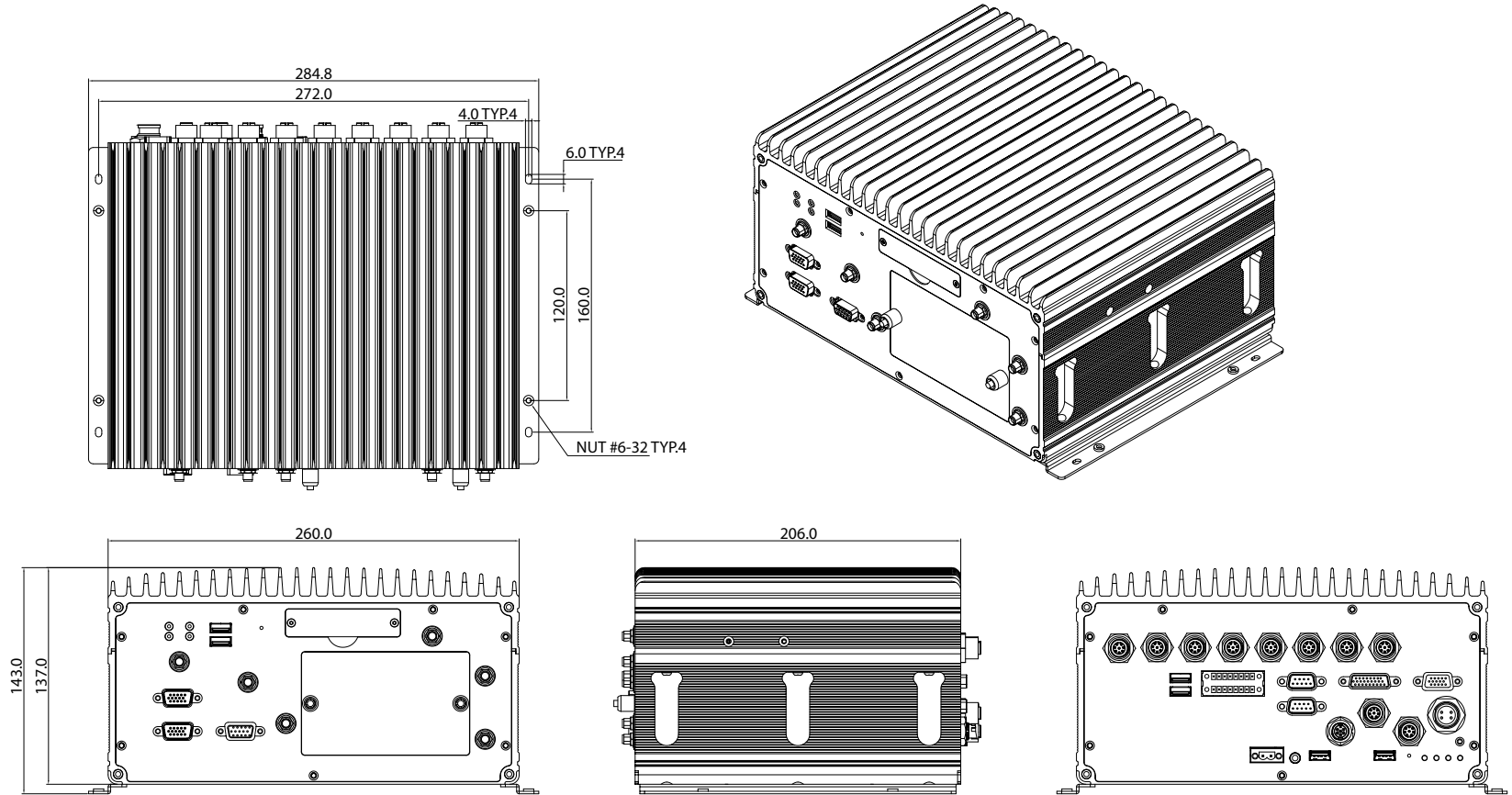


# Mechanical Dimensions

## MVS 5200 and MVS 5210



## MVS 5210-R



# CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the MVS 5200/5210 and MVS 5210-R 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:

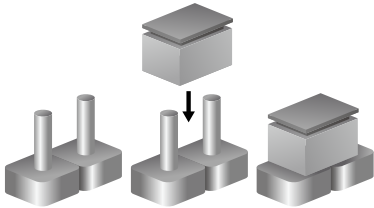
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

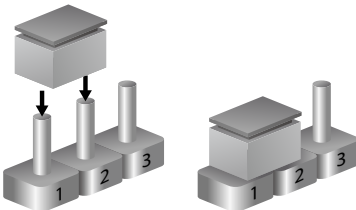
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

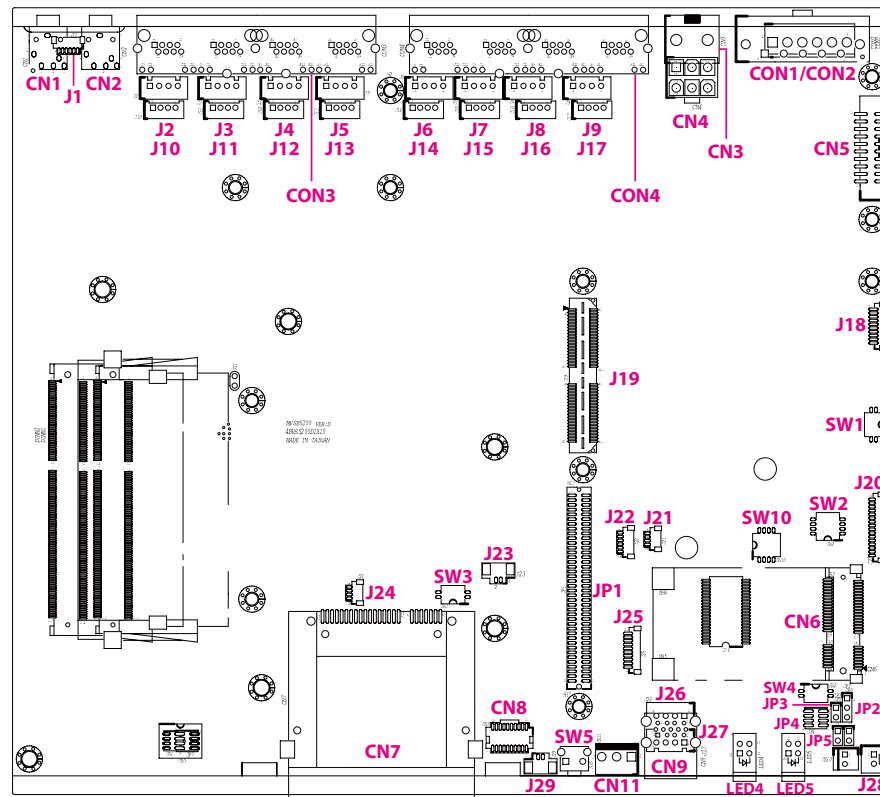


## The MVS 5200/5210 and MVS 5210-R Series System Components

The MVS 5200/5210 and MVS 5210-R series consist of a MVSB 5200 motherboard and I/O board. This chapter lists the location and pinout assignment of the jumpers and connectors on each component.

### Locations of the Jumpers and Connectors for MVSB 5200

Top View





## DIP Switch Settings

### ME/RTC Clear Switch

Connector location: SW3

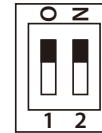


Function	Definition
Clear CMOS/ME	1-2 ON
Normal	*1-2 OFF

(\*) Default

### CN6 VCC Select Switch

Connector location: SW1

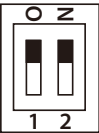


Function	Definition
CN6 3.3V	*1-2 OFF
CN6 3.6V	1-2 ON

(\*) Default

Input Voltage Control

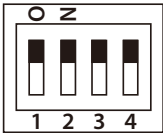
Connector location: SW4



Function	Definition		
	12V	24V	9~36V
POWERSW (Pin 1 & 4)	H (SW OFF)	H (SW OFF)	L (SW ON)
12V 24V (Pin 1 & 4)	H (SW OFF)	L (SW ON)	X (Don't care)

MDIO Power Switch

Connector location: SW2



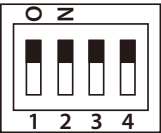
Function	Definition
PULL UP V3P3	ON
DON'T CARE	OFF

Pin	Definition	Pin	Definition
1	MDI1_DB1	2	MDI1_DB2
3	MDO1_DB1	4	MDO1_DB2
5	MDI1_DB1_R	6	MDI1_DB2_R
7	MDI1_DB2_R	8	MDO1_DB2_R



PCM Switch (For 3G Voice)

Connector location: SW10



Function	Definition
Enable	1, 4 ON
Disable	2, 3 OFF

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

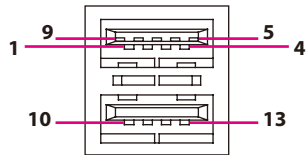
## Connector Pin Definitions

### External I/O Interfaces - Front Panel

#### USB 3.0/USB 2.0 Ports (Co-layout with J26 and J27)

Connector type: USB 3.0 and USB 2.0 port, Type A

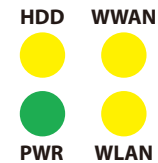
Connector location: CN9



Pin	Definition	Pin	Definition
1	VCC	2	USB0_N
3	USB0_P	4	GND
5	USB3_RXN	6	USB3_RXP
7	GND	8	USB3_TXN
9	USB3_TXP	10	VCC
11	USB1_N	12	USB1_P
13	GND		

### LED Indicators

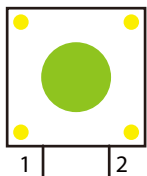
Connector location: LED4 and LED5



	Pin	Definition	Pin	Definition
<b>LED4</b>	A1	VCC3	C1	3G LED
	A2	VCC3	C2	WLAN LED
<b>LED5</b>	A1	VCC3	C1	SATA LED
	A2	VCC3	C2	PWR LED

## Reset Switch (Co-layout with J29)

Connector location: SW5

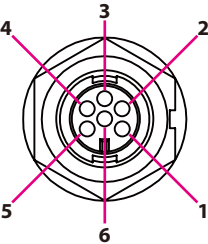


Pin	Definition
1	GND
2	RESET

## External I/O Interfaces - Rear Panel

### Audio Connector (Audio-IP CON For Audio)

Connector type: Mini Size 6-pin to JWT (MVS 5210-R)



Pin	Definition	Pin	Definition
1	GND	2	MIC_JD
3	MIC_R	4	SURR_OUT_R
5	SURR_JD	6	SURR_OUT_L

### Line-out Connector

Connector type: 3.5mm audio jack  
Connector location: CN1



Pin	Definition	Pin	Definition
1	SURR_OUT_R	2	SURR_JD
3	NC	4	SURR_OUT_L
5	GND	6	GND

Mic-in Connector

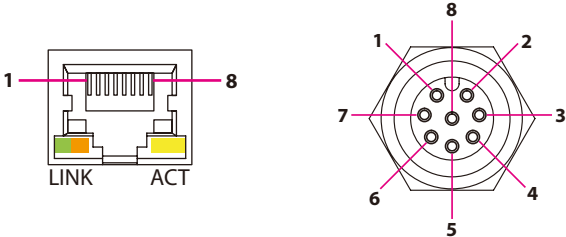
Connector type: 3.5mm audio jack  
Connector location: CN2



Pin	Definition	Pin	Definition
1	NC	2	MIC_JD
3	NC	4	MIC_R
5	GND	6	GND

LAN1 to LAN8 Ports (Co-layout with J2 to J17)

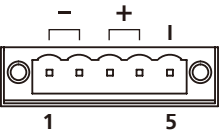
Connector type: RJ45 port with LEDs (MVS 5200/5210)  
M12 connector (MVS 5210-R)  
Connector location: CON4A to CON4D (LAN1 to LAN4)  
CON3A to CON3D (LAN5 to LAN8)



Pin	Definition	Pin	Definition
1	LAN_MDI_0P	2	LAN_MDI_0N
3	LAN_MDI_1P	4	LAN_MDI_2P
5	LAN_MDI_2N	6	LAN_MDI_1N
7	LAN_MDI_3P	8	LAN_MDI_3N

9V-36V DC Power Input (Co-layout with CON2)

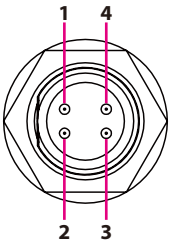
Connector type: Phoenix Contact 1x5 5-pin terminal block  
Connector location: CON1



Pin	Definition	Pin	Definition
1	GND_IN	2	GND_IN
3	V_IN	4	V_IN
5	IGNITION		

DC Power Input

Connector type: 4-pin male power connector to ECI (MVS 5210-R)

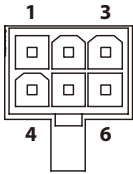


Pin	Definition	Pin	Definition
1	VIN	2	GND
3	Ignition	4	NC

## DC Output (Co-layout with CN4)

Connector type: 2x3 6-pin connector

Connector location: CN3



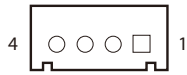
Pin	Definition	Pin	Definition
1	VIN BY PASS	2	12V OUT
3	I2C_CLK	4	GND
5	GND	6	I2C_DAT

## Internal Connectors

### USB 2.0 Connector

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

Connector location: J26/J27

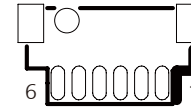


Pin	Definition	Pin	Definition
1	GND	2	USB0/1_N
3	USB0/1_P	4	VCC

### Front Panel Audio Connector

Connector type: 1x6 6-pin header, 1.0mm pitch

Connector location: J1

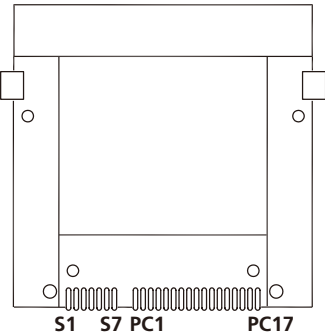


Pin	Definition	Pin	Definition
1	SURR_OUT_L	2	SURR_JD
3	SURR_OUT_R	4	MIC_R
5	MIC_JD	6	GND



CFast Card Slot (For PC System Only)

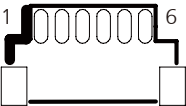
Connector type: Standard CFast connector  
Connector location: CN7



Pin	Definition	Pin	Definition
S1	GND	S2	SATA2_TXP
S3	SATA2_TXN	S4	GND
S5	SATA2_RXN	S6	SATA2_RXP
S7	GND	PC1	CFAST_CDI
PC2	GND	PC3	GND
PC4	GND	PC5	GND
PC6	NC	PC7	GND
PC8	CFAST_LED1	PC9	CFAST_LED2
PC10	NC	PC11	NC
PC12	NC	PC13	NC
PC14	NC	PC15	GND
PC16	GND	PC17	CFAST_CDO

GPS Connector

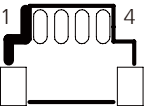
Connector type: 1x6 6-pin header, 1.0mm pitch  
Connector location: J22



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

**GPS-DR Connector**

Connector type: 1x4 4-pin header, 1.0mm pitch  
Connector location: J21



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

**SIO Temp2**

Connector type: 1x2 2-pin header, 2.54mm pitch  
Connector location: JP5



Pin	Definition
1	Temp
2	GND

## RTC Battery Connector

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

Connector location: J23



Pin	Definition
1	GND
2	RTC_BAT

## Debug 80 Port Connector

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

Connector location: J25

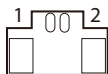


Pin	Definition	Pin	Definition
1	GND	2	PCIRST#
3	33M_CLK	4	LPC_FRAME#
5	LPC_AD3	6	LPC_AD2
7	LPC_AD1	8	LPC_AD0
9	VCC3	10	VCC3

## Reset Connector

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

Connector location: J29



Pin	Definition
1	GND
2	RESET

## Power Switch Connector

Connector type: 1x2 2-pin header, 2.5mm pitch

Connector location: J28



Pin	Definition
1	GND
2	PWRBT_IN#

## MCU Debug COM Connector

Connector type: 1x3 3-pin header, 2.54mm pitch

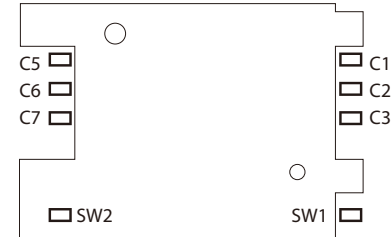
Connector location: JP2



Pin	Definition
1	UART5_TX
2	UART5_RX
3	GND

## SIM Card Connectors (SIM1 and SIM2)

Connector location: CN13 (SIM1) and CN12 (SIM2)



Pin	Definition	Pin	Definition
C1	SIM PWR	C2	SIM RST
C3	SIM CLK	C5	GND
C6	NC	C7	SIM DAT
SW1	NC	SW2	NC

## Reset

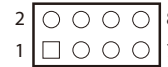
Connector type: 1x2 2-pin header, 2.54mm pitch  
Connector location: JP3



Pin	Definition
1	STM_RESET
2	GND

## MCU Update Connector

Connector type: 2x4 8-pin header, 1.27mm pitch  
Connector location: JP4



Pin	Definition	Pin	Definition
1	V3P3	2	STM_NJTRST
3	STM_JTDI	4	STM_JTMS
5	STM_JTCK	6	STM_JTDO
7	STM_RST	8	GND

DB15 Connector

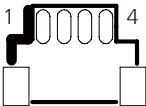
Connector type: 1x16 16-pin header, 1.0mm pitch  
Connector location: J20



Pin	Definition	Pin	Definition
1	ANA_GND	2	12VDC
3	12VDC	4	GND
5	U5TX_RF	6	U5RX_RF
7	GND	8	iButton_R
9	SPEED	10	DR_DIRECTIO_M
11	Analog_IN1	12	GND
13	MDI2_DB2R	14	MDI1_DB1R
15	MDO2_DB2R	16	MDO1_DB1R

USB Output

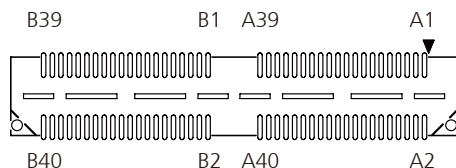
Connector type: 1x4 4-pin header, 1.0mm pitch  
Connector location: J24



Pin	Definition	Pin	Definition
1	GND	2	USB2_6_P
3	USB2_6_N	4	USB2_6_PWR

## Board to Board Connector (to IO Board)

Connector location: J19



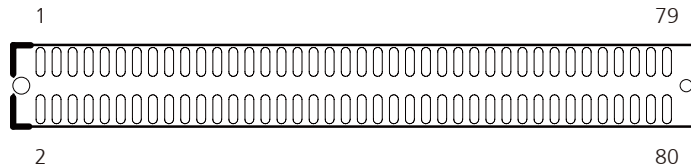
Pin	Definition	Pin	Definition
A1	GND	A2	PCIE_P2_RXN
A3	EDP_LANE1_N	A4	PCIE_P2_RXP
A5	EDP_LANE1_P	A6	GND
A7	GND	A8	PCIE_P2_TXN
A9	EDP_LANE0_N	A10	PCIE_P2_TXP
A11	EDP_LANE0_P	A12	GND
A13	GND	A14	PCIE_CLK2N
A15	EDP_AUXP	A16	PCIE_CLK2P
A17	EDP_AUXN	A18	GND
A19	GND	A20	PCIE_P1_RXN
A21	USB2_1_N	A22	PCIE_P1_RXP
A23	USB2_1_P	A24	GND
A25	GND	A26	PCIE_P1_TXN
A27	SATA_RXN2	A28	PCIE_P1_TXP
A29	SATA_RXP2	A30	GND
A31	GND	A32	PCIE_CLK1N

Pin	Definition	Pin	Definition
A33	SATA_TXN2	A34	PCIE_CLK1P
A35	SATA_TXP2	A36	GND
A37	GND	A38	USB2_3_N
A39	GND	A40	USB2_3_P
B1	USB2_5_N	B2	PCIE_P5_RX0N
B3	USB2_5_P	B4	PCIE_P5_RX0P
B5	GND	B6	GND
B7	SATA_RXN3	B8	PCIE_P5_TX0N
B9	SATA_RXP3	B10	PCIE_P5_TX0P
B11	GND	B12	GND
B13	SATA_TXN3	B14	PCIE_CLK0N
B15	SATA_TXP3	B16	PCIE_CLK0P
B17	GND	B18	GND
B19	USB3_2_RXN	B20	DPC2_AUXP
B21	USB3_2_RXP	B22	DPC2_AUXN
B23	GND	B24	GND
B25	USB3_2_TXN	B26	DPC2_LANE0_P
B27	USB3_2_TXP	B28	DPC2_LANE0_N
B29	GND	B30	GND
B31	DPC2_LANE1_P	B32	SATA_TXP1
B33	DPC2_LANE1_N	B34	SATA_TXN1
B35	GND	B36	GND
B37	USB2_7_N	B38	SATA_RXN1
B39	USB2_7_P	B40	SATA_RXP1



## Board to Board Connector (to IO Board)

Connector location: JP1



Pin	Definition	Pin	Definition
1	CH7511RST_GPIO47	2	GND
3	CH7511_ENVDD	4	VCC3_POK
5	CH7511_ENBKL	6	SMB_CLK
7	PM_SLP_S0#	8	SMB_DATA
9	GND	10	RXD5
11	CH7511_GPIO3	12	TXD5
13	CH7511_GPIO2	14	GND
15	CH7511_GPIO1	16	CAN_DO
17	CH7511_GPIO0	18	CAN_DI
19	GND	20	CAN_M_PWREN
21	EDP_HPD	22	DO_4
23	MCU_BKLEN	24	DO_3
25	MCU_LVDS_VDDEN	26	DO_2
27	EDP_BKLCTL	28	DO_1
29	PWRBT_IN#	30	GND
31	LVDS_DET#	32	DI_4

Pin	Definition	Pin	Definition
33	USB_PWREN	34	DI_3
35	USB_OC13#	36	DI_2
37	GND	38	DI_1
39	DCD2#	40	MINICARD1_EN
41	RXD2	42	PCIE1_LED_R
43	TXD2	44	MINICARD1_DIS#
45	DTR2#	46	MINI_BT_DIS#
47	DSR2#	48	GND
49	RTS2#	50	DPC2_HPD
51	CTS2#	52	DCD1#
53	RI2#	54	RXD1
55	GND	56	TXD1
57	SP339A_TERM_EN	58	DTR1#
59	SP339A_MODE1	60	DSR1#
61	SP339A_MODE0	62	RTS1#
63	SP339B_TERM_EN	64	CTS1#
65	SP339B_MODE1	66	RI1#
67	SP339B_MODE0	68	EDP_BKLEN
69	GND	70	CAN1_TXD
71	CB_RESET#_B	72	CAN1_RXD
73	+VCCIO_OUT	74	+12VSB
75	GND	76	VCC12
77	GND	78	VCC12
79	GND	80	VCC12

## IO Board Power Connector

Connector type: 1x3 3-pin header, 3.96mm pitch

Connector location: CN11

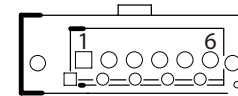


Pin	Definition
1	VCC3
2	GND
3	VCC5

## VIN Connector

Connector type: 1x6 6-pin header

Connector location: CON2



Pin	Definition	Pin	Definition
1	GND_IN	2	GND_IN
3	V_IN	4	V_IN
5	IGNITION	(6)	IGNITION (CON4 only)

## Battery Connector

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

Connector location: J18



Pin	Definition	Pin	Definition
1	BAT_GND	2	BAT_GND
3	BAT_PRECHG	4	BAT_TEST
5	BAT_SMBDAT	6	3V3ALW_BAT
7	BAT_SMBCLK	8	BAT_CHG#
9	BAT_TS#	10	BAT_ID1

## Battery Power Connector

Connector type: 2x20 20-pin header, 2.0mm pitch

Connector location: CN5

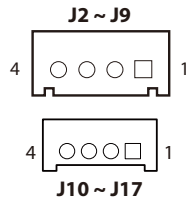


Pin	Definition	Pin	Definition
1	VIN_M	2	BACKUP_BAT
3	BAT_GND	4	BACKUP_BAT
5	BAT_GND	6	BACKUP_BAT
7	BAT_GND	8	BACKUP_BAT
9	BAT_GND	10	BACKUP_BAT
11	BAT_GND	12	BACKUP_BAT
13	BAT_GND	14	BACKUP_BAT
15	BAT_GND	16	BACKUP_BAT
17	BAT_GND	18	BACKUP_BAT
19	BAT_GND	20	BACKUP_BAT

## LAN Connectors (Two 4-pin Connectors for Each LAN)

Connector type: 1x4 4-pin header, 2.5mm pitch

Connector location: J2 to J17 (LAN 1 to LAN 8)



### J2 ~ J9

Pin	Definition	Pin	Definition
1	LAN_MDI_0P	2	LAN_MDI_0N
3	LAN_MDI_1P	4	LAN_MDI_1N

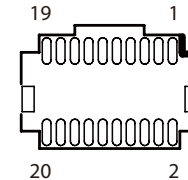
### J10 ~ J17

Pin	Definition	Pin	Definition
1	LAN_MDI_2P	2	LAN_MDI_2N
3	LAN_MDI_3P	4	LAN_MDI_3N

## NVR LAN Connector

Connector type: 2x10 20-pin header, 1.0mm pitch

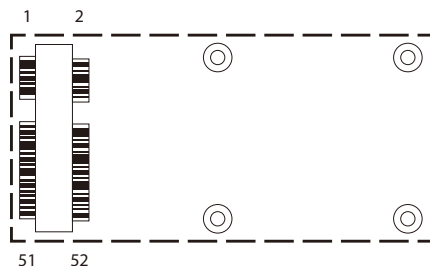
Connector location: CN8



Pin	Definition	Pin	Definition
1	LSW1-2_0P	2	NVR_12V
3	LSW1-2_0N	4	NVR_12V
5	LSW1-2_1P	6	GND
7	LSW1-2_1N	8	NVR_GPIO
9	LSW1-2_2P	10	GND
11	LSW1-2_2N	12	NVR_GND
13	LSW1-2_3P	14	UART5_RXD_N
15	LSW1-2_3N	16	UART5_TXD_N
17	Test_POINT	18	NVR_GND
19	NVR_GND	20	NVR_GND
MH1	NVR_GND	MH2	NVR_GND

## Mini-PCle Connector for 3G

Connector location: CN6

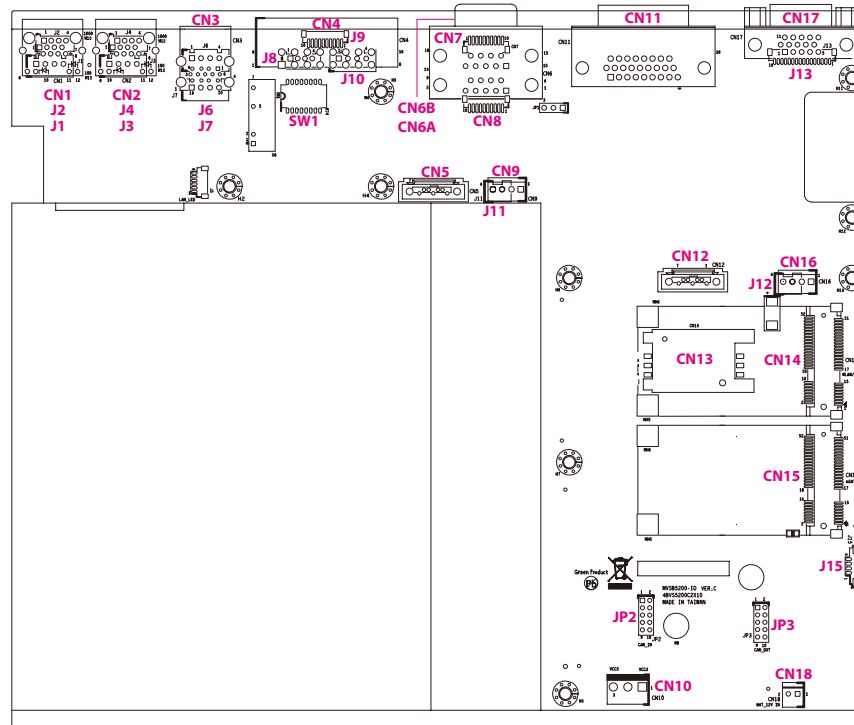


Pin	Definition	Pin	Definition
1	MIC_P/WAKE_N	2	+V3.3A_MINI4
3	NC	4	GND
5	NC	6	NC
7	NC	8	UIMA_PWR
9	GND	10	UIMA_DAT
11	VCC_MSM26_DIG	12	UIMA_CLK
13	SPI_MRDY_3G	14	UIMA_RST
15	GND	16	SPI_SCLK_3G
17	USART6_TXD_3.5G	18	GND
19	USART6_RXD_3.5G	20	3.5G_DIS#
21	GND	22	3.5G_RST#
23	SPI_SRDY_3G	24	+V3.3A_MINI4
25	SPI_MISO_3G	26	GND

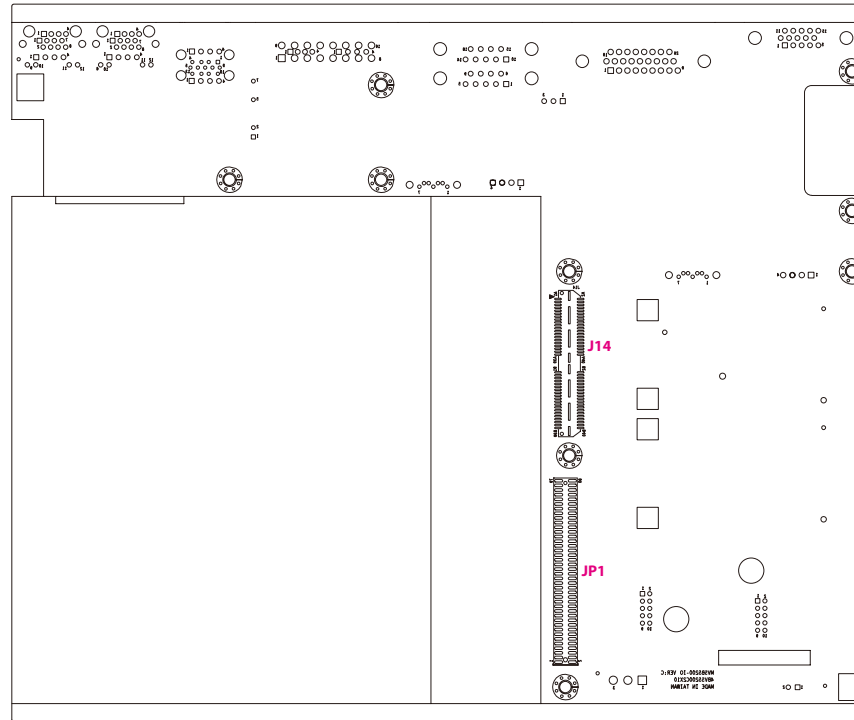
Pin	Definition	Pin	Definition
27	GND	28	NC
29	GND	30	NC
31	SPI_MOSI_3G	32	NC
33	UMTS_RESET#	34	GND
35	GND	36	USB-
37	GND	38	USB+
39	+V3.3A_MINI4	40	GND
41	+V3.3A_MINI4	42	WWAN_LED#
43	GND	44	3.5G_GPS_EXTINT
45	PCM_CLK	46	GPS_TXD_3.5G
47	PCM_RX	48	3.5G_GPSPWREN
49	PCM_TX	50	GND
51	PCM_SYNC	52	+V3.3A_MINI4

## Locations of the Jumpers and Connectors for the I/O Board

Top View



## Bottom View



## Connector Pin Definitions

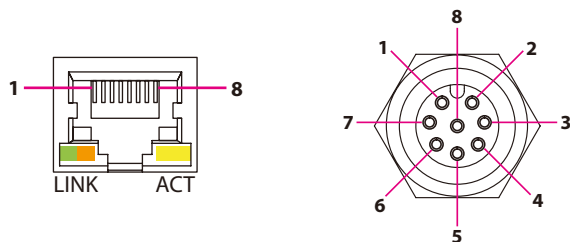
### External I/O Interfaces

#### LAN1 Port (Co-layout with J1 and J2)

Connector type: RJ45 port with LEDs (MVS 5200/5210)

M12 connector (MVS 5210-R)

Connector location: CN1



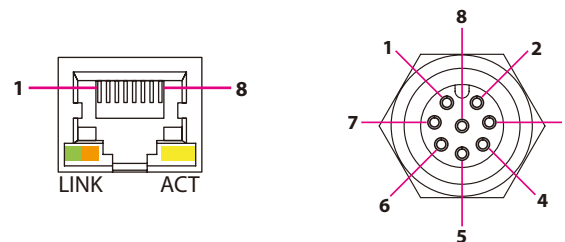
Pin	Definition	Pin	Definition
1	MDI0P	2	MDI0N
3	MDI1P	4	MDI2P
5	MDI2N	6	MDI1N
7	MDI3P	8	MDI3N
9	LED1-	10	LED1+
11	LED2-	12	LED2+

#### LAN2 Port (Co-layout with J3 and J4)

Connector type: RJ45 port with LEDs (MVS 5200/5210)

M12 connector (MVS 5210-R)

Connector location: CN2

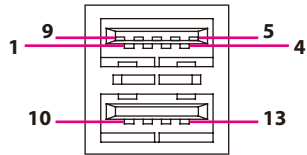


Pin	Definition	Pin	Definition
1	MDI0P	2	MDI0N
3	MDI1P	4	MDI2P
5	MDI2N	6	MDI1N
7	MDI3P	8	MDI3N
9	LED1-	10	LED1+
11	LED2-	12	LED2+



## LAN1 and USB 3.0/USB 2.0 Ports (Co-layout with J6 and J7)

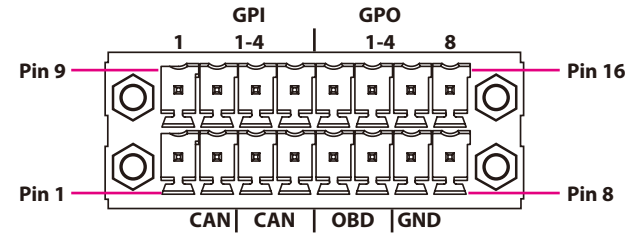
Connector type: USB 3.0 and USB 2.0 port, Type A  
Connector location: CN3



Pin	Definition	Pin	Definition
1	VCC	2	USB2_1N
3	USB2_1P	4	GND
5	USB3_2_RXN	6	USB3_2_RXP
7	GND	8	USB3_2_TXN
9	USB3_2_TXP	10	VCC
11	USB2_7N	12	USB2_7P
13	GND		

## GPIO/CAN Connector (Co-layout with J8, J9 and J10)

Connector type: 2x8 16-pin switch  
Connector location: CN4

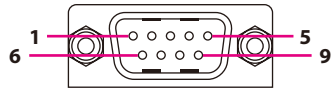


Pin	Definition	Pin	Definition
1	CAN1_H_R	9	GPI_R_1
2	CAN1_L_R	10	GPI_R_2
3	CAN_M_H_R	11	GPI_R_3
4	CAN_M_L_R	12	GPI_R_4
5	C1708_1_L_R	13	GPO_R_1
6	C1708_1_H_R	14	GPO_R_2
7	CAN_GND	15	GPO_R_3
8	ISO_GND	16	GPO_R_4

## COM1 Port (Co-layout with CN7)

Connector type: DB-9 port, 9-pin D-Sub

Connector location: CN6B

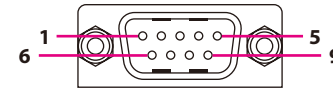


Pin	Definition	Pin	Definition
1	COM1_DCD#_TX-	2	COM1_RX_TX+
3	COM1_TX_RX+	4	COM1_DTR#_RX-
5	COM1_GND	6	COM1_DSR#
7	COM1_RTS#	8	COM1_CTS#
9	COM1_RI#		

## COM2 Port (Co-layout with CN8)

Connector type: DB-9 port, 9-pin D-Sub

Connector location: CN6A

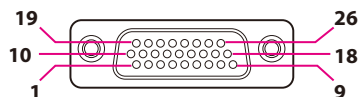


Pin	Definition	Pin	Definition
1	COM2_DCD#_TX-	2	COM2_RX_TX+
3	COM2_TX_RX+	4	COM2_DTR#_RX-
5	COM2_GND	6	COM2_DSR#
7	COM2_RTS#	8	COM2_CTS#
9	COM2_RI#		

## LVDS Port

Connector type: 26-pin female port

Connector location: CN11

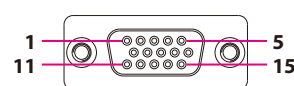


Pin	Definition	Pin	Definition
1	LVDS_DDC_CLK	2	LVDS_DDC_DATA
3	Panel_VDD	4	LVDSA_DATA0
5	LVDSA_DATA3	6	LVDSA_DATA#0
7	LVDSA_DATA#3	8	Panel_VDD
9	LVDS_GND	10	LVDS_GND
11	LVDSA_CLK	12	LVDSA_DATA1
13	LVDSA_CLK#	14	LVDSA_DATA#1
15	LVDS_GND	16	LVDS_GND
17	LVDSA_DATA2	18	Panel_backlight
19	LVDSA_DATA#2	20	Panel_backlight
21	LVDS_GND	22	MCU_PWRBTN#
23	USBHUB_2_N	24	LVDS_DET#
25	USBHUB_2_P	26	LVDS_USB_PWR
27	USB_GND	28	USB_GND
28	Panel_backlight	29	GND

## VGA and DVI-D Connectors (Co-layout with J13)

Connector type: DB-15 port, 15-pin D-Sub

Connector location: CN17



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		

Internal Connectors

VGA Connector

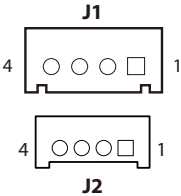
Connector type: 1x16 16-pin header, 1.0mm pitch  
Connector location: J13



Pin	Definition	Pin	Definition
1	GND	2	VGA_VCC
3	VGA_CLK	4	VGA_DAT
5	VGA_VS	6	VGA_HS
7	GND	8	GND
9	GND	10	VGA_GND
11	BLUE	12	VGA_GND
13	GREEN	14	VGA_GND
15	RED	16	M_DET

LAN1 Connectors

Connector type: 1x4 4-pin header, 2.0mm/2.5mm pitch  
Connector location: J1 and J2



J1

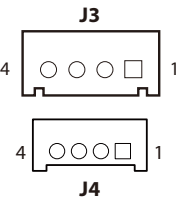
Pin	Definition	Pin	Definition
1	LAN_MDI_2P_R	2	LAN_MDI_2N_R
3	LAN_MDI_3P_R	4	LAN_MDI_3N_R

J2

Pin	Definition	Pin	Definition
1	LAN_MDI_0P_R	2	LAN_MDI_0N_R
3	LAN_MDI_1P_R	4	LAN_MDI_1N_R

LAN2 Connectors

Connector type: 1x4 4-pin header, 2.0mm/2.5mm pitch  
Connector location: J3 and J4



J3

Pin	Definition	Pin	Definition
1	LAN_MDI_2P_R	2	LAN_MDI_2N_R
3	LAN_MDI_3P_R	4	LAN_MDI_3N_R

J4

Pin	Definition	Pin	Definition
1	LAN_MDI_0P_R	2	LAN_MDI_0N_R
3	LAN_MDI_1P_R	4	LAN_MDI_1N_R

COM1 and COM2 Connectors

Connector type: 1x10 10-pin header, 1.0mm pitch  
Connector location: CN7 and CN8



Pin	Definition	Pin	Definition
1	GND	2	GND
3	CTS	4	DSR
5	DTR_RX-	6	RXD_TX+
7	RI_PWR	8	RTS
9	TXD_RX+	10	DCD_TX-

RS485: PIN 10\_DATA-, PIN6\_DATA+  
RS422: PIN 10\_TX-, PIN6\_TX+, PIN5\_RX-, PIN9\_RX+

## GPIO Connector

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

Connector location: J9

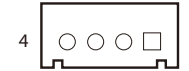


Pin	Definition	Pin	Definition
1	ISO_GND	2	ISO_GND
3	GPIO8	4	GPIO7
5	GPIO6	6	GPIO5
7	GPIO4	8	GPIO3
9	GPIO2	10	GPIO1

## CAN Module Connector

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

Connector location: J8 and J10



### J8

Pin	Definition	Pin	Definition
1	CAN1_H_R	2	CAN1_L_R
3	CAN_M_L_R	4	CAN_M_H_R

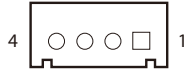
### J10

Pin	Definition	Pin	Definition
1	C1708_1_L_R	2	C1708_1_H_R
3	CAN_GND	4	CAN_GND

## USB 2.0 Connector

Connector type: 1x4 4-pin header, 2.5mm pitch

Connector location: J6 and J7



### J6

Pin	Definition	Pin	Definition
1	GND	2	USB2_7N
3	USB2_7P	4	USB_R_PWR

### J7

Pin	Definition	Pin	Definition
1	GND	2	USB2_1N
3	USB2_1P	4	USB_R_PWR

## SATA Power Connector

Connector type: 1x2 2-pin header, 2.5mm pitch

Connector location: J11 and J12

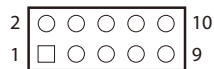


Pin	Definition
1	VCC5
2	GND

## CAN Module Connector

Connector type: 2x5 10-pin header, 2.0mm pitch

Connector location: JP2 and JP3



### JP2 Input

Pin	Definition	Pin	Definition
1	TXD5	2	RXD5
3	CAN_DI1	4	CAN_DO1
5	GND	6	GND
7	NC	8	NC
9	CAN_M_VCC5	10	NC

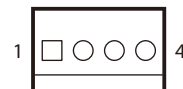
### JP3 Output

Pin	Definition	Pin	Definition
1	CAN_M_H	2	C1708_1_H
3	CAN_M_L	4	C1708_1_L
5	CAN_ISO	6	GND
7	NC	8	NC
9	NC	10	NC

## SATA Power Connectors

Connector type: 1x4 4-pin Wafer, 2.54mm pitch

Connector location: CN9 and CN16



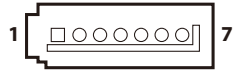
Pin	Definition
1	VCC12
2	GND
3	GND
4	VCC5



## SATA Connectors

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

Connector location: CN5 and CN12

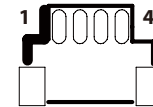


Pin	Definition	Pin	Definition
1	GND	2	SATA1/0_TXP
3	SATA1/0_TXN	4	GND
5	SATA1/0_RXN	6	SATA1/0_RXP
7	GND		

## 24V Battery-out Connector

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

Connector location: J15



Pin	Definition	Pin	Definition
1	CHG-OUT_24V	2	CHG-OUT_24V
3	GND	4	GND
MH1	GND	MH2	GND

12V Battery-in Connector

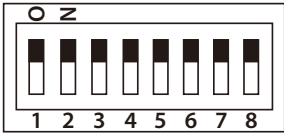
Connector type: 1x2 2-pin header, 2.54mm pitch  
Connector location: CN18



Pin	Definition
1	CHG-IN_12V
2	GND

GPIO Switch

Connector type: 8-pin DIP switch  
Connector location: SW1



Pin	Definition	Pin	Definition
1	GPO_1	2	GPO_2
3	GPO_3	4	GPO_4
5	GPI_1	6	GPI_2
7	GPI_3	8	GPI_4
9	DP_GPI_4	10	DP_GPI_3
11	DP_GPI_2	12	DP_GPI_1
13	DP_GPO_4	14	DP_GPO_3
15	DP_GPO_2	16	DP_GPO_1

IO Board Power Connector

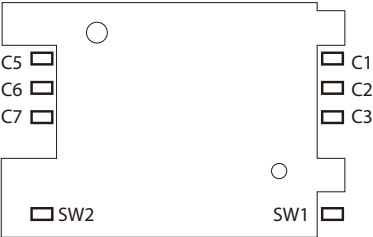
Connector type: 1x3 3-pin header, 3.96mm pitch  
Connector location: CN10



Pin	Definition
1	VCC3
2	GND
3	VCC5

SIM Card Slot

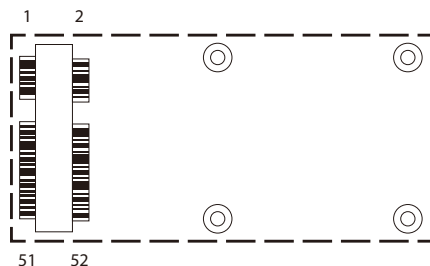
Connector location: CN13



Pin	Definition	Pin	Definition
C 1	UIM_PWR	C 2	UIM_RESET
C 3	UIM_CLK	C 5	GND
C 6	NC	C 7	UIM_DATA

## Mini-PCle Connector for WLAN/Bluetooth1

Connector location: CN14

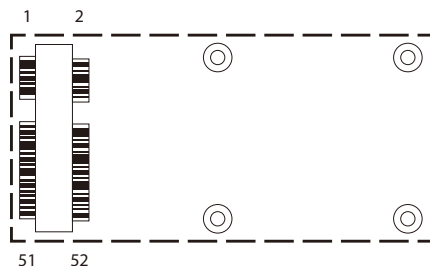


Pin	Definition	Pin	Definition
1	NC	2	+V3.3_MINI1
3	NC	4	GND
5	NC	6	+V1.5S_MINI1
7	NC	8	UIMB_PWR
9	GND	10	UIMB_DATA
11	PCIE_CLK0N	12	UIMB_CLK
13	PCIE_CLK0P	14	UIMB_RST
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD1_DIS#
21	GND	22	CB_RESET#_B
23	PCIE_RX0N	24	+V3.3_MINI1
25	PCIE_RX0P	26	GND

Pin	Definition	Pin	Definition
27	GND	28	+V1.5S_MINI1
29	GND	30	SMBCLK
31	PCIE_TX0N	32	SMBDAT
33	PCIE_TX0P	34	GND
35	GND	36	USB-
37	GND	38	USB+
39	+V3.3_MINI1	40	GND
41	+V3.3_MINI1	42	NC
43	GND	44	PCIE1_LED_R
45	NC	46	PCIE1_LED
47	NC	48	+V1.5S_MINI1
49	NC	50	GND
51	MINI_BT_DIS#	52	+V3.3_MINI1

## Mini-PCle Connector for mSATA (For PC System Only)

Connector location: CN15

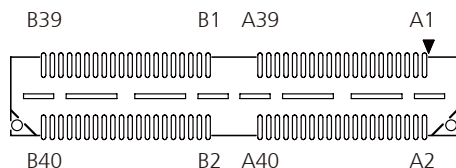


Pin	Definition	Pin	Definition
1	NC	2	+V3.3_MINI3
3	NC	4	GND
5	NC	6	+V1.5S_MINI3
7	NC	8	NC
9	GND	10	NC
11	PCIE_CLK0N	12	NC
13	PCIE_CLK0P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	+V3.3_MINI_3
21	GND	22	NC
23	SATA_RXP3	24	+V3.3_MINI3
25	SATA_RXN3	26	GND

Pin	Definition	Pin	Definition
27	GND	28	+V1.5S_MINI3
29	GND	30	NC
31	SATA_TXN3	32	NC
33	SATA_TXP3	34	GND
35	GND	36	NC
37	GND	38	NC
39	+V3.3_MINI3	40	GND
41	+V3.3_MINI3	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+V1.5S_MINI3
49	NC	50	GND
51	Z1001	52	+V3.3_MINI3

## Board to Board Connector (to Motherboard)

Connector location: J14

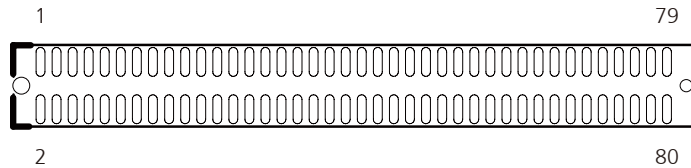


Pin	Definition	Pin	Definition
A1	GND	A2	PCIE_P2_RXN
A3	EDP_LANE1_N	A4	PCIE_P2_RXP
A5	EDP_LANE1_P	A6	GND
A7	GND	A8	PCIE_P2_TXN
A9	EDP_LANE0_N	A10	PCIE_P2_TXP
A11	EDP_LANE0_P	A12	GND
A13	GND	A14	PCIE_CLK2N
A15	EDP_AUXP	A16	PCIE_CLK2P
A17	EDP_AUXN	A18	GND
A19	GND	A20	PCIE_P1_RXN
A21	USB2_1_N	A22	PCIE_P1_RXP
A23	USB2_1_P	A24	GND
A25	GND	A26	PCIE_P1_TXN
A27	SATA_RXN2	A28	PCIE_P1_TXP
A29	SATA_RXP2	A30	GND
A31	GND	A32	PCIE_CLK1N

Pin	Definition	Pin	Definition
A33	SATA_TXN2	A34	PCIE_CLK1P
A35	SATA_TXP2	A36	GND
A37	GND	A38	USB2_3_N
A39	NC	A40	USB2_3_P
B1	USB2_5_N	B2	PCIE_P5_RX0N
B3	USB2_5_P	B4	PCIE_P5_RX0P
B5	GND	B6	GND
B7	SATA_RXN3	B8	PCIE_P5_TX0N
B9	SATA_RXP3	B10	PCIE_P5_TX0P
B11	GND	B12	GND
B13	SATA_TXN3	B14	PCIE_CLK0N
B15	SATA_TXP3	B16	PCIE_CLK0P
B17	GND	B18	GND
B19	USB3_2_RXN	B20	DPC2_AUXP
B21	USB3_2_RXP	B22	DPC2_AUXN
B23	GND	B24	GND
B25	USB3_2_TXN	B26	DPC2_LANE0_P
B27	USB3_2_TXP	B28	DPC2_LANE0_N
B29	GND	B30	GND
B31	DPC2_LANE1_P	B32	SATA_TXP1
B33	DPC2_LANE1_N	B34	SATA_TXN1
B35	GND	B36	GND
B37	USB2_7_N	B38	SATA_RXN1
B39	USB2_7_P	B40	SATA_RXP1

## Board to Board Connector (to Motherboard)

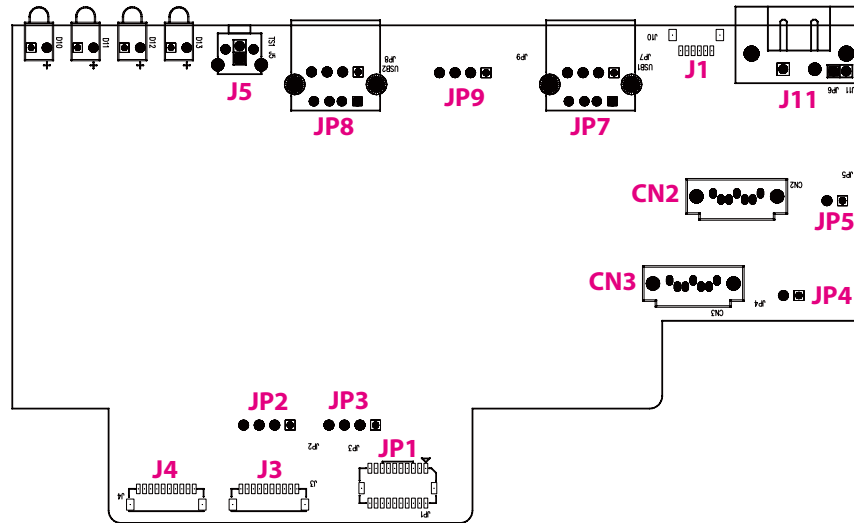
Connector location: JP1



Pin	Definition	Pin	Definition
1	CH7511RST_GPIO47	2	GND
3	CH7511_ENVDD	4	VCC3_POK
5	CH7511_ENBKL	6	SMB_CLK
7	PM_SLP_S0#	8	SMB_DATA
9	GND	10	RXD5
11	CH7511_GPIO3	12	TXD5
13	CH7511_GPIO2	14	GND
15	CH7511_GPIO1	16	CAN_DO
17	CH7511_GPIO0	18	CAN_DI
19	GND	20	CAN_M_PWREN
21	EDP_HPD	22	DO_4
23	MCU_BKLEN	24	DO_3
25	MCU_LVDS_VDDEN	26	DO_2
27	EDP_BKLCTL	28	DO_1
29	PWRBT_IN#	30	GND
31	LVDS_DET#	32	DI_4

Pin	Definition	Pin	Definition
33	USB_PWREN	34	DI_3
35	USB_OC13#	36	DI_2
37	GND	38	DI_1
39	DCD2#	40	MINICARD1_EN
41	RXD2	42	PCIE1_LED_R
43	TXD2	44	MINICARD1_DIS#
45	DTR2#	46	MINI_BT_DIS#
47	DSR2#	48	GND
49	RTS2#	50	DPC2_HPD
51	CTS2#	52	DCD1#
53	RI2#	54	RXD1
55	GND	56	TXD1
57	SP339A_TERM_EN	58	DTR1#
59	SP339A_MODE1	60	DSR1#
61	SP339A_MODE0	62	RTS1#
63	SP339B_TERM_EN	64	CTS1#
65	SP339B_MODE1	66	RI1#
67	SP339B_MODE0	68	EDP_BKLEN
69	GND	70	GND
71	CB_RESET#_B	72	GND
73	+VCCIO_OUT	74	12VSB
75	GND	76	VCC12
77	GND	78	VCC12
79	GND	80	VCC12

## Locations of the Jumpers and Connectors for the NVR Board





# Connector Pin Definitions

## External I/O Interfaces

### KVM Switch Connector

Connector type: 2-pin terminal block  
Connector location: J11



Pin	Definition
1	VIN
2	GND

### Audio Line-out

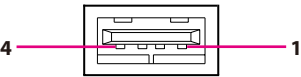
Connector type: 3.5mm audio jack  
Connector location: J1



Pin	Definition	Pin	Definition
1	SURR_OUT_L 4 MIC_R	2	SURR_JD 5 MIC_JD
3	SURR_OUT_R 6 GND	4	
5		6	GND

USB 2.0 Ports

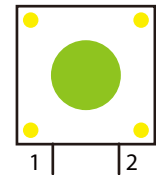
Connector type: USB port, Type A  
Connector location: JP7 and JP8



Pin	Definition	Pin	Definition
1	GND	2	USB_P
3	USB_N	4	USB_PWR

Reset Connector

Connector location: J5



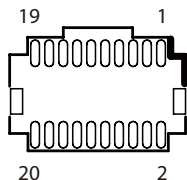
Pin	Definition
1	GND
2	RESET

## Internal Connectors

### LAN Connector

Connector type: 2x10 20-pin header

Connector location: JP1

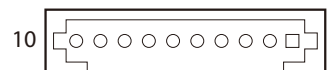


Pin	Definition	Pin	Definition
1	LSW1-2_0P	2	NVR_12V
3	LSW1-2_0N	4	NVR_12V
5	LSW1-2_1P	6	GND
7	LSW1-2_1N	8	NVR_GPIO
9	LSW1-2_2P	10	GND
11	LSW1-2_2N	12	NVR_GND
13	LSW1-2_3P	14	UART1_TXD
15	LSW1-2_3N	16	UART1_RXD
17	TEST_POINT	18	NVR_GND
19	NVR_GND	20	NVR_GND
MH1	NVR_GND	MH2	NVR_GND

### NVR/X86 VGA Connectors

Connector type: 1x10 10-pin header

Connector location: J3 and J4



#### J3

Pin	Definition	Pin	Definition
1	5V0	2	SCL2
3	SDA2	4	V2
5	H2	6	GND
7	B2	8	G2
9	R2	10	DGND
11	DGND	12	DGND

#### J4

Pin	Definition	Pin	Definition
1	5V0	2	I2C_SCL_VGA
3	I2C_SDA_VGA	4	VGA_VS
5	VGA_HS	6	GND
7	VGA_B	8	VGA_G
9	VGA_R	10	DGND
11	DGND	12	DGND

## GPIO Connectors

Connector type: 1x4 4-pin header, 2.5mm pitch  
 Connector location: JP2 and JP3



### JP2

Pin	Definition	Pin	Definition
1	DIGITAL_IN2	2	DGND
3	DIGITAL_IN3	4	DGND

### JP3

Pin	Definition	Pin	Definition
1	ALARM_OUT1	2	DGND
3	ALARM_OUT2	4	DGND

## SATA Connectors

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)  
 Connector location: CN2 and CN3



Pin	Definition	Pin	Definition
1	GND	2	SATA1/O_TXP
3	SATA1/O_TXN	4	GND
5	SATA1/O_RXN	6	SATA1/O_RXP
7	GND		

## SATA Power Connectors - 5V

Connector type: 1x2 2-pin header, 2.5mm pitch

Connector location: JP4 and JP5

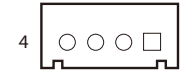


Pin	Definition
1	VCC5
2	GND

## Internal USB Connector

Connector type: 1x4 4-pin header, 2.5mm pitch

Connector location: JP9



Pin	Definition	Pin	Definition
1	GND	2	USB_P
3	USB_N	4	USB_PWR

# CHAPTER 3: SYSTEM SETUP

## Removing the Chassis Bottom Cover



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

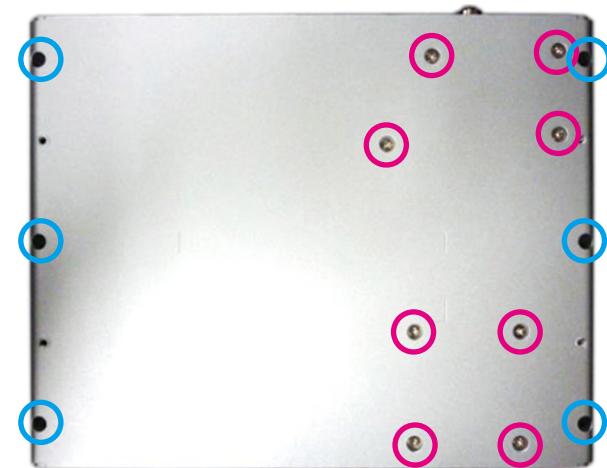
1. The screws circled on the front, rear and bottom are used to secure the bottom cover to the chassis. Remove these screws and put them in a safe place for later use.



Front View



Rear View



Bottom View

## Installing a SSD/HDD Drive (For NVR System Only)

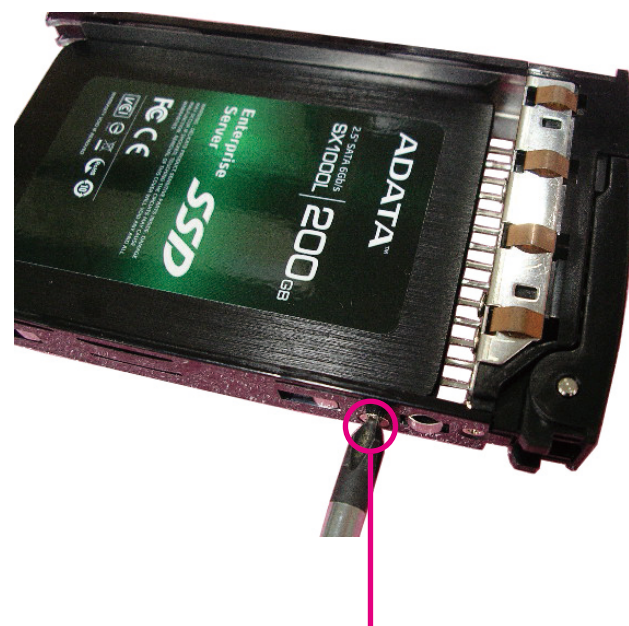
1. The two SSD/HDD bays on the front are used to install 2.5" hard drives. Loosen the thumb screws and remove the cover.
2. Insert the hard drive into the drive bay with the SATA data and power connector facing towards the end. Align the hard drive's mounting holes with the mounting holes on the drive bay, and use the provided screws to secure the hard drive in place.



**Thumb  
screws**

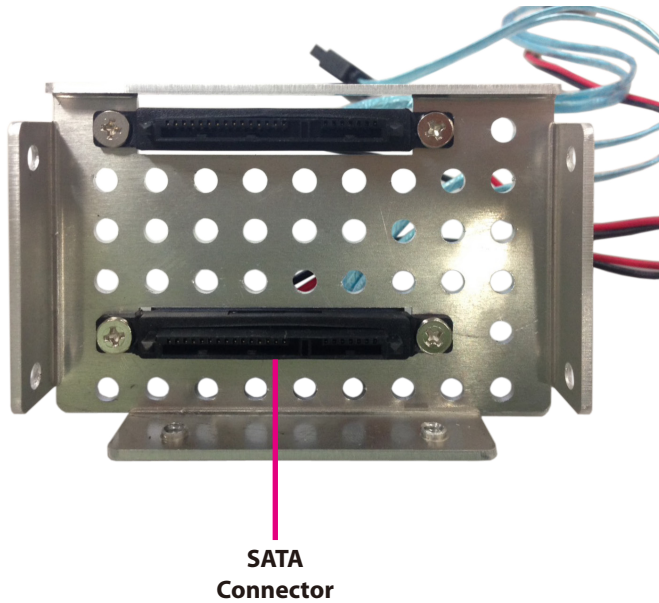


Dual SSD/HDD trays are only used by NVR system. Installing OS onto HDDs in drive bays is not recommended for PC system as they will not be recognized.

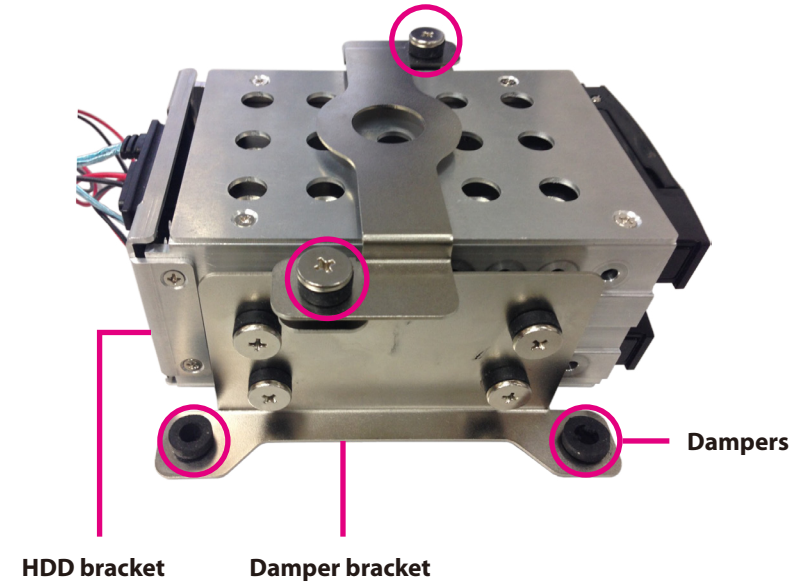


**Mounting  
screws**

3. Connect the SATA data and power connectors on the hard drive to the SATA connector on the hard drive bracket and screw the connectors in place.

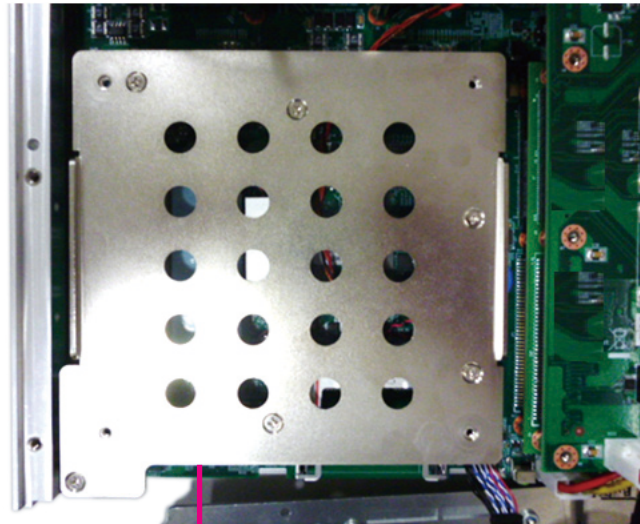


4. Place the dampers onto the damper bracket, then insert the HDD bracket into the damper bracket.

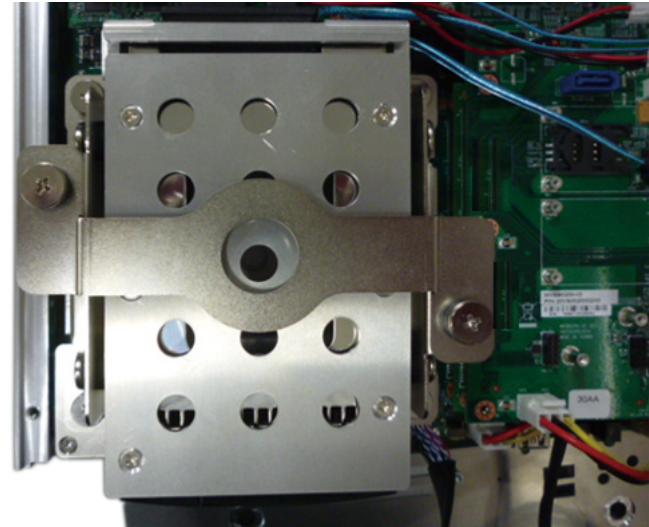




5. With the damper bracket secured, install it on top of the metal base and secure it using screws.



**Metal  
base**

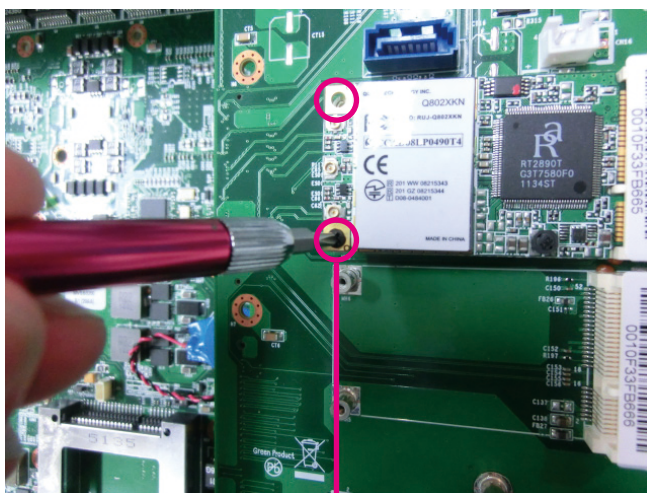


7. Reinstall the SSD/HDD drive bay cover and tighten the thumb screws to secure it.



## Installing a WLAN Module

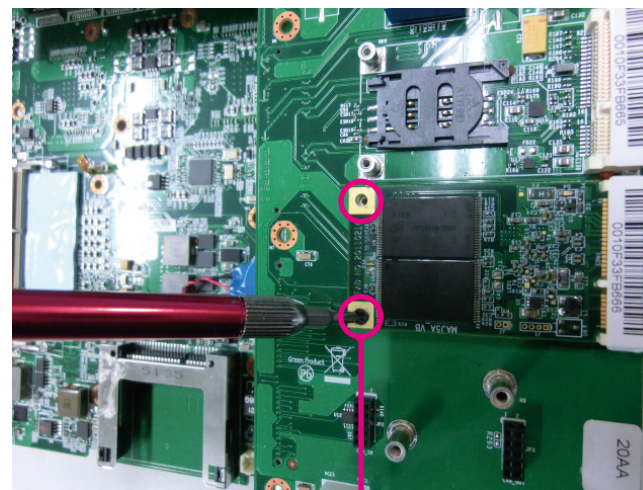
1. Locate the WLAN Mini PCI Express slot (CN14). Insert the module into the Mini PCI Express slot at a 45 degrees angle until the gold-plated connector on the edge of the module completely disappears inside the slot. Then fasten screws into the mounting holes to secure the module.



Mounting  
screws

## Installing an mSATA Module (For PC System Only)

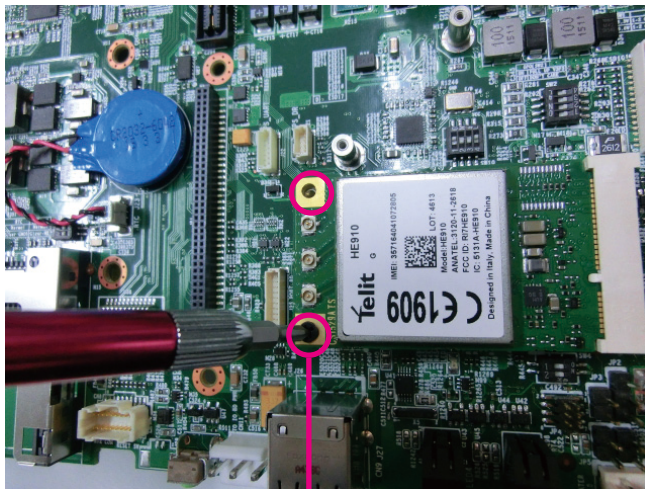
1. Locate the mSATA slot (CN15). Insert the module into the Mini PCI Express slot at a 45 degrees angle until the gold-plated connector on the edge of the module completely disappears inside the slot. Then fasten screws into the mounting holes to secure the module.



Mounting  
screws

## Installing a WWAN Module

1. Locate the WWAN 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.

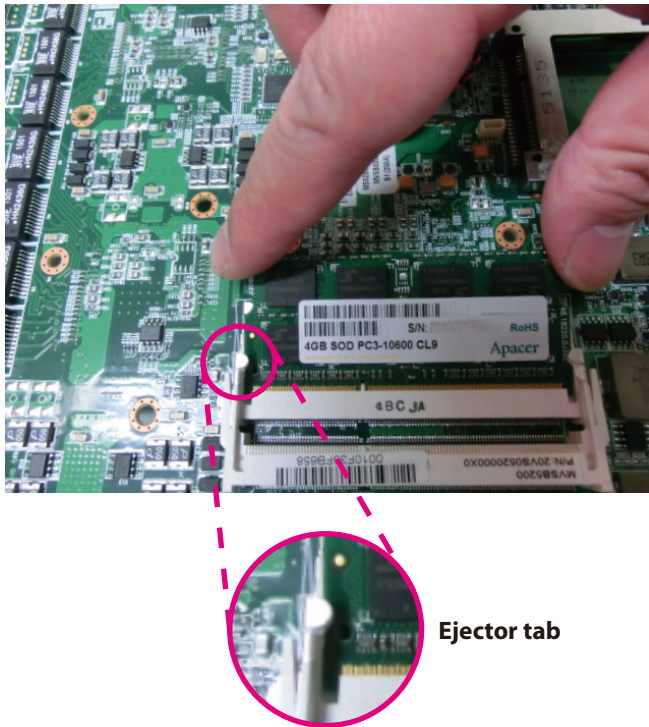


**Mounting  
screws**



## Installing a SO-DIMM

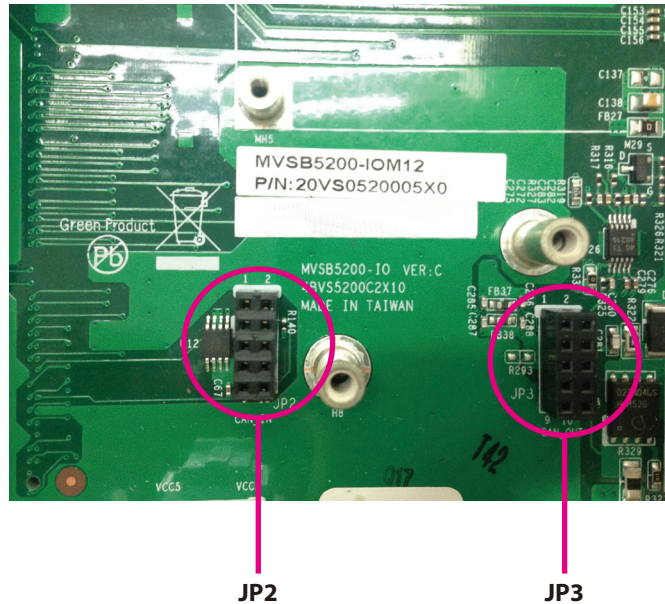
1. Push the ejector tabs which are at the ends of the socket outward. Then insert the module into the socket at an approximately 30 degrees angle. Apply firm even pressure to each end of the module until it slips down into the socket. The contact fingers on the edge of the module will almost completely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



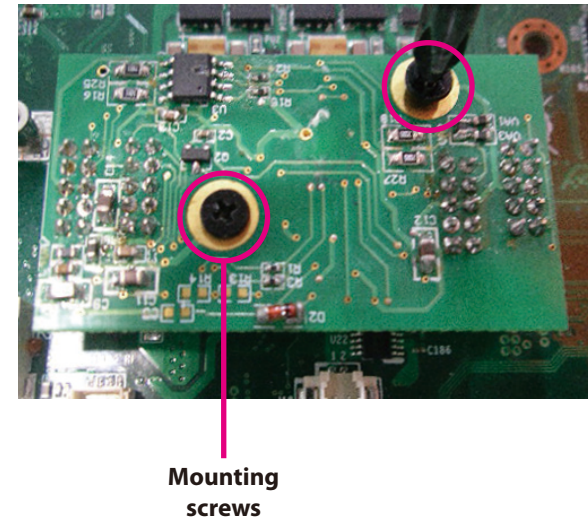
**Ejector tab**

## Installing an OBDII Module

1. Locate the OBDII connectors (JP2 and JP3).



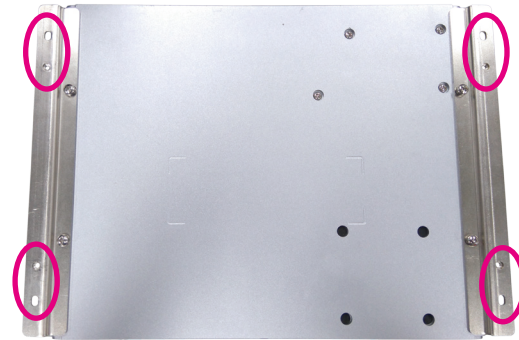
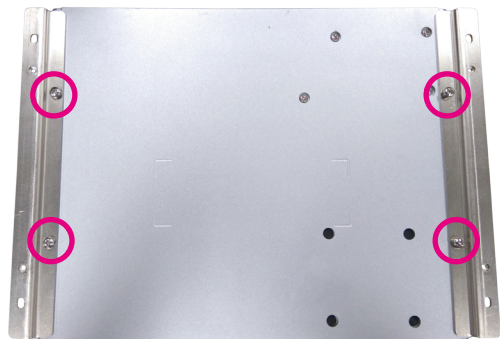
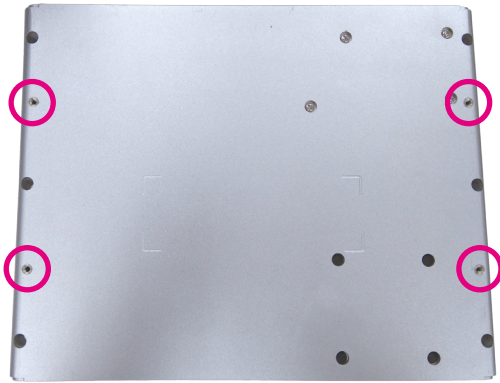
2. Connect the OBDII module to JP2 and JP3 and secure the OBDII module with screws.



## Installing Rackmount Brackets

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

1. The mounting holes are located at the bottom of the system. Secure the brackets on each side of the system using the provided mounting screws.
2. Now mount the system on the wall by fastening screws through the bracket's mounting holes.



# APPENDIX A:

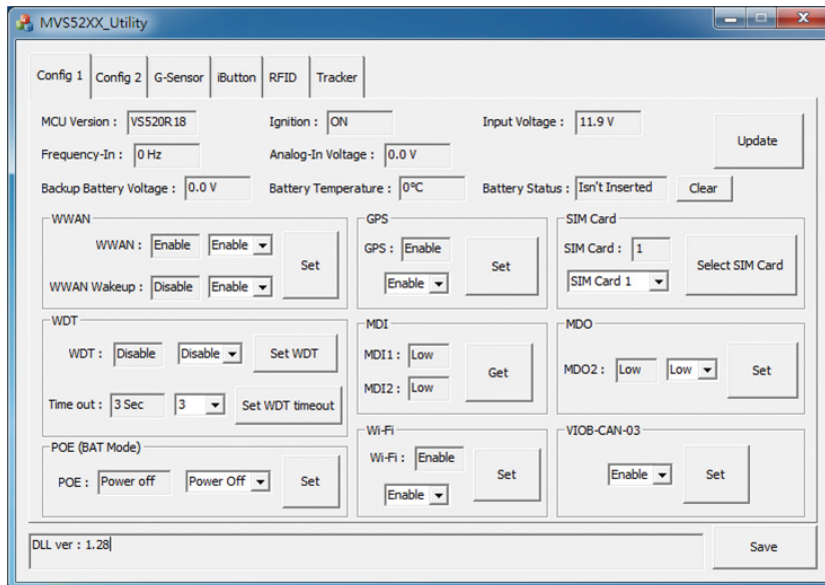
## SOFTWARE DEMO UTILITY FOR I/O PORTS OF FUNCTION CONTROL

DELTA COMPONENTS' software demo utility enables users to test and control different I/O port functions on the MVS 5200 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

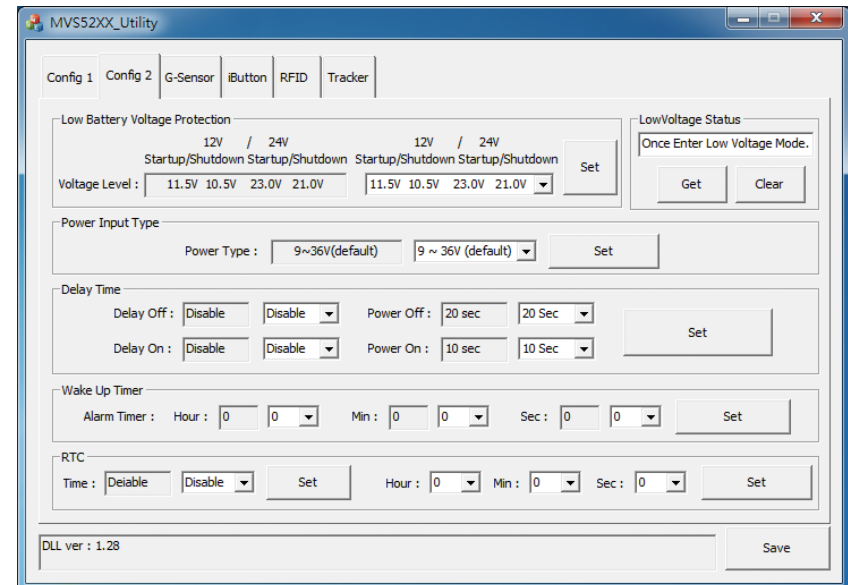
### Config1



The Config1 screen displays various system parameters and their settings. The top navigation bar includes tabs for Config 1, Config 2, G-Sensor, IButton, RFID, and Tracker. The main area is divided into several sections:

- MCU Version:** VSS20R18
- Ignition:** ON
- Input Voltage:** 11.9 V
- Frequency-In:** 0 Hz
- Analog-In Voltage:** 0.0 V
- Backup Battery Voltage:** 0.0 V
- Battery Temperature:** 0°C
- Battery Status:** Isn't Inserted
- Update** button
- WWAN:** WWAN: Enable, WWAN Wakeup: Disable
- GPS:** GPS: Enable
- SIM Card:** SIM Card: 1, SIM Card 1
- WDT:** WDT: Disable, Time out: 3 Sec
- MDI:** MDI1: Low, MDI2: Low
- MDO:** MDO2: Low
- Wi-Fi:** Wi-Fi: Enable
- VIOB-CAN-03:** Enable
- POE (BAT Mode):** POE: Power off
- Set** buttons for various sections
- Save** button at the bottom right
- DLL ver: 1.28** at the bottom left

### Config2



The Config2 screen displays advanced configuration options. The top navigation bar includes tabs for Config 1, Config 2, G-Sensor, IButton, RFID, and Tracker. The main area is divided into several sections:

- Low Battery Voltage Protection:** Voltage Level: 11.5V, 10.5V, 23.0V, 21.0V
- Power Input Type:** Power Type: 9~36V(default)
- Delay Time:** Delay Off: Disable, Delay On: Disable
- Wake Up Timer:** Alarm Timer: Hour: 0, Min: 0, Sec: 0
- RTC:** Time: Deable
- Low Voltage Status:** Once Enter Low Voltage Mode.
- Set** buttons for various sections
- Save** button at the bottom right
- DLL ver: 1.28** at the bottom left



## 1. Config1

### 1.1 MCU Version

Shows the MCU Version.  
If the Version is R18, VS520R18 is shown.

MCU Version : VS520R18

### 1.2 Ignition

Shows the Ignition Status.  
ON .....Signal of ignition is high.  
OFF .....Signal of ignition is low.

Ignition : ON

### 1.3 Input Voltage

Shows the Input Voltage.

Input Voltage : 11.9 V

### 1.4 Frequency-In

Shows the Frequency-In.

Frequency-In : 0 Hz

### 1.5 Analog-In Voltage

Shows the Analog-In Voltage.

Analog-In Voltage : 0.0 V

### 1.6 Backup Battery Voltage

Shows the Backup Battery Voltage.

Backup Battery Voltage : 0.0 V

### 1.7 Battery Temperature

Shows the Battery Temperature.

Battery Temperature : 0°C

### 1.8 Battery Status

Shows the Battery Status.

Battery Status : Isn't Inserted

### 1.9 WWAN

Enables or disables the WWAN/WWAN Wakeup function.  
The setting can also be cleared by the Set button.

WWAN

WWAN : Enable Enable ▾

WWAN Wakeup : Disable Enable ▾

Set

### 1.10 GPS

Enables or disables the GPS function.

GPS

GPS : Enable

Enable ▾

Set

### 1.11 SIM Card

Selects the SIM Card.

SIM Card

SIM Card : 1

SIM Card 1 ▾

Select SIM Card

### 1.12 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.

WDT

WDT : Disable Disable ▾

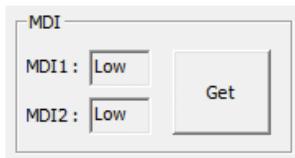
Set WDT

Time out : 3 Sec 3 ▾

Set WDT timeout

### 1.13 MDI

Sets the MDI1/MDI2 function.



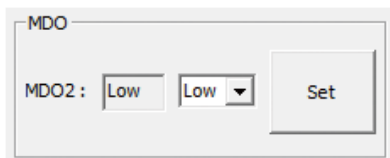
MDI

MDI1 :

MDI2 :

### 1.14 MDO

Sets the MDO function.

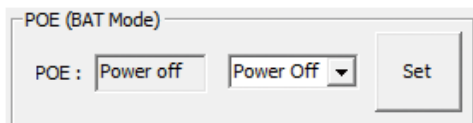


MDO

MDO2 :

### 1.15 POE

Sets the POE function.

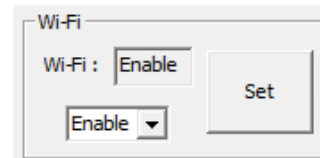


POE (BAT Mode)

POE :

### 1.16 Wi-Fi

Enables or disables the Wi-Fi function.

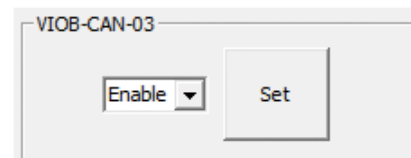


Wi-Fi

Wi-Fi :

### 1.17 VIOB-CAN-03

Enables or disables the VIOB-CAN-03 function.



VIOB-CAN-03

## 2. Config2

### 2.1 Low Battery Voltage Protection

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

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

### 2.2 Low Voltage Status

Selects the Low Voltage Status.

LowVoltage Status	
Once Enter Low Voltage Mode.	
Get	Clear

### 2.3 Power Input Type

Sets the Power Type. The default is 9 ~ 36V.

Power Input Type	
Power Type :	9~36V(default) 9 ~ 36V (default) Set

### 2.4 Delay Time

Enables or disables the delay time function. There are several selections of delay time.

Delay Time			
Delay Off :	Disable	Disable	Set
Power Off :	20 sec	20 Sec	
Delay On :	Disable	Disable	
Power On :	10 sec	10 Sec	

### 2.5 Wake Up Timer

Sets the Alarm wake up timer.

Wake Up Timer			
Alarm Timer :	Hour :	0	0
	Min :	0	0
	Sec :	0	0
			Set

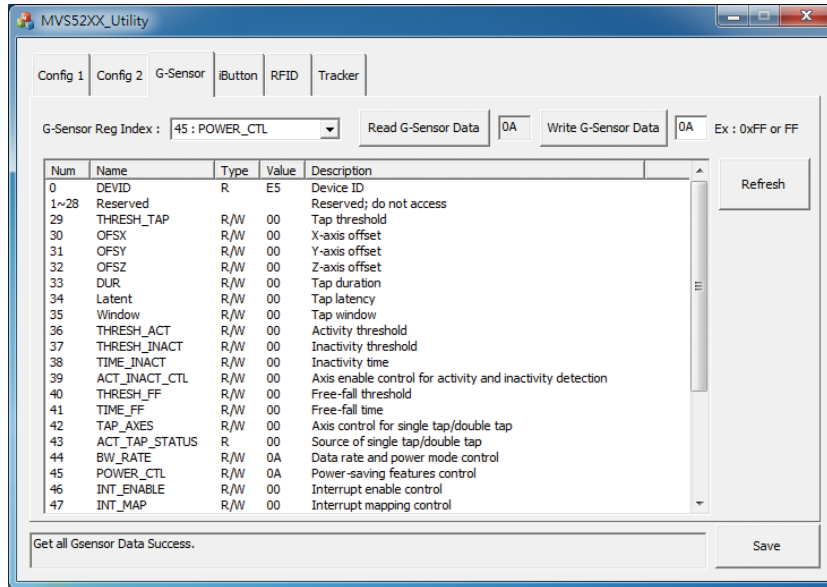
### 2.6 RTC

Enables or disables the RTC wake up function. The timer setting of RTC is located in the BIOS setting.

RTC			
Time :	Deiable	Disable	Set
Hour :	0	Min :	0
		Sec :	0
			Set

### 3. G-Sensor

Refer to the G-sensor utility screen to set up and save your request.



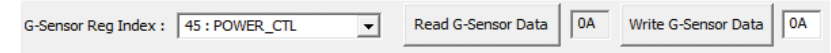
G-Sensor Reg Index : 45 : POWER\_CTL    Read G-Sensor Data    0A    Write G-Sensor Data    0A    Ex : 0xFF or FF

Num	Name	Type	Value	Description
0	DEVID	R	E5	Device ID
1~28	Reserved			Reserved; do not access
29	THRESH_TAP	R/W	00	Tap threshold
30	OFSX	R/W	00	X-axis offset
31	OFSY	R/W	00	Y-axis offset
32	OFSZ	R/W	00	Z-axis offset
33	DUR	R/W	00	Tap duration
34	Latent	R/W	00	Tap latency
35	Window	R/W	00	Tap window
36	THRESH_ACT	R/W	00	Activity threshold
37	THRESH_INACT	R/W	00	Inactivity threshold
38	TIME_INACT	R/W	00	Inactivity time
39	ACT_INACT_CTL	R/W	00	Axis enable control for activity and inactivity detection
40	THRESH_FF	R/W	00	Free-fall threshold
41	TIME_FF	R/W	00	Free-fall time
42	TAP_AXES	R/W	00	Axis control for single tap/double tap
43	ACT_TAP_STATUS	R	00	Source of single tap/double tap
44	BW_RATE	R/W	0A	Data rate and power mode control
45	POWER_CTL	R/W	0A	Power-saving features control
46	INT_ENABLE	R/W	00	Interrupt enable control
47	INT_MAP	R/W	00	Interrupt mapping control

Get all Gsensor Data Success.    Save

#### 3.1 G-Sensor Reg Index

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



G-Sensor Reg Index : 45 : POWER\_CTL    Read G-Sensor Data    0A    Write G-Sensor Data    0A

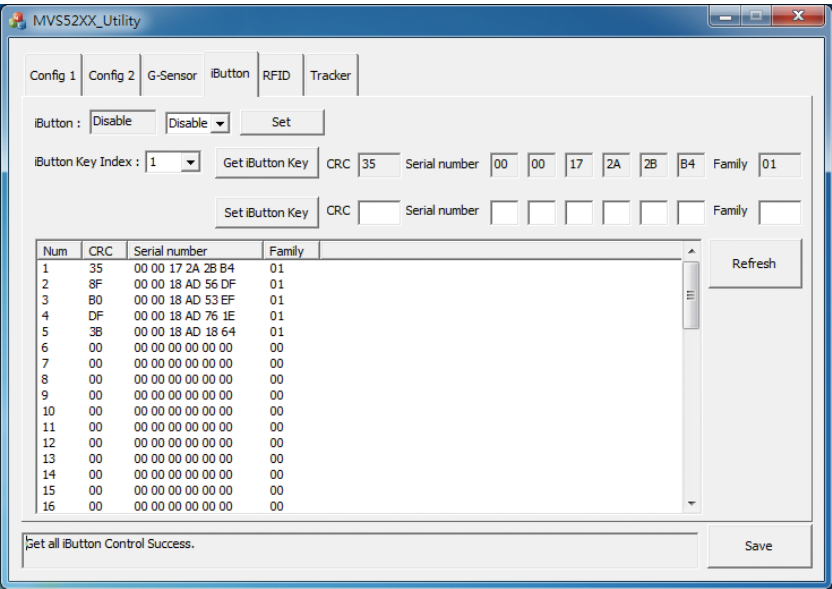
#### 3.2 Register Table

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

Num	Name	Type	Value	Description	Refresh
0	DEVID	R	E5	Device ID	
1~28	Reserved			Reserved; do not access	
29	THRESH_TAP	R/W	00	Tap threshold	
30	OFSX	R/W	00	X-axis offset	
31	OFSY	R/W	00	Y-axis offset	
32	OFSZ	R/W	00	Z-axis offset	
33	DUR	R/W	00	Tap duration	
34	Latent	R/W	00	Tap latency	
35	Window	R/W	00	Tap window	
36	THRESH_ACT	R/W	00	Activity threshold	
37	THRESH_INACT	R/W	00	Inactivity threshold	
38	TIME_INACT	R/W	00	Inactivity time	
39	ACT_INACT_CTL	R/W	00	Axis enable control for activity and inactivity detection	
40	THRESH_FF	R/W	00	Free-fall threshold	
41	TIME_FF	R/W	00	Free-fall time	
42	TAP_AXES	R/W	00	Axis control for single tap/double tap	
43	ACT_TAP_STATUS	R	00	Source of single tap/double tap	
44	BW_RATE	R/W	0A	Data rate and power mode control	
45	POWER_CTL	R/W	0A	Power-saving features control	
46	INT_ENABLE	R/W	00	Interrupt enable control	
47	INT_MAP	R/W	00	Interrupt mapping control	

## 4. iButton

Refer to the iButton utility screen to set up and save your request.



Num	CRC	Serial number	Family
1	35	00 00 17 2A 2B B4	01
2	8F	00 00 18 AD 56 DF	01
3	B0	00 00 18 AD 53 EF	01
4	DF	00 00 18 AD 76 1E	01
5	3B	00 00 18 AD 18 64	01
6	00	00 00 00 00 00 00	00
7	00	00 00 00 00 00 00	00
8	00	00 00 00 00 00 00	00
9	00	00 00 00 00 00 00	00
10	00	00 00 00 00 00 00	00
11	00	00 00 00 00 00 00	00
12	00	00 00 00 00 00 00	00
13	00	00 00 00 00 00 00	00
14	00	00 00 00 00 00 00	00
15	00	00 00 00 00 00 00	00
16	00	00 00 00 00 00 00	00

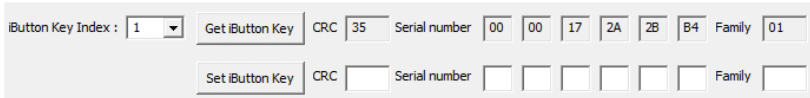
### 4.1 iButton

Enables or disables the iButton function.

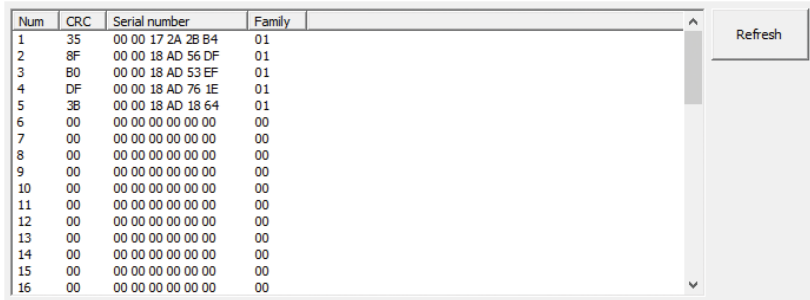


### 4.2 iButton Key Index

Retrieves or defines iButton Key Number by selecting iButton Key Index.



Num	CRC	Serial number	Family
1	35	00 00 17 2A 2B B4	01
2	8F	00 00 18 AD 56 DF	01
3	B0	00 00 18 AD 53 EF	01
4	DF	00 00 18 AD 76 1E	01
5	3B	00 00 18 AD 18 64	01
6	00	00 00 00 00 00 00	00
7	00	00 00 00 00 00 00	00
8	00	00 00 00 00 00 00	00
9	00	00 00 00 00 00 00	00
10	00	00 00 00 00 00 00	00
11	00	00 00 00 00 00 00	00
12	00	00 00 00 00 00 00	00
13	00	00 00 00 00 00 00	00
14	00	00 00 00 00 00 00	00
15	00	00 00 00 00 00 00	00
16	00	00 00 00 00 00 00	00

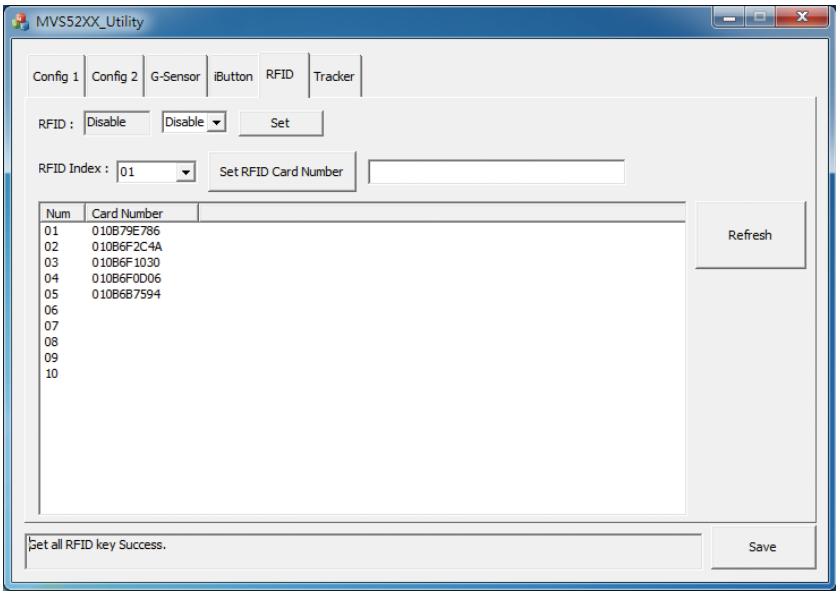


Num	CRC	Serial number	Family
1	35	00 00 17 2A 2B B4	01
2	8F	00 00 18 AD 56 DF	01
3	B0	00 00 18 AD 53 EF	01
4	DF	00 00 18 AD 76 1E	01
5	3B	00 00 18 AD 18 64	01
6	00	00 00 00 00 00 00	00
7	00	00 00 00 00 00 00	00
8	00	00 00 00 00 00 00	00
9	00	00 00 00 00 00 00	00
10	00	00 00 00 00 00 00	00
11	00	00 00 00 00 00 00	00
12	00	00 00 00 00 00 00	00
13	00	00 00 00 00 00 00	00
14	00	00 00 00 00 00 00	00
15	00	00 00 00 00 00 00	00
16	00	00 00 00 00 00 00	00

Once the iButton Key Numbers are defined, all the iButton Key Numbers will be shown by pressing Refresh Button.

## 5. RFID

Refer to the RFID utility screen to set up and save your request.



### 5.1 RFID

Enables or disables the RFID function. A total of 10 RFID cards can be registered.



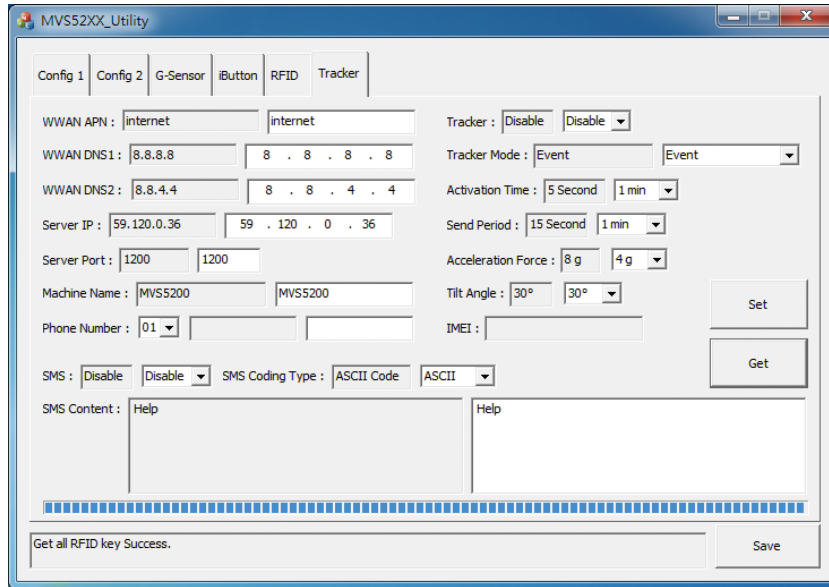
Select RFID Index Number and enter the ID number, then press Set RFID Card Number Button, the ID number will be registered.



Once the Refresh Button is pressed, all registered RFID ID numbers will be shown.

## 6. Tracker

Refer to the Tracker utility screen to set up and save your request.



MVS52XX\_Utility

Config 1 | Config 2 | G-Sensor | iButton | RFID | Tracker

WWAN APN : internet internet

WWAN DNS1 : 8.8.8.8 8 . 8 . 8 . 8

WWAN DNS2 : 8.8.4.4 8 . 8 . 4 . 4

Server IP : 59.120.0.36 59 . 120 . 0 . 36

Server Port : 1200 1200

Machine Name : MVS5200 MVS5200

Phone Number : 01

SMS : Disable Disable SMS Coding Type : ASCII Code ASCII

SMS Content : Help Help

Tracker : Disable Disable

Tracker Mode : Event Event

Activation Time : 5 Second 1 min

Send Period : 15 Second 1 min

Acceleration Force : 8 g 4 g

Tilt Angle : 30° 30°

IMEI :

Set

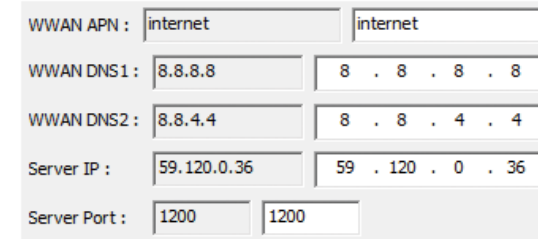
Get

Get all RFID key Success.

Save

### 6.1 Network Settings

Configures the network settings for the server.



WWAN APN : internet internet

WWAN DNS1 : 8.8.8.8 8 . 8 . 8 . 8

WWAN DNS2 : 8.8.4.4 8 . 8 . 4 . 4

Server IP : 59.120.0.36 59 . 120 . 0 . 36

Server Port : 1200 1200

**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)

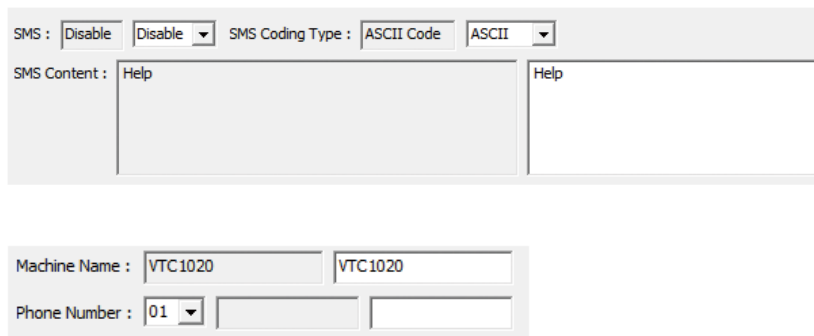
**Server IP:** 59.120.0.36 (default). It can be adjusted based on users' situation.

**Server Port:** 1200 (default). It can be adjusted based on users' situation.



## 6.2 SMS and Phone Number

Configures the SMS content and phone numbers for delivering SMS message.



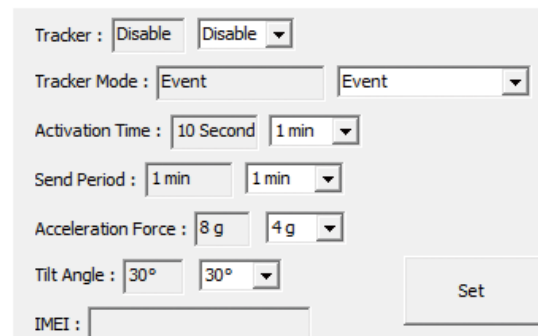
The interface shows the following fields and controls:

- SMS :** A button labeled "Disable" and a dropdown menu currently showing "Disable".
- SMS Coding Type :** A button labeled "ASCII Code" and a dropdown menu currently showing "ASCII".
- SMS Content :** A large text area containing the word "Help".
- Machine Name :** Two input fields, both containing "VTC1020".
- Phone Number :** A dropdown menu showing "01" followed by two empty input fields.

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.

## 6.3 Tracker Settings

Configures settings for the tracker.



The interface shows the following fields and controls:

- Tracker :** A button labeled "Disable" and a dropdown menu currently showing "Disable".
- Tracker Mode :** Two dropdown menus, both showing "Event".
- Activation Time :** Two dropdown menus, the first showing "10 Second" and the second showing "1 min".
- Send Period :** Two dropdown menus, both showing "1 min".
- Acceleration Force :** Two dropdown menus, the first showing "8 g" and the second showing "4 g".
- Tilt Angle :** Two dropdown menus, both showing "30°".
- IMEI :** An empty input field.
- Set :** A button to save the settings.

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.

# 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

**COM Port for GPS: COM 4**

**Baud Rate: 9600**

### Features

<b>Receiver type</b>	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)		
<b>Nav. update rate<sup>1</sup></b>	Single GNSS: up to 18 Hz Concurrent GNSS: up to 10 Hz		
<b>Position accuracy</b>	2.0 m CEP		
		NEO-M8N/Q	NEO-M8M
<b>Acquisition</b>	Cold starts:	26 s	27 s
	Aided starts:	2 s	4 s
	Reacquisition:	1 s	1 s
<b>Sensitivity</b>	Tracking & Nav:	–167 dBm	–164 dBm
	Cold starts:	–148 dBm	–147 dBm
	Hot starts:	–156 dBm	–156 dBm
<b>Assistance</b>	AssistNow GNSS Online AssistNow GNSS Offline (up to 35 days) AssistNow Autonomous (up to 6 days) OMA SUPL & 3GPP compliant		
<b>Oscillator</b>	TCXO (NEO-M8N/Q), Crystal (NEO-M8M)		
<b>RTC crystal</b>	Built-in		
<b>Noise figure</b>	On-chip LNA (NEO-M8M). Extra LNA for lowest noise figure (NEO-M8N/Q)		

## Features cont.

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

<sup>1</sup> For NEO-M8M/Q

## Electrical data

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

<sup>2</sup> NEO-M8M

## Interfaces

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

## Package

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

Pinout

13	GND	GND	12
14	ANT_ON/Reserved	RF_IN	11
15	Reserved	GND	10
16	Reserved	VCC_RF	9
17	Reserved	RESET_N	8
<b>NEO-M8 Top View</b>			
18	SDA	VDD_USB	7
19	SCL	USB_DP	6
20	TxD	USB_DM	5
21	RxD	EXTINT	4
22	V_BCKP	TIMEPULSE	3
23	VCC	D_SEL	2
24	GND	Reserved	1

## Environmental data, quality & reliability

<b>Operating temp.</b>	−40° C to 85° C
<b>Storage temp.</b>	−40° C to 85° C (NEO-M8N/Q) −40° C to 105° C (NEO-M8M)

**RoHS compliant (lead-free)**

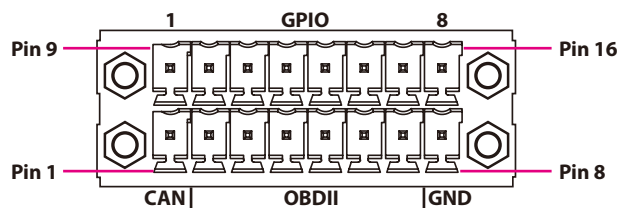
**Qualification according to ISO 16750**

**Manufactured and fully tested in ISO/TS 16949 certified production sites**

**Uses u-blox M8 chips qualified according to AEC-Q100**

# APPENDIX C: SIGNAL CONNECTION OF DI/DO

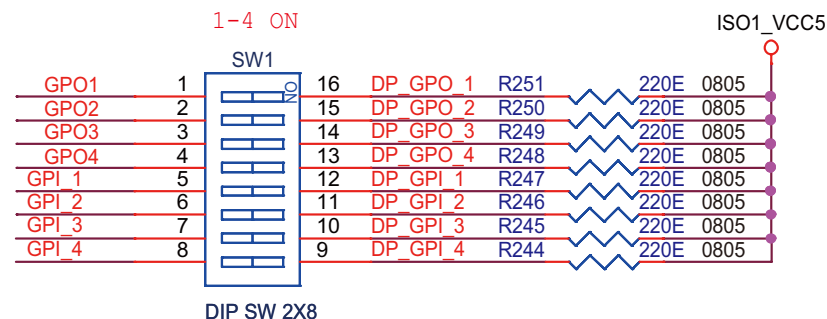
## GPIO Pinout Description



Pin	Definition
9	GPIO1 (Default: GPI1)
10	GPIO2 (Default: GPI2)
11	GPIO3 (Default: GPI3)
12	GPIO4 (Default: GPI4)
13	GPIO5 (Default: GPO1)
14	GPIO6 (Default: GPO2)
15	GPIO7 (Default: GPO3)
16	GPIO8 (Default: GPO4)

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

## SW1 Setting



GPIO (SW1)	
On	Pull up VCC5
Off	Don't Care

Default Settings:

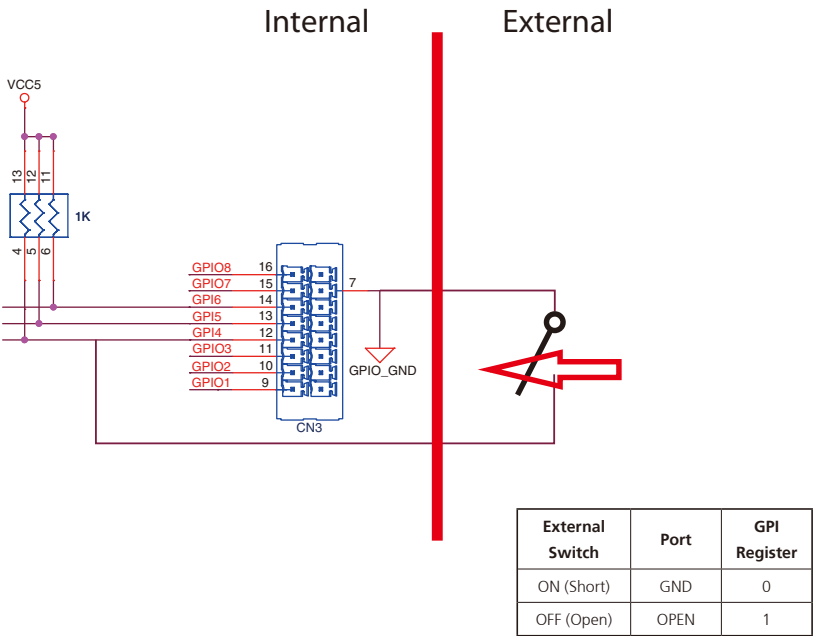
GPIO (SW1)	
SW1.1~SW1.8	Pull up VCC5

# Digital Input

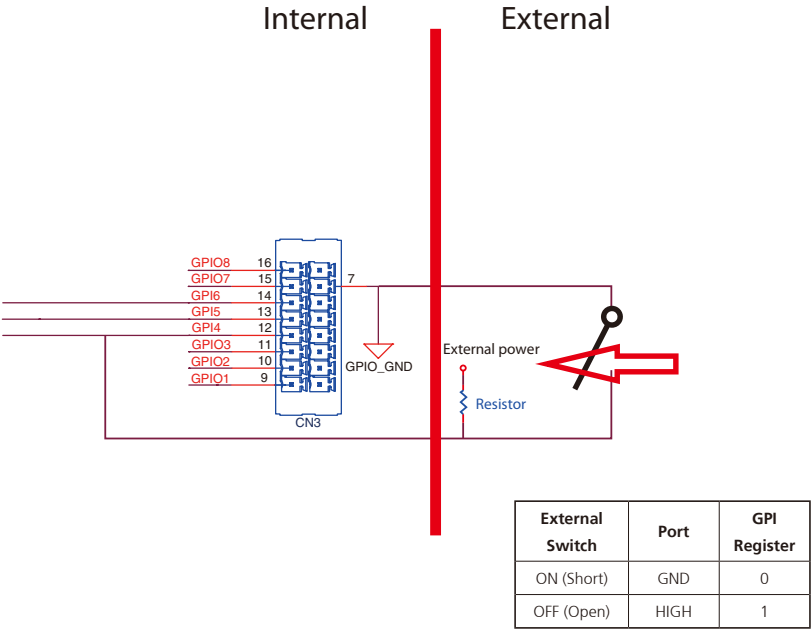
CN3 connector for GPI signal (digital signal input)  
The CN3 has 4 digital input channels by default.

Wet Contact (default)  
The GPI signals have a pull up resistor to 5V internally.

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



Dry Contact:



## Digital Output

CN3 connector for GPO signal (digital signal output)

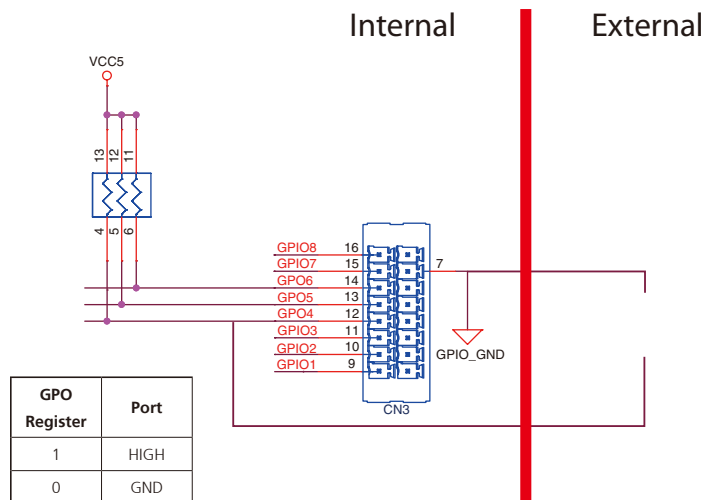
The CN3 connector has 4 digital output channels by default. The signal connection of CN3 support two connected methods for output signal type.

The output signal has two states, one is low level (driven to 0V from GPO signal) other is open (high voltage is provided from external device).

Wet Contact (default)

The SW1 needs to switch to "ON" state. The GPO signal will have a pull up resistor to 5V internally when you switch "SW1" to "ON" state. The output signal has two states, one is low level (driven to 0V from GPO signal) other is high level (driven to 5V from GPO signal).

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

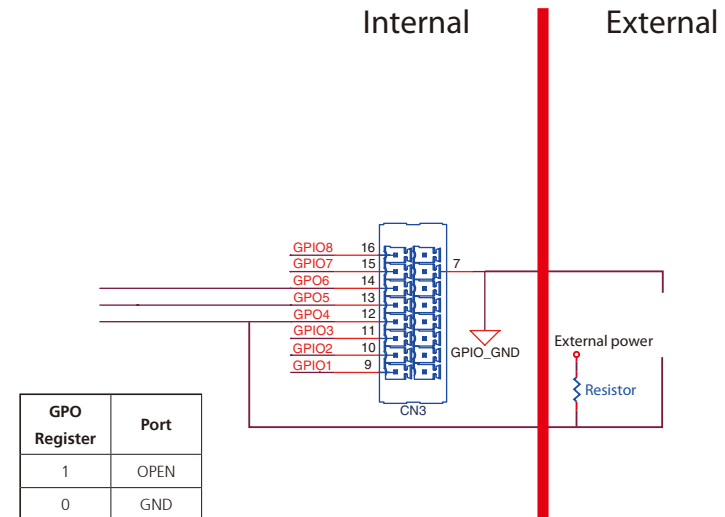


Dry Contact

Each channel can accept 3~24Vdc voltage. And it is able to drive 150mA current for low level.

The SW1 needs to switch to "OFF" state. The GPO 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 input source to one of the output channel.



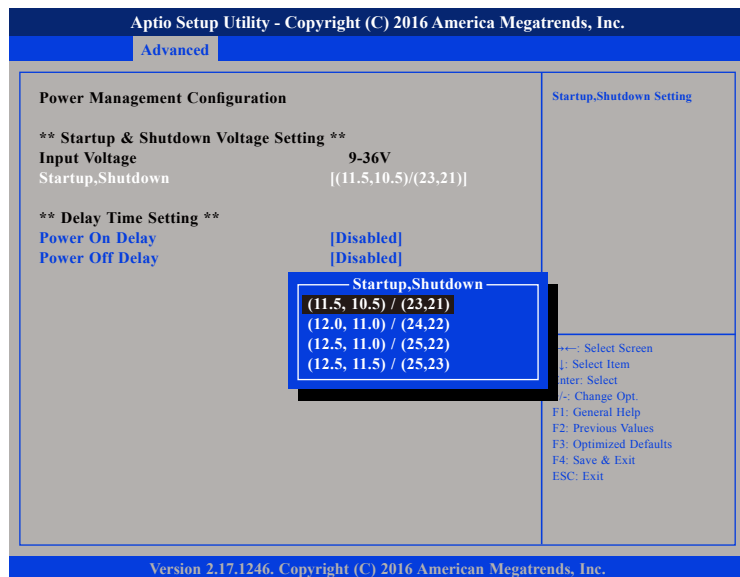
# APPENDIX D: VEHICLE POWER MANAGEMENT SETUP

## 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: set the startup voltage to 11.5V and the shutdown voltage to 10.5V.

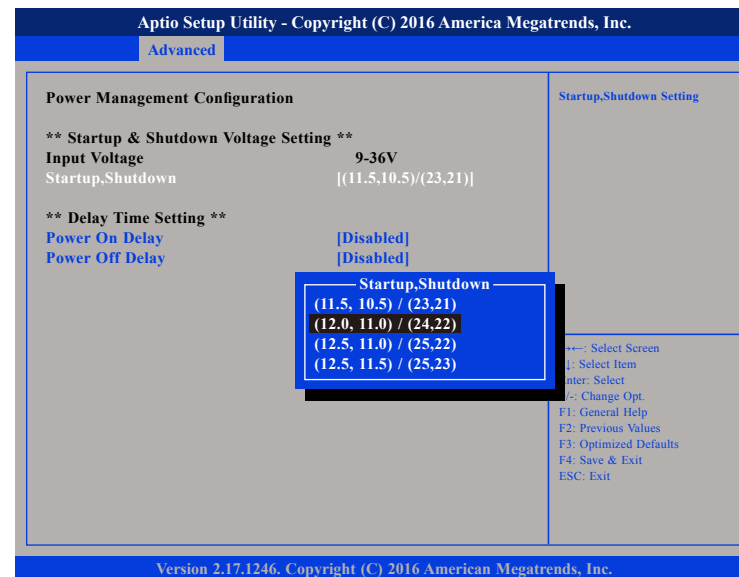
If the input voltage is 24V: set the startup voltage to 23V and the shutdown voltage to 21V.



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

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

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

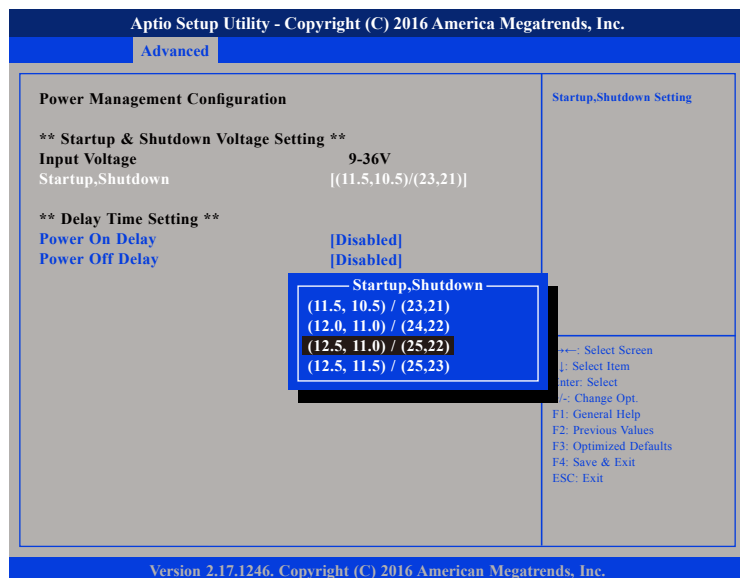




### Set the startup voltage to 12.5V or 25V and the shutdown voltage to 11.0V or 22V

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

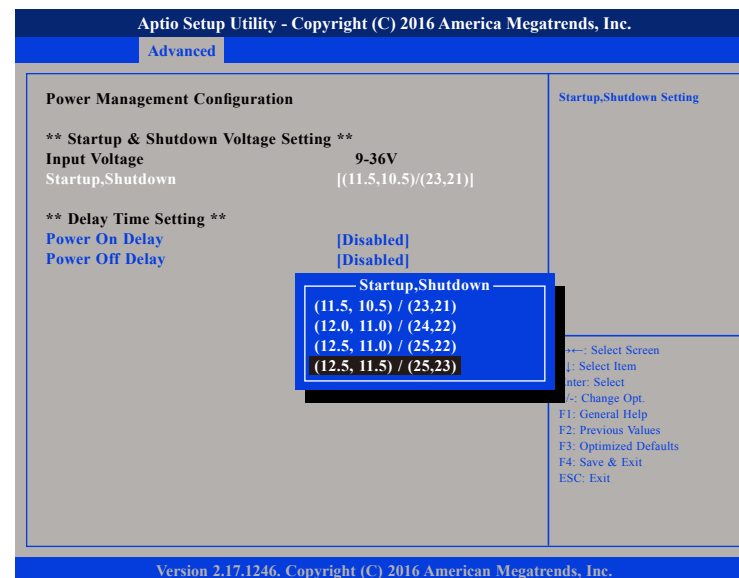
If the input voltage is 24V: set the startup voltage to 25V and the shutdown voltage to 22V.



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

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

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





# Power-on Delay Setting

## Disable Power-on Delay

Aptio Setup Utility - Copyright (C) 2016 America Megatrends, Inc.

Advanced

Power Management Configuration

\*\* Startup & Shutdown Voltage Setting \*\*

Input Voltage9-36V

Startup,Shutdown[(11.5,10.5)/(23,21)]

\*\* Delay Time Setting \*\*

Power On Delay[Disabled]

Power Off Delay[Disabled]

Power On Delay Setting

→←: Select Screen

↑↓: Select Item

Enter: Select

+/-: Change Opt.

F1: General Help

F2: Previous Values

F3: Optimized Defaults

F4: Save & Exit

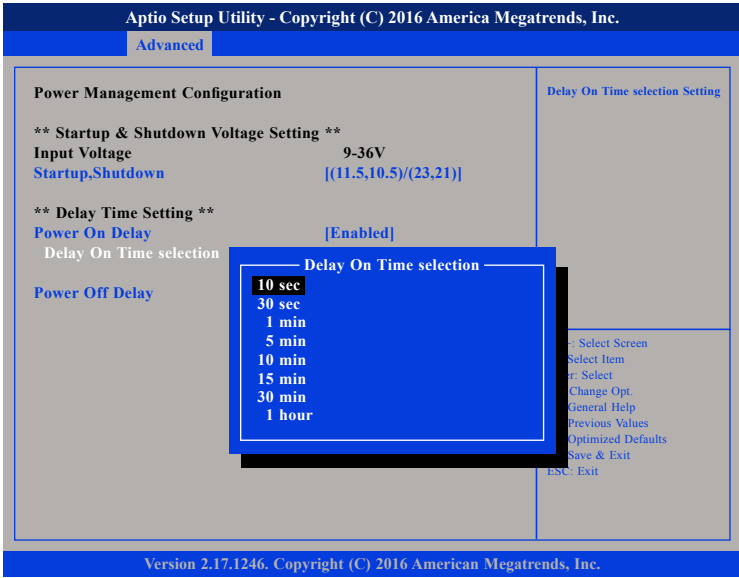
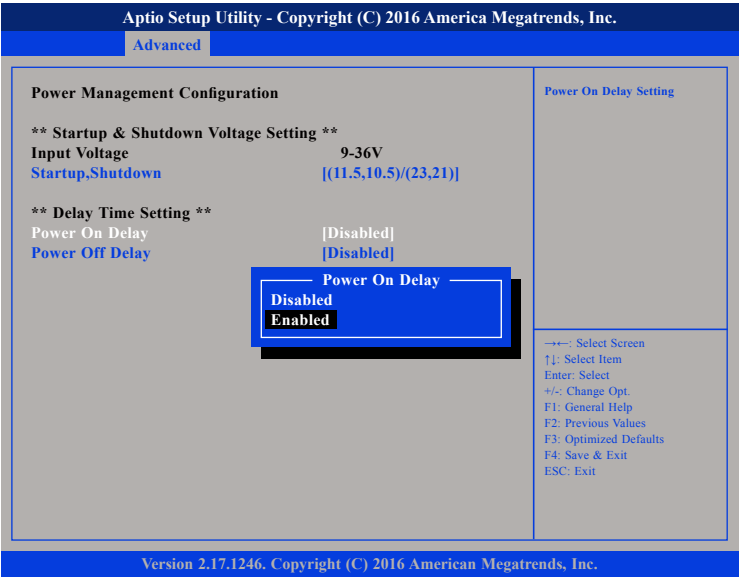
ESC: Exit

Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.



Enable Power-on Delay

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





# Power-off Delay Setting

## Disable Power-off Delay

Aptio Setup Utility - Copyright (C) 2016 America Megatrends, Inc.

Advanced

Power Management Configuration

\*\* Startup & Shutdown Voltage Setting \*\*

Input Voltage9-36V

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

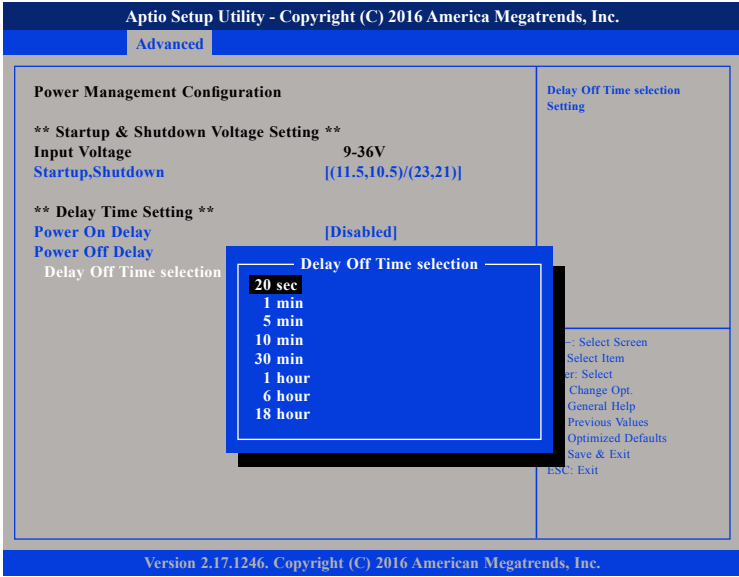
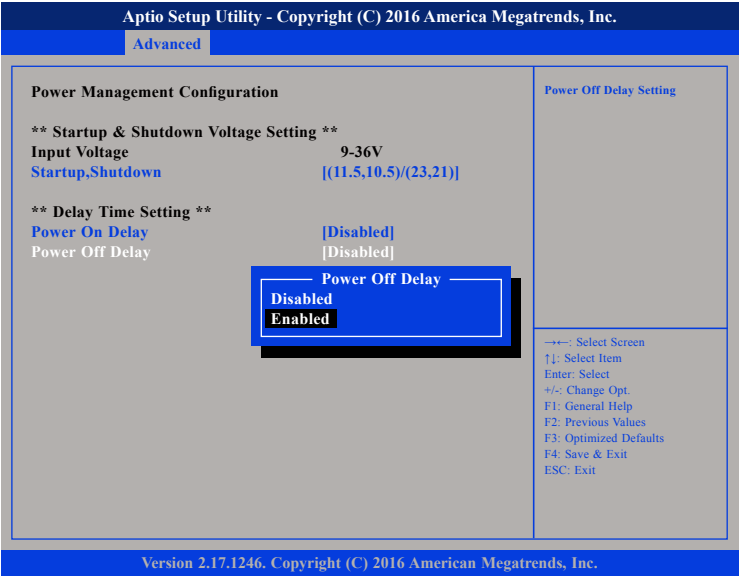
ESC: Exit

Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.



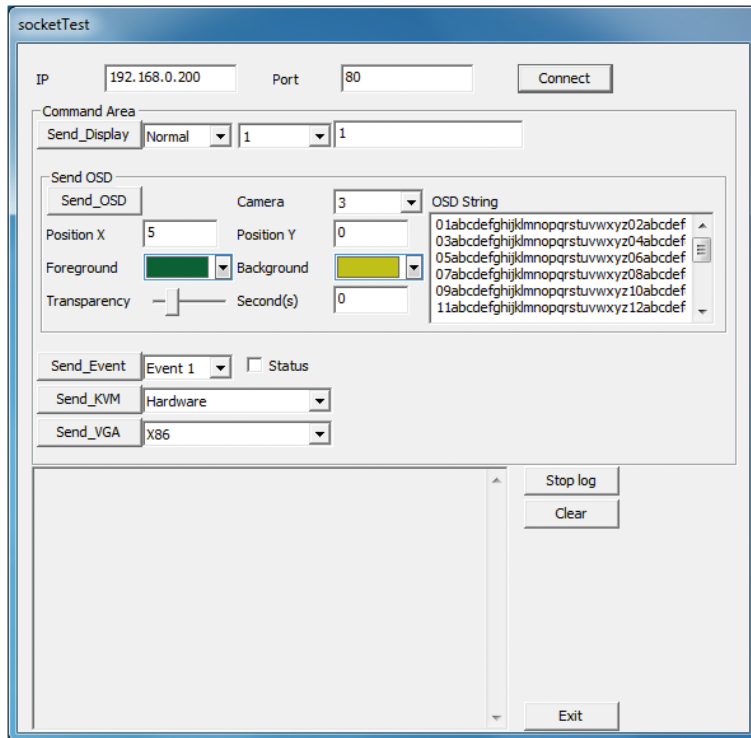
Enable Power-off Delay

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

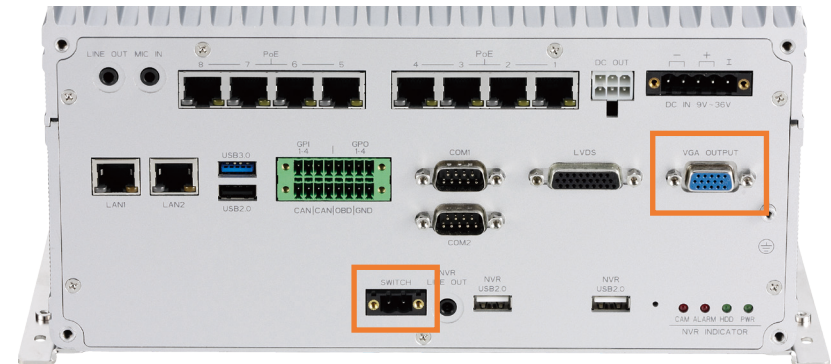


# APPENDIX E: PC-NVR COMMUNICATION TOOL (UTILITY)

## PC-NVR Communication Tool



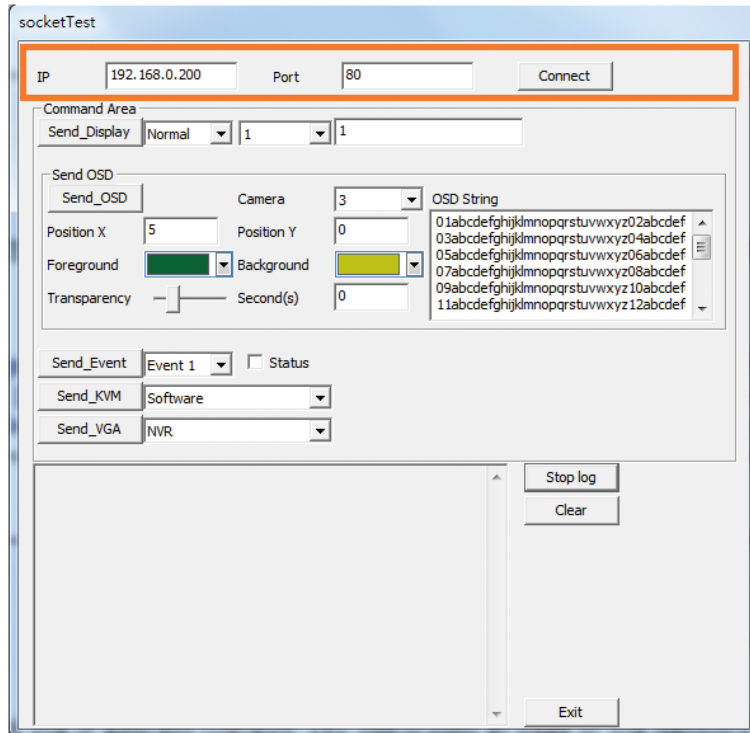
## Port for External Switch, PC VGA Output



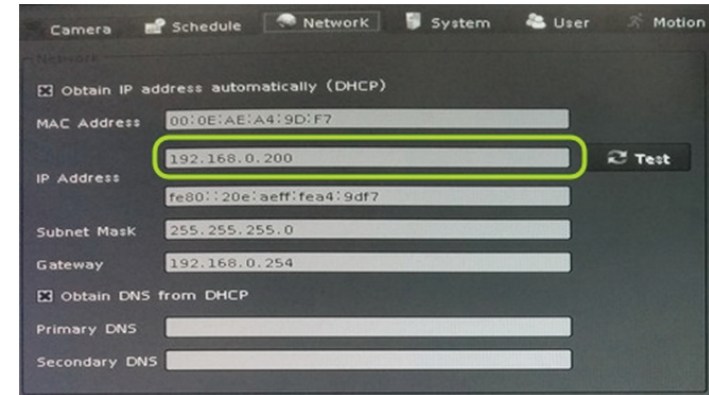
## VGA Input Port & NVR VGA Output Port



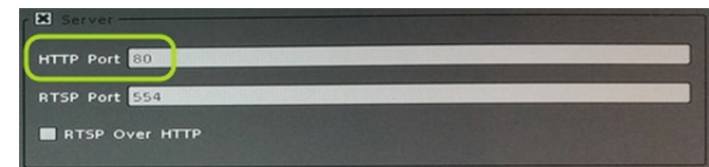
## IP Settings



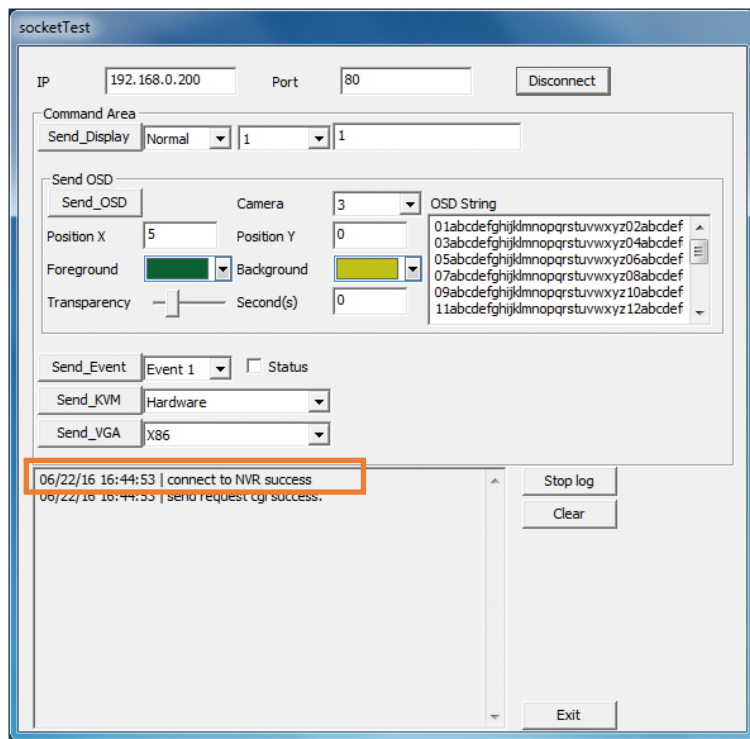
1. Check the IP address (Default: 192.168.0.200) on the Network settings page in NVR, and make sure the IP address is in the same subnet as the PC.



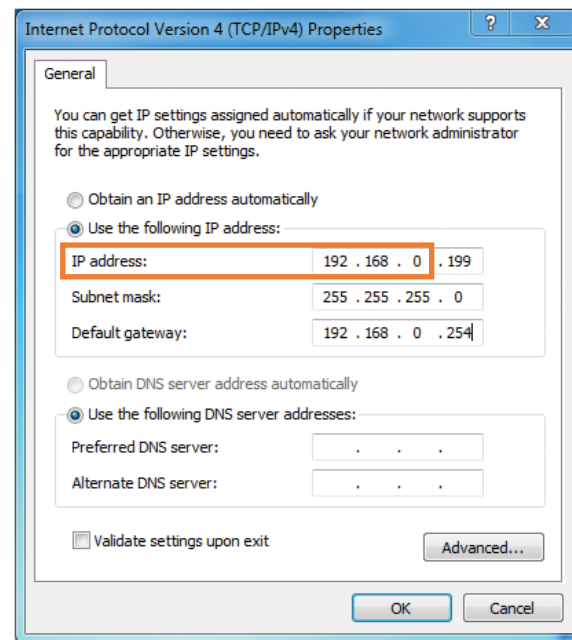
2. Check the HTTP Port (Default: 80) on the Network settings page in NVR, make the port number is same as the HTTP port number.



3. Press the **Connect** button. When connected successfully, the message "connect to NVR success" will be shown in the Log Screen.

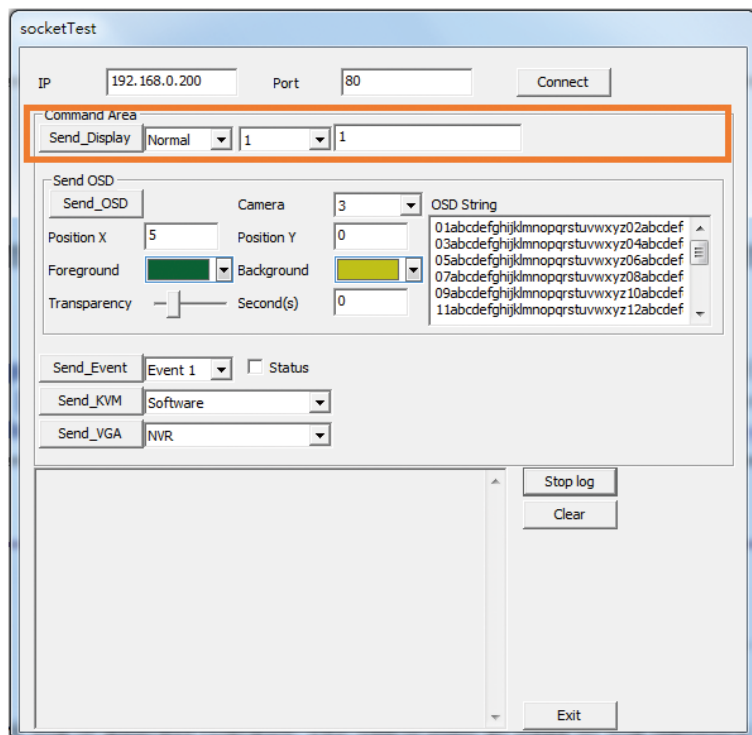


Note: The IP address of the PC must be in the same network segment as the NVR in order to establish a connection.

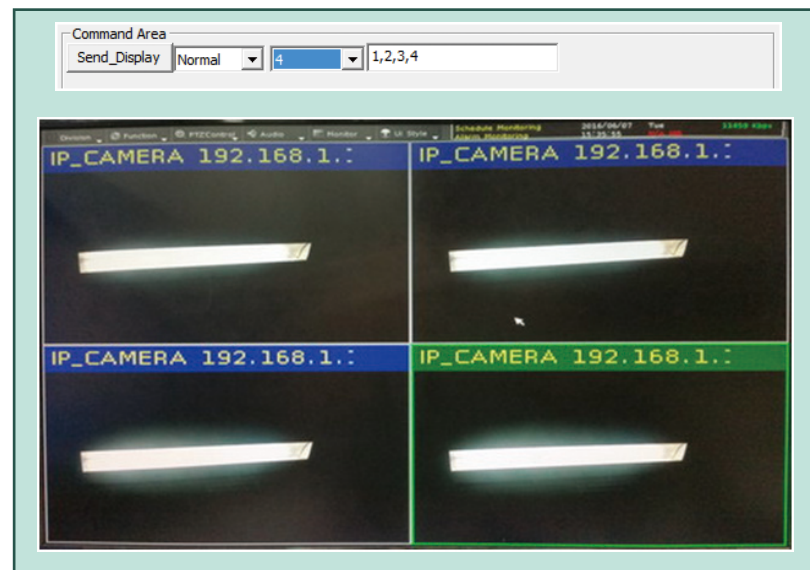




## Display Mode

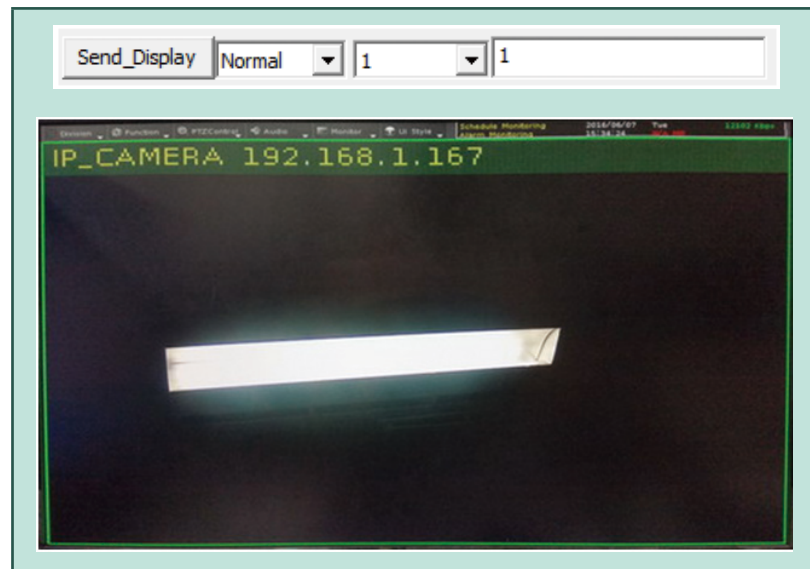
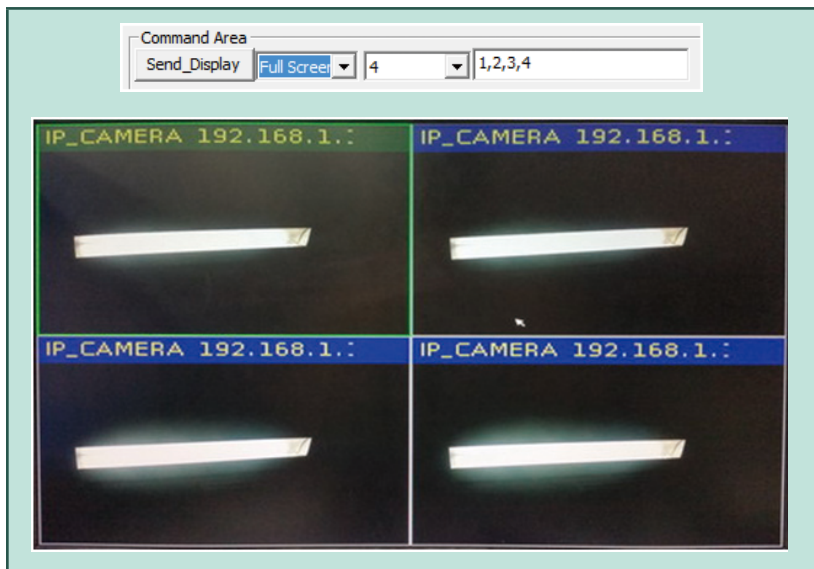


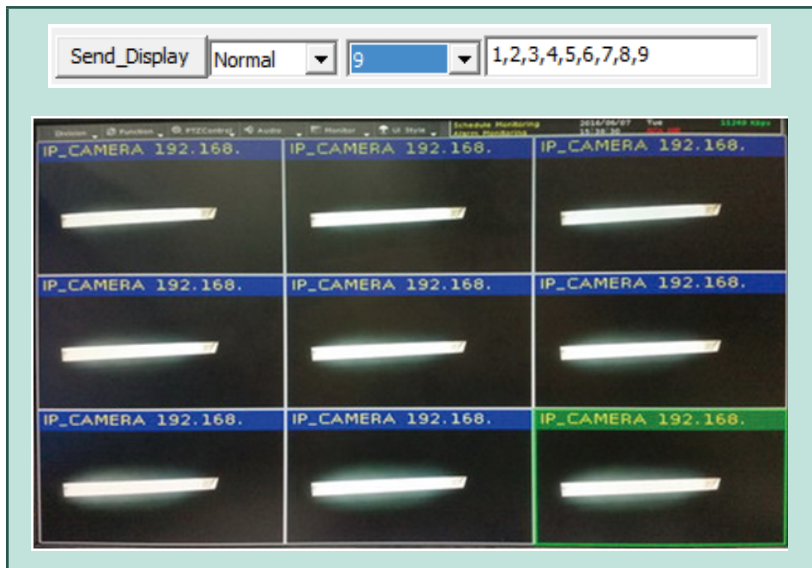
## (Example)



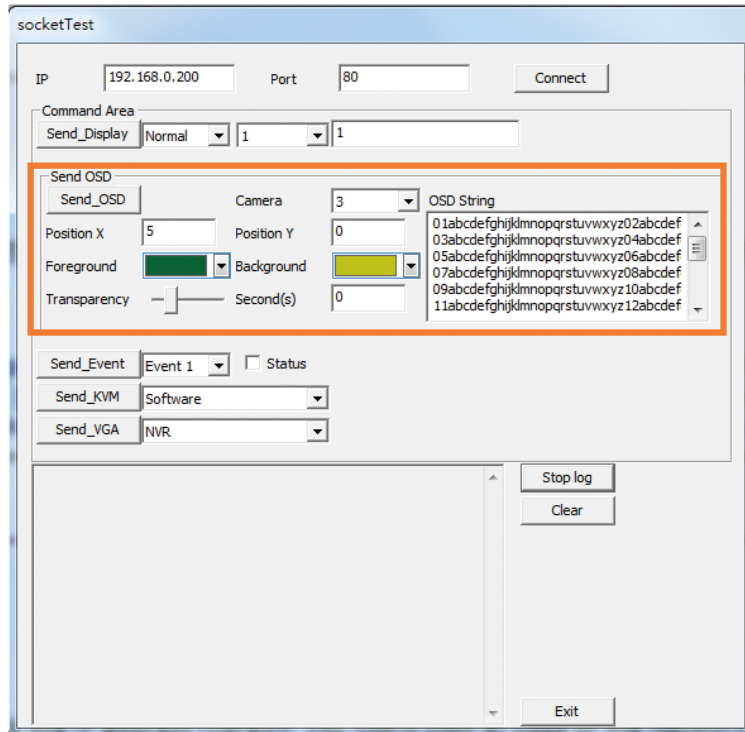
The **Send\_Display** option is used to configure the screen layout and division.

- Normal:** The row of System Function is shown.  
**Full Screen:** The row of System Function is hidden.  
**Division:** Support 1, 4 and 9 screen divisions.



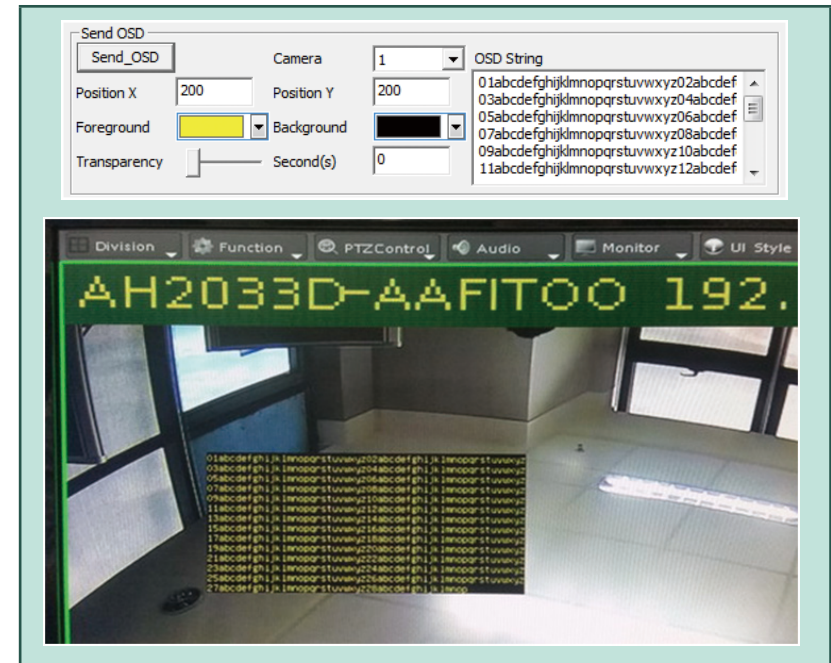


## OSD Function



- Camera:** Select which camera the message will be shown on.
- Position X:** Define the position of X-Axis for the message.
- Position Y:** Define the position of Y-Axis for the message.
- Foreground:** Define the word color of the message.
- Background:** Define the background color of the message.

- Transparency:** Define the transparency level of the background color.
- Second(s):** Define how long the message is shown. If "0" is specified, the message will be shown constantly.
- OSD String:** Define the text message. Maximum of 300 characters.



Note: This function is only supported on AMTK IP cameras.  
(<http://www.a-mtk.com/>)

## Event

There are 5 different events that can be defined.



### (In NVR)

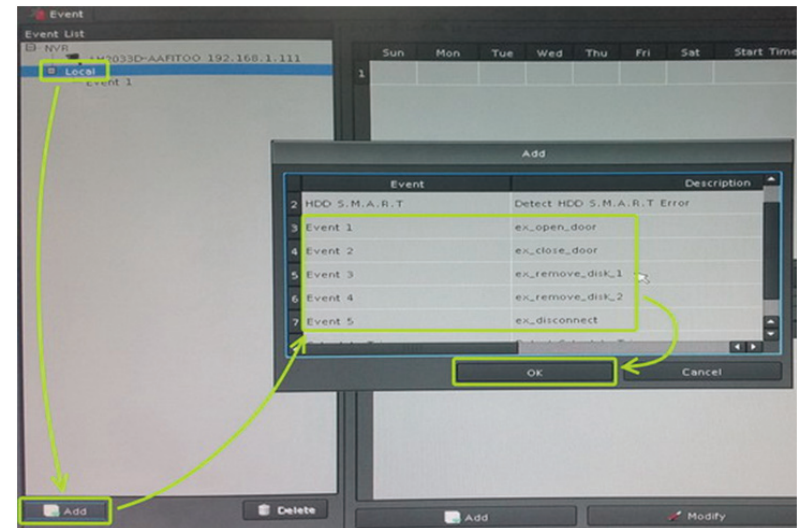
1. Define the type of Event.

Press **Function** and select **Event Setting**.



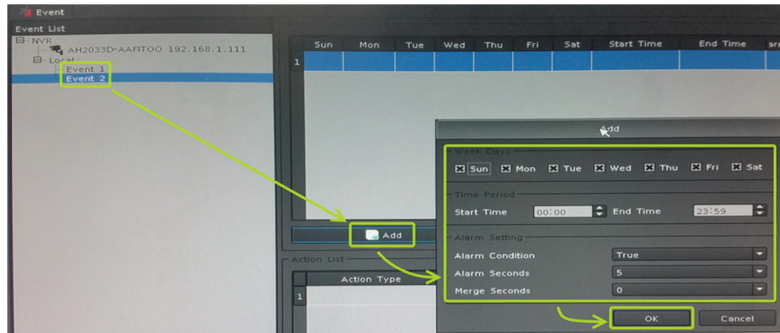
2. Press **Local** and select **Add**, then choose one of the events from Event 1~5. Press **OK**.

Example: Event 2 is selected.

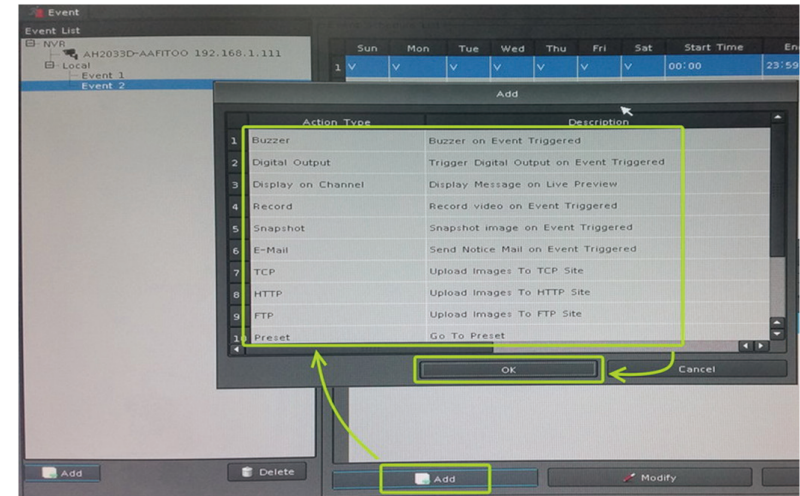




3. Define the time period of the event. Press **Event 2** to select Event 2, then press **Add**. Fill in the **Start Time** and **End Time**, then define the **Alarm Setting** function. Press **OK**.



4. Press **Add** for defining the action type of triggering alarm for Event 2. Press **OK**.





After Event 2 is defined, the **Action Types** will be shown.

	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Start Time	End Time	arm	Tr	rm	Secor
1	✓	✓	✓	✓	✓	✓	✓	00:00	23:59	1		5	
2													

Add

Modify

Delete

Action List

	Action Type	Description
1	Display on Channel	C001.
2	Buzzer	
3	Record	C001.C002.C003.
4		

Add

Modify

Delete

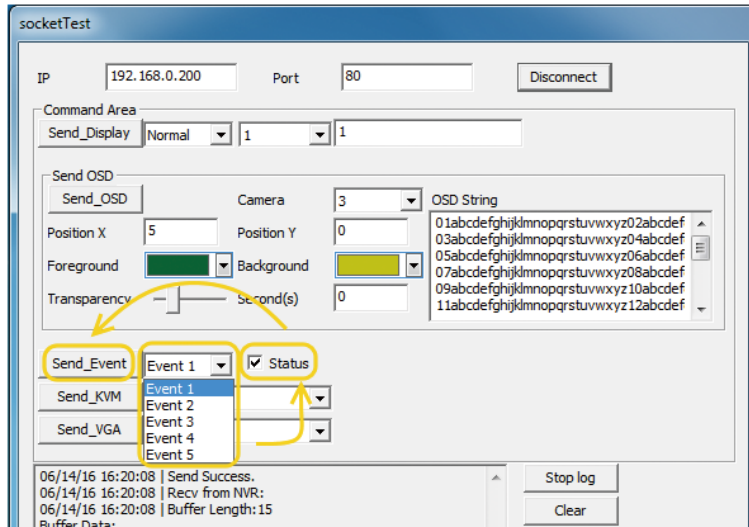
OK

Cancel

## (In PC-NVR Communication Tool)

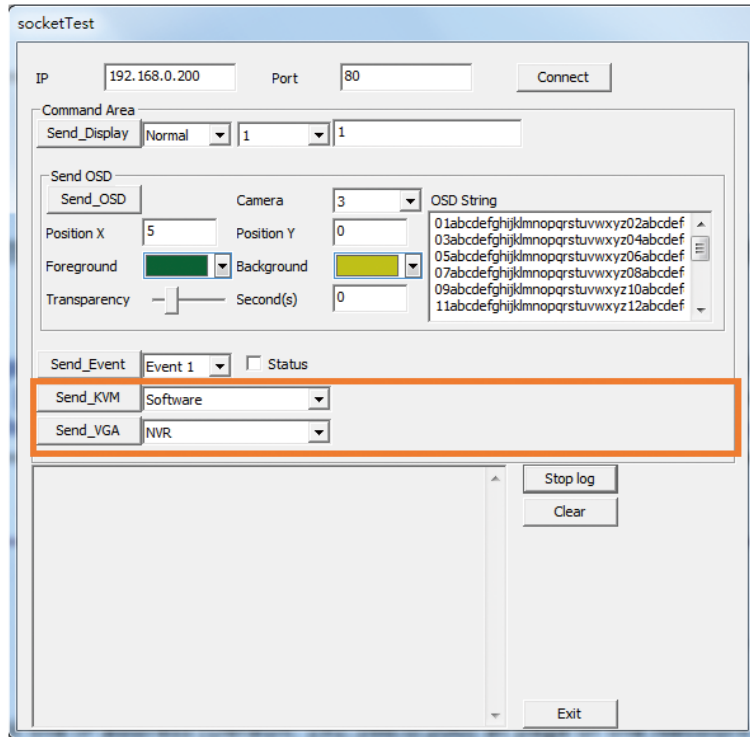
Select the event that was already defined in NVR. Enable **Status**. Press **Send\_Event**.

For example, if Event 2 is selected, the message “Event 2” will be shown on the division that you defined in the **Display on Channel** function.





## KVM



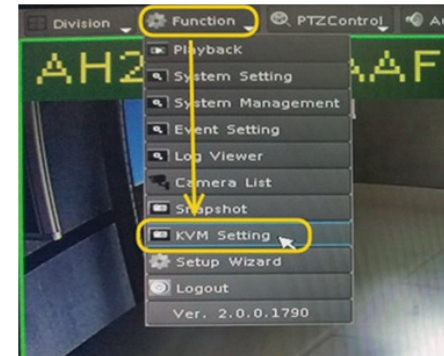
The VGA port on NVR can have PC VGA output or NVR VGA output (default setting). They can be switched by hardware setting (external switch) or software setting.

Note: KVM function can only be used when PC VGA Output port is connected with VGA Input port.

## Selecting Hardware/Software Setting

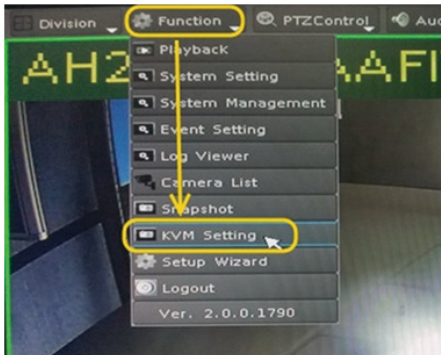
### (Enable Hardware Setting in NVR)

Press **Function**, select **KVM Setting**. Enable **Manual**. PC VGA output or NVR VGA output can then be selected by external switch.



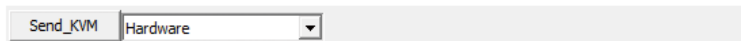
### (Enable Software Setting in NVR)

Press **Function**, select **KVM Setting**. Enable **Software control** and press **Switch**. PC VGA output or NVR VGA output can then be selected by software.



### (Enable Hardware Setting in PC-NVR Communication Tool)

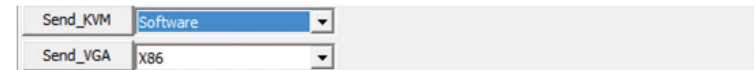
Select **Hardware** and press **Send\_KVM**. PC VGA output or NVR VGA output can then be selected by external switch.



### (Enable Software Setting in PC-NVR Communication Tool)

Select **Software** and press **Send\_KVM**. PC VGA output or NVR VGA output can then be selected by software.

If "X86" is selected and **Send\_VGA** is pressed, the VGA output is from PC. If "NVR" is selected and **Send\_VGA** is pressed, the VGA output is from NVR.



Note: **Send\_VGA** function can only be implemented when **Software** is selected.

## Log



**Stop log:** Stop showing log message.  
**Clear:** Clear all log messages.

