

SPC-3000/3500 USER Manual

Intel® Core™ i7/i5/i3 SoC (Skylake-U) Ultra-Compact Fanless
Embedded System, 4 GigE LAN, 4 USB 3.0, 9 COM, SUMIT, -40°C to 85°C

Record of Revision

Version	Date	Page	Description	Remark
0.1	08/10/2016	All	Preliminary Release	
1.0	10/21/2016	All	Official Release	
1.1	07/20/2017	96-97	Update	
1.2	10/02/2017	90-91	Update	
1.3	03/22/2021	3, 5, 6, 8, 10, 12, 18, 24, 31, 38, 44, 52, 76	Update	
1.4	09/01/2021	iv, 10, 12	Update	
1.5	07/04/2022	139-141	Update	
1.6	05/30/2023	15, 94, 127, 133	Update	

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Order Information

Part Number	Description
SPC-3010-600U	SPC-3000, onboard Intel® Core™ i7-6600U, 2 GigE LAN, 1 SSD, 4 USB 3.0, 2 COM, 1 SIM
SPC-3010-300U	SPC-3000, onboard Intel® Core™ i5-6300U, 2 GigE LAN, 1 SSD, 4 USB 3.0, 2 COM, 1 SIM
SPC-3010-955U	SPC-3000, onboard Intel® Celeron® 3955U, 2 GigE LAN, 1 SSD, 4 USB 3.0, 2 COM, 1 SIM
SPC-3020-600U	SPC-3000, onboard Intel® Core™ i7-6600U, 4 GigE LAN, 1 SSD, 4 USB 3.0, 5 COM, 1 SIM, 16 Isolated DIO
SPC-3020-300U	SPC-3000, onboard Intel® Core™ i5-6300U, 4 GigE LAN, 1 SSD, 4 USB 3.0, 5 COM, 1 SIM, 16 Isolated DIO
SPC-3020-955U	SPC-3000, onboard Intel® Celeron® 3955U, 4 GigE LAN, 1 SSD, 4 USB 3.0, 5 COM, 1 SIM, 16 Isolated DIO
SPC-3030-600U	SPC-3000, onboard Intel® Core™ i7-6600U, 4 GigE LAN, 2 SSD, 4 USB 3.0, 9 COM, 1 SIM, 16 Isolated DIO
SPC-3510-600U	SPC-3500, onboard Intel® Core™ i7-6600U, 2 GigE LAN, 1 SSD, 4 USB 3.0, 2 COM, 1 SIM
SPC-3510-300U	SPC-3500, onboard Intel® Core™ i5-6300U, 2 GigE LAN, 1 SSD, 4 USB 3.0, 2 COM, 1 SIM
SPC-3510-955U	SPC-3500, onboard Intel® Celeron® 3955U, 2 GigE LAN, 1 SSD, 4 USB 3.0, 2 COM, 1 SIM
SPC-3520-600U	SPC-3500, onboard Intel® Core™ i7-6600U, 4 GigE LAN, 1 SSD, 4 USB 3.0, 5 COM, 1 SIM, 16 Isolated DIO
SPC-3520-300U	SPC-3500, onboard Intel® Core™ i5-6300U, 4 GigE LAN, 1 SSD, 4 USB 3.0, 5 COM, 1 SIM, 16 Isolated DIO
SPC-3520-955U	SPC-3500, onboard Intel® Celeron® 3955U, 4 GigE LAN, 1 SSD, 4 USB 3.0, 5 COM, 1 SIM, 16 Isolated DIO
SPC-3530-600U	SPC-3500, onboard Intel® Core™ i7-6600U, 4 GigE LAN, 2 SSD, 4 USB 3.0, 9 COM, 16 Isolated DIO

Order Accessories

Part Number	Description
DDR4 16G	Certified DDR4 16GB 2133MHz RAM
DDR4 8G	Certified DDR4 8GB 2133MHz RAM
DDR4 4G	Certified DDR4 4GB 2133MHz RAM
PWA-120W	120W, 24V, 90V AC to 264V AC Power Adapter with 3-pin Terminal Block
PWA-160W-WT	160W, 24V, 85V AC to 264V AC Power Adaptor with 3-pin Terminal Block, Wide Temperature -30°C to +70°C
TMK2-20P-100	Terminal Block 20-pin to Terminal Block 20-pin Cable, 100cm
TMK2-20P-500	Terminal Block 20-pin to Terminal Block 20-pin Cable, 500cm
TMB-TMBK-20P	Terminal Board with One 20-pin Terminal Block Connector and DIN-Rail Mounting
VESA Mount	VESA Mounting Kit
DIN-RAIL	DIN Rail Kit
Rack Mount	1U Rackmount/ 2U Rackmount
3G Module	Mini PCIe 3G/GPS Module with Antenna
4G Module	Mini PCIe 4G/GPS Module with Antenna
WiFi & Bluetooth Module	Mini PCIe WiFi & Bluetooth Module with Antenna

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1

GENERAL INTRODUCTION

1.1 Overview

SPC-3000/3500 is a series of rugged Ultra-compact Fanless Embedded Box PC. Powered by 6th generation Intel® Core™ i7/i5/i3 processor (Skylake-U), dual channel DDR4 2133MHz up to 16GB memory, SPC-3000/3500 serves up to 10% CPU performance enhances than the former generation Intel® SoC solution with lower CPU power consumption; Advanced Intel® HD Graphics 520 graphics engine supports DirectX 12, OpenGL 4.4 and OpenCL 2.0 API, DVI-I and DisplayPort interfaces support up to ultra HD 4K resolution, SPC-3000/3500 offers up to 34% improved graphics performance than the former generation.

Multiple Gen 3 PCIe (8GT/s), SATA III (6Gbps), USB 3.0 (5Gbps), PoE (1Gbps) LAN and flexible 3G/ 4G/ WiFi/ LTE/ GPS/ GPRS/ UMTS wireless connections make high-speed data conveying possible. Vecow SPC-3000/3500 Series Ultra-compact Fanless Embedded System delivers you outstanding Power-Efficient Performance for demanding workloads.

Featured with 2 independent Gigabit LANs support iAMT 11.0, 2 COM RS-232/ 422/ 485, 4 external USB 3.0, 4 USB 2.0, 2 Mini PCIe sockets, 1 SIM card socket for 3G/ 4G/ LTE/ WiFi/ GPRS/ UMTS, 2 SATA III and 16 GPIO, 9V to 36V wide range power input, fanless -40°C to 85°C operating temperature, smart manageability features, all-in-one and cable-less designs, SPC-3000/3500 is your compact embedded engine.

Onboard SUMIT A, B connection supports up to 5 GigE LAN connections, up to 9 COM RS-232/422/485 expansions, 10GB LAN data delivery or any customized expansion function for your application, Vecow SPC-3000/3500 Series Ultra-compact Fanless Embedded System integrates outstanding performance, remarkable power productivity, smart manageability, mobile availability, versatile expandability, industrial-grade reliability and all-in-one compact solution for low-profile performance driven embedded applications.

Vecow SPC-3000/3500 Series Ultra-compact Fanless Embedded System delivers outstanding performance, compact integrated functions, smart manageability, mobile availability, trusted reliability and flexible expansion features for your Healthcare Service, Smart Automation, Point-Of-Information (POI), Self-Services, In-vehicle Infotainment, Industry 4.0 and any performance driven compact Internet of Things (IoT) applications.

1.2 Features

- 6th Generation Intel® Core™ i7/ i5/ i3 U-series Processor (Skylake-U)
- DDR4 2133MHz memory, up to 16GB
- Fanless, -40°C to 85°C Operating Temperature
- Onboard DisplayPort and DVI-D display interfaces support up to 4K display
- 2 Independent GigE LAN, iAMT 11.0 supported
- 2 Mini PCIe Socket for 3G/ 4G/ LTE/ WiFi/ GPRS/ UMTS
- 4 USB 3.0, 1 SIM Socket, 1 SSD, 2 COM RS-232/422/485, 16 GPIO
- Supports Full function SUMIT A, B expansion : Up to 5 Independent GigE LAN, up to 9 COM RS-232/422/485, up to 4 SIM Socket or fiber connections
- 9V to 36V DC Power Input, 16 Isolated DIO
- Easy to customize for low-profile system applications
- One-stop SUMIT Expansion Design and Manufacturing Services

1.3 Product Specification

1.3.1 Specifications of SPC-3010

System	
Processor	Intel® Core™ i7-6600U/ i5-6300U/ Celeron® 3955U Processor (Skylake-U)
Chipset	Intel® SoC (Skylake)
BIOS	AMI
SIO	IT8786E
Memory	1 DDR4 2133MHz SO-DIMM, up to 16GB
I/O Interface	
Serial	2 COM RS-232/ 422/ 485
USB 3.0	4 USB 3.0 (External)
USB 2.0	SPC-3010-600U, SPC-3010-300U : 4 USB 2.0 (Internal) SPC-3010-955U : 2 USB 2.0 (Internal)
GPIO	16 GPIO (Internal)
LED	Power, HDD
SIM Card	1 SIM Card Socket (Internal)
Expansion	
Mini PCIe	2 Mini PCIe Socket : <ul style="list-style-type: none"> • 1 Full-size for PCIe/ USB/ Internal SIM Card • 1 Full-size for PCIe/ USB/ mSATA
SUMIT A, B	<ul style="list-style-type: none"> • 1 SUMIT Connector A (Internal, optional) • 1 SUMIT Connector B (Internal, optional)

Graphics	
Graphics Processor	Intel® HD Graphics 520
Interface	<ul style="list-style-type: none"> • DVI-D : Up to 1920 x 1200 • DisplayPort : Up to 4096 x 2304
Storage	
SATA	2 SATA III (6Gbps)
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
Storage Device	1 2.5" SSD/ HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219 Gigabit LAN supports iAMT 11.0
LAN 2	Intel® I210 Gigabit LAN
Power	
Power Input	9V to 36V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Remote Switch	2-pin Terminal Block : On, Off
Others	
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
Microsoft	Windows 10, Windows 8.1, Windows 7
Linux	Fedora 19, Ubuntu 10.04 LTS, or Linux Kernel 3.0 above
Mechanical	
Dimensions (WxLxH)	150mm x 106mm x 44mm (5.9" x 4.2" x 1.7")
Weight	0.9 kg (1.98 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 1U Rackmount (Optional)
Environment	
Operating Temperature	-40°C to 70°C (-40°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, non-condensing

Relative Humidity	95% at 70°C
Shock	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN 50155, EN 50121-3-2

1.3.2 Specifications of SPC-3020

System	
Processor	Intel® Core™ i7-6600U/ i5-6300U/ Celeron® 3955U Processor (Skylake-U)
Chipset	Intel® SoC (Skylake)
BIOS	AMI
SIO	IT8786E
Memory	1 DDR4 2133MHz SO-DIMM, up to 16GB
I/O Interface	
Serial	2 COM RS-232/ 422/ 485
USB 3.0	4 USB 3.0 (External)
USB 2.0	SPC-3020-600U, SPC-3020-300U : 4 USB 2.0 (Internal) SPC-3020-955U : 2 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD
SIM Card	1 SIM Card Socket (Internal)
Expansion	
Mini PCIe	2 Mini PCIe Socket : <ul style="list-style-type: none"> • 1 Full-size for PCIe/ USB/ Internal SIM Card • 1 Full-size for PCIe/ USB/ mSATA
SUMIT A, B	<ul style="list-style-type: none"> • 1 SUMIT Connector A (Internal, optional) • 1 SUMIT Connector B (Internal, optional)
Graphics	
Graphics Processor	Intel® HD Graphics 520
Interface	<ul style="list-style-type: none"> • DVI-D : Up to 1920 x 1200 • DisplayPort : Up to 4096 x 2304
Storage	
SATA	2 SATA III (6Gbps)
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)

Storage Device	1 2.5" SSD/ HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM Gigabit LAN supports iAMT 11.0
LAN 2	Intel® I210 Gigabit LAN
LAN 3	Intel® I210 Gigabit LAN
LAN 4	Intel® I210 Gigabit LAN
Power	
Power Input	9V to 36V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Remote Switch	2-pin Terminal Block : On, Off
Others	
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
Microsoft	Windows 10, Windows 8.1, Windows 7
Linux	Fedora 19, Ubuntu 10.04 LTS, or Linux Kernel 3.0 above
Mechanical	
Dimensions (WxLxH)	150mm x 106mm x 68mm (5.9" x 4.2" x 2.7")
Weight	1.3 kg (2.87 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	-40°C to 70°C (-40°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, non-condensing
Relative Humidity	95% at 70°C
Shock	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN 50155, EN 50121-3-2

1.3.3 Specifications of SPC-3030

System	
Processor	Intel® Core™ i7-6600U Processor (Skylake-U)
Chipset	Intel® SoC (Skylake)
BIOS	AMI
SIO	IT8786E
Memory	1 DDR4 2133MHz SO-DIMM, up to 16GB
I/O Interface	
Serial	9 COM RS-232/ 422/ 485
USB	<ul style="list-style-type: none"> • 4 USB 3.0 (External) • 4 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD
SIM Card	1 SIM Card Socket (Internal)
Expansion	
Mini PCIe	2 Mini PCIe Socket : <ul style="list-style-type: none"> • 1 Full-size for PCIe/ USB/ Internal SIM Card • 1 Full-size for PCIe/ USB/ mSATA
SUMIT A, B	<ul style="list-style-type: none"> • 1 SUMIT Connector A (Internal, optional) • 1 SUMIT Connector B (Internal, optional)
Graphics	
Graphics Processor	Intel® HD Graphics 520
Interface	<ul style="list-style-type: none"> • DVI-D : Up to 1920 x 1200 • DisplayPort : Up to 4096 x 2304
Storage	
SATA	2 SATA III (6Gbps)
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
Storage Device	1 2.5" SSD/ HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM Gigabit LAN supports iAMT 11.0
LAN 2	Intel® I210 Gigabit LAN
LAN 3	Intel® I210 Gigabit LAN
LAN 4	Intel® I210 Gigabit LAN

Power	
Power Input	9V to 36V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Remote Switch	2-pin Terminal Block : On, Off
Others	
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
Microsoft	Windows 10, Windows 8.1, Windows 7
Linux	Fedora 19, Ubuntu 10.04 LTS, or Linux Kernel 3.0 above
Mechanical	
Dimensions (WxLxH)	150mm x 106mm x 82mm (5.9" x 4.2" x 3.2")
Weight	1.7 kg (3.75 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional)
Environment	
Operating Temperature	-40°C to 70°C (-40°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, non-condensing
Relative Humidity	95% at 70°C
Shock	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN 50155, EN 50121-3-2

1.3.4 Specifications of SPC-3510

System	
Processor	Intel® Core™ i7-6600U/ i5-6300U/ Celeron® 3955U Processor (Skylake-U)
Chipset	Intel® SoC (Skylake)
BIOS	AMI
SIO	IT8786E
Memory	1 DDR4 2133MHz SO-DIMM, up to 16GB
I/O Interface	
Serial	2 COM RS-232/ 422/ 485
USB 3.0	4 USB 3.0 (External)
USB 2.0	SPC-3510-600U, SPC-3510-300U : 4 USB 2.0 (Internal) SPC-3510-955U : 2 USB 2.0 (Internal)
GPIO	16 GPIO (Internal)
LED	Power, HDD
SIM Card	1 SIM Card Socket (Internal)
Expansion	
Mini PCIe	2 Mini PCIe Socket : <ul style="list-style-type: none"> • 1 Full-size for PCIe/ USB/ Internal SIM Card • 1 Full-size for PCIe/ USB/ mSATA
SUMIT A, B	<ul style="list-style-type: none"> • 1 SUMIT Connector A (Internal, optional) • 1 SUMIT Connector B (Internal, optional)
Graphics	
Graphics Processor	Intel® HD Graphics 520
Interface	<ul style="list-style-type: none"> • DVI-D : Up to 1920 x 1200 • DisplayPort : Up to 4096 x 2304
Storage	
SATA	2 SATA III (6Gbps)
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
Storage Device	1 2.5" SSD/ HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM Gigabit LAN supports iAMT 11.0
LAN 2	Intel® I210 Gigabit LAN

Power	
Power Input	9V to 36V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Remote Switch	2-pin Terminal Block : On, Off
Others	
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
Microsoft	Windows 10, Windows 8.1, Windows 7
Linux	Fedora 19, Ubuntu 10.04 LTS, or Linux Kernel 3.0 above
Mechanical	
Dimensions (WxLxH)	150mm x 106mm x 62mm (5.9" x 4.2" x 2.5")
Weight	1.4 kg (3.08 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	-40°C to 85°C (-40°F to 185°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, non-condensing
Relative Humidity	95% at 70°C
Shock	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN 50155, EN 50121-3-2

1.3.5 Specifications of SPC-3520

System	
Processor	Intel® Core™ i7-6600U/ i5-6300U/ Celeron® 3955U Processor (Skylake-U)
Chipset	Intel® SoC (Skylake)
BIOS	AMI
SIO	IT8786E
Memory	1 DDR4 2133MHz SO-DIMM, up to 16GB
I/O Interface	
Serial	2 COM RS-232/ 422/ 485
USB 3.0	4 USB 3.0 (External)
USB 2.0	SPC-3520-600U, SPC-3520-300U : 4 USB 2.0 (Internal) SPC-3520-955U : 2 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD
SIM Card	1 SIM Card Socket (Internal)
Expansion	
Mini PCIe	2 Mini PCIe Socket : 1 Full-size for PCIe/ USB/ Internal SIM Card
SUMIT A, B	<ul style="list-style-type: none"> • 1 SUMIT Connector A (Internal, optional) • 1 SUMIT Connector B (Internal, optional)
Graphics	
Graphics Processor	Intel® HD Graphics 520
Interface	<ul style="list-style-type: none"> • DVI-D : Up to 1920 x 1200 • DisplayPort : Up to 4096 x 2304
Storage	
SATA	2 SATA III (6Gbps)
Storage Device	1 2.5" SSD/ HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM Gigabit LAN supports iAMT 11.0
LAN 2	Intel® I210 Gigabit LAN
LAN 3	Intel® I210 Gigabit LAN

LAN 4	Intel® I210 Gigabit LAN
Power	
Power Input	9V to 36V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Remote Switch	2-pin Terminal Block : On, Off
Others	
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
Microsoft	Windows 10, Windows 8.1, Windows 7
Linux	Fedora 19, Ubuntu 10.04 LTS, or Linux Kernel 3.0 above
Mechanical	
Dimensions (WxLxH)	150mm x 106mm x 86mm (5.9" x 4.2" x 3.4")
Weight	1.8 kg (3.97 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	-40°C to 85°C (-40°F to 185°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, non-condensing
Relative Humidity	95% at 70°C
Shock	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN 50155, EN 50121-3-2

1.3.6 Specifications of SPC-3530

System	
Processor	Intel® Core™ i7-6600U Processor (Skylake-U)
Chipset	Intel® SoC (Skylake)
BIOS	AMI
SIO	IT8786E
Memory	1 DDR4 2133MHz SO-DIMM, up to 16GB
I/O Interface	
Serial	9 COM RS-232/ 422/ 485
USB	<ul style="list-style-type: none"> • 4 USB 3.0 (External) • 4 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD
Expansion	
SUMIT A, B	<ul style="list-style-type: none"> • 1 SUMIT Connector A (Internal, optional) • 1 SUMIT Connector B (Internal, optional)
Graphics	
Graphics Processor	Intel® HD Graphics 520
Interface	<ul style="list-style-type: none"> • DVI-D : Up to 1920 x 1200 • DisplayPort : Up to 4096 x 2304
Storage	
SATA	2 SATA III (6Gbps)
Storage Device	2 2.5" SSD/ HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM Gigabit LAN supports iAMT 11.0
LAN 2	Intel® I210 Gigabit LAN
LAN 3	Intel® I210 Gigabit LAN
LAN 4	Intel® I210 Gigabit LAN
Power	
Power Input	9V to 36V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Remote Switch	2-pin Terminal Block : On, Off

Others	
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
Microsoft	Windows 10, Windows 8.1, Windows 7
Linux	Fedora 19, Ubuntu 10.04 LTS, or Linux Kernel 3.0 above
Mechanical	
Dimensions (WxLxH)	150mm x 106mm x 100mm (5.9" x 4.2" x 3.9")
Weight	2.1 kg (4.62 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional)
Environment	
Operating Temperature	-40°C to 85°C (-40°F to 185°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, non-condensing
Relative Humidity	95% at 70°C
Shock	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ Wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN 50155, EN 50121-3-2

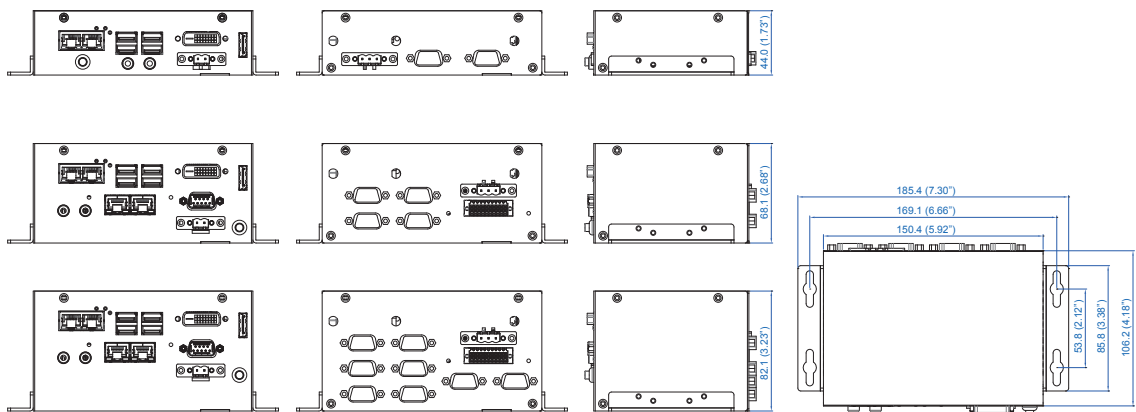
1.4 Supported CPU List

Processor No.	TDP	Cache	Max. Frequency	Embedded
i7-6600U	15W	4M	Up to 3.40 GHz	Yes
i5-6300U	15W	4M	Up to 3.00 GHz	Yes
i3-6100U	15W	4M	Up to 2.30 GHz	Yes
Celeron 3955U	15W	4M	Up to 2.00 GHz	Yes

1.5 Mechanical Dimension

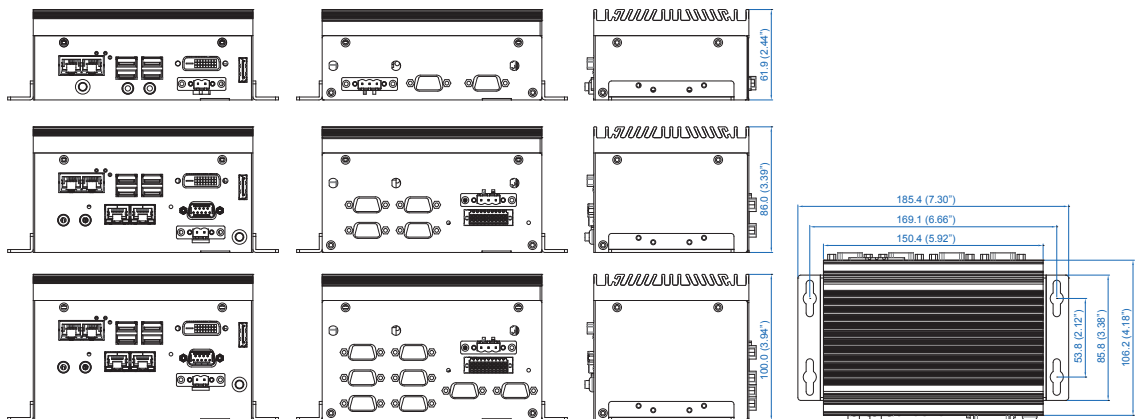
1.5.1 Dimensions of SPC-3000

Unit: mm (inch)



1.5.1 Dimensions of SPC-3500

Unit: mm (inch)



2

GETTING TO KNOW YOUR SPC-3000/3500

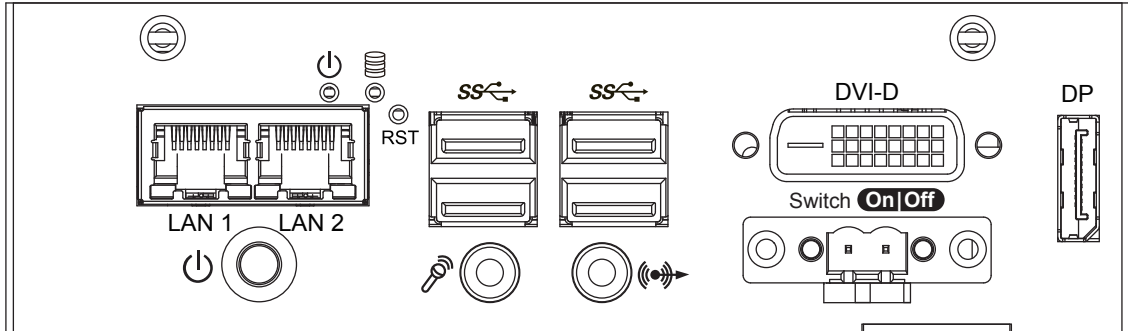
2.1 Packing List

Item	Description	Qty
1	SPC-3000/3500 Embedded System	1
2	SPC-3010/3510 <ul style="list-style-type: none">• Wall-mounting bracket• Terminal block plug pitch 2.54mm 2x10-pin• Terminal block plug pitch 5.0mm 3-pin• Terminal block plug pitch 5.0mm 2-pin• Foot Pad• PH-M4x16.5 for Din Rail• EPE• Plastic Bag• PH-M2.5x6 screws for MiniPCIe slot• KH-M3x6 for SSD/HDD bracket and Wall-mount bracket	2 1 1 1 4 4 1 1 2 12
3	SPC-3020/3520 <ul style="list-style-type: none">• Wall-mounting bracket• Terminal block plug pitch 2.54mm 2x10-pin• Terminal block plug pitch 5.0mm 3-pin• Terminal block plug pitch 5.0mm 2-pin• Foot Pad• PH-M4x16.5 for Din Rail• EPE• Plastic Bag• PH-M2.5x6 screws for MiniPCIe slot• KH-M3x6 for SSD/HDD bracket and Wall-mount bracket	2 1 1 1 4 4 1 1 2 12
4	SPC-3030/3530 <ul style="list-style-type: none">• Wall-mounting bracket• Terminal block plug pitch 2.54mm 2x10-pin• Terminal block plug pitch 5.0mm 3-pin• Terminal block plug pitch 5.0mm 2-pin• Foot Pad• PH-M4x16.5 for Din Rail• EPE• Plastic Bag• KH-M3x6 for SSD/HDD bracket and Wall-mount bracket	2 1 1 1 4 4 1 1 16

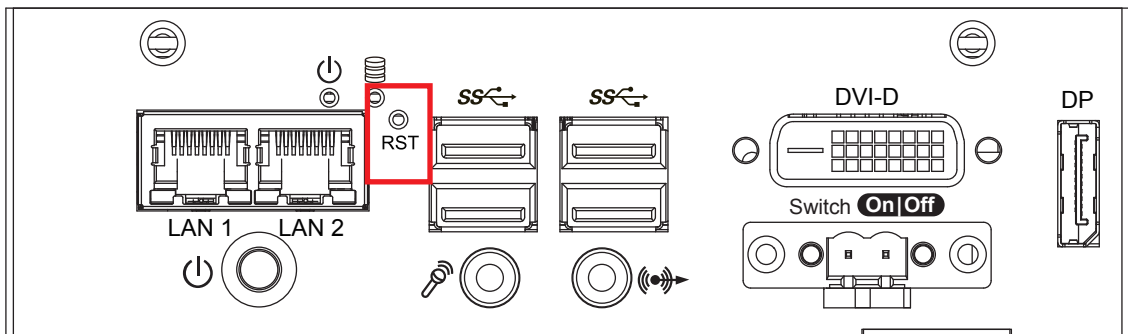
2.2 Front Panel I/O Functions

2.2.1 SPC-3010 Front I/O & Functions

In Vecow's SPC-3000 series family, all I/O connectors are located on the front panel. Most of the general connections to the computer device, such as audio, USB, DVI-D, LAN Jack, and DisplayPort, are placed on the front panel.

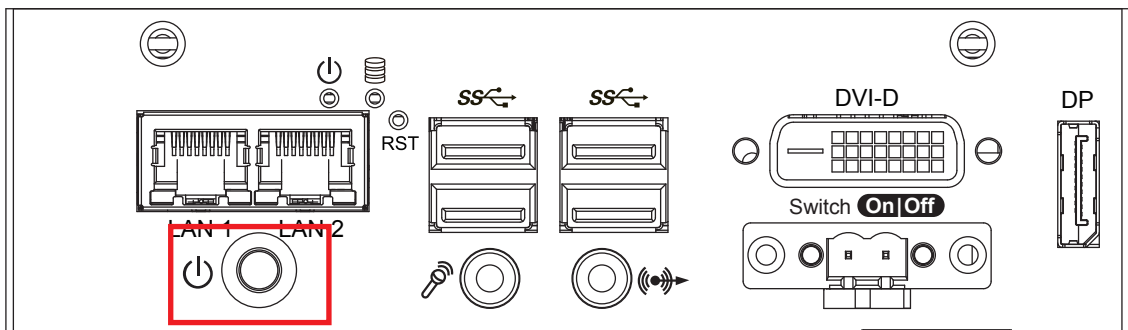


2.2.1.1 Reset Tact Switch



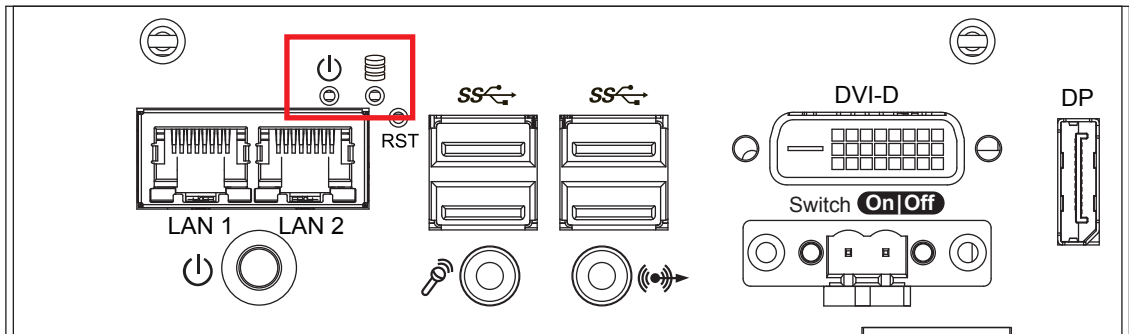
It is a hardware reset switch. Use this switch to reset the system without power off the system. Press the Reset Switch for a few seconds, then reset will be enabled.

2.2.1.2 Power Button



The power button is a non-latched switch. In case of system halts, you can press and hold the power button for 4 seconds to compulsorily shut down the system. Please note that a 4 seconds interval is kept by the system between two on/off operations (i.e. once turning off the system, you shall wait for 4 seconds to initiate another power-on operation).

2.2.1.3 PWR and HDD LED Indicator

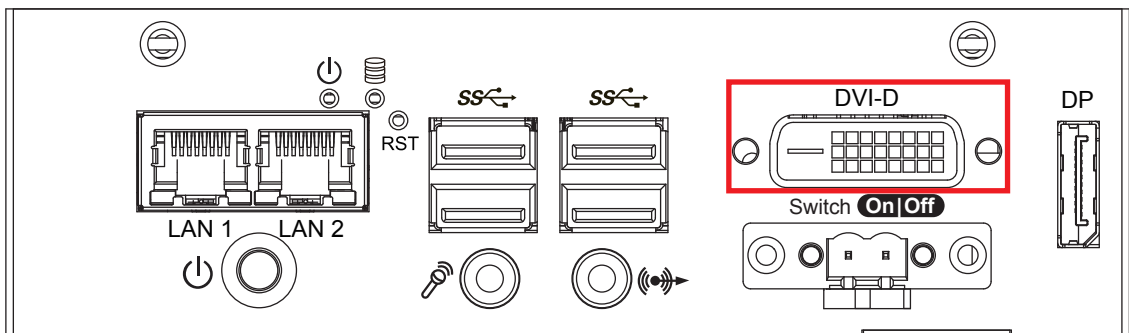


Yellow-HDD LED: A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities are in progress.

Green-Power LED: If the LED is solid green, it indicates that the system is powered on.

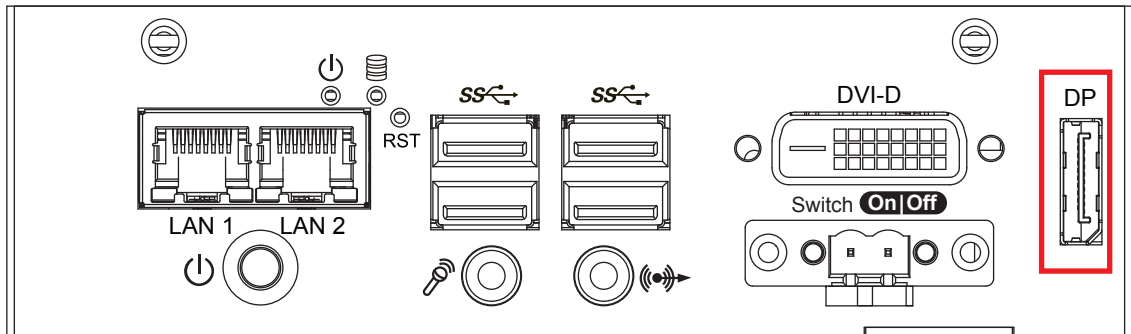
LED Color	Power Status	System Status
Yellow	HDD	<ul style="list-style-type: none"> • On/ Off : Storage status, function or not. • Twinkling : Data transferring.
Green	Power	System power status (on/ off)

2.2.1.4 DVI-D Connector



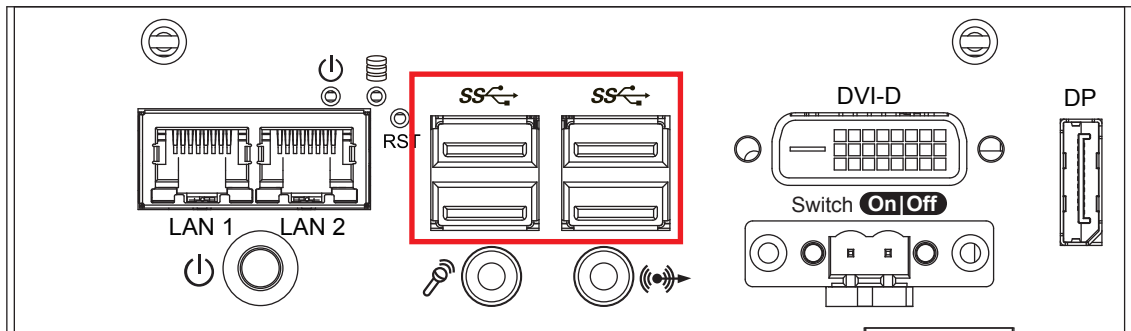
The DVI-D connector on the front panel supports both DVI display. This connector can either output DVI signals signal. The DVI output mode supports up to 1920 x 1200 resolution and output mode supports up to 1920 x 1200 resolution. The DVI is automatically selected according to the display device connected. You will need a DVI-D cable when connecting to a display device.

2.2.1.5 DisplayPort



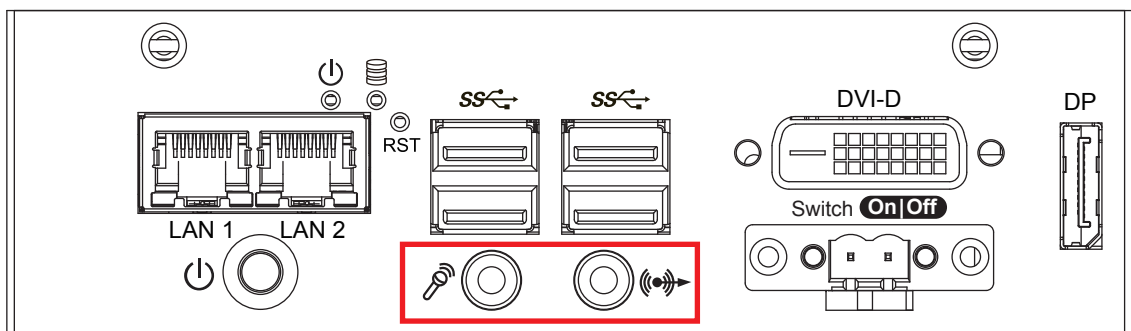
Onboard DisplayPort connection supports up to 4096 x 2304 resolution at 60Hz.

2.2.1.6 USB 3.0



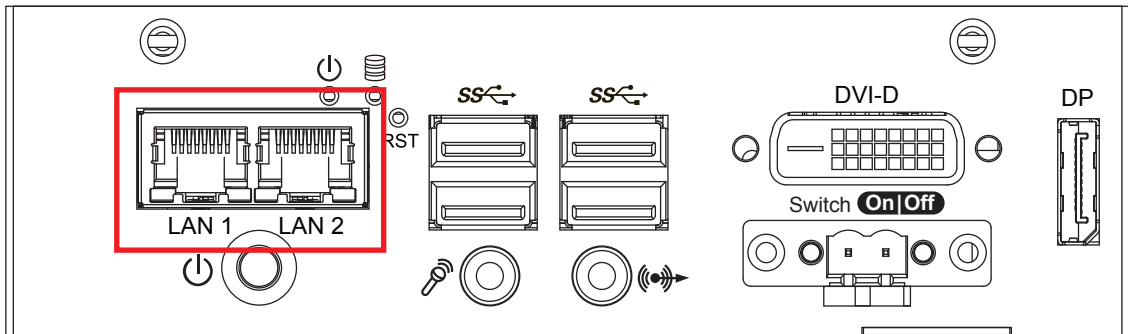
There are 4 USB 3.0 connections available supporting up to 5GB per second data rate in the front side of SPC-3010. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.2.1.7 Audio Jack



There are 2 audio connectors, Mic-in and Line-out, in the front side of SPC-3010. Onboard Realtek ALC888S-VD audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications. To utilize the audio function in Windows platform, you need to install corresponding drivers for Realtek ALC888S-VD codec.

2.2.1.8 10/ 100/ 1000 Mbps Ethernet Port

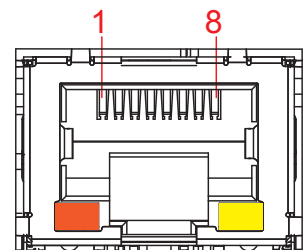


There are 2 8-pin RJ-45 jacks supporting 10/ 100/1000 Mbps Ethernet connections in the front side. LAN 1 is powered by Intel i219 Ethernet Phy; LAN 2 is powered by Intel I210 Ethernet engine. When both LAN 1 and LAN 2 work in normal status, iAMT 11.0 function is enabled. Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both of LAN 1 and LAN 2 supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 and LAN 2 are listed as follows:

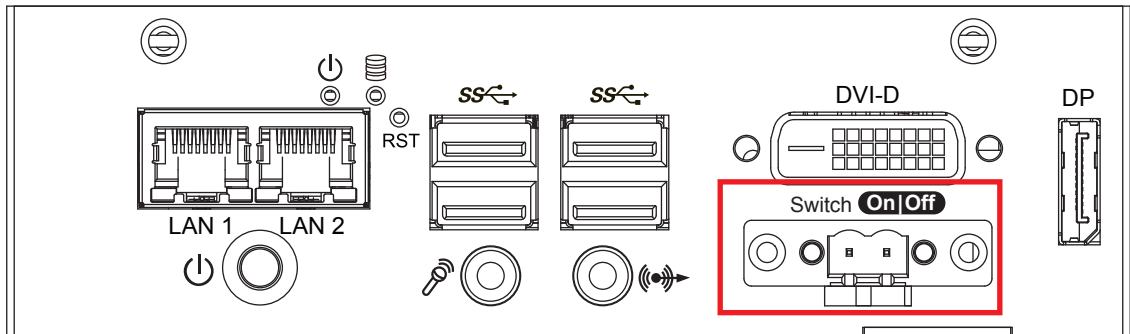
Pin No.	10/ 100Mbps	1000Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	----	MDI2_P
5	-----	MDI2_N
6	E_RX-	MDI1_N
7	-----	MDI3_P
8	-----	MDI3_N

Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/ Link/ Speed status of the connection. The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100 Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/ off when Ethernet data packets are being transmitted/ received.

	10Mbps	100Mbps	1000Mbps
Right Bottom Led	Off	Solid Green	Solid Orange
Left Bottom Led	Flash Yellow	Flash Yellow	Flash Yellow



2.2.1.9 Remote Power On/ Off Switch

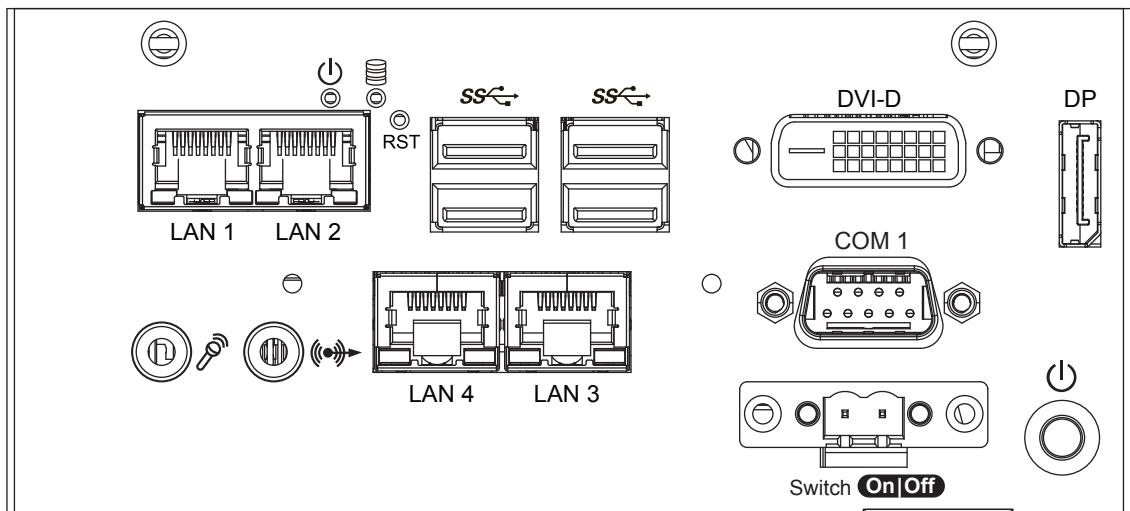


It is a 2-pin power-on/power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function on soft power-on/power-off (instant off or delay four seconds), and suspend mode.

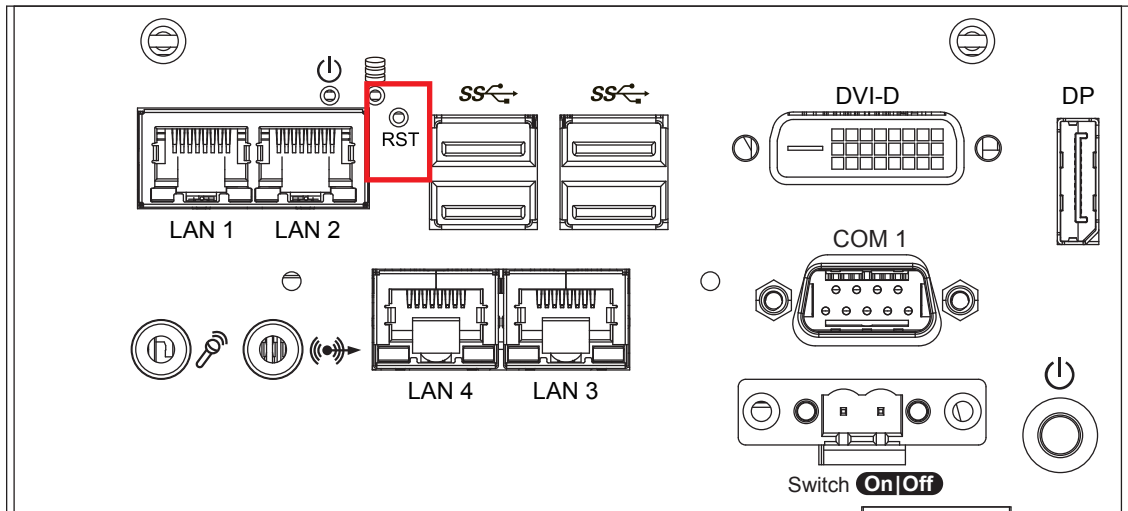
Pin No.	Definition	Pin No.	Definition
1	SW+	2	SW-

2.2.2 SPC-3020 Front I/O & Functions

In Vecow's SPC-3000 series family, all I/O connectors are located on the front panel. Most of the general connections to the computer device, such as audio, USB, DVI-D, LAN Jack, and DisplayPort, are placed on the front panel.

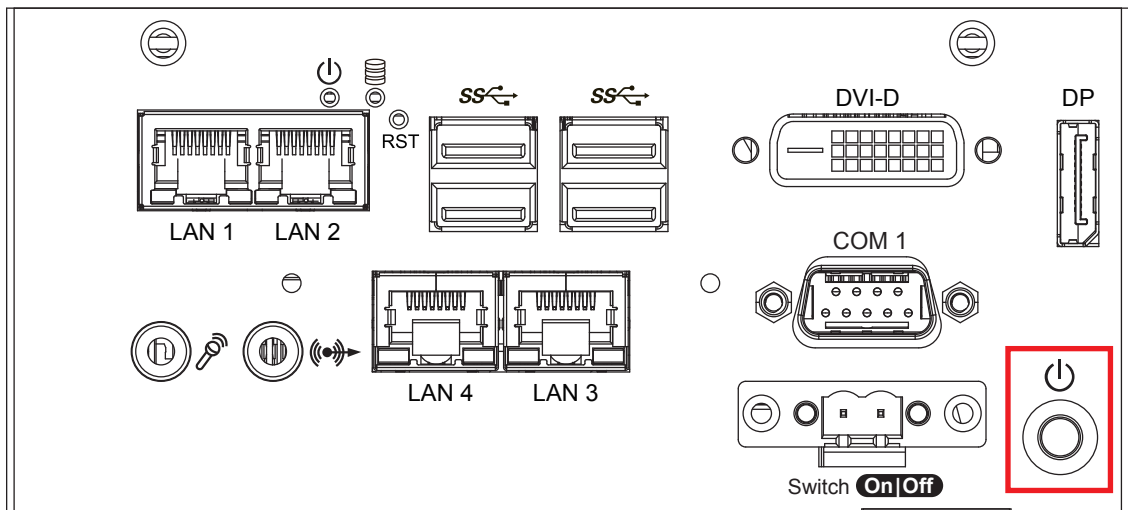


2.2.2.1 Reset Tact Switch



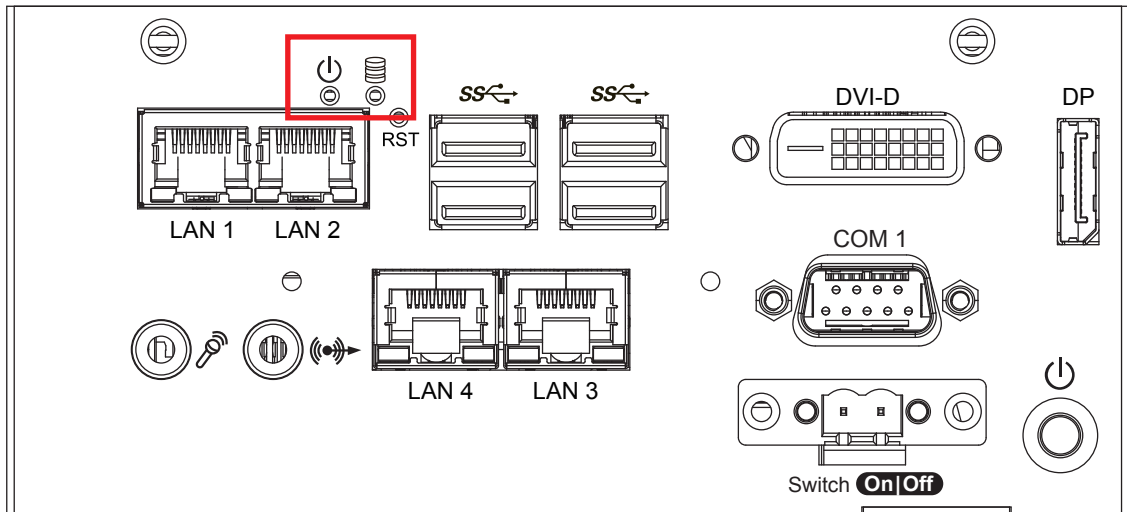
It is a hardware reset switch. Use this switch to reset the system without power off the system. Press the Reset Switch for a few seconds, then reset will be enabled.

2.2.2.2 Power Button



The power button is a non-latched switch. In case of system halts, you can press and hold the power button for 4 seconds to compulsorily shut down the system. Please note that a 4 seconds interval is kept by the system between two on/off operations (i.e. once turning off the system, you shall wait for 4 seconds to initiate another power-on operation).

2.2.2.3 PWR and HDD LED Indicator

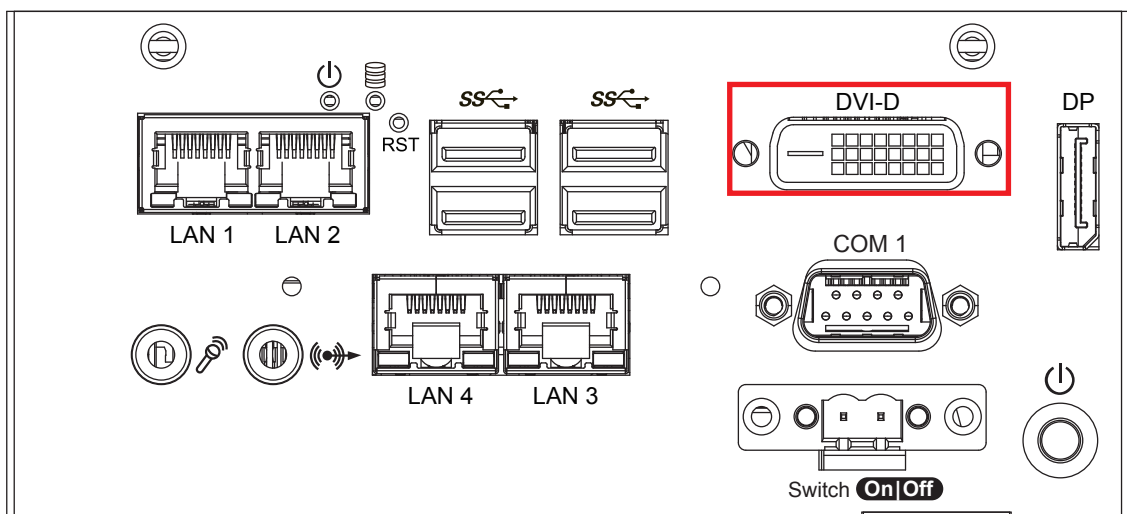


Yellow-HDD LED: A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities are in progress.

Green-Power LED: If the LED is solid green, it indicates that the system is powered on.

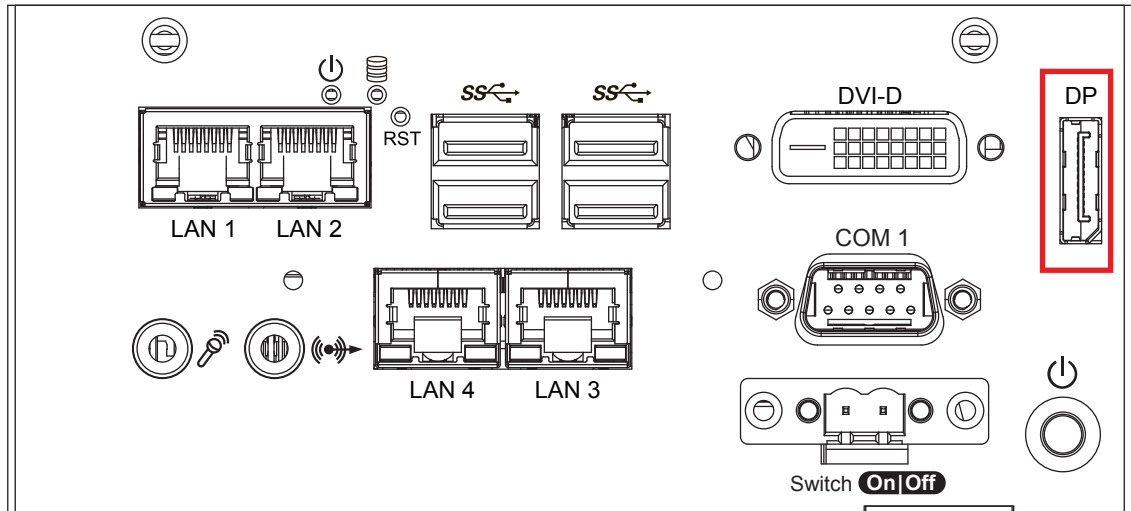
LED Color	Power Status	System Status
Yellow	HDD	<ul style="list-style-type: none"> On/ Off : Storage status, function or not. Twinkling : Data transferring.
Green	Power	System power status (on/ off)

2.2.2.4 DVI-D Connector



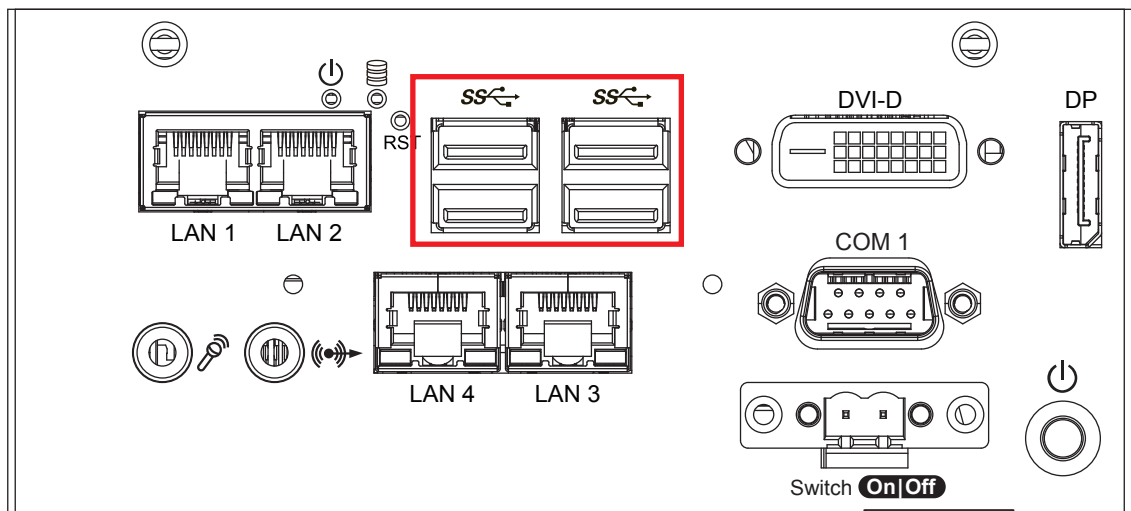
The DVI-D connector on the front panel supports both DVI display. This connector can either output DVI signals signal. The DVI output mode supports up to 1920 x 1200 resolution and output mode supports up to 1920 x 1200 resolution. The DVI is automatically selected according to the display device connected. You will need a DVI-D cable when connecting to a display device.

2.2.2.5 DisplayPort



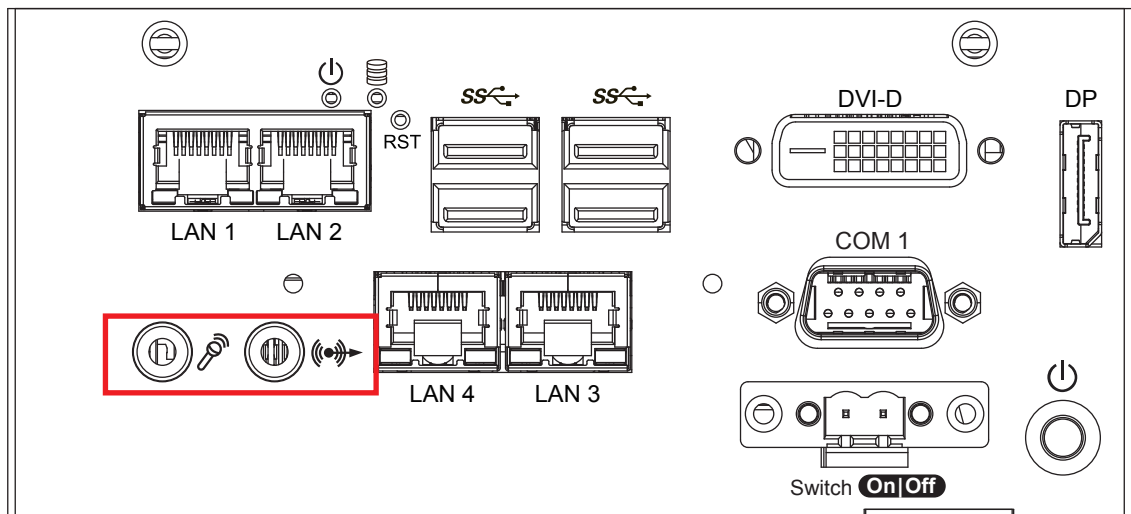
Onboard DisplayPort connection supports up to 4096 x 2304 resolution at 60Hz.

2.2.2.6 USB 3.0



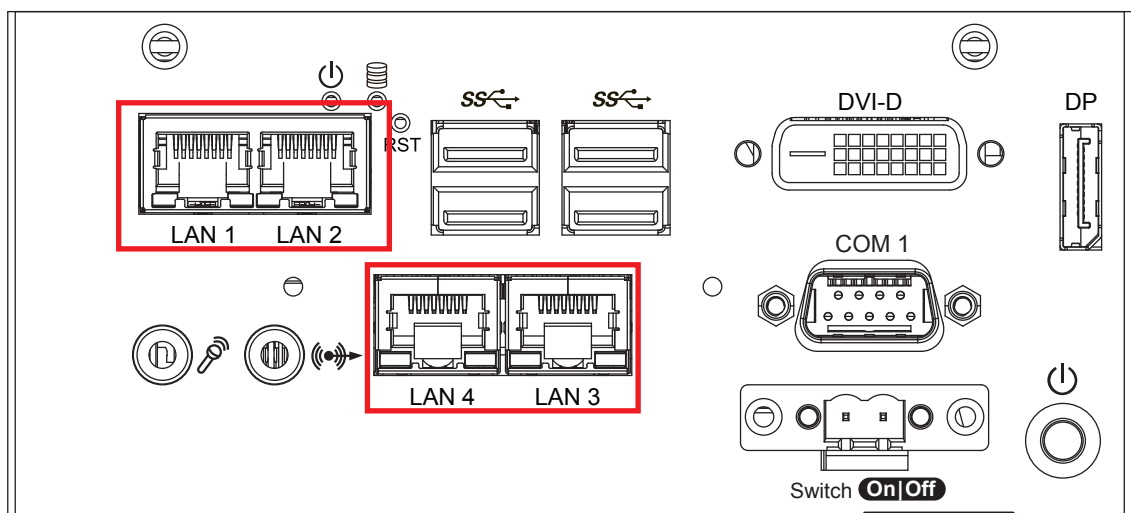
There are 4 USB 3.0 connections available supporting up to 5GB per second data rate in the front side of SPC-3020. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.2.2.7 Audio Jack



There are 2 audio connectors, Mic-in and Line-out, in the front side of SPC-3020. Onboard Realtek ALC888S-VD audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications. To utilize the audio function in Windows platform, you need to install corresponding drivers for Realtek ALC888S-VD codec.

2.2.2.8 10/ 100/ 1000 Mbps Ethernet Port

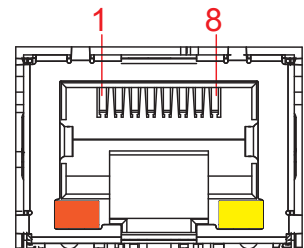


There are 4 8-pin RJ-45 jacks supporting 10/ 100/1000 Mbps Ethernet connections in the front side. LAN 1 is powered by Intel i219 Ethernet Phy; LAN 2 – 4 are powered by Intel I210 Ethernet engine. When all LAN ports work in normal status, iAMT 11.0 function is enabled. Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, All of LAN ports supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 - 4 are listed as follows:

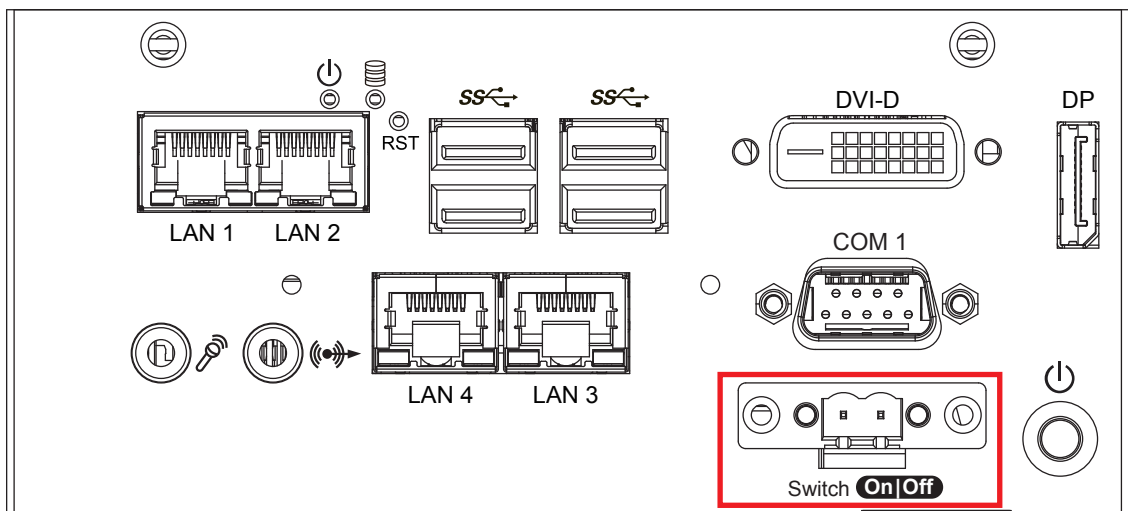
Pin No.	10/ 100Mbps	1000Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	----	MDI2_P
5	----	MDI2_N
6	E_RX-	MDI1_N
7	----	MDI3_P
8	-----	MDI3_N

Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/ Link/ Speed status of the connection. The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100 Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/ off when Ethernet data packets are being transmitted/ received.

	10Mbps	100Mbps	1000Mbps
Right Bottom Led	Off	Solid Green	Solid Orange
Left Bottom Led	Flash Yellow	Flash Yellow	Flash Yellow



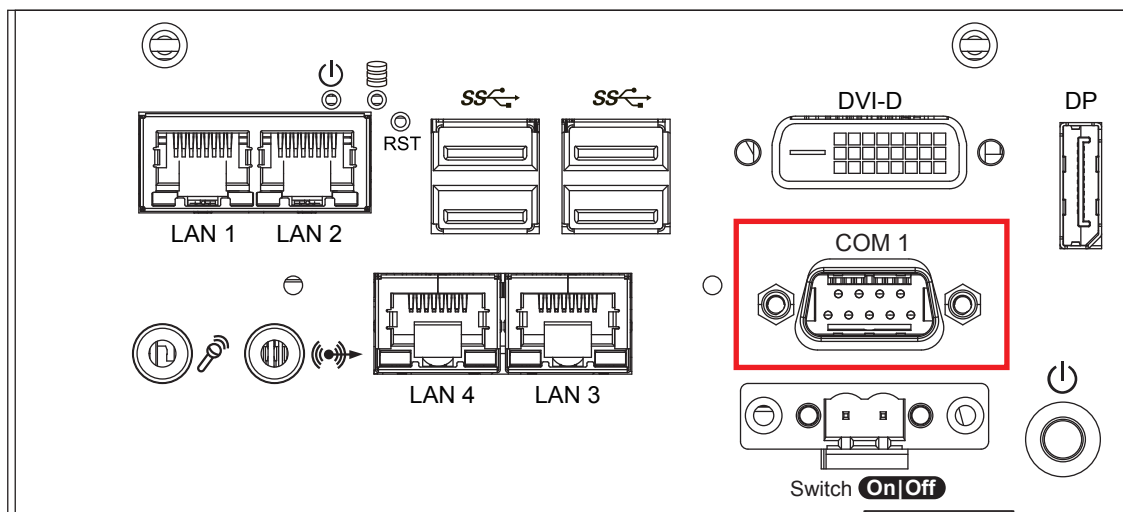
2.2.2.9 Remote Power On/ Off Switch



It is a 2-pin power-on/power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function on soft power-on/power-off (instant off or delay four seconds), and suspend mode.

Pin No.	Definition	Pin No.	Definition
1	SW+	2	SW-

2.2.2.10 Serial Port COM



Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

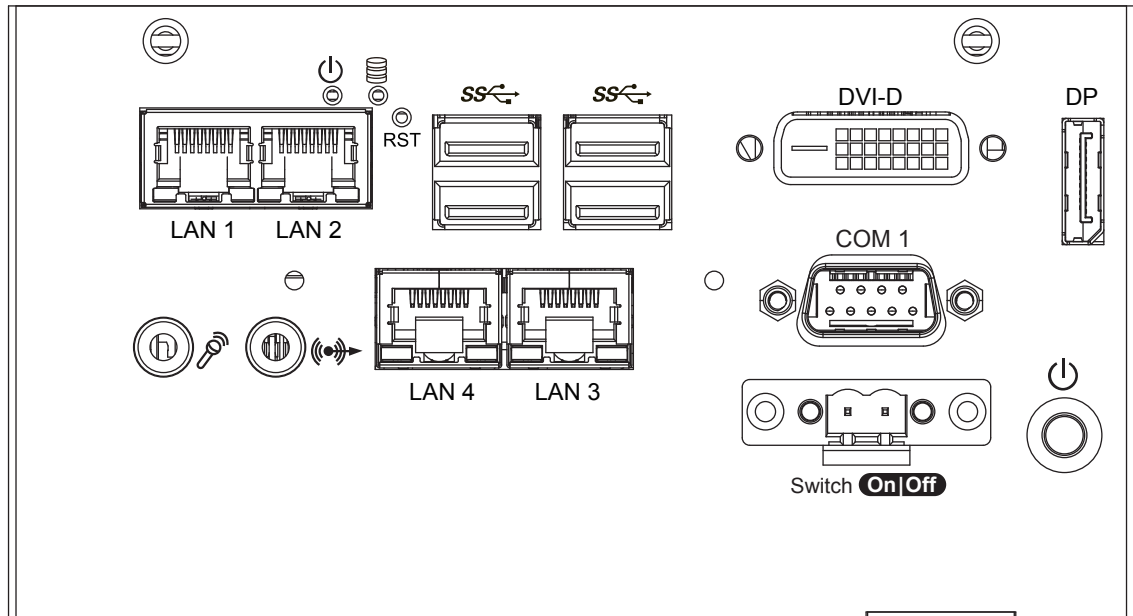
BIOS Setting	Function
COM 1	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed in the table as follow :

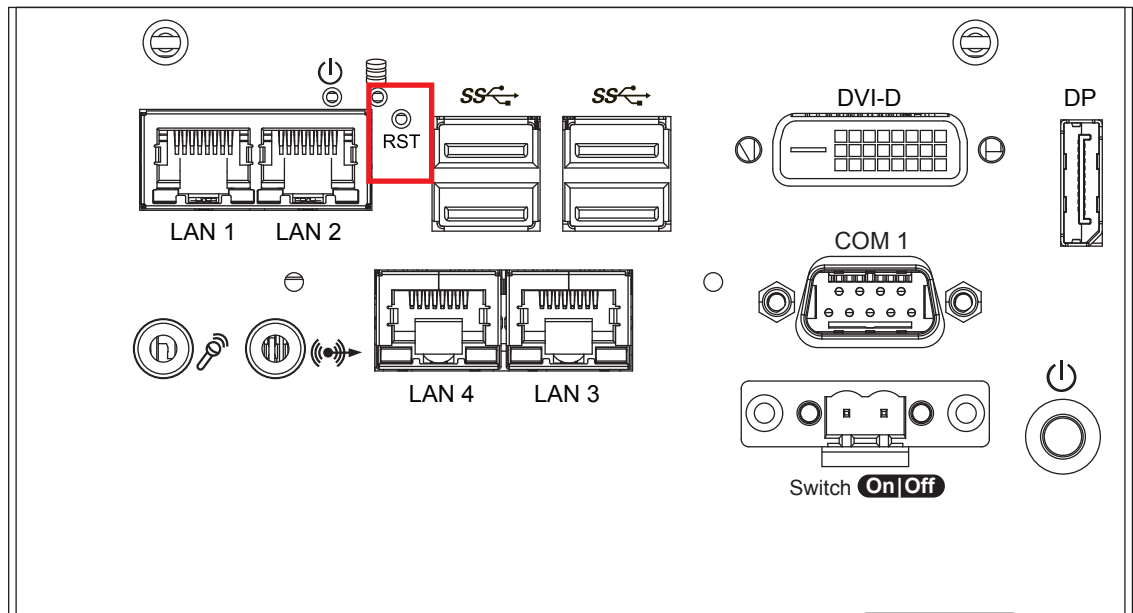
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
COM 1	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
	6	DSR	-----	RTS-	-----
	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

2.2.3 SPC-3030 Front I/O & Functions

In Vecow's SPC-3000 series family, all I/O connectors are located on the front panel. Most of the general connections to the computer device, such as audio, USB, DVI-D, LAN Jack, and DisplayPort, are placed on the front panel.

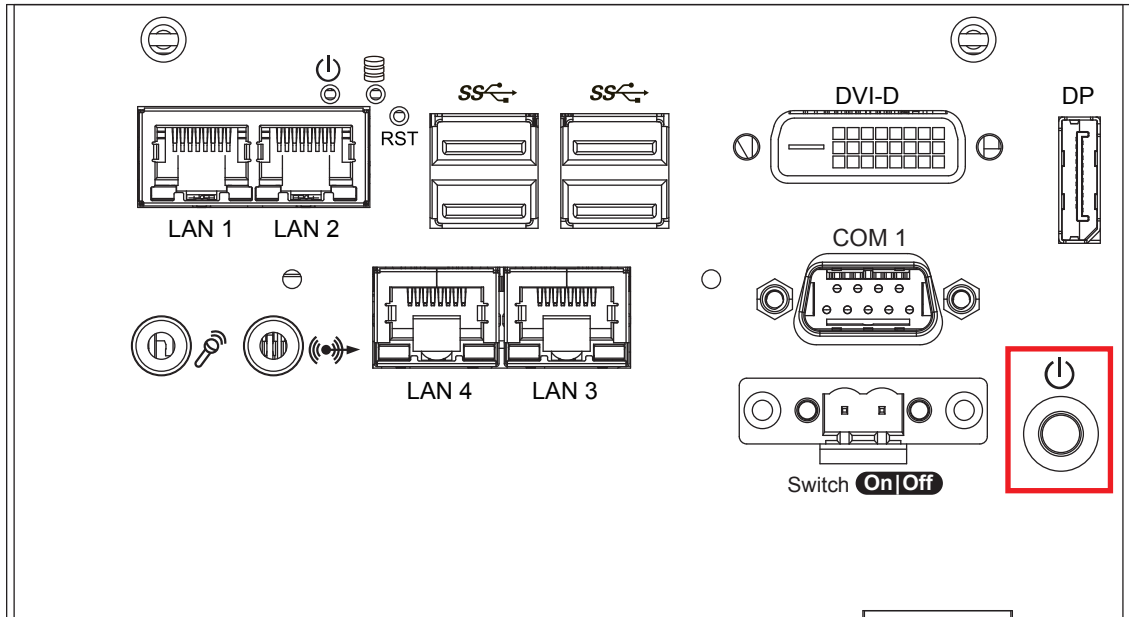


2.2.3.1 Reset Tact Switch



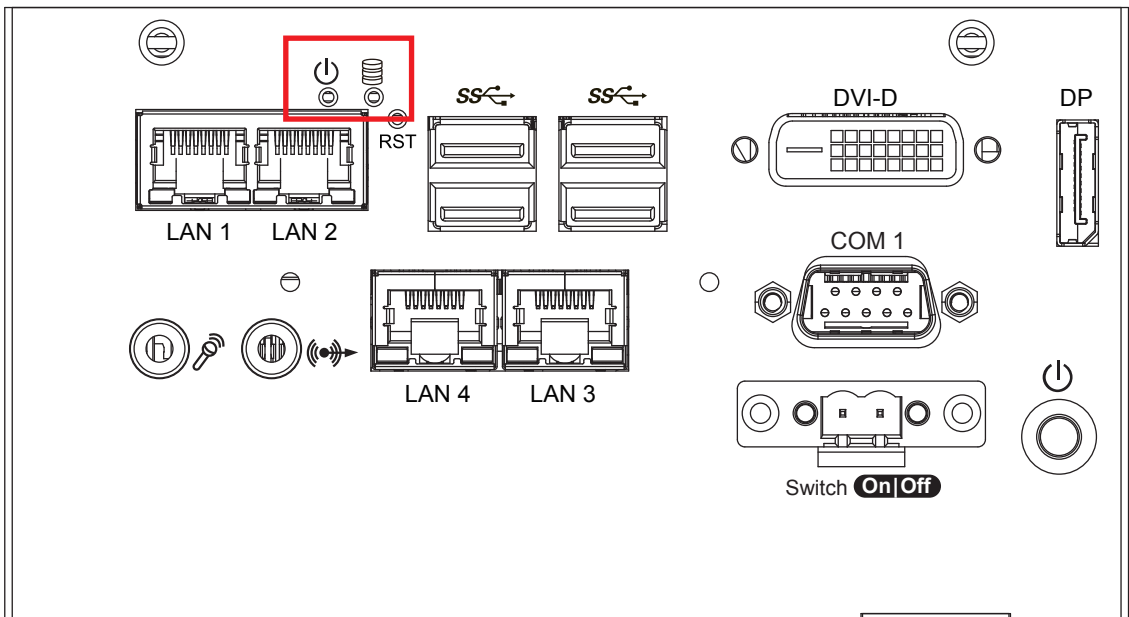
It is a hardware reset switch. Use this switch to reset the system without power off the system. Press the Reset Switch for a few seconds, then reset will be enabled.

2.2.3.2 Power Button



The power button is a non-latched switch. In case of system halts, you can press and hold the power button for 4 seconds to compulsorily shut down the system. Please note that a 4 seconds interval is kept by the system between two on/off operations (i.e. once turning off the system, you shall wait for 4 seconds to initiate another power-on operation).

2.2.3.3 PWR and HDD LED Indicator

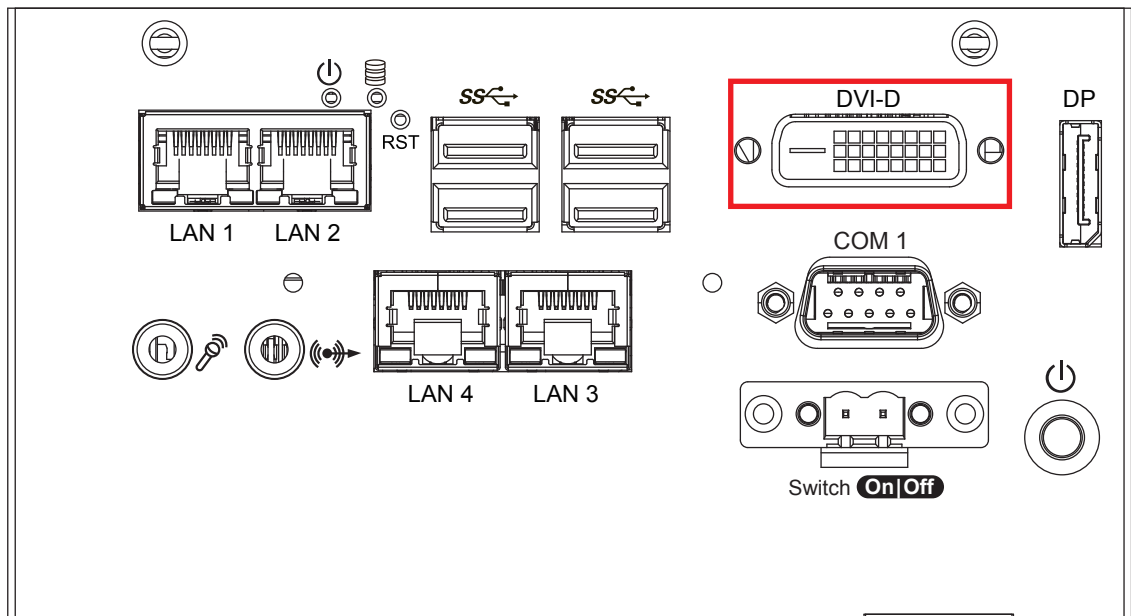


Yellow-HDD LED: A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities are in progress.

Green-Power LED: If the LED is solid green, it indicates that the system is powered on.

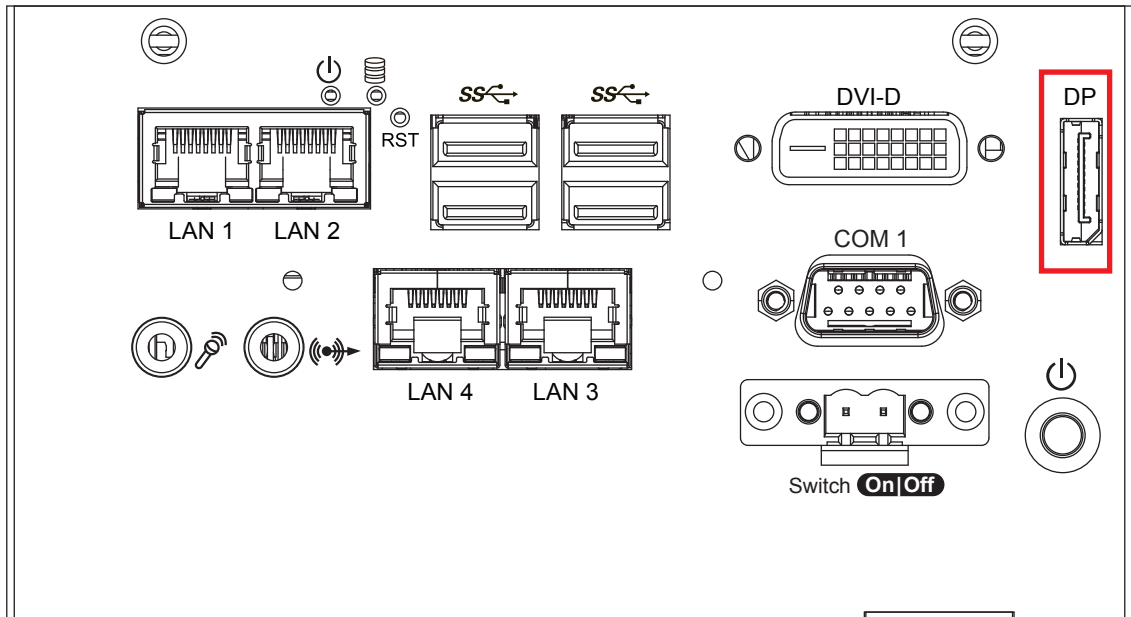
LED Color	Power Status	System Status
Yellow	HDD	<ul style="list-style-type: none"> • On/ Off : Storage status, function or not. • Twinkling : Data transferring.
Green	Power	System power status (on/ off)

2.2.3.4 DVI-D Connector



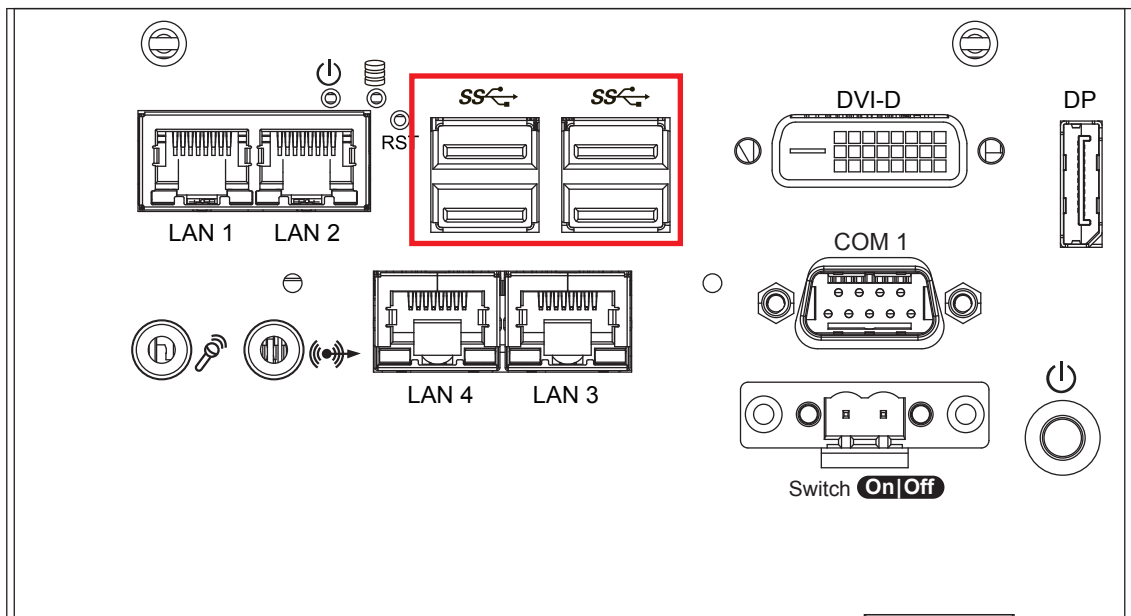
The DVI-D connector on the front panel supports both DVI display. This connector can either output DVI signals signal. The DVI output mode supports up to 1920 x 1200 resolution and output mode supports up to 1920 x 1200 resolution. The DVI is automatically selected according to the display device connected. You will need a DVI-D cable when connecting to a display device.

2.2.3.5 DisplayPort



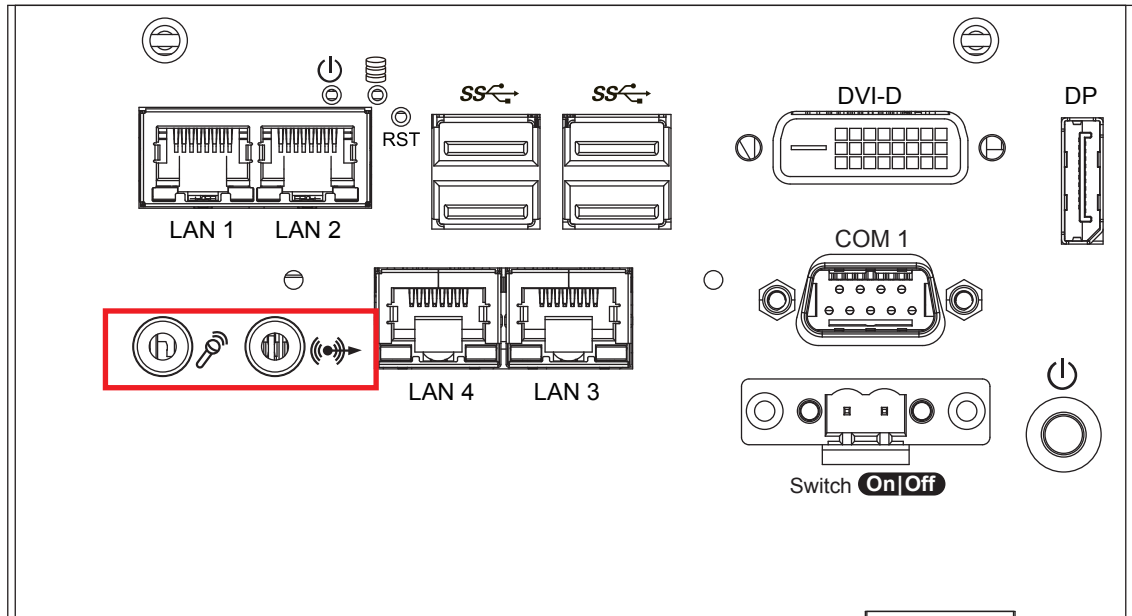
Onboard DisplayPort connection supports up to 4096 x 2304 resolution at 60Hz.

2.2.3.6 USB 3.0



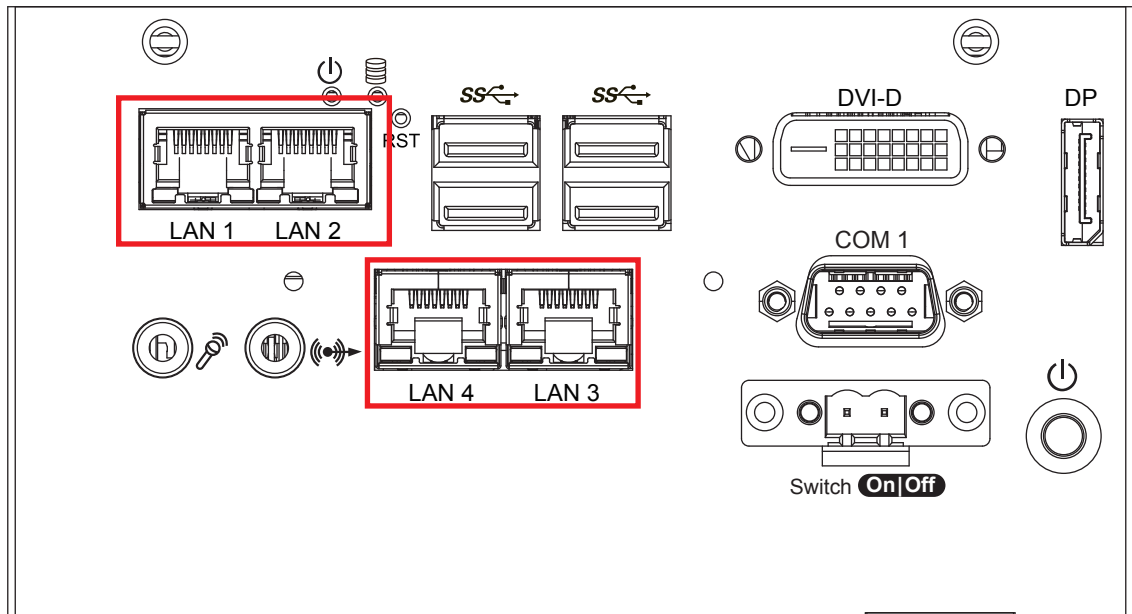
There are 4 USB 3.0 connections available supporting up to 5GB per second data rate in the front side of SPC-3030. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.2.3.7 Audio Jack



There are 2 audio connectors, Mic-in and Line-out, in the front side of SPC-3030. Onboard Realtek ALC888S-VD audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications. To utilize the audio function in Windows platform, you need to install corresponding drivers for Realtek ALC888S-VD codec.

2.2.3.8 10/ 100/ 1000 Mbps Ethernet Port

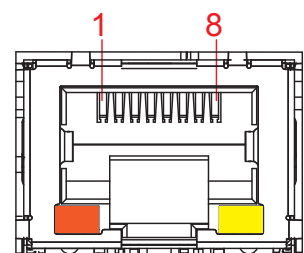


There are 4 8-pin RJ-45 jacks supporting 10/ 100/1000 Mbps Ethernet connections in the front side. LAN 1 is powered by Intel i219 Ethernet Phy; LAN 2 – 4 are powered by Intel I210 Ethernet engine. When all LAN ports work in normal status, iAMT 11.0 function is enabled. Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, All of LAN ports supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 - 4 are listed as follows:

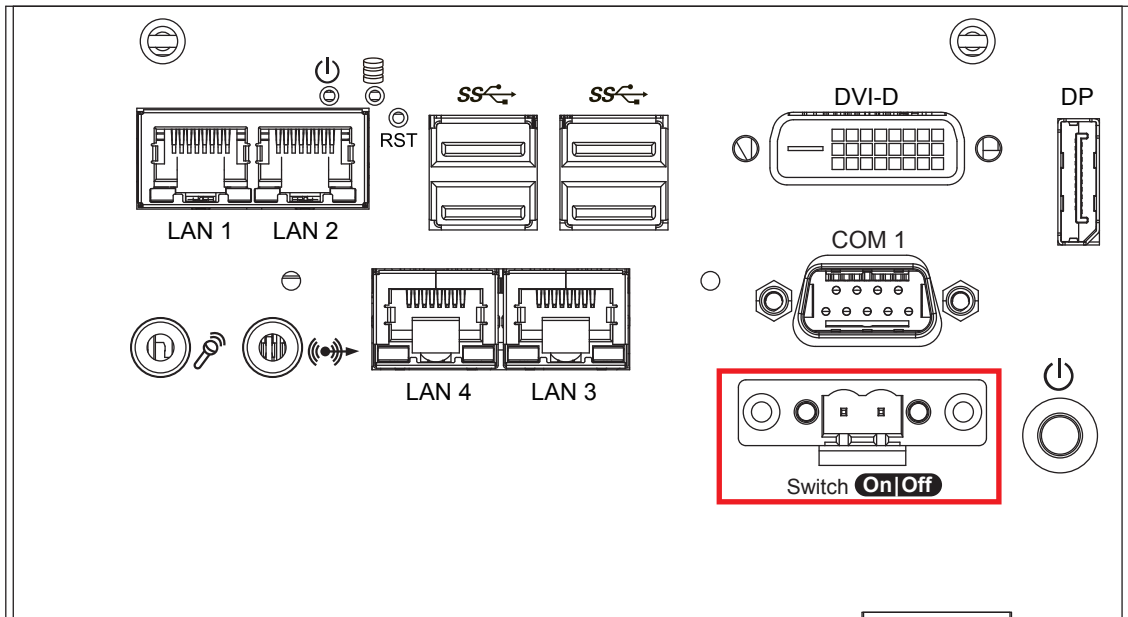
Pin No.	10/ 100Mbps	1000Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	----	MDI2_P
5	-----	MDI2_N
6	E_RX-	MDI1_N
7	-----	MDI3_P
8	-----	MDI3_N

Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/ Link/ Speed status of the connection. The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100 Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/ off when Ethernet data packets are being transmitted/ received.

	10Mbps	100Mbps	1000Mbps
Right Bottom Led	Off	Solid Green	Solid Orange
Left Bottom Led	Flash Yellow	Flash Yellow	Flash Yellow



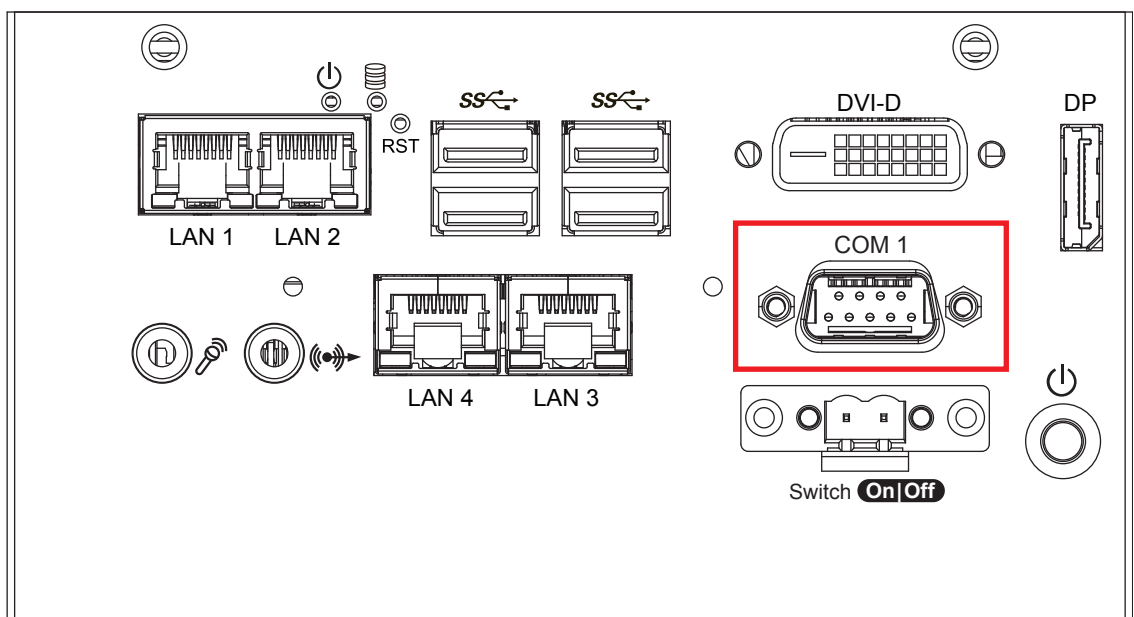
2.2.3.9 Remote Power On/ Off Switch



It is a 2-pin power-on/power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function on soft power-on/power-off (instant off or delay four seconds), and suspend mode.

Pin No.	Definition	Pin No.	Definition
1	SW+	2	SW-

2.2.3.10 Serial Port COM



Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

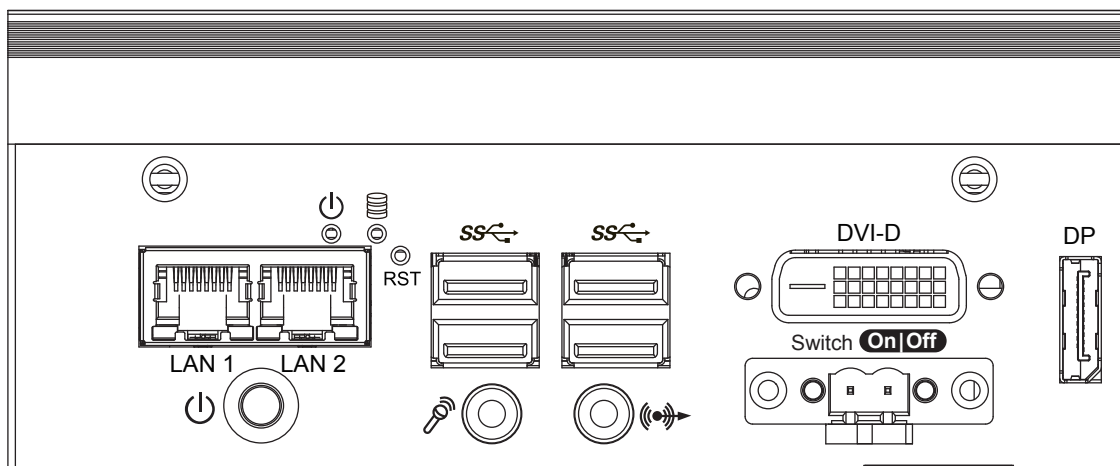
BIOS Setting	Function
COM 1	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed in the table as follow :

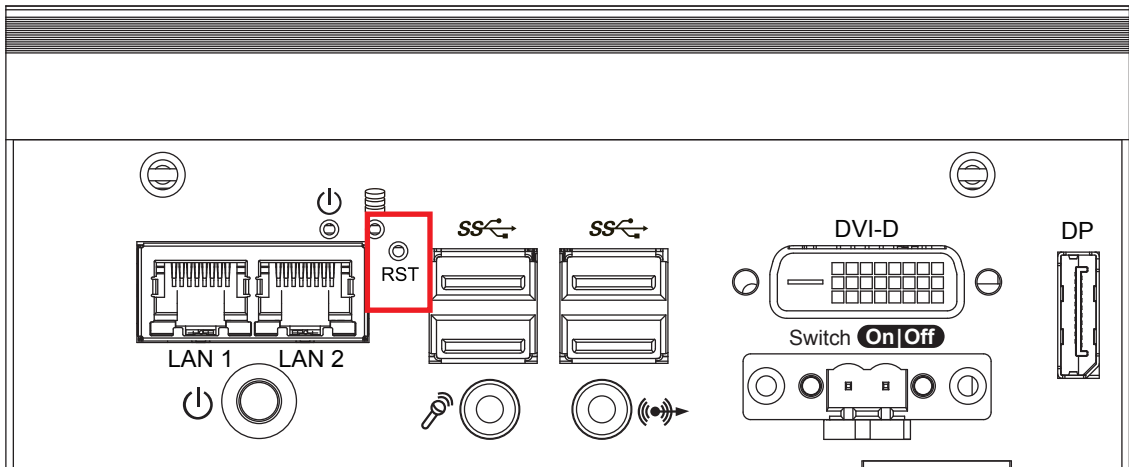
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
COM 1	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
	6	DSR	-----	RTS-	-----
	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

2.2.4 SPC-3510 Front I/O & Functions

In Vecow's SPC-3500 series family, all I/O connectors are located on the front panel. Most of the general connections to the computer device, such as audio, USB, DVI-D, LAN Jack, and DisplayPort, are placed on the front panel.

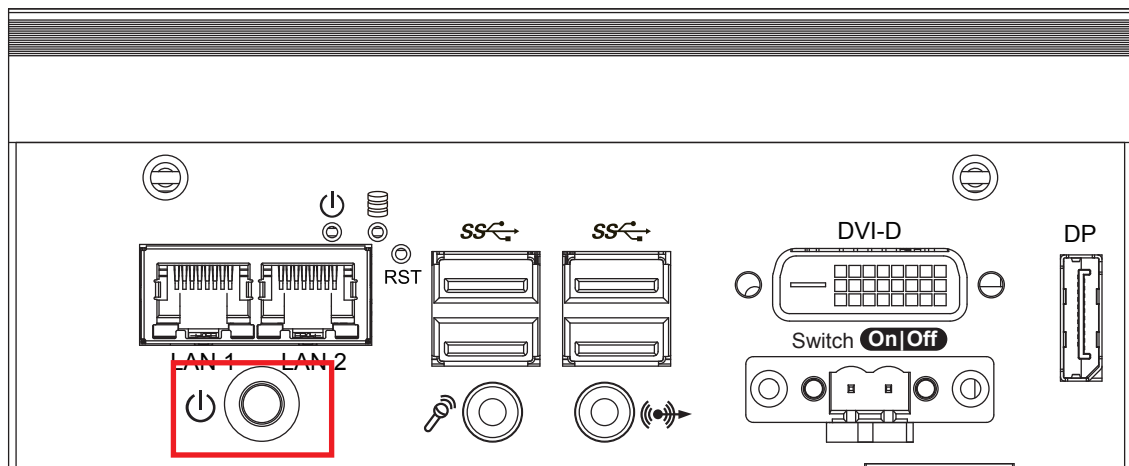


2.2.4.1 Reset Tact Switch



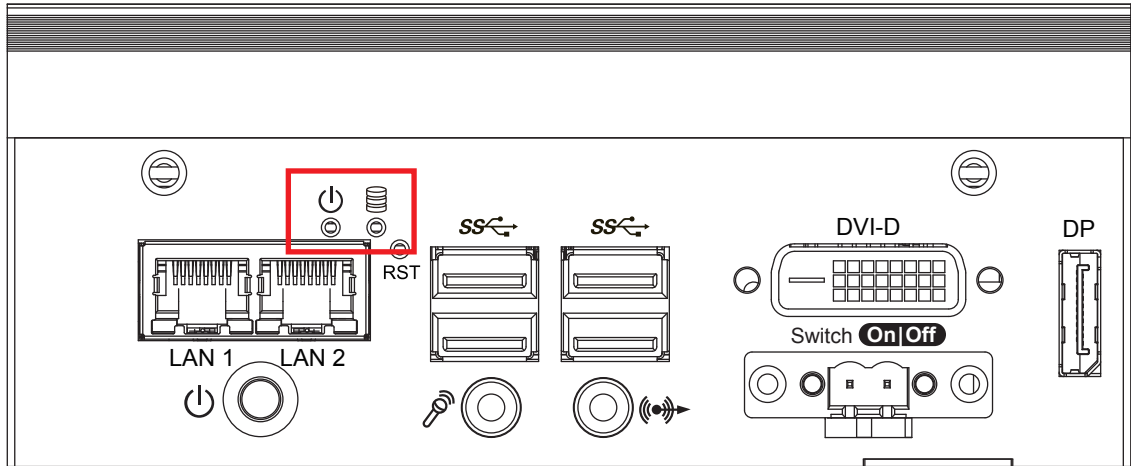
It is a hardware reset switch. Use this switch to reset the system without power off the system. Press the Reset Switch for a few seconds, then reset will be enabled.

2.2.4.2 Power Button



The power button is a non-latched switch. In case of system halts, you can press and hold the power button for 4 seconds to compulsorily shut down the system. Please note that a 4 seconds interval is kept by the system between two on/off operations (i.e. once turning off the system, you shall wait for 4 seconds to initiate another power-on operation).

2.2.4.3 PWR and HDD LED Indicator

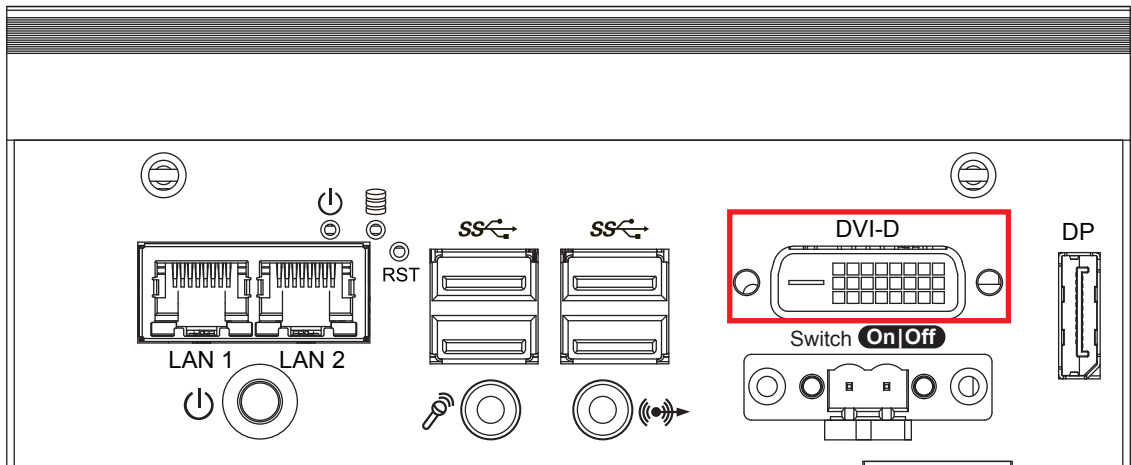


Yellow-HDD LED: A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities are in progress.

Green-Power LED: If the LED is solid green, it indicates that the system is powered on.

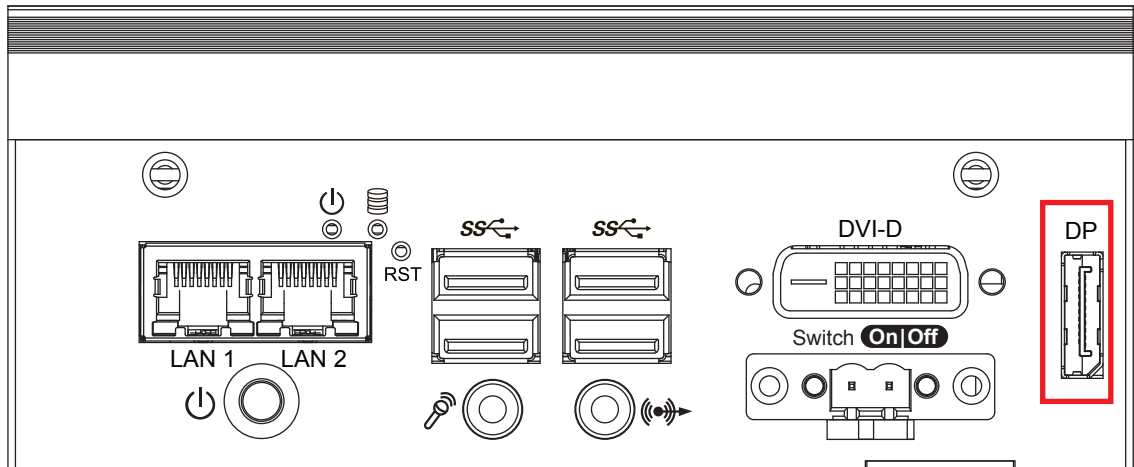
LED Color	Power Status	System Status
Yellow	HDD	<ul style="list-style-type: none"> On/ Off : Storage status, function or not. Twinkling : Data transferring.
Green	Power	System power status (on/ off)

2.2.4.4 DVI-D Connector



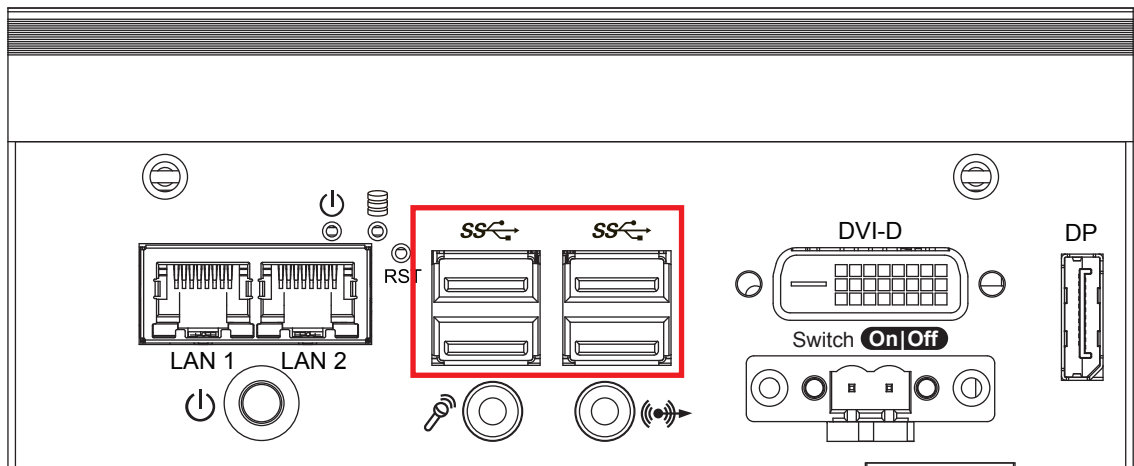
The DVI-D connector on the front panel supports both DVI display. This connector can either output DVI signals signal. The DVI output mode supports up to 1920 x 1200 resolution and output mode supports up to 1920 x 1200 resolution. The DVI is automatically selected according to the display device connected. You will need a DVI-D cable when connecting to a display device.

2.2.4.5 DisplayPort



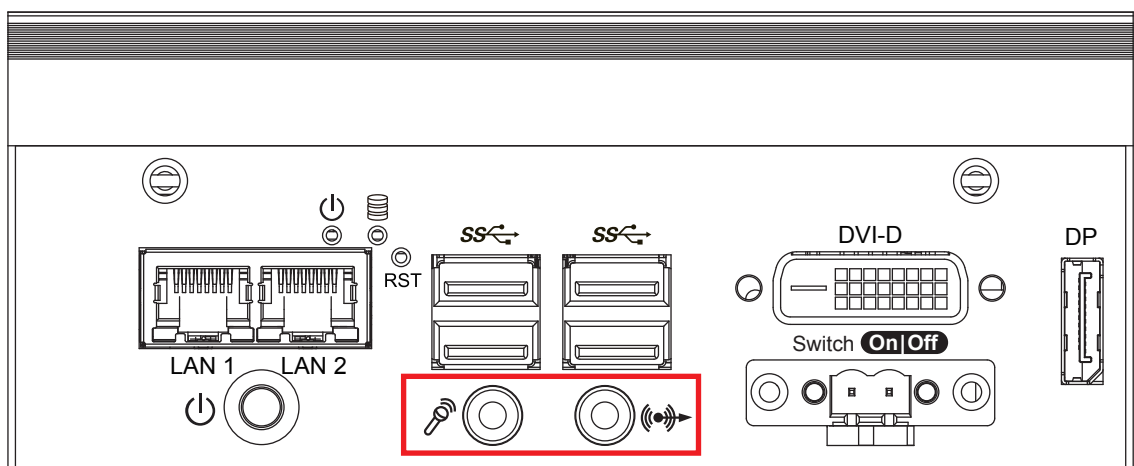
Onboard DisplayPort connection supports up to 4096 x 2304 resolution at 60Hz.

2.2.4.6 USB 3.0



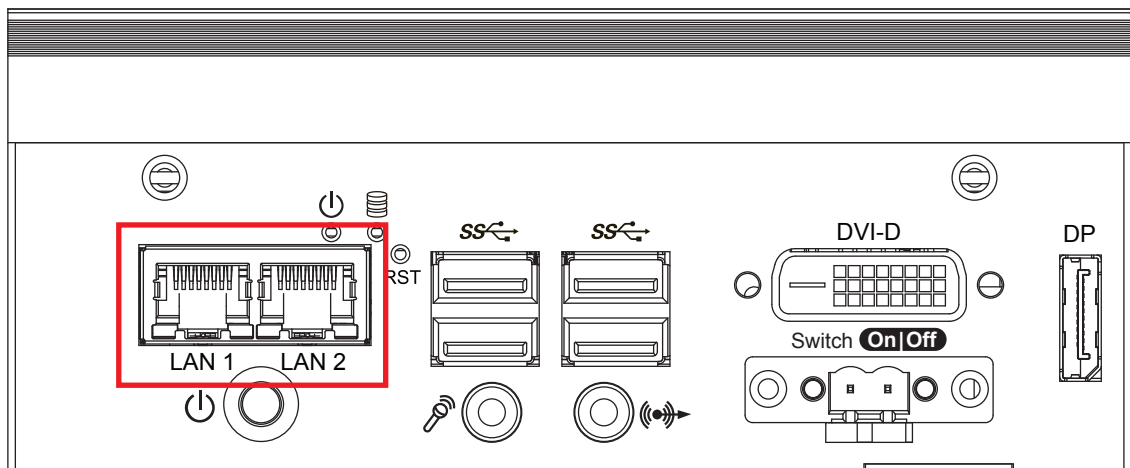
There are 4 USB 3.0 connections available supporting up to 5GB per second data rate in the front side of SPC-3510. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.2.4.7 Audio Jack



There are 2 audio connectors, Mic-in and Line-out, in the front side of SPC-3510. Onboard Realtek ALC888S-VD audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications. To utilize the audio function in Windows platform, you need to install corresponding drivers for Realtek ALC888S-VD codec.

2.2.4.8 10/ 100/ 1000 Mbps Ethernet Port

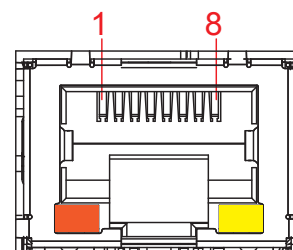


There are 2 8-pin RJ-45 jacks supporting 10/ 100/1000 Mbps Ethernet connections in the front side. LAN 1 is powered by Intel i219 Ethernet Phy; LAN 2 is powered by Intel I210 Ethernet engine. When both LAN 1 and LAN 2 work in normal status, iAMT 11.0 function is enabled. Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both of LAN 1 and LAN 2 supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 and LAN 2 are listed as follows:

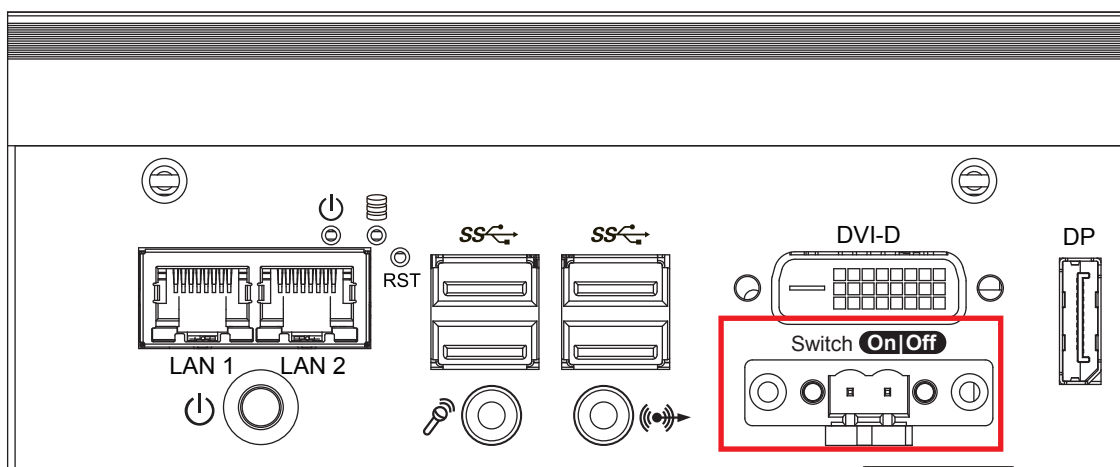
Pin No.	10/ 100Mbps	1000Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	----	MDI2_P
5	----	MDI2_N
6	E_RX-	MDI1_N
7	----	MDI3_P
8	-----	MDI3_N

Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/ Link/ Speed status of the connection. The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100 Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/ off when Ethernet data packets are being transmitted/ received.

	10Mbps	100Mbps	1000Mbps
Right Bottom Led	Off	Solid Green	Solid Orange
Left Bottom Led	Flash Yellow	Flash Yellow	Flash Yellow



2.2.4.9 Remote Power On/ Off Switch

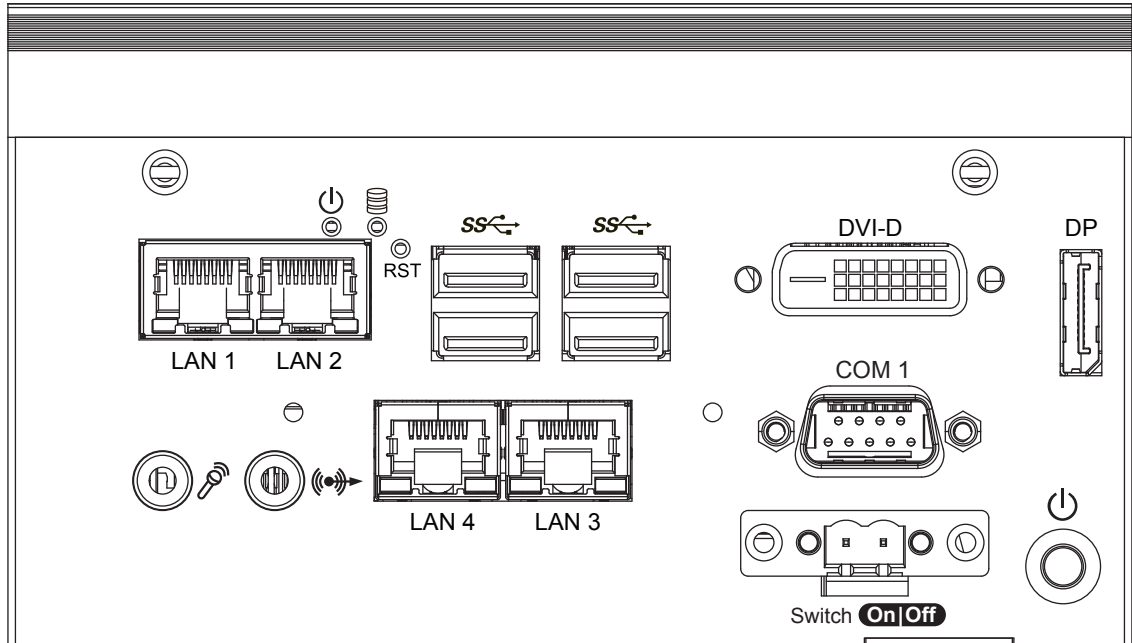


It is a 2-pin power-on/power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function on soft power-on/power-off (instant off or delay four seconds), and suspend mode.

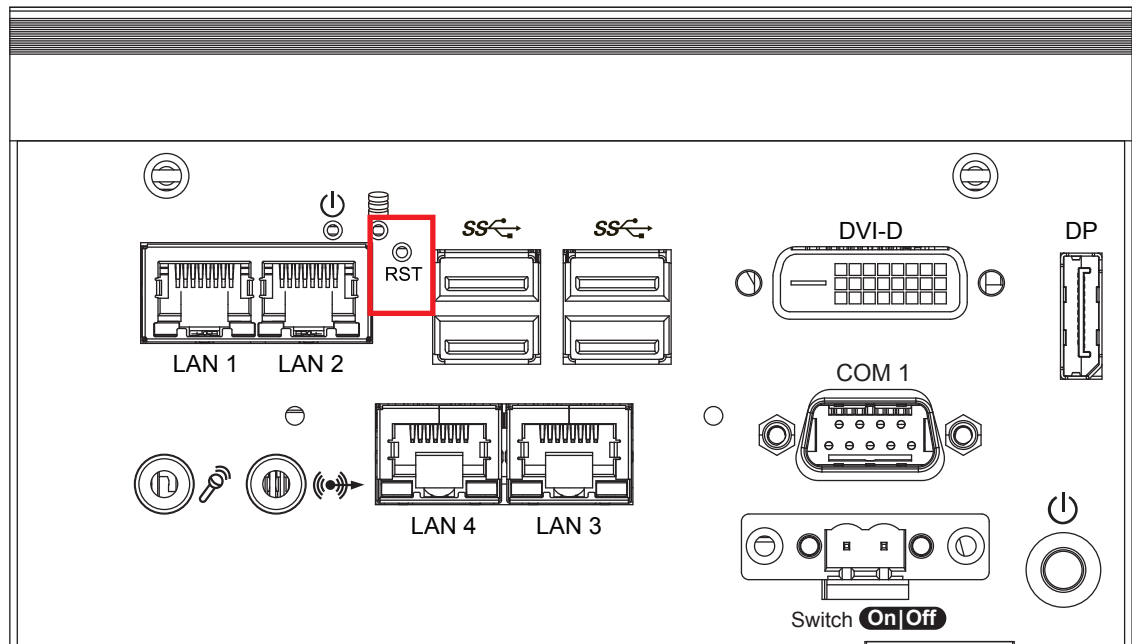
Pin No.	Definition	Pin No.	Definition
1	SW+	2	SW-

2.2.5 SPC-3520 Front I/O & Functions

In Vecow's SPC-3500 series family, all I/O connectors are located on the front panel. Most of the general connections to the computer device, such as audio, USB, DVI-D, LAN Jack, and DisplayPort, are placed on the front panel.

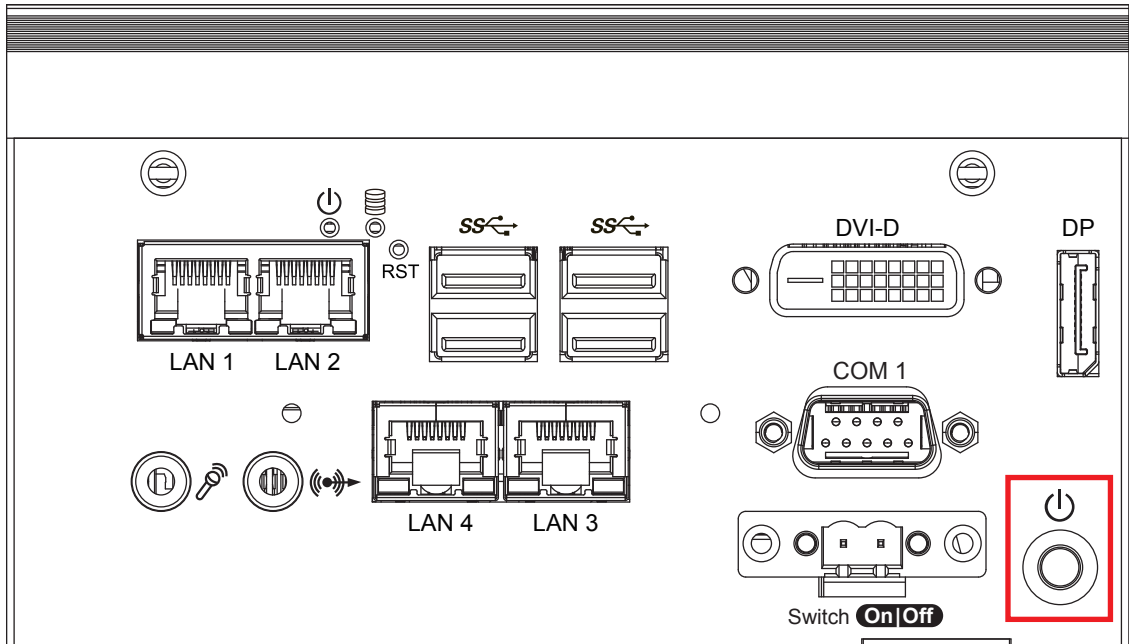


2.2.5.1 Reset Tact Switch



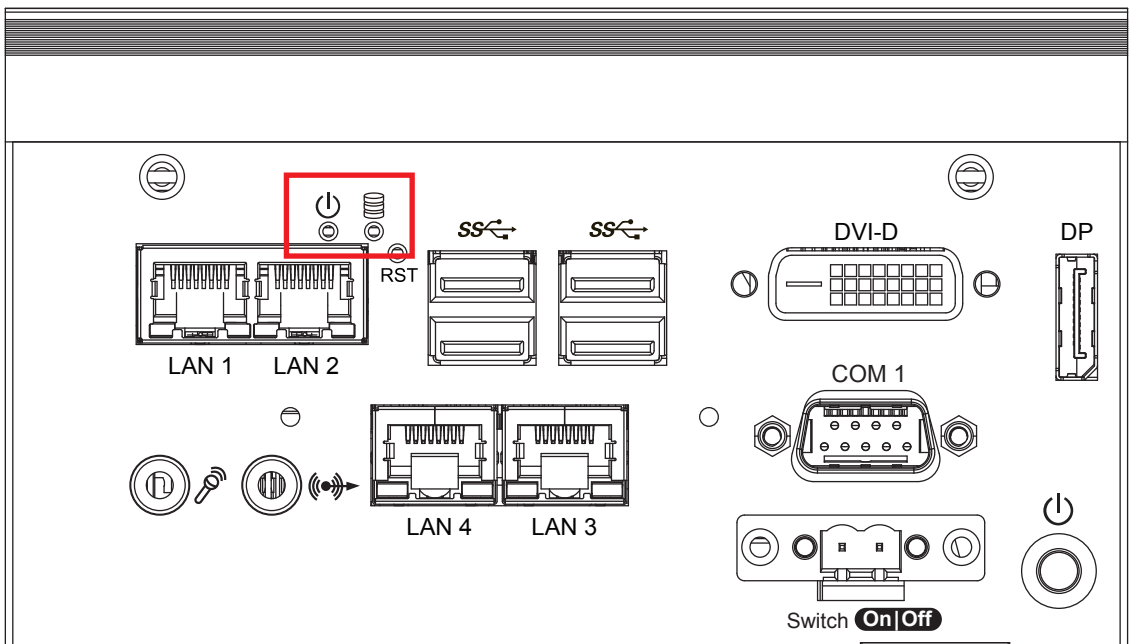
It is a hardware reset switch. Use this switch to reset the system without power off the system. Press the Reset Switch for a few seconds, then reset will be enabled.

2.2.5.2 Power Button



The power button is a non-latched switch. In case of system halts, you can press and hold the power button for 4 seconds to compulsorily shut down the system. Please note that a 4 seconds interval is kept by the system between two on/off operations (i.e. once turning off the system, you shall wait for 4 seconds to initiate another power-on operation).

2.2.5.3 PWR and HDD LED Indicator

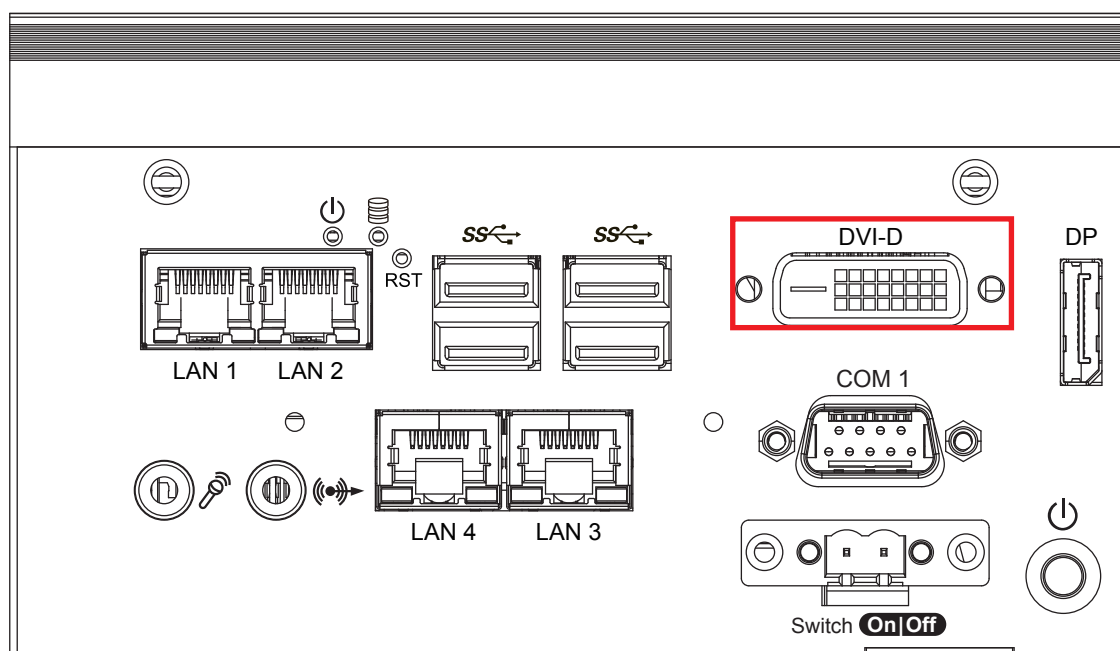


Yellow-HDD LED: A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities are in progress.

Green-Power LED: If the LED is solid green, it indicates that the system is powered on.

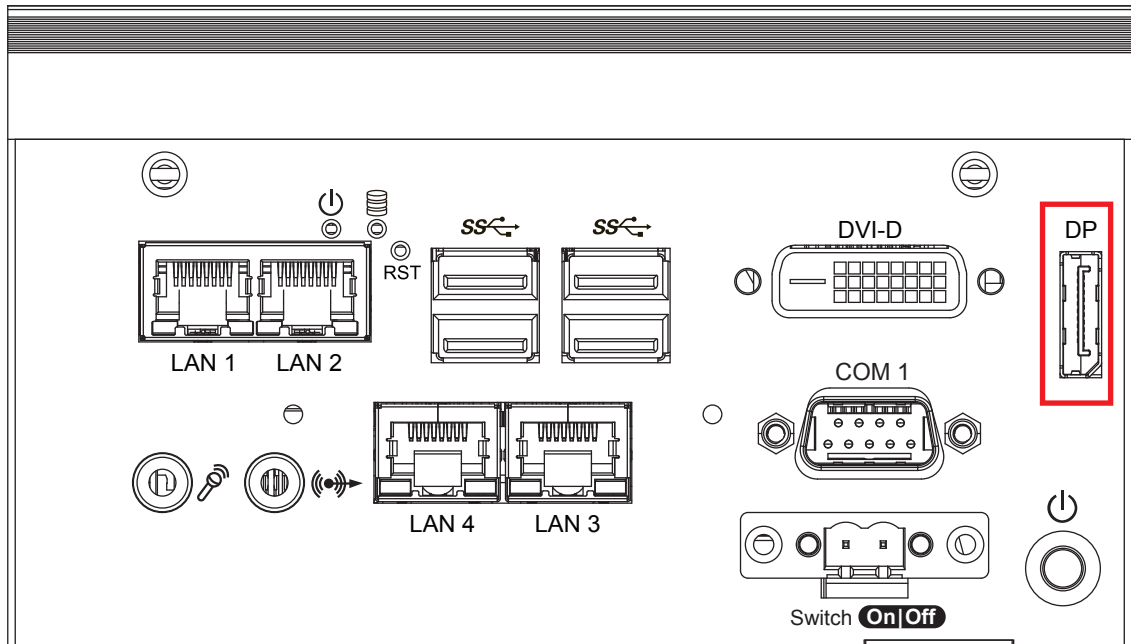
LED Color	Power Status	System Status
Yellow	HDD	<ul style="list-style-type: none"> • On/ Off : Storage status, function or not. • Twinkling : Data transferring.
Green	Power	System power status (on/ off)

2.2.5.4 DVI-D Connector



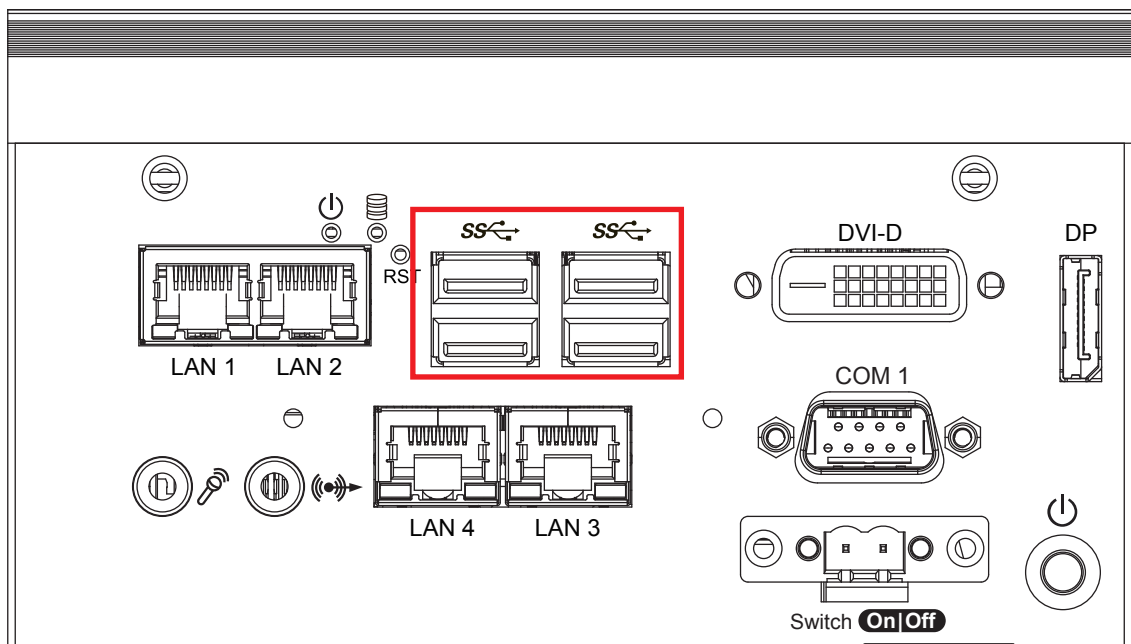
The DVI-D connector on the front panel supports both DVI display. This connector can either output DVI signals signal. The DVI output mode supports up to 1920 x 1200 resolution and output mode supports up to 1920 x 1200 resolution. The DVI is automatically selected according to the display device connected. You will need a DVI-D cable when connecting to a display device.

2.2.5.5 DisplayPort



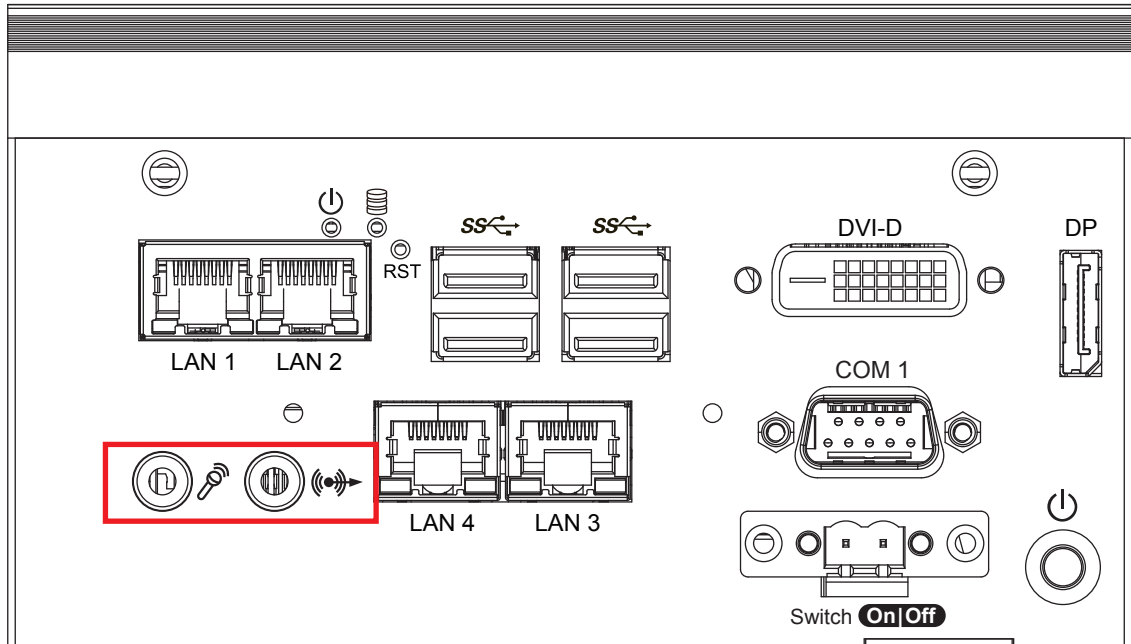
Onboard DisplayPort connection supports up to 4096 x 2304 resolution at 60Hz.

2.2.5.6 USB 3.0



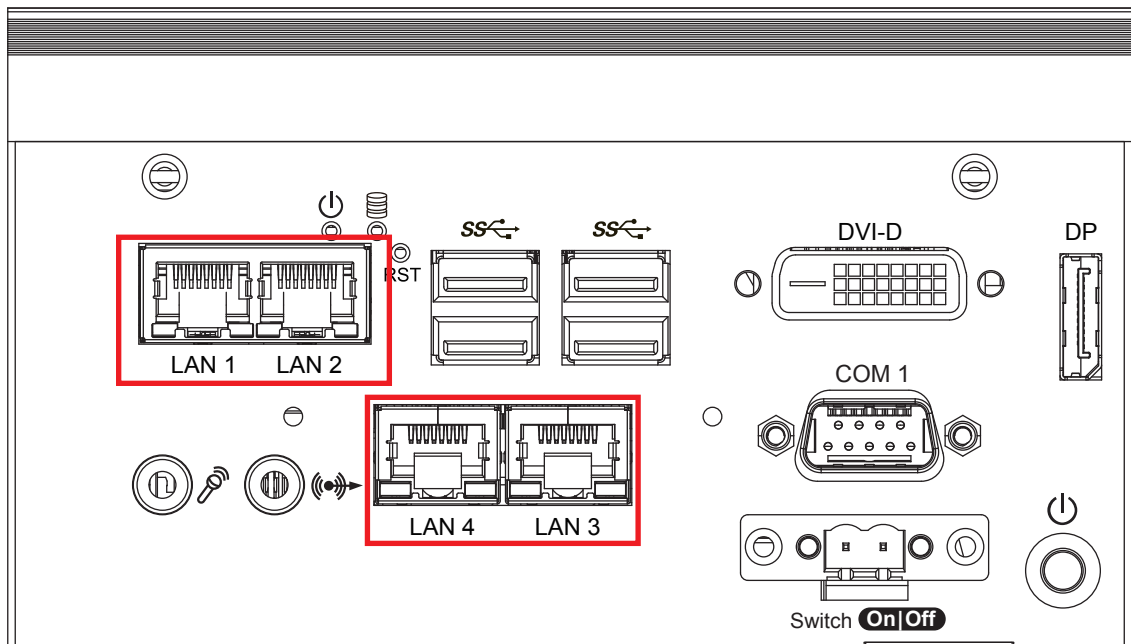
There are 4 USB 3.0 connections available supporting up to 5GB per second data rate in the front side of SPC-3520. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.2.5.7 Audio Jack



There are 2 audio connectors, Mic-in and Line-out, in the front side of SPC-3520. Onboard Realtek ALC888S-VD audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications. To utilize the audio function in Windows platform, you need to install corresponding drivers for Realtek ALC888S-VD codec.

2.2.5.8 10/ 100/ 1000 Mbps Ethernet Port

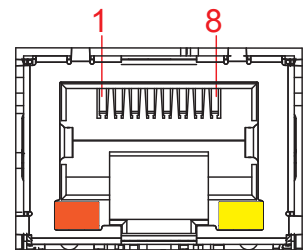


There are 4 8-pin RJ-45 jacks supporting 10/ 100/1000 Mbps Ethernet connections in the front side. LAN 1 is powered by Intel i219 Ethernet Phy; LAN 2 – 4 are powered by Intel I210 Ethernet engine. When all LAN ports work in normal status, iAMT 11.0 function is enabled. Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, All of LAN ports supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 - 4 are listed as follows:

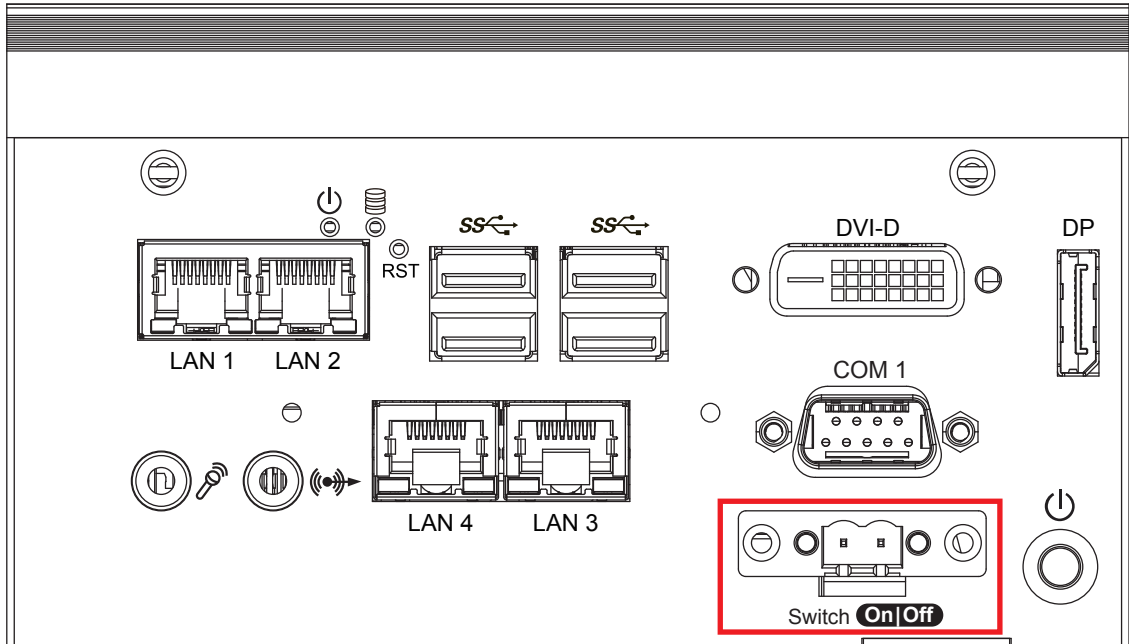
Pin No.	10/ 100Mbps	1000Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	----	MDI2_P
5	-----	MDI2_N
6	E_RX-	MDI1_N
7	-----	MDI3_P
8	-----	MDI3_N

Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/ Link/ Speed status of the connection. The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100 Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/ off when Ethernet data packets are being transmitted/ received.

	10Mbps	100Mbps	1000Mbps
Right Bottom Led	Off	Solid Green	Solid Orange
Left Bottom Led	Flash Yellow	Flash Yellow	Flash Yellow



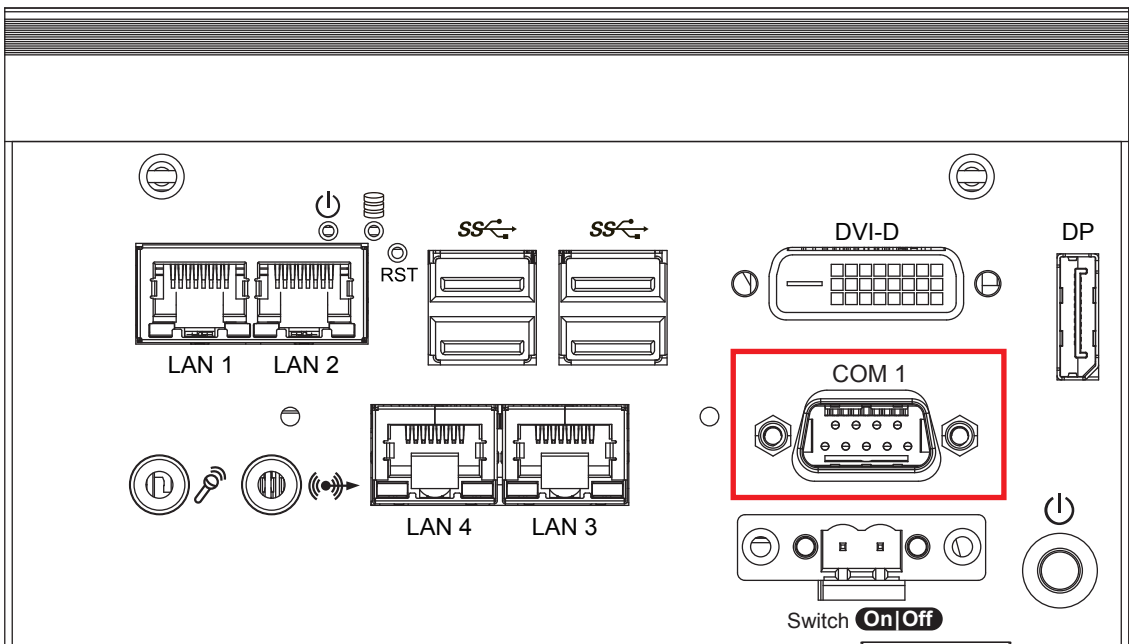
2.2.5.9 Remote Power On/ Off Switch



It is a 2-pin power-on/power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function on soft power-on/power-off (instant off or delay four seconds), and suspend mode.

Pin No.	Definition	Pin No.	Definition
1	SW+	2	SW-

2.2.5.10 Serial Port COM



Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

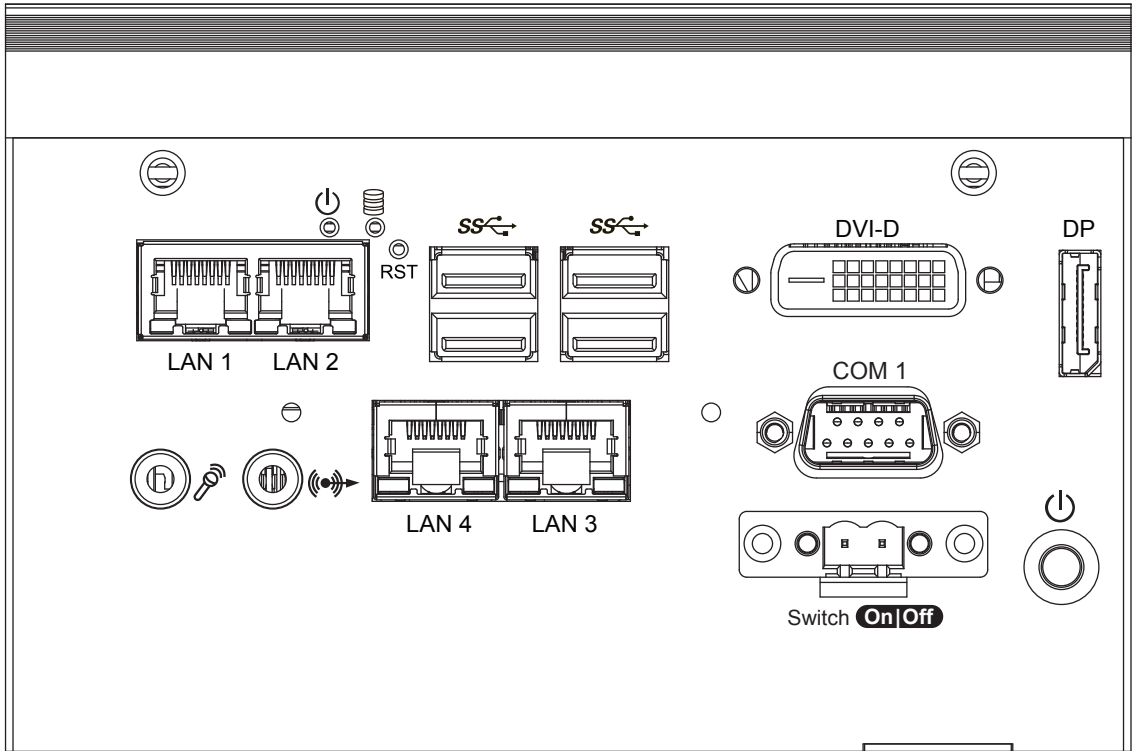
BIOS Setting	Function
COM 1	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed in the table as follow :

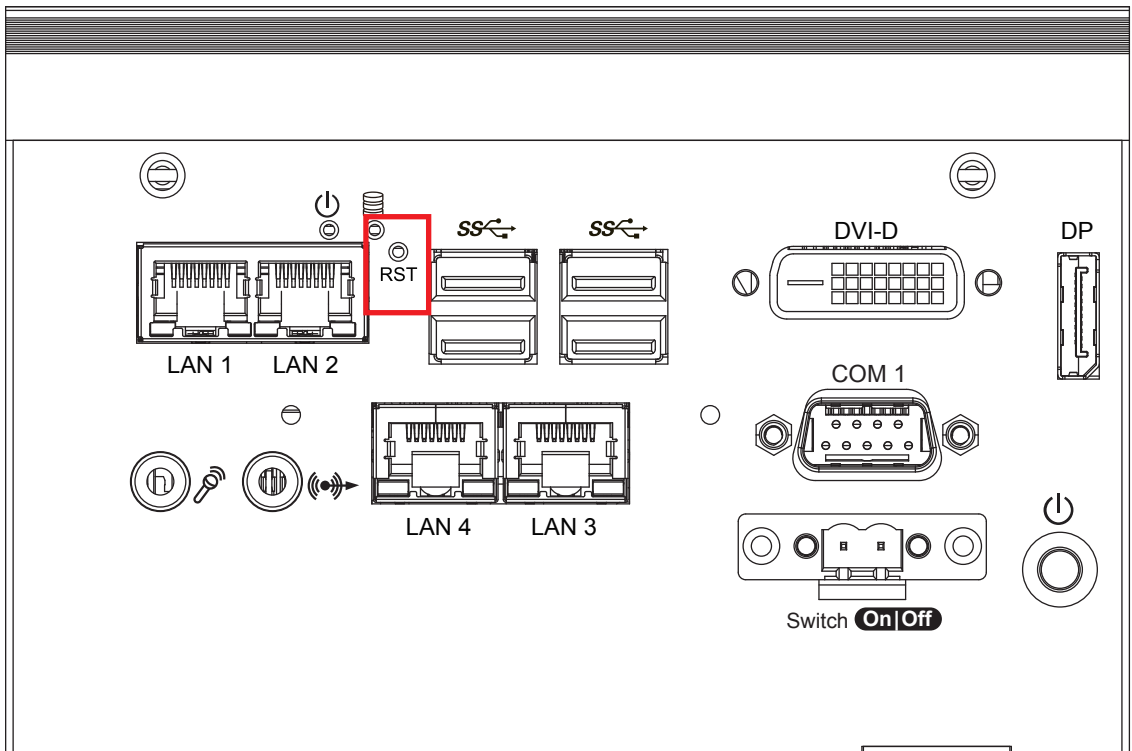
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
COM 1	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
	6	DSR	-----	RTS-	-----
	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

2.2.6 SPC-3530 Front I/O & Functions

In Vecow's SPC-3500 series family, all I/O connectors are located on the front panel. Most of the general connections to the computer device, such as audio, USB, DVI-D, LAN Jack, and DisplayPort, are placed on the front panel.

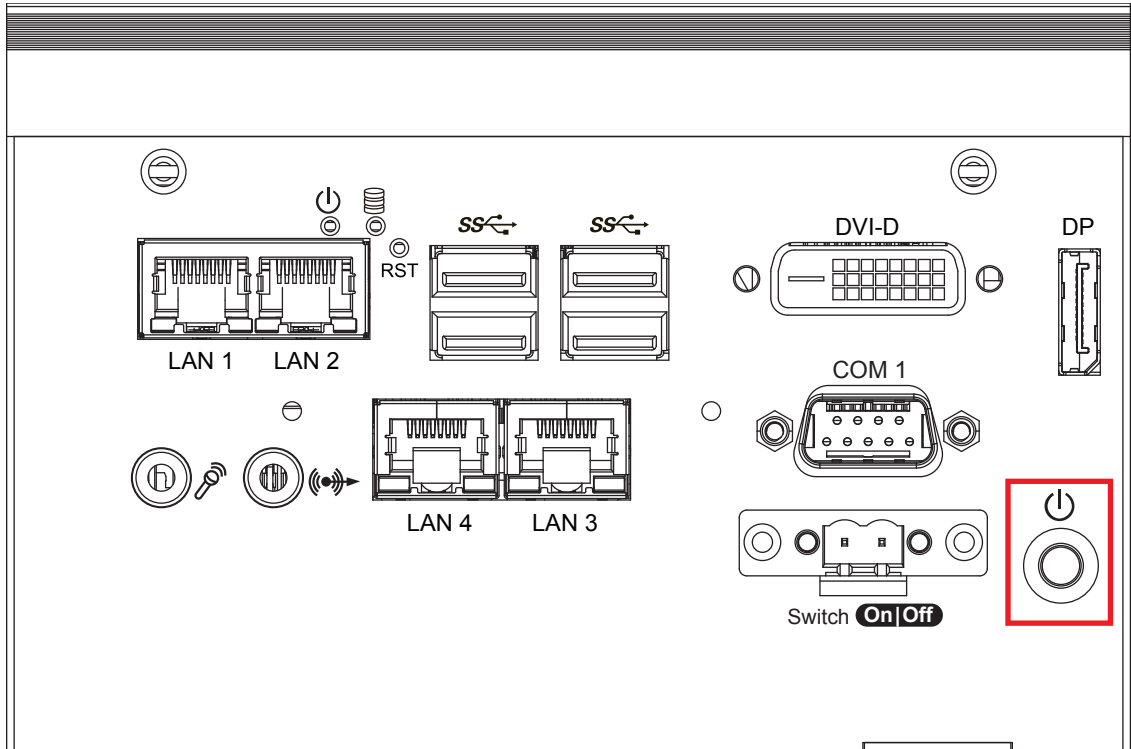


2.2.6.1 Reset Tact Switch



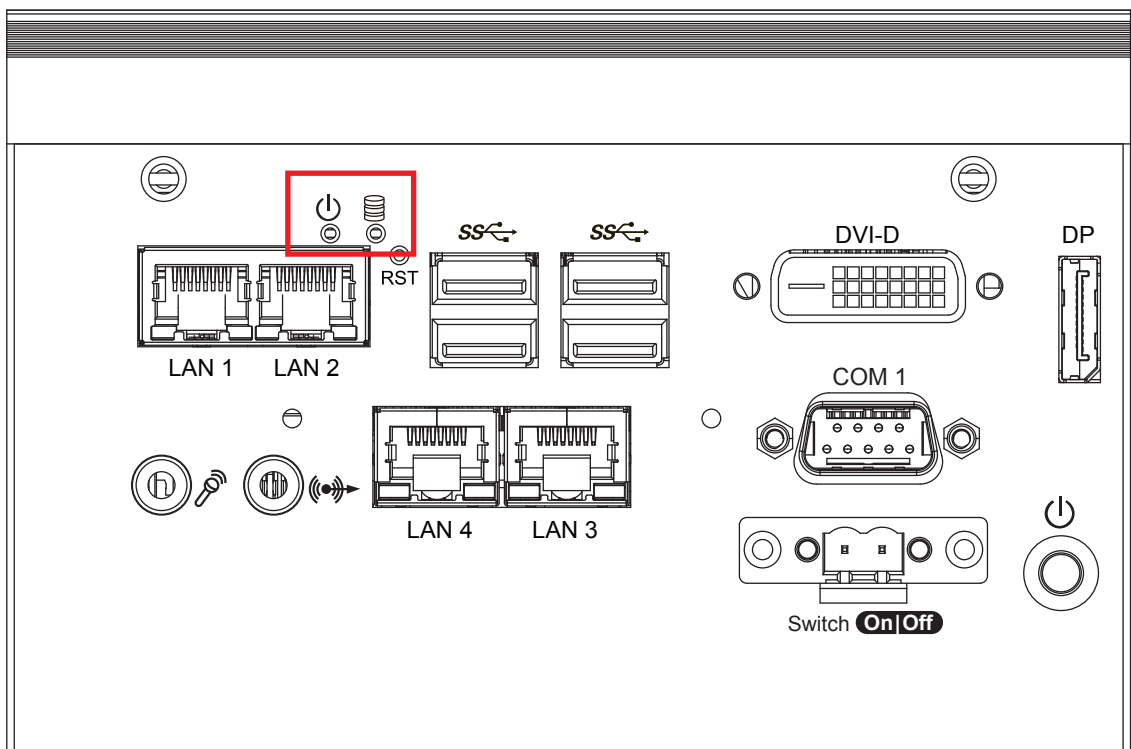
It is a hardware reset switch. Use this switch to reset the system without power off the system. Press the Reset Switch for a few seconds, then reset will be enabled.

2.2.6.2 Power Button



The power button is a non-latched switch. In case of system halts, you can press and hold the power button for 4 seconds to compulsorily shut down the system. Please note that a 4 seconds interval is kept by the system between two on/off operations (i.e. once turning off the system, you shall wait for 4 seconds to initiate another power-on operation).

2.2.6.3 PWR and HDD LED Indicator

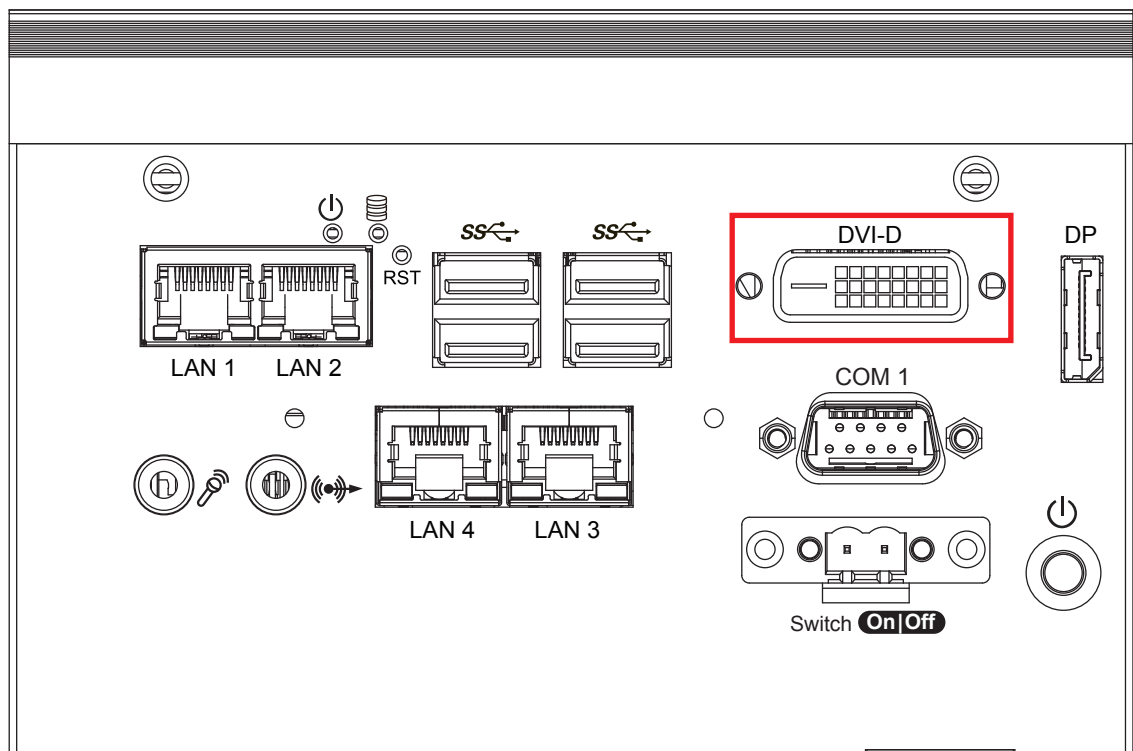


Yellow-HDD LED: A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities are in progress.

Green-Power LED: If the LED is solid green, it indicates that the system is powered on.

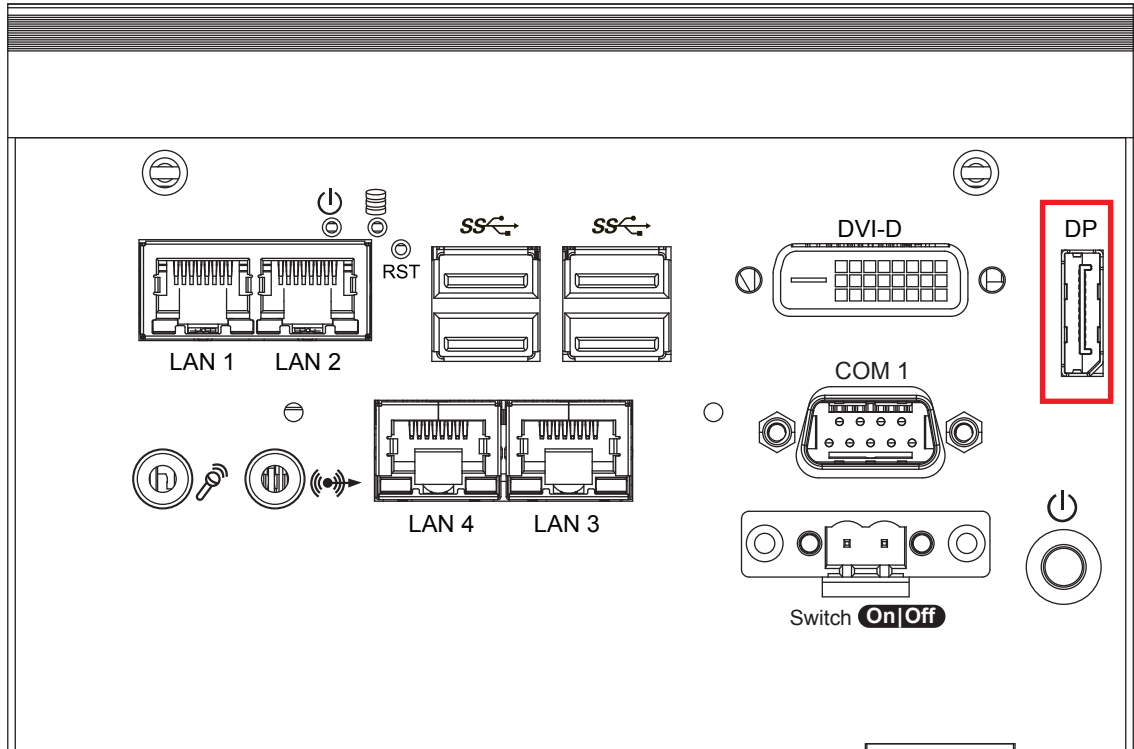
LED Color	Power Status	System Status
Yellow	HDD	<ul style="list-style-type: none"> • On/ Off : Storage status, function or not. • Twinkling : Data transferring.
Green	Power	System power status (on/ off)

2.2.6.4 DVI-D Connector



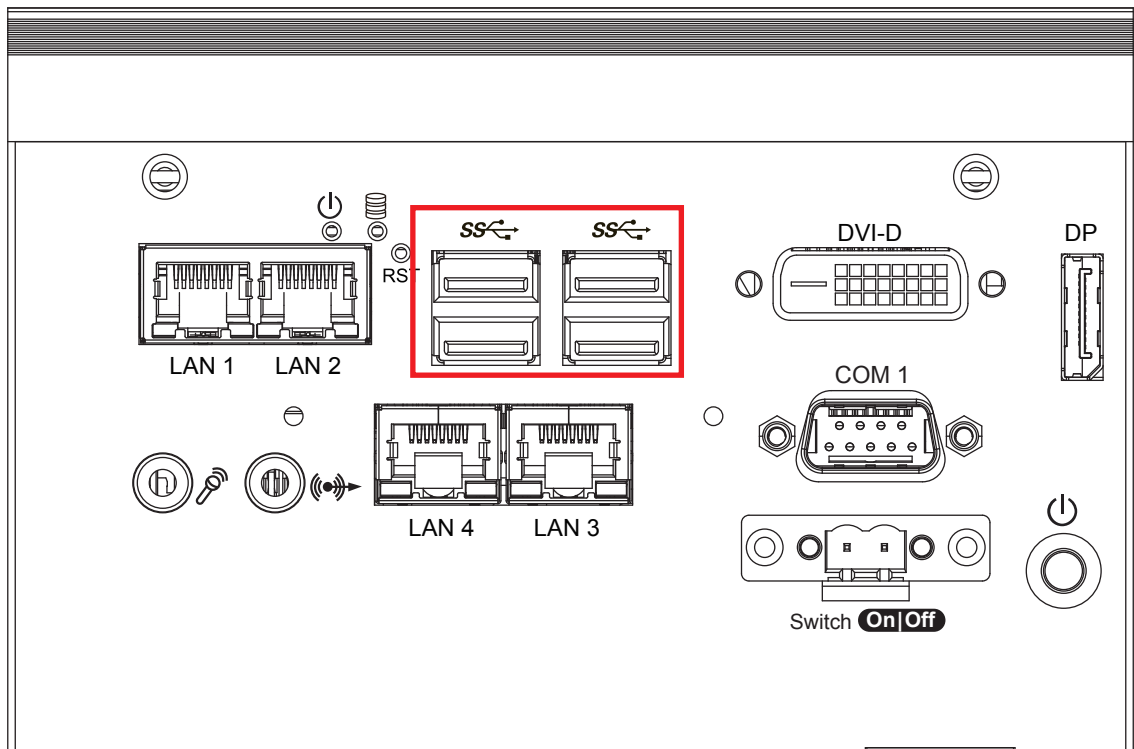
The DVI-D connector on the front panel supports both DVI display. This connector can either output DVI signals signal. The DVI output mode supports up to 1920 x 1200 resolution and output mode supports up to 1920 x 1200 resolution. The DVI is automatically selected according to the display device connected. You will need a DVI-D cable when connecting to a display device.

2.2.6.5 DisplayPort



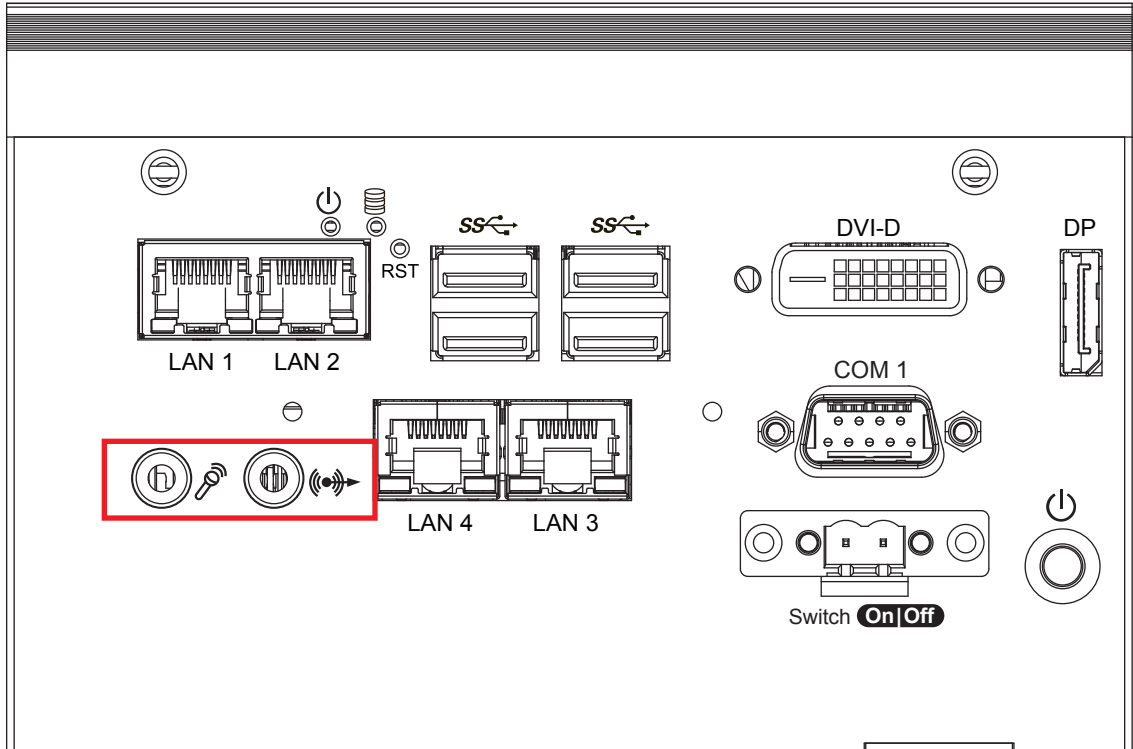
Onboard DisplayPort connection supports up to 4096 x 2304 resolution at 60Hz.

2.2.6.6 USB 3.0



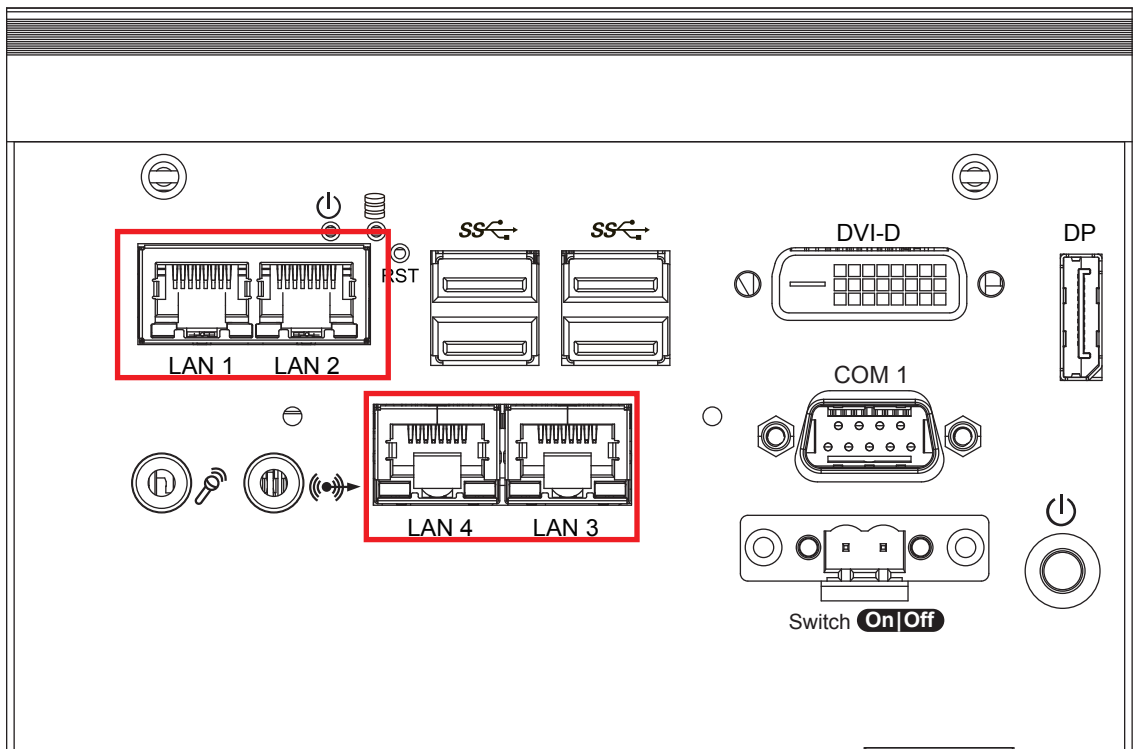
There are 4 USB 3.0 connections available supporting up to 5GB per second data rate in the front side of SPC-3530. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.2.6.7 Audio Jack



There are 2 audio connectors, Mic-in and Line-out, in the front side of SPC-3530. Onboard Realtek ALC888S-VD audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications. To utilize the audio function in Windows platform, you need to install corresponding drivers for Realtek ALC888S-VD codec.

2.2.6.8 10/ 100/ 1000 Mbps Ethernet Port

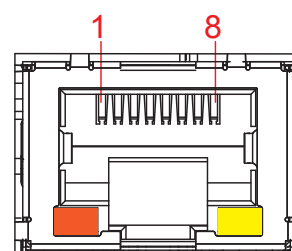


There are 4 8-pin RJ-45 jacks supporting 10/ 100/1000 Mbps Ethernet connections in the front side. LAN 1 is powered by Intel i219 Ethernet Phy; LAN 2 – 4 are powered by Intel I210 Ethernet engine. When all LAN ports work in normal status, iAMT 11.0 function is enabled. Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, All of LAN ports supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 - 4 are listed as follows:

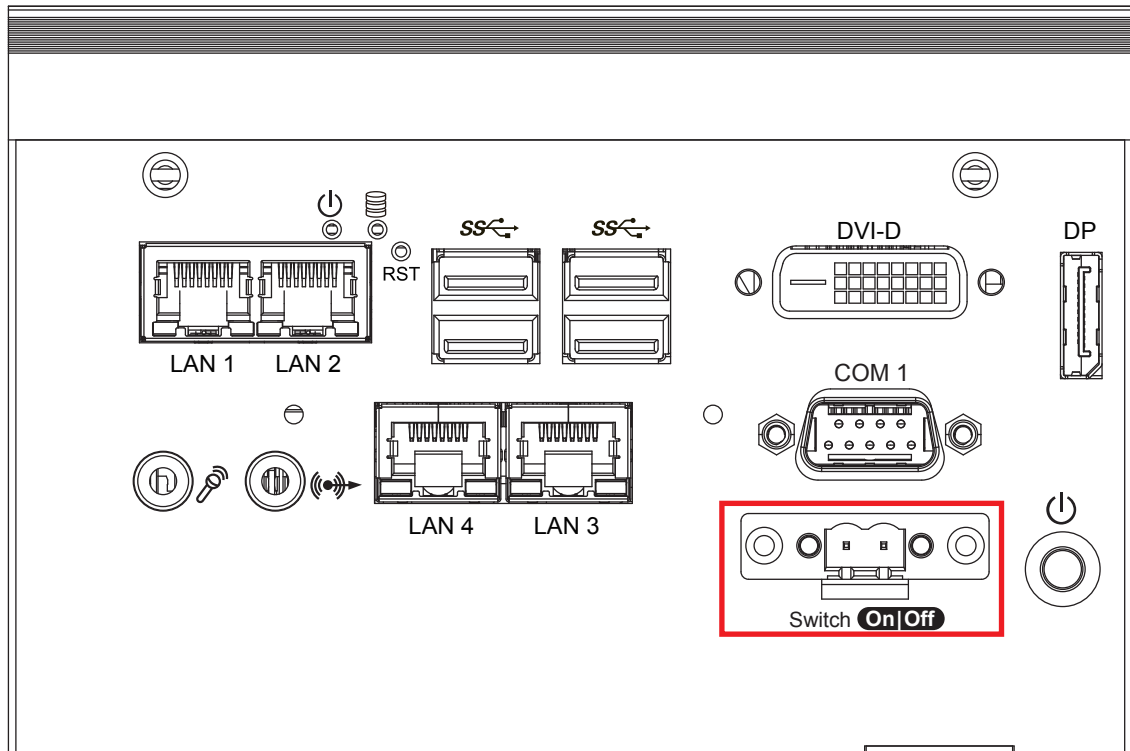
Pin No.	10/ 100Mbps	1000Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	----	MDI2_P
5	-----	MDI2_N
6	E_RX-	MDI1_N
7	-----	MDI3_P
8	-----	MDI3_N

Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/ Link/ Speed status of the connection. The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100 Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/ off when Ethernet data packets are being transmitted/ received.

	10Mbps	100Mbps	1000Mbps
Right Bottom Led	Off	Solid Green	Solid Orange
Left Bottom Led	Flash Yellow	Flash Yellow	Flash Yellow



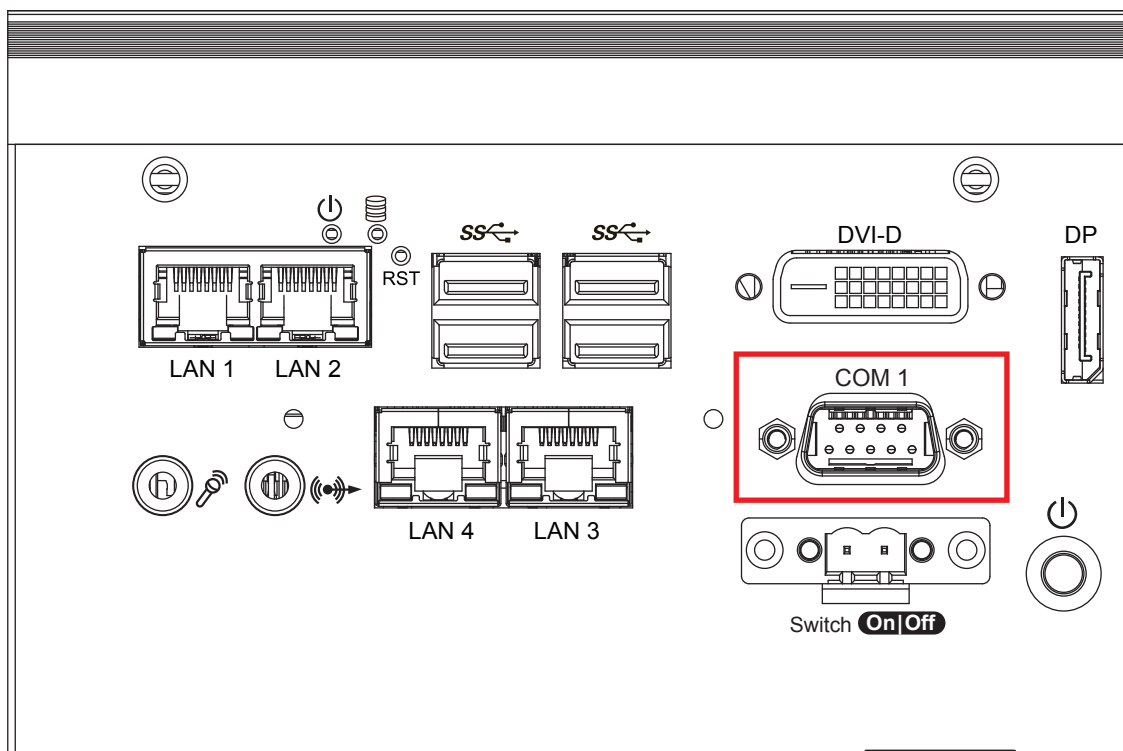
2.2.6.9 Remote Power On/ Off Switch



It is a 2-pin power-on/power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function on soft power-on/power-off (instant off or delay four seconds), and suspend mode.

Pin No.	Definition	Pin No.	Definition
1	SW+	2	SW-

2.2.6.10 Serial Port COM



Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

BIOS Setting	Function
COM 1	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control

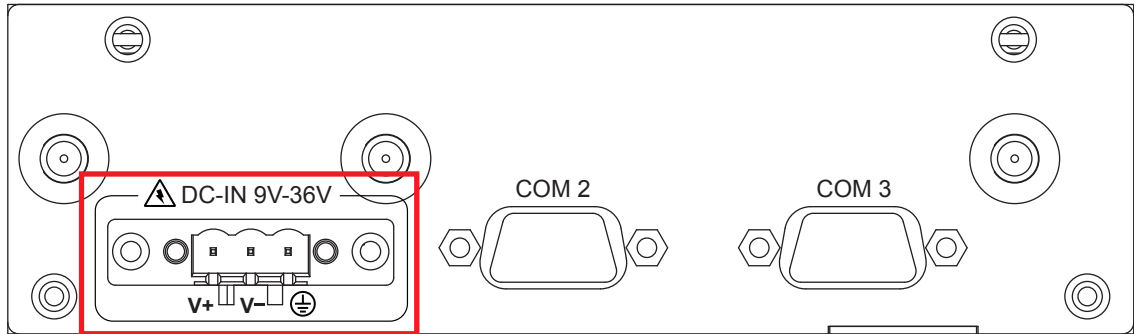
The pin assignments are listed in the table as follow :

Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
COM 1	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
	6	DSR	-----	RTS-	-----
	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

2.3 Rear Panel I/O Functions

2.3.1 SPC-3010 Rear I/O & Functions

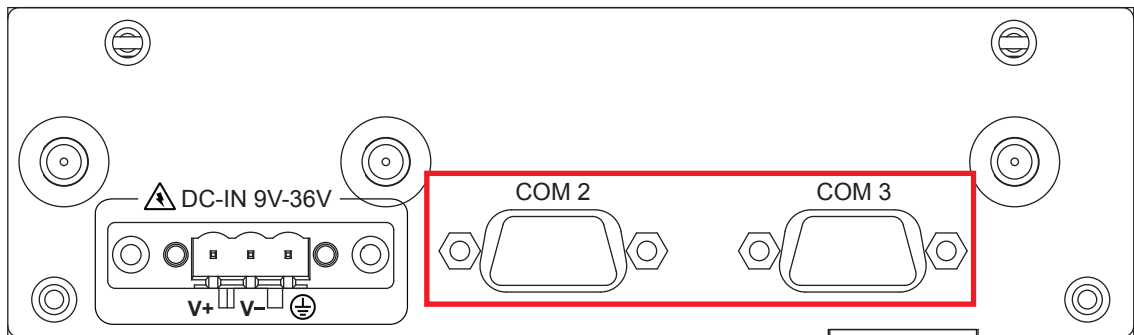
2.3.1.1 Power Terminal Block



SPC-3010 supports 9V to 36V DC power input.

Pin No.	Definition	Pin No.	Definition
1	V+	2	V-
3	Earth GND		

2.3.1.2 Serial Port COM



Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

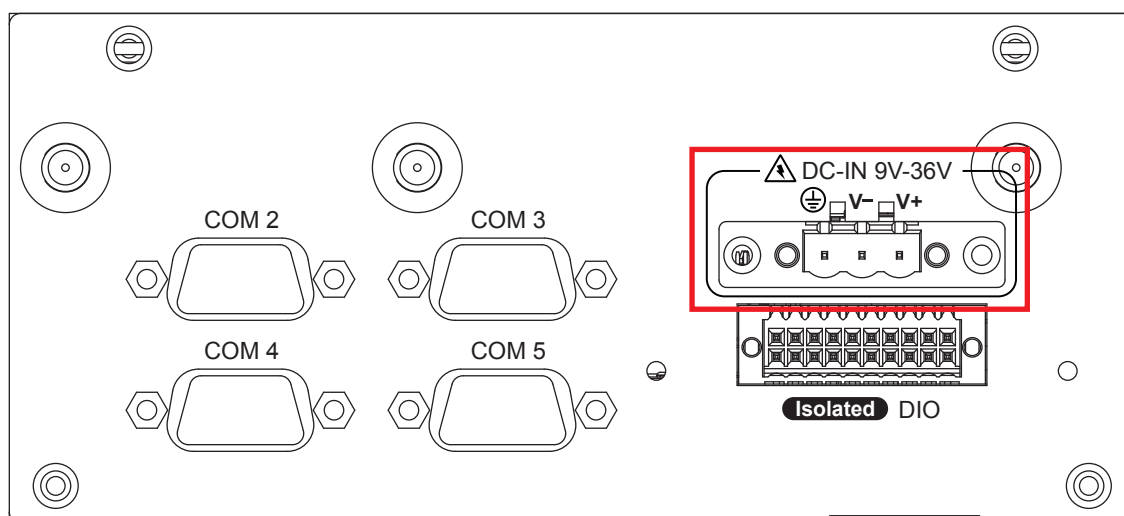
BIOS Setting	Function
COM 2	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
COM 3	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed in the table as follow :

Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
COM 2 COM 3	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
	6	DSR	-----	RTS-	-----
	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

2.3.2 SPC-3020 Rear I/O & Functions

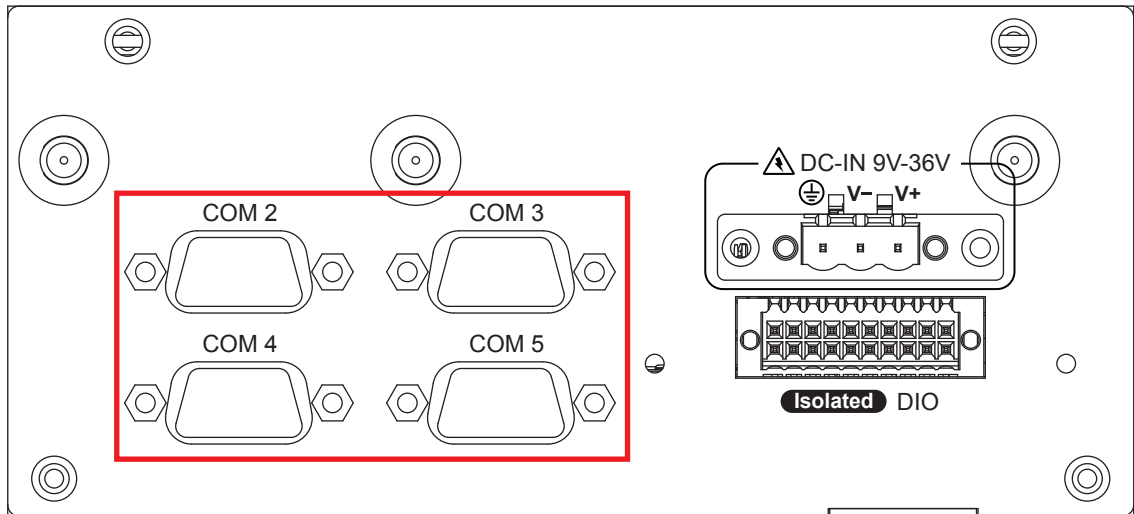
2.3.2.1 Power Terminal Block



SPC-3020 supports 9V to 36V DC power input.

Pin No.	Definition	Pin No.	Definition
1	V+	2	V-
3	Earth GND		

2.3.2.2 Serial Port COM



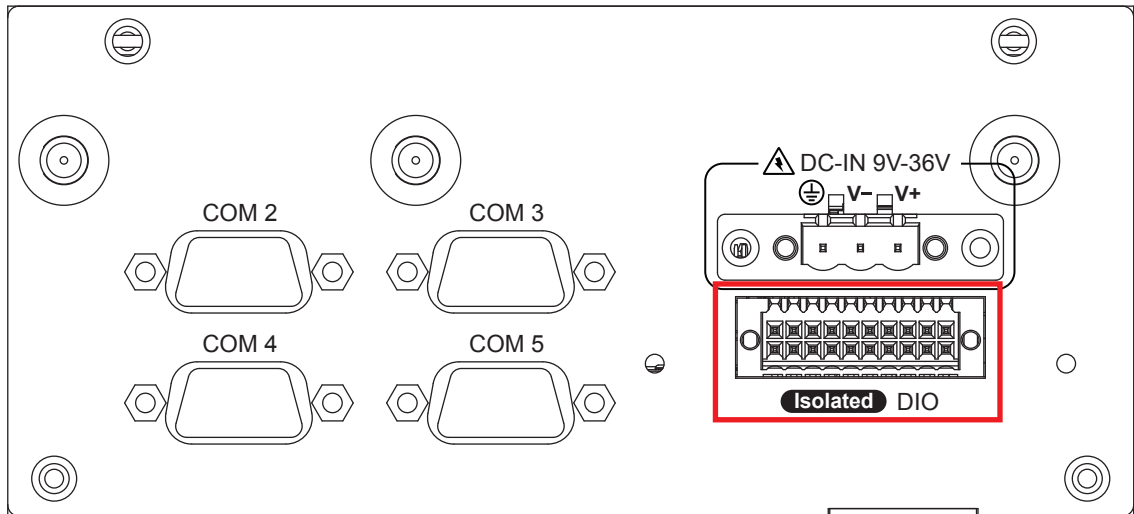
Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

BIOS Setting	Function
COM 2 COM 3 COM 4 COM 5	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed in the table as follow :

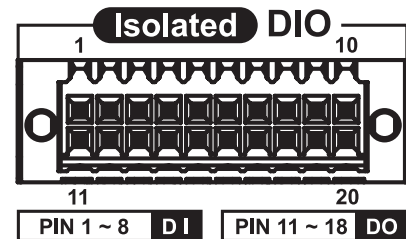
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
COM 2	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
COM 3	5	GND	GND	GND	GND
COM 4	6	DSR	-----	RTS-	-----
COM 5	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

2.3.2.3 Isolated DIO



There is a 16-bit DIO (8-bit DI, 8-bit DO) connector in the rear side. Each DIO channel is equipped with a photocoupler for isolated protection. A power buffer device, TPD2007F, is integrated in 8-DO circuit for motors, solenoids, and lamp driver applications.

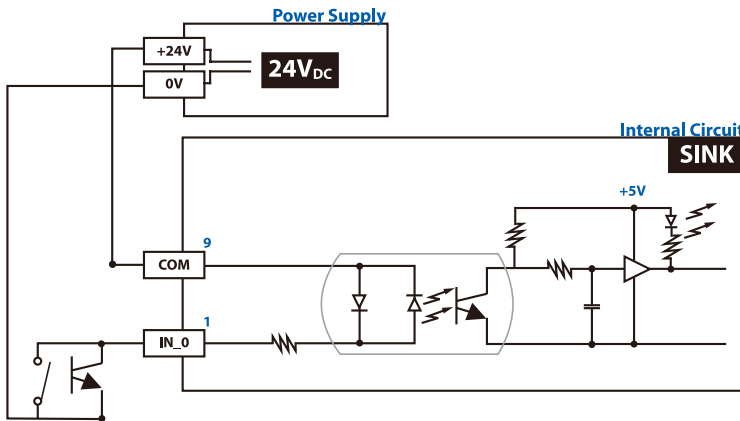
Pin No.	Definition
1	INPUT 0
2	INPUT 1
3	INPUT 2
4	INPUT 3
5	INPUT 4
6	INPUT 5
7	INPUT 6
8	INPUT 7
9	DI_COM
10	DIO_GND
11	OUTPUT 0
12	OUTPUT 1



13	OUTPUT 2
14	OUTPUT 3
15	OUTPUT 4
16	OUTPUT 5
17	OUTPUT 6
18	OUTPUT 7
19	DIO_GND
20	External 6V to 36V DC Input

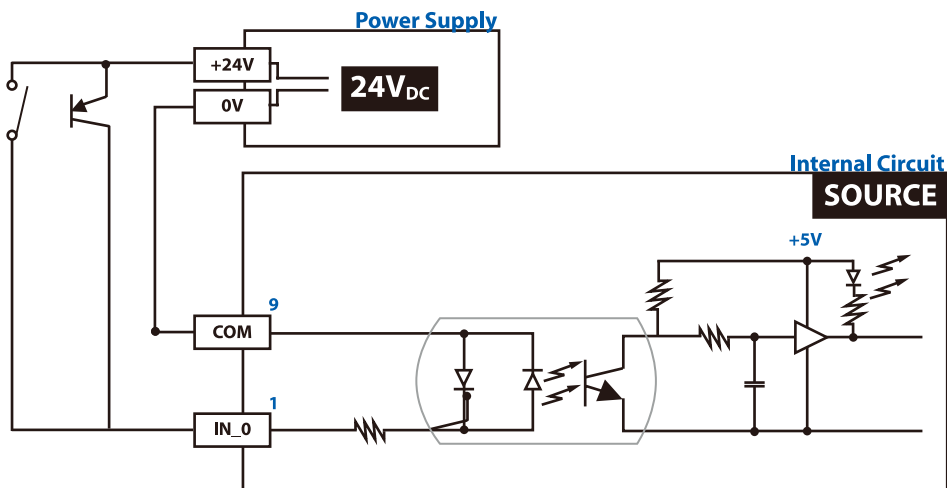
GPI SINK Mode

Isolated GPI input circuit in SINK mode (NPN) is illustrated as follow :



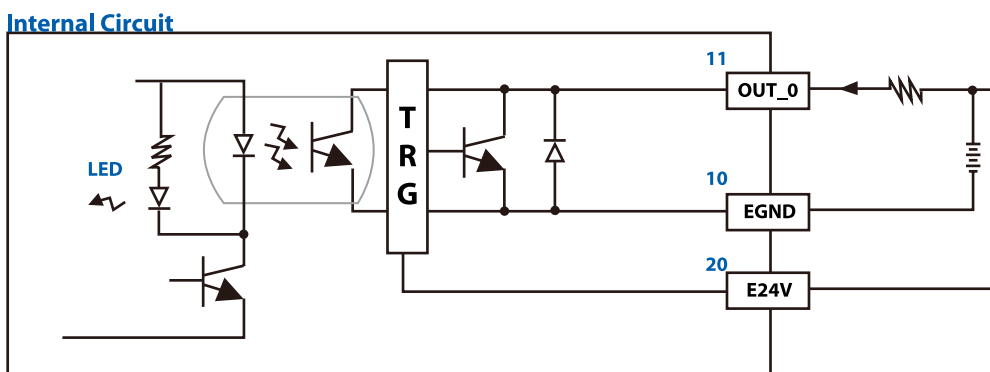
GPI SOURCE Mode

Digital GPI input signal circuit in SOURCE mode (PNP) is illustrated as follow :



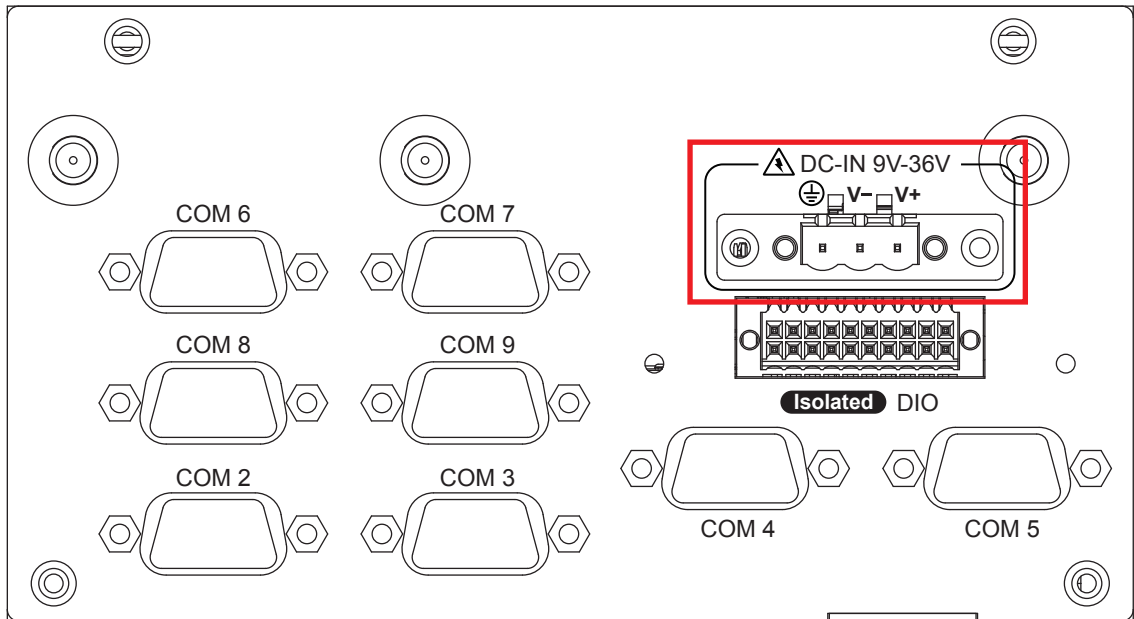
GPO SINK Mode

Digital GPO output circuit in SINK mode (NPN) is illustrated as follow :



2.3.3 SPC-3030 Rear I/O & Functions

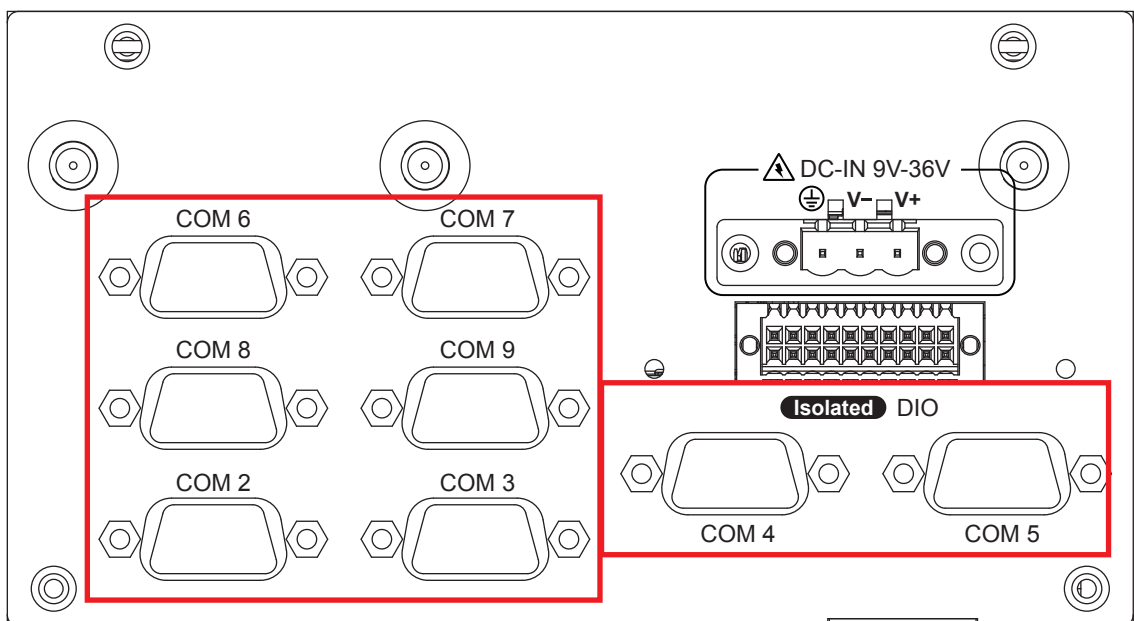
2.3.3.1 Power Terminal Block



SPC-3030 supports 9V to 36V DC power input.

Pin No.	Definition	Pin No.	Definition
1	V+	2	V-
3	Earth GND		

2.3.3.2 Serial Port COM



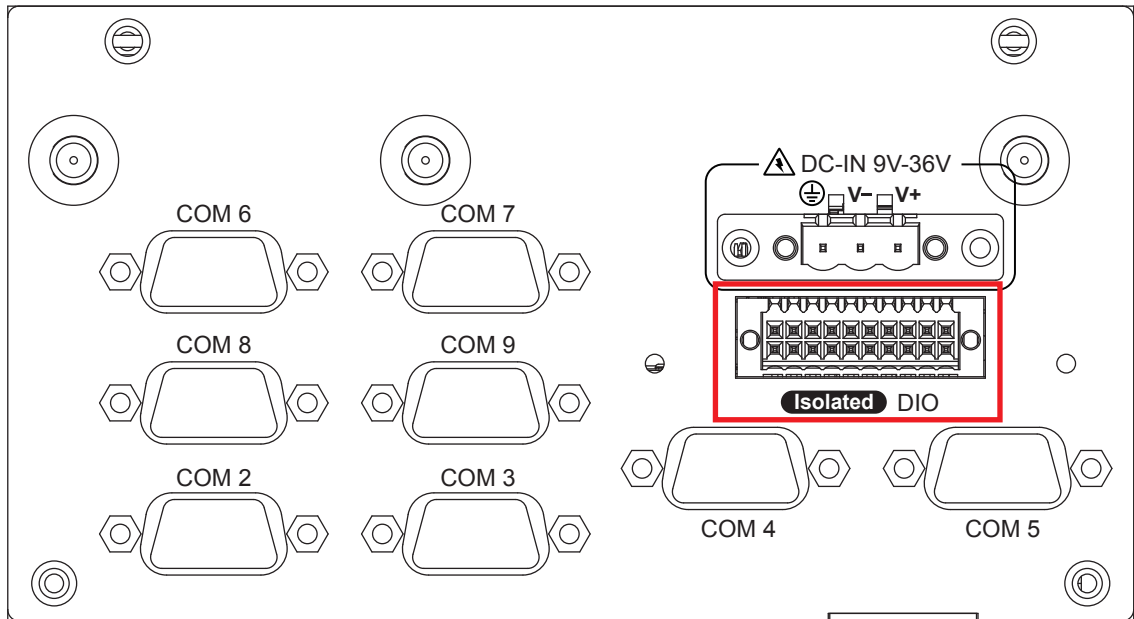
Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

BIOS Setting	Function
COM 2, COM 3, COM 4, COM 5, COM 6, COM 7, COM 8, COM 9	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed in the table as follow :

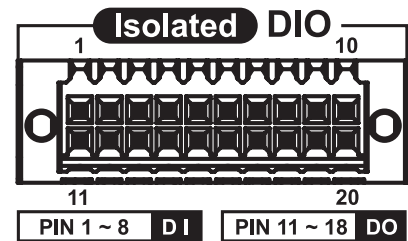
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
COM 2 to 9	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
	6	DSR	-----	RTS-	-----
	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

2.3.3.3 Isolated DIO



There is a 16-bit DIO (8-bit DI, 8-bit DO) connector in the rear side. Each DIO channel is equipped with a photocoupler for isolated protection. A power buffer device, TPD2007F, is integrated in 8-DO circuit for motors, solenoids, and lamp driver applications.

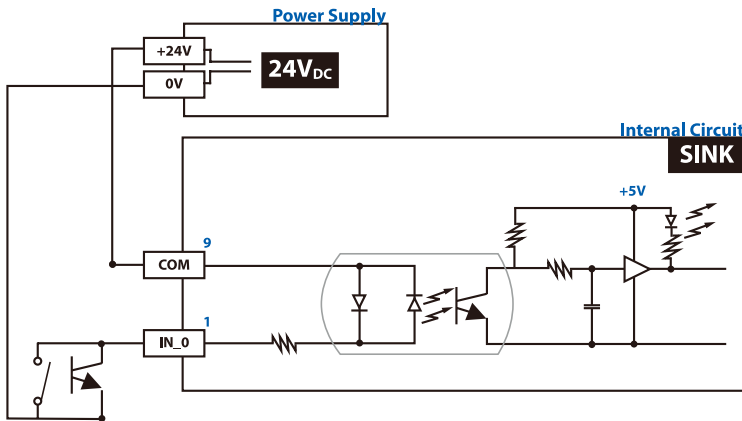
Pin No.	Definition
1	INPUT 0
2	INPUT 1
3	INPUT 2
4	INPUT 3
5	INPUT 4
6	INPUT 5
7	INPUT 6
8	INPUT 7
9	DI_COM
10	DIO_GND
11	OUTPUT 0
12	OUTPUT 1



13	OUTPUT 2
14	OUTPUT 3
15	OUTPUT 4
16	OUTPUT 5
17	OUTPUT 6
18	OUTPUT 7
19	DIO_GND
20	External 6V to 36V DC Input

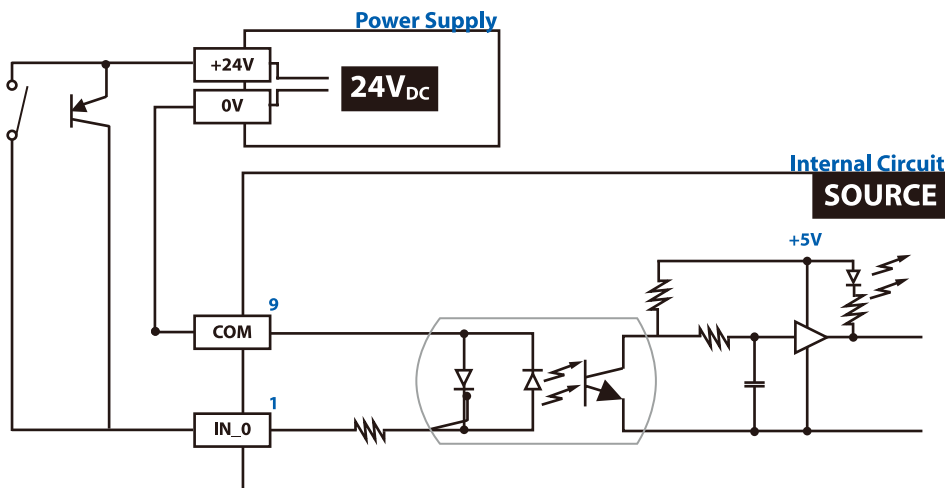
GPI SINK Mode

Isolated GPI input circuit in SINK mode (NPN) is illustrated as follow :



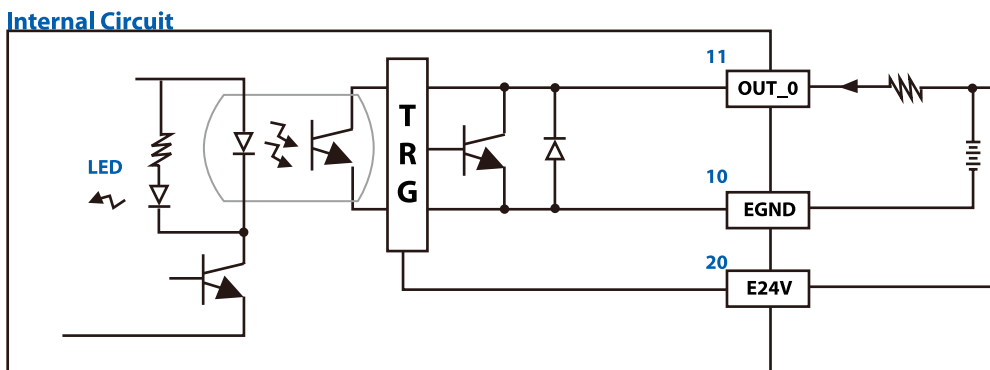
GPI SOURCE Mode

Digital GPI input signal circuit in SOURCE mode (PNP) is illustrated as follow :



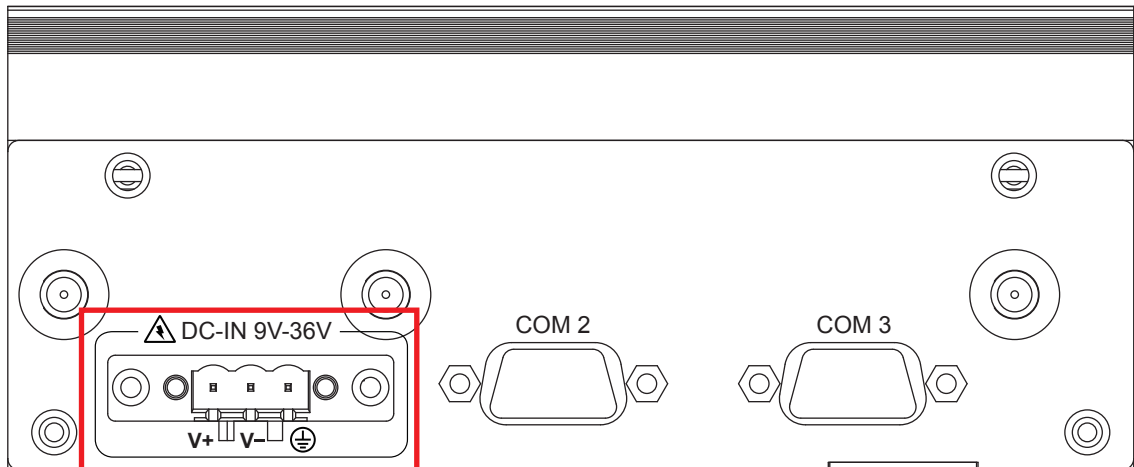
GPO SINK Mode

Digital GPO output circuit in SINK mode (NPN) is illustrated as follow :



2.3.4 SPC-3510 Rear I/O & Functions

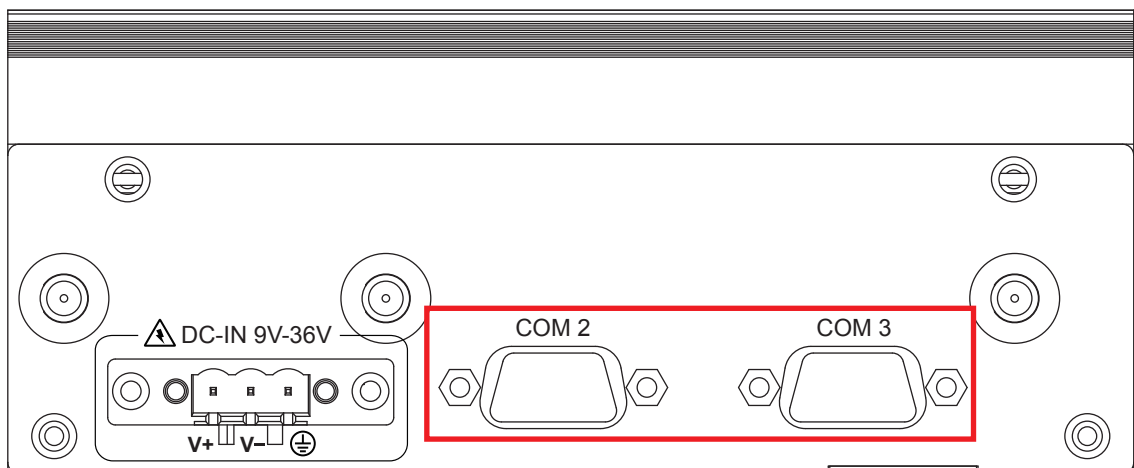
2.3.4.1 Power Terminal Block



SPC-3510 supports 9V to 36V DC power input.

Pin No.	Definition	Pin No.	Definition
1	V+	2	V-
3	Earth GND		

2.3.4.2 Serial Port COM



Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

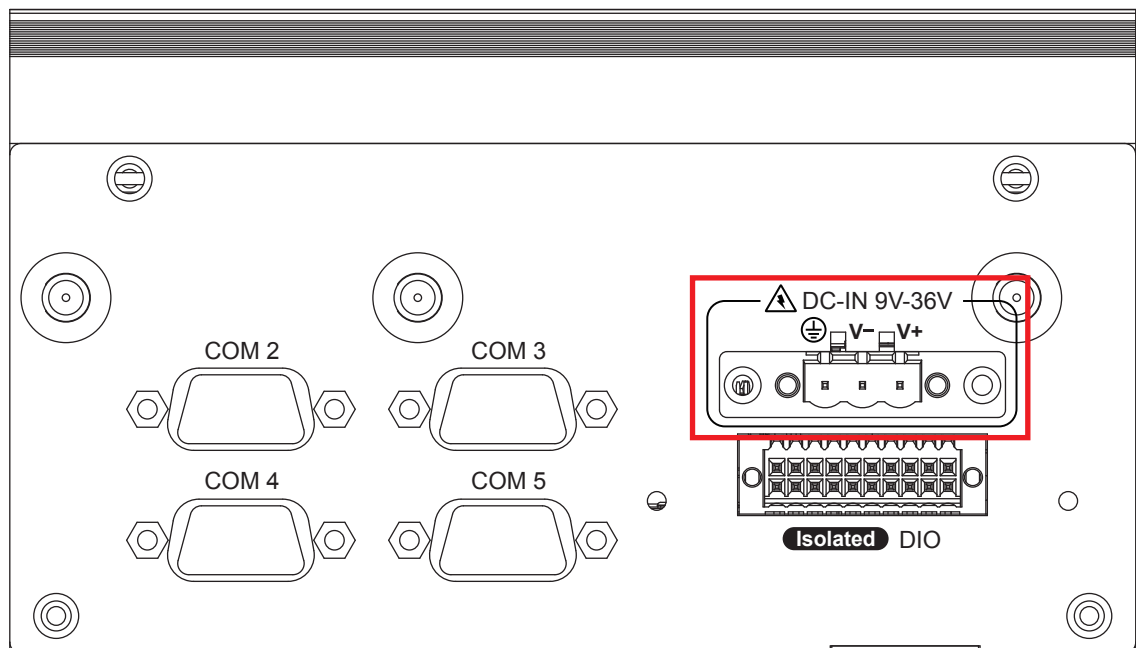
BIOS Setting	Function
COM 2	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
COM 3	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed in the table as follow :

Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
COM 2	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
COM 3	6	DSR	-----	RTS-	-----
	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

2.3.5 SPC-3520 Rear I/O & Functions

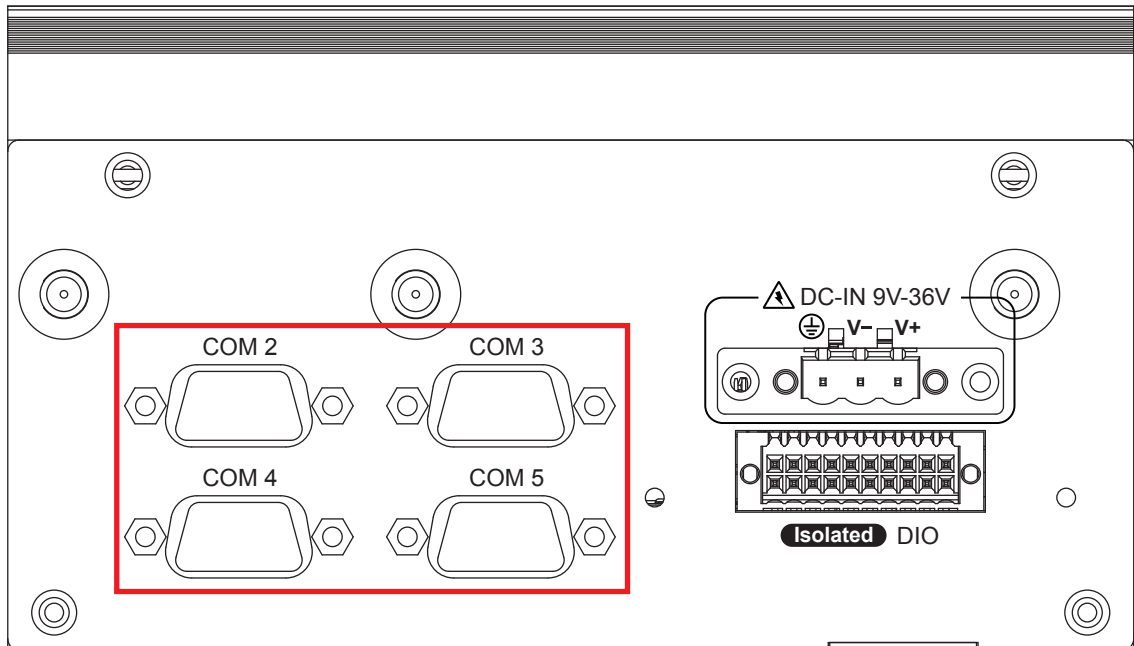
2.3.5.1 Power Terminal Block



SPC-3520 supports 9V to 36V DC power input.

Pin No.	Definition	Pin No.	Definition
1	V+	2	V-
3	Earth GND		

2.3.5.2 Serial Port COM



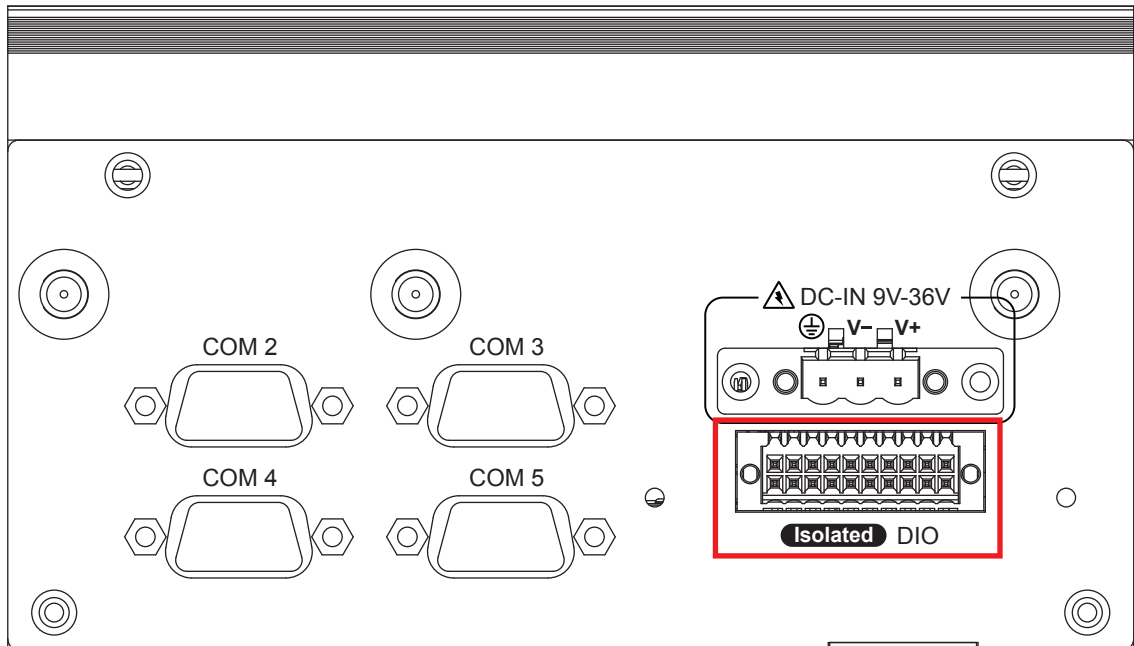
Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

BIOS Setting	Function
COM 2 COM 3 COM 4 COM 5	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed in the table as follow :

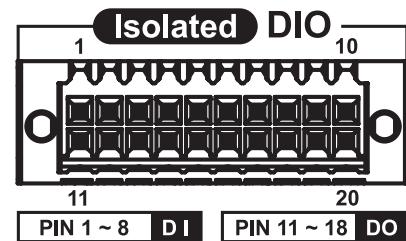
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
COM 2	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
COM 3	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
COM 4	6	DSR	-----	RTS-	-----
COM 5	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

2.3.5.3 Isolated DIO



There is a 16-bit DIO (8-bit DI, 8-bit DO) connector in the rear side. Each DIO channel is equipped with a photocoupler for isolated protection. A power buffer device, TPD2007F, is integrated in 8-DO circuit for motors, solenoids, and lamp driver applications.

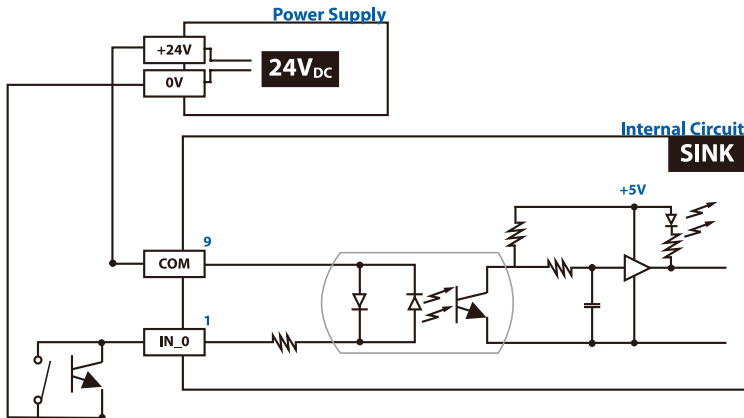
Pin No.	Definition
1	INPUT 0
2	INPUT 1
3	INPUT 2
4	INPUT 3
5	INPUT 4
6	INPUT 5
7	INPUT 6
8	INPUT 7
9	DI_COM
10	DIO_GND
11	OUTPUT 0
12	OUTPUT 1



13	OUTPUT 2
14	OUTPUT 3
15	OUTPUT 4
16	OUTPUT 5
17	OUTPUT 6
18	OUTPUT 7
19	DIO_GND
20	External 6V to 36V DC Input

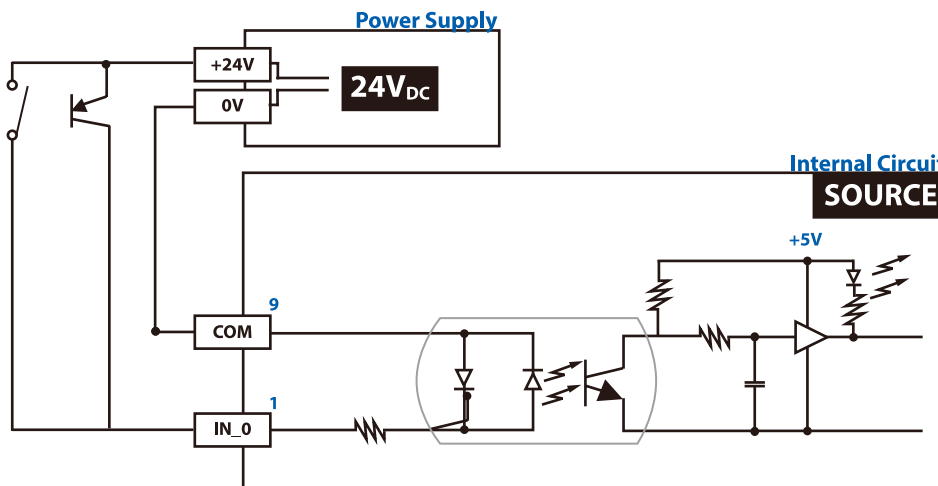
GPI SINK Mode

Isolated GPI input circuit in SINK mode (NPN) is illustrated as follow :



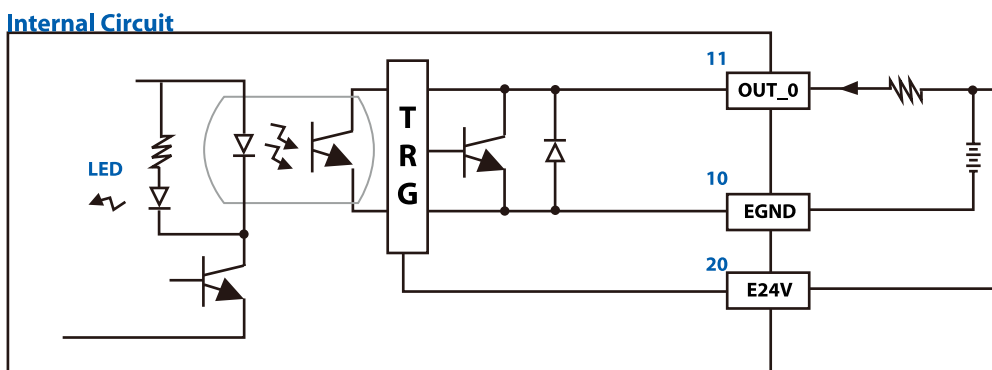
GPI SOURCE Mode

Digital GPI input signal circuit in SOURCE mode (PNP) is illustrated as follow :



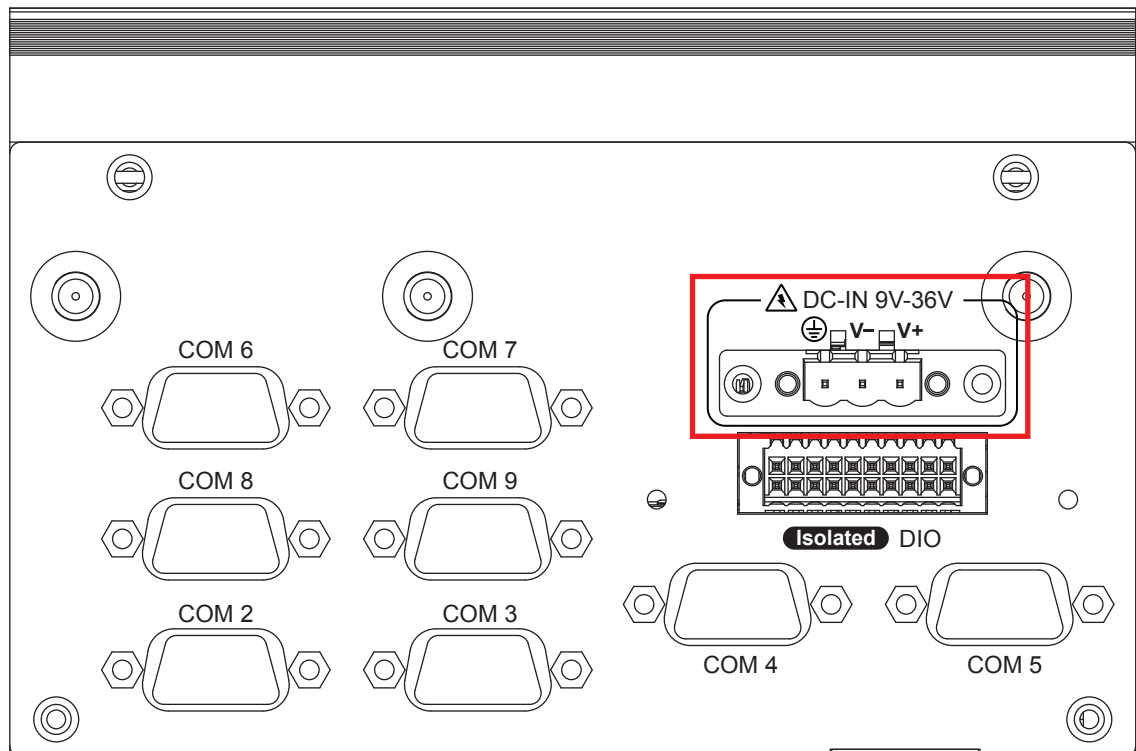
GPO SINK Mode

Digital GPO output circuit in SINK mode (NPN) is illustrated as follow :



2.3.6 SPC-3530 Rear I/O & Functions

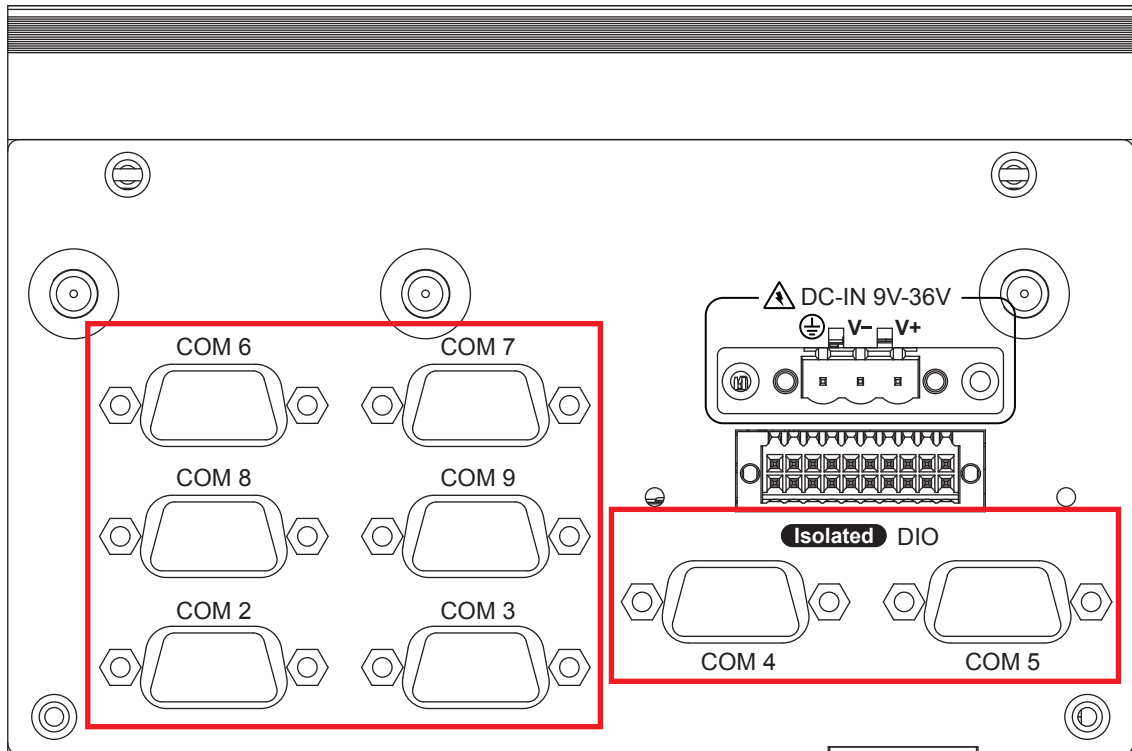
2.3.6.1 Power Terminal Block



SPC-3530 supports 9V to 36V DC power input.

Pin No.	Definition	Pin No.	Definition
1	V+	2	V-
3	Earth GND		

2.3.6.2 Serial Port COM



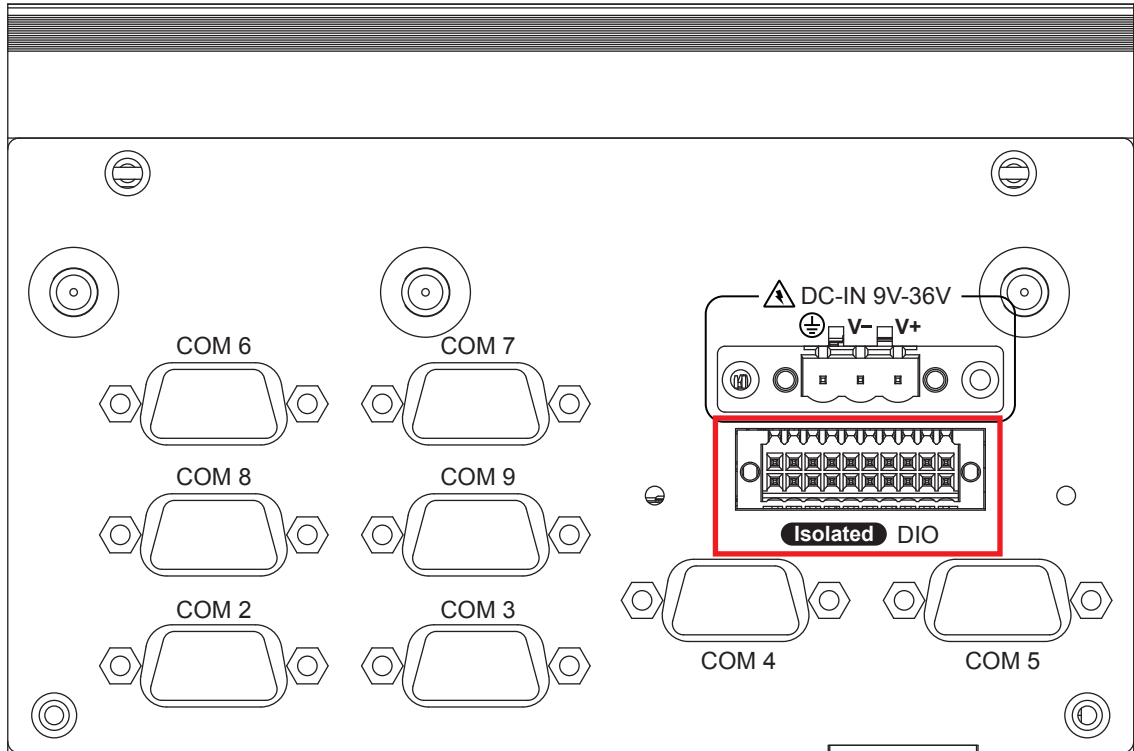
Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

BIOS Setting	Function
COM 2, COM 3, COM 4, COM 5, COM 6, COM 7, COM 8, COM 9	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed in the table as follow :

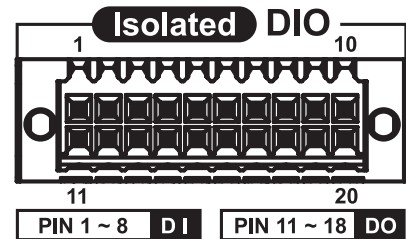
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
COM 2 to 9	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
	6	DSR	-----	RTS-	-----
	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

2.3.6.3 Isolated DIO



There is a 16-bit DIO (8-bit DI, 8-bit DO) connector in the rear side. Each DIO channel is equipped with a photocoupler for isolated protection. A power buffer device, TPD2007F, is integrated in 8-DO circuit for motors, solenoids, and lamp driver applications.

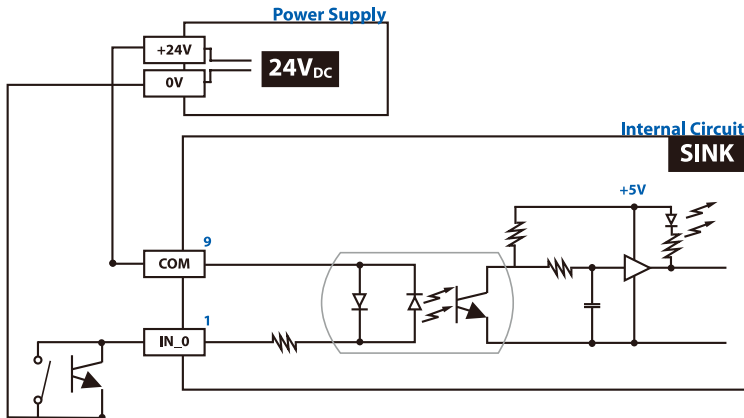
Pin No.	Definition
1	INPUT 0
2	INPUT 1
3	INPUT 2
4	INPUT 3
5	INPUT 4
6	INPUT 5
7	INPUT 6
8	INPUT 7
9	DI_COM
10	DIO_GND
11	OUTPUT 0



12	OUTPUT 1
13	OUTPUT 2
14	OUTPUT 3
15	OUTPUT 4
16	OUTPUT 5
17	OUTPUT 6
18	OUTPUT 7
19	DIO_GND
20	External 6V to 36V DC Input

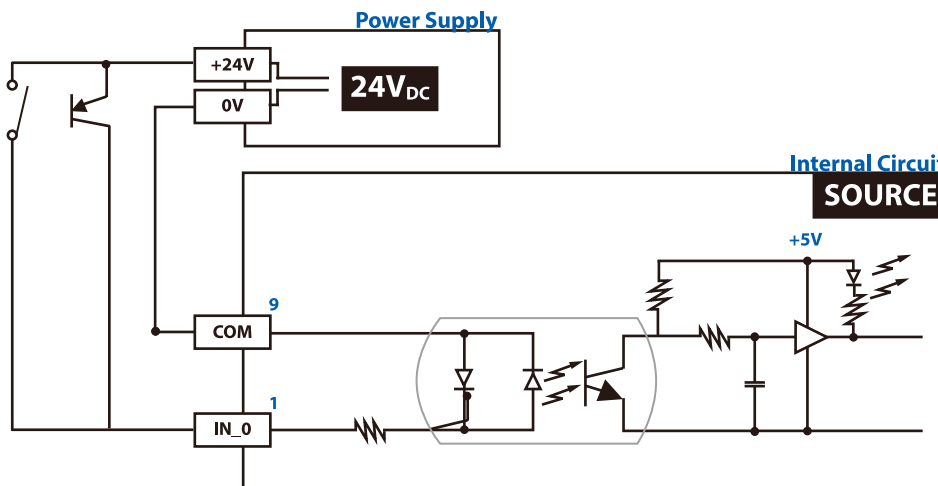
GPI SINK Mode

Isolated GPI input circuit in SINK mode (NPN) is illustrated as follow :



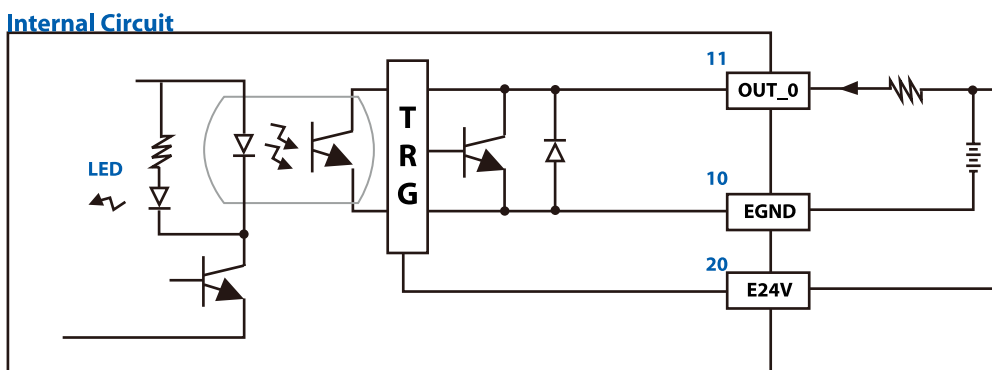
GPI SOURCE Mode

Digital GPI input signal circuit in SOURCE mode (PNP) is illustrated as follow :



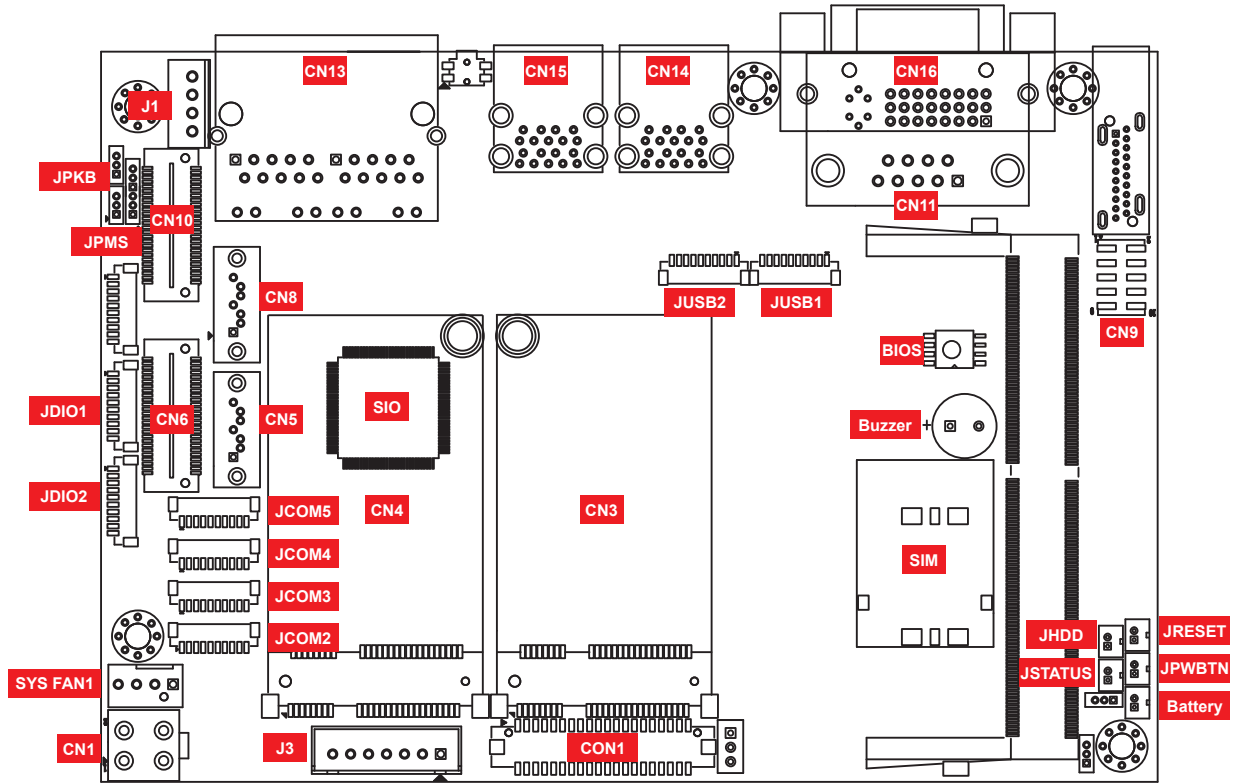
GPO SINK Mode

Digital GPO output circuit in SINK mode (NPN) is illustrated as follow :

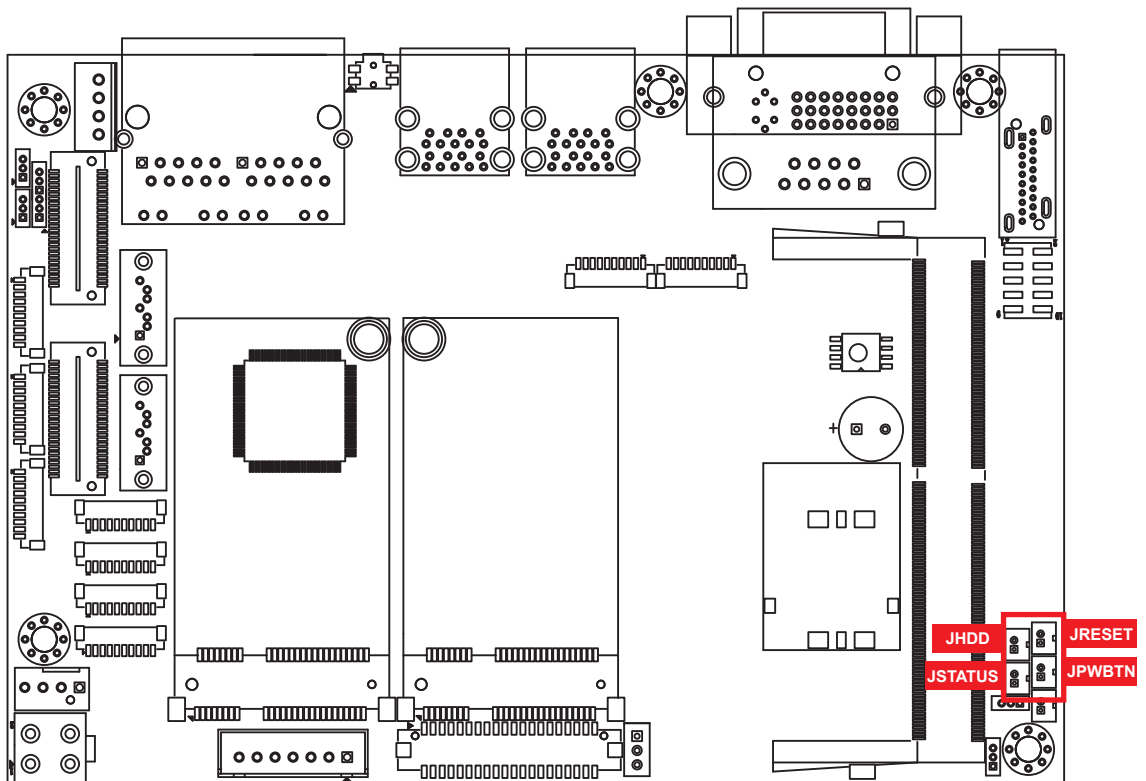


2.4 Main Board Expansion Connectors

2.4.1 SPC-3000/3500 Main Board Pin Header Location



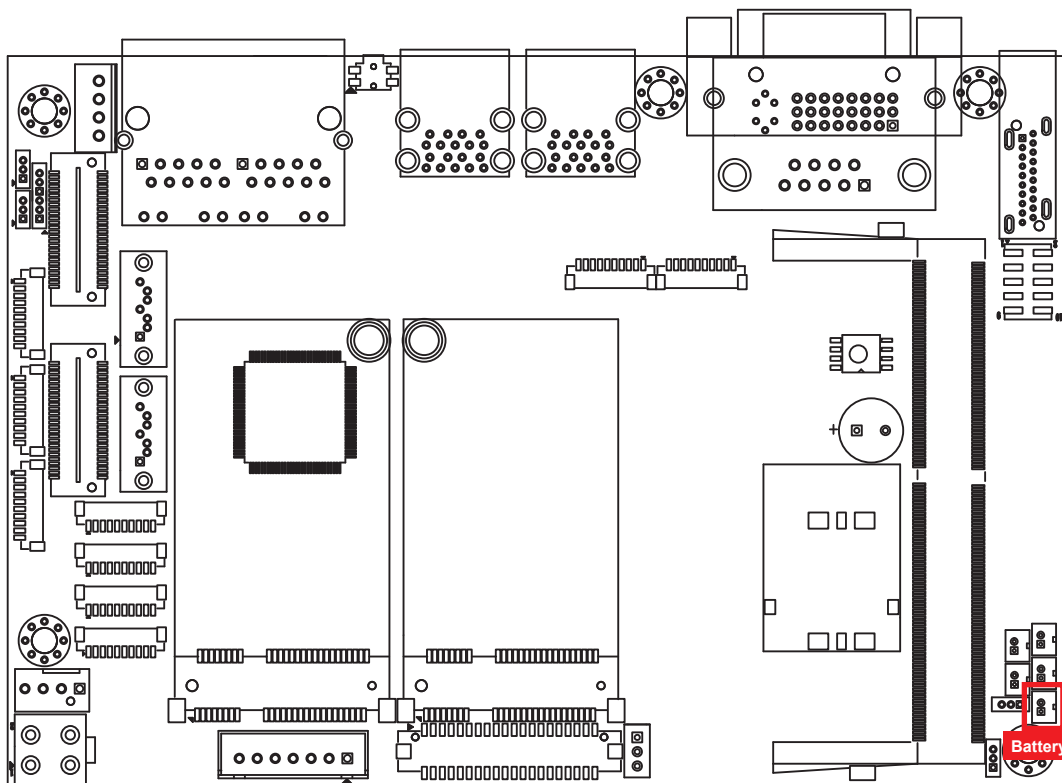
2.4.2 JPWBTN, JRESET, JSTATUS, JHDD : Miscellaneous Pin Header



These pin headers can be used as a backup for the following functions: hard drive, LED indicator, reset button, power LED indicator, and power on/off buttons, which already can be accessed by front panel and top panel. The pinouts of Miscellaneous port are listed in following table:

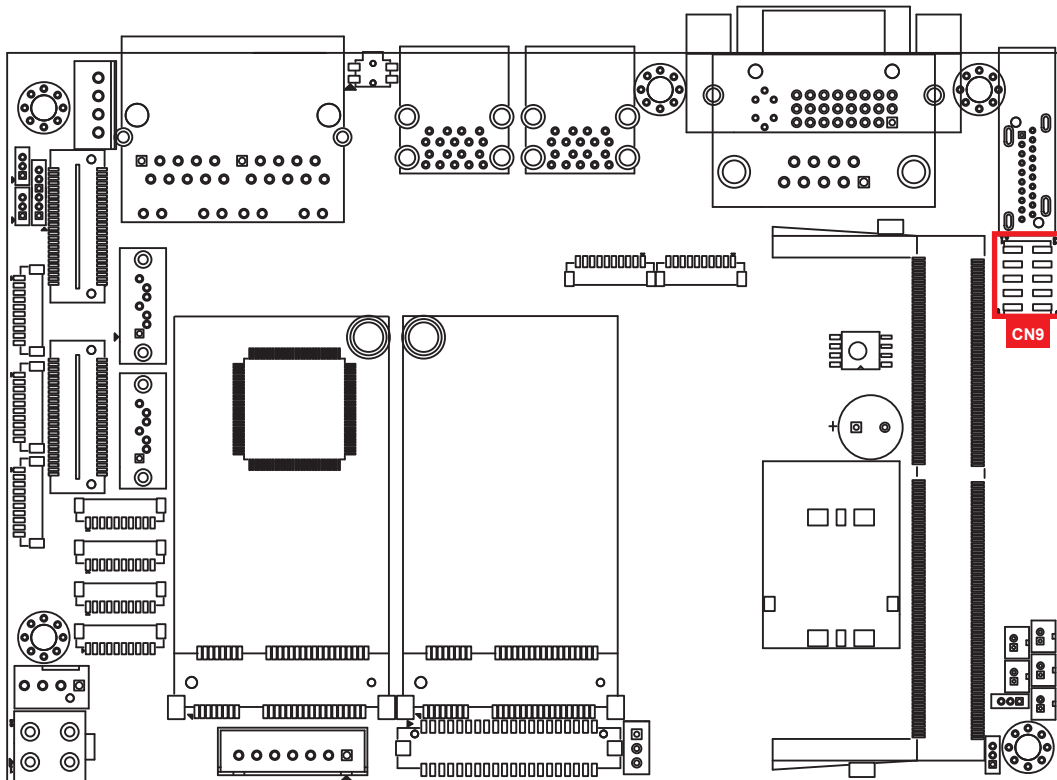
Group	Pin No.	Description
JPWBTN	1	GND
	2	FP_PWR_BTN_IN
JRESET	1	GND
	2	FP_RST_BTN_N
JSTATUS	1	PWR_LED_N
	2	PWR_LED_P
JHDD	1	HDD_LED_N
	2	HDD_LED_P

2.4.3 Battery



The SPC-3000's real-time clock is powered by a lithium battery. It is equipped with Panasonic BR2032 190mAh lithium battery. It is recommended that you not replace the lithium battery on your own, but if the battery needs to be changed, please contact the Vecow RMA service team.

2.4.4 CN9 : Audio Connector



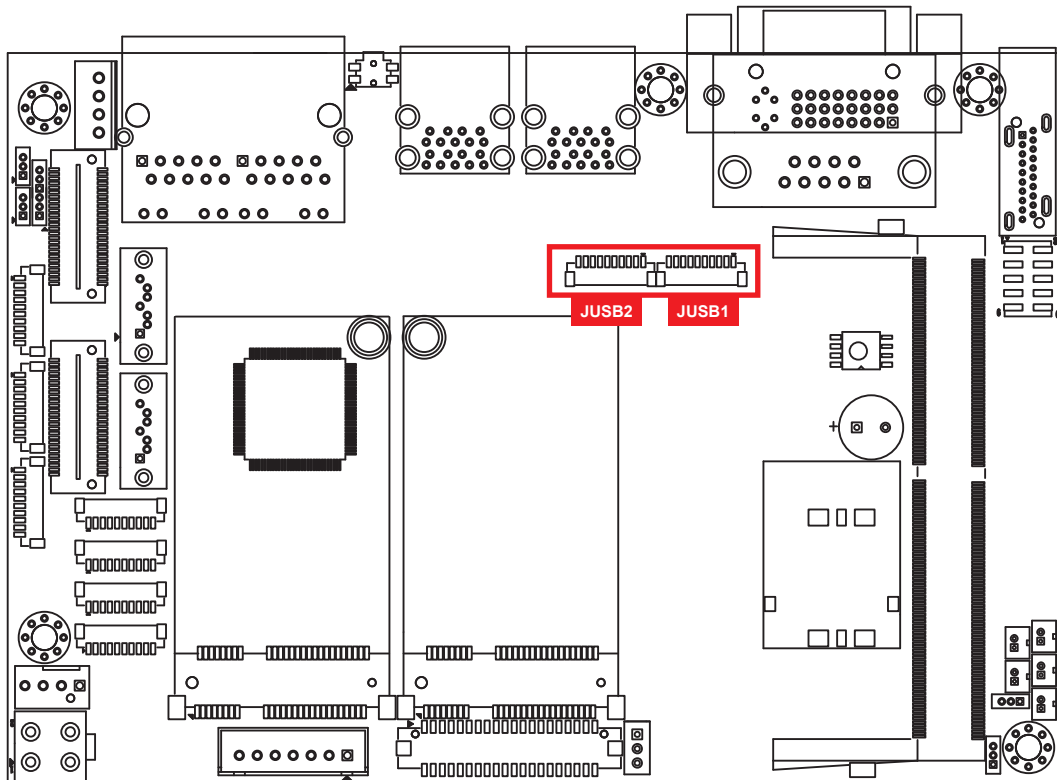
There are three audio connectors, mic-in, line-in, and line-out, in the top side of SPC-3000. Onboard Realtek ALC888S-VD audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications.

To utilize the audio function in Windows platform, you need to install corresponding drivers for both Intel Broadwell-U chipset and Realtek ALC888S-VDcodec. Please refer to Chapter 4 for more details of driver installation.

The pinouts of Audio port are listed in the following table:

Pin No.	Definition	Pin No.	Definition
1	A_z_MIC1-L	2	GND_A
3	A_z_MIC1-R	4	GND_EARTH
5	A_z_LINEO-R	6	A_z_LINEI-R
7	F_IO_SENSE	8	GND_EARTH
9	A_z_LINEO-L	10	A_z_LINEI-L

2.4.5 JUSB1, JUSB2 : Internal USB2.0 Connector



The SPC-3000 main board provides maxima eight expansion USB ports. The USB interface supports 480 Mbps transfer rate which comply with high speed USB specification Rev. 2.0.

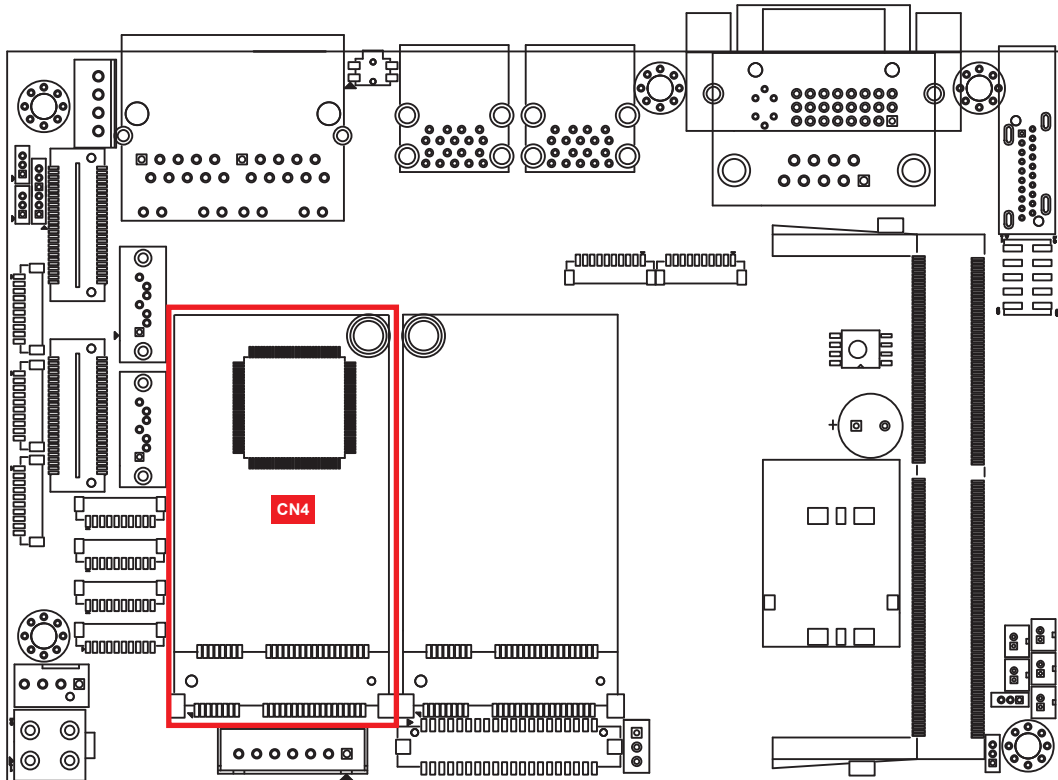
The USB interface is accessed through one 10-pin JST 1.0mm connector. You will need an adapter cable if you use a standard USB connector. The adapter cable has a 10-pin connector on one end and a USB connector on the other.

The pin assignments of JUSB1 and JUSB2 are listed in the following table:

Connector	Pin No.	Description	Pin No.	Description
JUSB1	1	USB_VCC	6	USB_D_5N
	2	USB_VCC	7	USB_D_5P
	3	USB_VCC	8	GND
	4	USB_D_4N	9	GND
	5	USB_D_4P	10	GND

Connector	Pin No.	Description	Pin No.	Description
JUSB2	1	USB_VCC	6	USB_D_7N
	2	USB_VCC	7	USB_D_7P
	3	USB_VCC	8	GND
	4	USB_D_6N	9	GND
	5	USB_D_6P	10	GND

2.4.6 CN4 : Mini PCIe, mSATA



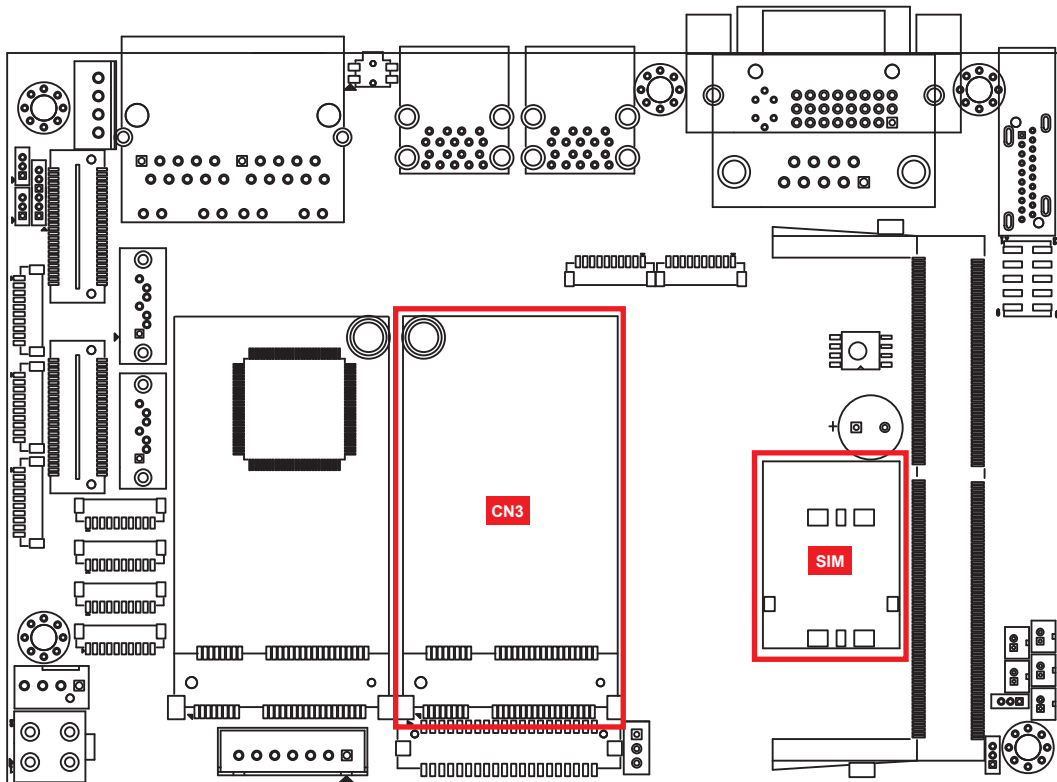
Both mSATA and Mini PCIe share the same form factor and similar electrical pinout assignments on their connectors. There was no clear mechanism to distinguish if a mSATA drive or a Mini PCIe device is plugged into the socket until recently that SATA I/O issued an ECN change (ECN #045) to redefine pin-43 on mSATA connector as “no connect” instead of “return current path” (or GND).

When an mSATA drive is inserted, its pin-43 is “no connect”, and the respective pin on the socket is being pulled-up to logic 1. When a Mini PCIe device is inserted, its pin-43 forces the respective pin on the socket to ground, or logic 0.

The pin assignments of CN4 are listed in the following table:

Pin No.	Signal Name	Pin No.	Signal Name
51	Reserved	52	+3.3Vaux
49	Reserved	50	GND
47	Reserved	48	+1.5V
45	Reserved	46	Reserved
43	Status	44	Reserved
41	+3.3Vaux	42	Reserved
39	+3.3Vaux	40	GND
37	GND	38	USB_D+
35	GND	36	USB_D-
33	PETp0	34	GND
31	PETn0	32	SMB_DATA
29	GND	30	SMB_CLK
27	GND	28	+1.5V
25	PERp0	26	GND
23	PERn0	24	+3.3Vaux
21	GND	22	PERST#
19	Reserved	20	reserved
17	Reserved	18	GND
Mechanical Key			
15	GND	16	UIM_VPP
13	REFCLK+	14	UIM_RESET
11	REFCLK-	12	UIM_CLK
9	GND	10	UIM_DATA
7	CLKREQ#	8	UIM_PWR
5	Reserved	6	1.5V
3	Reserved	4	GND
1	WAKE#	2	3.3Vaux

2.4.7 CN3, SIM : Mini PCIe



Note:

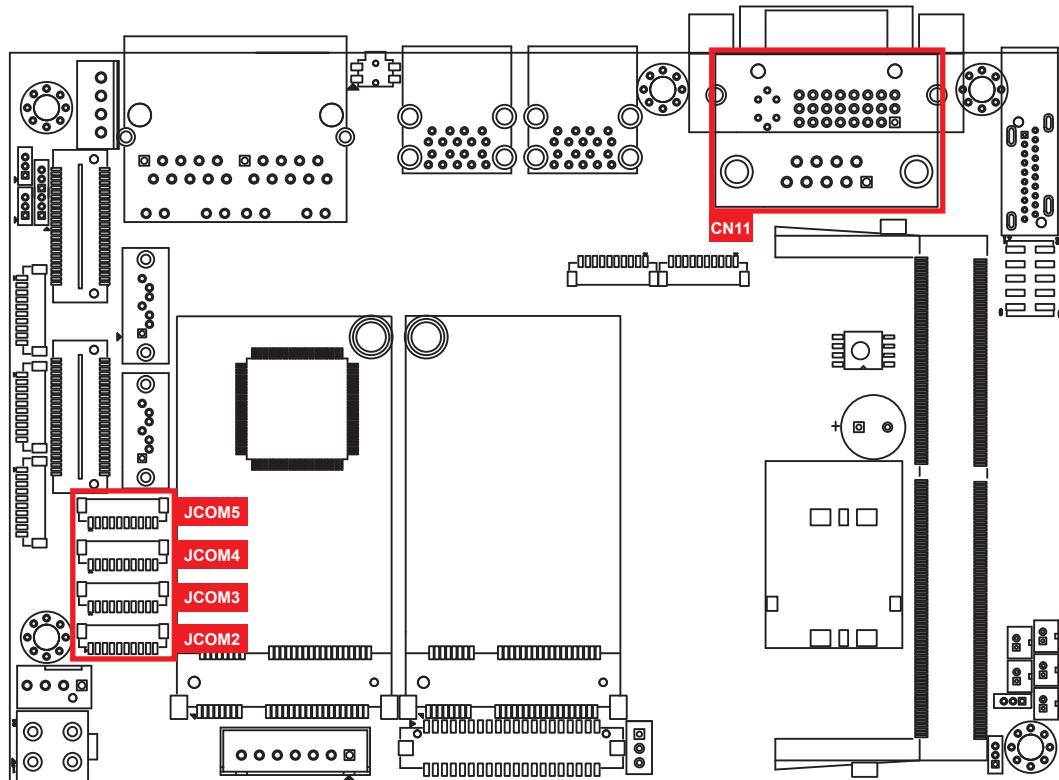
The SIM card sockets do not support hot-plug. Please make sure to unplug the system power before inserting the SIM card(s).

The pin assignments of CN3 are listed in the following table:

Pin No.	Signal Name	Pin No.	Signal Name
51	Reserved	52	+3.3Vaux
49	Reserved	50	GND
47	Reserved	48	+1.5V
45	Reserved	46	Reserved
43	GND	44	Reserved
41	+3.3Vaux	42	Reserved
39	+3.3Vaux	40	GND
37	GND	38	USB_D+
35	GND	36	USB_D-
33	PETp0	34	GND
31	PETn0	32	SMB_DATA

29	GND	30	SMB_CLK
27	GND	28	+1.5V
25	PERp0	26	GND
23	PERn0	24	+3.3Vaux
21	GND	22	PERST#
19	Reserved	20	reserved
17	Reserved	18	GND
Mechanical Key			
15	GND	16	UIM_VPP
13	REFCLK+	14	UIM_RESET
11	REFCLK-	12	UIM_CLK
9	GND	10	UIM_DATA
7	CLKREQ#	8	UIM_PWR
5	Reserved	6	1.5V
3	Reserved	4	GND
1	WAKE#	2	3.3Vaux

2.4.8 COM1 (CN11) , COM2~COM5 (JCOM2~JCOM5) : Serial Port



Serial port 1 ~ serial port 5 can be configured for RS-232, RS-422, or RS-485 with auto flow control communication.

The default definition of COM 1 and COM 2 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.

Group	Description
COM1 (CN11)/ COM2 (JCOM2)/ COM3 (JCOM3)/ COM4 (JCOM4)/ COM5 (JCOM5)	RS-232
	RS-422 (5-wire)
	RS-422 (9-wire)
	RS-485
	RS-485 w/z auto-flow control

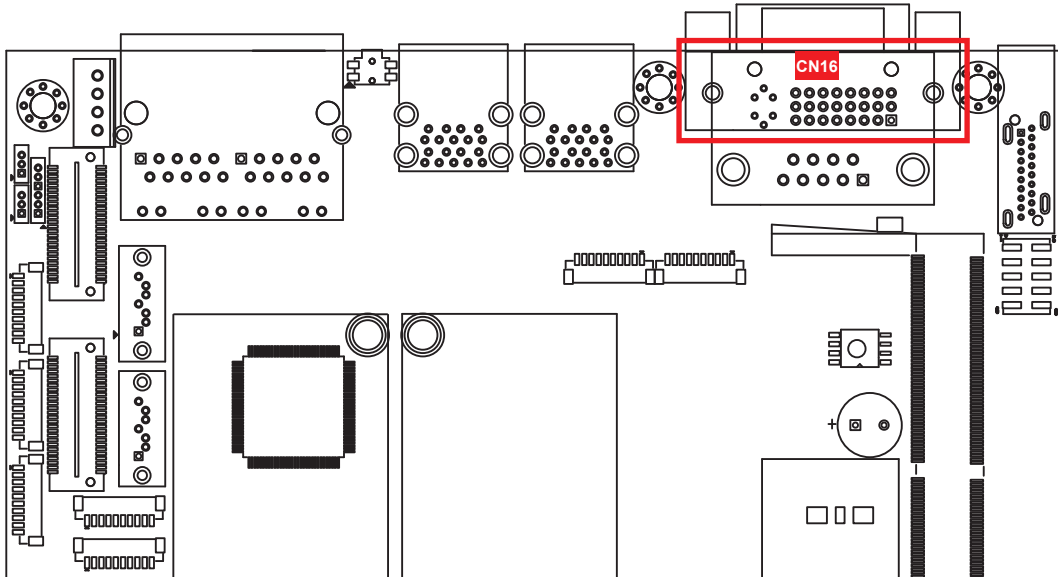
COM1 pin assignments are listed in the following table:

Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
1	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
	6	DSR	-----	RTS-	-----
	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

COM2~COM5 pin assignments are listed in the following table:

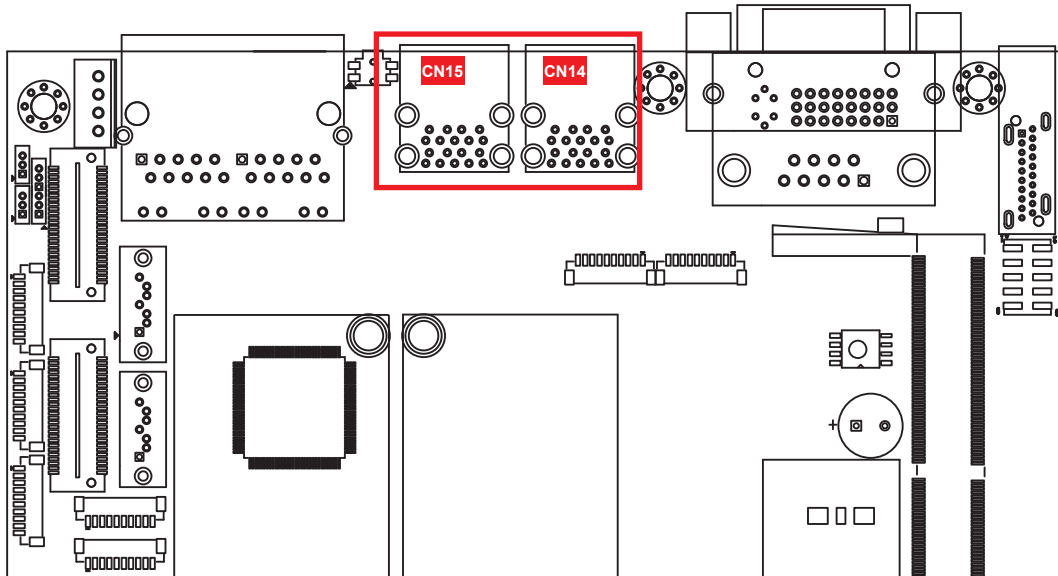
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
2, 3 4, 5	1	GND_EARTH	GND_EARTH	GND_EARTH	GND_EARTH
	2	GND	GND	GND	GND
	3	RI	-----	CTS-	RI
	4	DTR	RXD-	RXD-	-----
	5	CTS	-----	CTS+	-----
	6	TXD	RXD+	RXD+	-----
	7	RTS	-----	RTS+	-----
	8	RXD	TXD+	TXD+	DATA+
	9	DSR	-----	RTS-	-----
	10	DCD	TXD-	TXD-	DATA-

2.4.9 CN16 : DVI-D Connector



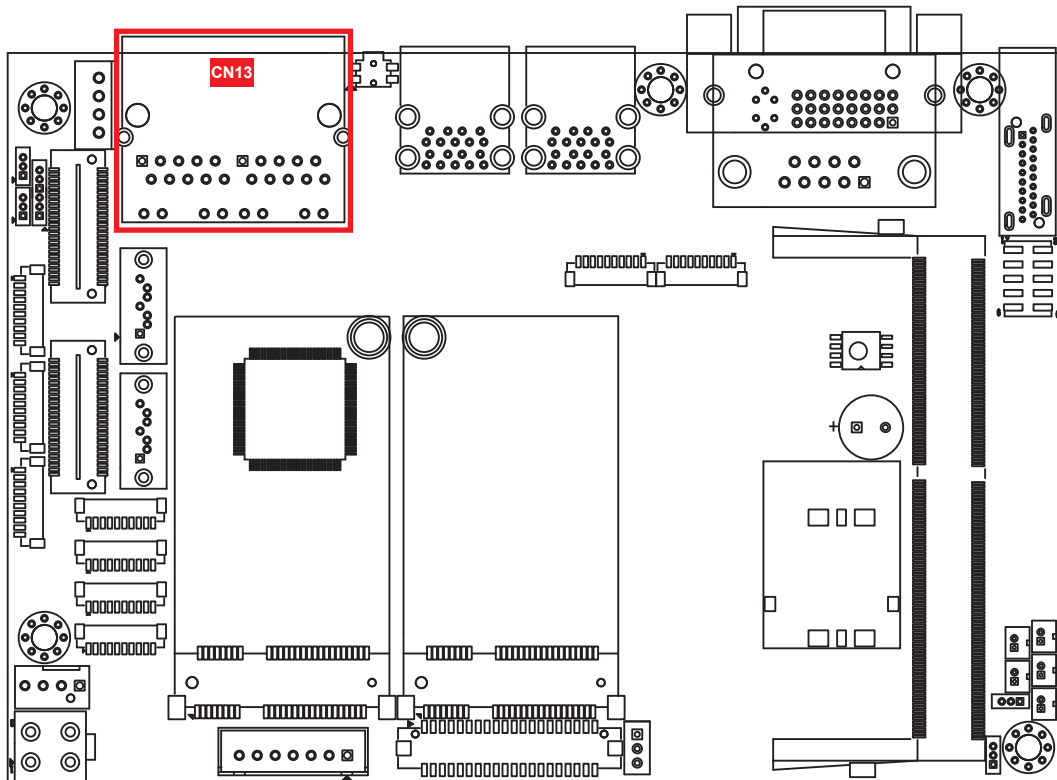
The DVI-D connector on the front panel supports DVI display modes. The DVI output mode supports up to 1920 x 1080 resolutions.

2.4.10 CN14, CN15 : External USB



There are 4 USB 3.0 connections available supporting up to 5GB per second data rate in the top side of SPC-3000. They are also compliant with the requirements of SuperSpeed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.4.11 CN13 : LAN



There are two 8-pin RJ-45 jacks supporting 10/ 100/1000 Mbps Ethernet connections in the front side of MTC-4015. LAN 1 is powered by Intel® 218LM Ethernet engine; LAN 2 is powered by Intel I210 Ethernet engine. When both LAN 1 and LAN 2 work in normal status, basic iAMT function is enabled.

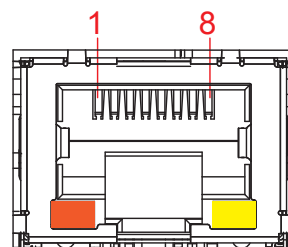
Using suitable RJ-45 cable, you can connect MTC-4015 system to a computer or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both LAN 1 and LAN 2 supports Wake on LAN and Pre-boot functions. The pinouts of LAN 1 and LAN 2 are listed as follows:

Pin No.	10/ 100Mbps	1000Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	----	MDI2_P
5	-----	MDI2_N
6	E_RX-	MDI1_N
7	-----	MDI3_P
8	-----	MDI3_N

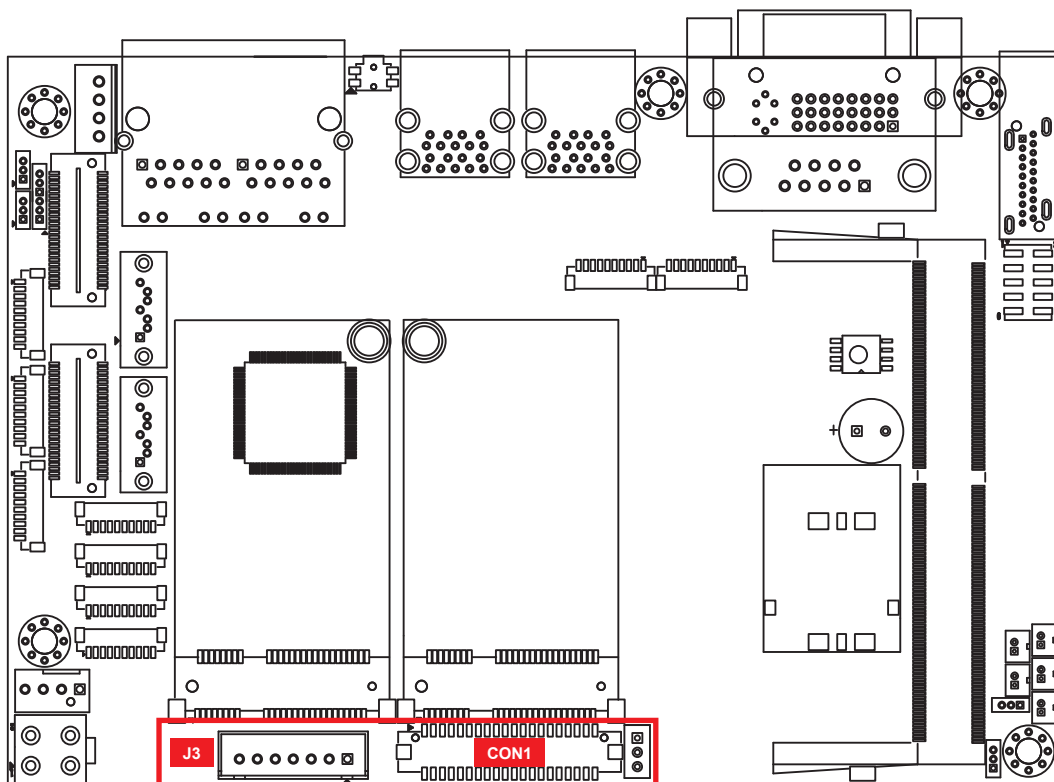
Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/ Link/ Speed status of the connection.

The LED indicator on the right bottom corner lightens solid green when the cable is properly connected to a 100Mbps Ethernet network and solid orange when the cable is properly connected to a 1000Mbps Ethernet network. The left LED will keep blinking off when Ethernet data packets are being transmitted/ received.

LED	10Mbps	100Mbps	1000Mbps
Right Bottom Led	Off	Solid Green	Solid Orange
Left Bottom Led	Blinking Yellow	Blinking Yellow	Blinking Yellow



2.4.12 CON1, J3 : LVDS



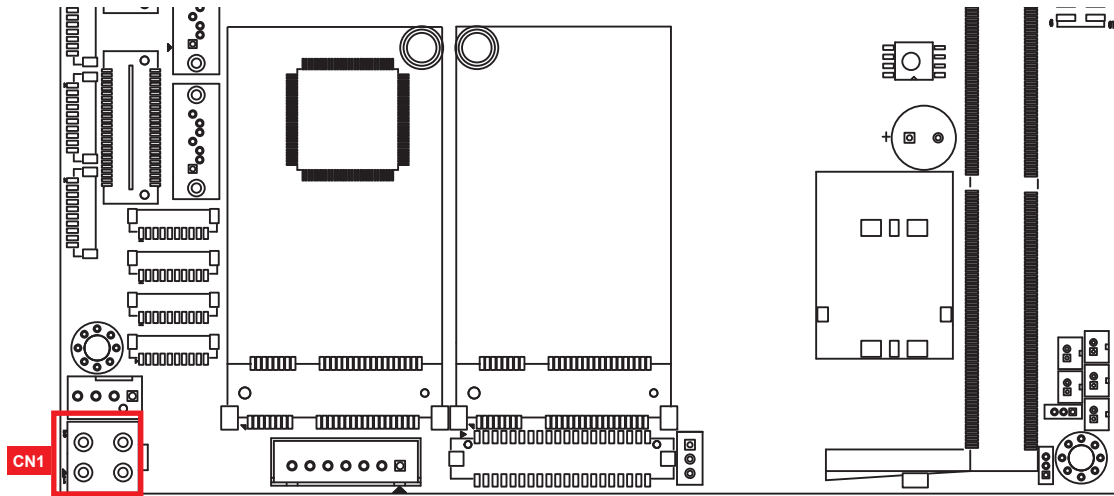
SPC-3000 supports dual-channel 24-bit LVDS display, up to 1920 x 1200 pixels resolution. The pin assignments of CON1 are listed in the following table:

Pin No.	function	Pin No.	function
1	PANEL_VDD	21	GND
2	TXO0-	22	TXE0-
3	PANEL_VDD	23	GND
4	TXO0+	24	TXE0+
5	PANEL_VDD	25	GND
6	TXO1-	26	TXE1-
7	GND	27	GND
8	TXO1+	28	TXE1+
9	GND	29	GND
10	TXO2-	30	TXE2-
11	GND	31	GND
12	TXO2+	32	TXE2+
13	GND	33	GND
14	TXOC-	34	TXEC-
15	GND	35	GND
16	TXOC+	36	TXEC+
17	GND	37	GND
18	TXO3-	38	TXE3-
19	GND	39	LVDS_DET#
20	TXO3+	40	TXE3+

The LCD inverter is connected to J3 via a JST 7-pin, a 2.5mm connector providing +5V/ +12V power to LCD display. The pin assignments are listed in the following table:

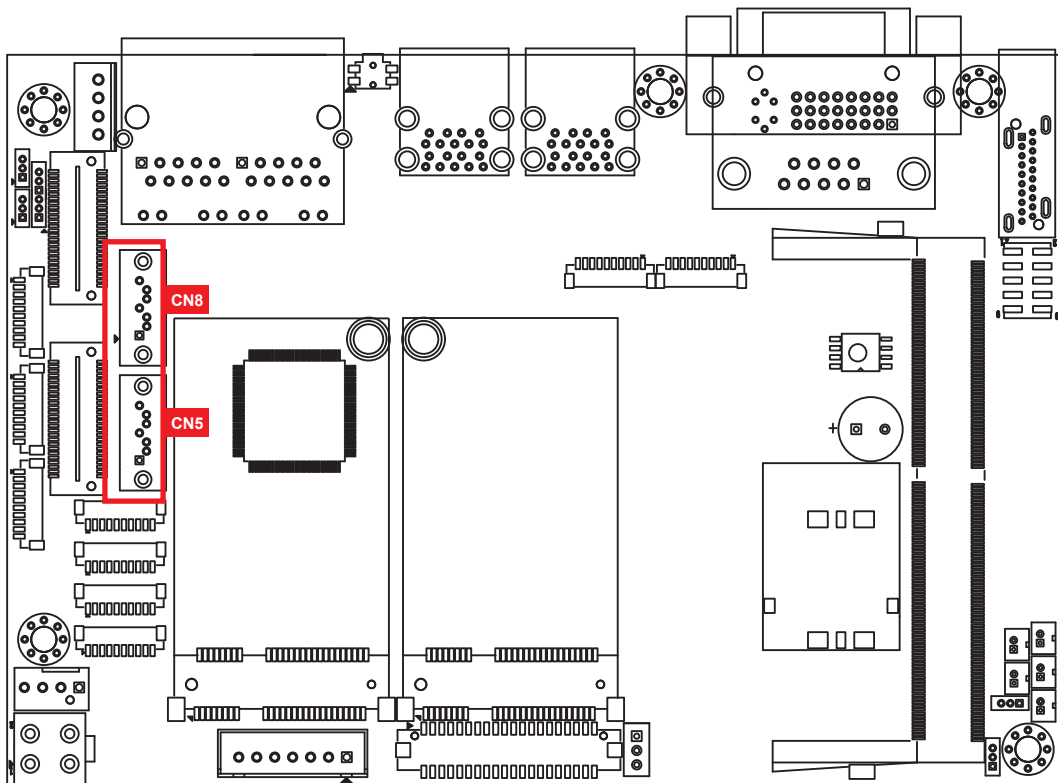
Pin No.	Definition	Pin No.	Definition
1	+5V	5	GND
2	+12V	6	GND
3	+12V	7	LBKLT_EN
4	LBKLT_CTL		

2.4.13 CN1 : Power Input



SPC-3000 supports 9V to 36V DC power input by wire-to-board connector in the top side.

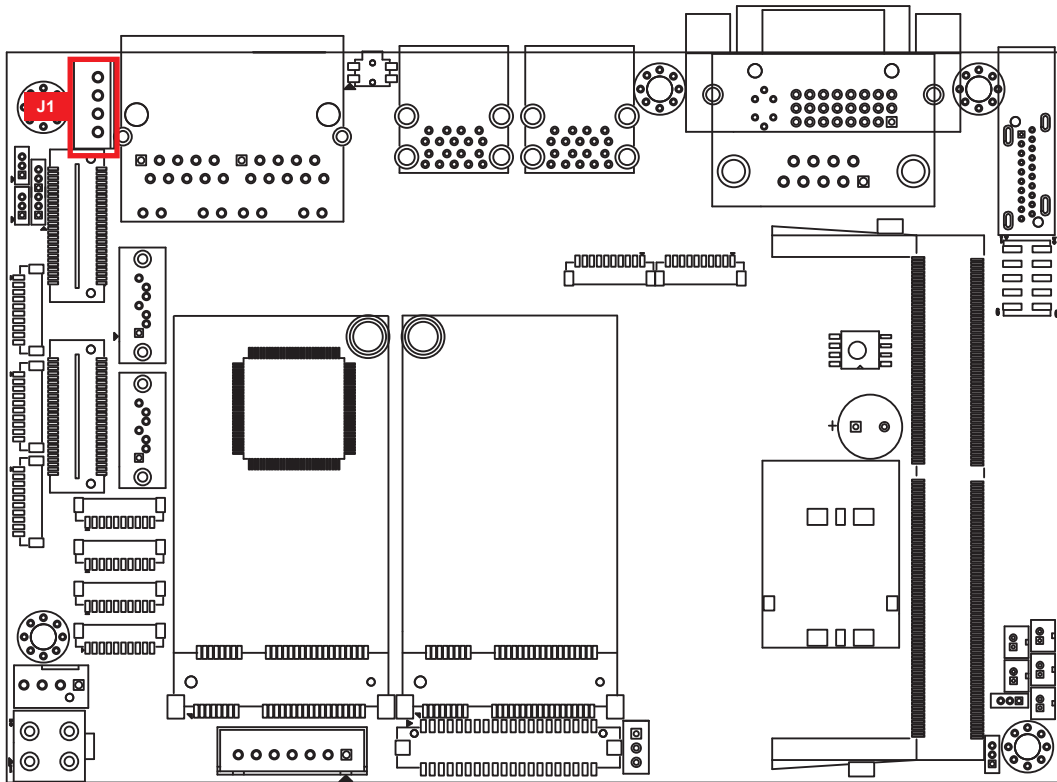
2.4.14 CN5, CN8 : SATA III Connector



There are two high performance Serial ATA III (SATA III) on the SPC-3000. They support higher storage capacity with less cabling effort and smaller required space. The pin assignments of CN5 and CN8 are listed in the following table:

Pin No.	Definition	Pin No.	Definition
1	GND	5	RXN
2	TXP	6	RXP
3	TXN	7	GND
4	GND		

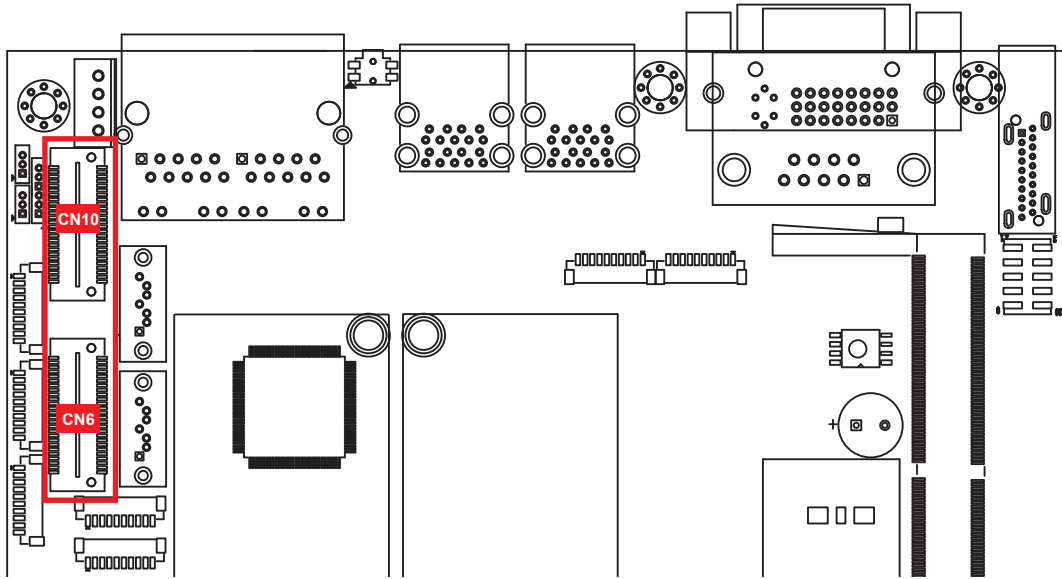
2.4.15 J1: SATA Power Connector



The SPC-3000 is also equipped with one SATA power connector. It supports 5V (Up to 2A) and 12V (Up to 1A) currents to the hard drive or SSD. The pin assignments of J1 is listed in the following table:

Pin No.	Definition	Pin No.	Definition
1	+12V	5	GND
2	GND	6	+5V

2.4.16 CN6, CN10 : SUMIT



CN10 Pin Out

Pin No.	Function	Pin No.	Function
1	+5V_AUX	2	+12V
3	+3.3V	4	SMB_DATA
5	+3.3V	6	SMB_CLK
7	Reserved	8	Reserved
9	Reserved	10	Reserved
11	USB_OC#	12	Reserved
13	Reserved	14	Reserved
15	+5V	16	Reserved
17	USB_3+	18	Reserved
19	USB_3-	20	Reserved
21	+5V	22	Test Point
23	USB_2+	24	LPC_AD0
25	USB_2-	26	LPC_AD1
27	+5V	28	LPC_AD2
29	USB_1+	30	LPC_AD3
31	USB_1-	32	LPC_FRAME#
33	+5V	34	SERIRQ#

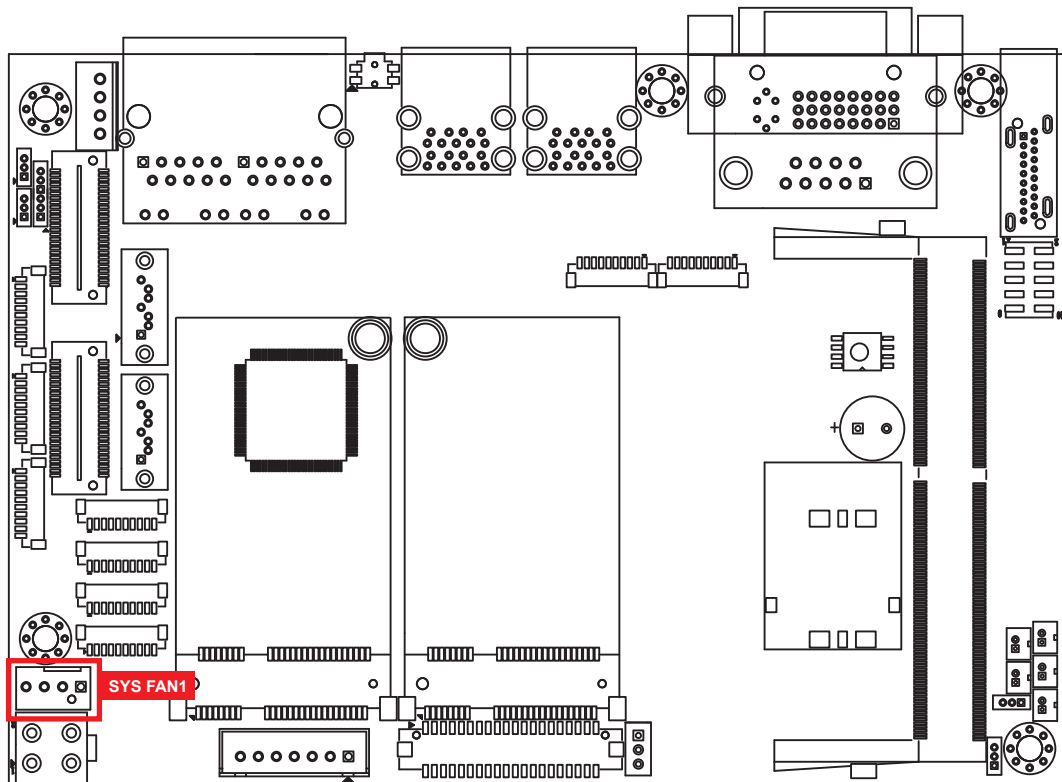
35	USB_0+	36	Reserved
37	USB_0-	38	CLK_33MHz
39	GND	40	GND
41	A_PET_P0	42	A_PER_P0
43	A_PET_N0	44	A_PER_N0
45	GND	46	GND
47	PERST#	48	A_CLKP
49	WAKE#	50	A_CLKN
51	+5V	52	GND

CN6 Pin Out

Pin No.	Function	Pin No.	Function
1	GND	2	GND
3	B_PET_P0	4	B_PER_P0
5	B_PET_N0	6	B_PER_N0
7	GND	8	GND
9	C_CLKP	10	B_CLKP
11	C_CLKN	12	B_CLKN
13	CPRSNT#/C_PE_CLKREQ#	14	GND
15	C_PET_P0	16	C_PER_P0
17	C_PET_N0	18	C_PER_N0
19	GND	20	GND
21	C_PET_P1	22	C_PER_P1
23	C_PET_N1	24	C_PER_N1
25	GND	26	GND
27	C_PET_P2	28	C_PER_P2
29	C_PET_N2	30	C_PER_N2
31	GND	32	GND
33	C_PET_P3	34	C_PER_P3
35	C_PET_N3	36	C_PER_N3

37	GND	38	GND
39	PERST#	40	WAKE#
41	Reserved	42	Reserved
43	+5V	44	Reserved
45	+5V	46	+3.3V
47	+5V	48	+3.3V
49	+5V	50	+3.3V
51	+5V	52	+5V_AUX

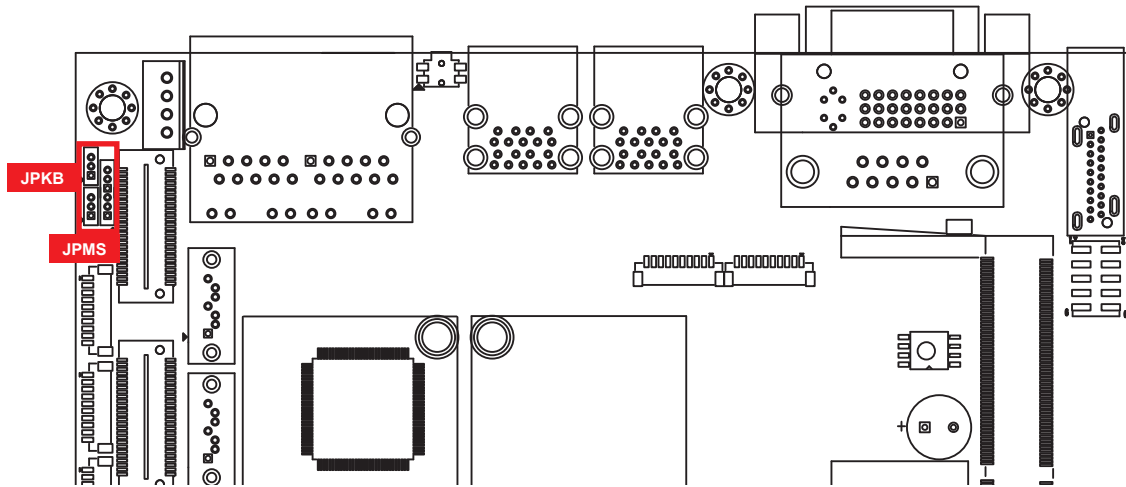
2.4.17 SYS FAN1 : Connector



Fan power connector supports higher thermal requirements.

Pin No.	Definition	Pin No.	Definition
1	+12V	3	FAN_TAC
2	FAN_CTL	4	GND

2.4.18 JPMS, JPKB : PS/2 Mouse Keyboard Pin Head



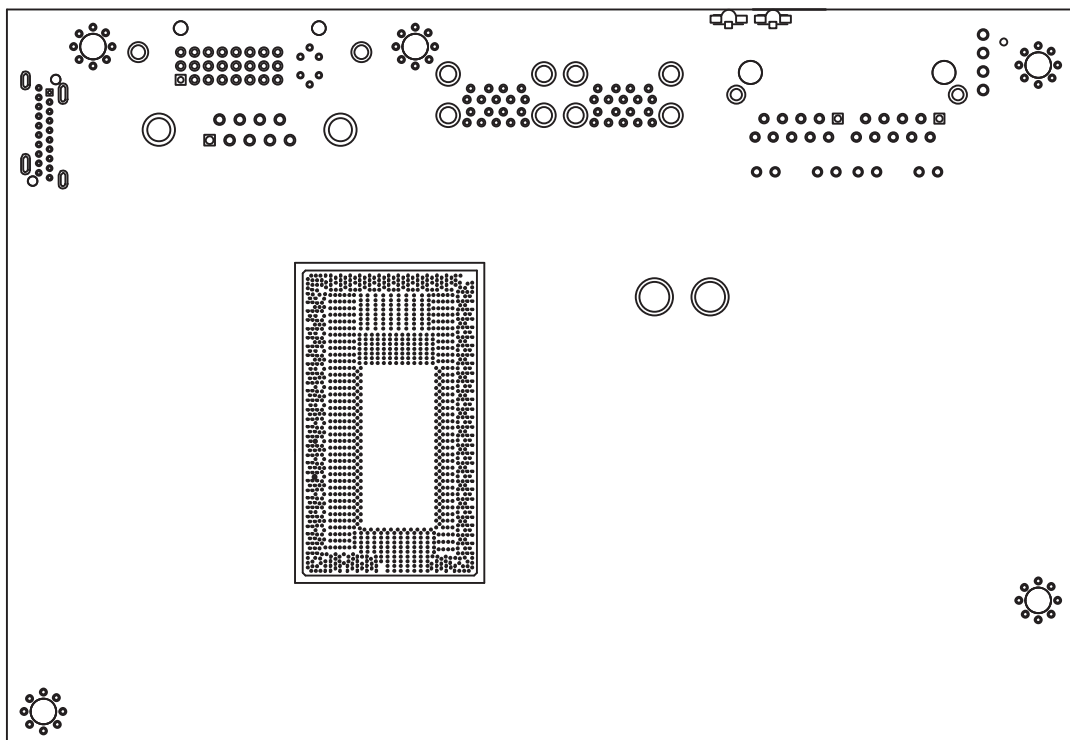
JPMS Mouse Pin assignment as the following table:

Pin No.	Definition
1	SIO_MCLK
2	SIO_MDAT
3	GND

JPMS Keyboard Pin assignment as the following table:

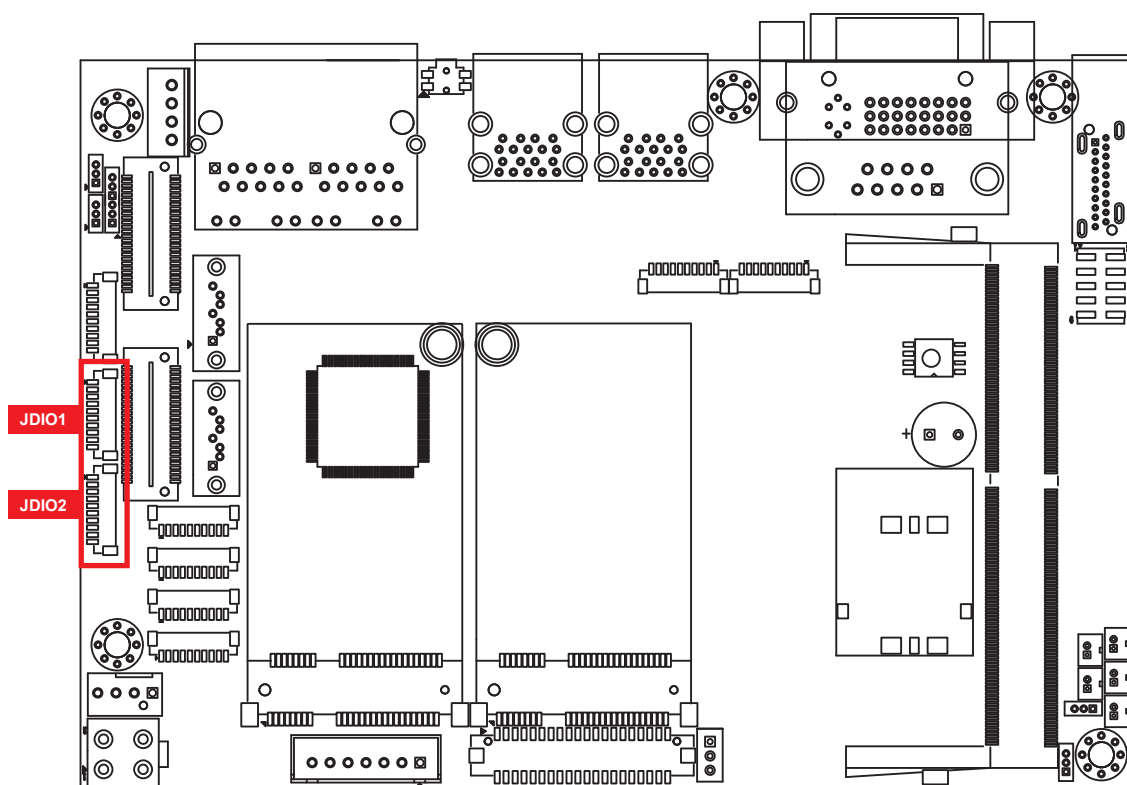
Pin No.	Definition
1	SIO_KCLK
2	SIO_KDAT
3	VCC5_KBMS

2.4.19 SPC-3000/3500 PCB Bottom Side



Green-Power LED: If the LED is solid green, it indicates that the system is powered on. Green-HDD LED: A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities.

2.4.20 JDIO1,JDIO2 : GPIO



There is a 16-bit GPIO connector in the Top side. Each GPIO channel can be configuration GPI or GPO. Detail setting see [APPENDIX A](#)
 JDIO1 and JDIO2 pins are defined in the following table:

Pin No.	JDIO1 Definition	JDIO2 Definition
1	SIO_GPI80	SIO_GPI84
2	SIO_GPI81	SIO_GPI85
3	SIO_GPI82	SIO_GPI86
4	SIO_GPI83	SIO_GPI87
5	SIO_GPO70	SIO_GPO74
6	SIO_GPO71	SIO_GPO75
7	SIO_GPO72	SIO_GPO76
8	SIO_GPO73	SIO_GPO77
9	+5V	+5V
10	GND	GND

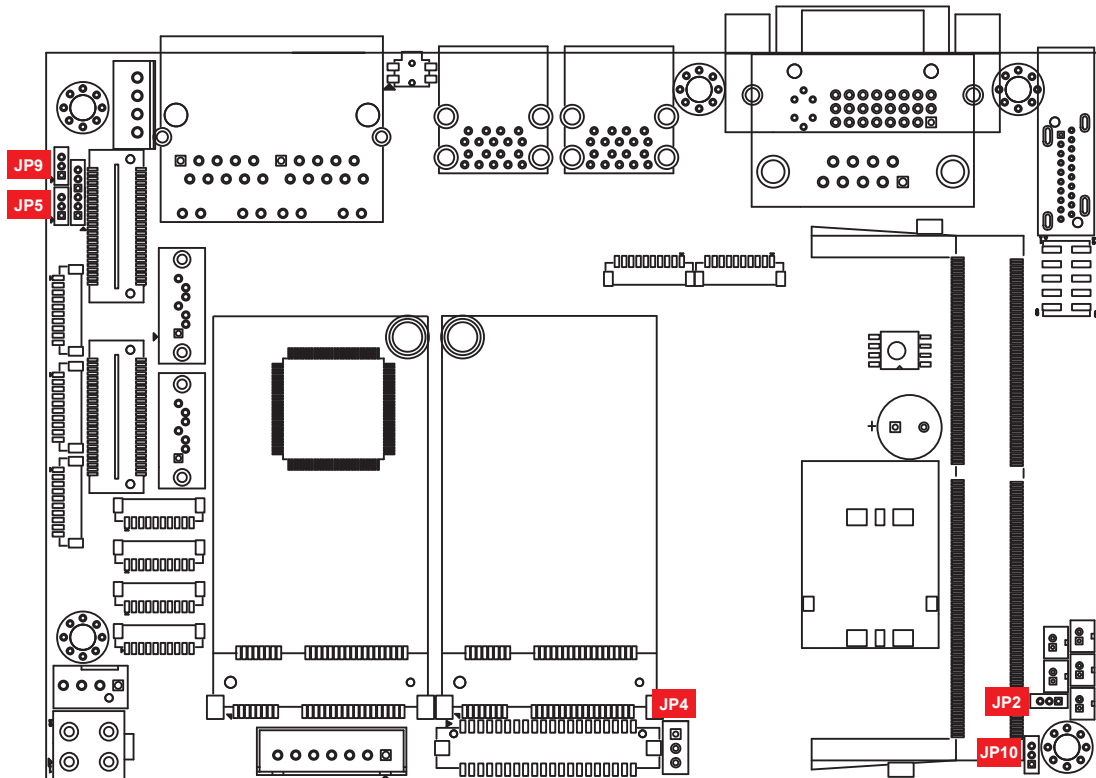
GIOP DC Electrical Characteristics:

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
V_{OL}	Low Output Voltage	$I_{OL} = 8 \text{ mA}$			0.4	V
V_{IL}	Low Input Voltage				0.8	V
V_{IH}	High Input Voltage		2.2			V
I_{IL}	Low Input Leakage	$V_{IN} = 0$			10	μA
I_{IH}	High Input Leakage	$V_{IN} = V_{CC3}$			-10	μA
I_{OZ}	3-state Leakage				20	μA

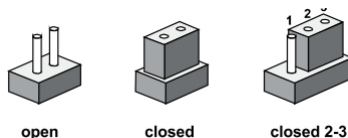
2.5 Main Board Jumper Settings

2.5.1 Front View of SPC-3000 Main Board With Jumper Location

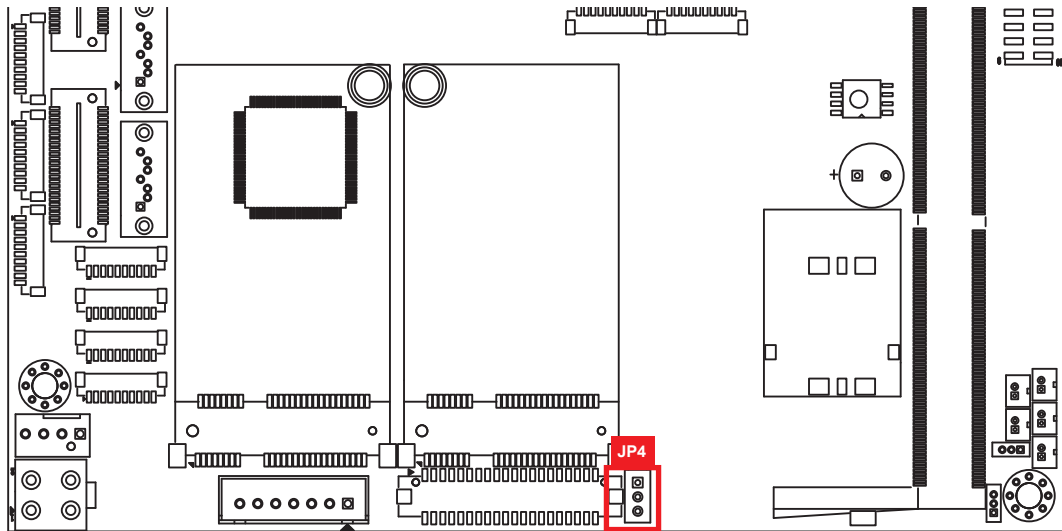
The figure below is the top view of the SPC-3000 main board. It shows the location of the jumpers.



You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, you connect the pins with the clip. To “open” a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



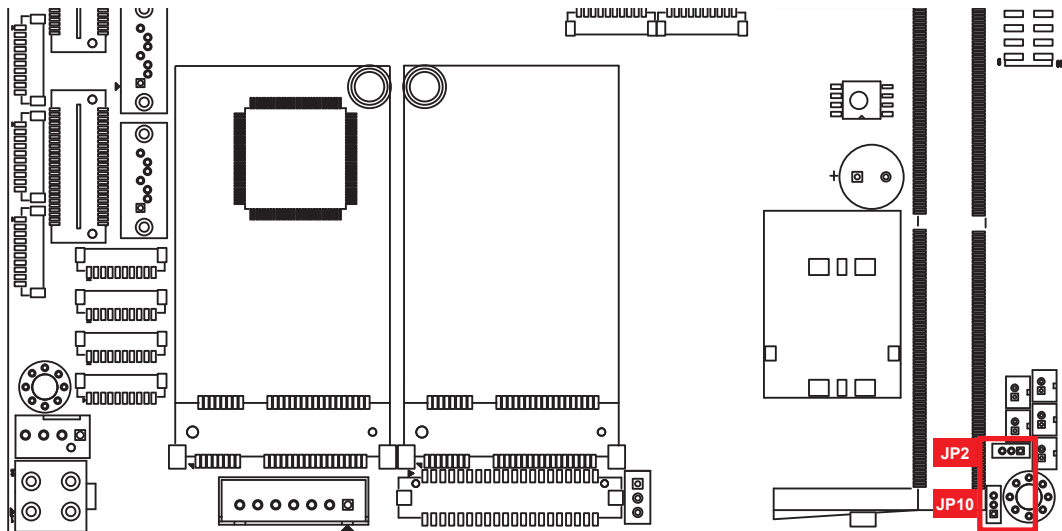
2.5.2 JP4 : LVDS Module, Power Selection



JP4 provides LVDS voltage selection function, Closing Pin 1 and Pin 2 is for 3.3V LVDS power input; closing Pin 2 and Pin 3 is for 5V LVDS power input.

Pin No.	Definition	Pin No.	Definition
1-2	+3.3V (Default)	2-3	+5V

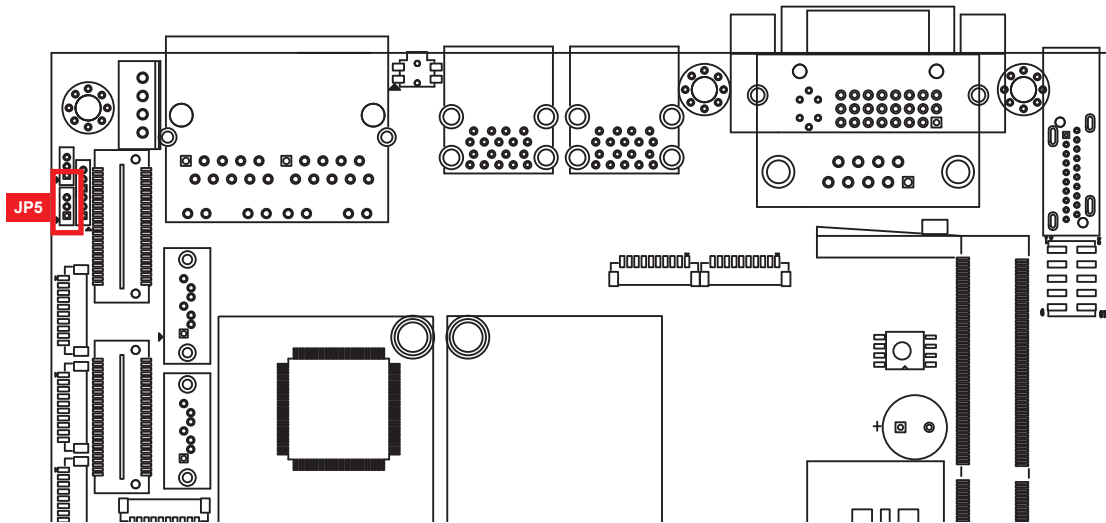
2.5.3 JP2(CMOS), JP10(ME)



CMOS	Header
1-2	Normal
2-3	Clear CMOS

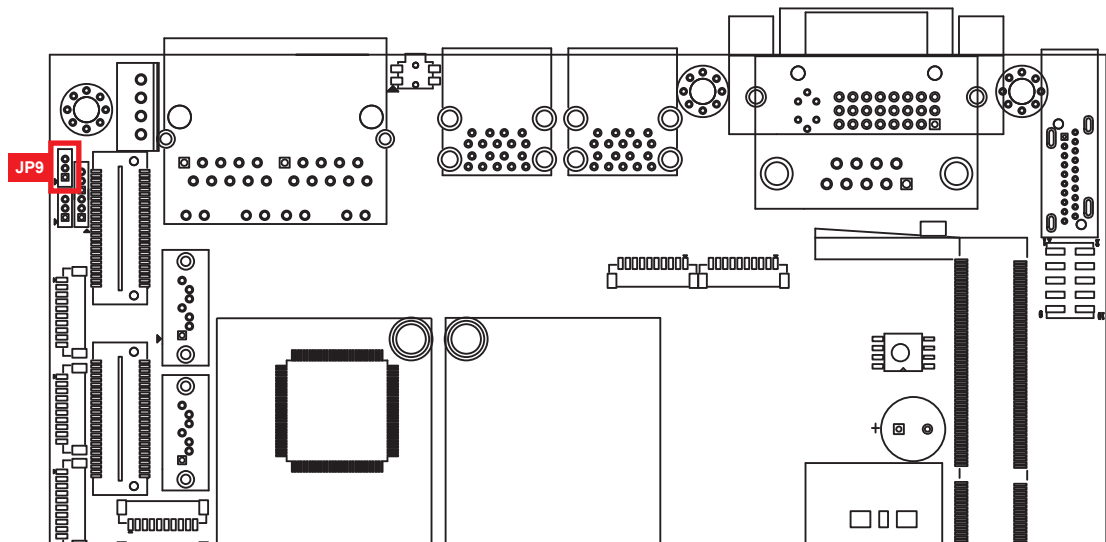
ME	Header
1-2	Normal
2-3	Clear ME

2.5.4 JP5 : External USB 3.0/ 2.0 Power Select



Header	Power	Header	Power
1-2	+5V Standby Power	2-3	+5V System Power

2.5.5 JP9 : Backlight Control Level Select



Pin No.	Definition	Pin No.	Definition
1-2	3.3V	2-3	5V

3

SYSTEM SETUP

3.1 How to Open Your SPC-3000/3500

Step 1 Remove one F-M3x4 screw.



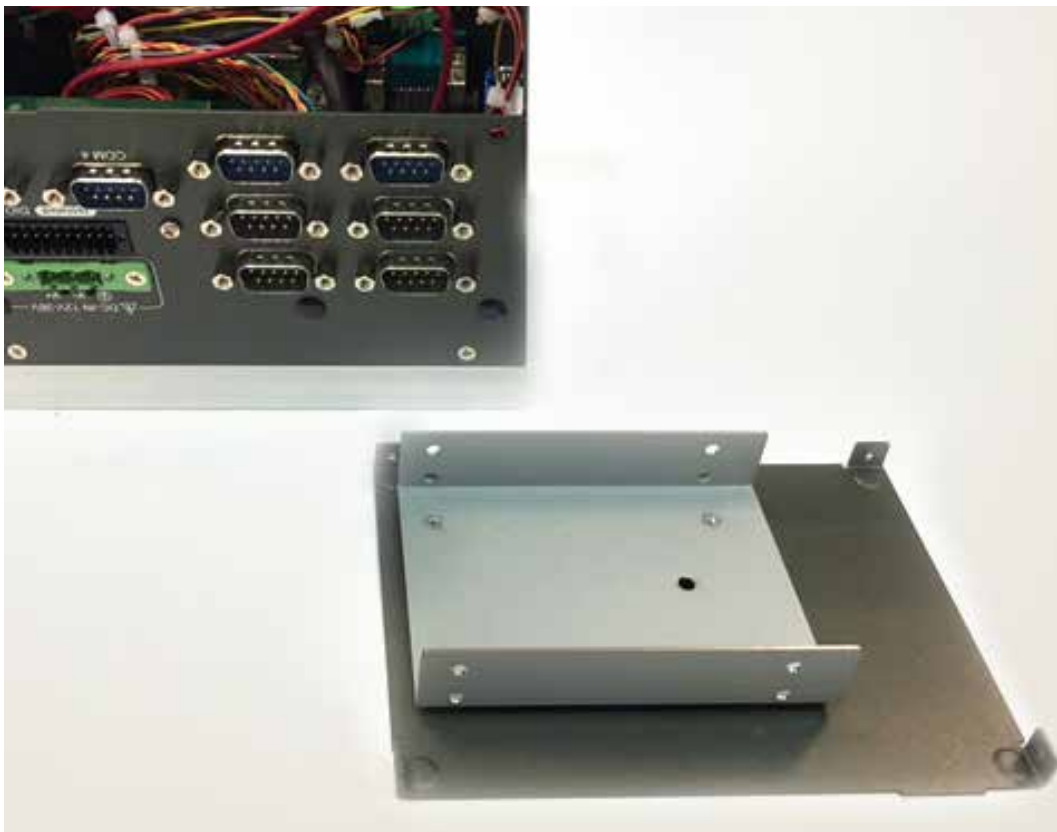
Step 2 Remove one F-M3x4 screw.



Step 3 Remove two F-M3x4 screws.



Step 4 Take off the bottom side.

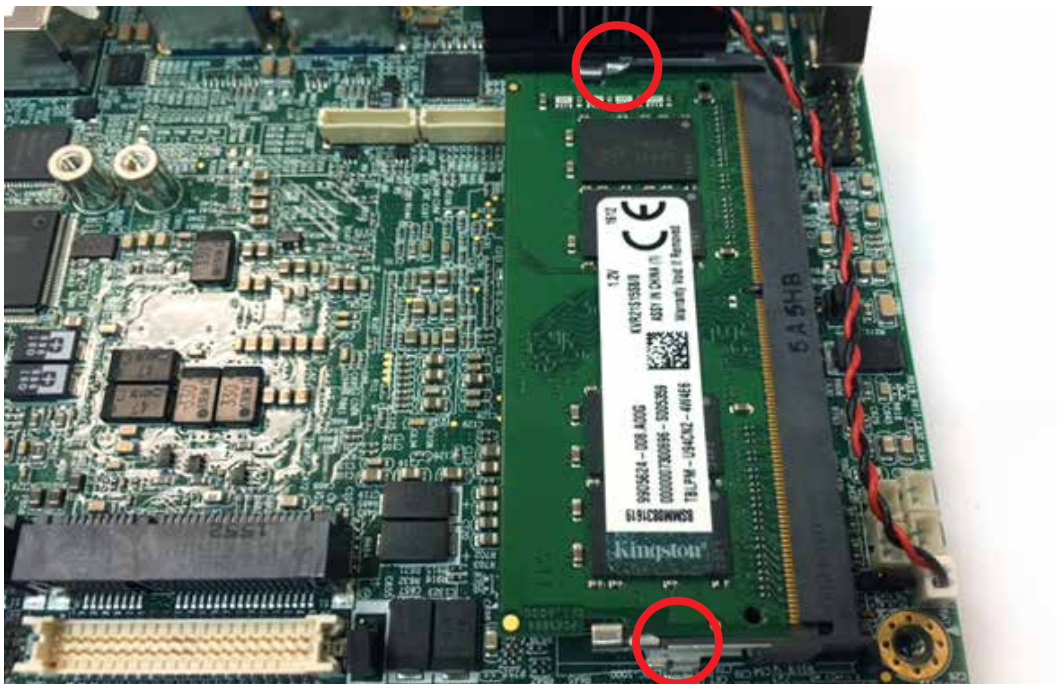


3.2 Installing DDR4 SO-DIMM Modules

Step 1 Install DDR4 RAM module into SO-DIMM slot.



Step 2 Make sure the RAM module is locked by the memory slot.



3.3 Installing Mini PCIe Card

Step 1 Install Mini PCIe card into the Mini PCIe socket.



Step 2 Fasten one M2.5 screw.



3.4 Installing Antenna Cable

Step 1 Check antenna cable and washers.



Step 2 Install Antenna cable and washer 1,2,3.

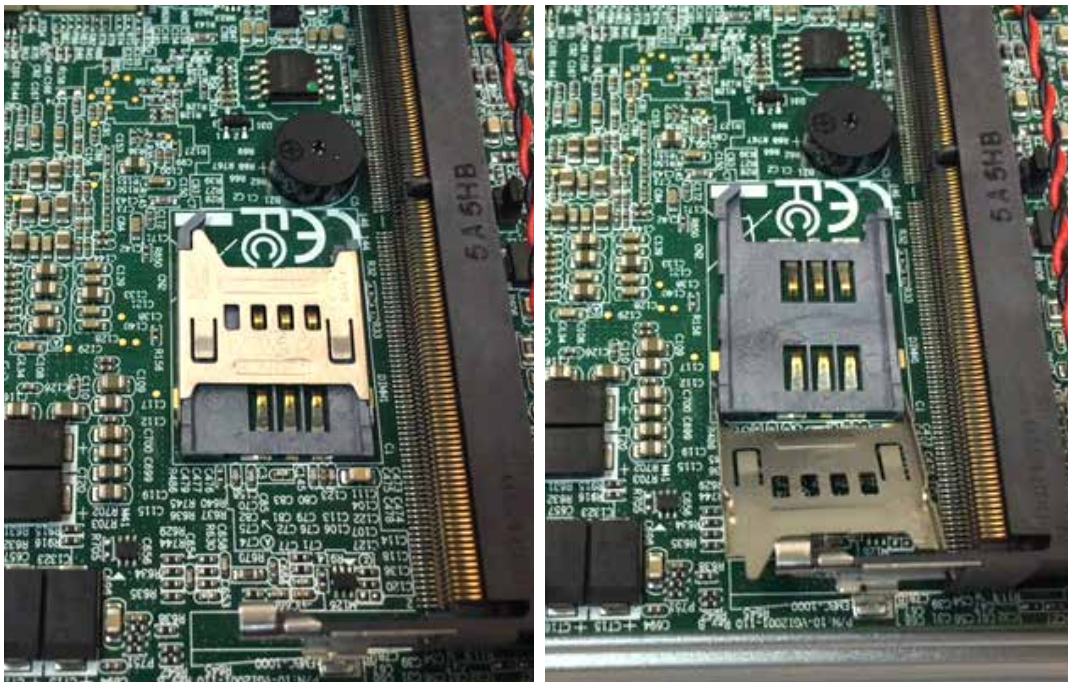


Step 3 Fasten the washer.



3.5 Installing SIM Card

Step 1 Open the SIM card cover.



Step 2 Install SIM card into to the SIM card slot and then close the SIM card cover.



3.6 Installing SSD/HDD

Step 1 Take the bottom side.



Step 2 Install SSD/HDD and fasten KH-M3x6 screws.



Step 3 Install SATA cable with SSD/HDD.



Step 4 Close the bottom side.



3.7 Mounting Your SPC-3000/3500

Step 1 Fasten KH-M3x6 with SPC-3000/3500 with wall mount bracket.



Step 2 Finish.



4

BIOS SETUP

4.1 Entering Setup

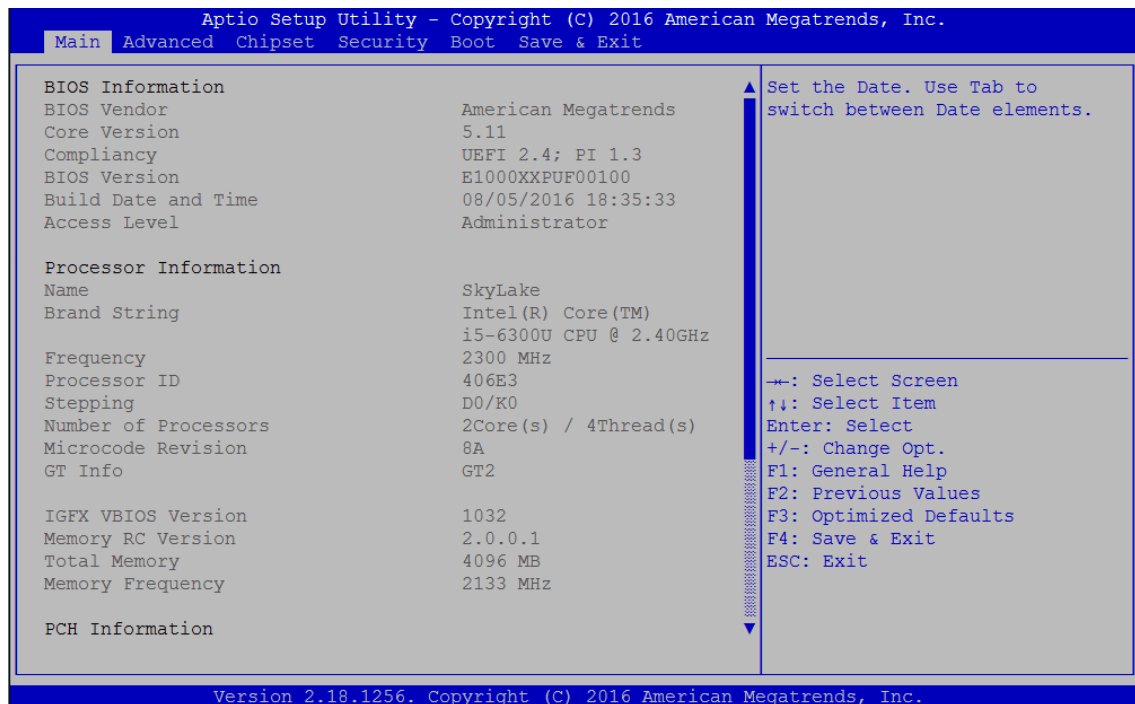


Figure 4-1 : Entering Setup Screen

BIOS provides an interface for users to check and change system configuration. The BIOS setup program is accessed by pressing the key when POST display output is shown.

4.2 Main Menu

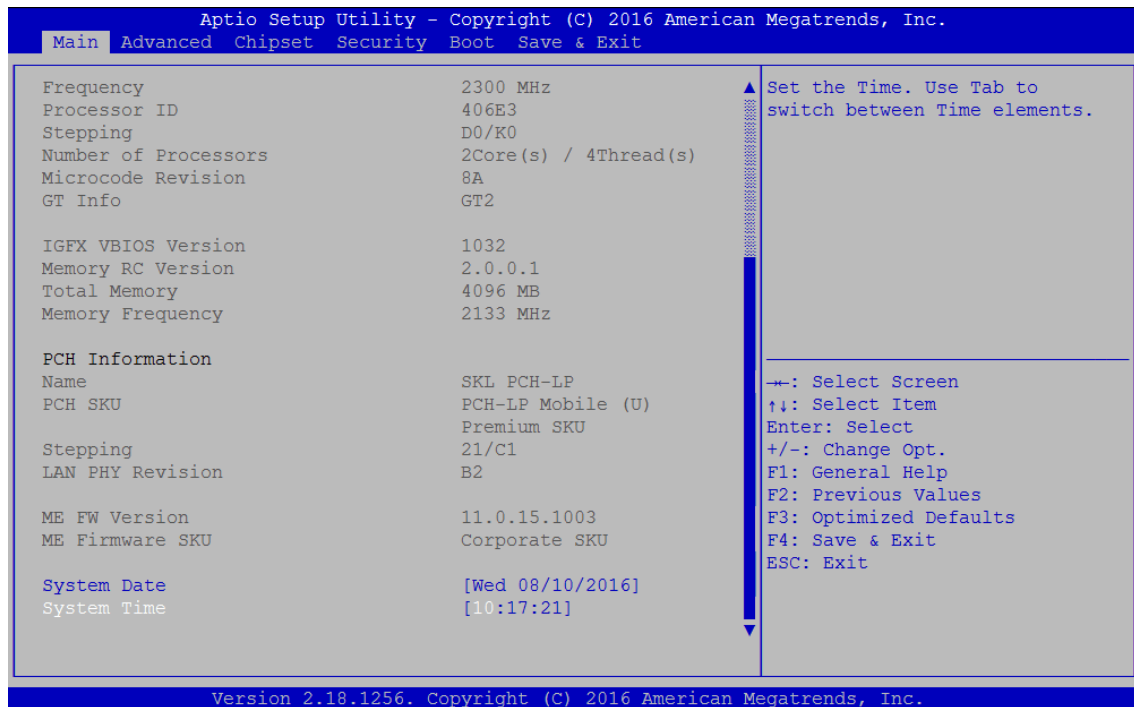


Figure 4-2 : BIOS Main Menu

The main menu displays BIOS version and system information. There are two options on Main menu.

System Date

Set the date. Use <Tab> to switch between date elements.

System Time

Set the time. Use <Tab> to switch between time elements.

4.3 Advanced Function

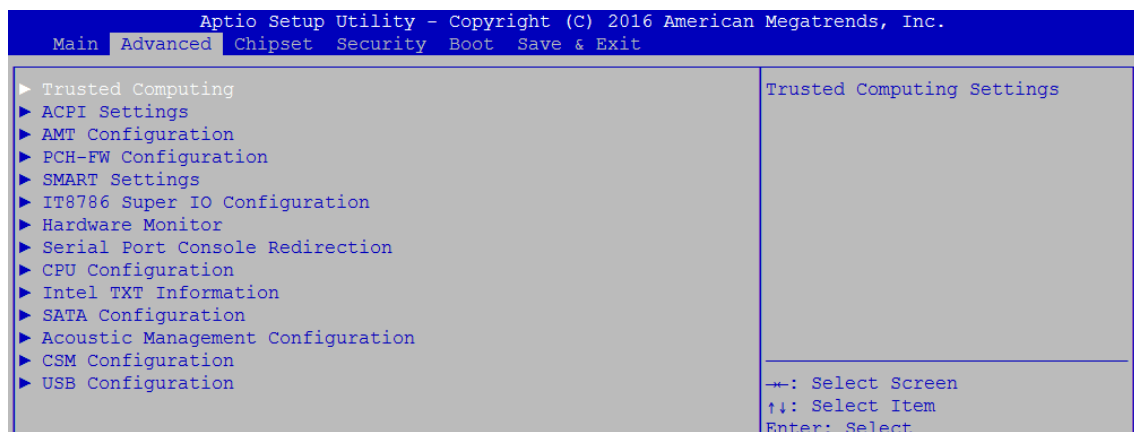


Figure 4-3 : BIOS Advanced Menu

Select advanced tab to enter advanced BIOS setup options, such as CPU configuration, SATA configuration, and USB configuration.

4.3.1 Trusted Computing

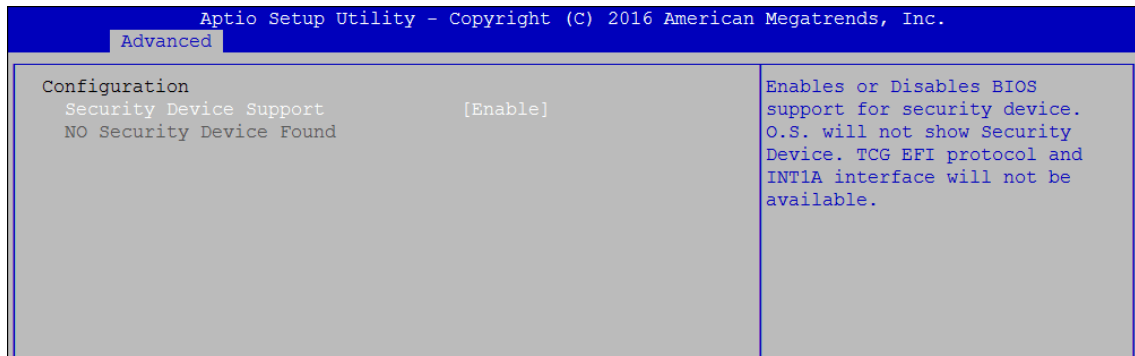


Figure 4-3-1 : Trusted Computing

Control the TPM device status and display related information if TPM chip is present.

4.3.2 ACPI Settings

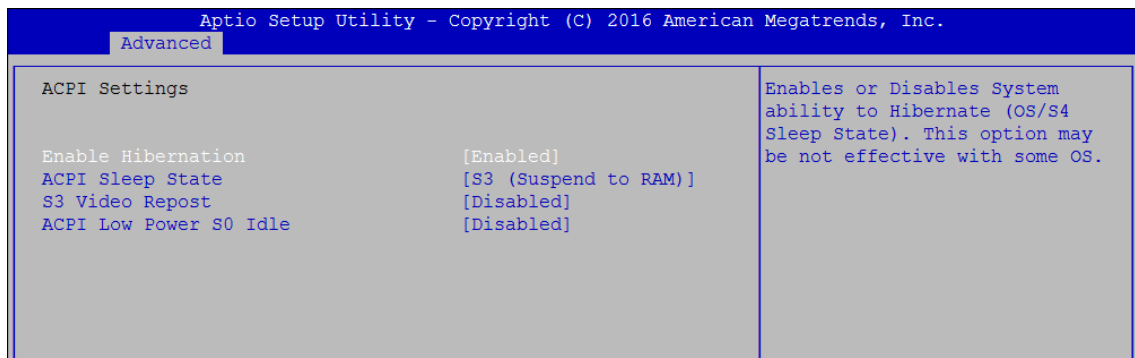


Figure 4-3-2 : ACPI Settings

Enable Hibernation

Enables or disables system's ability to hibernate (OS/S4 sleep state). This option may not be effective with some OS.

ACPI Sleep State

Selects the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

S3 Video Repost

Enables or disables S3 video repost.

ACPI Low Power S0 Idle

Enables or disables ACPI low power S0 idle support.

4.3.3 AMT Configuration

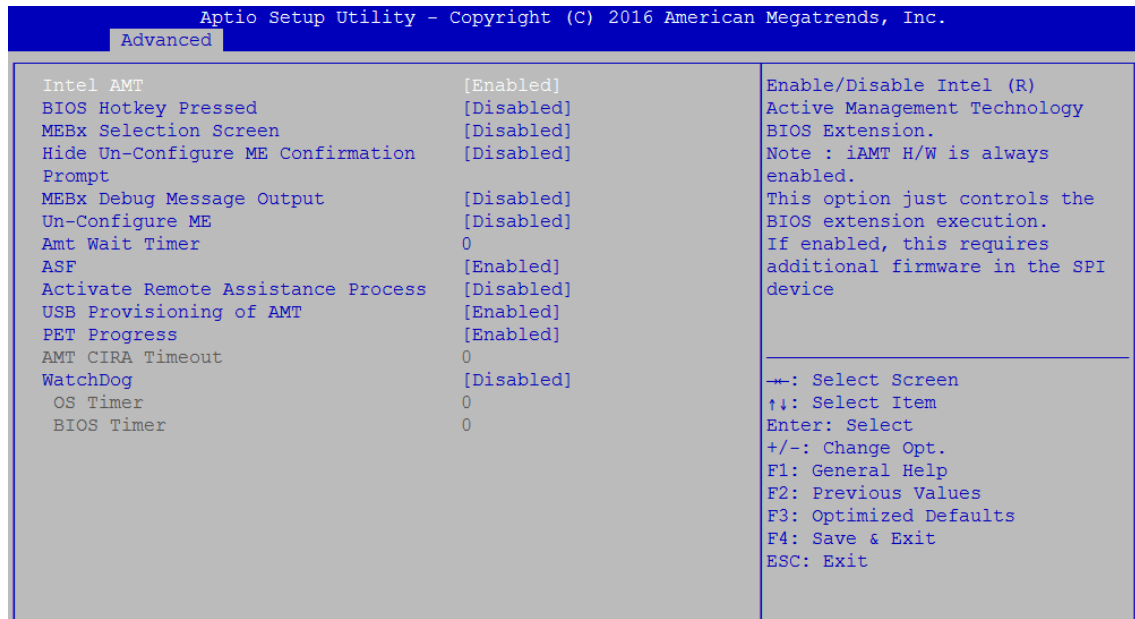


Figure 4-3-3 : Intel AMT Settings

Intel AMT

Enables/disables Intel (R) Active Management Technology BIOS extension.

Note: iAMT H/W is always enabled. This option just controls the BIOS extension execution. If enabled, this requires additional firmware in the SPI device.

4.3.4 PCH-FW Configuration

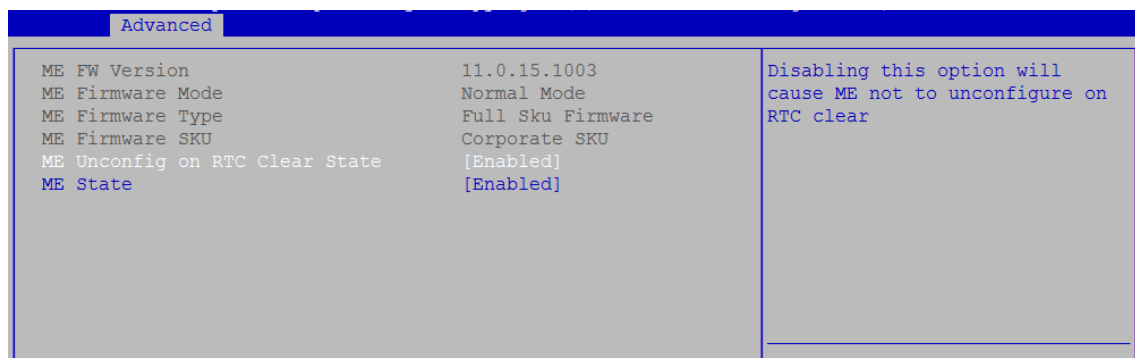


Figure 4-3-4 : PCH-FW Settings

ME Unconfig on RTC Clear State

Disabling this option will cause ME not to unconfigure on RTC clear.

ME State

Set ME to soft temporarily disabled.

4.3.5 SMART Settings

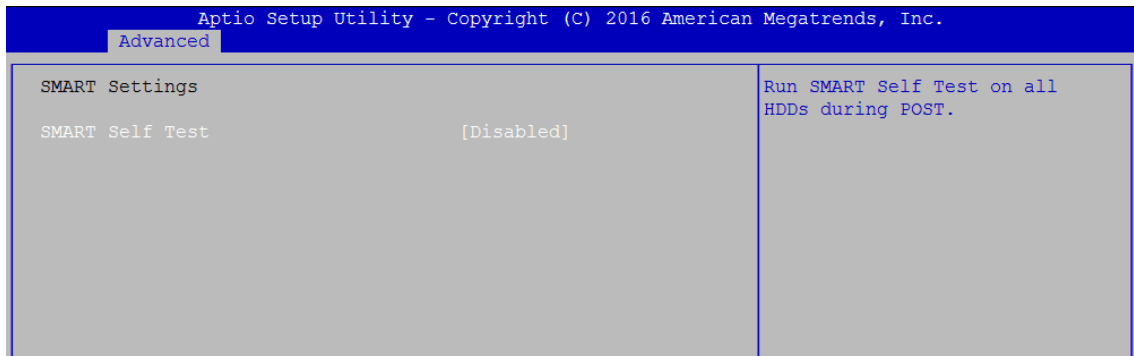


Figure 4-3-5 : SMART Settings

SMART Self Test

Run SMART Self Test on all HDDs during POST.

4.3.6 IT8786 Super IO Configuration

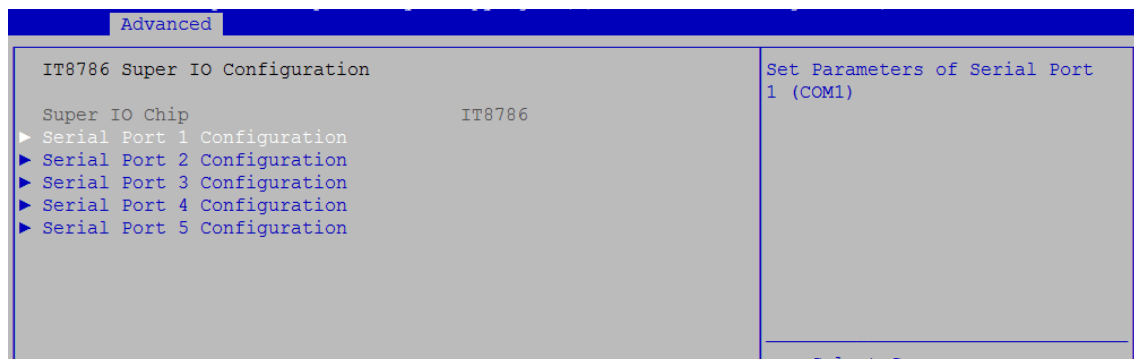


Figure 4-3-6-1 : Super IO Settings

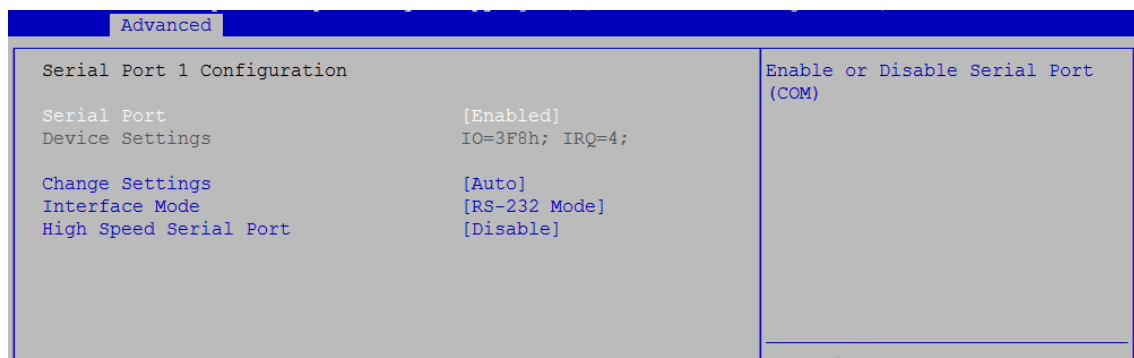


Figure 4-3-6-2 : Super IO Settings

Serial Port 1 to port 5 Configuration

Options for Serial Port 1 to Serial Port 5.

Entering the corresponding Port option then end user can change the settings such as I/O resource and UART mode.

4.3.7 Hardware Monitor

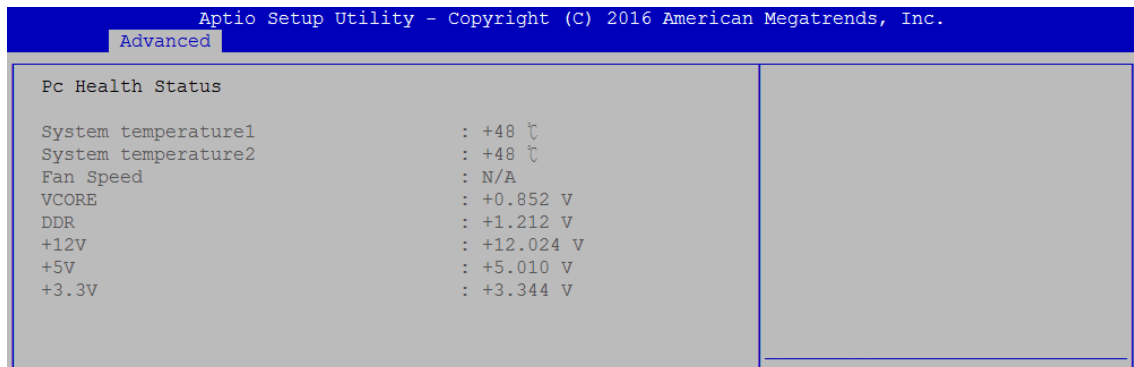


Figure 4-3-7 : Hardware Monitor Settings

The IT8786 SIO features an enhanced hardware monitor providing thermal, fan speed, and system voltages' status monitoring.

4.3.8 Serial Port Console Redirection

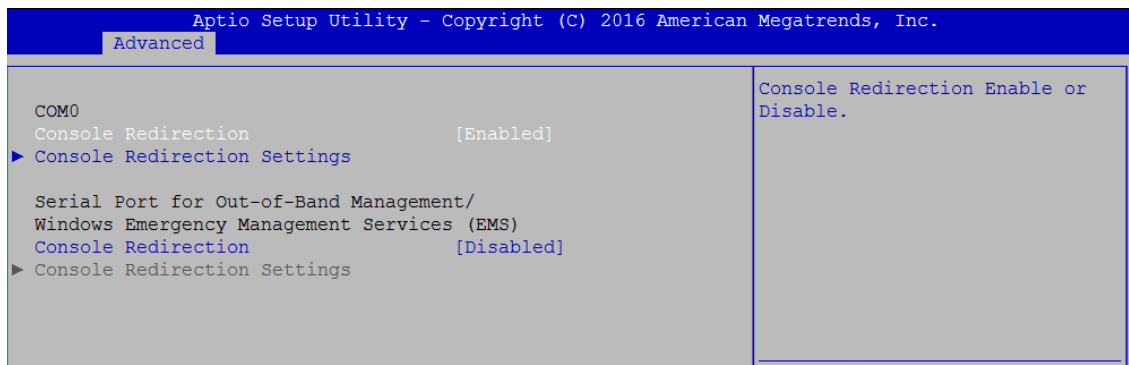


Figure 4-3-8 : Serial Port Console Redirection Settings

Console Redirection

Console redirection enable or disable.

Console Redirection Settings

These settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

4.3.9 CPU Configuration

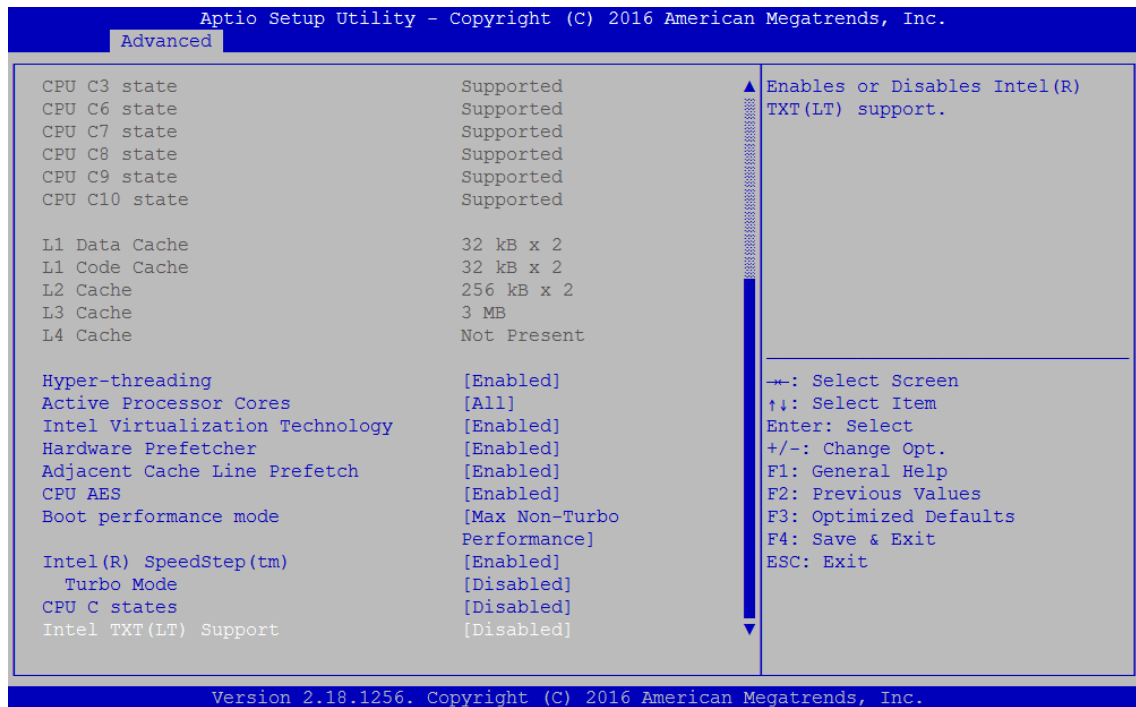


Figure 4-3-9: CPU Function Settings

Hyper-threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and disabled for other OS (OS not optimized for Hyper-Threading Technology). When disabled only one thread per core is enabled.

Active Processor Cores

Number of cores to enable in each processor package.

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hardware Prefetcher

To turn on/off the MLC streamer prefetcher.

Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

CPU AES

Enable/disable CPU Advanced Encryption Standard instructions.

Boot performance mode

Select the performance state that the BIOS will set before OS handoff.

Intel SpeedStep

Allows more than two frequency ranges to be supported.

Turbo Mode

Turbo Mode.

CPU C state

Enable or disable CPU C states.

Enhanced C-states

Enable/disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

Package C State limit

Package C State limit.

Intel TXT(LT) Support

Enables or disabled Intel TXT(LT) support.

4.3.10 Intel TXT Information

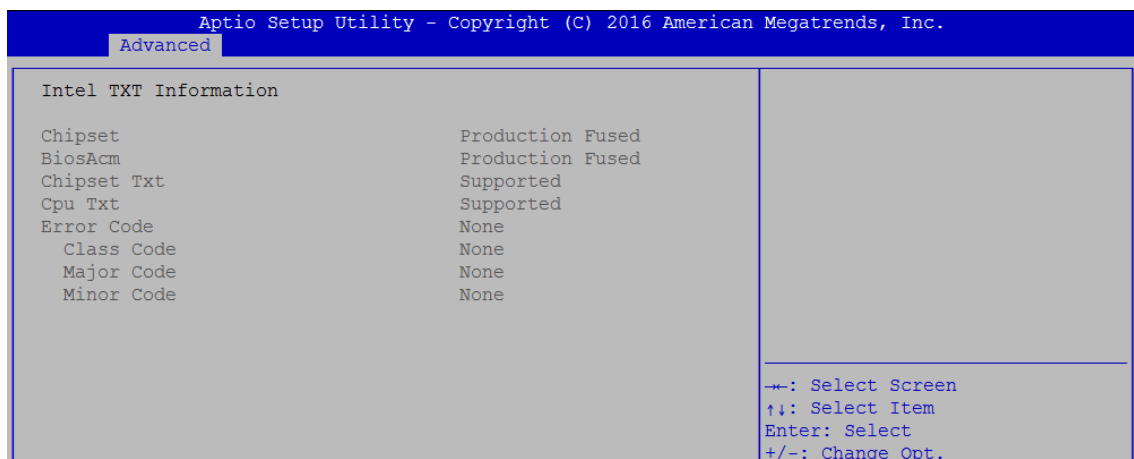


Figure 4-3-10 : Intel TXT Information

Display Intel TXT information.

4.3.11 SATA Configuration



Figure 4-3-11 : SATA Devices Settings

SATA Controller(s)

Enable or disable SATA Device.

SATA Mode Selection

Determines how SATA controller(s) operate.

Software Feature Mask Configuration

RAID OROM/RST driver will refer to the SWFM configuration to enable or disable the storage features.

Aggressive LPM Support

Enable PCH to aggressively enter link power state.

Options for each SATA port :

Port 0

Enable or disabled SATA Port.

Spin Up Device

On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

SATA Device Type

Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

4.3.12 Acoustic Management Configuration

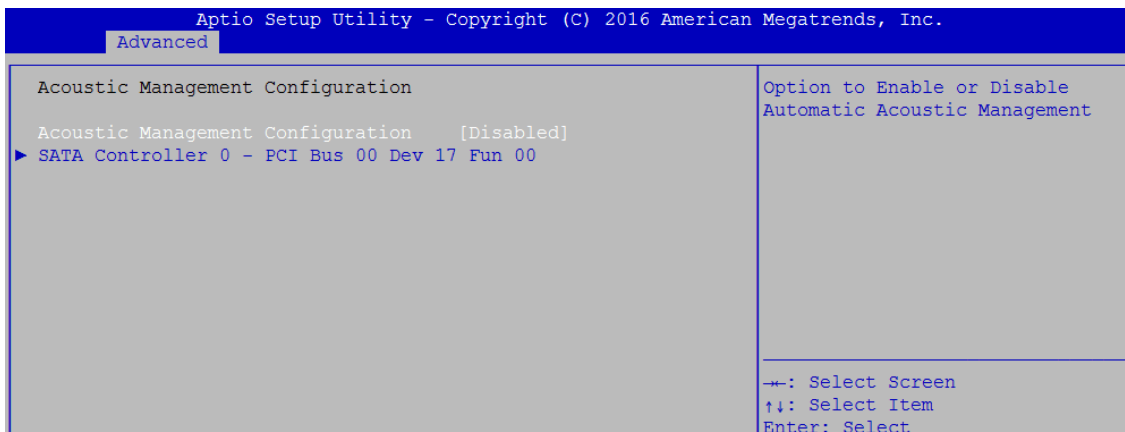


Figure 4-3-12 : Acoustic Management Settings

Acoustic Management Configuration

Option to enable or disable Automatic Acoustic Management.

4.3.13 CSM Configuration

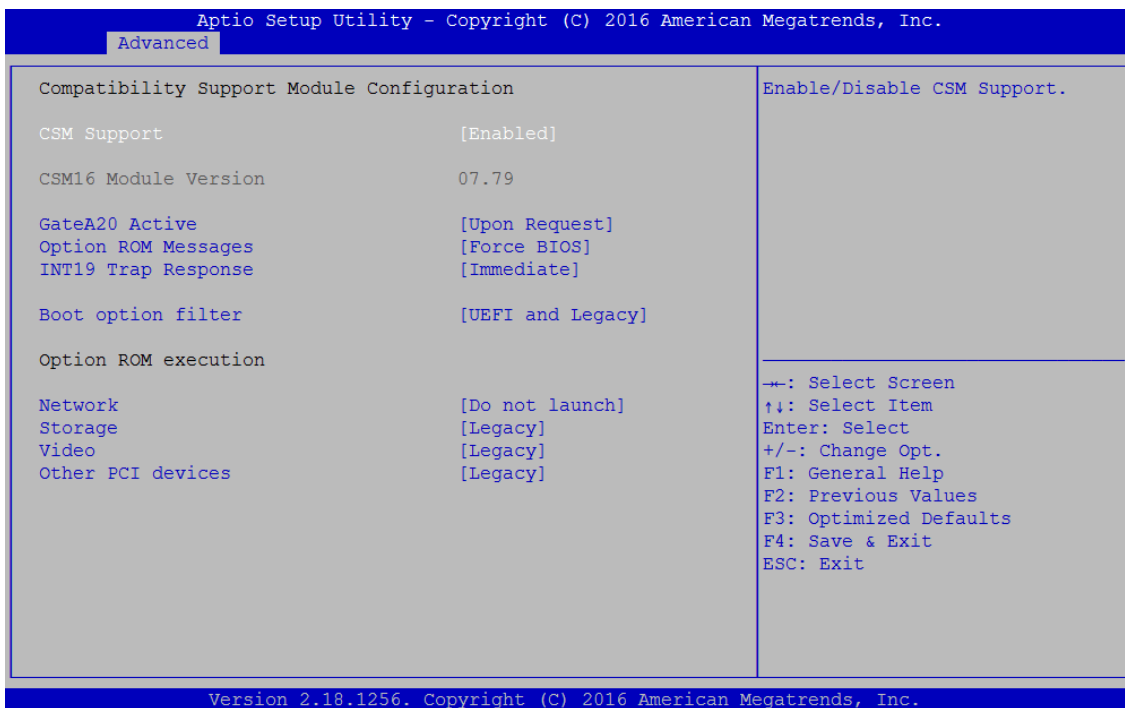


Figure 4-3-13 : CSM Settings

CSM Support

Enable/disable CSM Support.

GateA20 Active

UPON REQUEST - GA20 can be disabled using BIOS services.

ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Option ROM Messages

Set display mode for Option ROM.

INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM:

IMMEDIATE - execute the trap right away;

POSTPONED - execute the trap during legacy boot.

Boot option filter

This option controls Legacy/UEFI ROMs priority.

Network

Controls the execution of UEFI and Legacy PXE OpROM.

Storage

Controls the execution of UEFI and Legacy Storage OpROM.

Video

Controls the execution of UEFI and Legacy Video OpROM.

Other PCI devices

Determines OpROM execution policy for devices other than network, storage, or video.

4.3.14 USB Configuration

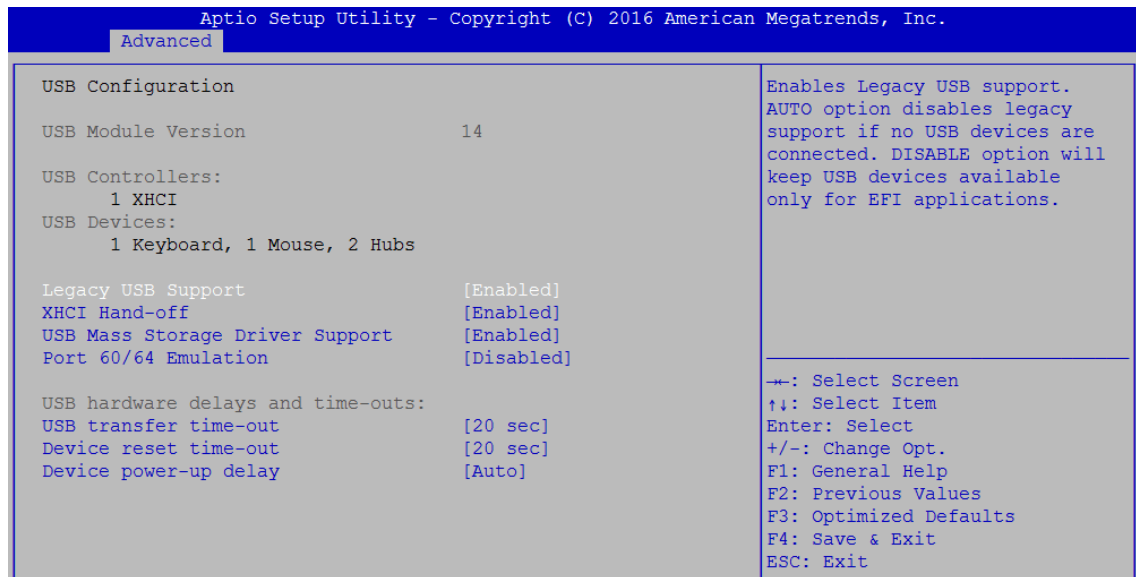


Figure 4-3-14 : USB Settings

Network Stack

Enable/disable UEFI Network Stack.

Legacy USB Support

Enables Legacy USB support.

AUTO option disables legacy support if no USB devices are connected.

DISABLE option will keep USB devices available only for EFI applications.

XHCI Hand-off

This is a workaround for OS-es without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

USB Mass Storage Driver Support

Enable/disable USB Mass Storage Driver Support.

Port 60/64 Emulation

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

USB transfer time-out

The time-out value for control, bulk, and interrupt transfers.

Device reset time-out

USB mass storage device Start Unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.

4.4 Chipset

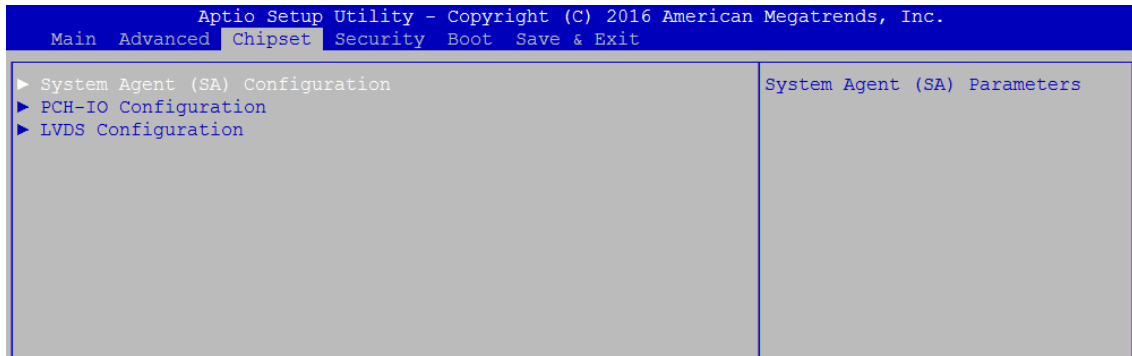


Figure 4-4 : BIOS Chipset Menu

System Agent (SA) Configuration

System Agent (SA) Parameters.

PCH-IO Configuration

PCH Parameters.

LVDS Configuration

Change panel resolution if LVDS panel is connected.

4.4.1 System Agent (SA) Configuration

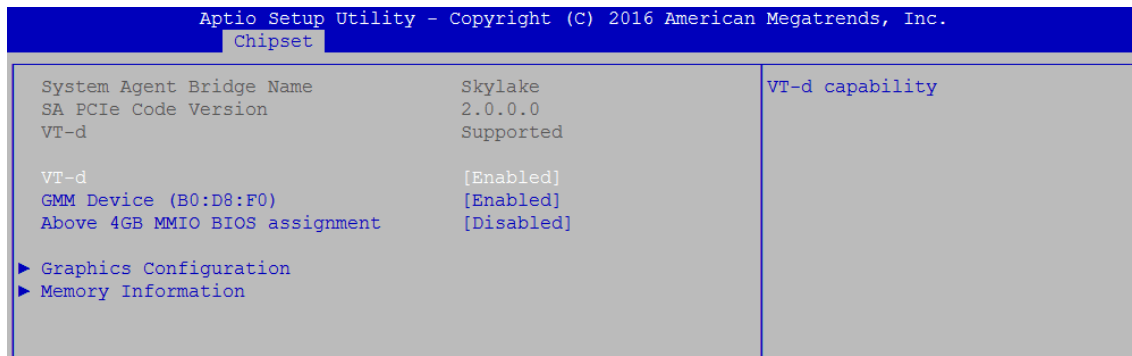


Figure 4-4-1 : System Agent Settings

VT-d

VT-d capability.

GMM Device (B0:D8:F0)

Enable/disable SA GMM Device.

Above 4GB MMIO BIOS assignment

Enable/disable above 4GB Memory MappedIO BIOS assignment. This is disabled automatically when Aperture Size is set to 2048MB.

4.4.2 Graphics Configuration of System Agent (SA)

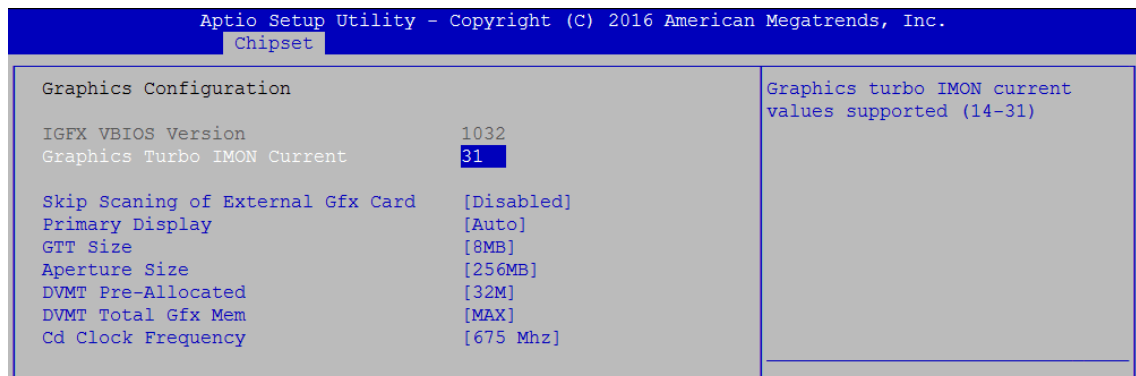


Figure 4-4-2 : Graphics Settings

Graphics Turbo IMON Current

Graphics turbo IMON current values supported (14-31).

Skip Scanning of External Gfx Card

If enable, it will not scan for External Gfx Card on PEG and PCH PCIE Ports.

Primary Display

Select which of IGFX/PEG/PCI graphics device should be primary display or select SG for Switchable Gfx.

GTT Size

Select the GTT Size.

Aperture Size

Select the Aperture Size.

Note: Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

DVMT Total Gfx Mem

Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

Cd Clock Frequency

Select the highest Cd Clock frequency supported by the platform.

4.4.3 Memory Information of System Agent (SA)

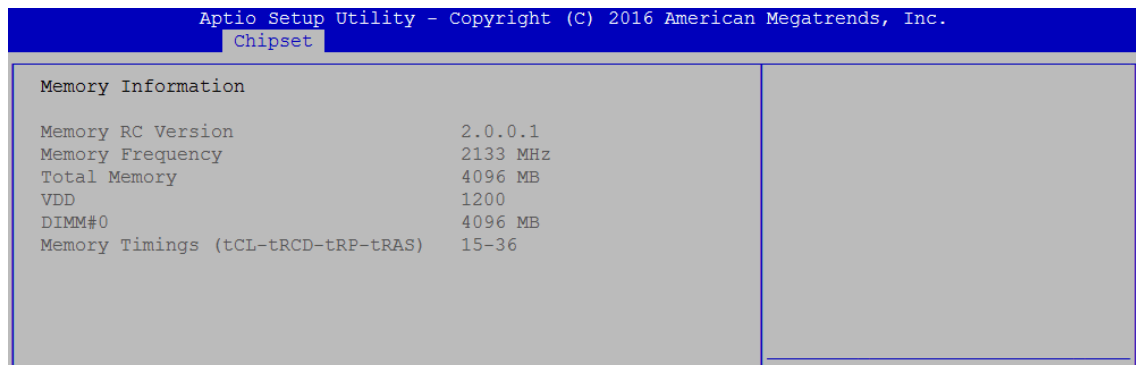


Figure 4-4-3 : Memory Information

Display memory information.

4.4.4 PCH-IO Configuration

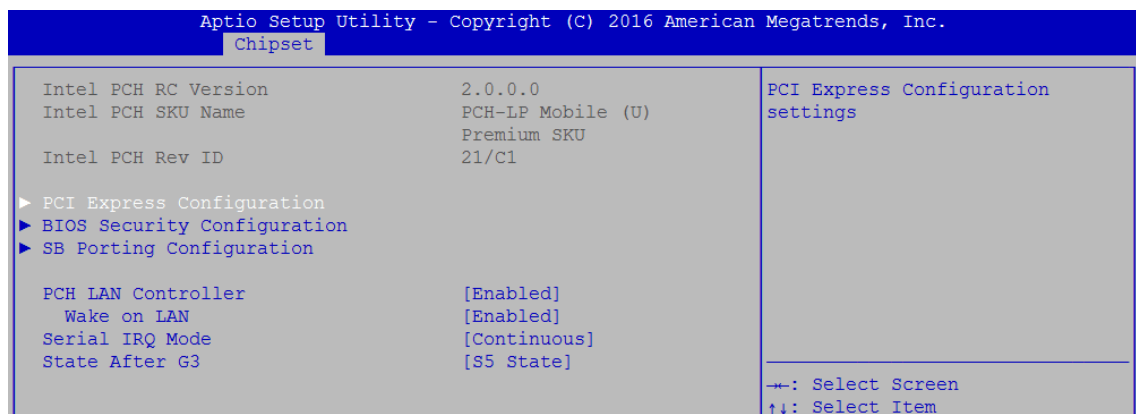


Figure 4-4-4: PCH-IO Settings

PCH LAN Controller

Enable or disable onboard NIC.

Wake on LAN

Enable or disable integrated LAN to wake the system. (The wake On LAN cannot be disabled if ME is on at Sx state.)

Serial IRQ Mode

Configure serial IRQ mode.

State After G3

Specify what state to go to when power is re-applied after a power failure (G3 state).

S0 State: Always turn-on the system when power source plugged-in.

S5 State: Always turn-off the system when power source plugged-in.

4.4.5 PCI Express Configuration of PCH-IO

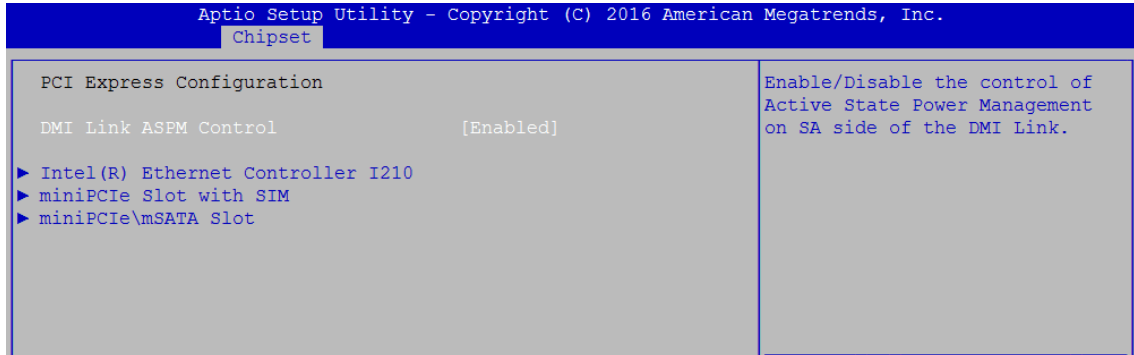


Figure 4-4-5: PCH-IO Settings

DMI Link ASPM Control

Enable/Disable the control of Active State Power Management on SA side of the DMI Link.

Intel(R) Ethernet Controller I210

Intel(R) Ethernet Controller I210 Settings.

Mini PCIe Slot with SIM

Mini PCIe Slot with SIM Settings.

Mini PCIe\mSATA Slot

Mini PCIe\mSATA Slot Settings.

4.4.6 BIOS Security Configuration of PCH-IO

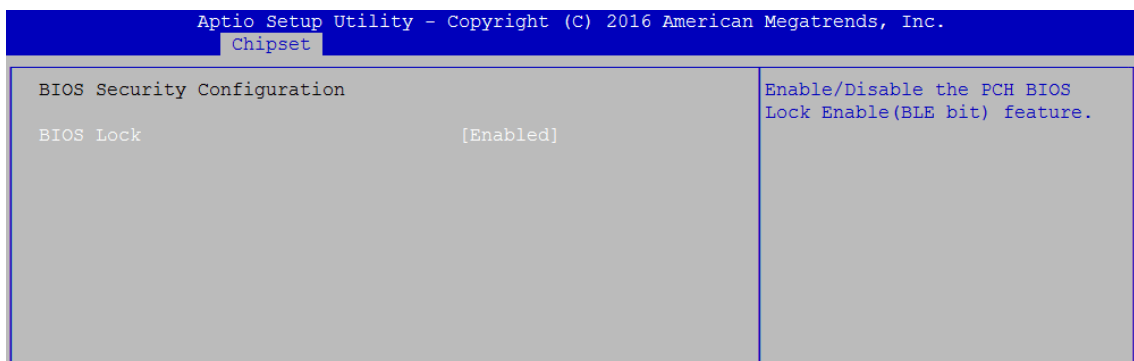


Figure 4-4-6: BIOS Security Settings

BIOS Lock

Enable/disable the PCH BIOS Lock Enable (BLE bit) feature.

4.4.7 PCI Express Configuration of PCH-IO

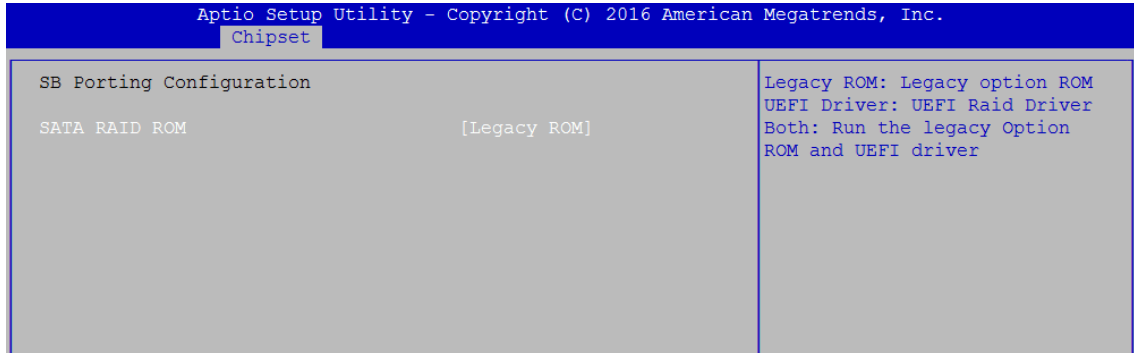


Figure 4-4-7: RAID ROM Settings

SATA RAID ROM

Legacy ROM: Legacy option ROM

UEFI Driver: UEFI Raid Driver

Both: Run the Legacy Option ROM and UEFI driver.

4.4.8 LVDS Configuration

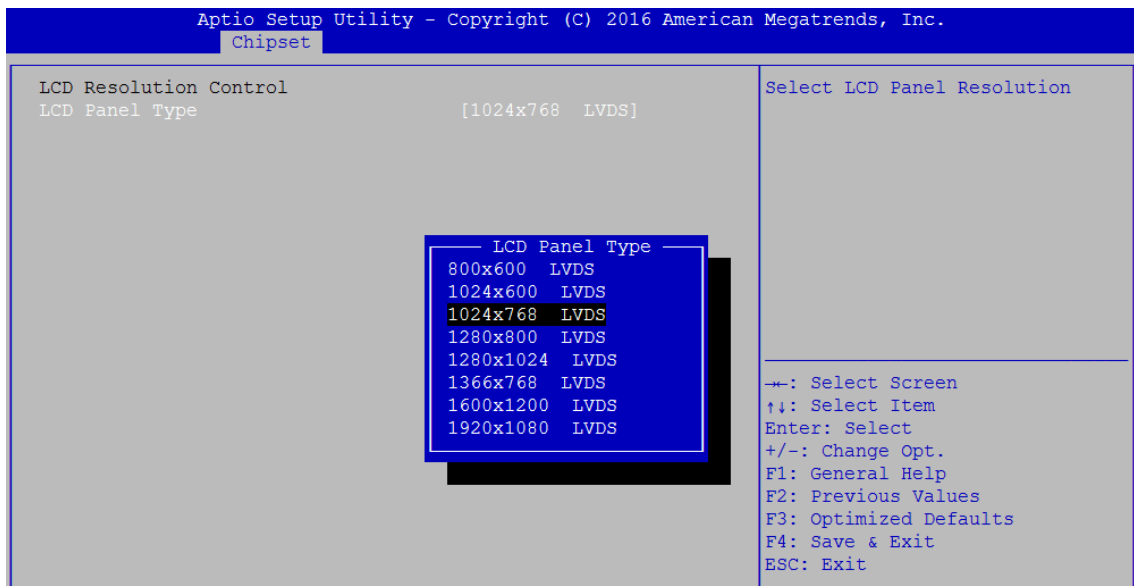


Figure 4-4-8: LVDS Panel Settings

The LVDS Configuration option will be present if LVDS panel is connected on system.

LCD Panel Type

Select LCD Panel Resolution.

4.5 Security

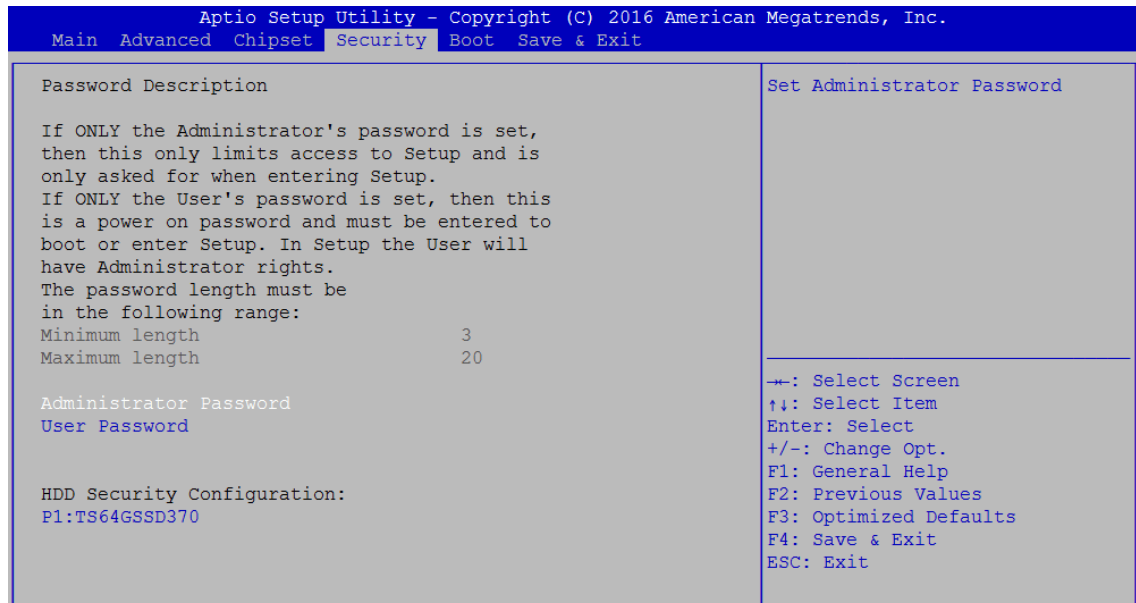


Figure 4-5 : BIOS Security Menu

Administrator Password

Set Administrator Password.

User Password

Set User Password.

4.5.1 HDD Security Configuration

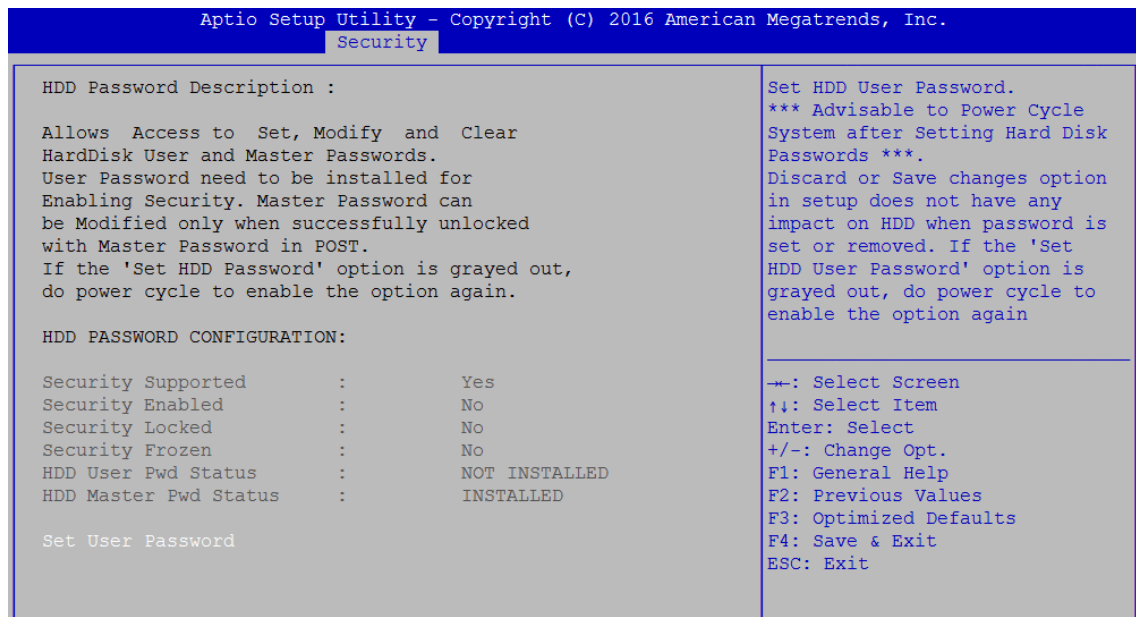


Figure 4-5-1 : HDD Security Settings

Set User Password

Set HDD user password.

Advisable to Power Cycle System after Setting Hard Disk Passwords.

Discard or save changes option in setup does not have any impact on HDD when password is set or removed. If the 'Set HDD User Password' option is grayed out, do power cycle to enable the option again.

4.6 Boot

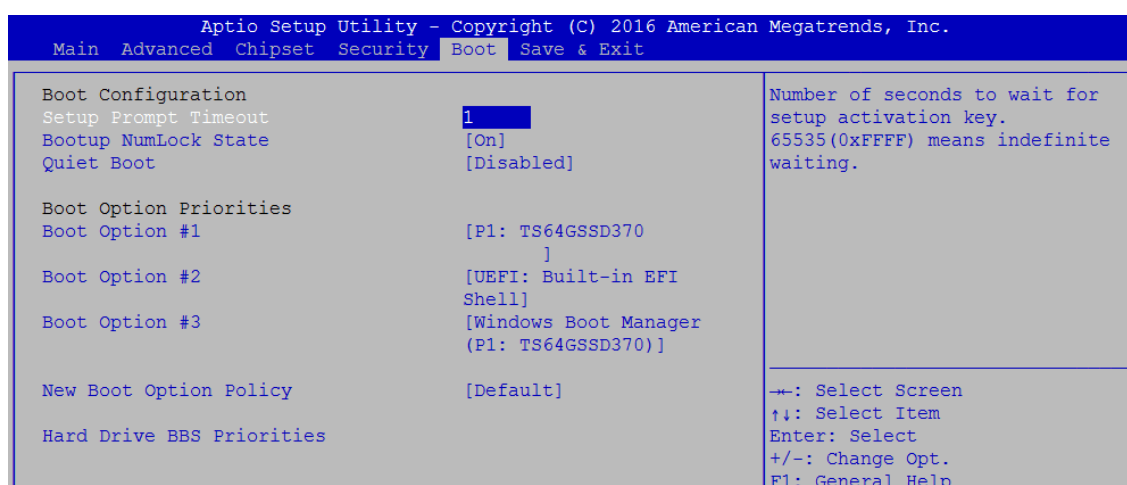


Figure 4-6 : BIOS Boot Menu

Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or disables Quiet Boot option.

Boot Option

Sets the system boot order.

New Boot Option Policy

Controls the placement of newly detected UEFI boot options.

Hard Drive BBS Priorities

Set the order of the legacy devices in this group.

4.7 Save & Exit

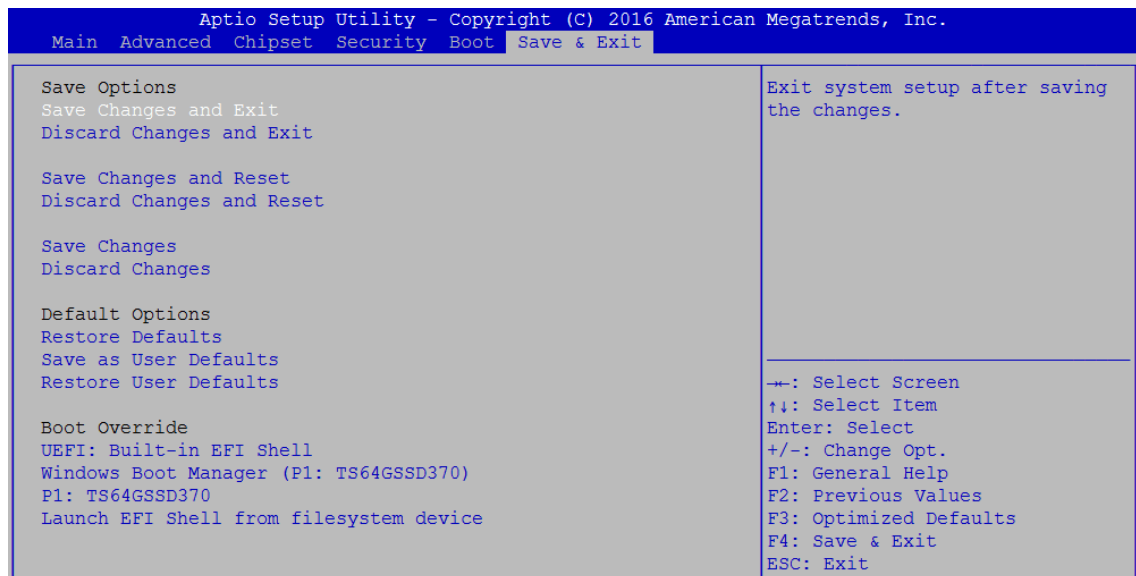


Figure 4-7 : Bios Save and Exit Menu

Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Save Changes

Save changes done so far to any of the setup options.

Discard Changes

Discard changes done so far to any of the setup options.

Default Options :

Restore Defaults

Restore/load default values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options.

A

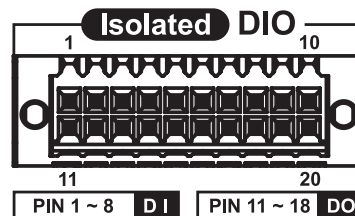
APPENDIX A : ISOLATED DIO GUIDE

A.1 IO Pin Definition

GPIO Pin	Base Address	Usage
70 ~ 77	0xA06	DO
80 ~ 87	0xA07	DI

A.2 Function Description

The SPC-3000 offers two 16-bit DIO (8-DI/ 8-DO) 20-pin terminal block connectors. Each bit of DI and DO equipped with a photo-coupler for isolated protection. All IO pins are fixed by Hardware design and cannot change in/out direction in runtime process. The definition is listed as follows:

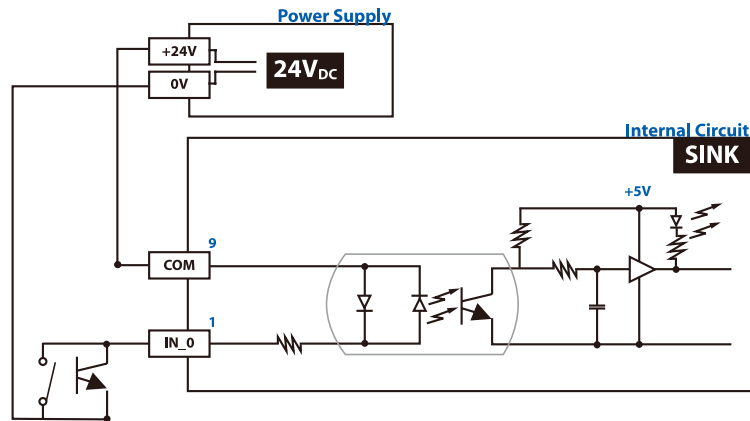


Pin No.	JDIO1 Definition	JDIO2 Definition
1	SIO_GPI80	SIO_GPI84
2	SIO_GPI81	SIO_GPI85
3	SIO_GPI82	SIO_GPI86
4	SIO_GPI83	SIO_GPI87
5	SIO_GPO70	SIO_GPO74
6	SIO_GPO71	SIO_GPO75
7	SIO_GPO72	SIO_GPO76
8	SIO_GPO73	SIO_GPO77
9	+5V	+5V
10	GND	GND

A.3 DIO Signal Circuit

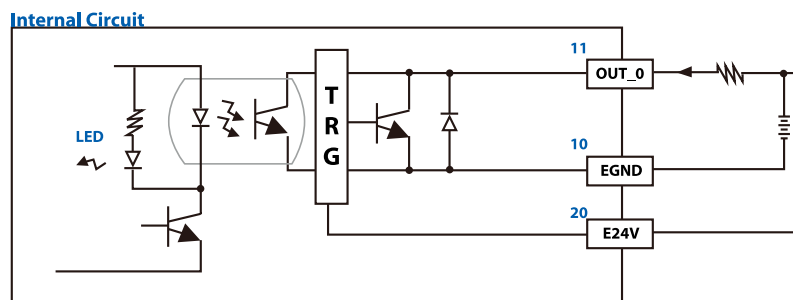
DI in SINK mode (NPN)

Signal Circuit of Input NPN



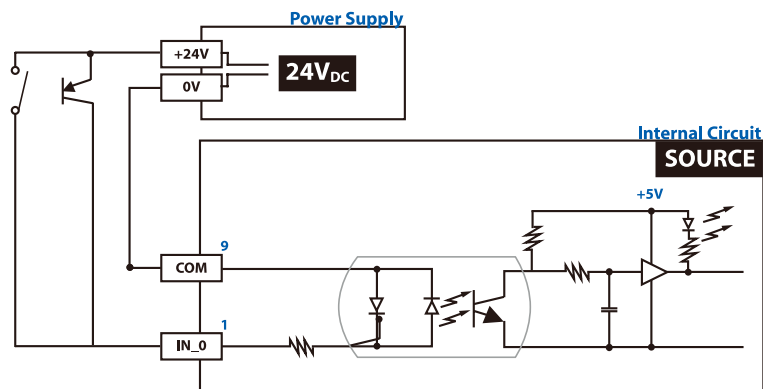
DO in SINK mode (NPN)

Signal Circuit of output NPN



DI in SOURCE mode (PNP)

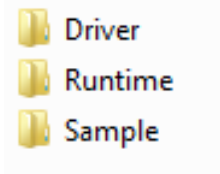
Signal Circuit of Input NPN



A.4 Software Package contain

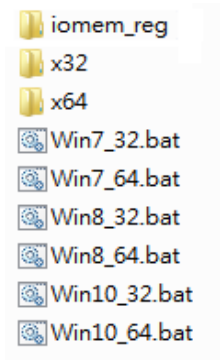
There are three folders with the following inside:

- Driver folder includes x32 & x64 versions
- Runtime folder includes DLL and header file for software developer or system integration
- Sample folder includes sample program



A.5 Driver Install

In Driver folder, you can find the files below inside. Please right click the batch file that is chosen by your OS version, and run as administrator.



Please press any key to install the Framework 3.5 installation.

```
C:\Windows\System32\cmd.exe
1 file(s) copied.
1 file(s) copied.
1 file(s) copied.
1 file(s) copied.
Microsoft PnP Utility
Processing inf :          iomem.inf
Successfully installed the driver on a device on the system.
Driver package added successfully.
Published name :          oem3.inf

Deployment Image Servicing and Management tool
Version: 10.0.10586.0

Image Version: 10.0.10586.0

Enabling feature(s)
[=====          11.8%          ]
```

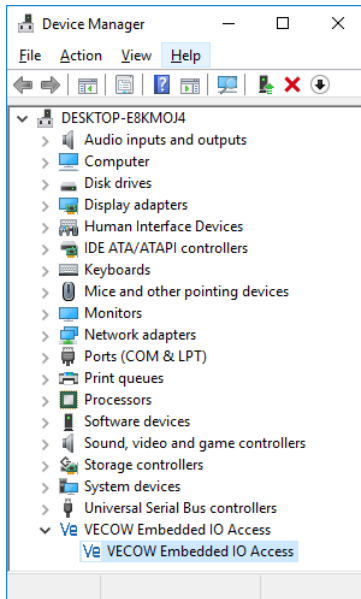
Please press any key to restart.

```
C:\Windows\System32\cmd.exe
1 file(s) copied.
1 file(s) copied.
1 file(s) copied.
1 file(s) copied.
Microsoft PnP Utility
Processing inf :          iomem.inf
Successfully installed the driver on a device on the system.
Driver package added successfully.
Published name :          oem3.inf

Deployment Image Servicing and Management tool
Version: 10.0.10586.0

Image Version: 10.0.10586.0

Enabling feature(s)
[=====100.0%=====]
The operation completed successfully.
Ready to Restart!
Press any key to continue . . .
```



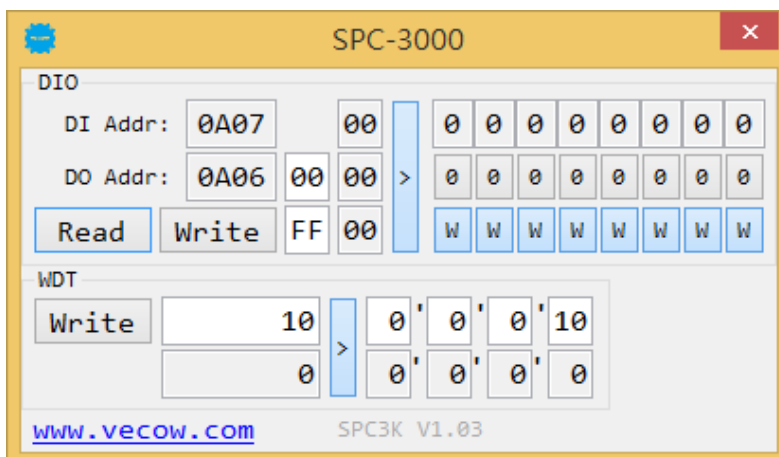
On Device Manager, “VEECOW Embedded IO Access” will be added.

A.6 DIO Demo Tool

Execute DIO Demo tool (RCS9K.exe).



Operation on DIO demo tool utility.



Operation on DIO demo tool utility.

Click “Read” button to get value; Input any number in Write and Write Mask textbox, and click “Write” Button to set value.

Please check the In-Out pin for GPIO.

B

APPENDIX B : GPIO & WDT Functions

B.1 IOMem.Dll API

int Outp(unsigned long Port, unsigned char Value);

Description: Set Byte-Data to Port.

Return: if success return 1; else return 0.

unsigned char Inp(unsigned long Port);

Description: Get Byte-Data from Port.

B.2 Entry Functions

int Get_DI(unsigned char *DI);

Description: Get DI Data for DIO.

Return: if success return 1; else return 0.

int Set_DO(unsigned char DO);

Description: Set DO Data for DIO.

Return: if success return 1; else return 0.

int Set_WDT(unsigned long time);

Description: Set WDT Time for WDT.

Return: if success return 1; else return 0.

C

APPENDIX C : RAID Installation Guide

C.1 SATA Mode for RAID

Please select SATA device to RAID mode on BIOS menu.
Advanced → SATA Configuration → SATA Mode Selection

Main	Advanced	Chipset	Boo	Security	Save & Exit	
SATA Controller(s)					[Enabled]	Item Specific Help
SATA Model Selection					[AHCI]	

C.2 OS Installation

SPC-3000 is featured with three SATA, including two internal SATA and 1 mSATA. You can select one of the SATA ports for OS installation. We use CFast card for Windows 10 OS installation as an example.

C.3 To Install All Device Drivers of SPC-3000 System

The instructions are as follows:

1. To install Chipset driver
2. To install Network driver
3. To install ME driver (if available)
4. To install Audio driver
5. To install VGA driver

C.4 To Install “Intel Rapid Storage Technology” Software

You can get the latest information and the software directly from Intel website.

http://www.intel.com/p/en_US/support/highlights/chpsts/imsm

The RAID environment has been done if you completed the steps above.

C.5 To Insert SATA HDD for RAID 1

Please notice, you can use two SATA ports for SATA HDD or one SATA port for SATA HDD with one slot for mSATA.

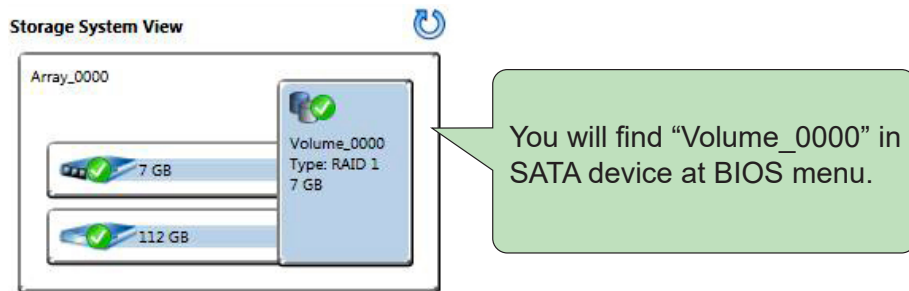
C.6 To Create RAID Volume on “Rapid Storage Technology” Software

SPC-3000 is featured with three SATA devices for RAID volume, so there are three options for choose on this page. Let’s take RAID 1 as an example, please select “RAID 1”.



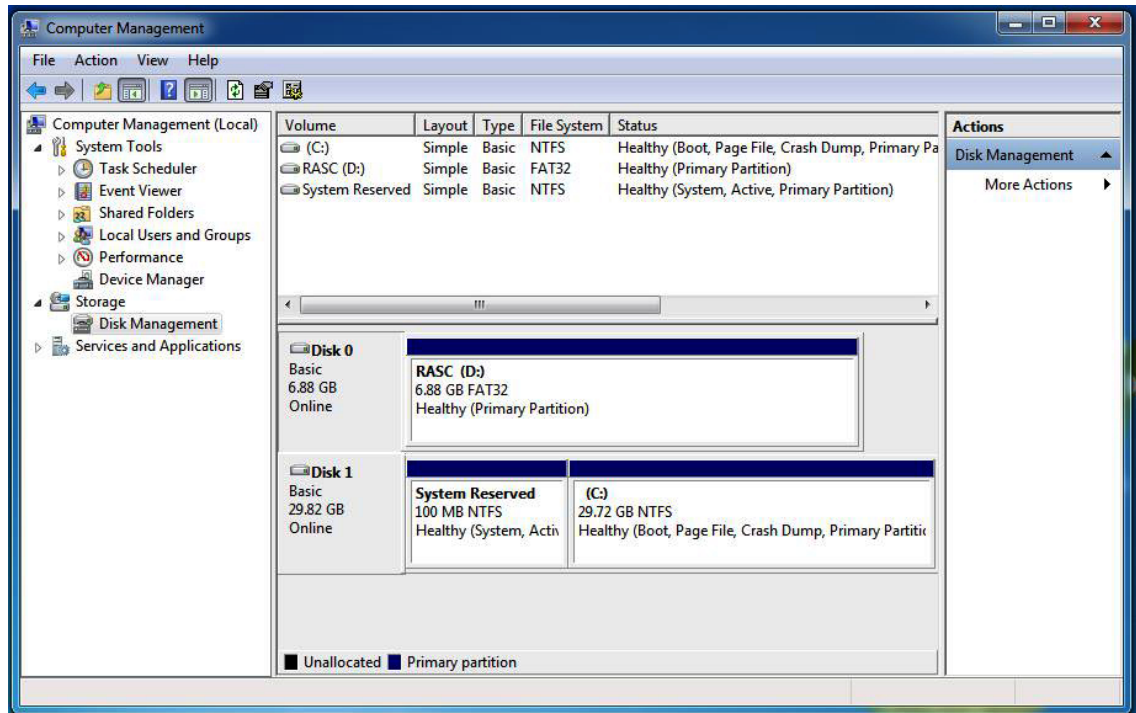
C.7 Disk Management : Partition the Disk

After RAID 1 volume created, you can see the figure of SATA device allocation.



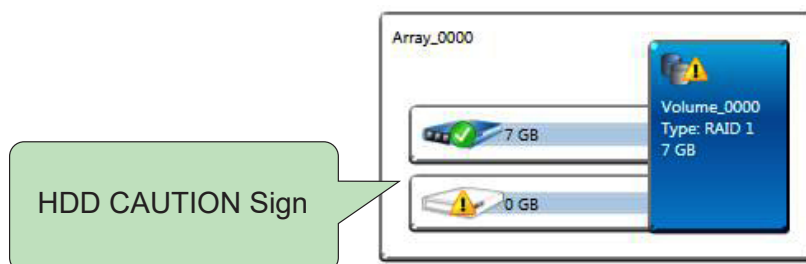
To start Disk Management tool, select "initialize disk."

Then add "Logical Device" for Windows access.

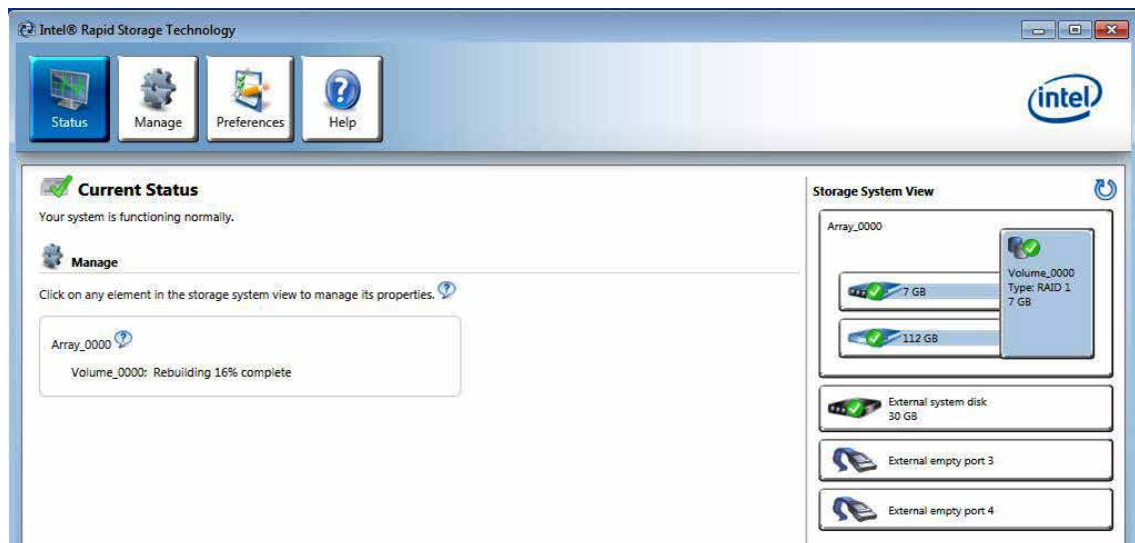


C.8 If One SATA HDD on RAID Volume is Out-of-use

After RAID 1 volume created, you can see the figure of SATA device allocation.



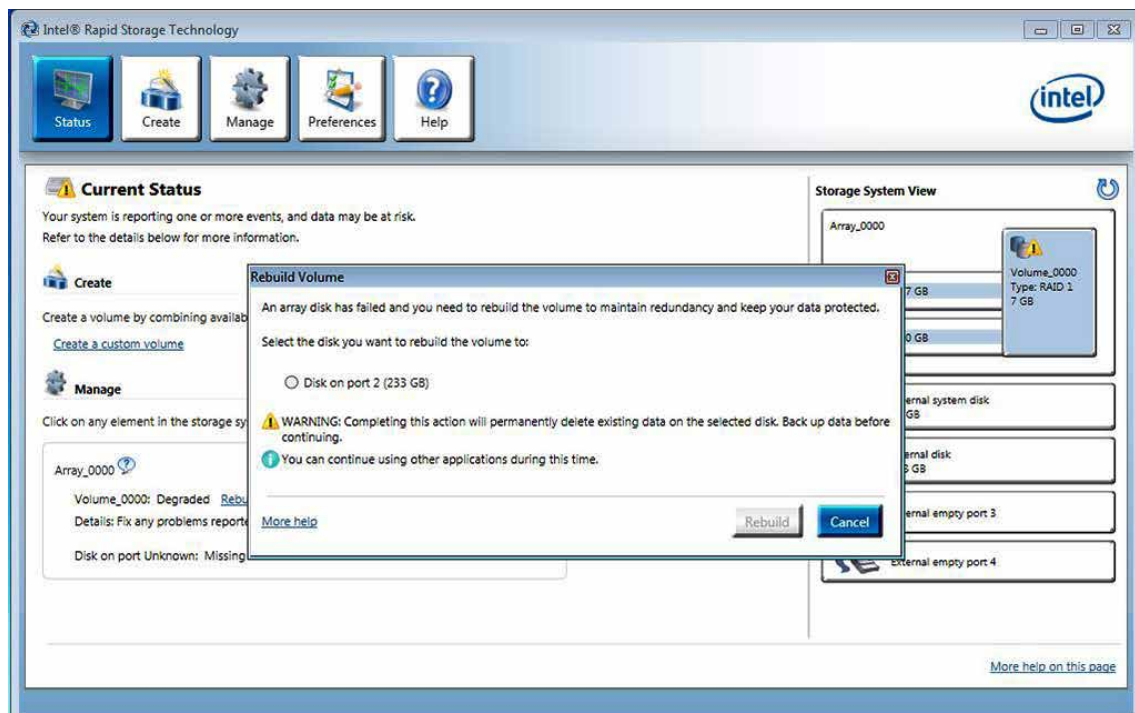
C.9 Recovery and Auto Re-build When Use the **SAME** RAID HDD



C.10 Recovery and Auto Re-build When Use **DIFFERENT** RAID HDD

A warning will pop-up to ask you if the disk is not a member of the original RAID volume.

If you press “Rebuild”, it will replace the broken SATA HDD to the last SATA HDD of RAID volume.



D

APPENDIX D : Power Consumption

D.1 SPC-3X10 with i7-6600U

Testing Board	SPC-3X10 Power consumption testing
RAM	Transcend 8GB
SATA 0	TOSHIBA SSD THNS064GE4BBDC 64GB
SATA 1	HITACHI HTS542580K9SA00 80G
USB3.0 -1	USB Flash Transcend 3.0 8GB
USB3.0 -2	USB Flash Transcend 3.0 8GB
USB3.0 -	USB Flash Transcend 3.0 8GB
USB3.0 -4	USB Flash Transcend 3.0 8GB
USB2.0 -1	USB Flash ADATA 8GB
USB2.0 -2	Logitech M105 Mouse
LAN1 (I219)	1.0 Gbps
LAN2 (I210)	1.0 Gbps
Graphics Output	DVI
Power plan	Balance(Windows8.1 Power Plan)
Power Source	Chroma 62006P-100-25

Power on and boot to Win8.1 64bit

CPU	Power Input	Standby Mode		Run 100% CPU usage without 3D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
i7-6600U	12V	0.327A	03.92W	0.869A	10.43W	2.01A	24.12W
i7-6600U	24V	0.279A	06.70W	0.565A	13.56W	1.125A	27.10W
i7-6600U	28V	0.274A	07.67W	0.478A	13.38W	1.009A	28.26W
i7-6600U	36V	0.258A	09.29W	0.439A	15.80W	0.801A	28.85W

D.2 SPC-3X20 with i7-6600U

Testing Board	SPC-3X10 Power consumption testing
RAM	Transcend 8GB
SATA 0	TOSHIBA SSD THNS064GE4BBDC 64GB
SATA 1	HITACHI HTS542580K9SA00 80G
USB3.0 -1	USB Flash Transcend 3.0 8GB
USB3.0 -2	USB Flash Transcend 3.0 8GB
USB3.0 -3	USB Flash Transcend 3.0 8GB
USB3.0 -4	USB Flash Transcend 3.0 8GB
USB2.0 -1	USB Flash ADATA 8GB
USB2.0 -2	Logitech M105 Mouse
LAN1 (I219)	1.0 Gbps
LAN2 (I210)	1.0 Gbps
LAN2 (I210)	1.0 Gbps
LAN2 (I210)	1.0 Gbps
Graphics Output	DVI
Power plan	Balance(Windows8.1 Power Plan)
Power Source	Chroma 62006P-100-25

Power on and boot to Win8.1 64bit

CPU	Power Input	Standby Mode		Run 100% CPU usage without 3D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
i7-6600U	12V	0.335A	04.02W	0.876A	10.52W	1.994A	23.93W
i7-6600U	24V	0.253A	06.80W	0.572A	13.74W	1.121A	26.92W
i7-6600U	28V	0.277A	07.78W	0.506A	14.18W	1.003A	28.08W
i7-6600U	36V	0.261A	09.41W	0.445A	16.02W	0.798A	28.72W

D.3 SPC-3X30 with i7-6600U

Testing Board	SPC-3X10 Power consumption testing
RAM	Transcend 8GB
SATA 0	TOSHIBA SSD THNS064GE4BBDC 64GB
SATA 1	HITACHI HTS542580K9SA00 80G
USB3.0 -1	USB Flash Transcend 3.0 8GB
USB3.0 -2	USB Flash Transcend 3.0 8GB
USB3.0 -3	USB Flash Transcend 3.0 8GB
USB3.0 -4	USB Flash Transcend 3.0 8GB
USB2.0 -1	USB Flash ADATA 8GB
USB2.0 -2	Logitech M105 Mouse
LAN1 (I219)	1.0 Gbps
LAN2 (I210)	1.0 Gbps
LAN2 (I210)	1.0 Gbps
LAN2 (I210)	1.0 Gbps
Graphics Output	DVI
Power plan	Balance(Windows8.1 Power Plan)
Power Source	Chroma 62006P-100-25

Power on and boot to Win8.1 64bit

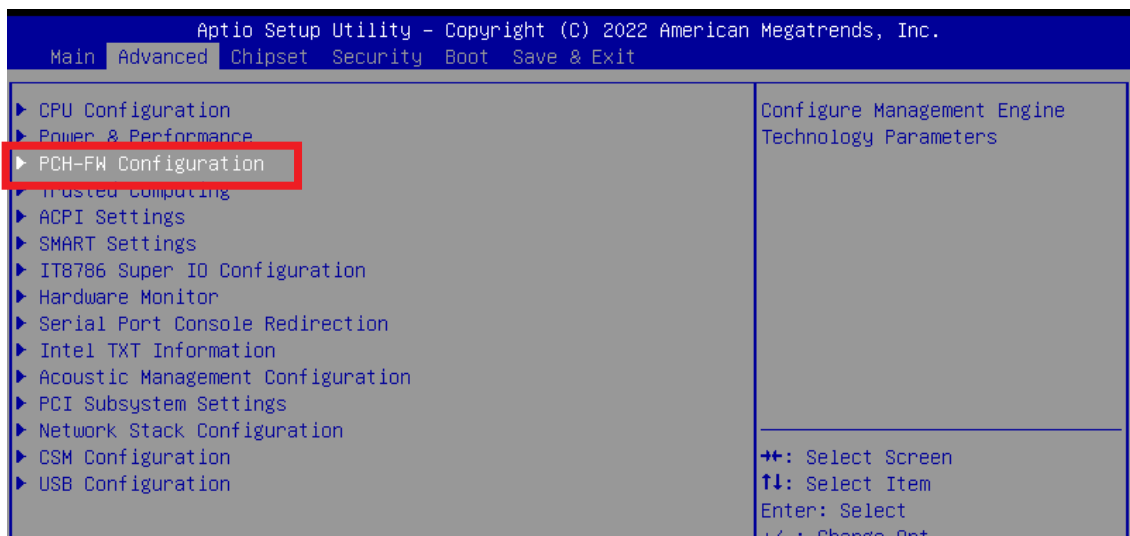
CPU	Power Input	Standby Mode		Run 100% CPU usage without 3D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
i7-6600U	12V	0.335A	04.02W	0.876A	10.51W	1.995A	23.95W
i7-6600U	24V	0.284A	06.82W	0.573A	13.75W	1.125A	26.94W
i7-6600U	28V	0.278A	07.81W	0.507A	14.20W	1.004A	28.11W
i7-6600U	36V	0.262A	09.42W	0.445A	16.03W	0.799A	28.75W

** If more help is needed, please contact Vecow technical support **

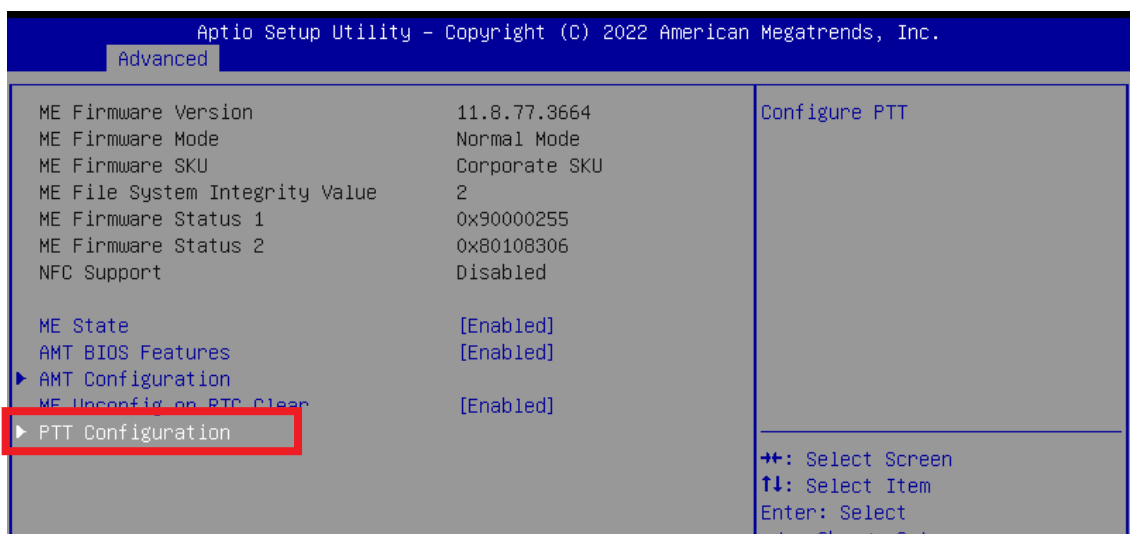
E

APPENDIX E : Install Win11 (BIOS TPM Setting)

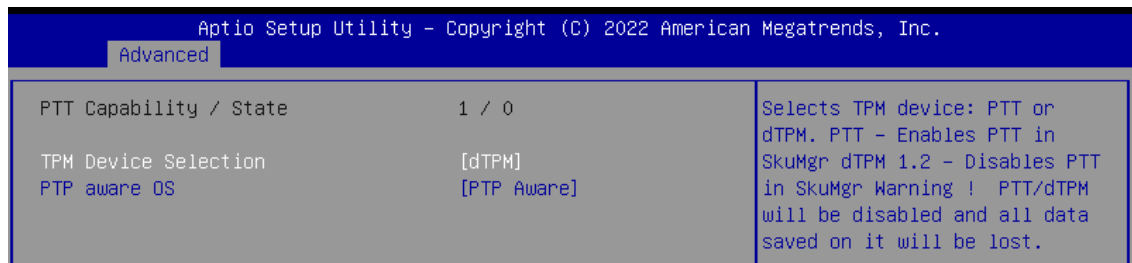
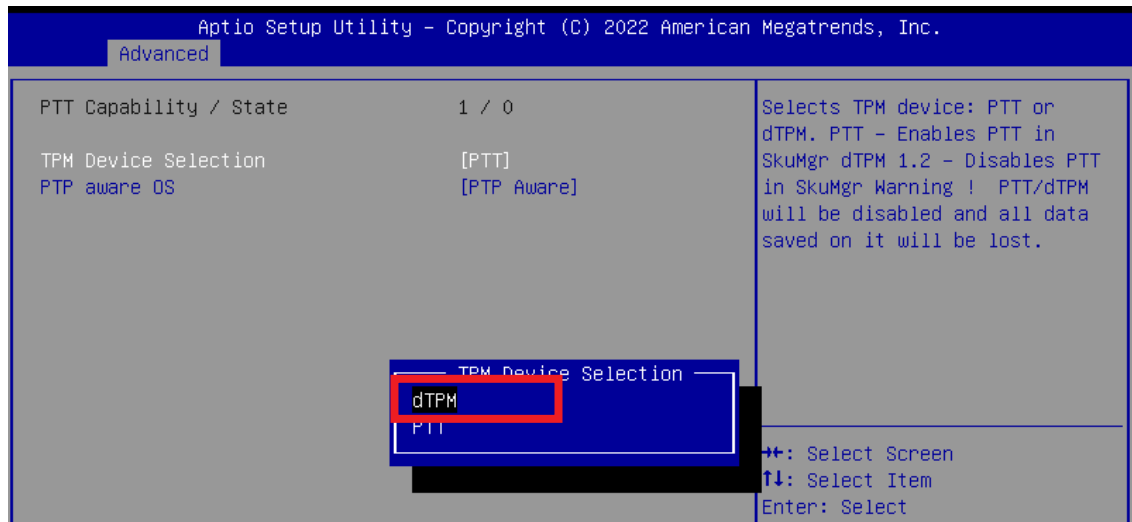
Step 1 Click on “Advanced”, then click on “PCH-FW Configuration”



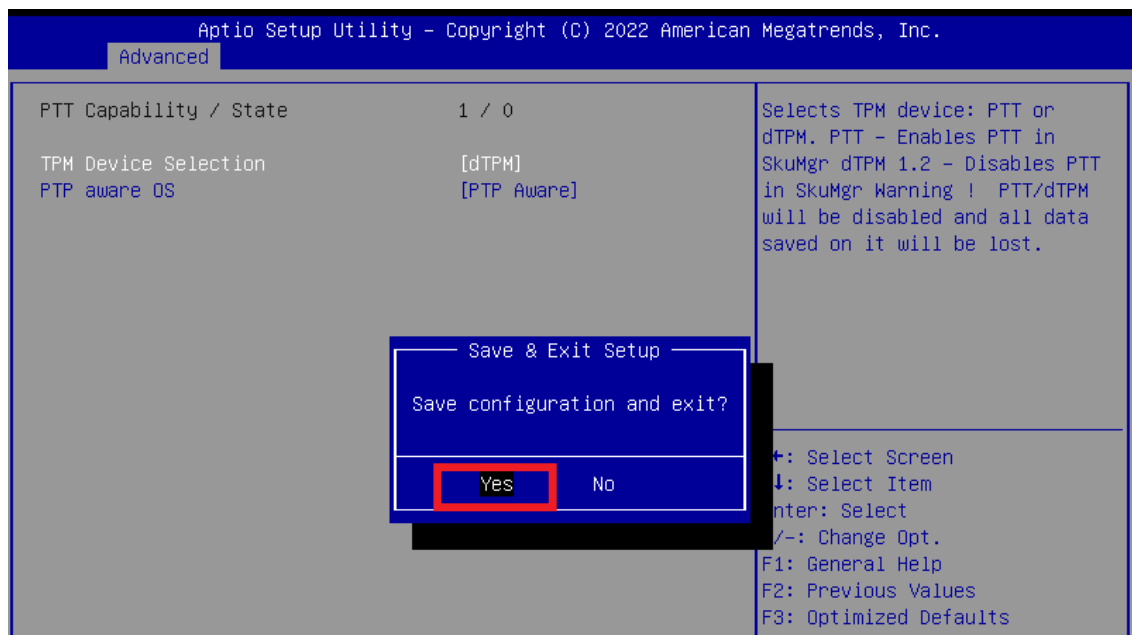
Step 2 Click on “PTT Configuration”



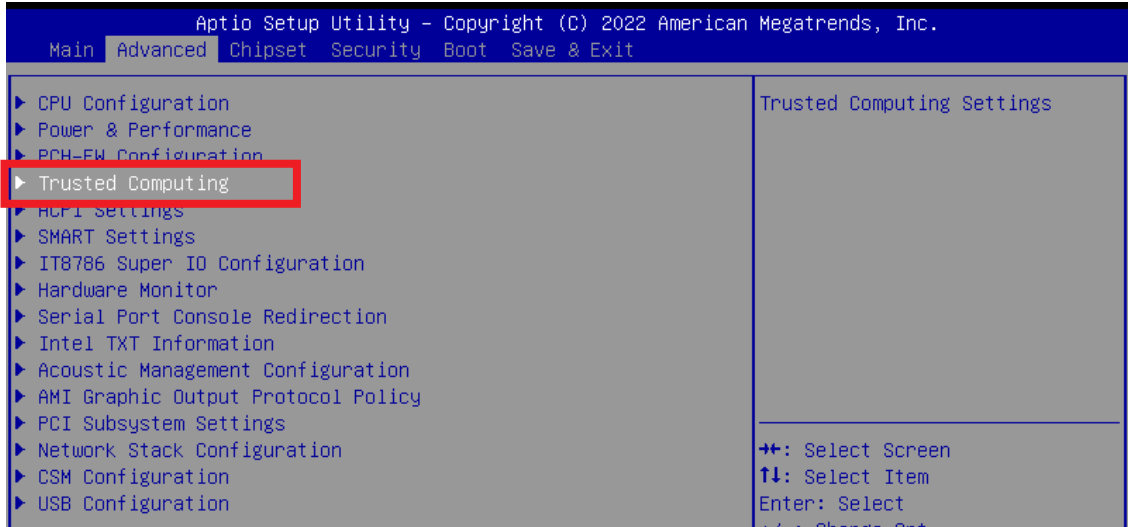
Step 3 Click on “dTPM” (TPM Device Selection)



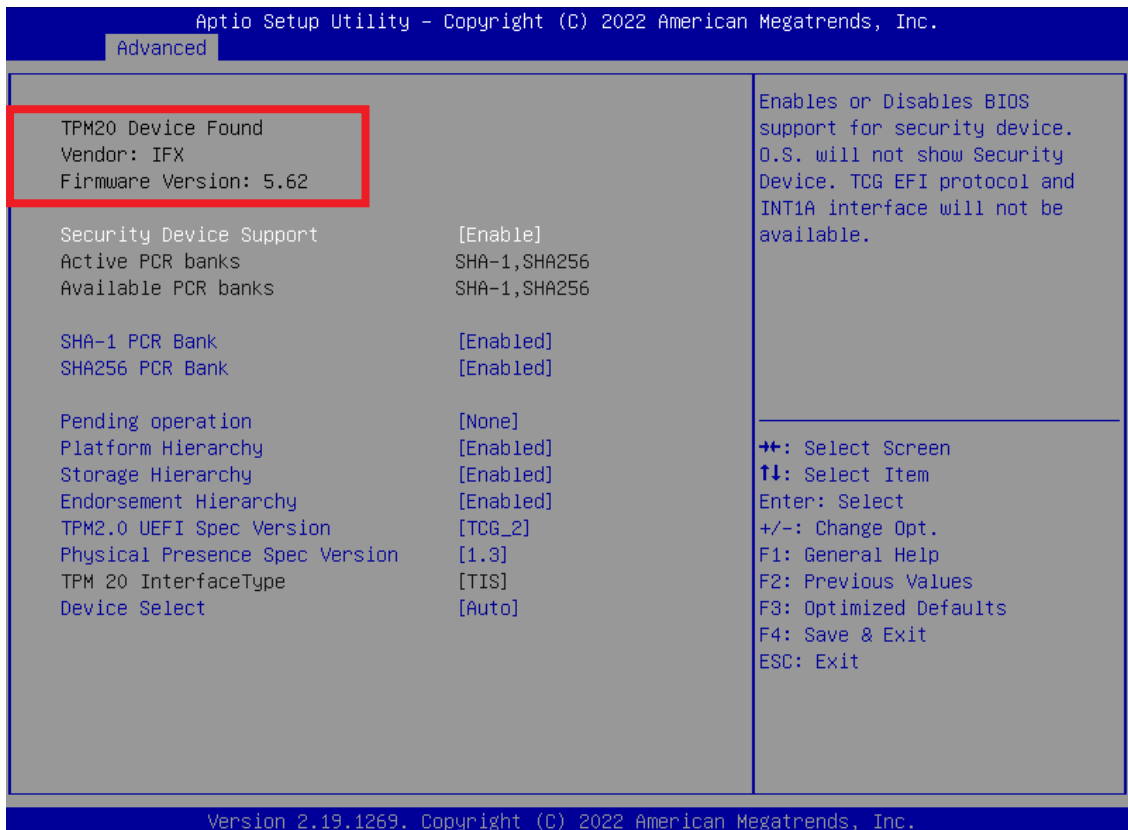
Step 4 Please save the BIOS settings by pressing F4. Please press Enter when the pop-up window which asks “Save configuration and exit?” appears. The computer will then restart.



Step 5 Click on “Trusted Computing”



Step 6 If the window shows “TPM2.0 Device Found Firmware Version:5.62”, then the setting is completed.



** If more help is needed, please contact Vecow technical support **



For further support information, please visit www.vecow.com

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