



**TEP-1560-BSW MODULAR HMI PRODUCT MANUAL**  
**(TEP-1560-BSW)**

**VER. 1.00**

**March 25, 2019**

## REVISION HISTORY

Revision	Date	Originator	Notes
1.00	March 25, 2019	TechNexion	First public release

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## 1. Introduction

### 1.1. General Care and Maintenance

Your device is a product of superior design and craftsmanship and should be treated with care.

The following suggestions will help you.

- Keep the device dry. Precipitation, humidity, and all types of liquids or moisture can contain minerals that will corrode electronic circuits. If your device does get wet, allow it to dry completely.
- Do not use or store the device in dusty or dirty areas. Its parts and electronic components can be damaged.
- Do not store the device in hot areas. High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics.
- Do not store the device in cold areas. When the device returns to its normal temperature, moisture can form inside the device and damage electronic circuit boards.
- Do not open the device while power is on. Otherwise electrical shock may result.
- Do not drop, knock, or shake the device. Rough handling can break internal circuit boards and fine mechanics.
- Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the device.
- Do not paint the device. Paint can clog the parts and prevent proper operation.
- Unauthorized modifications or attachments could damage the device and may violate regulations governing radio devices.

These suggestions apply equally to your device, battery, charger, or any enhancement. If any device is not working properly, take it to the nearest authorized service facility for service.

Regulatory information



**Disposal of Waste Equipment by Users in Private Household in the European Union**  
This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment

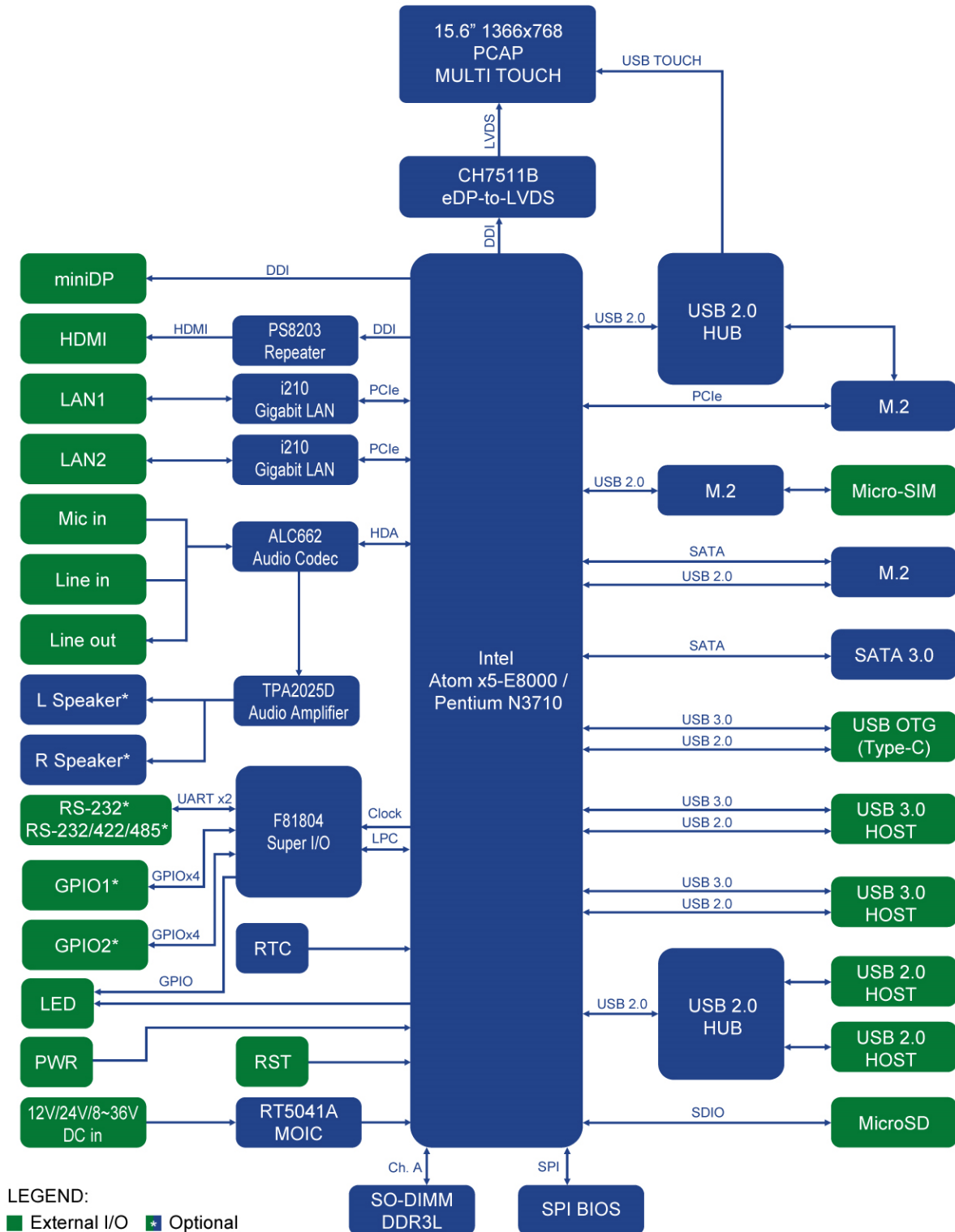
for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.



We hereby declare that the product is in compliance with the essential requirements and other relevant provisions of European Directive 2014/53/EU (Directive on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC).

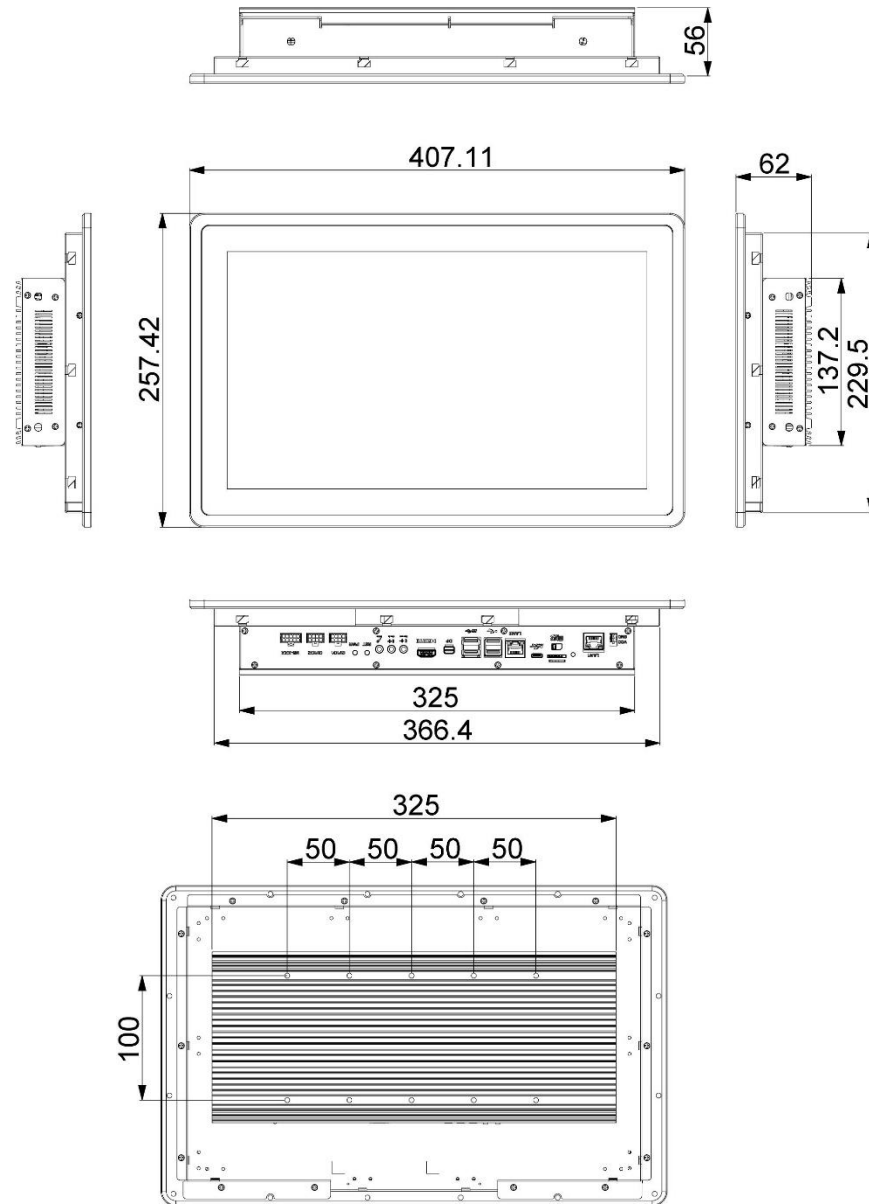
## 2. TEP-1560-BSW Product Overview

### 2.1. Functional Block Diagram



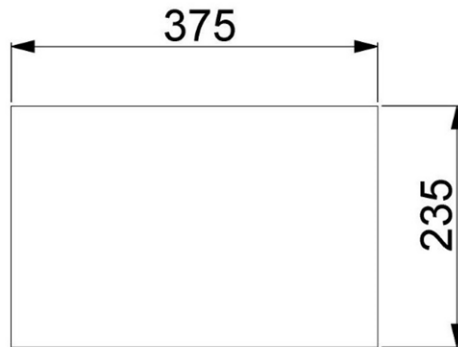
## 2.2. Dimensions

The following figure shows the TEP-1560-BSW dimensions (unit: mm):



### 2.3. Device Cut-out Dimensions For Mounting Though a Panel

The TEP-1560-BSW can be mounted on the front or the back of the panel. In order to mount it from the front, a nominal rectangular cutout must be made in the panel. The following drawing shows the dimensions of the cut-out area (unit: mm):





## 2.4. External Connectors

The TEP-1560-BSW has a number of external connectors.  
Bottom view:



External Connectors:

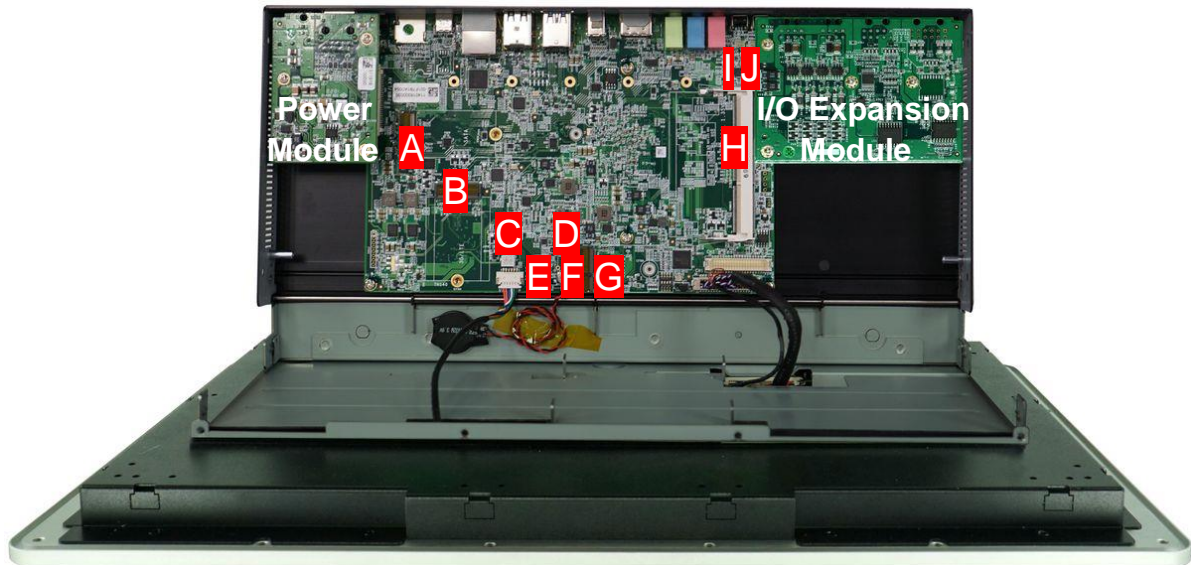
No.	Description	No.	Description
1	LED Light indicator	12	3.5mm jack Line out
2	Micro-SIM card slot	13	3.5mm jack Line in
3	MicroSD card slot	14	3.5mm jack Mic in
4	USB OTG (Type-C) connector	15	Reset button
5	LAN2 RJ45 connector	16	Power button
6	USB 2.0 Host connector	17	Power Input connector
7	USB 2.0 Host connector	18	LAN1 RJ45 connector (PoE)
8	USB 3.0 Host connector	19	GPIO1 connector (optional)
9	USB 3.0 Host connector	20	GPIO2 connector (optional)
10	miniDP connector	21	RS-XXX (Serial Port) connector (optional)
11	HDMI connector		

## 2.5. Internal Board Connectors

The TEP-1560-BSW has several connectors, switches and internal expansion options.

### 2.5.1. Galvanic Isolated (TEP1560-xxxxx-Rxx-Lxxx-XG21- xxxx-xxx-xxxx-xxxx)

Rear view (opened device) with the galvanic isolated I/O Expansion module:

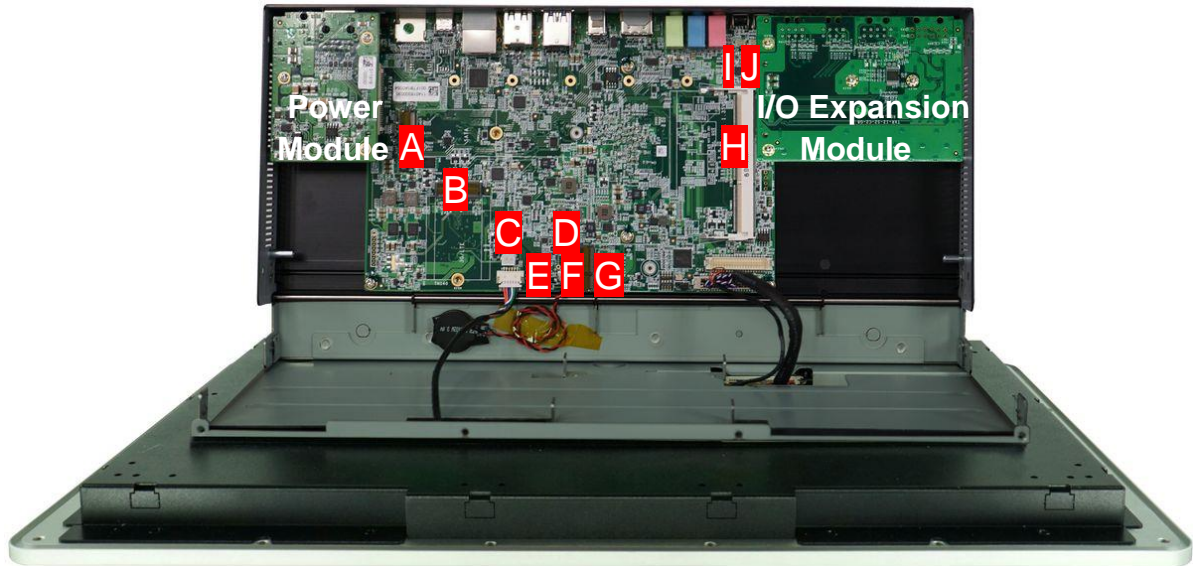


Internal Connectors and Switches:

No.	Description	No.	Description
A	M.2 KEY-B slot (SATA + USB 2.0)	F	RTC Battery connector
B	M.2 KEY-B slot (USB 2.0)	G	M.2 KEY-E slot (PCIe + USB 2.0)
C	SATA Power connector	H	SO-DIMM DDR3L slot
D	CMOS jumper	I	Internal R speaker connector
E	SATA 3.0 connector	J	Internal L speaker connector

### 2.5.2. Non-Galvanic Isolated (TEP1010-xxxxx-Rxx-Lxxx-**XS21**-xxxx-xxx-xxxx-xxxx)

Rear view (opened device) with the non-galvanic isolated I/O Expansion module:



Internal Connectors and Switches:

No.	Description	No.	Description
A	M.2 KEY-B slot (SATA + USB 2.0)	F	RTC Battery connector
B	M.2 KEY-B slot (USB 2.0)	G	M.2 KEY-E slot (PCIe + USB 2.0)
C	SATA Power connector	H	SO-DIMM DDR3L slot
D	CMOS jumper	I	Internal R speaker connector
E	SATA 3.0 connector	J	Internal L speaker connector

### 3. External Connectors

#### 3.1. LED Light Indicator

The TEP-1560-BSW has one Power LED Light indicator. The Power LED Light indicator is lit, when the system is powered on.

LED #	Color	Power on	Power off
1	Green	ON	OFF

#### 3.2. Micro-SIM Card Slot

The TEP-1560-BSW features an external Micro-SIM card slot for use by 3G/4G/LTE wireless module.

NOTE: This card slot can be only used by a M.2 KEY-B 3G/4G/LTE module installed into the 3G/LTE connector. The 3G/LTE connector can be found at location “A” in chapter [4. Internal Connectors and Expansion Options](#) of this manual. No M.2 KEY-B 3G/LTE module is included in this device (must be purchased separately, not sold by TechNexion).

#### 3.3. MicroSD Card Slot

The TEP-1560-BSW features a standard microSD card slot which is connected to the Intel processor’s (Atom x5-E8000 / Pentium N3710) integrated “Ultra Secured Digital Host Controller” (uSDHC).

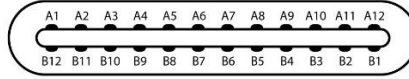
The following main features are supported by uSDHC:

- Compatible with the MMC System Specification version 4.2/4.3/4.4/4.41/5.0.
- Conforms to the SD Host Controller Standard Specification version 3.0.
- Compatible with the SD Memory Card Specification version 3.0 and supports the “Extended Capacity SD Memory Card”.
- Compatible with the SDIO Card Specification version 3.0.
- Supports 1-bit / 4-bit SD and SDIO modes

The MMC/SD/SDIO host controller can support a single MMC / SD / SDIO card or device.

### 3.4. USB OTG (Type-C) Connector

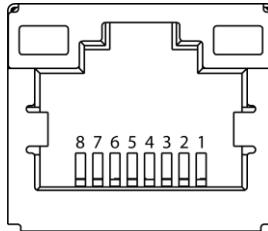
The TEP-1560-BSW has one USB OTG Type-C connector (USB 2.0 and USB 3.0 signals) that can be used to connect a host computer to the unit for programming and update purposes.



Pin #	Signal	Description	Pin #	Signal	Description
A1	GND	Ground	B1	GND	Ground
A2	TX1+	SS differential pair #1 signal	B2	TX2+	SS differential pair #3 signal
A3	TX1-		B3	TX2-	
A4	VBUS	5V Universal Serial Bus Power	B4	VBUS	5V Universal Serial Bus Power
A5	CC1	OTG detection signal port 1	B5	CC2	OTG detection signal port 2
A6	USB_D+	USB differential pair signal port 1	B6	USB_D+	USB differential pair signal port 2
A7	USB_D-		B7	USB_D-	
A8	SBU1	Sideband use port 1	B8	SBU1	Sideband use port 2
A9	VBUS	5V Universal Serial Bus Power	B9	VBUS	5V Universal Serial Bus Power
A10	RX2-	SS differential pair #4 signal	B10	RX1-	SS differential pair #2 signal
A11	RX2+		B11	RX1+	
A12	GND	Ground	B12	GND	Ground

### 3.5. Gigabit Ethernet Interface (LAN1/LAN2)

The TEP-1560-BSW comes with two Gigabit Ethernet RJ45 connectors. LAN1 connector can support 802.3at Power over Ethernet functionality if configured with the PoE power option (TEP1010-xxxx-Rxx-**LPOE**-xxxx-xxxx-xxx-xxxx-xxxx) by connecting it to an 802.3at compliant PoE switch or power injector.



LAN1 / LAN2:

Pin #	1000 Mbps	100 Mbps	10 Mbps
1	MDI0+	Transmit Data+	Transmit Data+
2	MDI0-	Transmit Data-	Transmit Data-
3	MDI1+	Receive Data+	Receive Data+
4	MDI2+		
5	MDI2-		
6	MDI1-	Receive Data-	Receive Data-
7	MDI3+		
8	MDI3-		

### 3.6. USB 2.0 Host Connectors

The TEP-1560-BSW has two USB 2.0 Host connectors (USB 2.0 signals only) to connect to a USB peripheral such as a keyboard, mouse, USB storage device or USB hub.

### 3.7. USB 3.0 Host Connectors

The TEP-1560-BSW has two USB 3.0 Host connectors (USB 2.0 and USB 3.0 signals) to connect to a USB peripheral such as a keyboard, mouse, USB storage device or USB hub.

### 3.8. miniDP (Mini DisplayPort) Connector

The miniDP interface available on the TEP-1560-BSW is based on Intel HD Graphics engine integrated into the Intel Braswell processor and can be configured to support a secondary display.

The miniDP supports the following standards & features:

- DisplayPort 1.1a
- DisplayPort Content Protection
- High-bandwidth Digital Content Protection
- Refresh rate up to 240 FPS for 1080p at 24 bpp
- Support for up to 4k x 2k and 3D video formats
- Support for up to 48 bpp Color Depth

### 3.9. HDMI (High Definition Multi-Media Interface) Connector

The HDMI interface available on the TEP-1560-BSW is based on Intel HD Graphics engine integrated into the Intel Braswell processor and can be configured to support a secondary display.

The HDMI supports the following standards & features:

- High-Definition Multimedia Interface Specification, Version 1.4b
- Digital Visual Interface, Revision 1.0
- HDMI Compliance Test Specification, Version 1.4b
- Support for up to 720p at 100Hz and 720i at 200Hz or 1080p at 60Hz and 1080i/720i at 120Hz HDTV display resolutions and up to QXGA graphic display resolutions.
- Support for 4k x 2k and 3D video formats
- Support for up to 16-bit Deep Color modes

### 3.10. Audio Connectors

The TEP-1560-BSW has three external 3.5mm stereo audio jacks.

Color Code	Signal	Description
Green	L/R Line out	Audio output
Blue	L/R Line in	Audio input
Pink	Mic in	Microphone input

### 3.11. RST Button

The TEP-1560-BSW features a “RST” button for system reset.

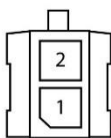
### 3.12. PWR Button

The TEP-1560-BSW features a “PWR” button for system power on. System is turned on when button is pressed, and the Power LED Light indicator lit. If the system hangs, depressing the button for 5 seconds powers down the system.

### 3.13. Power Input Connector

The TEP-1560-BSW can be powered either over the DC INPUT connector or PoE (optional) over the RJ45 LAN1 port.

NOTE: Do not power the unit by DC input when you apply power over the Power over Ethernet (RJ45)!



Pin #	Signal	Description
1	GND	Ground
2	VCC	DC Voltage input (12V/24V/8~36VDC)

Header on TEP-1560-BSW: Molex 43045-0200 (2-pin Micro-Fit 3.0).

Cable receptacle: Molex 43025-0200 (2-pin Micro-Fit 3.0) plug with crimp contact Molex 43030-0007.

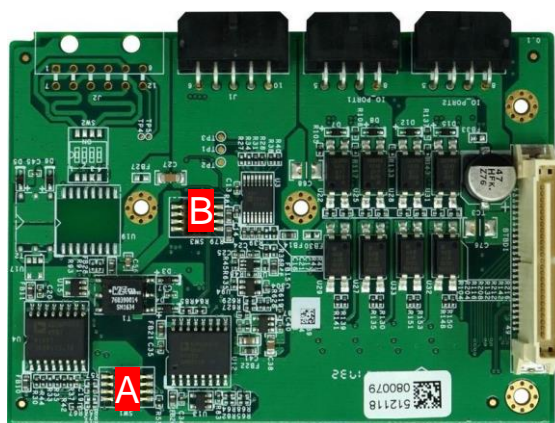
### 3.14. Antenna Holes

There are six antenna holes available (two each on the left side, on the right side and on the top side). They come fitted with breakaway metal tabs. In order to utilize them, the tabs must be removed by carefully using pincers or pliers.

### 3.15. Galvanic Isolated Connectors (TEP1560-xxxxx-Rxx-Lxxx-**XG21**-xxxx-xxx-xxxx-xxxx) (optional)

This product is available with three optional connectors: GPIO1, GPIO2, and RS-XXX that can be ordered in either galvanic isolated or non-galvanic isolated versions. The TEP1560-xxxxx-Rxx-Lxxx-**XG21**-xxxx-xxx-xxxx-xxxx has three optional galvanic isolated connectors: GPIO1, GPIO2, and RS-XXX.

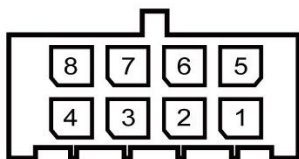
Bottom view of the galvanic isolated I/O Expansion module (TXR-I2-GS2-GG8):



No.	Description	No.	Description
A	SW1 DIP switch	B	SW3 Terminator Resistor DIP switch

### 3.15.1. Galvanic Isolated Digital I/O Connectors (GPIO1/GPIO2) (optional)

The galvanic isolated GPIO Expansion headers have the following pinout:



GPIO1:

Pin #	Signal	Description	Voltage			Current Max.	Interface Source	Controller	SIO Pin #
			Min.	Typ.	Max.				
1	GPIO1A	DIG_IN1	4.75V	5V	5.25V	300 mA	LPC	Fintek F81804	GPIO12
2	GPIO1B	DIG_IN2	4.75V	5V	5.25V	300 mA	LPC	Fintek F81804	GPIO17
3	GND_DIO	Ground for digital I/O							
4	GND	Common Ground							
5	GPIO1C	DIG_OUT5	11.21 V	11.8V	12.39 V	125 mA	LPC	Fintek F81804	GPIO91
6	GPIO1D	DIG_OUT6	11.21 V	11.8V	12.39 V	125 mA	LPC	Fintek F81804	GPIO94
7	VCC_DIO	Supply input for digital I/O	5V		12.39 V	300 mA			
8	VCC	Supply output	11.4V	12V	12.6V	300 mA			

GPIO2:

Pin #	Signal	Description	Voltage			Current Max.	Interface Source	Controller	SIO Pin #
			Min.	Typ.	Max.				
1	GPIO2A	DIG_IN1	4.75V	5V	5.25V	300 mA	LPC	Fintek F81804	GPIO93
2	GPIO2B	DIG_IN2	4.75V	5V	5.25V	300 mA	LPC	Fintek F81804	GPIO16
3	GND_DIO	Ground for digital I/O							
4	GND	Common Ground							
5	GPIO2C	DIG_OUT5	11.21 V	11.8V	12.39 V	125 mA	LPC	Fintek F81804	GPIO92
6	GPIO2D	DIG_OUT6	11.21 V	11.8V	12.39 V	125 mA	LPC	Fintek F81804	GPIO15
7	VCC_DIO	Supply input for digital I/O	5V		12.39 V	300 mA			
8	VCC	Supply output	11.4V	12V	12.6V	300 mA			

Header on TEP-1560-BSW: Molex 43045-0800 (8-pin Micro-Fit 3.0).

Cable receptacle: Molex 43025-0800 (8-pin Micro-Fit 3.0) plug with crimp contact Molex 43030-0007.



### 3.15.2. Galvanic Isolated Serial Port (RS-XXX) (optional)

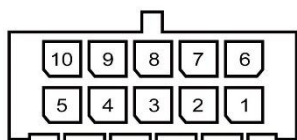
The dual 4-wire galvanic isolated serial port can be configured as follows: the primary serial port can only be used as a standard RS-232. The secondary port can be configured either as RS-232, or RS-422 or RS-485. This serial port is set by default as RS-232. Setting the TEP-1560-BSW in other mode will require to open the device and adjust the internal SW1 DIP and SW3 Terminator Resistor DIP switch settings on the TEP I/O Expansion board. The SW1 DIP switch can be found at location “A” and SW3 DIP switch at location “B” in chapter [3.15. Galvanic Isolated Connectors \(TEP1010-xxxx-Rxx-Lxxx-XG21-xxxx-xxx-xxxx-xxxx\) \(optional\)](#) of this manual.

SW1:

Pin #	RS-232 (default)	RS-422	RS-485
1-8	ON	OFF	OFF
2-7	OFF	ON	OFF
3-6	OFF	OFF	ON
4-5	-	-	-

SW3:

Pin #	ON	OFF
1-8	Enable RS-485 Terminator Resistor	Disable RS-485 Terminator Resistor
2-7	Enable RS-422 Terminator Resistor	Disable RS-422 Terminator Resistor
3-6	-	-
4-5	-	-



RS-232 + RS-232 (default setup):

Pin #	Signal	Description	Device
1	GND	Ground	
2	SERIAL1A_TXD	Port#1A Transmit data (output)	COM1
3	SERIAL1A_RXD	Port#1A Receive data (input)	COM1
4	SERIAL1A_RTS	Port#1A Request-to-send (output)	COM1
5	SERIAL1A_CTS	Port#1A Clear-to-send (input)	COM1
6	GND	Ground	
7	SERIAL1B_TXD	Port#1B Transmit data (output)	COM2
8	SERIAL1B_RXD	Port#1B Receive data (input)	COM2
9	SERIAL1B_RTS	Port#1B Request-to-send (output)	COM2
10	SERIAL1B_CTS	Port#1B Clear-to-send (input)	COM2

RS-232 + RS-422:

Pin #	Signal	Description	Device
1~5	SERIAL1A	Identical as above	COM1
6	GND	Ground	
7	SERIAL1B_TXD+	RS-422 Transmit positive data signal (output)	COM2
8	SERIAL1B_RXD-	RS-422 Receive negative data signal (input)	COM2
9	SERIAL1B_RXD+	RS-422 Receive positive data signal (input)	COM2
10	SERIAL1B_TXD-	RS-422 Transmit negative data signal (output)	COM2

RS-232 + RS-485:

Pin #	Signal	Description	Device
1~5	SERIAL1A	Identical as above	COM1
6	GND	Ground	
7	SERIAL1B+	RS-485 positive data signal	COM2
8	NC		
9	NC		
10	SERIAL1B-	RS-485 negative data signal	COM2

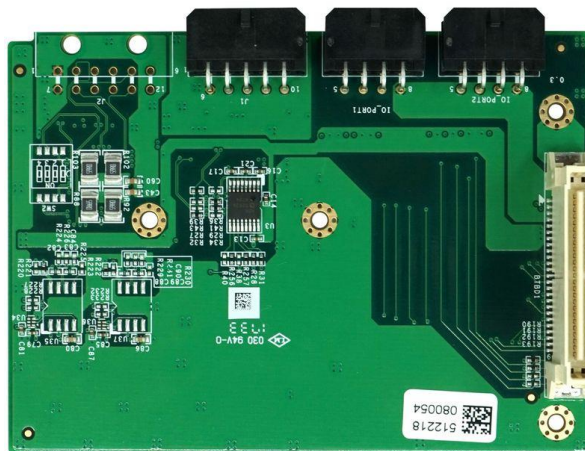
Header on TEP-1560-BSW: Molex 43045-1000 (10-pin Micro-Fit 3.0).

Cable receptacle: Molex 43025-1000 (10-pin Micro-Fit 3.0) plug with crimp contact Molex 43030-0007.

### 3.16. Non-Galvanic Isolated Connectors (TEP1560-xxxxx-Rxx-Lxxx-**XS21**- xxxx-xxx-xxxx-xxxx) (optional)

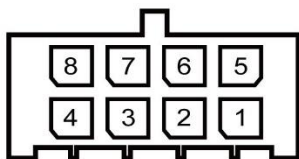
This product is available with three optional connectors: GPIO1, GPIO2, and RS-XXX that can be ordered in either galvanic isolated or non-galvanic isolated versions. The TEP1560-xxxxx-Rxx-Lxxx-**XS21**-xxxx-xxx-xxxx-xxxx has three optional non-galvanic isolated connectors: GPIO1, GPIO2, and RS-XXX.

Bottom view of the non-galvanic isolated I/O Expansion module (TXR-I2-S2-G8):



### 3.16.1. Non-Galvanic Isolated Digital I/O Connectors (GPIO1/GPIO2) (optional)

The non-galvanic isolated GPIO Expansion headers have the following pinout:



GPIO1:

Pin #	Signal	Description	Voltage			Current Max.	Interface Source	Controller	SIO Pin #
			Min.	Typ.	Max.				
1	GPIO1A	DIG_IN1/OUT1	3.14V	3.3V	3.46V	12 mA	LPC	Fintek F81804	GPIO12
2	GPIO1B	DIG_IN2/OUT2	3.14V	3.3V	3.46V	12 mA	LPC	Fintek F81804	GPIO17
3	NC								
4	GND	Common Ground							
5	GPIO1C	DIG_IN5/OUT5	3.14V	3.3V	3.46V	12 mA	LPC	Fintek F81804	GPIO91
6	GPIO1D	DIG_IN5/OUT6	3.14V	3.3V	3.46V	12 mA	LPC	Fintek F81804	GPIO94
7	NC								
8	VCC	Supply output	11.4V	12V	12.6V	300 mA			

GPIO2:

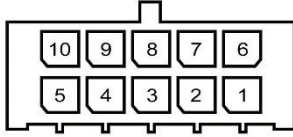
Pin #	Signal	Description	Voltage			Current Max.	Interface Source	Controller	SIO Pin #
			Min.	Typ.	Max.				
1	GPIO2A	DIG_IN1/OUT1	3.14V	3.3V	3.6V	12 mA	LPC	Fintek F81804	GPIO93
2	GPIO2B	DIG_IN2/OUT2	3.14V	3.3V	3.6V	12 mA	LPC	Fintek F81804	GPIO16
3	NC								
4	GND	Common Ground							
5	GPIO2C	DIG_IN5/OUT5	3.14V	3.3V	3.6V	12 mA	LPC	Fintek F81804	GPIO92
6	GPIO2D	DIG_IN5/OUT6	3.14V	3.3V	3.6V	12 mA	LPC	Fintek F81804	GPIO15
7	NC								
8	VCC	Supply output	11.4V	12V	12.6V	300 mA			

Header on TEP-1560-BSW: Molex 43045-0800 (8-pin Micro-Fit 3.0).

Cable receptacle: Molex 43025-0800 (8-pin Micro-Fit 3.0) plug with crimp contact Molex 43030-0007.

### 3.16.2. Non-Galvanic Isolated Serial Port (RS-XXX) (optional)

The dual 4-wire non-galvanic isolated serial port are configured as follows: the primary and the secondary serial port can only be used as a standard RS-232.



RS-232 + RS-232:

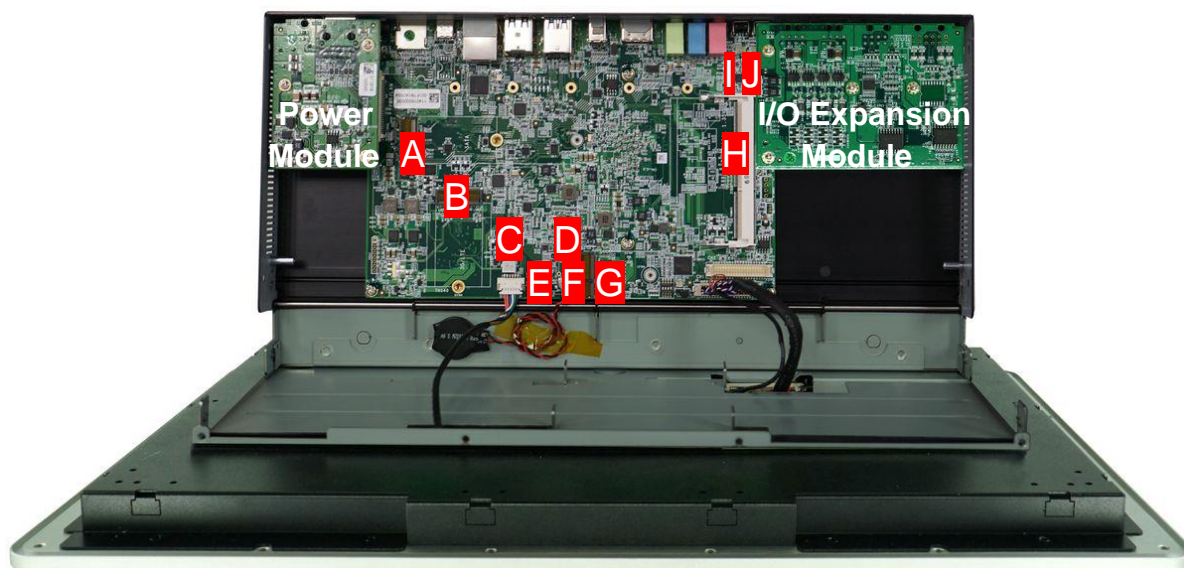
Pin #	Signal	Description	Device
1	GND	Ground	
2	SERIAL1A_TXD	Port#1A Transmit data (output)	COM1
3	SERIAL1A_RXD	Port#1A Receive data (input)	COM1
4	SERIAL1A_RTS	Port#1A Request-to-send (output)	COM1
5	SERIAL1A_CTS	Port#1A Clear-to-send (input)	COM1
6	GND	Ground	
7	SERIAL1B_TXD	Port#1B Transmit data (output)	COM2
8	SERIAL1B_RXD	Port#1B Receive data (input)	COM2
9	SERIAL1B_RTS	Port#1B Request-to-send (output)	COM2
10	SERIAL1B_CTS	Port#1B Clear-to-send (input)	COM2

Header on TEP-1560-BSW: Molex 43045-1000 (10-pin Micro-Fit 3.0).

Cable receptacle: Molex 43025-1000 (10-pin Micro-Fit 3.0) plug with crimp contact Molex 43030-0007.

## 4. Internal Connectors and Expansion Options

Rear view (opened device):



Internal Connectors and Switches:

No.	Description	No.	Description
A	M.2 KEY-B slot (SATA + USB 2.0)	F	RTC Battery connector
B	M.2 KEY-B slot (USB 2.0)	G	M.2 KEY-E slot (PCIe + USB 2.0)
C	SATA Power connector	H	SO-DIMM DDR3L slot
D	CMOS jumper	I	Internal R speaker connector
E	SATA 3.0 connector	J	Internal L speaker connector

### 4.1. M.2 KEY-B Slots

The TEP-1560-BSW has two internal M.2 KEY-B connectors: 3G/LTE and SATA (Marked B and A respectively). M.2 3G/LTE connector supports USB 2.0 signals only. M.2 3G/LTE cards in the industry-standard M.2 KEY-B 3042 (30 x 42 mm) or M.2 KEY-B 2242 (22 x 42 mm) form factor are supported. On the other hand, M.2 SATA connector supports SATA and USB 2.0 signals. Only M.2 SATA cards in the industry-standard M.2 KEY-B 2242 (22 x 42 mm) or M.2 KEY-B 2280 (22 x 80 mm) form factor are supported.

NOTE: M.2 3G/LTE connector can be only used by a M.2 KEY-B 3G/LTE module installed into the M.2 connector (Marked B). No M.2 KEY-B 3G/LTE module is included in this device (must be purchased separately, not sold by TechNexion).

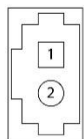
### 4.2. SATA 3.0 and SATA Power Connectors

The TEP-1560-BSW has one internal SATA 3.0 connector (Marked C) for connecting to a SATA storage device. SATA Power connector (Marked B) is located next to it.

NOTE: There is one 2.5" internal disk drive bracket available.

### 4.3. RTC Battery Connector

The TEP-1560-BSW features an internal RTC backup battery connector (Marked F).



Pin #	Signal	Description
1	RTC_VCC	3V (connect to standard CR2032 battery)
2	GND	Ground

Header on TEP-1560-BSW: Molex 53047-0210 (1.25mm Pitch PicoBlade Wire-to-Board Header).  
 Cable receptacle: Molex 051021-8602 (1.25mm Pitch PicoBlade Wire-to-Wire and Wire-to-Board Housing) plug with crimp contact Molex 50058-8000.  
 Battery P/N: KTS BCR2032H14.0AM1XB.

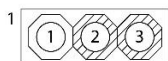
### 4.4. M.2 KEY-E Slot

The TEP-1560-BSW has one internal M.2 KEY-E connector: WIFI/BT (Marked G). M.2 WIFI/BT connector supports PCIe and USB 2.0 signals. Only M.2 cards in the industry-standard M.2 KEY-E 2230 (22 x 30 mm) form factor are supported.

NOTE: M.2 WIFI/BT connector can be only used by a M.2 KEY-E Wi-Fi / Bluetooth module installed into the M.2 KEY-E connector (Marked G).

### 4.5. CMOS Jumper

To clear CMOS settings please turn the system off and disconnect the RTC battery (Marked D).



Pin #	Description
1-2	Default CMOS jumper settings
2-3	Clear CMOS jumper settings

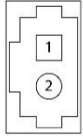
Then short Pin #2 and Pin #3 of the 3-pin JCMOS1 header (Marked F) for 60 seconds, after which the CMOS will be restored to default factory settings. Restore default CMOS jumper settings before turning on the power. Reconnect the RTC battery (Marked D).

### 4.6. SO-DIMM DDR3L Slot

The TEP-1560-BSW has one SO-DIMM DDR3L memory slot (Marked H).

## 4.7. Internal Stereo Speaker Connectors

The TEP-1560-BSW has two internal stereo speaker connectors to connect to two optional LEFT and RIGHT speakers (Marked J and I respectively). The signal is pre-amplified with a 2W Texas Instruments TPA2025D Class-D stereo audio amplifier.



LEFT Speaker connector (Marked J):

Pin #	Signal	Description
1	S_OUTL+	LEFT Speaker Positive Signal
2	S_OUTL-	LEFT Speaker Analog Ground Signal

RIGHT Speaker connector (Marked I):

Pin #	Signal	Description
1	S_OUTR+	RIGHT Speaker Positive Signal
2	S_OUTR-	RIGHT Speaker Analog Ground Signal

Header on TEP-1560-BSW: Molex 53047-0210 (1.25mm Pitch PicoBlade Wire-to-Board Header).  
Cable receptacle: Molex 051021-8602 (1.25mm Pitch PicoBlade Wire-to-Wire and Wire-to-Board Housing) plug with crimp contact Molex 50058-8000.

## 5. BIOS Setup

The BIOS (Basic Input / Output System) firmware comes pre-installed on the TEP-1560-BSW. The AMI UEFI BIOS is a non-volatile firmware used to perform hardware initialization during the booting process and provides a basic level of communication between the processor and peripherals. The BIOS setup program includes menus for configuring settings and enabling features of the TEP-1560-BSW.

NOTE: BIOS options listed here are for reference only. This section may reflect only the BIOS version corresponding to initial release and may differ from that of the purchased system.

### 5.1. Entering and Exiting BIOS

Enter BIOS setup by selecting DEL key when the system is powered on and the POST (Power On Self Test) message is displayed. Exit BIOS setup by selecting ESC key.

### 5.2. BIOS Setup Screens Overview

When BIOS is started, the main BIOS setup utility top-level screen appears. This screen provides six top-level menu options across the top of the screen. The menu bar on top of the screen has the following main items:

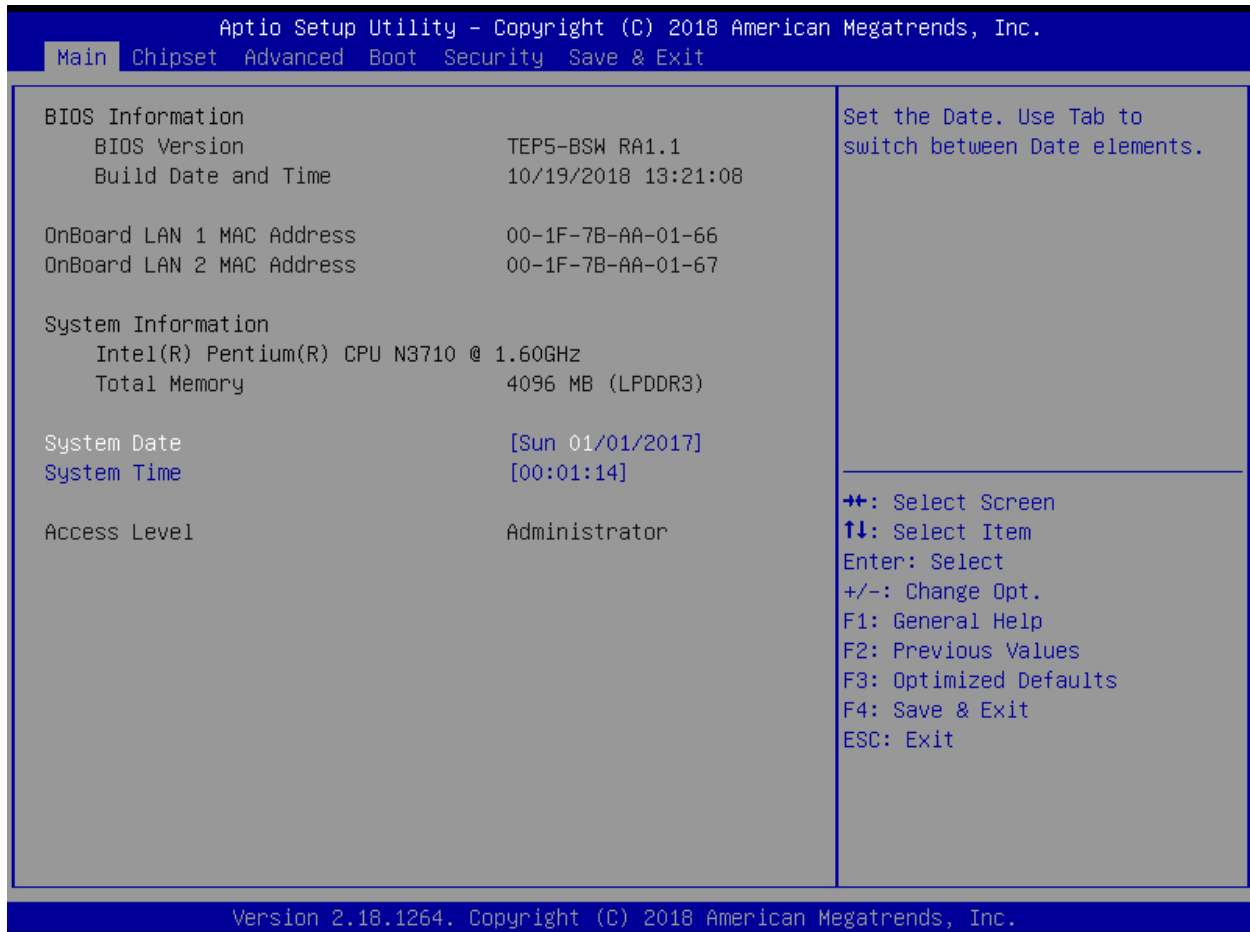
Item #	Screen Name	Description
1	Main	Contain basic system information
2	Chipset	View the configuration of system chipsets
3	Advanced	Access advanced configuration options
4	Boot	Configure the boot device priority
5	Security	Set or change the administrator and user passwords
6	Save & Exit	Contain save and exit options

The highlighted item on the menu bar displays the specific items for that menu. Use the left and right arrow keys to select the different menu options. As you select each menu option, the top-level screen for that menu option appears. To select an option on a top-level screen, use the up and down arrow keys to scroll up and down the options presented. To display the submenu, select the item and press ENTER key. On sub-screens that only provide configuration information and cannot be modified, press the ESC key to exit the screen.



### 5.2.1. Main

By default, the Main screen appears when you enter the BIOS setup program. Main screen contains basic system information, including BIOS type, processor, memory, and time/date.



### 5.2.2. Chipset

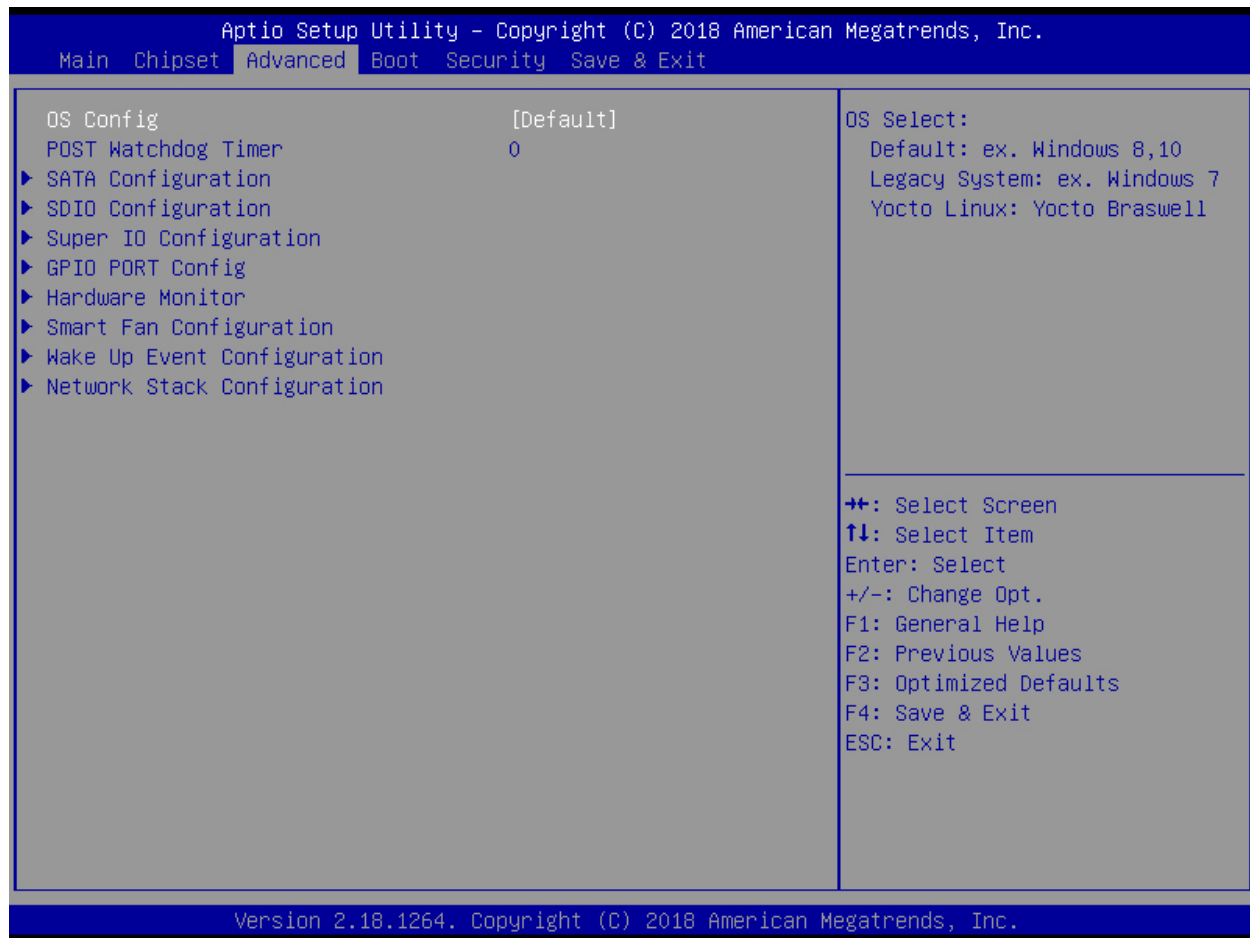
The Chipset screens contain North Bridge and South Bridge configuration options.



### 5.2.3. Advanced

The BIOS Advanced screens provide detailed configuration information for the OS, POST Watchdog Timer, SATA, SDIO, Super IO, GPIO PORT and other system information.

NOTE: Setting incorrect or conflicting values in Advanced BIOS setup may cause system malfunction or inability to boot. Section [4.5. CMOS Jumper](#) provides instruction on clearing the CMOS and restoring default factory settings. The CMOS jumper can be found at location “F” chapter [4. Internal Connectors and Expansion Options](#) of this manual.



#### OS Config

Screen Name	Options	Description
OS Config	Default	Default: Windows 8, 10
	Legacy System	Legacy System: Windows 7
	Yocto Linux	Yocto Linux: Yocto Braswell

**Super IO Configuration**

Screen Name	Options	Description
Serial Port X	Enable	Enable or Disable Serial Port (COM)
	Disable	
Change Settings	Auto	Select an optimal setting for Super IO Device
	IO=3F8h; IRQ=4;	
	IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;	
	IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;	

**GPIO PORT Config**

Screen Name	Options	Description
GPIO PORTX Config	GPIOXX Mode Select	Select input or output mode
	GPIOXX Value	Input Mode: Display input value Output Mode: Select output value

GPIO Control Address (TEP1010-xxxxx-Rxx-Lxxx-**XG21**-xxxx-xxx-xxxx)

Write IO port 0x2E -> 0x87

Write IO port 0x2E -> 0x87

Write IO port 0x2E -> 0x07

Write IO port 0x2F -> 0x06

Write IO port 0x2E -> 0xE0

Write IO port 0x2E -> 0xE1

Write IO port 0x2F -> // 0 : Output 0, 1 : Output 1 when in Output mode  
BIT5 = GPIO15

Write IO port 0x2E -> 0x99

Write IO port 0x2F -> // 0 : Output 0, 1 : Output 1 when in Output mode  
BIT1 = GPIO91  
BIT2 = GPIO92  
BIT4 = GPIO94

Write IO port 0x2E -> 0xAA

GPIO Control Address (TEP1010-xxxxx-Rxx-Lxxx-**XS21**-xxxx-xxx-xxxx)

Write IO port 0x2E -> 0x87

Write IO port 0x2E -> 0x87

Write IO port 0x2E -> 0x07

Write IO port 0x2F -> 0x06

Write IO port 0x2E -> 0xE0

Write IO port 0x2F -> // 0 : Input mode, 1 : Output mode  
BIT2 = GPIO12

BIT5 = GPIO15  
BIT6 = GPIO16  
BIT7 = GPIO17

Write IO port 0x2E -> 0xE1

Write IO port 0x2F -> // 0 : Output 0, 1 : Output 1 when in Output mode

BIT2 = GPIO12  
BIT5 = GPIO15  
BIT6 = GPIO16  
BIT7 = GPIO17

Write IO port 0x2E -> 0x98

Write IO port 0x2F -> // 0 : Input mode, 1 : Output mode

BIT1 = GPIO91  
BIT2 = GPIO92  
BIT3 = GPIO93  
BIT4 = GPIO94

Write IO port 0x2E -> 0x99

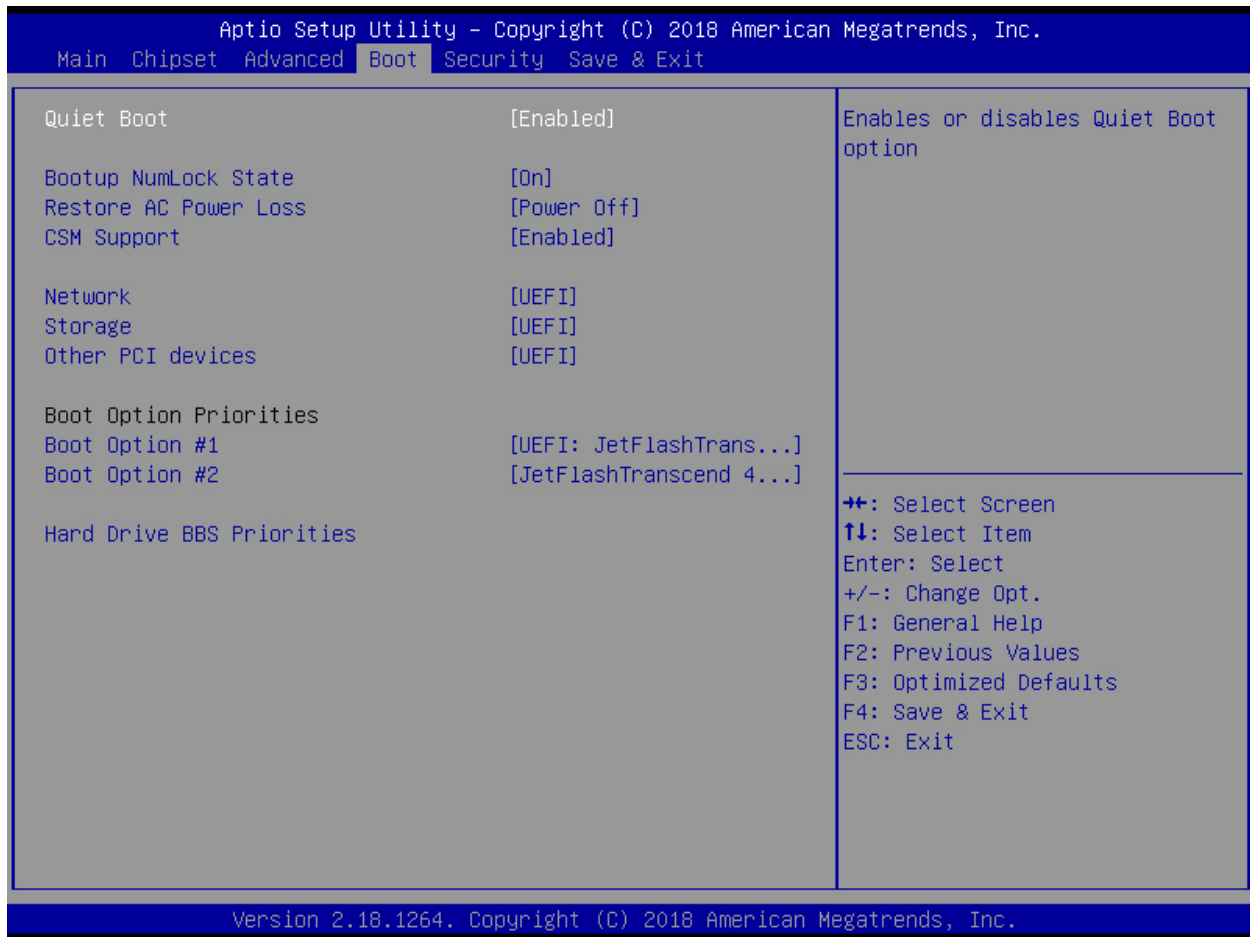
Write IO port 0x2F -> // 0 : Output 0, 1 : Output 1 when in Output mode

BIT1 = GPIO91  
BIT2 = GPIO92  
BIT3 = GPIO93  
BIT4 = GPIO94

Write IO port 0x2E -> 0xAA

## 5.2.4. Boot

The Boot screens contain device priority boot options.



### Restore AC Power Loss

Screen Name	Options	Description
Restore AC Power Loss	Power Off	Select AC power state when power is re-applied after a power failure
	Power On	
	Last State	

### Boot Option Priorities

Screen Name	Options	Description
Boot Option Priorities	Boot Option #1	Sets the system boot order
	Boot Option #2	

### 5.2.5. Security

The Security screens contain the administrator and user passwords settings.

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.					
Main Chipset Advanced Boot Security Save & Exit					
<p>Password Description</p> <p>If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.</p> <p>If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.</p> <p>The password length must be in the following range:</p> <table><tbody><tr><td>Minimum length</td><td>3</td></tr><tr><td>Maximum length</td><td>20</td></tr></tbody></table> <p>Administrator Password</p> <p>User Password</p>	Minimum length	3	Maximum length	20	<p>Set Administrator Password</p> <hr/> <p>←+: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</p>
Minimum length	3				
Maximum length	20				

Version 2.18.1264. Copyright (C) 2018 American Megatrends, Inc.

## 5.2.6. Save & Exit

The Save & Exit screens contain save and exit options.



### Save & Exit

Screen Name	Options	Description
Save & Exit	Save Changes and Reset	Save changes and exit, discard changes and exit, or discard changes
	Discard Changes and Reset	
	Restore Defaults	

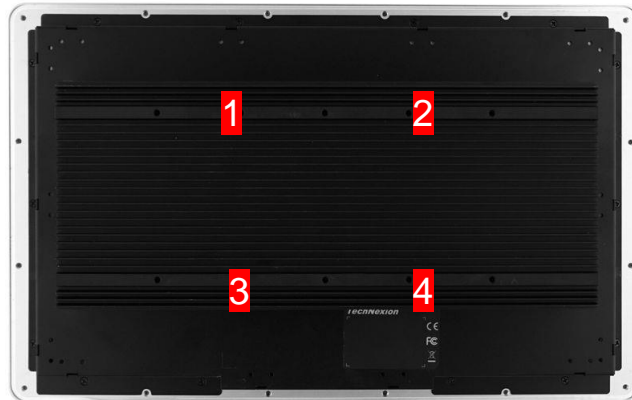


## 6. Mounting

This section describes the mounting procedures for the TEP-1560-BSW. The material in area of the mounting must provide sufficient strength for safe mounting of this device.

### 6.1. VESA Mounting

The TEP-1560-BSW is compatible with the VESA MIS-D Standard 100\*100mm hole pattern. There are 4 VESA MIS-D (M4) mounting holes on the rear side of the device. M4 screw holes are a depth of 6mm.



## 6.2. Rear Mounting and Mounting Clips Installation

There are 14 mounting clips required for rear mounting.



Please follow the steps below to secure the clips. Prepare mounting hook, post and screw (M3) (Step 1). Locate all removable tabs on the rear side of your device and use pincers or pliers to remove the tabs (Step 2-3). Press the mounting clip into the holes at an angle and slowly straighten it (Step 4-5). Then tighten the screw to the surface (Step 6). Repeat the steps for all clips required to secure your device.



### 6.3. Surface Mounting

There are 16 mounting holes (M4) on the rear side of the device required for surface mounting. M4 screws with at least 6mm head-to-tip length are required to secure this device.



## 7. Ordering Information

The TEP-1560-BSW is available in several configurations. Please contact your TechNexion sales contact window or distributor for options and availability details.

### 7.1. Custom Part Number Rule

The TEP-1560-BSW can be ordered in custom tailored configuration to meet special application requirements and conditions according to the following custom part number creation rules. Custom part numbers carry minimum order quantities (MOQ). Please connect with your TechNexion distributor or account manager for conditions and availability. Part number format:

**TEP1560-xxxxx-Rxx-Lxxx-xxxx-xxxx-xxx-xxxx-xxxx**

Interface	Code	Description
Processor	E8000	Intel Atom x5-E8000
	N3710	Intel Pentium N3710
Memory	R20	2GB SO-DIMM DDR3L
	R40	4GB SO-DIMM DDR3L
	R80	8GB SO-DIMM DDR3L
Power Expansion	L112	TXR-P1-12V-LAN1 (12V 3A)
	L130	TXR-P1-1030V-LAN1 (8-36V 5A)
	LPOE	TXR-P1-12V-POE1 (12V 3A) or (PoE 802.3at)
I/O Expansion	-	-
	XS21	2x RS-232 + 8x GPIO
	XG21	2x RS-232 + 8x GPIO (Galvanic Isolated)
Storage	-	-
	M064	64GB M.2 SSD
	S064	64GB 2.5" SATA SSD
Internal Speaker	-	-
	SPK	2x 2W/8Ω Stereo Speaker
Wi-Fi / Bluetooth	-	-
	9377	Qualcomm QCA9377 802.11a/b/g/n/ac (2.4 + 5GHz) + Bluetooth 5
Custom ID	XXXX	Custom Part number ID for customized software loader and special component (BOM)

## 7.2. Standard Package Contents



Item	Partnumber	Description
1	TEP-1560-BSW	15.6 inch PoE HMI PCAP touch system with Intel Braswell
2	Accessoires	14x mounting hooks
		14x short screws (M3)
		14x mounting posts
		2x Wi-Fi/LTE module screw
		2x screw (M3) for M.2 card
		2x plastic washer
		1x DC power latch cable (2-pin Micro-Fit 3.0)

NOTE: Pack contents might vary depending on your ordered configuration.

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TechNexion Ltd.  
16F-5, No. 736, Zhongzheng Road,  
ZhongHe District, 23511, New Taipei City, Taiwan  
Phone : +886-2-82273585  
Fax : +886-2-82273590  
E-mail : sales@technexion.com  
Web : <https://www.technexion.com/>