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Introduction

Product Description

The TM-5010-24P/24F Medical Panel PC are based on Intel *6th generation Core i* processor which can deliver faster graphic with higher CPU performance. It accommodates two SATA III devices and up to 32GB DDR4 SODIMM.

The high brightness LCD, Low noise (TM-5010-24F) / Fanless (TM-5010-24P) solution, integrated multimedia functions and extensive expansion options make them the perfect platform upon which to build comprehensive lifestyle computing applications.

The TM-5010-24P/24F includes all the features of a powerful computer into a slim and attractive chassis. The TM-5010-24P/24F has a 23.8″ high brightness TFT display with 1920 x 1080 resolutions.

The TM-5010-24P/24F is compact, Giga LAN and selectable WLAN network compatible PC with full safety and medical approval and features to control a dedicated system with a wide variety of applications. Combining the TM-5010-24P/24F into your system can achieve both cost-saving and efficient improvements.

Common applications include Surgical, Radiology, PACS (Picture Archiving Communication Systems), LIS (Lab Information Systems) and Electronic Medical Record. The TM-5010-24P/24F are definitely your perfect choices.

Package list

Before you begin installing your Medical Station, please make sure that the following items have been shipped:

- The TM-5010-24F or TM-5010-24P Medical Panel PC unit
- User manual, chipset drivers
- Power Adapter x 1 (Mf: Sinpro, type/model: HPU180A-108)
- Power cord – Hospital grade used(US type), or other type in UK, EU...etc.
- Screw x 4 (VESA 75/100 use)

Features

- *Anti-bacteria (MRSA) plastic housing*
- *23.8" full HD (1920X1080) , MVA, Diagnostic Panel*
- *High performance 6th generation intel Core i CPU (S series)*
- *Supports Dual Channel DDR4 SO-DIMM, Max. 32GB*
- *Projective Capacitive Multi-touch screen (10 fingers)*
- *Easy wipe surfaces with no internal corners*
- *Fanless solution*
- *High speed USB3.1 gen II*
- *One mini-PCIe expansion, support mSATA*
- *One M.2 E type support WLAN solution*
- *HDD Anti-vibration mechanism*
- *Supports PCI-E x 16 (option)*
- *USB/LAN/COM isolated module by different configuration*
- *Optional DVD-RW or Smart card reader by different configuration*
- *Optional WLAN/Bluetooth module with inner antenna, mSATA card, battery pack, Auto focus 5M pixel camera, desktop stand and project with RFID solution*

Specifications

Hardware Specifications

Display	23.8” 250 nits Full HD TFT LCD
CPU Support	**TM-5010-24F** LGA1151 for 6th generation Intel® mobile Core i7/i5/i3 processor (35W max.) **TM-5010-24P** LGA1151 for 6th generation Intel® mobile Core i7/i5/i3 processor
Disk Drive Space	2.5” Hard Disk Drive (SATA III) or 2.5” Solid State Drive (5Vdc,1.5A max. for TM-5010-24F; 5Vdc, 1.0A max. TM-5010-24P)
Expansion	One Mini PCIe slot (total loaded 1.65W) One M.2 Type E slot (total loaded 1.65W) One PCI-E expansion slot (total loaded 15W) (option)
Button	Power // Audio adjustment (+)(-) // brightness (+)(-) // Reading Light // Video input selection // LCD on/off // Clean me(auto release after 1 minute) // Fn

I/O	**Standard version** USB 3.1 gen II x 2, USB 3.0 x 2 RS232 x 2 RJ-45 x 1 (Gigabit Ethernet) 3.5mm phone jack connector * 2 (Line-out, and Mic-in) DP video output x 2 Reset x 1 DC-in Jack x 1(with lock function) Two 5W speaker on back side **Expansion I/O version** USB 3.1 gen II x 2, USB 3.0 x 2, USB 2.0 x 2 RS232 x 1, RS232/RS422/RS485 x 1 (RS-485 auto flow support) RJ-45 x 2 (Gigabit Ethernet) 3.5mm phone jack connector * 2 (Line-out, and Mic-in) DP video output x 2 Reset x 1 DC-in Jack x 1(with lock function) Two 5W speaker on back side **Isolated version** USB 3.1 gen II x 2, USB 3.0 x 2 RJ-45 x 1 (Gigabit Ethernet) 3.5mm phone jack connector * 2 (Line-out, and Mic-in) DP video output x 2 Reset x 1 DC-in Jack x 1(with lock function) Two 5W speaker on back side Isolation: 4KV isolated RS-232 x 1, RS-232/422/485 x 1 4KV isolated USB 2.0 x 1 (Full speed) 4KV isolated Lan x 1 (Gigabit) (The isolated ports verified through Dielectric test 4000Vac only)

LCD Specifications

Display Type	23.8” LED backlight LCD
Max. Resolution	1920 x 1080 (Full HD)
Contrast Ratio	3000 : 1 (Typ)
Pixel Pitch (um)	*274.5 (per one triad) × 274.5*
Luminance (cd/m2)	250 (TYP)

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Viewing Angle	178°(H)
	178°(V)
Operating Temperature	0°C~ 40°C (32°F~104°F)
Brightness Control	Yes

Cautions:

Continuous displaying fixed pattern may induce image sticking. It's recommended to use screen saver or moving content periodically if fixed pattern is displayed on the screen.

Power Adapter Specifications

Power	Close-frame
MFR	Sinpro
Type	HPU180A-108
Input Rating	AC 100 ~ 240 V, 2.2-0.9A @ 47 ~ 63 Hz
Output Rating	DC 24V, 7.5A
MTBF	100,000 hrs operation at 25°C
Classification	Power by Class I certified power adapter. No applied part.
Mode of operation	Continuous operation
System input rating	DC 24V, 7A

Mechanical Specifications

Architecture	Close-frame
Front Bezel	PCT touch
Color	Medical-white
Mounting / Holder	VESA 75/100mm
Construction	3mm ABS + PC TYPE Plastic housing
Dimension (WxHxD)	606 x 398 x 65.6 mm
Net Weight	TM-5010-24F: 10.83kg (w/o power adapter) TM-5010-24P: 10.80kg (w/o power adapter)
Packing Filler	PE

Environmental Specifications

Temperature	Operating: 0°C to 35°C (32°F ~95°F) with Sinpro Adapter Storage, Transportation: -20°C to 60°C (-4°F ~140°F)

Humidity	Operating: 10% to 90%@ 35℃, non-condensing Storage, Transportation: 10% to 90%, non-condensing
Vibration	Operating: 15g/0.53 oz, 11 ms, half sine wave Non-operating: 50g/1.76 oz, 11 ms, half sine wave
Shock	Operating: 5 ~ 17 Hz , Amplitude：0.117 ~ 500Hz , Acceleration：1.0G Non-operating:10~55Hz/0.15g, 55~500Hz/2.0g
Altitudes	Operational: up to 3000 m (9842 feet) Shipping: up to 12192 m (40000 feet)
Pressure	700 – 1060 hPa (Operation) 186 – 1060 hPa (Storage) 186 – 1060 hPa (Transportation)

Touch Screen
P.cap touch (10 fingers)

Type	Full flat projective capacitive touch panel
Interface	Controller with USB interface, 5V
Resolution	100ppi to 25ppi Based WIN7 definition ppi (Pixel per inch)
Light Transmission	90% ± 3%
Life Time	100M times

Guidance and manufacturer's declaration – electromagnetic emissions		
The model TM-5010-24P/24F is intended for use in the electromagnetic environment specified below. The customer or the user of the model TM-5010-24P/24F should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11		The model TM-5010-24P/24F uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11		The model TM-5010-24P/24F is suitable for use in all establishments,

Harmonic emissions IEC 61000-3-2		including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Voltage fluctuations/ flicker emissions IEC 61000-3-3		

Recommended separation distances between portable and mobile RF communications equipment and the model TM-5010-24P/24F

The model TM-5010-24P/24F is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the model TM-5010-24P/24F can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the model TM-5010-24P/24F as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	**Separation distance according to frequency of transmitter** m		
	150 kHz to 80 MHz $d = 1{,}2\sqrt{P}$	**80 MHz to 800 MHz** $d = 1{,}2\sqrt{P}$	**800 MHz to 2.7 GHz** $d = 2{,}3\sqrt{P}$
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distanced in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Guidance and manufacturer's declaration – electromagnetic immunity			
The model TM-5010-24P/24F is intended for use in the electromagnetic environment specified below. The customer or the user of the model TM-5010-24P/24F should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±15 kV air	±8 kV contact ±15 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV line(s) to line(s) ±2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.

interruptions and voltage variations on power supply input lines IEC 61000-4-11	0% *U*T (100 % dip in *U*T) for 0.5 cycle 0 % *U*T (100 % dip in *U*T) for 1 cycles 70 % *U*T (30 % dip in *U*T) for 25 cycles 0 % *U*T (100 % dip in *U*T) for 250 cycles	0 % *U*T (100 % dip in *U*T) for 0.5 cycle 0 % *U*T (100 % dip in *U*T) for 1 cycles 70 % *U*T (30 % dip in *U*T) for 25 cycles 0 % *U*T (100 % dip in *U*T) for 250 cycles	Mains power quality should be that of a typical commercial or hospital environment. If the user of the model TM-5010-24P/24F requires continued operation during power mains interruptions, it is recommended that the model TM-5010-24P/24F be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE *U*T is the a.c. mains voltage prior to application of the test level.			
Guidance and manufacturer's declaration – electromagnetic immunity			
The model TM-5010-24P/24F is intended for use in the electromagnetic environment specified below. The customer or the user of the model TM-5010-24P/24F should assure that it is used in such an environment.			
Immunity	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**

Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.7 GHz	Vrms V/m	Portable and mobile RF communications equipment should be used no closer to any part of the model TM-5010-24P/24F, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = 1{,}2\sqrt{P}$ $d = 1{,}2\sqrt{P}$ 80 MHz to 800 MHz $d = 2{,}3\sqrt{P}$ 800 MHz to 2.7 GHz where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and *d* is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, [a] should be less than the compliance level in each frequency range. [b] Interference may occur in the vicinity of equipment marked with the following symbol:
NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the model TM-5010-24P/24F is used exceeds the applicable RF compliance level above, the model TM-5010-24P/24F should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the model TM-5010-24P/24F. [b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.			

Cleaning / Disinfecting

Steps:

1. Wipe the TM-5010-24P/24F with a dry clean cloth.
2. Operate with manufacturer's instructions or hospital protocol.

Cautions:

- Do not immerse or rinse the TM-5010-24P/24F and its peripherals. If you accidentally spill liquid on the device, disconnect the unit from the power source. Contact your Biomed regarding the continued safety of the unit before placing it back in operation.
- Do not spray cleaning agent on the chassis.
- Do not use disinfectants that contain phenol.
- Do not autoclave or clean the TM-5010-24P/24F or its peripherals with strong aromatic, chlorinated, ketone, ether, or Esther solvents, sharp tools or abrasives. Never immerse electrical connectors in water or other liquids.

Getting Started

System Set Up

The following is a summary of the steps in setting up the system for use.

(1). You can fix the system to a mounting fixture using the screw holes on the sides of the system.
(2). Make any required external connections such as the display, keyboard, and LAN.
(3). Plug the appropriate end of the power cord into the power connector on the rear of the system and the plug to an electrical outlet.
(4). *Waiting for 3 seconds* then press the power switch on the front panel of the system once to turn on the system power.
(5). If necessary, run the BIOS SETUP programs to configure the system.

Caution:
In order to boot up system from USB-CD/DVD drive, please connect USB-CD/DVD drive, turn on computer power, keep on pressing "F11" key, go into BIOS quick boot menu, select "USB-CD ROM", WAIT FOR 20 SECONDS, then press enter, system OS will boot up from USB-CD/DVD drive directly.

Notice:
The installation is only to be carried out by manufacturer trained and authorized personnel.

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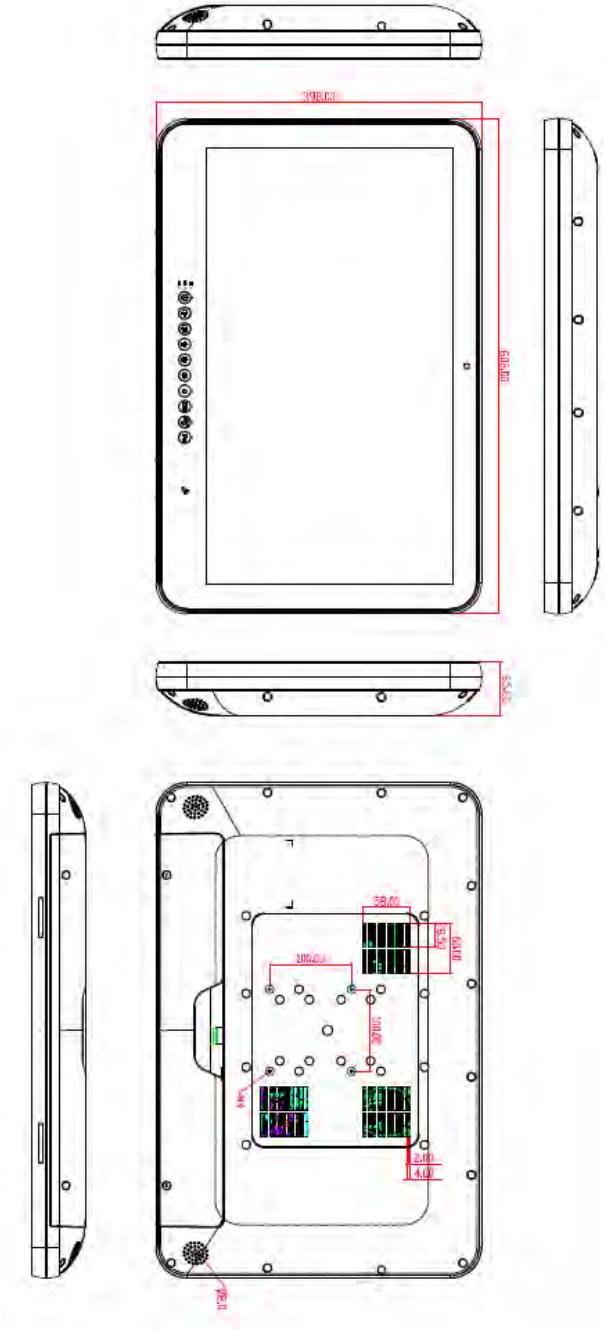
Dimension

TM-5010-24F
(VESA Mount Screw type: M4)



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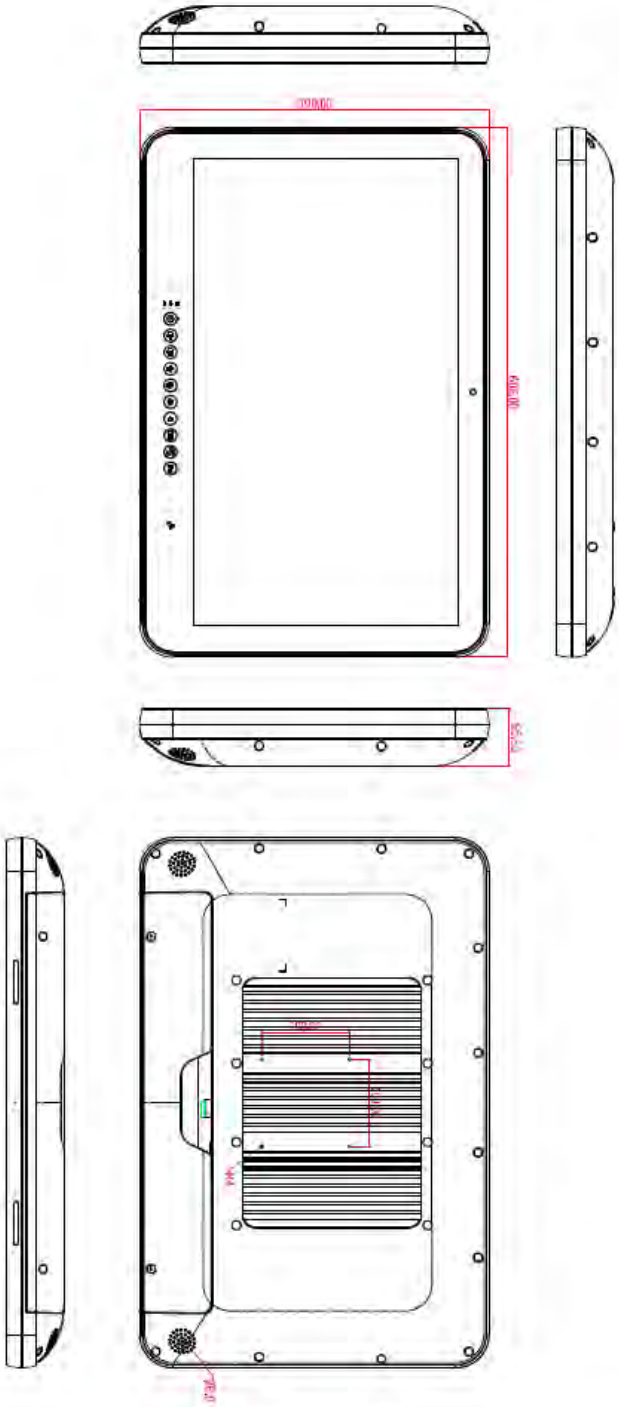
TM-5010-24P
(VESA Mount Screw type: M4)



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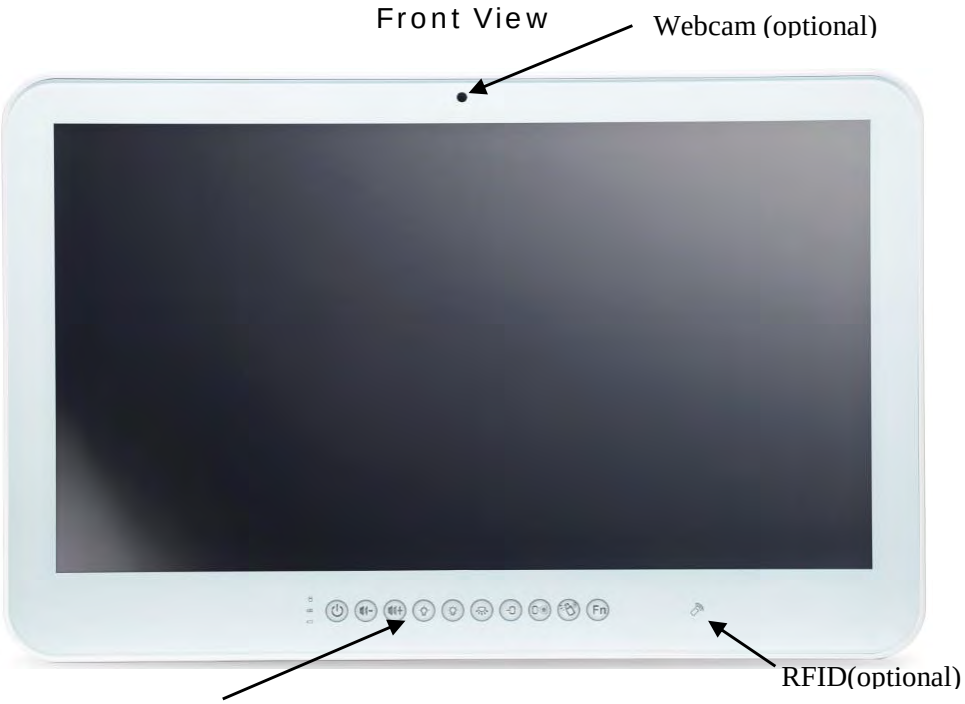
System View

Front View



Hotkey and LED definition at front panel

Located on Touch screen bottom side, from left to right, front view
1-1. Up. HDD: Amber
1-2 Down. Battery1(Green) & Battery2(Amber):

	LED 1	LED 2
	(Charge/Discharge/Low)	(Batt present/ not present)
In charge	blinking	ON
Discharge	OFF	ON
Full charge	ON	ON
Low battery	blinking	blinking
No battery	OFF	OFF

2. Power Button (with LED status indicator: ON: Green, OFF: dark)
Operation: always on.

Suspend: Flash 2(light)/2(dark) sec.

3. *Volume adjustment (-)*
4. *Volume adjustment (+)*
5. *Brightness (-)*
6. *Brightness (+)*
7. *Reading light*
8. *Video input selection (with LED status indicator: ON: Green->DVI input, OFF: dark->PC mode)*

	PC mode	DVI input	Remark
Sys power off	No any message	1. No connect - 60S message off (no connection) 2. No signal -60S message off (cable connected, but no signal input) 3. DVI input - message for 3 sec.	
Sys power on	PC mode forcibly	Switch to PC mode when sys power on	
In Windows	Message for 3 sec	Same as power off	

9. *LCD on/off (with LED status indicator: LCD ON: dark, LCD OFF: Green)*
10. *Clean me (with LED status indicator: ON: Amber, OFF: dark)*
    a. *Keep on contacting 5 seconds to active*
    b. *keep contacting 5 seconds to release*
    c. *auto release after 60 seconds*
11. *Fn: Function key (with LED status indicator: ON: Green, OFF: dark)*

Side View

Standard model without door	Customized model with DVD (or Smart card reader)

Rear View

TM-5010-24F (Fan)	TM-5010-24P (Fanless)

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I/O parts (Standard version)

1. LAN x 1
2. RS232 x 2
3. USB 3.1 x 2
4. USB 3.0 x 2
5. Reset
6. DC-in
7. PCI-E/PCI expansion
8. Line-out
9. Microphone-in
10. DP Port x 2 (Output)

I/O parts (Expansion I/O version)

1. LAN x 2
2. RS232 x 1
3. RS232/RS422/RS485 x 1 (RS-485 auto flow support)
4. USB 3.1 x 2
5. USB 3.0 x 2
6. USB 2.0 x 2
7. Reset
8. DC-in
9. PCI-E/PCI expansion
10. Line-out
11. Microphone-in
12. DP Port x 2 (Output)

I/O parts (Isolated version)

isolation	
isolated COM	*4KV isolated RS-232 x 1, RS-232/422/485 x 1*
isolated USB	*4KV isolated USB 2.0 x 1 (Full speed)*
isolated LAN	*4KV isolated Lan x 1 (Gigabit)*

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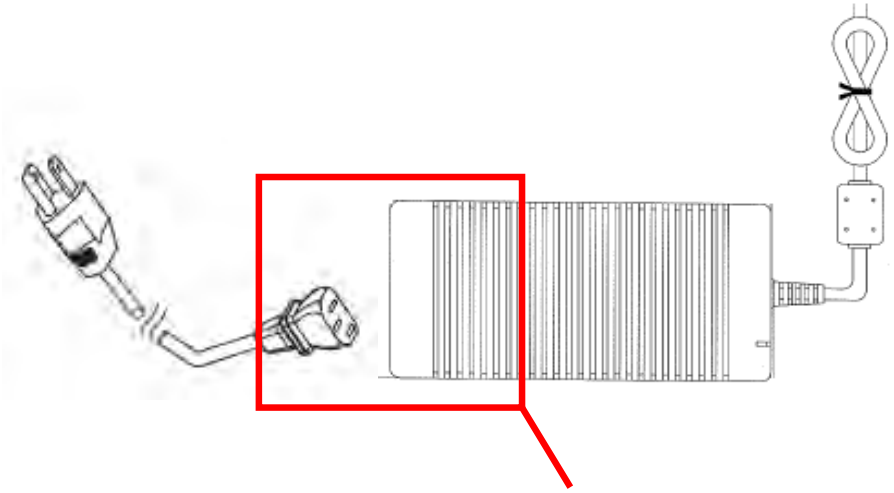
Disconnect Device



Unplug the power cord from the power adapter jack to disconnect the device.

Turn off the system:

Turning off TM-5010-24P/24F properly is important for system reliability.

1. On the start menu, click “Shut down” and select “OK”.

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BIOS Setup

BIOS Introduction

The AMI BIOS (Basic Input / Output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

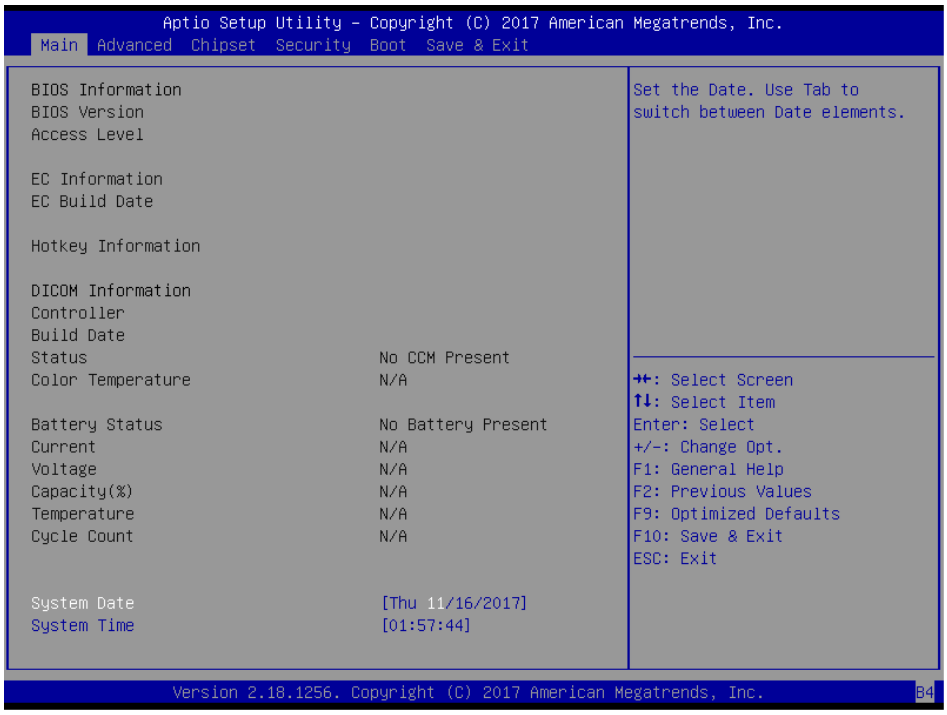
The AMI BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the AMI BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

Press <DEL> to Enter Setup

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Main



This section provides information on the BIOS information, Embedded controller information and Battery information

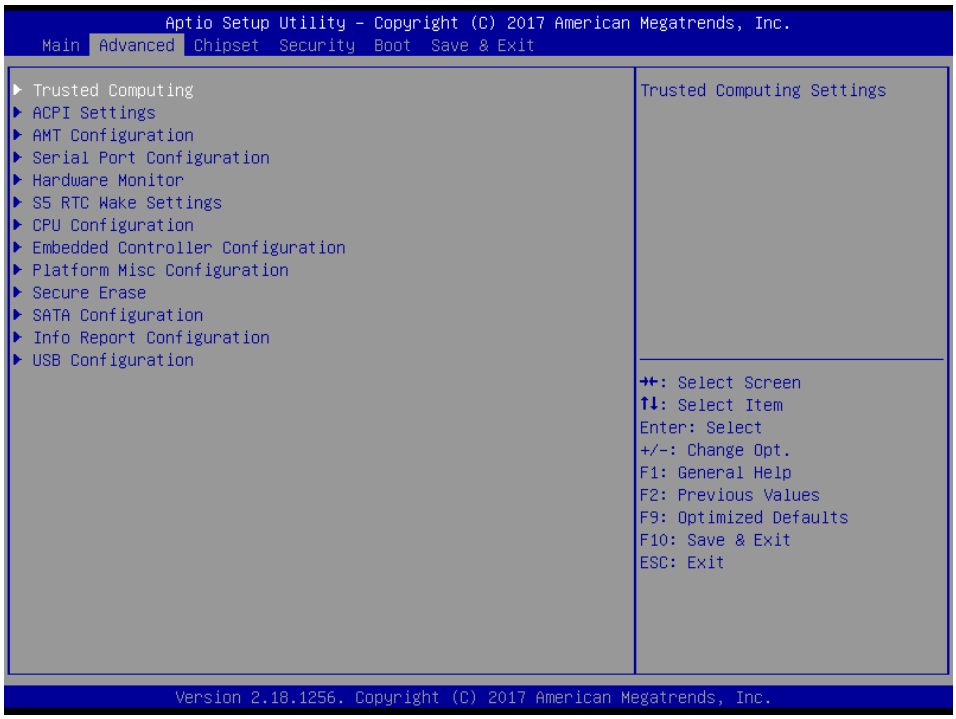
System Date

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

System Time

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

Advanced



Trusted Computing

Configuration

Enables or disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

ACPI Settings

Enable Hibernation

Enables or Disables System ability to Hibernate (0S/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SISPEND button is pressed.

AMT Configuration

Intel AMT

Enable/Disable 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.

BIOS Hotkey Pressed
OEMFLag Bit 1: Enable/Disable BIOS hotkey press.

MEBx Selection Screen
OEMFLag Bit 2:Enable/Disable MEBx selection screen.

Hide Un-Configure ME Confirmation Prompt
OEMFlag Bit 6:Hide Un-Configure ME without password Confirmation Prompt.

Un-Configure ME
OEMFlag Bit 15:Un-Configure ME without password.

Serial Port Configuration
Serial Port 1 Configuration
Serial Port
Select an optimal settings for super IO Device.
Change Settings
Select an optimal settings for Super IO Device.
Set Parameters of Serial Port 1.

Serial Port 2 Configuration
Serial Port
Enable or Disable Serial Port (COM).

Change Settings
Select an optimal settings for super IO Device.

Serial Port 3 Configuration
Serial Port
Enable or Disable Serial Port (COM).

Change Settings
Select an optimal settings for super IO Device.

Serial Port 4 Configuration
Serial Port
Enable or Disable Serial Port (COM).

Change Settings
Select an optimal settings for super IO Device.

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Serial Port 5 Configuration

Serial Port

Enable or Disable Serial Port (COM).

Change Settings

Select an optimal settings for super IO Device.

Serial Port 6 Configuration

Serial Port

Enable or Disable Serial Port (COM).

Change Settings

Select an optimal settings for super IO Device.

Hardware Monitor

Monitor hardware status

S5 RTC Wake Settings

Wake system From S5

Enable or disable System wake on alarm event. Select FixedTime, System will wake on the hr::min::sec specified. Select DynamicTime , System will wake on the current time + Increase minute(s).

CPU Configuration

CPU Configuration Parameters

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.

Intel(R) SpeedStep(tm)

Allows more than tow frequency ranges to be supported.

Turbo Mode

Enable / Disable Turbo Mode.

Battery Mode Power Limit

Enable / Disable battery mode power limit function.

Embedded Controller Configuration

Battery off Time

Number of seconds of cut off battery output after system shutdowns.0~600 second(s) 0 means disable battery off function.

Max CPU Temperature
Start point of CPU temperature for throttling.
Max CPU Temperature(Fanless)
Start point of CPU temperature for throttling
Adopter Power Limitation
Adopter Power Limitation in watts.
Battery Power Limitation
Battery Power Limitation in watts.

Platform Misc Configuration
Native PCIE Enable
PCI Express Native Support Enable/Disable. This feature is only available in Vista
Native ASPM
On enable, Vista will control the ASPM Support for the device. If disabled, the BIOS will

Show/hide hidden items
For debug only.
Show / hide hidden items.

Secure Erase
Secure Erase mode
Change behavior of Secure Erase module . <Simulated> Causes the module to show the flow without actually erasing SSD, <Real> Causes the module to erase SSD.
Force Secure Erase
Force Secure Erase on next boot.

SATA Configuration
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.

Serial-ATA Port 0
Enable / Disable Serial ATA Port 0.
Port 0
Enable or Disable SATA Port
HotPlug
Designates this port as hot Pluggable.

External SATA
External SATA Support
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.
Topology
Identify the SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2
Device Sleep
mSATA for RTD3.
SATA DEVSLEP Idle Timeout config
Enable/Disable SATA DTIO Config

Serial-ATA Port 1
Enable / Disable Serial ATA Port 0.
Port 0
Enable or Disable SATA Port
HotPlug
Designates this port as hot Pluggable.
External SATA
External SATA Support
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.
Topology
Identify the SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2
Device Sleep
mSATA for RTD3.
SATA DEVSLEP Idle Timeout config
Enable/Disable SATA DTIO Config

Serial-ATA Port 3
Enable / Disable Serial ATA Port 0.
Port 0
Enable or Disable SATA Port

HotPlug
Designates this port as hot Pluggable.
External SATA
External SATA Support
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.
Topology
Identify the SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2
Device Sleep
mSATA for RTD3.
SATA DEVSLEP Idle Timeout config
Enable/Disable SATA DTIO Config

Serial-ATA Port 4
Enable / Disable Serial ATA Port 0.
Port 0
Enable or Disable SATA Port
HotPlug
Designates this port as hot Pluggable.
External SATA
External SATA Support
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.
Topology
Identify the SATA Topology if it is Default or ISATA or Flex or DirectConnect or M2
Device Sleep
mSATA for RTD3.
SATA DEVSLEP Idle Timeout config
Enable/Disable SATA DTIO Config

Info Report Configuration
Post Report

Post Repost Support Enabled / Disabled.

Info Error Message
Info Error Message Support Enabled / Disabled.

Summary Screen
Summary Screen Support Enabled / Disabled.

USB Configuration
USB Support
USB Support Parameters.

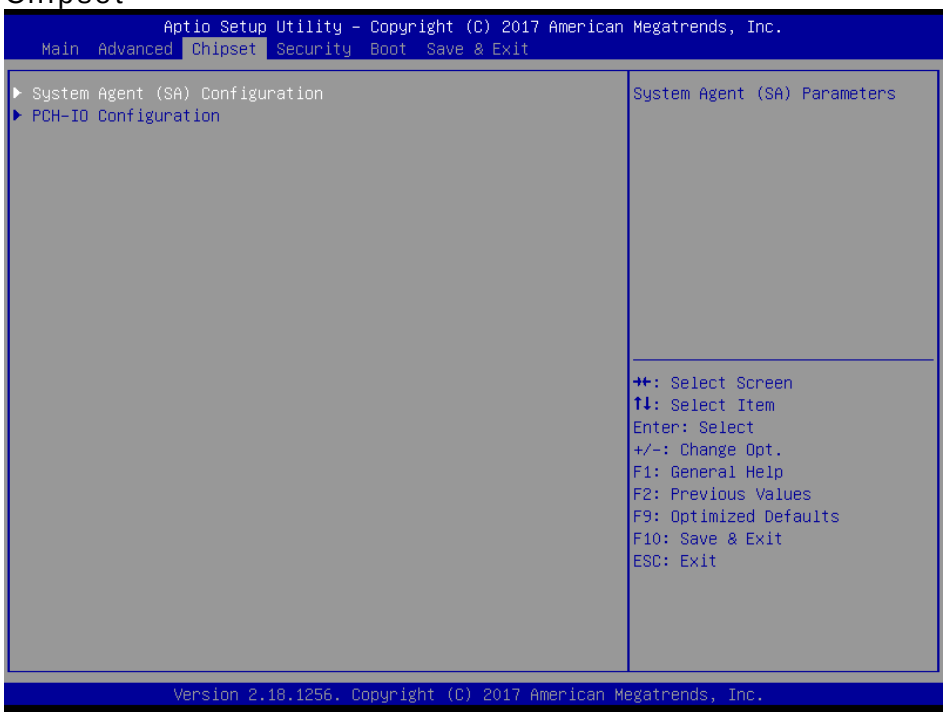
Legacy USB Support
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications

XHCI Hand-off
Enable / Disable XHCI Controller Legacy support.

USB Mass Storage Driver Support
Enable/Disable USB Mass Storage Driver Support.

USB hardware delays and time-outs:
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
Maximun time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port the delay is taken from Hub descriptor.

Chipset



System Agent (SA) Configuration
System Agent (SA) Parameters.

- VT-d
  - VT-d capability
- Graphics Configuration
- Graphics Turbo IMON Current
  - Graphics Turbo IMON current values supported(14-31)
- Skip Scaning 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.
- Internal Graphics
  - Keep IGFX enabled based on the setup options
- GTT Size
  - Select the GTT Size
- Aperture Size

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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.

Memory Configuration

Memory configuration Parameters

PCH-IO Configuration

PCI Express Configuration

PCI Express Configuration settings

USB Configuration

USB Precondition

Precondition work on USB host controller and root ports for faster enumeration.

PCI Express Configuration settings

XHCI Disable Compliance Mode

Options to disable Compliance Mode. Default is FALSE to not disable Compliance Mode. Set TRUE to disable Compliance Mode.

USB Port Disable Override

Selectively Enable/Disable the corresponding USB port from reporting a Device Connection to the controller..

HD Audio

Control Detection of the HD-Audio device.\n\nDisabled = HDA will be unconditionally disabled\n\nEnabled = HDA will be unconditionally enabled\n\nAuto = HDA will be enabled if present, disabled otherwise.

PCH LAN Controller

Enable or disable onboard NIC

DeepSx Power Policies

Configure the DeepSx Mode Configuration

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.)

SLP_LAN# Low on DC Power

Enable/Disable SLP_LAN# Low on DC power.

Wake on WLAN Enable

Enable/Disable PCI Express Wireless LAN to wake the system.

Restore AC Power Loss

Select AC power state when power is re-applied after a power failure.

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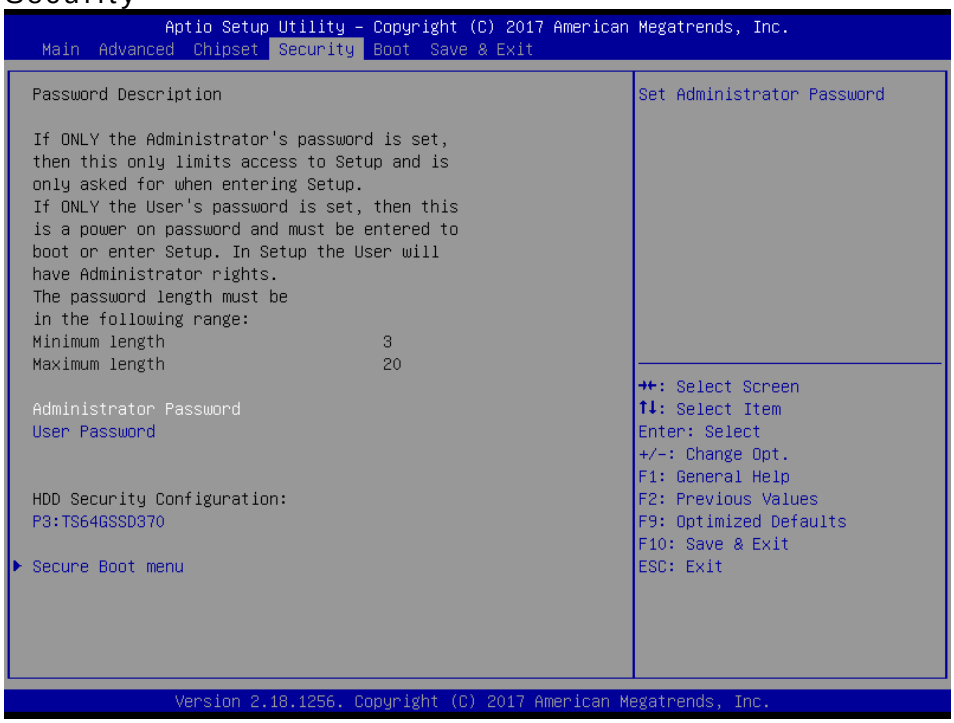
Security



Administrator Password

Set Administrator Password.

User Password

Set user Password.

P3：TS64GSSD370

HDD Security Configuration for selected drive.

Secure Boot menu

Secure Boot

Secure Boot can be enabled if 1.System running in User mode with enrolled Platform key(PK). 2. CSM function is disabled.

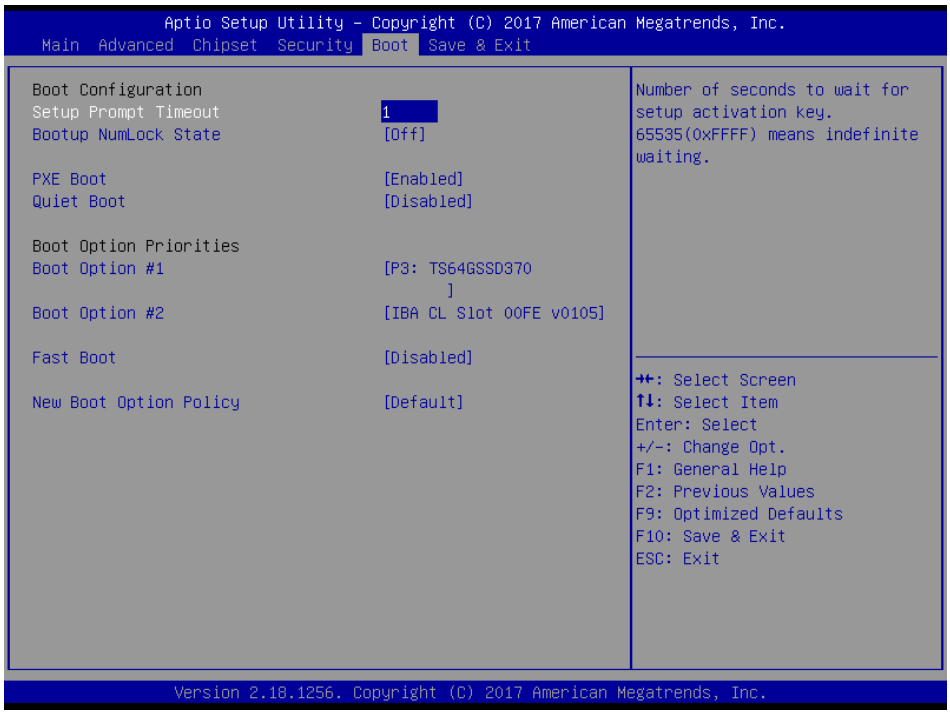
Secure Boot Mode

Secure Boot mode selector. 'Custom' Mode enables users to change Image Execution policy and manage Secure Boot keys.

Key Management

Enables experienced users to modify Secure Boot variables

Boot



Setup Prompt Timeout

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

Bootup Numlock State

Selects the keyboard NumLock state.

PXE Boot

PXE Network Boot Enable / Disable.

Quiet Boot

Enable or disables Quiet Boot option.

Boot Option #1

Sets the system boot order.

Boot Option #2

Sets the system boot order.

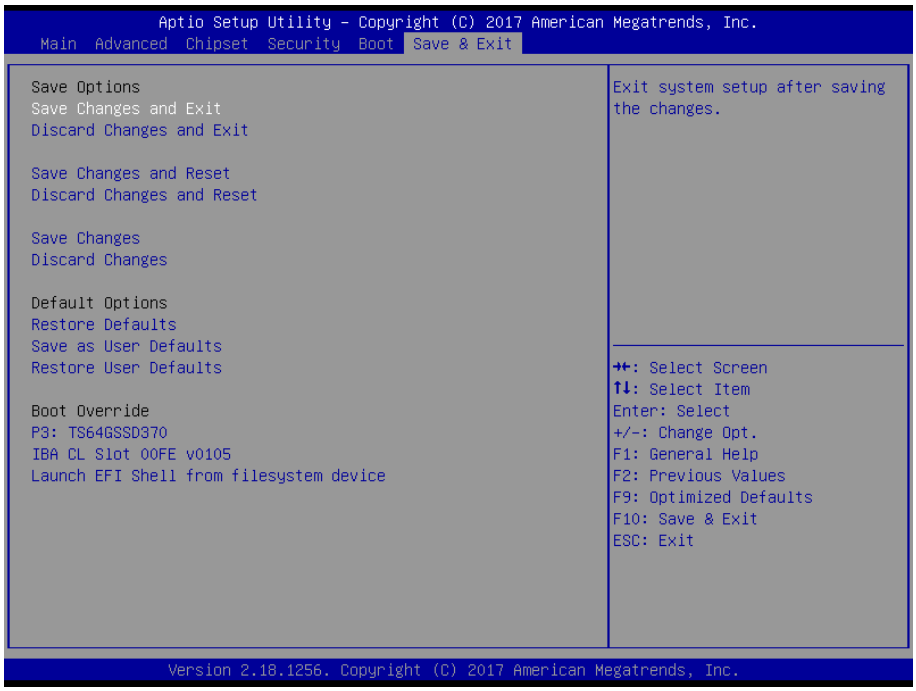
Fast Boot

Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

New Boot Option

Controls the placement of newly detected UEFI boot options

Save & Exit



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 the changes.

Save Changes

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

Discard Changes

Discard the changes done so far to any of setup 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.

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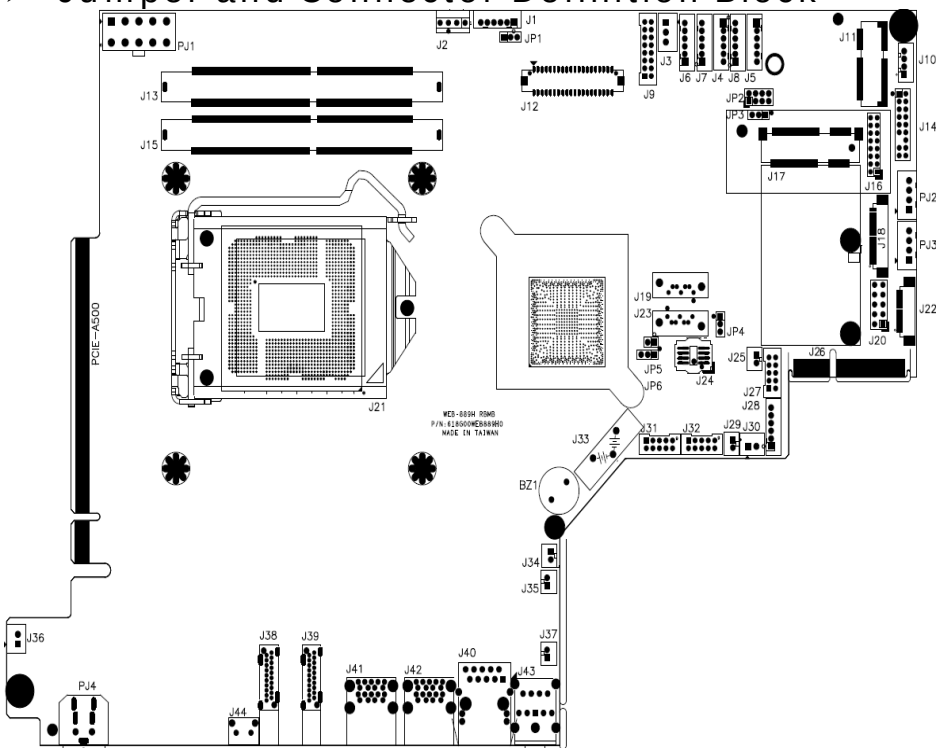
Appendix

A. Jumper settings and Connectors

This appendix gives the definitions and shows the positions of jumpers, headers and connectors. All of the configuration jumpers on TM-5010-24P/24F are in the proper position.

Note: Some of jumpers or connectors will be removed base on system configuration.

➢ Jumper and Connector Definition Block



JP1 – Backlight Adjust

Description	Jumper Setting
Analog Inverter	1-2
PWM Inverter	***2-3 (default)***

JP2 – BISO code select Settings

Description	Jumper Setting
1-2	***LVDS BIOS (Low) default***
3-4	VEDIO-IN BIOS function
5-6	DICOM BIOS function
7-8	eDP BIOS function

JP3 –mini-PCIe connector mSATA Settings

Description	Jumper Setting
mSATA	***2-3 (NA)default***
PCIe	1-2

JP4 –SATA or SATA DOM Selection

Description	Jumper Setting
SATA DOM	1-2 ---power +5V
SATA Port	***2-3 (GND) default***

JP5 –ME Clear

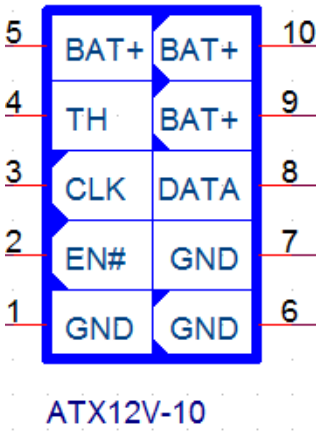
Description	Jumper Setting
Clear ME	***1-2 (NC) default***

JP6 –CMOS Clear

Description	Jumper Setting
Normal Open	***1-2 (default)***
CMOS Clear	2-3

1.1 Connector Definition

- **PJ1 – Battery Connector**

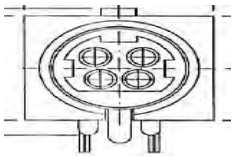


Pin #	Signal Description
1	Ground
2	BATT_EN#
3	BATT_CLK
4	BATT_T
5	BATT+
6	Ground
7	Ground
8	BATT_DAT
9	BATT+
10	BATT+

- **PJ2 /PJ3 – HDD Power Connector**

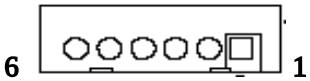
Pin #	Signal Description
1	+12VS
2	Ground
3	Ground
4	+5VS

PJ4 Power Jack Connector



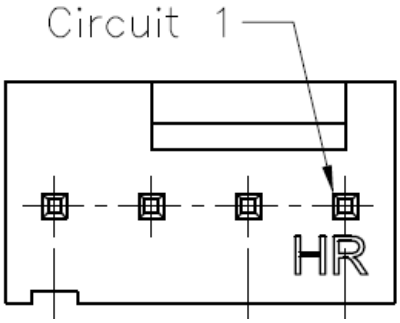
Pin #	Signal Description
1	DC In
2	DC In
3	Ground
4	Ground
5	Ground

J1 – Inverter connect



Pin #	Signal Description
1	+12VS
2	+12VS
3	Backlight Adjust
4	Backlight Enable
5	Ground
6	Ground

J2 – CPU PWM FAN



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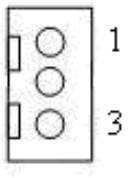
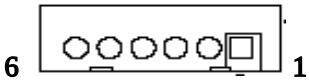
Pin #	Signal Description
1	GND
2	+12VS
3	CPU_FAN_RPM
4	FAN_PWM

- **J3 – PCI POWER**



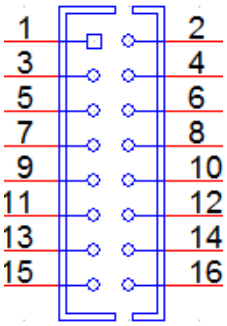
Pin #	Signal Description
1	+5V
2	Ground
3	+5V

- **J4/J5/J6/J7/J8 – Internal USB Interface**



Pin #	Signal Description
1	+5VSB
2	+5VSB
3	D-
4	D+
5	Ground
6	Ground

- **J9 – VEDIO-IN**



Pin #	Signal Description
	J9(VEDIO-IN)
1	DVI_DATA0+
2	DVI_DATA2+
3	DVI_DATA0-
4	DVI_DATA2-
5	DVI_DATA1+
6	GND
7	DVI_DATA1-
8	DET_DVI
9	GND
10	DVI_5V
11	SCL
12	GND
13	SDA
14	DVI_CLK+
15	HPD_DVI
16	DVI_CLK-

● J10 – SYSTEM FAN

Pin #	Signal Description
	J10(System Fan)
1	SYS_PWM

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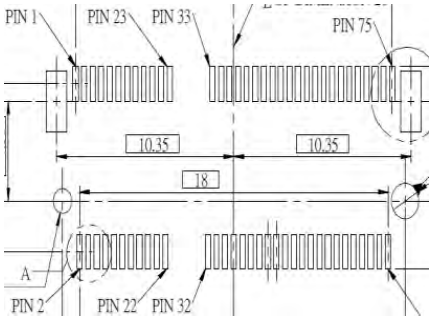
2	SYS_RPM
3	+12VS
4	GND

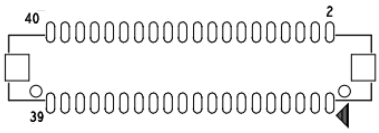
● J11 – M.2 E-KEY Socket



Pin #	Signal Description	Pin #	Signal Description
1	GND	2	+3.3V
3	USB_D+	4	+3.3V
5	USB_D-	6	LED1#(O)(OD)
7	GND	8	KEY A
9	KEY A	10	KEY A
11	KEY A	12	KEY A
13	KEY A	14	KEY A
15	KEY A	16	LED2#(O)(OD)
17	NA	18	GND
19	NA	20	NA
21	NA	22	NA
23	NA	24	KEY E
25	KEY E	26	KEY E
27	KEY E	28	KEY E
29	KEY E	30	KEY E
31	KEY E	32	NA
33	GND	34	NA
35	PETP0	36	NA
37	PETN0	38	CLINK Reset(I)(0/3.3V)
39	GND	40	CLINK DATA (I/O)
41	PERP0	42	CLINK CLK(I/O)
43	PERN0	44	COEX3(I/O)(0/1.8V)
45	GND	46	COEX2(I/O)(0/1.8V)
47	REFCLKP0	48	COEX1(I/O)(0/1.8V)
49	REFCLKN0	50	SUSCLK(32kHz)(I)(0/3.3V)

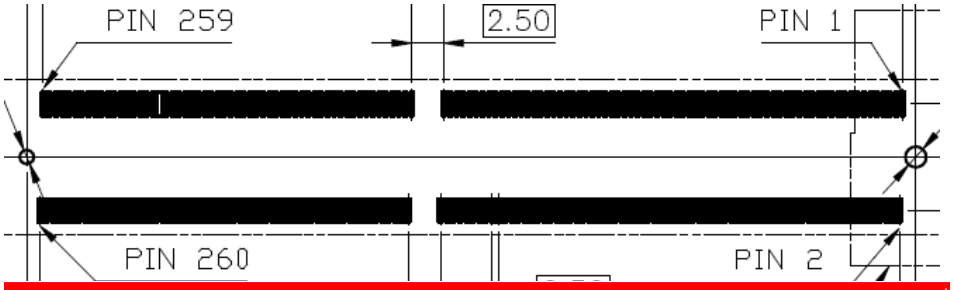
51	GND	52	PERST0#(0/3.3V)
53	CLKREQ0#(I/O)(0/3.3V)	54	BT_DISABLE2#(I)(0/3.3V)
55	PEWAKE0#(I/O)(0/3.3V)	56	W_DISABLE1#(I)(0/3.3V)
57	GND	58	NA
59	NA	60	NA
61	NA	62	NA
63	GND	64	NA
65	NA	66	NA
67	NA	68	NA
69	GND	70	NA
71	NA	72	+3.3V
73	NA	74	+3.3V
75	GND		

J12 – LVDS Interface



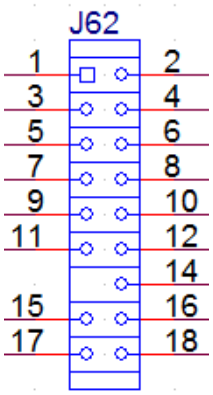
Pin #	Signal Description	Pin #	Signal Description
1	+LCD (+5VSB)	2	+LCD (+5VSB)
3	+LCD (+5VSB)	4	+LCD (+5VSB)
5	Ground	6	Ground
7	Ground	8	Ground
9	A_RxIn0-	10	B_RxIn0-
11	A_RxIn0+	12	B_RxIn0+
13	Ground	14	Ground
15	A_RxIn1-	16	B_RxIn1-
17	A_RxIn1+	18	B_RxIn1+
19	Ground	20	Ground
21	A_RxIn2-	22	B_RxIn2-
23	A_RxIn2+	24	B_RxIn2+
25	Ground	26	Ground
27	A_CKIN-	28	B_CKIN-
29	A_CKIN+	30	B_CKIN+
31	Ground	32	Ground
33	A_RxIn3-	34	B_RxIn3-
35	A_RxIn3+	36	B_RxIn3+
37	Ground	38	Ground
39	Ground	40	Ground

J13 / J15 – DIMM1 / DIMM0 DDR4 Vertical Connect



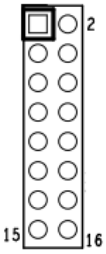
Pin	Front	Pin	Back	Pin	Front	Pin	Back	Pin	Front	Pin	Back	Pin	Front	Pin	Back
1	VSS	2	VSS	67	DQ29	68	VSS	133	A1	134	EVENT_n, NF	199	DM5_n/ DBI5_n	200	DQS5_t
3	DQ5	4	DQ4	69	VSS	70	DQ24	135	VDD	136	VDD	201	VSS	202	VSS
5	VSS	6	VSS	71	DQ25	72	VSS	137	CK0_t	138	CK1_t/NF	203	DQ46	204	DQ47
7	DQ1	8	DQ0	73	VSS	74	DQS3_c	139	CK0_c	140	CK1_c/NF	205	VSS	206	VSS
9	VSS	10	VSS	75	DM3_n/ DM9_n	76	DQS3_t	141	VDD	142	VDD	207	DQ42	208	DQ43
11	DQS0_c	12	DM0_n/ DM10_n	77	VSS	78	VSS	143	PARITY	144	A0	209	VSS	210	VSS
13	DQS0_t	14	VSS	79	DQ30	80	DQ31	145	BA1	146	A10/AP	211	DQ52	212	DQ53
15	VSS	16	DQ6	81	VSS	82	VSS	147	VDD	148	VDD	213	VSS	214	VSS
17	DQ7	18	VSS	83	DQ26	84	DQ27	149	CS0_n	150	BA0	215	DQ49	216	DQ48
19	VSS	20	DQ2	85	VSS	86	VSS	151	WE_n/ A14	152	RAS_n/ A16	217	VSS	218	VSS
21	DQ3	22	VSS	87	CB5/NC	88	CB4/NC	153	VDD	154	VDD	219	DQS6_c	220	DM6_n/ DBI6_n
23	VSS	24	DQ12	89	VSS	90	VSS	155	ODT0	156	CAS_n/ A15	221	DQS6_t	222	VSS
25	DQ13	26	VSS	91	CB1/NC	92	CB0/NC	157	CS1_n	158	A13	223	VSS	224	DQ54
27	VSS	28	DQ8	93	VSS	94	VSS	159	VDD	160	VDD	225	DQ55	226	VSS
29	DQ9	30	VSS	95	DQS8_c	96	DM8_n/ DBI_n/NC	161	ODT1	162	C0/ CS2_n/NC	227	VSS	228	DQ50
31	VSS	32	DQS1_c	97	DQS8_t	98	VSS	163	VDD	164	VREFCA	229	DQ51	230	VSS
33	DM1_n/DBI_n	34	DQS1_t	99	VSS	100	CB6/NC	165	C1, CS3_n, NC	166	SA2	231	VSS	232	DQ60
35	VSS	36	VSS	101	CB2/NC	102	VSS	167	VSS	168	VSS	233	DQ61	234	VSS
37	DQ15	38	DQ14	103	VSS	104	CB7/NC	169	DQ37	170	DQ36	235	VSS	236	DQ57
39	VSS	40	VSS	105	CB3/NC	106	VSS	171	VSS	172	VSS	237	DQ56	238	VSS
41	DQ10	42	DQ11	107	VSS	108	RESET_n	173	DQ33	174	DQ32	239	VSS	240	DQS7_c
43	VSS	44	VSS	109	CKE0	110	CKE1	175	VSS	176	VSS	241	DM7_n/ DBI7_n	242	DQS7_t
45	DQ21	46	DQ20	111	VDD	112	VDD	177	DQS4_c	178	DM4_n/ DBI4_n	243	VSS	244	VSS
47	VSS	48	VSS	113	BG1	114	ACT_n	179	DQS4_t	180	VSS	245	DQ62	246	DQ63
49	DQ17	50	DQ16	115	BG0	116	ALERT_n	181	VSS	182	DQ39	247	VSS	248	VSS
51	VSS	52	VSS	117	VDD	118	VDD	183	DQ38	184	VSS	249	DQ58	250	DQ59
53	DQS2_c	54	DM2_n/ DBI2_n	119	A12	120	A11	185	VSS	186	DQ35	251	VSS	252	VSS
55	DQS2_t	56	VSS	121	A9	122	A7	187	DQ34	188	VSS	253	SCL	254	SDA
57	VSS	58	DQ22	123	VDD	124	VDD	189	VSS	190	DQ45	255	VDDSPD	256	SA0
59	DQ23	60	VSS	125	A8	126	A5	191	DQ44	192	VSS	257	VPP	258	VTT
61	VSS	62	DQ18	127	A6	128	A4	193	VSS	194	DQ41	259	VPP	260	SA1
63	DQ19	64	VSS	129	VDD	130	VDD	195	DQ40	196	VSS				
65	VSS	66	DQ28	131	A3	132	A2	197	VSS	198	DQS5_c				

- ## J14 – TPM 2.0 support



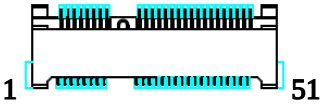
1	DEBUG_CLK	6	SMBDATA	11	LPC_AD0	16	SERIRQ
2	GND	7	LPC_LAD3	12	GND	17	GND
3	LPC_FRAME#	8	LPC_DAT2	13	NA	18	
4	SMBCLK	9	+3VS	14	SUS_SATA#		
5	PLT_RST#	10	LPC_DAT1	15	+3.3VSB		

- ## J16 –TPM / ID-394



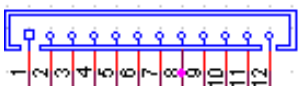
Pin #	Signal Description	Pin #	Signal Description
1	LPC AD0	2	PCI reset
3	LPC AD1	4	SERIRQ
5	LPC AD2	6	+3.3VS
7	LPC AD3	8	+5VSB
9	LPC Frame	10	PCI CLKRUN
11	Debug CLK	12	SMB CLK
13	GND	14	SMB DATA
15	SUS_STAT#	16	+3.3VB

J17–mini PCI Express Socket



Pin #	Signal Description	Pin #	Signal Description
1	WAKE#	2	+3.3VSB
3	Reserved	4	GND
5	Reserved	6	+1.5VS
7	CLKREQ#	8	Reserved
9	GND	10	Reserved
11	REFCLK-	12	Reserved
13	REFCLK+	14	Reserved
15	GND	16	Reserved
17	Reserved	18	GND
19	Reserved	20	Reserved
21	GND	22	PERST#
23	PERn0	24	+3.3VSB
25	PERp0	26	GND
27	GND	28	+1.5VS
29	GND	30	SMB_CLK
31	PETn0	32	SMB_DATA
33	PETp0	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3VSB	40	GND
41	+3.3VSB	42	Reserved
43	SEL_PCIE_SATA	44	Reserved
45	CL_CLK	46	Reserved
47	CL_ DATA	48	+1.5VS
49	Controller Link RST#	50	GND
51	Reserved	52	+3.3VSB

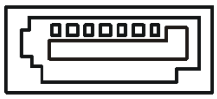
J18 – DICOM connect



Pin #	Signal Description

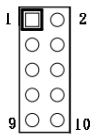
1	ASIC_RST#
2	+3.3VS
3	+3.3VS
4	CSC_DET#
5	SCK_OUT
6	SDA_OUT
7	GND
8	SPI_PROG
9	SPI_CLK
10	SPI_DO
11	SPI_DI
12	GND

J19 / J23 – Standard SATA / SATA DOM Interface



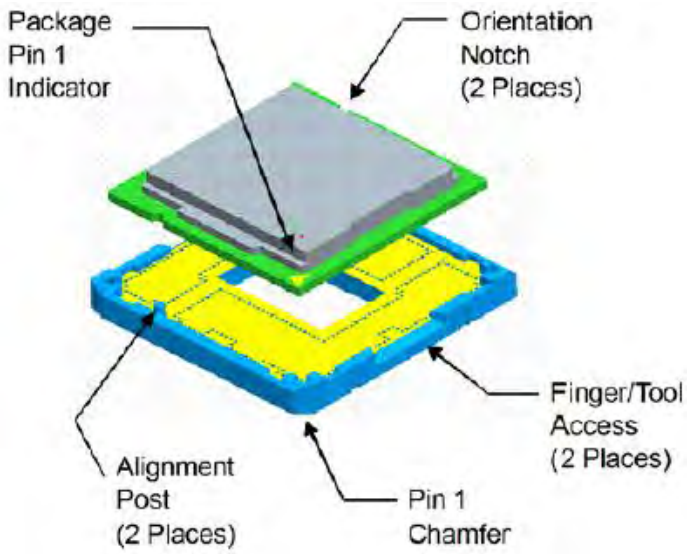
Pin #	Signal Description
1	Ground
2	Tx+
3	Tx-
4	Ground
5	Rx-
6	Rx+
7	Ground / **+5VS (jump select SATA DOM only)**

J20 – DICOM JTAG

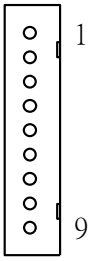


Pin #	Signal Description	Pin #	Signal Description
1	+3.3VS	2	GND
3	GND	4	394_C2D
5	+3.3VS Pull High	6	X
7	394_RST#	8	X
9	GND	10	X

- **J21 – CPU Interface (Please refer to FCLGA1151)**



- **J22 – CAP Front Bezel Button Connector**

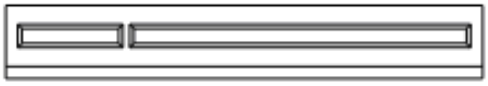


Pin #	Signal Description
1	+5V_AWS
2	+3.3_AWS
3	KP_SCL
4	KP_SDA
5	PWR_LED#
6	KP_P_LED#
7	SATA_LED#
8	Ground
9	Ground

J24 – BIOS SOCKET

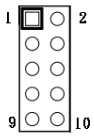
Pin #	Signal Description	Pin #	Signal Description
1	CS#	5	VDD
2	SO	6	HOLD#
3	WP#	7	SCK
4	VSS	8	SI

J26 – STD or ISO Slot Interface



Pin #	Side B	Side A	Pin #	Side B	Side A
1	+5VSB	+3.3V_LAN	17	Ground	USBPN8
2	+5VSB	+3.3V_LAN	18	UARTCLK2_24M	Ground
3	+5VSB	+3.3V_LAN	19	Ground	Ground
4	+5VSB	+3.3V_LAN	20	232_RI#	Ground
5	+5VSB	+3.3V_LAN	21	Ground	USBPP9
6	+5VSB	+3.3V_LAN	22	Ground	USBPN9
7	Ground	Ground	23	PCIE_RXN12	Ground
8	LPC_AD0	+5VS	24	PCIE_RXP12	ISOCOM_GPIO2
9	LPC_AD1	+5VS	25	Ground	ISOCOM_GPIO3
10	LPC_AD2	+3.3VS	26	Ground	CLKRQ#_LAN
11	LPC_AD3	ISOCOM_GPIO1	27	PCIE_TXN12	Ground
12	LPC_FRAME#	USB_PWREN	28	PCIE_TXP12	Ground
13	PLT_RST#	Ground	29	Ground	LANCLK2_100MN
14	SERIRQ	USB_OC#89	30	PCIE_WAKE#	LANCLK2_100MP
15	Ground	Ground	31	Ground	Ground
16	ISO_24M	USBPP8	32	Ground	Ground

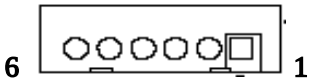
J27 – EC 80 Port



Pin #	Signal Description	Pin #	Signal Description

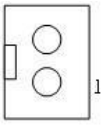
1	LPC_AD0	2	+5VS
3	LPC_AD1	4	+3.3VS
5	LPC_AD2	6	L80HLAT
7	LPC_AD3	8	L80LLAT

J28 – WRDM Interface



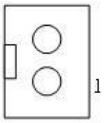
Pin #	Signal Description
1	GND
2	232_EC_SOUT7
3	GND
4	232_EC_SIN7
5	+5VSB
6	+3.3VSB

J29 – Power Switch connect



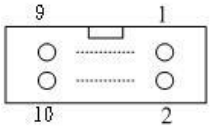
Pin #	Signal Description
1	Power ON
2	GND

J30,J36 – Reading Light



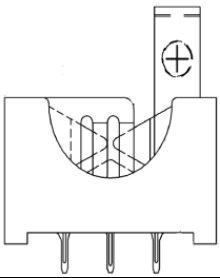
Pin #	Signal Description
1	+12VP
2	READING LIGHT

J31,J32 – COM5, COM6 Serial Port



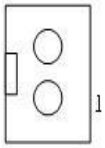
Pin #	Signal Description	Pin #	Signal Description
1	232_DCD	2	232_DSR
3	232_SIN	4	232_RTS
5	232_SOUT	6	232_CTS
7	232_DTR	8	232_RI
9	GND	10	+5VS

J33 – Battery Socket



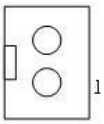
Pin #	Signal Description
1	RTC +3.3V
2	GND
3	RTC +3.3V

J34,J35 – L/R Speaker Connect



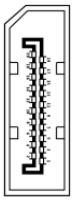
Pin #	Signal Description
1	AMP. Out +
2	AMP. Out -

J37– Internal MIC



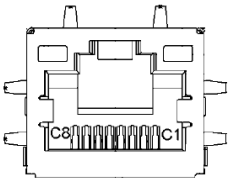
Pin #	Signal Description
1	MIC R/L Signals
2	AGND

J38,J39 – DisplayPort Interface



Pin #	Signal Description	Pin #	Signal Description
1	ML_LANE0+	11	GND
2	GND	12	ML_LANE3-
3	ML_LANE0-	13	CONFI G1
4	ML_LAN1+	14	CONGI G2
5	GND	15	AUX_CH+
6	ML_LAN1-	16	GND
7	ML_LANE2+	17	AUX_CH-
8	GND	18	HOT PLUG
9	ML_LANE2-	19	RETURN
10	ML_LANE3+	20	+3.3VS

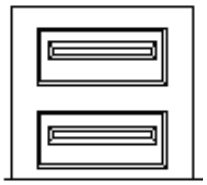
J40 – Ethernet Port



Pin #	Signal Description
1	LAN1_MDI3_N

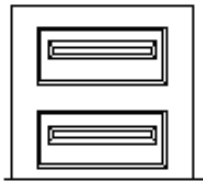
2	LAN1_MDI3_P
3	LAN1_MDI2_N
4	LAN1_MDI2_P
5	LAN1_MDI1_N
6	LAN1_MDI1_P
7	LAN1_MDI0_N
8	LAN1_MDI0_P

● J41– USB3.1 Gen2 Ports



Pin #	Signal Description	Pin #	Signal Description
1	+5VSB	10	+5VSB
2	Data1-	11	Data2-
3	Data1+	12	Data2+
4	GND	13	GND
5	SSRX1-	14	SSRX2-
6	SSRX1+	15	SSRX2+
7	GND	16	GND
8	SSTX1-	17	SSTX2-
9	SSTX1+	18	SSTX2+

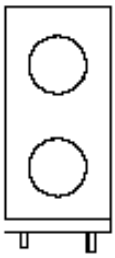
● J42– USB3.0 Port



Pin #	Signal Description	Pin #	Signal Description
1	+5VSB	10	+5VSB
2	Data1-	11	Data2-
3	Data1+	12	Data2+
4	GND	13	GND

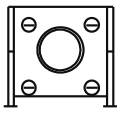
5	SSRX1-	14	SSRX2-
6	SSRX1+	15	SSRX2+
7	GND	16	GND
8	SSTX1-	17	SSTX2-
9	SSTX1+	18	SSTX2+

J43 – Audio Earphone / MIC



	Signal Description
UP	Line Out (stereo) Green
DOWN	Microphone (stereo) Pink

J44 – Reset Button



Pin #	Signal Description
1	SYS_RESET#
2	GND

J500 –eDP connector Interface (bottom layer)

Pin #	Signal Description	Pin #	Signal Description	Pin #	Signal Description
1	NA	15	EDP_AUX_DP_R	29	Ground
2	Ground	16	EDP_AUX_DN_R	30	Ground

3	EDP_TX3_DN_R	17	Ground	31	Ground
4	EDP_TX3_DP_R	18	+VLCD	32	EDP_BKLT_EN
5	Ground	19	+VLCD	33	EDP_BKLT_CTL
6	EDP_TX2_DN_R	20	+VLCD	34	Test Point
7	EDP_TX2_DP_R	21	+VLCD	35	Test Point
8	Ground	22	NA	36	NA
9	EDP_TX1_DN_R	23	Ground	37	NA
10	EDP_TX1_DP_R	24	Ground	38	NA
11	Ground	25	Ground	39	NA
12	EDP_TX0_DN_R	26	Ground	40	NA
12	EDP_TX0_DP_R	27	EDP_HPD		
14	Ground	28	Ground		

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B. L type Stand (optional kit)

Key Features and Benefits

- Similar color as TM series
- 5,000 times hinge life cycle

Specifications:

Weight Capacity:	Max 10kgs
Monitor Mounting Holes	VESA 75*75mm or 100*100mm
Application using	Desktop stand

C. Battery Pack Specifications (optional kit)

Battery Type	Li-ion 2S2P
Minimum Capacity	3900 mAh
Nominal Voltage	7.2 V
Max. Charge Voltage	8.4V
Cut Off Voltage	6.0v
Suggested Charge Current (Max.)	2A
System Continuous Discharging Current (Max.)	16.6 A
The End of Charge Condition	150 mA/min
Discharge Protection	UVP/OCP
Charge Protection	OVP/OTP
Self-discharge Rate	10uA ~800 uA
Dimensions	133 x 47 x 21mm
Weight	220g+/-20g
Ambient Temperature	0°C ~ +45°C
Storage Temperature	-20°C ~ +60°C
Energy	28.08Wh
Backup	100 W/ 10 min

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D. Scrap Computer Recycling

If the computer equipments need the maintenance or are beyond repair, we strongly recommended that you should inform us as soon as possible for the suitable solution. For the computers that are no longer useful or work well, please contact with worldwide distributors for recycling.

The worldwide distributors show on the following website:
www.teguar.com

Note:
Follow the national requirement to dispose unit

Appendix K: Tablet Computer User Guide

User Guide

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Product notice

This user guide describes features that are common to most models. Some features may not be available on your computer.

Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See http://www.microsoft.com.

To access the latest user guides or manuals for your product, go to http://www.hp.com/support. Select **Find your product**, and then follow the on-screen instructions.

Software terms

By installing, copying, downloading, or otherwise using any software product preinstalled on this computer, you agree to be bound by the terms of the HP End User License Agreement (EULA). If you do not accept these license terms, your sole remedy is to return the entire unused product (hardware and software) within 14 days for a full refund subject to the refund policy of your seller.

For any further information or to request a full refund of the price of the computer, please contact your seller.

Your product does not support Windows 8 or Windows 7. In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on this product or provide any Windows 8 or Windows 7 drivers on http://support.hp.com.

Safety warning notice

⚠ **WARNING!** To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to come into contact with the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

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1 Welcome

After you set up and register the computer, we recommend the following steps to get the most out of your smart investment:

- **TIP:** To quickly return to the computer Start screen from an open app or the Windows desktop, press the Windows key on your keyboard. Pressing the Windows key again will return you to the previous screen.
- **Connect to the Internet**—Set up your wired or wireless network so that you can connect to the Internet. For more information, see Network connections on page 24.
- **Update your antivirus software**—Protect your computer from damage caused by viruses. The software is preinstalled on the computer. For more information, see Using antivirus software on page 57.
- **Get to know your computer**—Learn about your computer features. See Components on page 4 and Navigating the screen on page 28 for additional information.
- **Find installed software**—Access a list of the software preinstalled on the computer:

  Select the **Start** button.

  – or –

  Right-click the **Start** button, and then select **Apps and Features**.
- Back up your hard drive by creating recovery discs or a recovery flash drive. See Backing up, restoring, and recovering on page 63.

Finding information

To locate resources that provide product details, how-to information, and more, use this table.

Resource	Contents
Setup Instructions	• Overview of computer setup and features
HP support For HP support, go to http://www.hp.com/support.	• Online chat with an HP technician • Support telephone numbers • Replacement parts videos (select products only) • Maintenance and service guides • HP service center locations
Safety & Comfort Guide To access this guide: ▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**. – or – ▲ Select the **Start** button, select **HP**, and then select **HP Documentation**. – or – ▲ Go to http://www.hp.com/ergo. **IMPORTANT:** You must be connected to the Internet to access the latest version of the user guide.	• Proper workstation setup • Guidelines for posture and work habits that increase your comfort and decrease your risk of injury • Electrical and mechanical safety information
Regulatory, Safety and Environmental Notices To access this document: ▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**. – or – ▲ Select the **Start** button, select **HP**, and then select **HP Documentation**.	• Important regulatory notices, including information about proper battery disposal, if needed.
*Limited Warranty** To access this document: ▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**. – or – ▲ Select the **Start** button, select **HP**, and then select **HP Documentation**. – or – ▲ Go to http://www.hp.com/go/orderdocuments. **IMPORTANT:** You must be connected to the Internet to access the latest version of the user guide.	• Specific warranty information about this computer

*You can find your HP Limited Warranty located with the user guides on your product and/or on the CD or DVD provided in the box. In some countries or regions, HP may provide a printed warranty in the box. For countries or regions where the warranty is not provided in printed format, you can request a copy from http://www.hp.com/go/orderdocuments. For products purchased in Asia Pacific, you can

Resource	Contents
write to HP at POD, PO Box 161, Kitchener Road Post Office, Singapore 912006. Include your product name, and your name, phone number, and postal address.	

2 Components

Your computer features top-rated components. This chapter provides details about your components, where they're located, and how they work.

Locating hardware

To find out what hardware is installed on your computer:

▲ Type `device manager` in the taskbar search box, and then select the **Device Manager** app.

A list displays all the devices installed on your computer.

For information about system hardware components and the system BIOS version number, press fn+esc (select products only).

Locating software

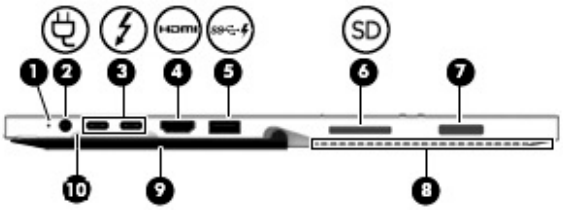
To find out what software is installed on your computer:

▲ Select the **Start** button.

– or –

Right-click the **Start** button, and then select **Apps and Features**.

Right

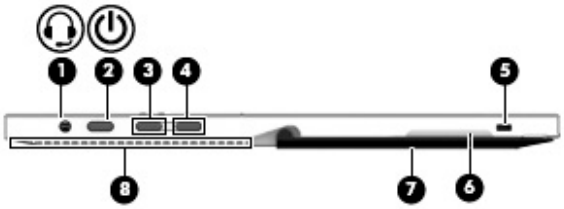


Component		Description
(1)	Battery light	When AC power is connected: • White: The battery charge is greater than 90 percent. • Amber: The battery charge is from 0 to 90 percent. • Off: The battery is not charging. When AC power is disconnected (battery not charging): • Blinking amber: The battery has reached a low battery level. When the battery has reached a critical battery level, the battery light begins blinking rapidly. • Off: The battery is not charging.

Component			Description
(2)		Power connector	Connects an AC adapter.
(3)		USB Type-C power and Thunderbolt™ ports with HP Sleep and Charge (2)	Connect an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery. – and – Connect and charge most USB devices that have a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer. **NOTE:** Cables and/or adapters (purchased separately) may be required. – and – Connect a display device that has a USB Type-C connector, providing DisplayPort output. **NOTE:** Your computer may also support a Thunderbolt docking station.
(4)		HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High Definition Multimedia Interface (HDMI) device.
(5)		USB 3.x SuperSpeed port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.
(6)		Memory card reader	Reads optional memory cards that store, manage, share, or access information. To insert a card: 1. Hold the card label-side up, with the connectors facing the computer. 2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. To remove a card: ▲ Press in on the card, and then remove it from the memory card reader.
(7)		Fingerprint reader (select products only)	Allows a fingerprint logon to Windows®, instead of a password logon.
(8)		Vents	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(9)		Kickstand	Provides stability and a variety of viewing angles.
(10)		Kickstand access tab	Provides access to lift the kickstand away from the back of the computer.

Right 5

Left



Component			Description
(1)		Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones. **WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*. To access this guide: 1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app. – or – Click the question mark icon in the taskbar. 2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**. **NOTE:** When a device is connected to the jack, the computer speakers are disabled.
(2)		Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep. • When the computer is in Hibernation, press the button briefly to exit Hibernation. **CAUTION:** Pressing and holding down the power button results in the loss of unsaved information. If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer. To learn more about your power settings, see your power options. ▲ Right-click the **Power meter** icon and then select **Power Options**.
(3)		Volume up button	Increases speaker volume incrementally while you hold down the button.

Component		Description
(4)	Volume down button	Decreases speaker volume incrementally while you hold down the key.
(5)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(6)	Kickstand access tab	Provides access to lift the kickstand away from the back of the computer.
(7)	Kickstand	Provides stability and a variety of viewing angles.
(8)	Vents	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

Front

NOTE: This computer has HP Quick Keys. These keys provide quick access to app shortcuts, and they can be customized to perform the most common key commands with the push of a single button.

Component		Description
(1)	HP Quick Key customizable button	Press the button to perform the customized action. The default action is Reference, which displays the interactive Virtual Desktop overlay for the customizable buttons and optional pen. The overlay displays what function each button is mapped to perform. For more information, see Viewing button mappings with the Virtual Desktop on page 39. To customize the button settings, see HP Create Control Panel software on page 32.
(2)	HP Quick Key customizable button	Press the button to perform the customized action. The default action is Undo. To customize the button settings, see HP Create Control Panel software on page 32.

Component		Description
(3)	HP Quick Key customizable button	Press the button to perform the customized action. The default action is Touch On/Off, which toggles the touch option on or off. To customize the button settings, see HP Create Control Panel software on page 32.
(4)	HP Quick Key Mode Select button	Press the button to cycle through the three customized options for the top two HP Quick Keys (the ones with the up and down arrows). The HP Quick Key Mode lights display which of the three Modes are active. The default setting controls only the left buttons. The left and right can be changed to mirror selections; see HP Create Control Panel software on page 32.
(5)	HP Quick Key customizable button	Press the button to perform the customized action. There are up to three actions, which depend on the Mode selected. Use the HP Quick Key Mode Select button to choose the mode. The HP Quick Key Mode lights show which Mode is active. The default actions are: • Switch the Virtual Desktop left • Snap the current window left • Display File Explorer To customize the button settings, see HP Create Control Panel software on page 32.
(6)	HP Quick Key customizable button	Press the button to perform the customized action. There are up to three actions, which depend on the Mode selected. Use the HP Quick Key Mode Select button to choose the mode. The HP Quick Key Mode lights show which Mode is active. The default actions are: • Switch the Virtual Desktop right • Snap the current window right • Display Desktop To customize the button settings, see HP Create Control Panel software on page 32.
(7)	HP Quick Key Mode lights	On: The Mode is in use. In the default setting, the left Mode light displays when the HP Quick Key customizable buttons on the top left are used, and the right mode light displays when the HP Quick Key customizable buttons on the top right are used. The lights cycle to the next light each time the button is pressed, which corresponds to the function the HP Quick Key Mode button is set to perform.
(8)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(9)	Camera lights (select products only)	On: One or more cameras are in use.
(10)	Internal microphones	Record sound.
(11)	Cameras (select products only)	Allow you to video chat, record video, and record still images. To use your camera, see Using a camera (select products only) on page 42. Some cameras also allow a facial recognition logon to Windows, instead of a password logon. For more information, see Using Windows Hello (select products only) on page 56. **NOTE:** Camera functions vary depending on the camera hardware and software installed on your product.

Component		Description
(12)	HP Quick Key Mode Select button	Press the button to cycle through the three customized options for the top two HP Quick Keys (the ones with the up and down arrows) The HP Quick Key Mode lights display which of the three Modes are active. The default setting controls only the right buttons. The left and right can be changed to mirror selections; see HP Create Control Panel software on page 32.
(13)	HP Quick Key customizable button	Press the button to perform the customized action. The default action is Screen Rotation Lock, which toggles screen rotation on or off. To customize the button settings, see HP Create Control Panel software on page 32.
(14)	HP Quick Key customizable button	Press the button to perform the customized action. The default is Action Center, which displays the Windows Action Center. To customize the button settings, see HP Create Control Panel software on page 32.
(15)	HP Quick Key customizable button	Press the button to perform the customized action. The default action is Cortana® Voice, which starts the Windows personal assistant. To customize the button settings, see HP Create Control Panel software on page 32.

*The antennas are not visible from the outside of the computer, and antenna location varies. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

To access this guide:

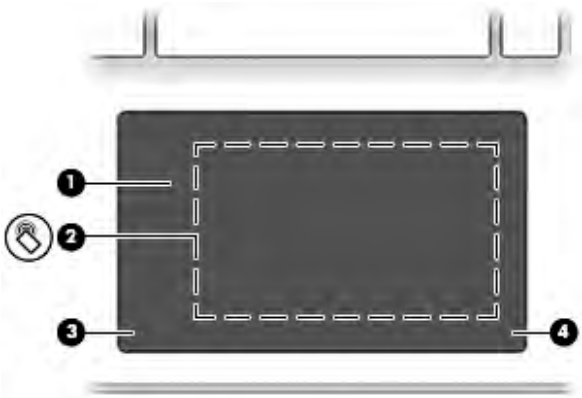
▲ Select the **Start** button, select **All apps** (required on some products), select **HP Help and Support**, and then select **HP Documentation**.

Front 9

Keyboard base components

Your tablet supports a keyboard. This section provides information about the features of the keyboard.

TouchPad



Component		Description
(1)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2)	Near Field Communications (NFC) tapping area and antenna*	Allows you to wirelessly share information when you tap it with an NFC-enabled device.
(3)	Left TouchPad click area	Functions like the left button on an external mouse.
(4)	Right TouchPad click area	Functions like the right button on an external mouse.

*The antenna is not visible from the outside of the computer. For optimal transmission, keep the area immediately around the antenna free from obstructions.

For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

To access this guide:

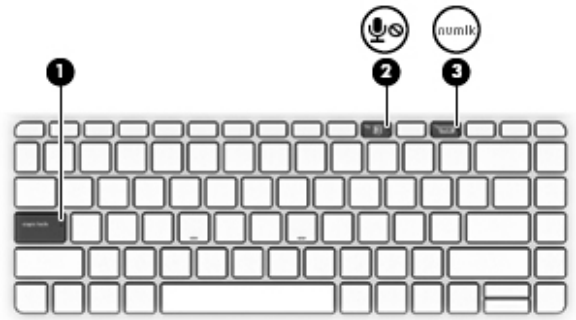
1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

   – or –

   Click the question mark icon in the taskbar.

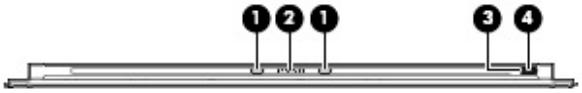
2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**.

Lights



Component		Description
(1)	Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.
(2)	Microphone mute light	• Amber: Microphone sound is off. • Off: Microphone sound is on.
(3)	Num lock light	On: Num lock is on.

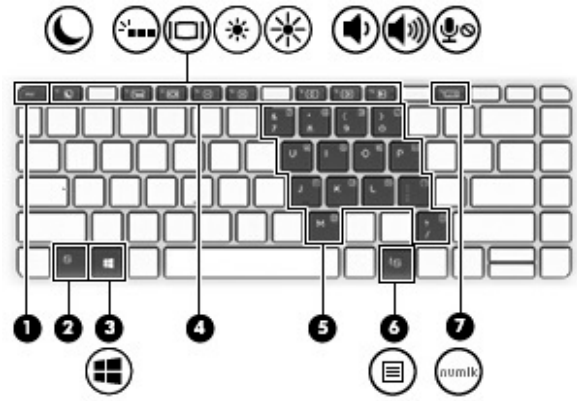
Keyboard connectors, button, and status light



Component		Description
(1)	Alignment posts (2)	Connect to the alignment connectors on the tablet.
(2)	Docking connector	Connects the keyboard to the tablet. The keyboard battery charges automatically when it is connected to the tablet using this connector.
(3)	Keyboard button	Turns the keyboard on or off. The button is also used for manual Bluetooth® pairing.
(4)	Keyboard status light	When AC power is connected: • Red: The keyboard battery charge is less than 15 percent. • White: The keyboard battery is charging using the micro-USB port, and the keyboard battery charge is from 15 to 99 percent. • Blue: The keyboard is connected to the tablet using Bluetooth, and the keyboard battery charge is 100 percent. • Blinking blue: The keyboard is pairing using Bluetooth. • Off: The keyboard is fully charged and is not connected using Bluetooth.

Component	Description
	When AC power is disconnected (the battery is not charging): • Red: The keyboard battery charge is less than 15 percent. • Blue: The keyboard is connected to the tablet using Bluetooth, and the keyboard battery charge is from 15 to 100 percent. • Blinking blue: The keyboard is pairing using Bluetooth. • Off: The keyboard is off. **NOTE:** If the keyboard does not have enough power to start when the keyboard button is pressed, the light will blink red several times and then turn off.

Special keys



Component			Description
(1)		esc key	Displays system information when pressed in combination with the fn key.
(2)		fn key	Executes frequently used system functions when pressed in combination with another key. Such key combinations are called *action keys* and *hot keys*. See Action keys on page 14 and Hot keys on page 15.
(3)		Windows key	Opens the **Start** menu. **NOTE:** Pressing the Windows key again will close the **Start** menu.
(4)		Action keys	Execute frequently used system functions, when pressed in combination with the fn key. See Action keys on page 14.
(5)		Embedded numeric keypad	A numeric keypad superimposed over the keyboard alphabet keys. When fn+num lk is pressed, the keypad can be used like an external numeric keypad. Each key on the keypad performs the function indicated by the icon in the upper-right corner of the key. **NOTE:** If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on.
(6)		Windows application key	Displays options for a selected object.
(7)		num lk key	Turns the embedded numeric keypad on and off when pressed in combination with the fn key.

Action keys

An action key performs the function indicated by the icon on the key. To determine which keys are on your product, see Special keys on page 13.

▲ To use an action key, press and hold the fn key and then press the action key.

Icon	Description
	Initiates Sleep, which saves your information in system memory. The display and other system components turn off and power is conserved. To exit Sleep, briefly press the power button. **CAUTION:** To reduce the risk of information loss, save your work before initiating Sleep.
	Turns the keyboard backlight off, on high, or on low. **NOTE:** To conserve battery power, turn off this feature.
	Switches the screen image among display devices connected to the system. For example, if a monitor is connected to the computer, repeatedly pressing the key alternates the screen image from computer display to monitor display to simultaneous display on both the computer and monitor.
	Decreases the screen brightness incrementally as long as you hold down the key.
	Increases the screen brightness incrementally as long as you hold down the key.
	Decreases speaker volume incrementally while you hold down the key.
	Increases speaker volume incrementally while you hold down the key.
	Mutes the microphone.

Hot keys

A hot key is the combination of the fn key and another key.

To use a hot key:

▲ Press and hold the fn key, and then press one of the keys listed in the following table.

Key	Description
C	Turns on scroll lock.
E	Turns on the insert function.
R	Breaks the operation.
S	Sends a programing query.
W	Pauses the operation.

USB port and smart card reader/pen holder slot (select products only)

Component		Description
(1)	Micro USB port	Connects a micro USB cable (purchased separately), that can be used to supply power to the keyboard and, if needed, charge the keyboard battery. **NOTE:** The keyboard battery charges automatically when the keyboard is connected to the tablet using the docking connector. See Keyboard connectors, button, and status light on page 11.
(2)	Smart card reader/pen holder slot	Supports optional smart cards or provides a slot for the pen holder insert. **IMPORTANT:** The keyboard must be connected to the tablet for the smart card feature to work.

Connecting the tablet to the keyboard base

To connect the tablet to the keyboard base, follow these steps:

1. Lower the tablet **(1)** onto the alignment posts on the keyboard base.
2. Position the kickstand **(2)** at the desired angle.

NOTE: If you close the kickstand, you can leave the keyboard attached and rotate the keyboard so that the back of the keyboard rests against the back of the behind the tablet. The keyboard keys and TouchPad are locked to prevent you from accidently typing while the keyboard is in this position.

Removing the tablet from the keyboard base

To remove the tablet from the keyboard, pull the tablet away from the keyboard.

Using the keyboard wirelessly

IMPORTANT: During the initial startup, the software will prompt you to pair the keyboard with the tablet. Refer to the *Setup Instructions* for information about the initial pairing.

After your keyboard is paired to the tablet, you can use the keyboard when it is not connected to the tablet. Using the keyboard wirelessly expands your options for use.

NOTE: Connect the keyboard to the tablet when you are using these functions:

- Computer Setup, or Basic Input/Output System (BIOS)
- HP PC Hardware Diagnostics
- Back up, restore, and recovery

NOTE: The automatic paring method is the preferred method to connect the keyboard wirelessly.

If the keyboard cannot communicate with the tablet, confirm the following:

- The tablet Bluetooth setting is turned on. See Network connections on page 24.
- The keyboard Bluetooth setting is turned on. The keyboard button light should be blue. See Keyboard connectors, button, and status light on page 11.

If needed, set the Bluetooth pairing again.

Setting the Bluetooth pairing automatically

If the keyboard cannot communicate with the tablet, follow these steps to automatically set the Bluetooth pairing:

NOTE: The tablet Bluetooth feature must be turned on.

1. Attach the keyboard to the tablet.

   The Keyboard Pairing Request screen appears.

2. Follow the screen instructions to pair the keyboard to the tablet.

Setting the Bluetooth pairing manually

If the keyboard cannot communicate with the tablet and automatic pairing fails, follow these steps to manually set the Bluetooth pairing:

1. Remove the keyboard from the tablet.
2. Type `bluetooth` in the taskbar search box, and then select **Bluetooth and other device settings**.
3. Turn on Bluetooth, if it is not already turned on.
4. Press the keyboard button for more than 3 seconds. The blue light should begin to blink. For the button and light location, see Keyboard connectors, button, and status light on page 11.
5. Select **Add Bluetooth or other device**.
6. Select **Bluetooth**.
7. Select **HP ZBook x2 Bluetooth Keyboard**.

   A passcode displays on the tablet screen.

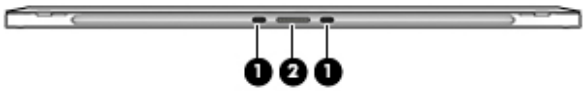
8. Type the passcode on the keyboard and press Enter.

   The installation continues and the keyboard is connected.

Top

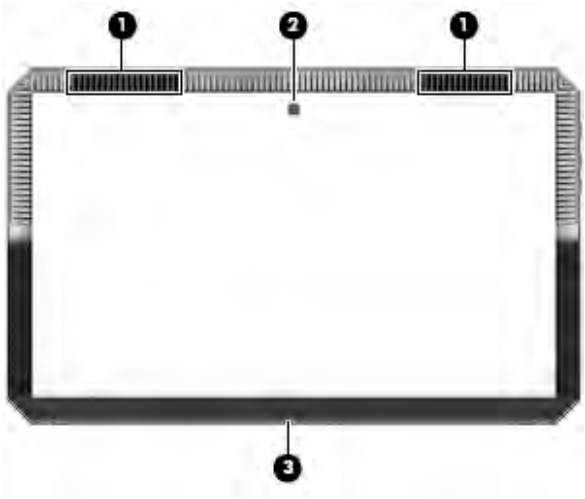
Component	Description
Speakers	Produce sound.

Bottom



Component		Description
(1)	Alignment post connectors (2)	Connect to the alignment posts on the keyboard.
(2)	Docking connector	Connects the tablet to the keyboard.

Rear



Component		Description
(1)	Vents	Enable airflow to cool internal components.

Component		Description
		NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(2)	Rear camera (select products only)	Allows you to video chat, record video, and record still images. To use your camera, see Using a camera (select products only) on page 42.
(3)	Kickstand	Provides stability and a variety of viewing angles.

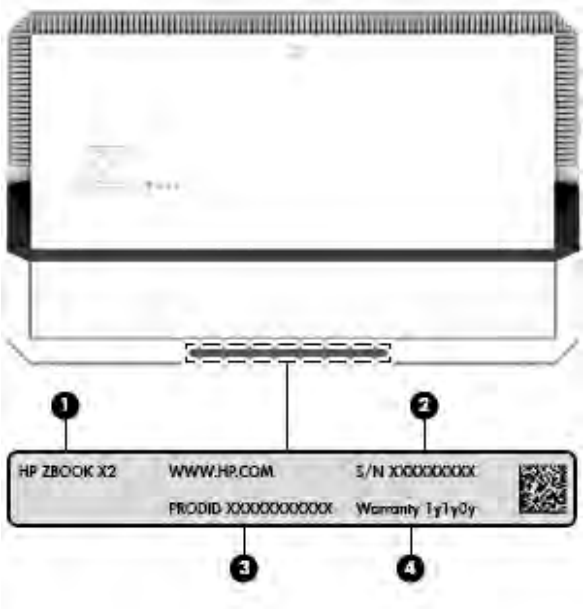
Labels

The labels on the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer.

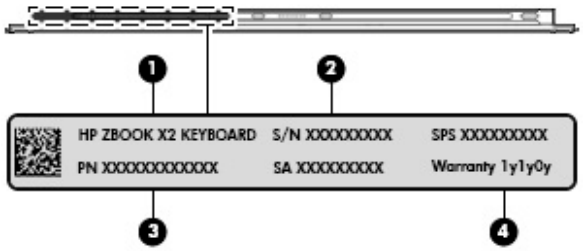
IMPORTANT: Check the following locations for the labels described in this section: the back of the display under the kickstand and the connection area of the keyboard.

- Service label—Provides important information to identify your computer and the keyboard. When contacting support, you will probably be asked for the serial number, and possibly for the product number or the model number. Locate these numbers before you contact support.

  Your service label will resemble the examples shown below.



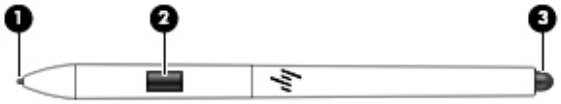
Component	
(1)	Model name (select products only)
(2)	Serial number
(3)	Product number
(4)	Warranty period



Component	
(1)	Model name (select products only)
(2)	Serial number
(3)	Product number
(4)	Warranty period

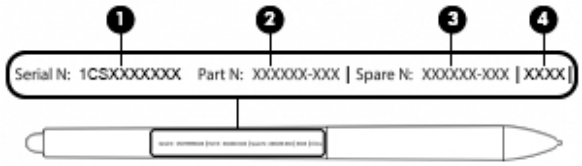
- Regulatory label(s)—Provide(s) regulatory information about the computer.
- Wireless certification label(s)—Provide(s) information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

Optional HP ZBook x2 Pen



Component		Description
(1)	Tip/removable nib	Draws on the screen. Increased pressure applied to the tip results in wider or darker lines, depending on the software app. The nib is removable. **NOTE:** Felt and POM tips are included with the pen. To remove the nib from the pen, use the nib removal tool or pen case provided.
(2)	Button	Provides additional functions for the pen, depending on the software app. To customize the button settings, see HP Create Control Panel software on page 32.
(3)	Eraser	Removes what is drawn on the screen, depending on the software app. To customize the eraser settings, see HP Create Control Panel software on page 32.

The labels on the pen provide information you may need when you troubleshoot problems or replace the pen.



Component	
(1)	Serial number
(2)	Part number
(3)	Spare number
(4)	Batch number

Hold the pen as you would a normal pen or pencil. Adjust your grip so that you can toggle the pen button easily with your thumb or forefinger. Be careful not to accidentally press the button while drawing or positioning with the pen.

Software provided with your tablet offers the following methods for customizing your pen and button settings:

- HP Create Control Panel software—For more information see HP Create Control Panel software on page 32.
- Windows Pen & Windows Ink software settings—To access this setting, type `pen settings` in the taskbar search box, select **Pen settings**, and then select **Pen & Windows Ink**.

3 Network connections

Your computer can travel with you wherever you go. But even at home, you can explore the globe and access information from millions of websites using your computer and a wired or wireless network connection. This chapter will help you get connected to that world.

Connecting to a wireless network

Your computer may be equipped with one or more of the following wireless devices:

- WLAN device—Connects the computer to wireless local area networks (commonly referred to as Wi-Fi networks, wireless LANs, or WLANs) in corporate offices, your home, and public places such as airports, restaurants, coffee shops, hotels, and universities. In a WLAN, the mobile wireless device in your computer communicates with a wireless router or a wireless access point.
- Bluetooth® device—Creates a personal area network (PAN) to connect to other Bluetooth-enabled devices such as computers, phones, printers, headsets, speakers, and cameras. In a PAN, each device communicates directly with other devices, and devices must be relatively close together—typically within 10 meters (approximately 33 feet) of each other.

Using the wireless controls

You can control the wireless devices in your computer using one or more of these features:

- Wireless button (also called airplane mode key or wireless key) (referred to in this chapter as wireless button)
- Operating system controls

Wireless button

The computer may have a wireless button, one or more wireless devices, and one or two wireless lights. All the wireless devices on your computer are enabled at the factory.

The wireless light indicates the overall power state of your wireless devices, not the status of individual devices.

Operating system controls

The Network and Sharing Center allows you to set up a connection or network, connect to a network, and diagnose and repair network problems.

To use operating system controls:

1. Type `control panel` in the taskbar search box, and then select **Control Panel**.
2. Select **Network and Internet**, and then select **Network and Sharing Center**.

Connecting to a WLAN

NOTE: When you are setting up Internet access in your home, you must establish an account with an Internet service provider (ISP). To purchase Internet service and a modem, contact a local ISP. The ISP will help set up the modem, install a network cable to connect your wireless router to the modem, and test the Internet service.

To connect to a WLAN, follow these steps:

1. Be sure that the WLAN device is on.
2. Select the network status icon in the taskbar, and then connect to one of the available networks.

   If the WLAN is a security-enabled WLAN, you are prompted to enter a security code. Enter the code, and then select **Next** to complete the connection.

   NOTE: If no WLANs are listed, you may be out of range of a wireless router or access point.

   NOTE: If you do not see the WLAN you want to connect to, right-click the network status icon in the taskbar, and then select **Open Network and Sharing Center**. Select **Set up a new connection or network**. A list of options is displayed, allowing you to manually search for and connect to a network or to create a new network connection.
3. Follow the on-screen instructions to complete the connection.

After the connection is made, select the network status icon at the far right of the taskbar, to verify the name and status of the connection.

NOTE: The functional range (how far your wireless signals travel) depends on WLAN implementation, router manufacturer, and interference from other electronic devices or structural barriers such as walls and floors.

Using GPS (select products only)

Your computer may be equipped with a Global Positioning System (GPS) device. GPS satellites deliver location, speed, and direction information to GPS-equipped systems.

To enable GPS, make sure location is enabled under the Windows privacy setting.

1. Type `location` in the taskbar search box, and then select **Location privacy settings**.
2. Follow the on-screen instructions for using location settings.

Using Bluetooth wireless devices (select products only)

A Bluetooth device provides short-range wireless communications that replace the physical cable connections that traditionally link electronic devices such as the following:

- Computers (desktop, notebook)
- Phones (cellular, cordless, smartphone)
- Imaging devices (printer, camera)
- Audio devices (headset, speakers)
- Mouse
- External keyboard

Connecting Bluetooth devices

Before you can use a Bluetooth device, you must establish a Bluetooth connection.

1. Type `bluetooth` in the taskbar search box, and then select **Bluetooth and other devices settings**.
2. Turn on Bluetooth, if it is not already turned on.
3. Select your device from the list, and then follow the on-screen instructions.

NOTE: If the device requires verification, a pairing code is displayed. On the device you are adding, follow the on-screen instructions to verify that the code on your device matches the pairing code. For more information, refer to the documentation provided with the device.

NOTE: If your device does not appear in the list, be sure that Bluetooth on that device is turned on. Some devices may have additional requirements; refer to the documentation provided with the device.

Using NFC to share information (select products only)

Your computer supports Near Field Communication (NFC), which allows you to wirelessly share information between two NFC-enabled devices. Information is transferred by tapping the tapping area (antenna) of the computer with the antenna of your phone or other device. With NFC and supported apps, you can share websites, transfer contact information, transfer payments, and print on NFC-enabled printers.

NOTE: To locate the tapping area on your computer, see Components on page 4.

Sharing

1. Confirm that the NFC function is enabled.
   a. Type `wireless` in the taskbar search box, and then select **Turn wireless devices on or off**.
   b. Confirm that the selection for NFC is **On**.
2. Tap the NFC tapping area with an NFC-enabled device. You may hear a sound when the devices connect.

   NOTE: To find the location of the antenna on the other NFC device, refer to your device instructions.
3. Follow any on-screen instructions to continue.

Using HP MAC Address Manager to identify your computer on a network (select products only)

You can enable a system Media Access Control (MAC) address to provide a customizable way of identifying your computer and its communications on networks. This system MAC address provides unique identification even when your computer is connected through an external device, such as a docking station or external wireless adapter. This address is disabled by default.

Turning on and customizing the system MAC address

1. Connect a network cable to the network jack on the computer, or on an optional docking device or expansion product.
2. Start Computer Setup (BIOS).
   ▲ Turn off the tablet. Press the power button, and then quickly hold down the volume down button until the Startup menu is displayed. Tap **F10** to enter Computer Setup.

NOTE: The keyboard keys can only be used for BIOS functions after the Startup menu displays. The keys will not display the Startup menu.

3. Select **Advanced**, and then select **Host Based MAC Address**.
4. In the box to the right of **Host Based MAC Address**, select either **System** to enable the host-based MAC address or **Custom** to customize the address.
5. Make selections for boot order and devices supported.
6. If you selected Custom, select **MAC ADDRESS**, enter your customized system MAC address, and then press enter to save the address.
7. To save your changes and exit Computer Setup, select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

   – or –

   Select **Main**, select **Save Changes and Exit**, and then press enter.

Your changes go into effect when the computer restarts.

For additional documentation about HP MAC Address Manager and using system MAC addresses, go to http://www.hp.com/support. Select **Find your product**, and then follow the on-screen instructions.

4 Navigating the screen

You can navigate the computer screen in one or more of the following ways:

- Use touch gestures directly on the computer screen
- Use touch gestures on the TouchPad
- Use an optional mouse or keyboard (purchased separately)
- Use an on-screen keyboard
- Use a pointing stick

Using TouchPad and touch screen gestures

The TouchPad helps you navigate the computer screen and control the pointer using simple touch gestures. You can also use the left and right TouchPad buttons as you would use the corresponding buttons on an external mouse. To navigate a touch screen (select products only), touch the screen directly using gestures described in this chapter.

You can also customize gestures and view demonstrations of how they work. Type `control panel` in the taskbar search box, select **Control Panel**, and then select **Hardware and Sound**. Under **Devices and Printers**, select **Mouse**.

NOTE: Unless noted, gestures can be used on the TouchPad or a touch screen (select products only).

Tap

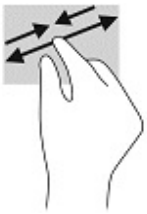
Use the tap/double-tap gesture to select or open an item on the screen.

- Point to an item on the screen, and then tap one finger on the TouchPad zone or touch screen to select the item. Double-tap an item to open it.

Two-finger pinch zoom

Use the two-finger pinch zoom to zoom out or in on images or text.

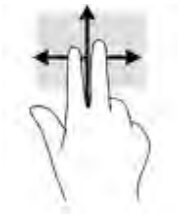
- Zoom out by placing two fingers apart on the TouchPad zone or touch screen and then moving your fingers together.
- Zoom in by placing two fingers together on the TouchPad zone or touch screen and then moving your fingers apart.



Two-finger slide (TouchPad only)

Use the two-finger slide to move up, down, or sideways on a page or image.

- Place two fingers slightly apart on the TouchPad zone and then drag them up, down, left, or right.



Two-finger tap (TouchPad only)

Use the two-finger tap to open the menu for an object on the screen.

NOTE: The two-finger tap performs the same function as right-clicking with the mouse.

- Tap two fingers on the TouchPad zone to open the options menu for the selected object.

Four-finger tap (TouchPad only)

Use the four-finger tap to open the action center.

- Tap four fingers on the Touchpad to open the action center and view current settings and notifications.

Three-finger swipe (TouchPad only)

Use the three-finger swipe to view open windows and to switch between open windows and the desktop.

- Swipe 3 fingers away from you to see all open windows.
- Swipe 3 fingers toward you to show the desktop.
- Swipe 3 fingers left or right to switch between open windows.

One-finger slide (touch screen only)

Use the one-finger slide to pan or scroll through lists and pages, or to move an object.

- To scroll across the screen, lightly slide one finger across the screen in the direction you want to move.
- To move an object, press and hold your finger on an object, and then drag your finger to move the object.

Using an optional keyboard or mouse

An optional keyboard or mouse allows you to type, select items, scroll, and perform the same functions as you do using touch gestures. The keyboard also allows you to use action keys and hot keys to perform specific functions.

Using an on-screen keyboard (select products only)

1. To display an on-screen keyboard, tap the keyboard icon in the notification area, at the far right of the taskbar.
2. Begin typing.

NOTE: Suggested words may be displayed above the on-screen keyboard. Tap a word to select it.

NOTE: Action keys and hot keys do not display or function on the on-screen keyboard.

5 HP Create Control Panel software

Use HP Create Control Panel software to customize your tablet or tools. When you open the software, icons for all connected computers and all tools that have been used on the tablet display in the Tool list. All settings apply to the selected computer or pen.

Starting the HP Create Control Panel software

▲ Select the Start button, and then select **HP Create Control Panel**.

– or –

Select the **HP Create Control Panel** icon from the Windows task tray.

The HP Create Control Panel software main panel displays.

Customizing tools

To customize your device, use the controls available on the tabs for HP Quick Keys, pen, and other features. Changes will take effect immediately.

Customizing the HP Quick Keys

You can customize the HP Quick Keys to perform the functions that make your work quickest and easiest for you. For the location of the HP Quick Keys and HP Quick Keys Mode lights, see Front on page 7.

To customize your HP Quick Keys:

1. Start the HP Create Control Panel software.
2. Select the device you are customizing in the **Device** section.

   NOTE: If you have not added other devices, the default HP ZBook x2 is selected.

3. Select **Functions** in the **Tool** section.
4. Select **All Other Apps** in the **Application** section to customize settings for all applications.

   – or –

   Select a specific application.

5. Select the **HP Quick Keys** tab.
6. Select the Mode you want to customize.
7. Select the down arrow next to the Quick Keys settings, for example next to **Keystroke...**, to display customized settings. Follow the on-screen instructions. For more information about possible entries, see Button functions on page 34.

   NOTE: If the Mirror left/right buttons checkbox is selected, the HP Quick Keys mirror the other side. The side mirrored depends on how the Windows pen setting for right hand or left hand is set. For example, if the Windows pen setting is for left hand, then the right side buttons are mirrored to the left side settings. And if the Windows pen setting is for right hand, then the left side settings are mirrored to the right side settings.

NOTE: Make sure one of the buttons is assigned to Reference, so you can easily display the Virtual Desktop overlay for the tablet and pen button mappings.

Customizing the optional pen

Customize settings for pen tip feel and pressure, eraser feel, side button, and application-specific pen functions.

To customize your pen:

1. Open the **HP Create Control Panel** app.
2. Select the device you are customizing in the **Device** section.

   NOTE: If you have not added other devices, the default HP ZBook x2 is selected.

3. Select **ZBook x2 Pen** in the **Tool** section.
4. Select **All** in the **Application** section to customize settings for all applications.

   – or –

   Select a specific application.

5. Select the **Pen** tab and choose from the available options.
6. Follow the on-screen instructions. For more information about possible entries, see Button functions on page 34.

   NOTE: The tip must be set to **Click** to draw in most graphics applications.

   NOTE: The **Tip Feel** slider overrides the advanced pressure settings selected using the **Customize** button.

Advanced customizing for the pen

To further customize tip or eraser pressure settings:

1. Select the **Pen** or **Eraser** tab.
2. Click on the **Customize** button.

   Options within the **Pen Feel Details** dialog box let you independently change the tip or eraser pressure sensitivity and click threshold settings.

3. Use the line on the left to adjust your pen settings. The pressure controls are displayed as symbols on the line that can be moved to change the outcome.
   - **Click Threshold** determines the amount of force required to register pressure or generate a pen click.
   - **Sensitivity** changes the slope of the pressure response curve.
   - **Max Pressure** determines how hard you must press the pen tip to reach maximum pressure.
4. Use the **Try Here** box to test the results of your changes.
5. Select **OK** to save your changes.

Customizing the eraser

To customize your eraser:

1. Open the **HP Create Control Panel** app.
2. Select the device you are customizing in **Device** section.

   NOTE: If you have not added other devices, the default HP ZBook x2 is selected.

3. Select **ZBook x2 Pen** in the **Tool** section.
4. Select **All** in the **Application** section to customize settings for all applications.

   – or –

   Select a specific application.

5. Select the **Eraser** tab.
6. Follow the on-screen instructions. For more information about possible entries, see Button functions on page 34.

   NOTE: To determine pressure levels, position the screen cursor over an empty area of the control panel, and then press down on the **Current Pressure** bar with the eraser.

   NOTE: The **Eraser Feel** slider overrides the advanced pressure settings selected using the **Customize** button.

Button functions

Use HP Create Control Panel software to customize the functions that are assigned to tool buttons, HP Quick Keys, and other elements of your tablet. Note that button function options may vary.

- Clicks
  - Click: Simulates a left mouse button click. Be sure at least one button performs this function so you can always navigate and click.
  - Right click: Simulates a right mouse button click to display a context menu.
  - Middle click: Simulates a middle mouse button click.
  - Double click: Simulates a double-click. For easier double-clicking, use this function instead of tapping twice with the pen tip.
  - 4th click or 5th click: Simulates a fourth or fifth mouse button click.
- Keystroke: Displays the **Define Keystroke** dialog box to create keystroke combinations for HP Quick Keys, mouse, and other functions.
  - Enter your keystroke combination in the **Keys** box. The combinations can include letters, numbers, function keys, and modifier keys. You can also choose combinations from the **Add Special** list.
  - To learn which keystroke shortcuts are supported by a particular application, see the instructions for the application.
- Modifier: Displays a dialog box that enables you to simulate modifier keys: Shift, Alt, or Ctrl. Use the Key setting to perform modifier functions, and a modifier to simulate pressing the associated button on a mouse.
- Radial Menu: Displays the Radial Menu.
- Back and Forward: Simulates the Back or Forward command in browser applications.

- Pan/Scroll: Enables you to position a document or image within the active pane by pressing a pen button set for Pan/Scroll and then dragging with the pen tip across the tablet active area. Use the **Pan/Scroll** slider to set a scrolling speed for use in applications that do not support grabber hand (pixel-level) panning.
- Scroll Up: Scrolls your active application up.
- Scroll Down: Scrolls your active application down.
- Zoom In: Zooms your active application in.
- Zoom Out: Zooms your active application out.
- Show Desktop: Minimizes all open windows to display a clean desktop.
- Switch Application: Brings up the application-switching dialog box with focus on the next open application.
- Launchpad: Displays menu where you can start applications.
- Open/Run: Opens a dialog box to select a specific application, file, or a script to launch. Browse to select the item, and it will appear in the **Name** box. Click **OK** to assign the item as your tool button option.
- Pressure Hold: Locks the pressure at the current pressure level until the button is released. For example, you can paint with pressure sensitivity until you reach the brush size you like. You can then press the button and continue painting with the same size brush until the button is released.
- Erase: Sets your strokes to erase mode.
- Tablet PC Options: Displays a menu of Windows Tablet PC settings.
- Disabled: Disables the button function.
- Application Defined: This is for applications, such as CAD programs, that have built-in tablet support. It reports only the button number to the application. It may also be used by some integrated applications for direct control of the HP Quick Keys.
- Default: Resets the button to its default function.
- Button Function Toggles
  - Precision Mode: Use the slider to change the mapping around the current pen tip position. Press the button again to return to normal mapping.
  - Mode Toggle: This setting for pen buttons toggles between Pen mode and Mouse mode. When first setting a button to Mode Toggle when in Mouse mode, use the sliders to adjust the screen cursor acceleration and tracking speed.
  - Touch On/Off: Use Touch On/Off when you want to work in Pen mode only. Disable touch by pressing a HP Quick Key you have assigned to Touch On/Off. Press the HP Quick Key again to enable touch.
  - On Screen Keyboard: Use On Screen Keyboard option to toggle the Windows On Screen Keyboard for pen or touch keyboard input.
  - Reference: Displays the interactive Virtual Desktop overlay for the customizable buttons and optional pen.
- Undo: Undoes the last operation.
- Redo: Redoes the last operation.
- Switch Virtual Desktop Right: Displays the Virtual Desktop on the right side of the screen.
- Switch Virtual Desktop Left: Displays the Virtual Desktop on the left side of the screen.

- Snap Window Right: Displays the selected window on the right side of the screen.
- Snap Window Left: Displays the selected window on the left side of the screen.
- Tilt Toggle: Turns on or off the tablet's ability to sense the amount of tilt between the pen and tablet.
- Screen Rotation Lock: Turns on or off the tablet's ability to automatically change orientation when the tablet is rotated.
- Windows Key: Provides a shortcut to the Windows Key.

Calibrating the pen

NOTE: The Calibration menu will appear with the irst use or the re-install of the HP Create Control Panel after the pen is in range of the HP ZBook x2.

Your pen is calibrated at the factory. Calibration is required to compensate for viewing angle and to adjust for parallax. You can also manually recalibrate your pen:

1. Open the **HP Create Control Panel** app.
2. Select the device you are customizing in **Device** section.

   NOTE: If you have not added other devices, the default HP ZBook x2 is selected.

3. Select **ZBook x2 Pen** in the **Tool** section.
4. Select **All** in the **Application** area to customize settings for all applications.

   – or –

   Select a specific application.

5. Select the **Calibrate** tab.
6. Select down arrow beside **Monitor** to choose your monitor.

   NOTE: If you have not added other devices, use the default HP Z Book x2 Display.

7. Select the **Calibrate** button, and then follow the on-screen instructions.

Setting advanced options

The Options feature lets you set several use preferences for your pen, such as the type of click supported for the pen or the pressure compatibility if you are using graphics applications that support a maximum of 1024 levels of pressure.

1. Open the **HP Create Control Panel** app.
2. Select **Options**, and then follow the on-screen instructions.

Adding applications

1. Open the **HP Create Control Panel** app.
2. Select the **+** to the right of the **Application** section.

   The **Add Application for custom Settings** dialog box displays.

3. Select an application you want to create custom settings for, or browse to select the executable file of any application installed on your computer.
4. Select **OK**.

NOTE: If you are working with a commonly used application such as Adobe Photoshop® or Illustrator®, your tablet's software will identify the application and set the HP Quick Keys to commonly used functions for that application. Default settings will take effect automatically only if you have not entered your own HP Quick Key settings for that application.

NOTE: If two programs have the same executable file name, they will share the same customized settings.

Integrated applications

Some software applications may directly control HP Quick Key settings, which may cause them to perform differently than the function set in HP Create Control Panel software.

- When an HP Quick Key setting is overridden by an application, the HP Quick Key automatically updates, using either Application Defined or the new function name. Some or all of the HP Quick Keys may be overridden, depending on the application.
- An integrated application has control only when that application is active and in the foreground. When you close that application or select a new application to work in, your settings are returned to their previous state.
- To review settings for the current application, set an HP Quick Key to Reference and press the key at any time.
- Applications that have been integrated typically allow you to disable this functionality when first using your tablet with the application. Refer to your application documentation for specific instructions on how to customize or disable this feature. If that information is not available, use the HP Create Control Panel software to create application-specific settings that will override the behavior of the integrated application.

Customizing the display of on-screen controls on the Radial Menu

Use the software to customize the display of a hierarchical menu (in radial format) for on-screen controls. The menu is an on-screen extension of the HP Quick Keys and pen options, using eight slices of the circle to display shortcuts to various features and options.

For example, if you assign an HP Quick Key to the Radial Menu, the Radial Menu displays anytime you press that HP Quick Key button. You can then tap on the menu slice to perform the function you want.

NOTE: The Radial Menu works for all of the devices set up using the software.

Assigning the option to display the Radial Menu

Before you can customize the Radial Menu, you must assign an HP Quick Key button or pen button to display the menu.

1. Open the **HP Create Control Panel** app.
2. To assign an HP Quick Key button to display the Radial Menu, select **Functions** in the **Tool** section.

   – or –

   To assign the pen button to display the Radial Menu, select **ZBook x2 Pen** in the **Tool** section.
3. Select the **Radial Menu** from the list corresponding to the button assignment you want.

Customizing the Radial Menu options

1. Open the **HP Create Control Panel** app.
2. Select the **Radial Menu** tab.
3. Use the list corresponding to the assignments you want to customize the Radial Menu options displayed.

   NOTE: A default set of Key Assignments is provided that you can keep or use as a guide for customization.

4. Follow the on-screen instructions.

NOTE: When you display the Radial Menu, you can keep the menu open by selecting the **Push Pin** icon.

You can also open the HP Create Control menu from the Radial Menu by clicking the **Wrench** icon.

Adding devices

You can customize tool and application settings for certain devices connected to your tablet. An icon for each device will appear in the **Device** list.

To add a new device:

1. Connect the device to your tablet.

   The new device's icon will appear in the **Device** list.

   NOTE: If an icon for the device does not display, the device is not supported.

2. Click on that icon to customize settings.

   NOTE: Settings can only be viewed or changed for an attached device.

   NOTE: The eraser function may not work in some applications when using an added device.

Adding tools

You can add a tool simply by using the tool on your tablet. Adding tools is available for HP Quick Keys, Functions, and Pen. An icon for each tool appears in the **Tool** list.

- When you select a tool that has been added to the Tool list, the tab settings for that tool are displayed. Any changes you make to the tab settings will then apply to the tool.
- If a similar tool has been added, the new tool will inherit the settings of that tool. These settings can then be customized for the newly added tool. Identical tools use the same settings.

To display the **Tool** list:

1. Open the **HP Create Control Panel** app.
2. An icon for each tool appears in the **Tool** list.

   NOTE: To remove a selected tool from the Tool list, click on the Tool list **-** button, and then select **Delete**. The selected tool is removed from the list, along with any custom settings you may have created for it.

   The **-** button is inactive when there is only one item in the list. The Functions icon cannot be deleted.

Viewing button mappings with the Virtual Desktop

You can view the current button mappings for the HP Quick Keys and pen by displaying the Virtual Desktop.

- In the HP Create Control tab, set an HP Quick Key to Reference. See Customizing the HP Quick Keys on page 32.
- To view the settings on the screen, press that HP Quick Key.
- To open the Pen settings, select the **Pen Setting** button on the Virtual Desktop reference screen.
- To open the HP Quick Key settings, click on the Quick Key mappings display area with your mouse or tap it with your pen.
- To close the Virtual Desktop reference screen, click on it with your mouse, tap it with your pen, or press the HP Quick Key again.

NOTE: If you do not want to display the HP Create Control Panel software screen, click or tap on nonselectable area.

NOTE: Some applications can override and control the HP Quick Key functions.

Backing up and restoring settings

The **HP Create Control Panel Preferences** app allows you to save your current settings to a file and then restore them if needed. You can also use the utility to remove your preferences or remove all user preferences.

To back up settings:

1. Select the **Start** button, and then select the **HP Create Control Panel Preferences** app.
2. Select **Backup**.
3. Follow the on-screen instructions.

To restore settings:

1. Select the **Start** button, and then select the **HP Create Control Panel Preferences** app.
2. Select **Restore**.
3. Follow the on-screen instructions.

Importing expert settings

The import expert settings feature enables you to import customized settings that have been specified in an XML (Extensible Markup Language) file. Some software developers create custom settings files which are designed to provide optimum performance when using your tablet with their applications.

Each XML file may include customized settings for one or more applications. These settings may apply to the HP Quick Keys, On-Screen Controls, pen button or eraser, and other functions.

To import expert settings:

1. Back up any existing settings. See Backing up and restoring settings on page 39.
2. Choose the XML file with settings for use with a particular application. Double-click on your file selection.
3. Follow the on-screen instructions.

NOTE: When you choose to import settings, only the settings specified in the XML file are imported. Any corresponding settings are overwritten with the new values. All other existing settings remain unchanged.

Updating the HP Create Control Panel software

HP recommends that you update the software on a regular basis. Update can bring new features and resolve problems. Check the HP website for updated versions of the software.

The updates on the HP website are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named Readme.txt, which contains information regarding installing and troubleshooting the file.

Determining the software version

To decide whether you need to update the software, first determine the software version on your computer.

1. Open the **HP Create Control Panel** app.
2. Select **About**.
3. Make note of the driver version, and then select **OK**.

To check for later HP Create Control Panel software versions, see Downloading a software update on page 40.

Downloading a software update

CAUTION: To reduce the risk of damage to the computer or an unsuccessful installation, download and install a software update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a software update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:

Do not disconnect power on the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate Sleep.

Do not insert, remove, connect, or disconnect any device, cable, or cord.

1. Type `support` in the taskbar search box, and then select the HP Support Assistant app.
2. Follow the on-screen instructions.
3. At the download area, follow these steps:
   a. Identify the most recent HP Create Control Panel software update and compare it to the HP Create Control Panel software version currently installed on your computer. Make a note of the version number. You may need this information to locate the update later, after it has been downloaded to your hard drive.
   b. Follow the on-screen instructions to download your selection to the hard drive.

      Make a note of the path to the location on your hard drive where the HP Create Control Panel software update is downloaded. You will need to access this path when you are ready to install the update.

NOTE: If you connect your computer to a network, consult the network administrator before installing any software updates.

HP Create Control Panel software installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed, follow these steps:

1. Type `file` in the taskbar search box, and then select **File Explorer**.
2. Select your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename*.exe).

   The HP Create Control Panel software installation begins.
5. Complete the installation by following the on-screen instructions.

NOTE: After a message on the screen reports a successful installation, you can delete the downloaded file from your hard drive.

Troubleshooting

If you have problems with the software, buttons, or pen, use the Diagnose tool.

1. Start the HP Create Control Panel software.
2. Select **About**.
3. Select **Diagnose**, and then follow the on-screen instructions.

6 Entertainment features

Use your HP computer for business or pleasure to meet with others via the webcam, mix audio and video, or connect external devices like a projector, monitor, TV, or speakers. See Components on page 4 to locate the audio, video and camera features on your computer.

Using a camera (select products only)

Your computer has a camera (integrated camera) that records video and captures photographs. Some models allow you to video conference and chat online using streaming video.

▲ To access the camera, type `camera` in the taskbar search box, and then select **Camera** from the list of applications.

Using audio

You can download and listen to music, stream audio content (including radio) from the web, record audio, or mix audio and video to create multimedia. You can also play music CDs on the computer (on select models) or attach an external optical drive to play CDs. To enhance your listening enjoyment, attach headphones or speakers.

Connecting speakers

You can attach wired speakers to your computer by connecting them to a USB port or to the audio-out (headphone)/audio-in (microphone) combo jack on your computer or on a docking station.

To connect wireless speakers to your computer, follow the device manufacturer's instructions. To connect high-definition speakers to the computer, see Setting up HDMI audio on page 45. Before connecting speakers, lower the volume setting.

Connecting headphones

⚠ **WARNING!** To reduce the risk of personal injury, lower the volume setting before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety and Environmental Notices*.

To access this document:

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

   – or –

   Click the question mark icon in the taskbar.

2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**.

You can connect wired headphones to the headphone jack or to the audio-out (headphone)/audio-in (microphone) combo jack on your computer.

To connect wireless headphones to your computer, follow the device manufacturer's instructions.

Connecting headsets

WARNING! To reduce the risk of personal injury, lower the volume setting before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety and Environmental Notices*.

To access this document:

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

   – or –

   Click the question mark icon in the taskbar.

2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**.

Headphones combined with a microphone are called headsets. You can connect wired headsets to the audio-out (headphone)/audio-in (microphone) combo jack on your computer.

To connect wireless headsets to your computer, follow the device manufacturer's instructions.

Using sound settings

Use sound settings to adjust system volume, change system sounds, or manage audio devices.

To view or change sound settings:

▲ Type `control panel` in the taskbar search box, select **Control Panel**, select **Hardware and Sound**, and then select **Sound**.

– or –

Right-click the **Start** button, select **Control Panel**, select **Hardware and Sound**, and then select **Sound**.

Your computer may include an enhanced sound system by Bang & Olufsen, DTS, Beats audio, or another provider. As a result, your computer may include advanced audio features that can be controlled through an audio control panel specific to your audio system.

Use the audio control panel to view and control audio settings.

▲ Type `control panel` in the taskbar search box, select **Control Panel**, select **Hardware and Sound**, and then select the audio control panel specific to your system.

– or –

Right-click the **Start** button, select **Control Panel**, select **Hardware and Sound**, and then select the audio control panel specific to your system.

Using video

Your computer is a powerful video device that enables you to watch streaming video from your favorite websites and download video and movies to watch on your computer when you are not connected to a network.

To enhance your viewing enjoyment, use one of the video ports on the computer to connect an external monitor, projector, or TV.

IMPORTANT: Be sure that the external device is connected to the correct port on the computer, using the correct cable. Follow the device manufacturer's instructions.

For information on using your video features, refer to HP Support Assistant.

Connecting video devices using a USB Type-C cable (select products only)

NOTE: To connect a USB Type-C Thunderbolt device to your computer, you need a USB Type-C cable, purchased separately.

To see video or high-resolution display output on an external Thunderbolt device, connect the Thunderbolt device according to the following instructions:

1. Connect one end of the USB Type-C cable to the USB Type-C Thunderbolt port on the computer.

2. Connect the other end of the cable to the external Thunderbolt device.
3. Press fn+f4 to alternate the computer screen image between 4 display states.
   - **PC screen only:** View the screen image on the computer only.
   - **Duplicate:** View the screen image simultaneously on both the computer and external device.
   - **Extend:** View the screen image extended across both the computer and external device.
   - **Second screen only:** View the screen image on the external device only.

   Each time you press fn+f4 the display state changes.

NOTE: For best results, especially if you choose the "Extend" option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.

Connecting video devices using an HDMI cable (select products only)

NOTE: To connect an HDMI device to your computer, you need an HDMI cable, purchased separately.

To see the computer screen image on a high-definition TV or monitor, connect the high-definition device according to the following instructions:

1. Connect one end of the HDMI cable to the HDMI port on the computer.

2. Connect the other end of the cable to the high-definition TV or monitor.
3. Press fn+f4 to alternate the computer screen image between 4 display states:
   - **PC screen only:** View the screen image on the computer only.
   - **Duplicate:** View the screen image simultaneously on both the computer and the external device.
   - **Extend:** View the screen image extended across both the computer and the external device.
   - **Second screen only:** View the screen image on the external device only.

   Each time you press fn+f4, the display state changes.

   NOTE: For best results, especially if you choose the "Extend" option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.

Setting up HDMI audio

HDMI is the only video interface that supports high-definition video and audio. After you connect an HDMI TV to the computer, you can then turn on HDMI audio by following these steps:

1. Right-click the **Speakers** icon in the notification area, at the far right of the taskbar, and then select **Playback devices**.
2. On the **Playback** tab, select the name of the digital output device.
3. Click **Set Default**, and then click **OK**.

To return the audio stream to the computer speakers:

1. Right-click the **Speakers** icon in the notification area, at the far right of the taskbar, and then click **Playback devices**.
2. On the Playback tab, click **Speakers**.
3. Click **Set Default**, and then click **OK**.

Discovering and connecting to Miracast-compatible wireless displays (select products only)

NOTE: To learn what type of display you have (Miracast-compatible or Intel® WiDi), refer to the documentation that came with your TV or secondary display.

To discover and connect to Miracast-compatible wireless displays without leaving your current apps, follow the steps below.

To open Miracast:

▲ Type `project` in the taskbar search box, and then click **Project to a second screen**. Click **Connect to a wireless display**, and then follow the on-screen instructions.

7 Managing power

Your computer can operate on either battery power or external power. When the computer is running on battery power and an external power source is not available to charge the battery, it is important to monitor and conserve the battery charge.

Some power management features described in this chapter may not be available on your computer.

Using Sleep and Hibernation

CAUTION: Several well-known vulnerabilities exist when a computer is in the Sleep state. To prevent an unauthorized user from accessing data on your computer, even encrypted data, HP recommends that you always initiate Hibernation instead of Sleep anytime the computer will be out of your physical possession. This practice is particularly important when you travel with your computer.

CAUTION: To reduce the risk of possible audio and video degradation, loss of audio or video playback functionality, or loss of information, do not initiate Sleep while reading from or writing to a disc or an external media card.

Windows has two power-saving states, Sleep and Hibernation.

- Sleep—The Sleep state is automatically initiated after a period of inactivity. Your work is saved to memory, allowing you to resume your work very quickly. You can also initiate Sleep manually. For more information, see Initiating and exiting Sleep on page 47.
- Hibernation—The Hibernation state is automatically initiated if the battery reaches a critical level. In the Hibernation state, your work is saved to a hibernation file and the computer powers down. You can also initiate Hibernation manually. For more information, see Initiating and exiting Hibernation (select products only) on page 48.

Initiating and exiting Sleep

You can initiate Sleep in any of the following ways:

- Close the display (select products only).
- Select the **Start** button, select the **Power** icon, and then select **Sleep**.
- Press the Sleep hot key; for example, fn+ f1

You can exit Sleep in any of the following ways:

- Briefly press the power button.
- If the computer is closed, raise the display (select products only).
- Press a key on the keyboard (select products only).
- Tap the TouchPad (select products only).

When the computer exits Sleep, your work returns to the screen.

NOTE: If you have set a password to be required on exiting Sleep, you must enter your Windows password before your work returns to the screen.

Initiating and exiting Hibernation (select products only)

You can enable user-initiated Hibernation and change other power settings and timeouts using Power Options.

1. Right-click the **Power** icon , and then select **Power Options**.
2. In the left pane, select **Choose what the power buttons do** (wording may vary by product).
3. Depending on your product, you can enable Hibernation for battery power or external power in any of the following ways:
   - **Power button**—Under **Power and sleep buttons and lid settings** (wording may vary by product), select **When I press the power button**, and then select **Hibernate**.
   - **Sleep button** (select products only)—Under **Power and sleep buttons and lid settings** (wording may vary by product), select **When I press the sleep button**, and then select **Hibernate**.
   - **Lid** (select products only)—Under **Power and sleep buttons and lid settings** (wording may vary by product), select **When I close the lid**, and then select **Hibernate**.
   - **Power menu**—Select **Change Settings that are currently unavailable**, and then, under **Shutdown settings**, select the **Hibernate** check box.

     The Power menu can be accessed by selecting the **Start** button.
4. Select **Save changes**.

▲ To initiate Hibernation, use the method that you enabled in step 3.

▲ To exit Hibernation, briefly press the power button.

NOTE: If you have set a password to be required on exiting Hibernation, you must enter your Windows password before your work returns to the screen.

Shutting down (turning off) the computer

CAUTION: Unsaved information is lost when the computer shuts down. Be sure to save your work before shutting down the computer.

The Shut down command closes all open programs, including the operating system, and then turns off the display and the computer.

Shut down the computer when it will be unused and disconnected from external power for an extended period.

The recommended procedure is to use the Windows Shut down command.

NOTE: If the computer is in the Sleep state or in Hibernation, first exit Sleep or Hibernation by briefly pressing the power button.

1. Save your work and close all open programs.
2. Select the **Start** button, select the **Power** icon, and then select **Shut down**.

If the computer is unresponsive and you are unable to use the preceding shutdown procedures, try the following emergency procedures in the sequence provided:

- Press ctrl+alt+delete, select the **Power** icon, and then select **Shut down**.
- Press and hold the power button for at least 10 seconds.
- If your computer has a user-replaceable battery (select products only), disconnect the computer from external power, and then remove the battery.

Using the Power icon and Power Options

The Power icon is located on the Windows taskbar. The Power icon allows you to quickly access power settings and view the remaining battery charge.

- To view the percentage of remaining battery charge and the current power plan, place the mouse pointer over the **Power** icon .
- To use Power Options, right–click the **Power** icon , and then select **Power Options**.

Different Power icons indicate whether the computer is running on battery or external power. Placing the mouse pointer over the icon reveals a message if the battery has reached a low or critical battery level.

Running on battery power

WARNING! To reduce potential safety issues, use only the battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

When a charged battery is in the computer and the computer is not plugged into external power, the computer runs on battery power. When the computer is off and unplugged from external power, the battery in the computer slowly discharges. The computer displays a message when the battery reaches a low or critical battery level.

Computer battery life varies, depending on power management settings, programs running on the computer, screen brightness, external devices connected to the computer, and other factors.

NOTE: When you disconnect external power, the display brightness is automatically decreased to conserve battery charge. Select computer products can switch between graphic modes to conserve battery charge.

Using HP Fast Charge (select products only)

The HP Fast Charge feature allows you to quickly charge your computer battery. Charging time may vary by +/- 10%. Depending on your computer model and the HP AC adapter provided with your computer, HP Fast Charge operates in one of the following ways:

- When the remaining battery charge is between zero and 50%, the battery will charge to 50% of full capacity in no more than 30 minutes.
- When the remaining battery charge is between zero and 90%, the battery will charge to 90% of full capacity in no more than 90 minutes.

To use HP Fast Charge, shut down your computer, and then connect the AC adapter to your computer and to external power.

Displaying battery charge

To view the percentage of remaining battery charge and the current power plan, place the mouse pointer over the **Power** icon .

Finding battery information in HP Support Assistant (select products only)

To access battery information:

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

   – or –

   Select the question mark icon in the taskbar.

2. Select **My PC**, select the **Diagnostics and tools** tab, and then select **HP Battery Check**. If HP Battery Check indicates that your battery should be replaced, contact support.

HP Support Assistant provides the following tools and information about the battery:

- HP Battery Check
- Information about battery types, specifications, life cycles, and capacity

Conserving battery power

To conserve battery power and maximize battery life:

- Lower the brightness of the display.
- Select the **Power saver** setting in Power Options.
- Turn off wireless devices when you are not using them.
- Disconnect unused external devices that are not plugged into an external power source, such as an external hard drive connected to a USB port.
- Stop, disable, or remove any external media cards that you are not using.
- Before you leave your work, initiate Sleep or shut down the computer.

Identifying low battery levels

When a battery that is the sole power source for the computer reaches a low or critical battery level, the following behavior occurs:

- The battery light (select products only) indicates a low or critical battery level.

– or –

- The Power icon shows a low or critical battery notification.

NOTE: For additional information about the Power icon, see Using the Power icon and Power Options on page 49.

The computer takes the following actions for a critical battery level:

- If Hibernation is disabled and the computer is on or in the Sleep state, the computer remains briefly in the Sleep state and then shuts down and loses any unsaved information.
- If Hibernation is enabled and the computer is on or in the Sleep state, the computer initiates Hibernation.

Resolving a low battery level

Resolving a low battery level when external power is available

Connect one of the following to the computer and to external power:

- AC adapter
- Optional docking device or expansion product
- Optional power adapter purchased as an accessory from HP

Resolving a low battery level when no power source is available

Save your work and shut down the computer.

Resolving a low battery level when the computer cannot exit Hibernation

1. Connect the AC adapter to the computer and to external power.
2. Exit Hibernation by pressing the power button.

Factory-sealed battery

To monitor the status of the battery, or if the battery is no longer holding a charge, run HP Battery Check in the HP Support Assistant app (select products only).

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

   – or –

   Select the question mark icon in the taskbar.
2. Select **My PC**, select the **Diagnostics and tools** tab, and then select **HP Battery Check**. If HP Battery Check indicates that your battery should be replaced, contact support.

The battery[ies] in this product cannot be easily replaced by users themselves. Removing or replacing the battery could affect your warranty coverage. If a battery is no longer holding a charge, contact support.

When a battery has reached the end of its useful life, do not dispose of the battery in general household waste. Follow the local laws and regulations in your area for battery disposal.

Running on external power

For information about connecting to external power, refer to the *Setup Instructions* poster provided in the computer box.

The computer does not use battery power when the computer is connected to external power with an approved AC adapter or an optional docking device or expansion product.

WARNING! To reduce potential safety issues, use only the AC adapter provided with the computer, a replacement AC adapter provided by HP, or a compatible AC adapter purchased from HP.

WARNING! Do not charge the computer battery while you are aboard aircraft.

Connect the computer to external power under any of the following conditions:

- When charging or calibrating a battery
- When installing or updating system software
- When updating the system BIOS
- When writing information to a disc (select products only)
- When running Disk Defragmenter on computers with internal hard drives
- When performing a backup or recovery

When you connect the computer to external power:

- The battery begins to charge.
- The screen brightness increases.
- The Power icon changes appearance.

When you disconnect external power:

- The computer switches to battery power.
- The screen brightness automatically decreases to conserve battery charge.
- The Power icon changes appearance.

Managing power for the keyboard base

The keyboard base runs on battery power whenever it is not plugged into external AC power. Battery life varies, depending on use and whether the backlight is used. The keyboard also supports sleep state.

Viewing battery charge

The Keyboard battery icon is located on the Windows taskbar. The icon allows you to quickly view the remaining battery charge.

To view the remaining battery charge, select the **Keyboard battery** icon .

NOTE: The keyboard button light also provides information about battery status. See Keyboard connectors, button, and status light on page 11.

Resolving a keyboard low battery level

To charge the keyboard, use one of these options:

- Connect the keyboard to the tablet. See Connecting the tablet to the keyboard base on page 16.
- Connect the keyboard to external AC power using the USB port on the keyboard and a USB adapter (purchased separately). To locate the USB port on the keyboard, see USB port and smart card reader/pen holder slot (select products only) on page 15.

8 Security

Protecting the computer

Standard security features provided by the Windows operating system and the Windows Computer Setup utility (BIOS, which runs under any operating system) can protect your personal settings and data from a variety of risks.

NOTE: Security solutions are designed to act as deterrents. These deterrents may not prevent a product from being mishandled or stolen.

NOTE: Before you send your computer for service, back up and delete confidential files, and remove all password settings.

NOTE: Some features listed in this chapter may not be available on your computer.

NOTE: Your computer supports Computrace, which is an online security-based tracking and recovery service available in select regions. If the computer is stolen, Computrace can track the computer if the unauthorized user accesses the Internet. You must purchase the software and subscribe to the service in order to use Computrace. For information about ordering the Computrace software, go to http://www.hp.com.

Computer risk	Security feature
Unauthorized use of the computer	• HP Client Security software, in combination with a password, smart card, contactless card, registered fingerprints, or other authentication credential • BIOS power-on password
Unauthorized access to Computer Setup (BIOS)	BIOS administrator password in Computer Setup*
Unauthorized startup from an optional external optical drive (select products only), optional external hard drive (select products only), or internal network adapter	Boot options feature in Computer Setup*
Unauthorized access to a Windows user account	Windows user password
Unauthorized access to data	Windows BitLocker
Unauthorized removal of the computer	Security cable slot (used with an optional security cable on select products only)

*Computer Setup is an embedded, ROM-based utility that can be used even when the operating system is not working or will not load. You can use a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

NOTE: On tablets without keyboards, you can use the touch screen.

NOTE: If you log into the computer with the keyboard detached and the kickstand open, you must select the **Ease of access** icon and then select **On-Screen Keyboard** to display the on-screen keyboard.

Using passwords

A password is a group of characters that you choose to secure your computer information. Several types of passwords can be set, depending on how you want to control access to your information. Passwords can be set in Windows or in Computer Setup, which is preinstalled on the computer.

- BIOS administrator and power-on passwords are set in Computer Setup and are managed by the system BIOS.
- Windows passwords are set only in the Windows operating system.

You can use the same password for a Computer Setup feature and for a Windows security feature.

Use the following tips for creating and saving passwords:

- When creating passwords, follow requirements set by the program.
- Do not use the same password for multiple applications or websites, and do not reuse your Windows password for any other application or website.
- Use the Password Manager feature of HP Client Security to store your user names and passwords for your websites and applications. You can securely read them in the future if they cannot be remembered.
- Do not store passwords in a file on the computer.

The following tables list commonly used Windows and BIOS administrator passwords and describe their functions.

Setting passwords in Windows

Password	Function
Administrator password*	Protects access to a Windows administrator-level account. **NOTE:** Setting the Windows administrator password does not set the BIOS administrator password.
User password*	Protects access to a Windows user account.
*For information about setting a Windows administrator password or a Windows user password, type `support` in the taskbar search box, and then select the **HP Support Assistant** app.	

Setting passwords in Computer Setup

Password	Function
BIOS administrator password*	Protects access to Computer Setup. **NOTE:** If features have been enabled to prevent removing the BIOS administrator password, you may not be able to remove it until those features have been disabled.
Power-on password	• Must be entered each time you turn on or restart the computer. • If you forget your power-on password, you cannot turn on or restart the computer.

Managing a BIOS administrator password

To set, change, or delete this password, follow these steps:

Setting a new BIOS administrator password

1. Start Computer Setup.

   ▲ Turn off the tablet. Press the power button, quickly press and hold the volume down button until the Startup menu is displayed, and then tap **F10** to enter Computer Setup.

2. Select **Security**, select **Create BIOS Administrator Password** or **Set Up BIOS administrator Password** (select products only), and then press enter.
3. When prompted, enter a password.
4. When prompted, enter the new password again to confirm.
5. To save your changes and exit Computer Setup, select the **Save** icon and then follow the on-screen instructions.

   – or –

   Select **Main**, select **Save Changes and Exit**, and then press enter.

Your changes go into effect when the computer restarts.

Changing a BIOS administrator password

1. Start Computer Setup.

   ▲ Turn off the tablet. Press the power button, quickly press and hold the volume down button until the Startup menu is displayed, and then tap **F10** to enter Computer Setup.

2. Enter your current BIOS administrator password.
3. Select **Security**, select **Change BIOS administrator Password** or **Change Password** (select products only), and then press enter.
4. When prompted, enter your current password.
5. When prompted, enter your new password.

6. When prompted, enter your new password again to confirm.
7. To save your changes and exit Computer Setup, select the **Save** icon, and then follow the on-screen instructions.

   – or –

   Select **Main**, select **Save Changes and Exit**, and then press enter.

Your changes go into effect when the computer restarts.

Deleting a BIOS administrator password

1. Start Computer Setup.

   ▲ Turn off the tablet. Press the power button, quickly press and hold the volume down button until the Startup menu is displayed, and then tap **F10** to enter Computer Setup.
2. Enter your current BIOS administrator password.
3. Select **Security**, select **Change BIOS administrator Password** or **Change Password** (select products only), and then press enter.
4. When prompted, type your current password.
5. When prompted for the new password, leave the field empty, and then press enter.
6. When prompted to type your new password again, leave the field empty, and then press enter.
7. To save your changes and exit Computer Setup, select the **Save** icon, and then follow the on-screen instructions.

   – or –

   Select **Main**, select **Save Changes and Exit**, and then press enter.

Your changes go into effect when the computer restarts.

Entering a BIOS administrator password

At the **BIOS administrator password** prompt, type your password (using the same kind of keys you used to set the password), and then press enter. After two unsuccessful attempts to enter the BIOS administrator password, you must restart the computer and try again.

Using Windows Hello (select products only)

On products equipped with a fingerprint reader or an infrared camera, you can use Windows Hello to sign in by swiping your finger or looking at the camera.

To set up Windows Hello, follow these steps:

1. Select the **Start** button, select **Settings**, select **Accounts**, and then select **Sign-in options**.
2. Under **Windows Hello**, follow the on-screen instructions to add both a password and a numeric PIN, and then enroll your fingerprint or facial ID.

   NOTE: The PIN is not limited in length, but it must consist of numbers only. No alphabetic or special characters are allowed.

Using antivirus software

When you use the computer to access e-mail, a network, or the Internet, you potentially expose it to computer viruses. Computer viruses can disable the operating system, programs, or utilities, or cause them to function abnormally.

Antivirus software can detect most viruses, destroy them, and, in most cases, repair any damage they have caused. To provide ongoing protection against newly discovered viruses, antivirus software must be kept up to date.

Windows Defender is preinstalled on your computer. It is strongly recommended that you continue to use an antivirus program in order to fully protect your computer.

For more information about computer viruses, access the HP Support Assistant.

Using firewall software

Firewalls are designed to prevent unauthorized access to a system or network. A firewall can be a software program you install on your computer and/or network, or it can be a solution made up of both hardware and software.

There are two types of firewalls to consider:

- Host-based firewalls—Software that protects only the computer it is installed on.
- Network-based firewalls—Installed between your DSL or cable modem and your home network to protect all the computers on the network.

When a firewall is installed on a system, all data sent to and from the system is monitored and compared with a set of user-defined security criteria. Any data that does not meet those criteria is blocked.

Your computer or networking equipment may already have a firewall installed. If not, firewall software solutions are available.

NOTE: Under some circumstances a firewall can block access to Internet games, interfere with printer or file sharing on a network, or block authorized e-mail attachments. To temporarily resolve the problem, disable the firewall, perform the task that you want to perform, and then reenable the firewall. To permanently resolve the problem, reconfigure the firewall.

Installing software updates

HP, Windows, and third-party software installed on your computer should be regularly updated to correct security problems and improve software performance.

IMPORTANT: Microsoft sends out alerts regarding Windows updates, which may include security updates. To protect the computer from security breaches and computer viruses, install all updates from Microsoft as soon as you receive an alert.

You can install these updates automatically.

To view or change the settings:

1. Select the **Start** button, select **Settings**, and then select **Update & Security**.
2. Select **Windows Update**, and then follow the on-screen instructions.
3. To schedule a time for installing updates, select **Advanced Options**, and then follow the on-screen instructions.

Using HP Client Security (select products only)

HP Client Security software is preinstalled on your computer. This software can be accessed through the HP Client Security icon at the far right of the taskbar or Windows Control Panel. It provides security features that help protect against unauthorized access to the computer, networks, and critical data. For more information, see the HP Client Security software Help.

Using HP Touchpoint Manager (select products only)

HP Touchpoint Manager is a cloud-based IT solution that enables businesses to effectively manage and secure their company assets. HP Touchpoint Manager helps protect devices against malware and other attacks, monitors device health, and enables customers to reduce time spent solving end-user device and security issues. Customers can quickly download and install the software, which is highly cost effective relative to traditional in-house solutions. For more information, see http://www.hptouchpointmanager.com.

Using an optional security cable (select products only)

A security cable (purchased separately) is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen. To connect a security cable to your computer, follow the device manufacturer's instructions.

Using a fingerprint reader (select products only)

Integrated fingerprint readers are available on select products. In order to use the fingerprint reader, you must enroll your fingerprints in HP Client Security's Credential Manager. Refer to the HP Client Security software Help.

After you enroll your fingerprints in Credential Manager, you can use HP Client Security's Password Manager to store and fill in your user names and passwords in supported websites and applications.

Locating the fingerprint reader

The fingerprint reader is a small metallic sensor that is located in one of the following areas of your computer:

- Near the bottom of the TouchPad
- On the right side of the keyboard
- On the upper-right side of the display
- On the left side of the display
- On the back of the display

Depending on your product, the reader may be oriented horizontally or vertically.

9 Maintenance

It is important to perform regular maintenance to keep your computer in optimal condition. This chapter explains how to use tools like Disk Defragmenter and Disk Cleanup. It also provides instructions for updating programs and drivers, steps to clean the computer, and tips for traveling with (or shipping) the computer.

Improving performance

You can improve the performance of your computer by performing regular maintenance tasks with tools such as Disk Defragmenter and Disk Cleanup.

Using Disk Defragmenter

HP recommends using Disk Defragmenter to defragment your hard drive at least once a month.

NOTE: It is not necessary to run Disk Defragmenter on solid-state drives.

To run Disk Defragmenter:

1. Connect the computer to AC power.
2. Type `defragment` in the taskbar search box, and then select **Defragment and optimize your drives**.
3. Follow the on-screen instructions.

For additional information, access the Disk Defragmenter software Help.

Using Disk Cleanup

Use Disk Cleanup to search the hard drive for unnecessary files that you can safely delete to free up disk space and help the computer run more efficiently.

To run Disk Cleanup:

1. Type `disk` in the taskbar search box, and then select **Disk Cleanup**.
2. Follow the on-screen instructions.

Using HP 3D DriveGuard (select products only)

HP 3D DriveGuard protects a hard drive by parking the drive and halting data requests under either of the following conditions:

- You drop the computer.
- You move the computer with the display closed while the computer is running on battery power.

A short time after the end of one of these events, HP 3D DriveGuard returns the hard drive to normal operation.

NOTE: Only internal hard drives are protected by HP 3D DriveGuard. A hard drive installed in an optional docking device or connected to a USB port is not protected by HP 3D DriveGuard.

NOTE: Because solid-state drives (SSDs) lack moving parts, HP 3D DriveGuard is unnecessary for these drives.

For more information, see the HP 3D DriveGuard software Help.

Identifying HP 3D DriveGuard status

The hard drive light on the computer changes color to show that the drive in a primary hard drive bay and/or the drive in a secondary hard drive bay (select products only) is parked. To determine whether a drive is currently protected or whether it is parked, view the icon on the Windows desktop in the notification area, at the far right of the taskbar.

Updating programs and drivers

HP recommends that you update your programs and drivers on a regular basis. Updates can resolve issues and bring new features and options to your computer. For example, older graphics components might not work well with the most recent gaming software. Without the latest driver, you would not be getting the most out of your equipment.

Go to http://www.hp.com/support to download the latest versions of HP programs and drivers. In addition, register to receive automatic notifications when updates become available.

If you would like to update your programs and drivers, follow these instructions:

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

   – or –

   Click the question mark icon in the taskbar.
2. Select **My PC**, select the **Updates** tab, and then select **Check for updates and messages**.
3. Follow the on-screen instructions.

Cleaning your computer

Use the following products to safely clean your computer:

- Dimethyl benzyl ammonium chloride 0.3 percent maximum concentration (for example, disposable wipes, which come in a variety of brands)
- Alcohol-free glass-cleaning fluid
- Solution of water and mild soap
- Dry microfiber cleaning cloth or a chamois (static-free cloth without oil)
- Static-free cloth wipes

⚠ **CAUTION:** Avoid strong cleaning solvents that can permanently damage your computer. If you are not sure that a cleaning product is safe for your computer, check the product contents to make sure that ingredients such as alcohol, acetone, ammonium chloride, methylene chloride, and hydrocarbons are not included in the product.

Fibrous materials, such as paper towels, can scratch the computer. Over time, dirt particles and cleaning agents can get trapped in the scratches.

Cleaning procedures

Follow the procedures in this section to safely clean your computer.

WARNING! To prevent electric shock or damage to components, do not attempt to clean your computer while it is on.

1. Turn off the computer.
2. Disconnect AC power.
3. Disconnect all powered external devices.

CAUTION: To prevent damage to internal components, do not spray cleaning agents or liquids directly on any computer surface. Liquids dripped on the surface can permanently damage internal components.

Cleaning the display

Gently wipe the display using a soft, lint-free cloth moistened with an alcohol-free glass cleaner. Be sure that a display is dry before you close the computer.

Cleaning the sides or cover

To clean the sides or cover, use a soft microfiber cloth or chamois moistened with one of the cleaning solutions listed previously, or use an acceptable disposable wipe.

NOTE: When cleaning the cover of the computer, use a circular motion to aid in removing dirt and debris.

Cleaning the TouchPad, keyboard, or mouse (select products only)

WARNING! To reduce the risk of electric shock or damage to internal components, do not use a vacuum cleaner attachment to clean the keyboard. A vacuum cleaner can deposit household debris on the keyboard surface.

CAUTION: To prevent damage to internal components, do not allow liquids to drip between the keys.

- To clean the TouchPad, keyboard, or mouse, use a soft microfiber cloth or a chamois moistened with one of the cleaning solutions listed previously or use an acceptable disposable wipe.
- To prevent keys from sticking and to remove dust, lint, and particles from the keyboard, use a can of compressed air with a straw extension.

Traveling with or shipping your computer

If you have to travel with or ship your computer, follow these tips to keep your equipment safe.

- Prepare the computer for traveling or shipping:
  - Back up your information to an external drive.
  - Remove all discs and all external media cards, such as memory cards.
  - Turn off and then disconnect all external devices.
  - Shut down the computer.
- Take along a backup of your information. Keep the backup separate from the computer.
- When traveling by air, carry the computer as hand luggage; do not check it in with the rest of your luggage.

  CAUTION: Avoid exposing a drive to magnetic fields. Security devices with magnetic fields include airport walk-through devices and security wands. Airport conveyer belts and similar security devices that check carry-on baggage use X-rays instead of magnetism and do not damage drives.

- If you plan to use the computer during a flight, listen for the in-flight announcement that tells you when you are allowed to use your computer. In-flight computer use is at the discretion of the airline.
- If you are shipping the computer or a drive, use suitable protective packaging and label the package "FRAGILE."
- The use of wireless devices may be restricted in some environments. Such restrictions may apply aboard aircraft, in hospitals, near explosives, and in hazardous locations. If you are uncertain of the policy that applies to the use of a wireless device in your computer, ask for authorization to use your computer before you turn it on.
- If you are traveling internationally, follow these suggestions:
  - Check the computer-related customs regulations for each country or region on your itinerary.
  - Check the power cord and adapter requirements for each location in which you plan to use the computer. Voltage, frequency, and plug configurations vary.

  ⚠ **WARNING!** To reduce the risk of electric shock, fire, or damage to the equipment, do not attempt to power the computer with a voltage converter kit sold for appliances.

10 Backing up, restoring, and recovering

This chapter provides information about the following processes. The information in the chapter is standard procedure for most products.

- Creating recovery media and backups
- Restoring and recovering your system

For additional information, refer to the HP Support Assistant app.

▲ Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

– or –

Select the question mark icon in the taskbar.

IMPORTANT: If you will be performing recovery procedures on a tablet, the tablet battery must be at least 70% charged before you start the recovery process.

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning any recovery process.

Creating recovery media and backups

The following methods of creating recovery media and backups are available on select products only. Choose the available method according to your computer model.

- Use HP Recovery Manager to create HP Recovery media after you successfully set up the computer. This step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced. For information on creating recovery media, see Creating HP Recovery media (select products only) on page 63. For information on the recovery options that are available using the recovery media, see Using Windows tools on page 64.
- Use Windows tools to create system restore points and create backups of personal information.

  For more information, see Recovering using HP Recovery Manager on page 65.

  NOTE: If storage is 32 GB or less, Microsoft System Restore is disabled by default.
- On select products, use the HP Cloud Recovery Download Tool to create a bootable USB drive for your HP recovery media. Go to https://support.hp.com/us-en/document/c05115630?openCLC=true, select your country or region, and follow the on-screen instructions.

Creating HP Recovery media (select products only)

If possible, check for the presence of the Recovery partition and the Windows partition. Right-click the **Start** menu, select **File Explorer**, and then select **This PC**.

- If your computer does not list the Windows partition and the Recovery partition, you can obtain recovery media for your system from support. You can find contact information on the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

You can use Windows tools to create system restore points and create backups of personal information, see Using Windows tools on page 64.

- If your computer does list the Recovery partition and the Windows partition, you can use HP Recovery Manager to create recovery media after you successfully set up the computer. HP Recovery media can be used to perform system recovery if the hard drive becomes corrupted. System recovery reinstalls the original operating system and software programs that were installed at the factory and then configures the settings for the programs. HP Recovery media can also be used to customize the system or restore the factory image if you replace the hard drive.
  - Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
  - HP Recovery Manager examines the computer and determines the required storage capacity for the media that will be required.
  - To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a high-quality blank USB flash drive.
  - If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub. If you cannot create DVD media yourself, you can obtain recovery discs for your computer from HP. You can find contact information on the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.
  - Be sure that the computer is connected to AC power before you begin creating the recovery media.
  - The creation process can take an hour or more. Do not interrupt the creation process.
  - If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue.

To create HP Recovery media:

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps.

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Create recovery media**, and then follow the on-screen instructions.

If you ever need to recover the system, see Recovering using HP Recovery Manager on page 65.

Using Windows tools

You can create recovery media, system restore points, and backups of personal information using Windows tools.

NOTE: If storage is 32 GB or less, Microsoft System Restore is disabled by default.

For more information and steps, see the Get help app.

▲ Select the **Start** button, and then select the **Get Help** app.

NOTE: You must be connected to the Internet to access the Get help app.

Restore and recovery

There are several options for recovering your system. Choose the method that best matches your situation and level of expertise:

IMPORTANT: Not all methods are available on all products.

- Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state. For more information see the Get help app.

  ▲ Select the **Start** button, and then select the **Get Help** app.

  NOTE: You must be connected to the Internet to access the Get help app.

- If you need to correct a problem with a preinstalled application or driver, use the Reinstall drivers and/or applications option (select products only) of HP Recovery Manager to reinstall the individual application or driver.

  ▲ Type `recovery` in the taskbar search box, select **HP Recovery Manager**, select **Reinstall drivers and/or applications**, and then follow the on-screen instructions.

- If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select products only) or use the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 65. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 63.

- On select products, if you want to recover the computer's original factory partition and content, or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 65.

- On select products, if you want to remove the Recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

  For more information, see Removing the HP Recovery partition (select products only) on page 67.

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select products only). If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 63.

What you need to know before you get started

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.

  IMPORTANT: Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.

- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 63.

- To use the Factory Reset option (select products only), you must use HP Recovery media. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 63.
- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. You can find contact information from the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

IMPORTANT: HP Recovery Manager does not automatically provide backups of your personal data. Before beginning recovery, back up any personal data you want to retain.

Using HP Recovery media, you can choose from one of the following recovery options:

NOTE: Only the options available for your computer display when you start the recovery process.

- System Recovery—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.
- Factory Reset—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

The HP Recovery partition (select products only) allows System Recovery only.

Using the HP Recovery partition (select products only)

The HP Recovery partition allows you to perform a system recovery without the need for recovery discs or a recovery USB flash drive. This type of recovery can be used only if the hard drive is still working.

To start HP Recovery Manager from the HP Recovery partition:

1. Type `recovery` in the taskbar search box, select **HP Recovery Manager**, and then select **Windows Recovery Environment**.

   – or –

   Turn off the tablet. Press the power button, quickly press and hold the volume down button until the Startup menu is displayed, and then tap **F11**.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Recovery Manager**, select **System Recovery**, and then follow the on-screen instructions.

Using HP Recovery media to recover

You can use HP Recovery media to recover the original system. This method can be used if your system does not have an HP Recovery partition or if the hard drive is not working properly.

1. If possible, back up all personal files.
2. Insert the HP Recovery media, and then restart the computer.

   NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See Changing the computer boot order on page 67.
3. Follow the on-screen instructions.

Changing the computer boot order

If your computer does not restart in HP Recovery Manager, you can change the computer boot order, which is the order of devices listed in BIOS where the computer looks for startup information. You can change the selection to an optical drive or a USB flash drive.

To change the boot order:

1. Insert the HP Recovery media.
2. Access the system **Startup** menu.
   - ▲ Turn off the tablet. Press the power button, quickly press and hold the volume down button until the Startup menu is displayed, and then tap **F9**.
3. Select the optical drive or USB flash drive from which you want to boot.
4. Follow the on-screen instructions.

Removing the HP Recovery partition (select products only)

HP Recovery Manager software allows you to remove the HP Recovery partition to free up hard drive space.

IMPORTANT: After you remove the HP Recovery partition, you will not be able to perform System Recovery or create HP Recovery media from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see Creating HP Recovery media (select products only) on page 63.

NOTE: The Remove Recovery Partition option is only available on products that support this function.

Follow these steps to remove the HP Recovery partition:

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Remove Recovery Partition**, and then follow the on-screen instructions.

11 Computer Setup (BIOS), TPM, and HP Sure Start

Using Computer Setup

Computer Setup, or Basic Input/Output System (BIOS), controls communication between all the input and output devices on the system (such as disk drives, display, keyboard, mouse, and printer). Computer Setup includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

NOTE: Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

Starting Computer Setup

▲ Turn off the tablet. Press the power button, quickly press and hold the volume down button until the Startup menu is displayed, and then tap **F10** to enter the **BIOS Setup** menu.

Navigating and selecting in Computer Setup

- To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press enter, or use a pointing device to select the item.
- To scroll up and down, select the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.
- To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes:

  Select the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

  – or –

  Select **Main**, select **Ignore Changes and Exit**, and then press enter.
- To save your changes and exit Computer Setup menus:

  Select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

  – or –

  Select **Main**, select **Save Changes and Exit**, and then press enter.

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

NOTE: Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Start Computer Setup. See Starting Computer Setup on page 68.
2. Select **Main**, and then select **Apply Factory Defaults and Exit**.

   NOTE: On select products, the selections may display **Restore Defaults** instead of **Apply Factory Defaults and Exit**.

3. Follow the on-screen instructions.
4. To save your changes and exit, select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

   – or –

   Select **Main**, select **Save Changes and Exit**, and then press enter.

Your changes go into effect when the computer restarts.

NOTE: Your password settings and security settings are not changed when you restore the factory settings.

Updating the BIOS

Updated versions of the BIOS may be available on the HP website.

Most BIOS updates on the HP website are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named Readme.txt, which contains information regarding installing and troubleshooting the file.

Determining the BIOS version

To decide whether you need to update Computer Setup (BIOS), first determine the BIOS version on your computer.

BIOS version information (also known as *ROM date* and *System BIOS*) can be accessed by pressing fn+esc (if you are already in Windows) or by using Computer Setup.

1. Start Computer Setup. See Starting Computer Setup on page 68.
2. Select **Main**, and then select **System Information**.
3. To exit Computer Setup without saving your changes, select the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

   – or –

   Select **Main**, select **Ignore Changes and Exit**, and then press enter.

To check for later BIOS versions, see Downloading a BIOS update on page 70.

Downloading a BIOS update

⚠ **CAUTION:** To reduce the risk of damage to the computer or an unsuccessful installation, download and install a BIOS update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a BIOS update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:

Do not disconnect power on the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate Sleep.

Do not insert, remove, connect, or disconnect any device, cable, or cord.

1. Type `support` in the taskbar search box, and then select the HP Support Assistant app.

   – or –

   Select the question mark icon in the taskbar.
2. Select **Updates**, and then select **Check for updates and messages**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:
   a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
   b. Follow the on-screen instructions to download your selection to the hard drive.

      Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

NOTE: If you connect your computer to a network, consult the network administrator before installing any software updates, especially system BIOS updates.

BIOS installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed, follow these steps:

1. Type `file` in the taskbar search box, and then select **File Explorer**.
2. Select your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename*.exe).

   The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.

NOTE: After a message on the screen reports a successful installation, you can delete the downloaded file from your hard drive.

Changing the boot order

To dynamically choose a boot device for the current startup sequence, follow these steps:

1. Turn off the tablet. Press the power button, quickly press and hold the volume down button until the Startup menu is displayed, and then tap **F9** to enter the **Boot** menu.
2. Select a boot device, press enter, and then follow the on-screen instructions.

TPM BIOS settings (select products only)

IMPORTANT: Before enabling Trusted Platform Module (TPM) functionality on this system, you must ensure that your intended use of TPM complies with relevant local laws, regulations and policies, and approvals or licenses must be obtained if applicable. For any compliance issues arising from your operation/usage of TPM which violates the above mentioned requirement, you shall bear all the liabilities wholly and solely. HP will not be responsible for any related liabilities.

TPM provides additional security for your computer. You can modify the TPM settings in Computer Setup (BIOS).

NOTE: If you change the TPM setting to Hidden, TPM is not visible in the operating system.

To access TPM settings in Computer Setup:

1. Start Computer Setup. See Starting Computer Setup on page 68.
2. Select **Security**, select **TPM Embedded Security**, and then follow the on-screen instructions.

Using HP Sure Start (select products only)

Select computer models are configured with HP Sure Start, a technology that monitors the computer's BIOS for attacks or corruption. If the BIOS becomes corrupted or is attacked, HP Sure Start automatically restores the BIOS to its previously safe state, without user intervention.

HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. The default configuration can be customized by advanced users.

To access the latest documentation on HP Sure Start, go to http://www.hp.com/support. Select **Find your product**, and then follow the on-screen instructions.

12 Using HP PC Hardware Diagnostics (UEFI)

HP PC Hardware Diagnostics is a Unified Extensible Firmware Interface (UEFI) that allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs outside the operating system so that it can isolate hardware failures from issues that are caused by the operating system or other software components.

When HP PC Hardware Diagnostics UEFI detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. This ID code can then be provided to support to help determine how to correct the problem.

To start HP PC Hardware Diagnostics (UEFI), follow these steps:

1. Turn off the tablet. Press the power button, and then quickly press and hold the volume down button until the Startup menu is displayed.
2. Tap **F2**.

   The BIOS searches three places for the diagnostic tools, in the following order:

   a. Connected USB drive

   NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 73.

   b. Hard drive

   c. BIOS
3. When the diagnostic tool opens, select the type of diagnostic test you want to run, and then follow the on-screen instructions.

NOTE: To stop a test, press the button you used to access UEFI.

Downloading HP PC Hardware Diagnostics (UEFI) to a USB device

NOTE: The HP PC Hardware Diagnostics (UEFI) download instructions are provided in English only, and you must use a Windows computer to download and create the HP UEFI support environment because only .exe files are offered.

There are two options to download HP PC Hardware Diagnostics to a USB device.

Download the latest UEFI version

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. In the HP PC Hardware Diagnostics section, select the **Download** link, and then select **Run**.

Download any version of UEFI for a specific product

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**.
3. Enter the product name or number.

4. Select your computer, and then select your operating system.
5. In the **Diagnostic** section, follow the on-screen instructions to select and download the UEFI version you want.

13 Specifications

Input power

The power information in this section may be helpful if you plan to travel internationally with the computer.

The computer operates on DC power, which can be supplied by an AC or a DC power source. The AC power source must be rated at 100–240 V, 50–60 Hz. Although the computer can be powered from a standalone DC power source, it should be powered only with an AC adapter or a DC power source supplied and approved by HP for use with this computer.

The computer can operate on DC power within the following specifications.

Input Power	Rating
Operating voltage and current	19.5 V dc @ 3.33 A – 65 W
	19.5 V dc @ 4.62 A – 90 W

NOTE: This product is designed for IT power systems in Norway with phase-to-phase voltage not exceeding 240 V rms.

NOTE: The computer operating voltage and current can be found on the system regulatory label.

Operating environment

Factor	Metric	U.S.
Temperature		
Operating (writing to optical disc)	**5°C to 35°C**	41°F to 95°F
Nonoperating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	**10% to 90%**	10% to 90%
Nonoperating	**5% to 95%**	5% to 95%
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	-50 ft to 40,000 ft

14 Electrostatic Discharge

Electrostatic discharge is the release of static electricity when two objects come into contact—for example, the shock you receive when you walk across the carpet and touch a metal door knob.

A discharge of static electricity from fingers or other electrostatic conductors may damage electronic components.

To prevent damage to the computer, damage to a drive, or loss of information, observe these precautions:

- If removal or installation instructions direct you to unplug the computer, first be sure that it is properly grounded.
- Keep components in their electrostatic-safe containers until you are ready to install them.
- Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.
- Use nonmagnetic tools.
- Before handling components, discharge static electricity by touching an unpainted metal surface.
- If you remove a component, place it in an electrostatic-safe container.

15 Accessibility

HP designs, produces, and markets products and services that can be used by everyone, including people with disabilities, either on a stand-alone basis or with appropriate assistive devices.

Supported assistive technologies

HP products support a wide variety of operating system assistive technologies and can be configured to work with additional assistive technologies. Use the Search feature on your device to locate more information about assistive features.

NOTE: For additional information about a particular assistive technology product, contact customer support for that product.

Contacting support

We are constantly refining the accessibility of our products and services and welcome feedback from users. If you have an issue with a product or would like to tell us about accessibility features that have helped you, please contact us at +1 (888) 259-5707, Monday through Friday, 6 a.m. to 9 p.m. North American Mountain Time. If you are deaf or hard-of-hearing and use TRS/VRS/WebCapTel, contact us if you require technical support or have accessibility questions by calling +1 (877) 656-7058, Monday through Friday, 6 a.m. to 9 p.m. North American Mountain Time.

NOTE: Support is in English only.

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