
M1923

19" Fanless Intel® Medical Station

User's Manual

Version 1.1

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Revision History

Version	Release Time	Description
1.0	2019.10	Initial release
1.1	2021.10	Modify “4 th generation” to “7 th generation” in chapter 1.1[Page 2].

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Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

About This Manual

This user's manual provides the general information and installation instructions for the product. The manual is meant for the experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this manual, consult your vendor before further handling.

We recommend that you keep one copy of this manual for the quick reference for any necessary maintenance in the future. Thank you for choosing ARBOR products.

Preface.....	vi
Declaration of Conformity	vi
CE	vi
FCC.....	vi
IEC 60601-1/EN60601-1/EN60601-1-2	vii
RoHS	vii
SVHC / REACH	viii
Intended Use	viii
Symbol Descriptions	viii
Important Safety Instructions	viii
General Cleaning Tips	x
Cleaning Tools	xi
Recommended Cleaning Procedures	xii
Disposing of the Equipment.....	xii
Additional Information & Technical Support	xiii
Warranty	xiv
Chapter 1 Introduction.....	1
1.1 Product Highlights.....	2
1.2 Package Contents	3
1.3 Ordering Information.....	4
1.3.1 Optional Accessories	4
1.3.2 Optional Configuration (Configure-to-Order Service).....	4
1.4 Dimensions	5
1.5 Specifications.....	6
Chapter 2 Getting Started.....	9
2.1 Getting to Know the Computer	10
2.1.1 Front View	10
2.1.2 Rear Side	12
2.1.3 Bottom Side	13
2.1.4 Top Side	15
2.1.5 Side View	15
2.2 Conneting to AC Power	16
2.3 Periodic Cleaning & Disinfection.....	16
2.4 Drivers and Utilities Installation.....	18
Chapter 3 Using the Computer.....	21
3.1 Calibrating the Touch Screen.....	22
3.2 Touch Screen Settings.....	25
3.2.1 Edge Compensation Settings	25

Contents

3.2.2 Gesture Settings	26
3.3 Using the Touch Screen.....	28
3.3.1 Text Input	29
3.4 Function Keys.....	31
3.4.1 Using Function Keys.....	31
3.4.2 Customizing Function Keys	32
3.5 Using the Wi-Fi Feature.....	34
3.6 Using the Bluetooth Feature	36
3.6.1 Pairing/Connecting with Other Bluetooth Devices	36
3.6.2 Bluetooth Device Name	38
3.6.3 Hiding/Exposing the Computer	38
3.7 Using the Smart Card Reader	40
3.8 Using the Camera Feature (Configure-to-Order).....	42
3.8.1 Taking a Picture	42
3.8.2 Recording a Video	43
3.8.3 Configuring Video Recording	43
3.9 Using the RFID&NFC Reader (Configure-to-Order).....	44
Chapter 4 BIOS	47
4.1 Accessing the BIOS Setup Utility.....	48
4.2 Main Setup.....	49
4.3 Advanced Settings.....	50
4.3.1 ACPI Settings.....	51
4.3.2 CPU Configuration	53
4.3.3 SATA Configuration	54
4.3.4 AMT Configuration	56
4.3.5 USB Configuration	58
4.3.6 F81216 Secondary Super IO Configuration.....	61
4.4 Chipset.....	62
4.4.1 PCH IO Configuration	63
4.4.2 System Agent (SA) Configuration	64
4.5 Boot	67
4.6 Security.....	68
4.7 Save & Exit	69

Appendix	71
A. Maintaining the the Battery Pack (CTOS)	72

Declaration of Conformity

CE

The CE symbol on your product indicates that it is in compliance with the directives of the Union European (EU). A Certificate of Compliance is available by contacting Technical Support.

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from ARBOR. Please contact your local supplier for ordering information.

FCC

This device complies with Part 18 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the guarantee of this device could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 18 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

IEC 60601-1/EN60601-1/EN60601-1-2

- This product complies with the system standard IEC 60601-1 Medical Electrical Equipment Part 1: General Requirements for Safety. And therefore, the product is exclusively interconnected with IEC 60601-1 certified equipment in the patient environment.
- Equipment connected to the analog or digital interfaces of the unit must comply with the respective IEC standards (e.g. IEC 60601-1 for medical equipment). Furthermore all configurations shall comply with the current version of the standard for SYSTEMS IEC 60601-1-1.
- Everybody who connects additional equipment to the signal input part or signal output part configures a medical system, and is therefore responsible that the system complies with current version of the requirements of the system standard IEC 60601-1-1. If in doubt, consult the technical service department or your local representative.

RoHS

ARBOR Technology Corp. certifies that all components in its products are in compliance and conform to the European Union's Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2002/95/EC.

The above mentioned directive was published on 2/13/2003. The main purpose of the directive is to prohibit the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) in electrical and electronic products. Member states of the EU are to enforce by 7/1/2006.

ARBOR Technology Corp. hereby states that the listed products do not contain unintentional additions of lead, mercury, hex chrome, PBB or PBDB that exceed a maximum concentration value of 0.1% by weight or for cadmium exceed 0.01% by weight, per homogenous material. Homogenous material is defined as a substance or mixture of substances with uniform composition (such as solders, resins, plating, etc.). Lead-free solder is used for all terminations (Sn(96-96.5%), Ag(3.0-3.5%) and Cu(0.5%)).

SVHC / REACH

To minimize the environmental impact and take more responsibility to the earth we live, ARBOR hereby confirms all products comply with the restriction of SVHC (Substances of Very High Concern) in (EC) 1907/2006 (REACH --Registration, Evaluation, Authorization, and Restriction of Chemicals) regulated by the European Union.

All substances listed in SVHC < 0.1 % by weight (1000 ppm)

Intended Use

This product is intended for use in a medical system.

Symbol Descriptions



This “CAUTION” symbol indicates that there is a danger of injury to the user or a risk of damage to the product, should warning notices be disregarded.



Battery Recycle (for models with battery)



This symbol of “Electrical Safety” indicates electrical warning of specific electrical hazards.



Refer to the user manual for more information.

Important Safety Instructions

Read these safety instructions carefully:

1. Read all cautions and warnings on the equipment.
2. Place this equipment on a reliable surface when installing. Dropping it or letting it fall may cause damage
3. Make sure the correct voltage is connected to the equipment.

4. To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.
5. For pluggable equipment, the socket outlet should be near the equipment and should be easily accessible.
6. Keep this equipment away from humidity.
7. Disconnect this equipment from the A/C outlet before cleaning it. Use a moist cloth. Do not use liquid or sprayed detergent for cleaning.
8. To fully disengage the power to the unit, please disconnect the power from the AC outlet.
9. Do not scratch or rub the screen with a hard object.
10. Never use any of the solvents, such as Thinner Spray-type cleaner, Wax, Benzene, Abrasive cleaner, Acid or Alkaline solvent, on the display. Harsh chemicals may cause damage to the cabinet and the touch sensor.
11. Remove dirt with a lightly moistened cloth and a mild solvent detergent. Then wipe the cabinet with a soft dry cloth.
12. The openings on the enclosure are for air convection and protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
13. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
14. If the equipment will not be used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
15. Never pour any liquid into openings. This may cause fire or electrical shock.
16. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
17. No modification of the equipment is allowed.
18. Only personnel authorised by the manufacturer may carry out technical operations on the equipment.
19. The sound pressure level at the operator's position, according to IEC 704-1:1982, is no more than 70dB(A).
20. Keep this User's Manual for later reference.

21. DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS MAY DAMAGE THE EQUIPMENT.
22. If one of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.
 - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped or damaged.
 - f. The equipment has obvious signs of breakage.



Do not use the power adapter that isn't made for the equipment. Supplying the equipment with inappropriate voltage may cause harm to the battery (if any) or, even worse, burn the equipment.



Risk of explosion if RTC (Real-Time Clock) battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.



To prevent possible hearing damage, do not listen at high volume levels for long periods.

General Cleaning Tips

You may need the following precautions before you begin to clean the device. When you clean any single part or component for the device, please thoroughly read and understand the details below.

1. We strongly recommended that you should shut down the system before you start to clean any single components.
2. When you need to clean the device, please rub it with a piece of dry cloth.

3. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
4. Never drop the components inside the device or get circuit board damp or wet.
5. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
6. Try not to put any food, drink or cigarette around the device.

Cleaning Tools

Although many companies have created products to help improve the process of cleaning your devices and peripherals, users can also use household items to clean their devices and peripherals. Below is a listing of items you may need or want to use while cleaning your devices or peripherals. Keep in mind that some components in your device may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning.

- **Cloth:** A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you to rub it with a piece of cloth.
- **Water or rubbing alcohol:** You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the device. Unknown solvents may be harmful to the plastics parts.
- **Vacuum cleaner:** Absorb the dust, dirt, hair, cigarette particles, and other particles out of the device can be one of the best cleaning methods. Over time, these items can restrict the airflow in a device and cause circuitry to corrode.
- **Cotton swabs:** Cotton swabs moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and other locations.
- **Foam swabs:** Whenever possible, it is better to use lint-free swabs such as foam swabs.

Recommended Cleaning Procedures

1. Close all application programs
2. Close operating software
3. Turn off the equipment
4. Remove all peripherals
5. Disconnect the power cable
6. Proceed to clean.

Disposing of the Equipment

- **Within the European Union**



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste.

This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product, or if applicable, follow any agreements made between yourself. The mark on electrical and electronic products only applies to the current European Union Member States.

- **Outside the European Union**

If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.

Additional Information & Technical Support

All ARBOR products are built to the most accurate specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new equipment is destined for the laboratory or the factory floor, you can be assured that the computer will provide the reliability and ease of operation. Your satisfaction is our primary concern. We want you to get the maximum performance from the computer. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in the computer's documentation. These answers are normally a lot more detailed than the ones we can give over the phone. So please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from the computer. In fact, most problems reported are minor and are able to be easily solved over the phone. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Do not hesitate to contact us using the following contact information:

Website: <https://www.arbor-technology.com>

TEL: 886-2-8226-9396

Add: 10F., No.700, Zhongzheng Rd., Zhonghe Dist., New Taipei City 235, Taiwan

Warranty

This product is warranted to be in good working order during the warranty period. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

Chapter 1

Introduction

1.1 Product Highlights

The M1923 is a 19" fanless medical station with 7th Generation Intel® Core i5 Processor targeting on medical image diagnosis application. With high graphic performance, the M1923 becomes doctor's perfect assistant of medical diagnosis.



Applicable for clinical station, nursing and PACS, the M1923 supports rich I/O and multi-connectivity, including a SD card slot, dual smart card reader slots, Bluetooth, Wi-Fi, two Gigabit Ethernet LAN ports, three RS-232 serial ports with 4KV isolation, and four USB 3.0 ports. Plus, the M1923 is installed with 4GB DDR4 SO-DIMM memory and 128GB M.2 2280 PCIE SSD for storage. To work efficiently, the M1923 also provides one RFID/NFC module, and one DVD-RW drive as optional devices to fulfill further requirements.

Based on Intel's HD Graphics 630, the M1923 provides great visual experience for medical services. With the design of one DisplayPort (DP), the M1923 can support dual-screen graphic displays to simultaneously transmit medical graphics. The optional serial digital interface (SDI) connector of the M1923 enables the video input of endoscopy surgeries in high resolutions. In addition, the design of optional front-facing 5.0 megapixel CMOS camera facilitates the increasing demand of telemedicine and telecare services.

Another considerate design is the docking bay for alternative battery, which serves as uninterruptible power supply (UPS) to keep all medical procedures on in case of any accidental situations.

- Fanless design
- Applicable for clinical station, nursing and PACS
- Soldered onboard 7th Gen. Intel® Core™ i5-7442EQ processor
- 19 inch LCD with resistive touch
- IEC & EN 60601-1 (Edition 3.1) and IEC & EN 60601-1-2 (Edition 4th) certified
- Streamline appearance - 59mm in thickness
- Multi-connectivity (Bluetooth, WLAN and GbE)
- RFID & NFC reader, 5.0 MP camera, dual smart card readers, and slim DVD-RW

- Optional alternative of external battery or PCIe x16 expansion box
- Isolated serial ports, USB and LAN ports
- Multi-expansion (3 x RS-232, 5 x USB, 2 x LAN, 1 x DisplayPort and 1 x SD Card)

1.2 Package Contents

Upon opening the package, carefully inspect the contents. If any of the items is missing or appears damaged, contact your local dealer or distributor. The package should contain the following items:



1 x M1923



1 x user's Manual



1 x power cord (Left, French standard cordset)
1 x power cord (Right, American standard cordset)



1 x 100W medical-grade AC/DC adapter kit



1 x VESA 75-to-100 adapter

1.3 Ordering Information



M1923	19" Fanless 7th Gen. Intel® Core™ i5 Medical Station with WLAN and Bluetooth
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1.3.1 Optional Accessories

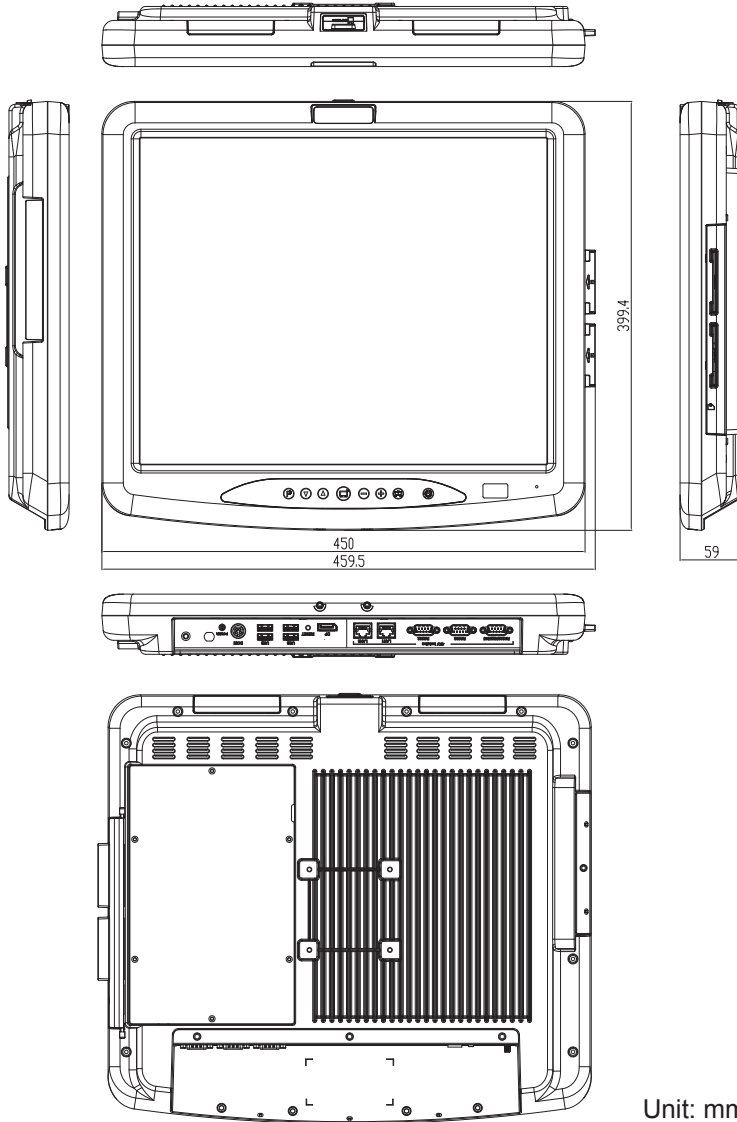
The following items are normally optional, but some vendors may include them as a standard package, or some vendors may not carry all the items.

ARM-Kits VESA-75/100 medical arms

1.3.2 Optional Configuration (Configure-to-Order Service)

	RFID & NFC-1920 RFID & NFC module kit for M192X
	CAM-1920 5.0MP CMOS camera module kit for M192X
	DVDRW-1920 Slim DVD-RW drive module kit for M192X
	SSD80G-192X 2.5" Intel® 80GB SSD kit for M192X
	eBAT-1920 7800mAh 9-cell external battery pack for M192X
	eEXP-1920 PCIe x16 expansion module kit for M192X

1.4 Dimensions



1.5 Specifications

System	
CPU	Soldered onboard 7 th Gen. Intel® Core™ i5-7442EQ 2.9GHz processor
Graphics Controller	Intel® HD Graphics 630
Memory	4GB DDR4 SO-DIMM memory module installed
Storage	128GB M.2 2280 PCIE Gen3 SSD
	2.5" 80GB SSD (optional)
Peripherals and Devices	
Camera	1 x 5.0 MP front facing CMOS camera with auto-focus (optional)
WLAN & Bluetooth	1 x WLAN 802.11 a/b/g/n & Bluetooth 4.0 LE, class 2
RFID & NFC	1 x 13.56MHz RFID & NFC reader with ISO 14443A/14443B/15693 support (optional)
Smart Card Reader	2 x Smart Card Reader slots
DVD-RW	1 x Slim DVD-RW (optional)
I/O Interface	
SD Card	1 x SD/SDHC card slot
Audio	1 x microphone, 2 x 3W speakers
	1 x Mic-in, 1 x Line-out
Video output	1 x DisplayPort
Video input	1 x SDI connector (optional)
LAN	2 x Intel® RJ-45 GbE with 4KV isolation
Serial Port	2 x RS-232 port with 4KV isolation
	1 x RS-232/422/485 with 4KV isolation
USB Port	4 x USB 3.0 ports
	1 x USB 2.0 port with 4KV isolation (12MB/Bits) (on the top)
Expansion	1 x for the alternative of external battery or PCIe x16 expansion box (optional, max. 25W)

Button & Indicator	
Cap-sensor Buttons	1 x Power on/off 1 x Touch & LCD on/off 1 x Brightness up 1 x Brightness down 1 x Voice up 1 x Voice down 1 x Menu 1 x Programmable
Physical Buttons	1 x Power button (supporting battery mode power on) 1 x Reset button
Touch Screen	
Type	Analog Resistive Touch
Light Transparency	80% (typ.)
Controller Interface	USB interface
LCD Display	
Size/Type	19" TFT Active Matrix Panel
Max. Resolution	1280 x 1024 (SXGA) with 16.7M colors
Luminance	350 cd/m ² (typ.)
Contrast Ratio	1000:1 (typ.)
Backlight Type	LED
View Angle (U/D/R/L)	80°/80°/85°/85° (typ.)
Power Requirement	
Adapter Input	100 ~ 240 VAC (full range)
Adapter Output	DC 18V, 5.55A, 100W with medical certificate
Battery Type	Li-battery pack
Battery Capacity	1 x 7800mAh 9-cell external battery pack (optional)
Mechanical & Environmental	
Operating Temp.	0 ~ 40°C (32 ~ 104°F)
Storage Temp.	-20 ~ 60°C (-4 ~ 140°F)
Operating Humidity	10 ~ 95% @ 40°C (non-condensing)

Dimensions (W x H x D)	450 x 399.4 x 59mm (17.7" x 15.7" x 2.32")
Net Weight	7.5 kg (16.53 lb)
Vibration	5 ~ 500Hz, 1G random operation (SSD only)
Shock	10G peak (11m/sec)
Mounting	VESA-75 compatible (M4)
IP Rating	Compliance design with IP65 (front touch panel)
Operational Altitude	Below 2000m
Regulatory	CE, FCC Part 18 Subpart C
	IEC & EN 60601-1 Safety (Edition 3.1), IEC & EN 60601-1-2 EMC (Edition 4th)
OS Support	
Windows 10 IoT Enterprise LTSC	
Linux: Ubuntu	

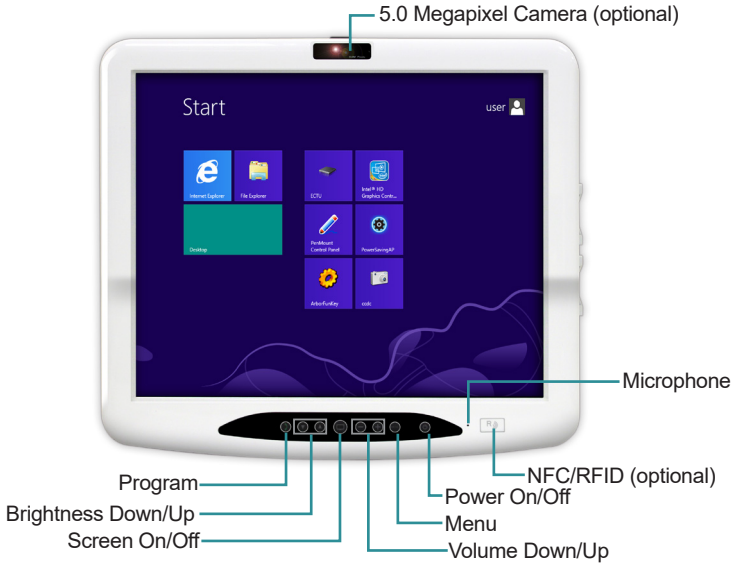
Chapter 2

Getting Started



2.1 Getting to Know the Computer

Understanding the computer help you jump seamlessly from component to component when using the computer. This section will quickly familiarize you with the computer.

2.1.1 Front View



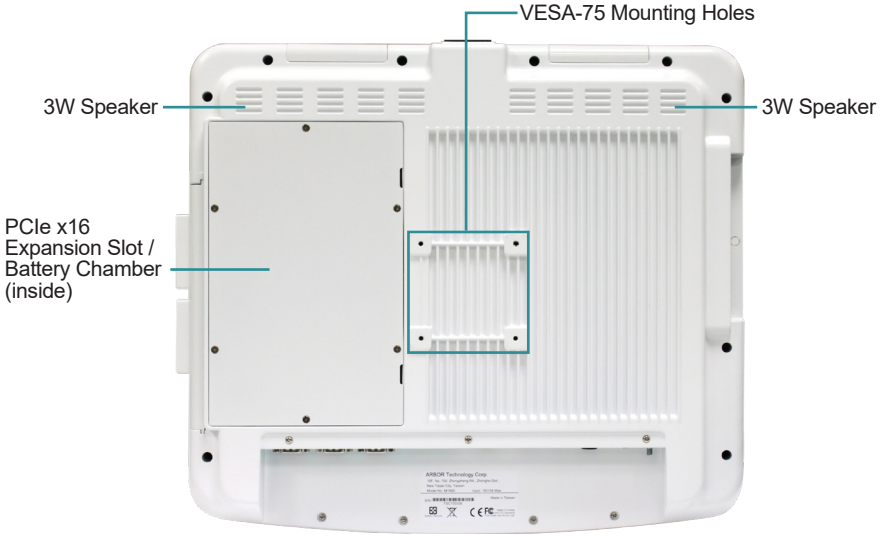
Function Key	Graphic	Default Function
Program		Press and hold for less than 3 seconds to launch user-specified application or function. To specify an application, refer to 3.4.2 Customizing Function Keys on 32 . Press and hold for more than 3 seconds to simulate the behavior of the CTRL+ALT+DEL key combination.
Brightness up/down		Increases/decreases display backlight brightness.
Screen on/off		Turns on/off the display.
Volume up/down		Increases/decreases system volume.

Function Key	Graphic	Default Function
Menu		Launches the ARBOR Tablet UI utility.
Power on/off		<p>Power on/off button</p> <ul style="list-style-type: none"> ▶ To turn on the computer in AC power mode: Press and hold the button until all the LEDs light up. <p>Note: The power on function doesn't work in battery mode. To power on the computer in battery mode, use the power button on the bottom I/O.</p> <ul style="list-style-type: none"> ▶ To force shut down the computer: Press the button for about 3~4 seconds to force shut down. ▶ To put the computer into hibernate or sleep mode: Press the button and the LCD screen will turn off. ▶ To wake the computer from hibernate or sleep mode: Press the button and the LCD screen will turn on.

Power Status LED

LED	Color	Status	Descriptions
Power	Green	On	The computer is turned on.
		Blinking	The computer is in sleep mode.
		Off	The computer is powered off.
	Orange	On	Battery charging 0%~99%
		Blinking	Battery discharging 0%~11%
		Off	Battery discharging 12%~100%

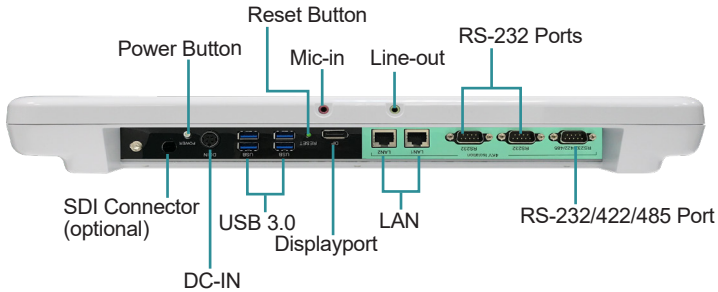
2.1.2 Rear Side



Warning: The computer's rear plate is highly heated when the computer is operating. As the temperature might reach up to 60°C (140°F), DO NOT touch the rear plate during operating.

Item	Descriptions
VESA-75 Mounting Holes	To attach VESA 75-compatible mounting kit. To attach a VESA-100 mount, use the VESA 75-to-100 adapter included in the package.
3W Speaker	Integrated 3W stereo speakers for audio output.
PCIe x16 Expansion Slot / Battery Chamber (inside)	PCIe x16 Expansion Slot: To install optional PCIe module (Configured-to-Order Service). Battery Chamber: To install the battery pack (Configured-to-Order Service).

2.1.3 Bottom Side



Item	Descriptions
Power Button	<p>Power on/off button</p> <ul style="list-style-type: none"> ▶ To turn on the computer: Press and hold the button for about 3~4 seconds. ▶ To force the computer to shut down: Press the button for about 3~4 seconds to force shut down. ▶ To put the computer into hibernate or sleep mode: Press and hold for about 2 seconds. ▶ To wake the computer from hibernate or sleep mode: Press and hold for about 2 seconds.
Reset	<p>Reset button</p> <p>If the computer becomes unresponsive, insert a paper clip into the hole and release. This will force the computer to shut down. Then you can use the power button to power on the computer again.</p>
Mic-In	<p>3.5mm microphone jack.</p> <p>To connect to a microphone to capture sound and voice.</p>
Line-out	<p>3.5mm line-out jack.</p> <p>To connect to a headphone for audio output.</p>
RS-232 Ports	<p>Two RS-232 DB-9 serial ports with 4KV isolation</p> <p>To connect to serial device(s).</p>
SDI Connector	<p>Serial digital interface input port.</p> <p>To connect to the SDI output port on SDI source device.</p>

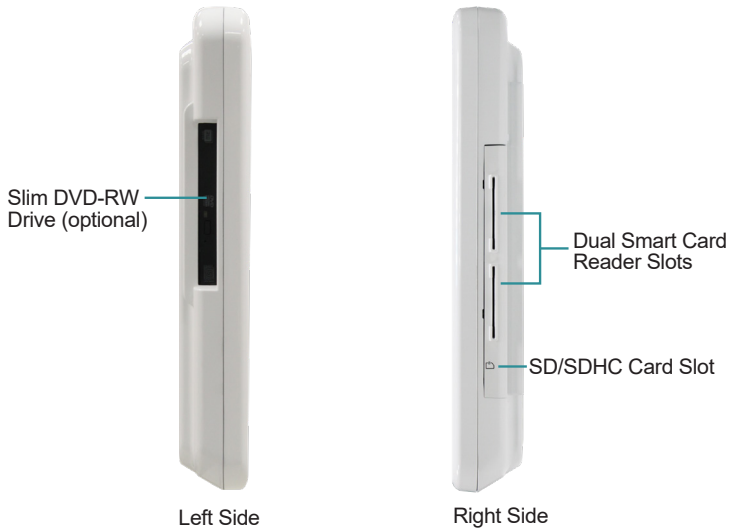
Item	Descriptions
DC-IN	DC-IN power jack. To connect the computer to a power source through provided AC power adapter.
USB Ports	Four USB 3.0 Type-A port. To connect to USB device(s).
Displayport	DisplayPort video output. To connect to the video input of a display device such as HDTV or projector for simultaneous display.
LAN	Two Gigabit Ethernet ports. To connect the computer to a network through an Ethernet cable.
RS-232/422/485 Port	RS-232/422/485 DB-9 serial port with 4KV isolation. To connect to serial device(s).

2.1.4 Top Side



Item	Descriptions
USB Port	USB 2.0 Type-A port with 4KV isolation To connect to a USB device.

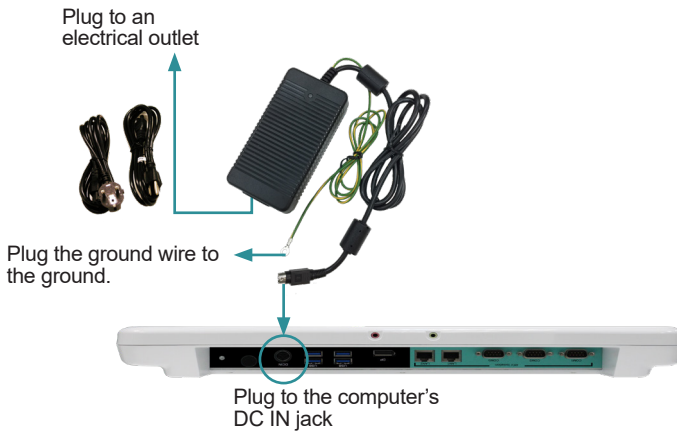
2.1.5 Side View



Item	Descriptions
Slim DVD-RW Drive (optional)	Optional DVD-RW drive
Dual Smart Card Reader Slots	Dual smart card reader slots with cover. Allows to insert smart cards.
SD/SDHC Slot	SD/SDHC card slot

2.2 Connecting to AC Power

1. Plug the power cord of the AC adapter to the power connector of the computer.
2. Plug the ground wire to the ground. To protect the computer from electrical shock, it's recommended that you connect the ground wire.
3. Plug the provided power cord to the AC adapter and the male end to an electrical outlet. (The power cord varies according to region.)

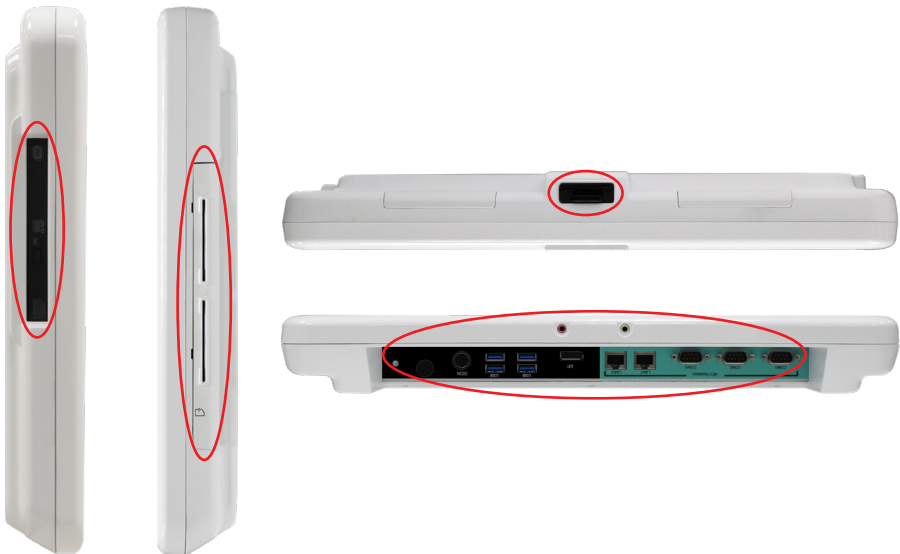


2.3 Periodic Cleaning & Disinfection

This medical computer is generally employed in medical environment, for example, hospitals, as medical image diagnosis device. It is strongly recommended that users follow the cleaning and disinfection instructions described below to ensure proper maintenance activities.

1. Always power off your unit first when you clean or disinfect it.
2. To wipe the outer case, use lint-free cloth, lightly moistened with warm water and a mild, non-abrasive cleaning solution made of either:
 - 70% isopropyl alcohol
 - 10% bleach solution

- Dimethyl ethylbenzyl ammonium chlorides 0.125%, dimethyl benzyl ammonium chlorides 0.125%, Isopropyl alcohol 14.850% (Sani-Cloth®)
 - Isopropanol 17.2%; Diisobutylphenoxyethyl dimethyl bezyl ammonium chlorides 0.28% (CaviCide®)
3. The touch screen can be wiped down (e.g. to remove fingerprints) during operation using standard computer screen solution.
 4. Use dry cloth to clean the rear panel and bottom, especially the areas around the connectors.

**Caution:**

- Do not spill liquids on or around the medical computer.
- Do not use other solutions than the ones mentioned above.
- Do not touch, press or rub the display panel with abrasive cleaning compounds, instruments, brushes, or rough-surface materials.
- Never spray cleaning liquids or foam onto the medical computer or soak it for cleaning.
- Do not use solvents to clean the unit.
- Do not clean, disinfect, or sterilize any part of the system by autoclaving or with the use of ethylene oxide gas; doing so may damage the unit.

- Never spray or squirt any type of liquid onto the medical computer; if a spray, gel or foam is needed, spray the liquid onto a cloth and then use the cloth to wipe or rub down the component.
- Always avoid contamination to minimize the need for disinfectants.
- Do not spill, spray, or squirt liquids to the power block and the power cable.

2.4 Drivers and Utilities Installation

For operating system of Windows 10 IoT, the computer comes with a Driver Pack that contains device drivers as well as some programs and utilities. You need to install the drivers to activate the devices and some device-related services. Some drivers will come with driver-related programs to facilitate the application.

To install the drivers and utilities:

- Use the DVD provided with the computer
- Or, you can go to our website at www.arbor-technology.com and download the driver pack from the product page.

The driver path is listed as below:

Driver/Utility	Path
Chipset	\Chipset\SetupChipset.exe
Graphic	\Graphic\win64\Setup.exe
ME	\ME_11.7\SetupME.exe
Audio	\Audio_New\AUD_Win7_8.1_10_6.0.1.7982\7982_PG453_Win10_TH_RS_Win8.1_Win8_Win7_WHQL\Setup.exe
LAN	\LAN\Intel LAN 22.9\PROWinx64.exe
WIFI	\WiFi_ENLI_QCNFA324\QCA6174-9377_r10487.1_Win10_v725_Win8.1_v782_Win7_v791\WiFi\Install_CD\Win10_Win8.1\setup.exe
BT	\WiFi_ENLI_QCNFA324\QCA6174-9377_r10487.1_Win10_v725_Win8.1_v782_Win7_v791\BT\Win10_Win8.1\setup.exe
Function key app	\Function key app\setup.exe

Follow the sequence below to install the drivers to prevent errors:

a. Onboard Chipset drivers:

Chipset → VGA → Intel ME → Audio and LAN drivers in either order

b. Device drivers:

Wi-Fi, Bluetooth, RFID&NFC, Smart Card Reader, Touch Screen drivers in any sequence

c. Function key utility:

Install the utility as needed.

The installation process of each driver is basically the same. Just follow the on-screen instructions to proceed. If prompted to restart the computer, tap **Yes** to do so. In some cases, **User Access Control** will appear asking for permission to make changes to the computer. Simply tap **Yes** to continue.

The drivers and utilities provided are described in the table below:

Driver/Utility	Necessity	Descriptions
Chipset	Required	Install the chipset driver to the computer. Note: Make sure to install the chipset driver before installing any other drivers to prevent errors.
VGA	Required	Install the graphic device driver. Select 64 or 32-bit according to your operating system.
Intel ME	Required	Install the Intel® Management Engine (Intel ME) software.
Audio	Required	Install the audio driver.
LAN	Required	Install the network device driver. Select your operating system and 64 or 32-bit as required.
WiFi	Required	Install the wireless network device driver and client utilities.
Bluetooth	Required	Install the Bluetooth driver. Select your operating system to proceed.
RFID/NFC	Required for RFID/NFC module	Install the RFID/NFC device driver. Select x64 (64-bit) or x86 (32-bit) according to your operating system.
Smart Card Reader	Required	Install the smart card reader driver.

Getting Started

Driver/Utility	Necessity	Descriptions
Touch Screen	Required	Install the touch screen driver and calibration utility.
Function Key	Recommended	Install the ArborFunKey utility to associate a function key with a specific feature or application program. A camera utility ccdc will also be installed.

Chapter 3

Using the Computer

After all drivers are installed as described in [2.4 Drivers and Utilities Installation](#) on page 18, you can start to use the computer. The chapter will walk you through the essential features of the computer.

3.1 Calibrating the Touch Screen

The computer comes with a resistive touch screen, which locates user's touch by the force applied on it. As a resistive touch screen, it needs the operation with a pointed object such as a stylus or simply your fingertip so it takes the minimum force to trigger actions from the touch screen.

When the computer is delivered, the touch screen is likely to work imprecisely because the driver isn't installed and the touch screen hasn't been calibrated yet. If you are using the touch screen for the first time, or if the touch screen doesn't respond correctly to touch, please follow the steps given in this section to calibrate the touch screen.

While you install the touch screen driver, the following utilities will also be installed to your system:

- **PenMount Control Panel:** Allows you to calibrate the touch screen and adjust the edge compensation of the touch screen.
- **Gesture AP:** Allows you to enable/configure touch gestures to interact with the Windows or an application.

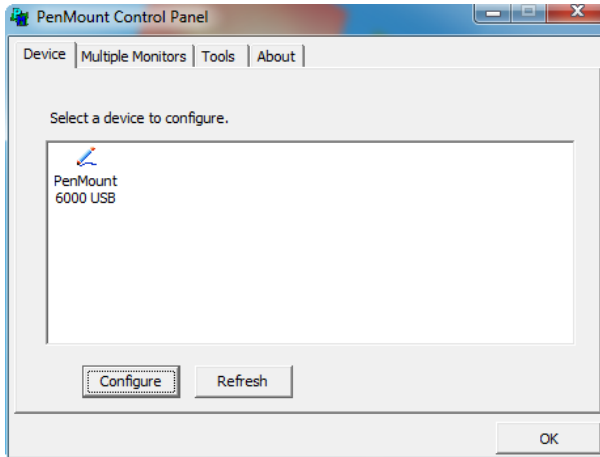
To calibrate the touch screen:

1. Launch the **PenMount Control Panel** by double-tapping the shortcut on the desktop.

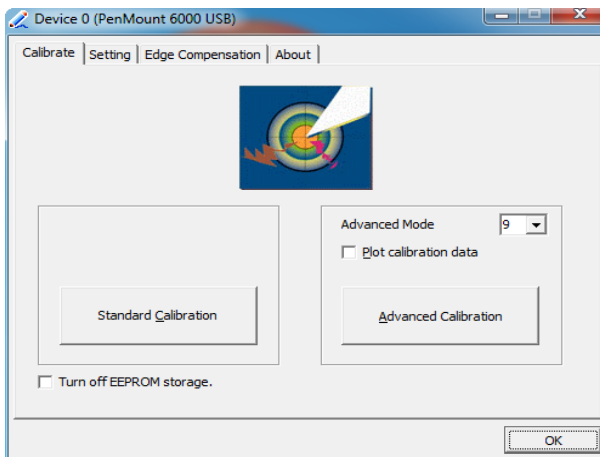


Or, you can launch the utility by tapping **Start > All programs > PenMount Windows Universal Driver > PenMount Control Panel** on Windows 7 or **All Apps list > PenMount Windows Universal Driver > PenMount Control Panel** on Windows 8/8.1.

- On the **Device** tab, the touch screen(s) detected by your system will be displayed. To set up the touch screen, click **Configure**. To detect the newly attached PenMount devices, click **Refresh**.



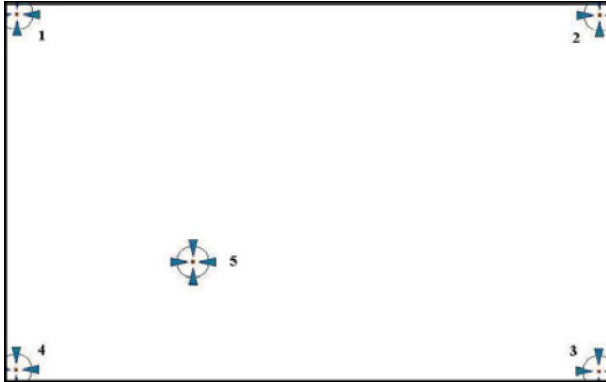
- After clicking **Configure**, there are two ways to calibrate your touch screen. **Standard Calibration** adjusts most touch screens while **Advanced Calibration** adjusts aging touch screens.



The settings on the **Configure** tab are described as below.

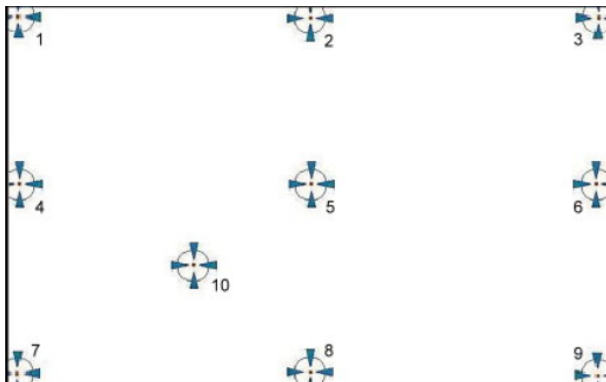
- **Standard Calibration**

If you are using the touch screen for the first time, select this option. After selecting the **Standard Calibration**, arrows appear pointing to red squares. Use your finger or stylus to touch the red squares in sequence. After the fifth red point the calibration is complete. To skip, press 'ESC'.



- **Advanced Calibration**

Advanced Calibration uses 9, 16 or 25 points to effectively calibrate touch panel linearity of aged touch screens. Select this button and touch the red squares in sequence with your finger or stylus. To skip, press 'ESC'.



Note: The older a touch screen is, the more calibration points the advanced calibration needs. For an optimal accuracy we suggest to use a stylus to make the advanced calibration.

- **Plot Calibration Data**

Check this function to have touch panel linearity comparison graph appear when you finish **Advanced Calibration**. The black lines reflect the ideal linearity assumed by PenMount's application program while the blue lines show the approximate linearity calculated by PenMount's application program as the result of user's execution of **Advanced Calibration**.

- **Turn off EEPROM storage**

This function disables the write-in of calibration data in the controller. This function is enabled by default.

3.2 Touch Screen Settings

3.2.1 Edge Compensation Settings

Edge Compensation enables the touch screen driver to automatically locate the touched positions around the edges of a touch screen. For example, in a Windows system where the taskbar is hidden and needs touch at the edge to be displayed, or in the cases you find it is difficult to touch items at the edges, you can increase the compensation value to extend the edge.

To adjust the Edge Compensation:

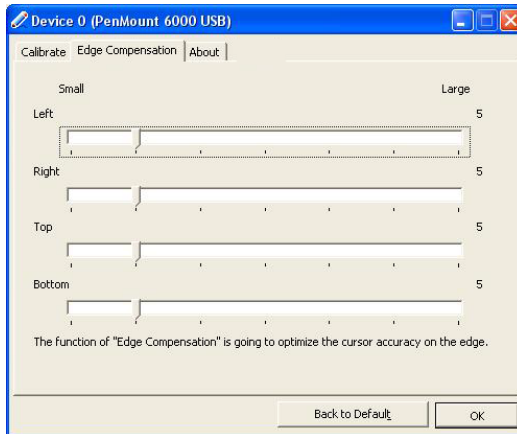
1. Launch the **PenMount Control Panel** by double-tapping the shortcut on the desktop.



Or, you can launch the utility by tapping **Start > All programs > PenMount Windows Universal Driver > PenMount Control Panel** on Windows 7 or **All Apps list > PenMount Windows Universal Driver > PenMount Control Panel** on Windows 8/8.1.

2. When the **PenMount Control Panel** opens, on the **Device** tab, select your touch screen (i.e., PenMount 6000 USB) and tap **Configure**.
3. Tap the **Edge Compensation** tab.

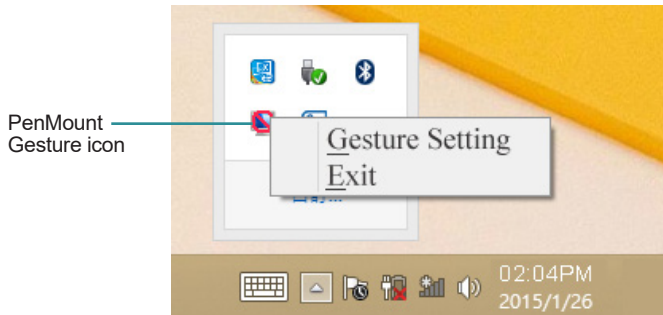
Move the slider to adjust the settings from 0 to 30 individually for the top, bottom, left and right edges. Increasing the value extends the edge while decreasing the value reducing the edge.



3.2.2 Gesture Settings

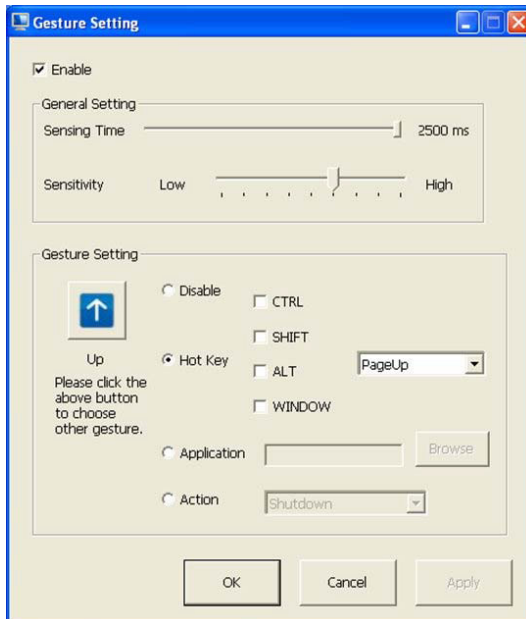
The touch screen allows you to customize the touch gestures to interact with Windows or an application. To enable or configure the touch gestures:

1. Tap the up arrow on the taskbar to bring up the notification area.
2. Tap and hold the **PenMount Gesture AP** icon in the notification area to bring up its context menu and then tap **Gesture Setting**.



If you didn't find the icon, launch the utility by tapping **Start > All programs > PenMount Windows Universal Driver > PenMount Gesture** on Windows 7 or **All Apps list > PenMount Windows Universal Driver > PenMount Gesture** on Windows 8/8.1.

3. Then the **Gesture Setting** window opens.



The settings on the **Gesture Settings** window are described as below.

- **Enable/disable:** Select/deselect the box to enable/disable PenMount Gestures.

General Setting

- **Sensing Time:** Move the slider to adjust PenMount Gestures Sensing Time between 200 ms (0.2 sec) and 2500 (2.5 sec). The shorter the sensing time is configured, the faster the gesture has to be done.
- **Sensitivity:** Move the slider to adjust how sensitive you want your finger stroke on the touch screen to be sensed.

Gesture Setting

- **Gesture Select Button:** Tap this button to select the specific gesture you are going to configure. When the gesture icon turns to blue, it is enabled. When it is gray, it is disabled.
- **Disable:** When this button is selected, the gesture is disabled.
- **Hot-key:** Configure the hot-keystrokes for specific gesture. The hot-key can include up to 5 keystrokes. When that gesture is sensed, the configured keystrokes will be reported.
- **Application:** Configure to invoke a specific application with particular gesture. So that when the gesture is sensed, the specific application will run.
- **Action:** Configure to make use of PenMount Gesture AP's built-in shortcuts. So that when a particular gesture is sensed, a specific action will be taken.

3.3 Using the Touch Screen

Touch control is the main way and an intuitive way to interact with the computer. Users are able to manipulate icons, graphic buttons, menus, property sheets, the on-screen keyboard or any on-screen items with touch control. This section will walk you through the basic operations for touch control.

3.3.1 Text Input

The computer doesn't have a physical keyboard to receive user's text input. To input text on the computer, it relies on either an external USB keyboard, or the "on-screen keyboard", or the Windows-featured handwriting recognition.

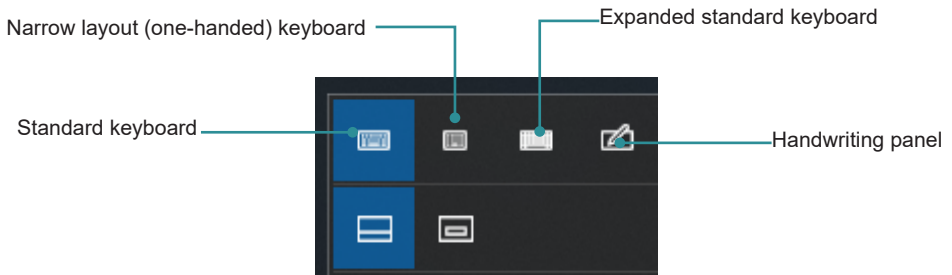
3.3.1.1 On-screen Keyboard

An "on-screen keyboard" is a virtual keyboard with all the standard keys. With Windows you can use either a touch keyboard or thumb keyboard to facilitate text input. To open the Windows on-screen keyboard:

1. Tap the keyboard icon on the Windows taskbar.



2. The **Input Panel** opens in either keyboard mode or handwriting mode, according to your previous use. Tap the icon in the lower right corner to switch between the modes.



3. To use the touch or thumb keyboard, just enter text by tapping the keys.

3.3.1.2 Handwriting Recognition

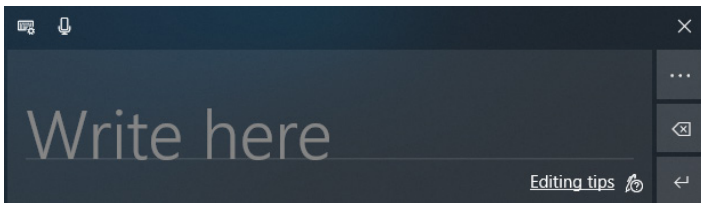
“Handwriting Recognition” is an input method that interprets and converts handwriting to text. The Windows features a “writing pad” to get the job done.

To launch the Windows handwriting panel:

1. Tap the keyboard icon on the Windows taskbar to open the **Input Panel**.

If it's in keyboard mode, tap the icon in the lower right corner and tap the handwriting icon to switch to handwriting mode.

2. Write in the writing area. Then tap the bottom-right **Enter** button to enter the text in a text field.



3.4 Function Keys

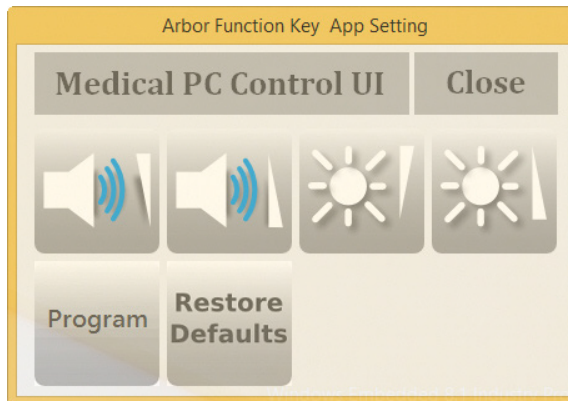
3.4.1 Using Function Keys

To use the function keys, you can press the keys on the front bezel below the LCD viewing screen.



Or, you can launch the **ArborFunKey** control UI on the Windows by either of the following methods:



1. Press the **Menu** key on the front bezel.
2. Double-tap the **ArborFunKey** shortcut icon on the desktop.

Then the Windows UI will appear on the lower right corner of the desktop.



The UI provide the following functions:

Icon	Descriptions
	Decreases system volume
	Increases system volume

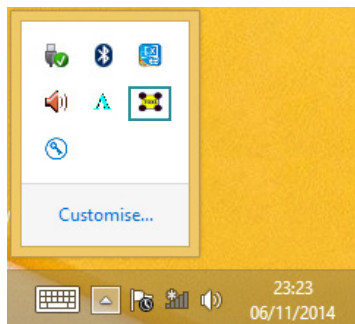
Icon	Descriptions
	Decreases LCD backlight brightness
	Increases LCD backlight brightness
Program	Press and hold for less than 3 seconds to launch user-specified application or function. Press and hold for more than 3 seconds to simulate the behavior of the CTRL+ALT+DEL key combination.
Restore Defaults	Restores defaults. The volume and LCD brightness will be restored to the default level and the program button will have no function.
Close	To close the Arbor Function Key utility UI.

3.4.2 Customizing Function Keys

Using the **ArborTabletUI**, you can also customize the function keys as needed. The keys you can re-assign a function include **Program** and **Menu**. Other keys cannot be re-assigned with new functions.

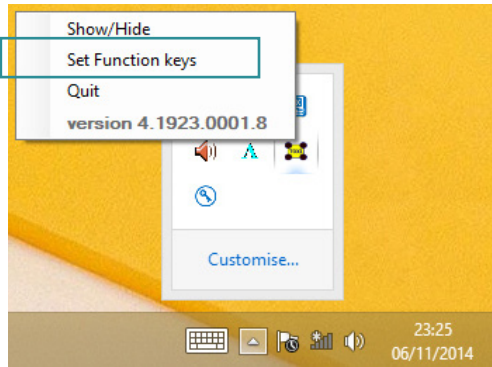
To customize your own function keys:

1. Tap the up arrow in the system tray to show the **Arbor Function Key App Setting** icon.

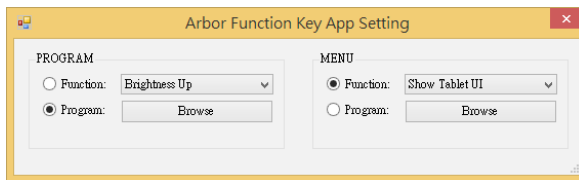


Note: If you didn't find the icon in the notification area, make sure the utility is running by tapping **Start > ARBORFunKeyAp > ArborFunKeyAp**.

2. Tap and hold the **ArborFunKey** icon to bring up its context menu and then tap **Set Function Keys**.

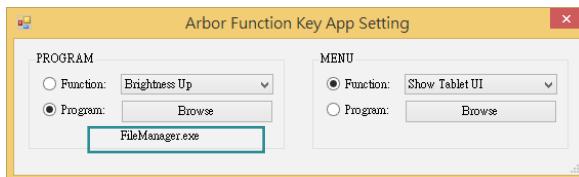


3. To re-assign a function, you can select a built-in function from the **Function** drop-down list.




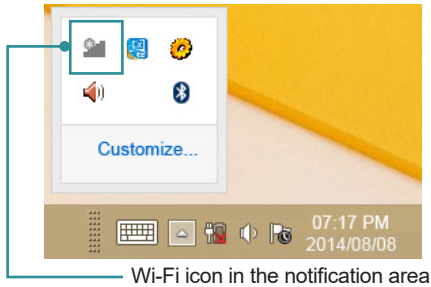
Or you can select **Program** and then tap the **Browse** button to select the executable file of the program that you want to associate.



Assigned file name will appear on the panel to indicate the assignment is done.






3.5 Using the Wi-Fi Feature

The computer is built-in with a Wi-Fi module for Wi-Fi networking. Once the driver is installed as described in [2.4 Drivers and Utilities Installation](#) on page [18](#), a Wi-Fi signal strength icon  shows up in the notification area.

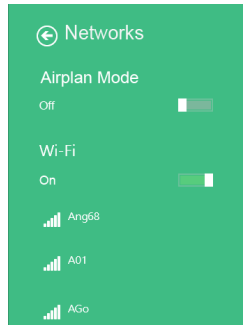


When Wi-Fi is enabled, the Wi-Fi signal strength icon in Windows notification area also changes from  to . The icon shows the Wi-Fi status as described below:

Icon	Descriptions
	Wi-Fi is disabled.
	Wi-Fi is enabled and there are available wireless networks in range.
	The computer is connected to a wireless network.

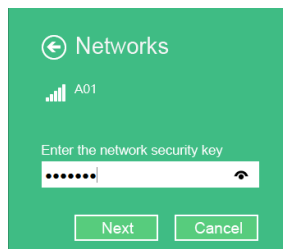
To connect to a wireless network:


1. Tap the Wi-Fi signal strength icon in the notification area. Turn on WiFi if it is turned off.
2. A list opens and shows the Wi-Fi hotspots available within the wireless coverage of the computer.



3. Tap the desired network to connect to it.

If the network to connect is a secured network, a dialog box will open and request for the password. Enter the password to access the Wi-Fi network. If it is an open network, it will be connected in a few seconds.




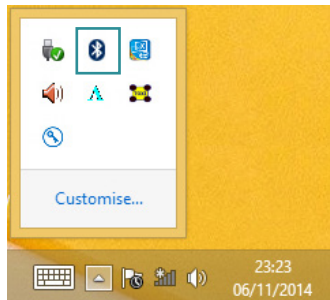
4. When the computer is connected to a Wi-Fi network, "Connected" will be displayed and the Wi-Fi signal strength icon in the notification area changes to .

3.6 Using the Bluetooth Feature

Bluetooth enables the wireless connection over a short distance about 8 meters. It is specified as a “wireless personal area network” (WPAN). The computer is Bluetooth-enabled to synchronize data with other Bluetooth-capable devices such as PCs, laptops, hands-free, headsets, printers, PDAs and cell phones.


Once the Bluetooth driver is installed as described in [2.4 Drivers and Utilities Installation](#) on page 18, you can start to use the Bluetooth function.

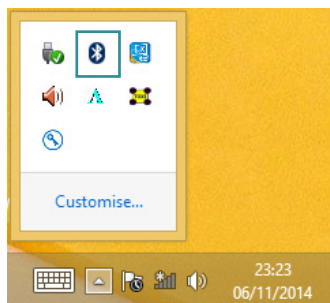
The Bluetooth function is always enabled on your computer, with the Bluetooth icon  displayed in the notification area.



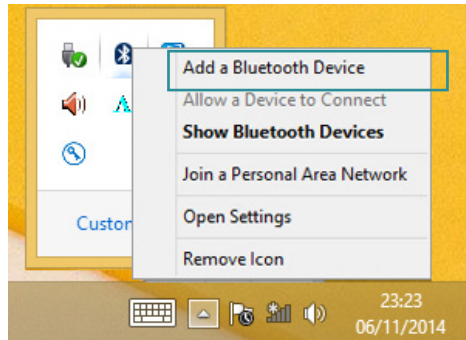
3.6.1 Pairing/Connecting with Other Bluetooth Devices

Before the computer can connect with other Bluetooth devices, it has to pair with them. To pair/connect with other Bluetooth devices:

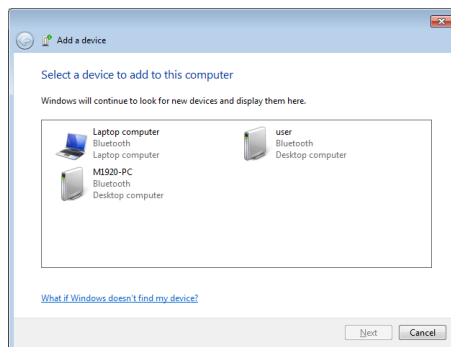
1. Tap the up arrow in the system tray to show the Bluetooth icon .



2. Tap and hold the Bluetooth icon to show the context menu. Select **Add a Bluetooth Device** from the context menu.

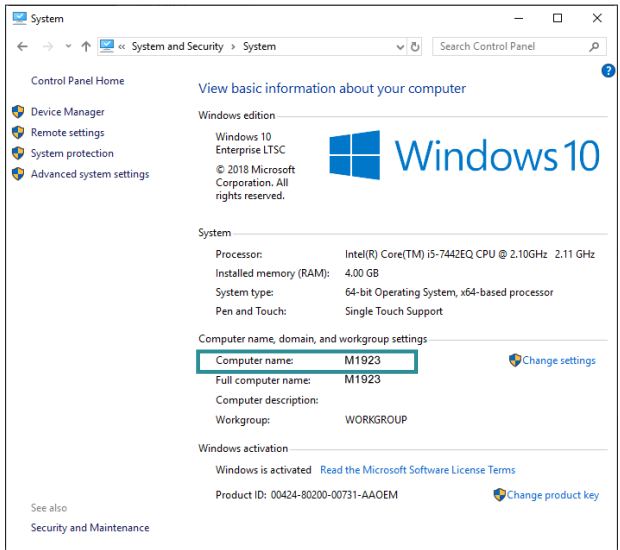


3. A **Manage Bluetooth devices** window opens. Select the Bluetooth device to connect and follow the on-screen instructions to proceed.




3.6.2 Bluetooth Device Name

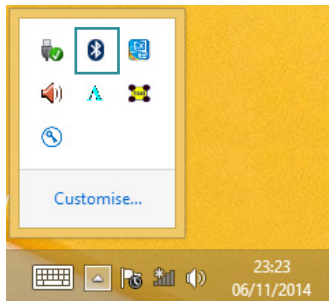
By default, the computer's Bluetooth device name is the computer name that is viewable at **Control Panel > System and Security > System**.



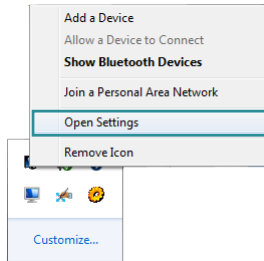
3.6.3 Hiding/Exposing the Computer

By default, the computer is NOT discoverable by other Bluetooth devices. To expose or hide the computer:

1. Tap the up arrow in the system tray to show the Bluetooth icon .

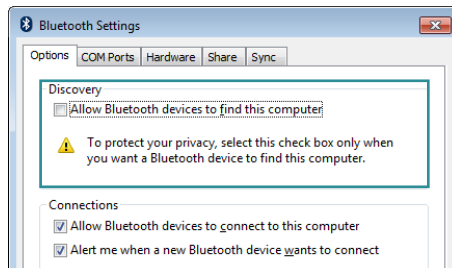


2. Tap and hold the Bluetooth icon to show the context menu. Select **Open Settings** from the context menu.



3. The **Bluetooth Settings** dialog box then opens. Tap the **Options** tab and find the **Discovery** section.

To make your computer discoverable to Bluetooth enabled devices, select the check box of **Allow Bluetooth devices to find this computer** or otherwise deselect the check box to make it undiscoverable.

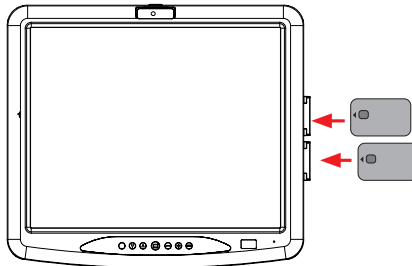


3.7 Using the Smart Card Reader

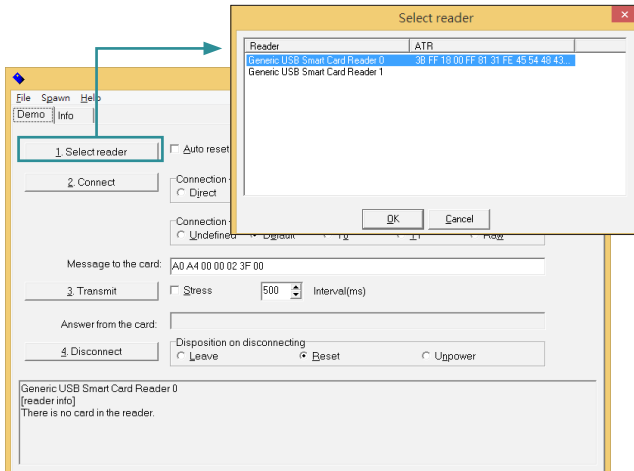
The computer is equipped with two smart card readers that allow users to provide identification and information using smart cards.

You may use your own Smart Card Reader application. However, you can optionally use the test program included in the driver DVD to test if the smart card readers function properly. To use the test program,

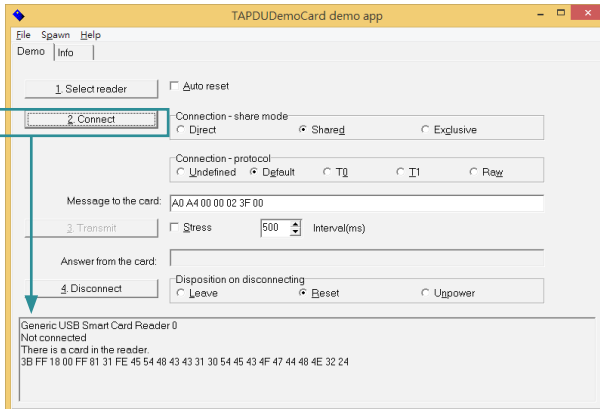
1. Execute the file **DEMO4.exe** from the following path:
disk drive:\Tools\Smart_Card_Reader\
2. Insert a smart card into the card reader that you want to test with the golden chip facing you as shown below.



3. Tap **Select reader**. Detected reader will be displayed in the **Select Reader** dialog box. Select the reader that you want to test and then tap **OK**.



4. Tap **Connect** to proceed. If a smart card is successfully detected, its information will be displayed.



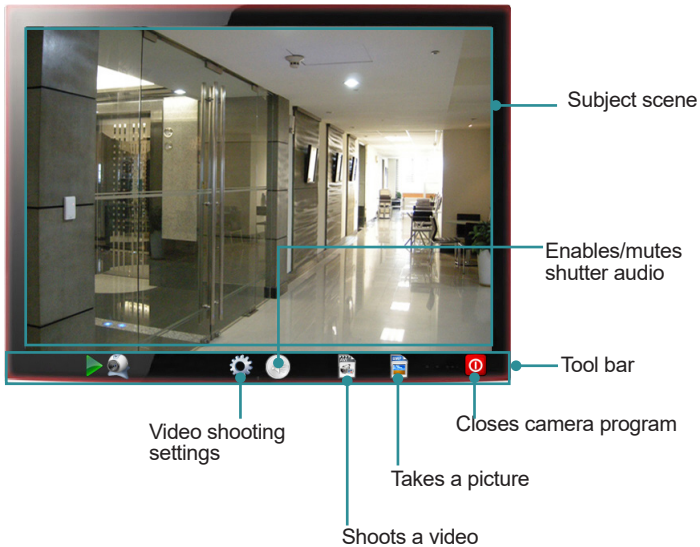
3.8 Using the Camera Feature (Configure-to-Order)

The computer comes with a ready-to-use camera without the need to install additional drivers. You can use Windows or third-party camera utility with the camera to take pictures, record videos or participate in a video conference.

Alternatively you can use the **ccdc** camera utility, which will be installed when you install the **ArborFunKey** utility.


To launch the **ccdc** camera utility:

Tap **Start > All programs > ArborFunKey > ccdc** on Windows 7 or tap the **ccdc** icon on **All Apps** list on Windows 8/8.1.



3.8.1 Taking a Picture


To take a picture:



1. From the **ccdc** camera utility tool bar, tap the take-a-picture icon .
2. The camera then proceeds to take a picture and save it to the local disk. The default location is:


C:\Users*<your user name>*\Documents\ccd

3.8.2 Recording a Video

To record a video:

1. From the **ccdc** camera utility tool bar, tap the record-a-video icon .


The  icon then changes to an in-recording button , and video recording starts.

2. Tap the in-recording button  again to stop recording. The video shot will be saved to the local disk. The default location is:

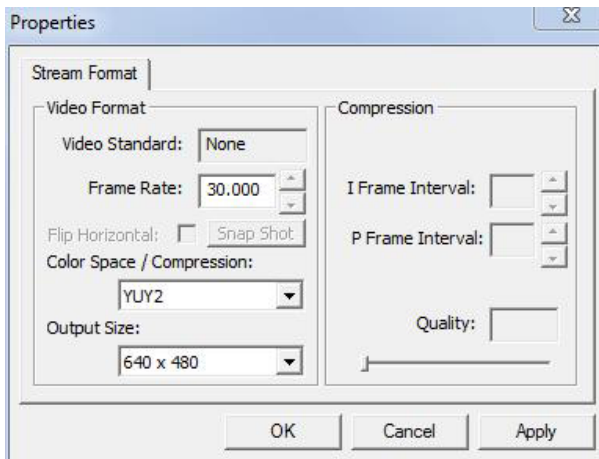
C:\Users*<your user name>*\Documents\ccd

3.8.3 Configuring Video Recording

To configure the video recording settings:

1. From the camera utility tool bar, tap the configuration icon .

The **Properties** dialog box opens.




2. Make the configuration as needed.
3. Tap the **Apply** button to apply the changes.

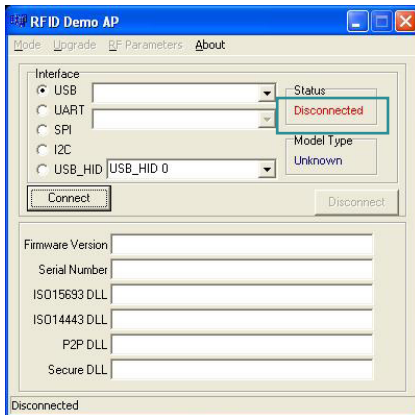
3.9 Using the RFID&NFC Reader (Configure-to-Order)

The RFID&NFC reader is a Configure-to-Order Service (CTOS) on the computer and can be identified by a label on the lower right corner of the front bezel.

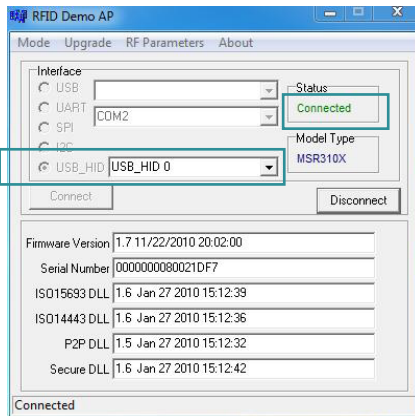


Once the driver for the RFID&NFC reader is installed, then it is ready for use. You may use your own RFID&NFC application. However, you can optionally use the provided test program to test if the reader functions properly. The test tool is installed when you installing the RFID&NFC reader driver.

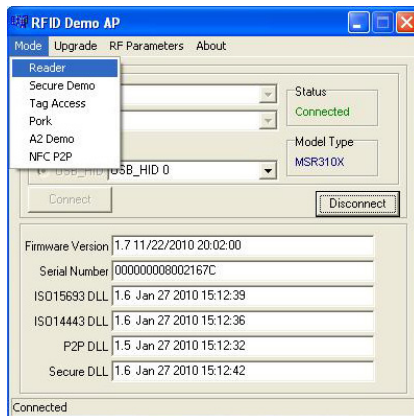
1. To launch the test program:
 - Double-tap the **RFID NFC Demo** shortcut icon  on the desktop.
 - Or, you can launch the test program by tapping **Start > All programs > RFID > NFC_Demo > Demo AP** on Windows 7 or **All Apps list > NFC_Demo > Demo AP** on Windows 8/8.1.
2. The **RFID Demo AP** then opens, with the **Status** column showing **Disconnected**.



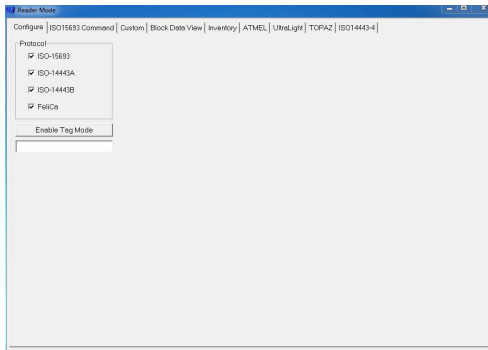
- In the **Interface** group box, select **USB_HID** and click the **Connect** button. The **Status** column then changes to “Connected”, meaning that the RFID/ NFC reader COM port is opened.



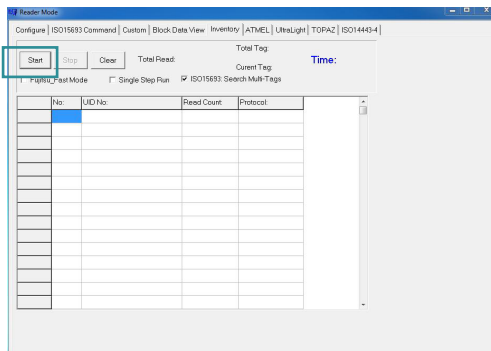
- From the menu bar, tap **Mode > Reader**.



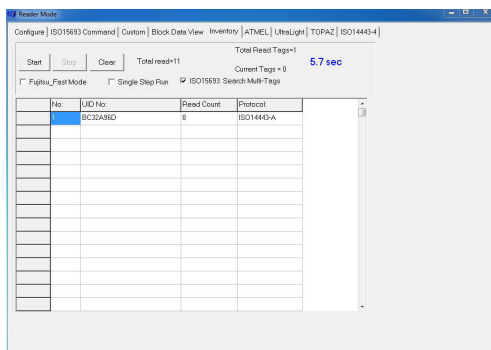
5. A **Reader Mode** window opens. Click the **Inventory** tab.



6. On the **Inventory** tab, click the **Start** button.



7. Tap the RFID/NFC card to the reader. The read and decoded data will be displayed in the table.



Chapter 4

BIOS

A BIOS (Basic Input/Output System) is a special utility usually stored in the ROM on the motherboard inside a computer. When you turn on the computer, the BIOS is immediately activated. During the startup, it checks and loads necessary information to ensure the computer can proceed with loading the operating system. The BIOS Setup Utility is typically accessed with a special key sequence, such as “Delete” or “Esc” key as soon as the computer is powering up.

Once you have entered the BIOS, you can get some system information and configure some hardware parameters. In most cases, there will be no need to make adjustments to the BIOS. The default settings apply to most applications and provide optimal performance.

Caution: If you need to make any change, be careful when making changes to the BIOS. Incorrect settings can cause system boot failure or malfunction.

Note: For system stability and performance, this BIOS utility is constantly improved. The screenshots demonstrated and descriptions hereinafter are for reference only and may not exactly meet what is presented on-screen.

4.1 Accessing the BIOS Setup Utility

To enter and use the BIOS Setup Utility, prepare a USB keyboard first and then:

1. Connect the USB keyboard to the computer first.
2. Power on the computer and press the “**Delete**” or “**Esc**” key immediately after powering on.
3. Then you will enter the BIOS Setup Utility and see the **Main** setup screen.

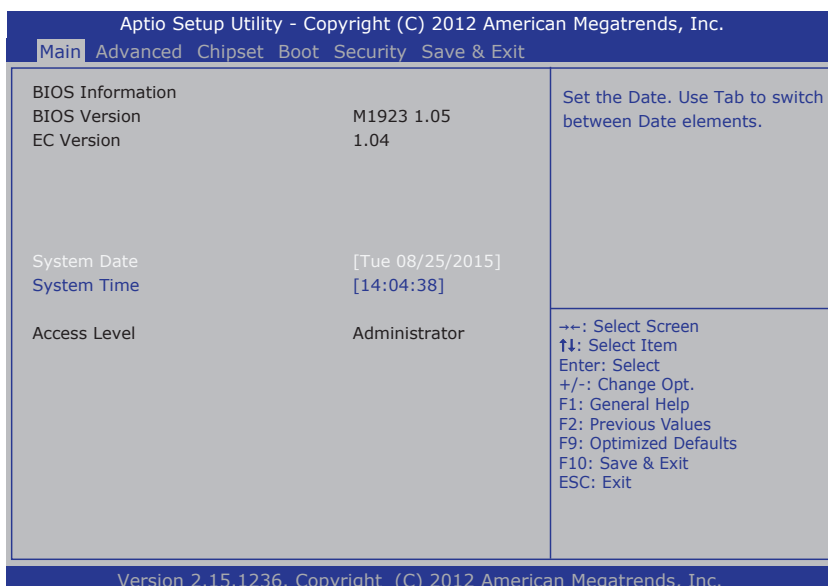
BIOS Setup Utility is mainly a key-based navigation interface. The bottom of the screen shows the keys for navigation and changing the settings. Refer to the table below for instructions on using the keys.

Keys	Descriptions
F1	Activate “General Help” screen.
← →	Move to select a particular configuration screen from the top menu bar / Move to highlight items on the screen.

Keys	Descriptions
↓ ↑	Move to select an item.
Enter	Select or enter a submenu
Esc	On the Main Menu – Exit the setup and not save changes into CMOS. On the Sub Menu – Exit current page and return to main menu.
+ / F6	Increase a numeric value.
- / F5	Decrease a numeric value.
F9	Load the optimal defaults. All settings will be set to the optimal defaults at startup.
F10	Save the changes that have been made and exit the BIOS Setup Utility.

4.2 Main Setup

When you first enter the BIOS Setup Utility, you will enter the **Main** setup screen. It reports basic system information and also allows you to configure the **System Date** and **System Time** settings.



The **Main** setup screen provides the following information and options:

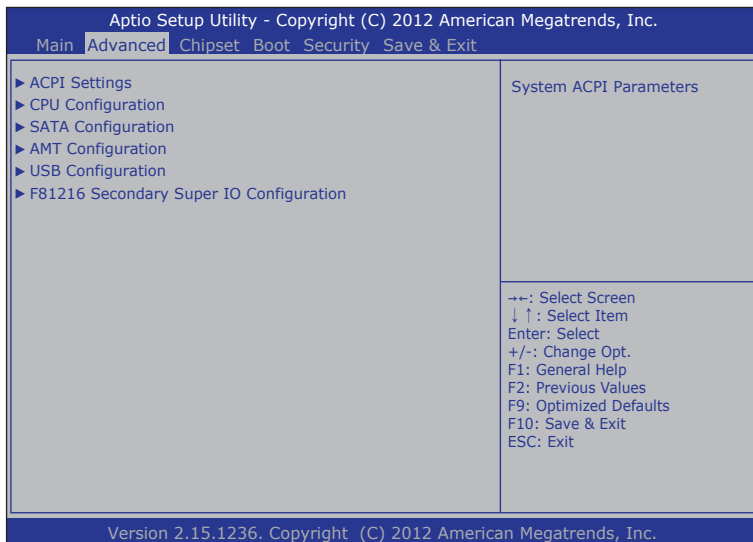
Info / Item	Descriptions
BIOS Version	Displays the computer's model and the BIOS version.
EC Version	Displays the current version of Embedded Controller.
System Date	Sets system date. Valid range is from 1 to 12, 1 to 31 and 2000 to 2099.
System Time	Sets system time. Valid range is from 0 to 23, 0 to 59 and 0 to 59.
Access Level	Displays the current user's access level.

4.3 Advanced Settings

The **Advanced** setup screen allows you to change the system and hardware settings. The **Advanced** screen provides the following setting options:

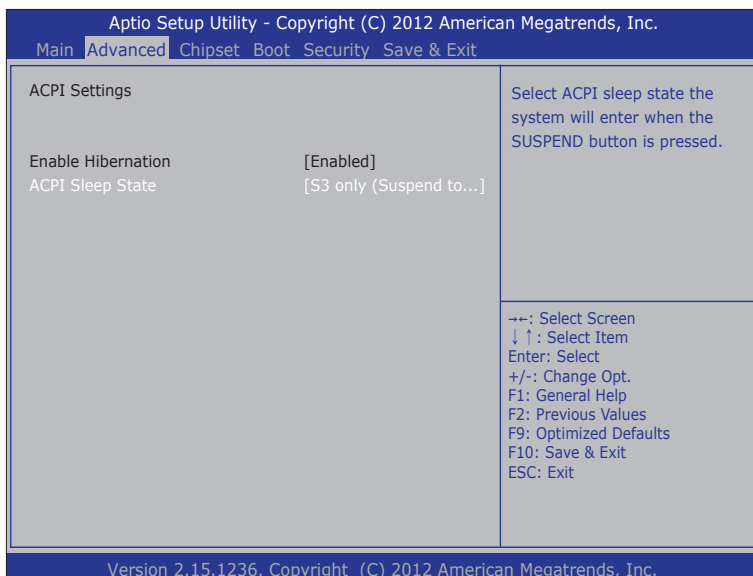
- [4.3 Advanced Settings](#) on page [50](#)
- [4.3.2 CPU Configuration](#) on page [53](#)
- [4.3.3 SATA Configuration](#) on page [54](#)
- [4.3.4 AMT Configuration](#) on page [56](#)
- [4.3.5 USB Configuration](#) on page [58](#)
- [4.3.6 F81216 Secondary Super IO Configuration](#) on page [61](#)

Caution: Be careful when making system and hardware changes. Incorrect settings can cause system boot failure or malfunction.



4.3.1 ACPI Settings

Access this menu to configure the Advanced Configuration and Power Interface (ACPI) settings.



The **ACPI Settings** screen provides the following setting options:

Settings	Descriptions
Enable Hibernation	Enables/Disables system ability to hibernation (OS/S4 sleep state). This option may not be effective on some operating systems. Options: Enabled [default], Disabled
ACPI Sleep State	Sets the ACPI sleep state that system enters when the suspend button is pressed. Options available are: ▶ Suspend Disabled ▶ S1 only (CPU Stop Clock) ▶ S3 only (Suspend to RAM) [default] ▶ Both S1 and S3 available for OS to choose from

4.3.2 CPU Configuration

Access this submenu to identify the CPU and its capabilities including the CPU's model name, processor speed, microcode revision, max./min. processor speeds, processor cores, and so on.

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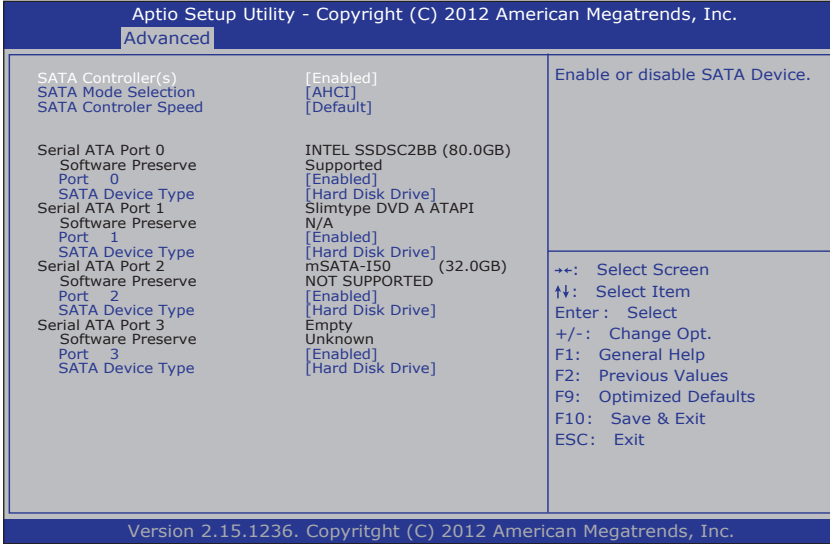
Main **Advanced** Chipset Boot Security Save & Exit

CPU Configuration		
Intel(R) Core(TM) i5-4402E CPU @ 1.60GHz		
CPU Signature	306c2	
Processor Family	6	
Microcode Patch	ffff0006	
FSB Speed	100 MHz	
Max CPU Speed	1800 MHz	
Min CPU Speed	800 MHz	
CPU Speed	2400 MHz	
Processor Cores	2	
Intel HT Technology	Supported	
Intel VT-x Technology	Supported	
Intel SMX Technology	Supported	
64-bit	Supported	
EIST Technology	Supported	
CPU C3 State	Supported	
CPU C6 State	Supported	
CPU C7 State	Supported	
L1 Data Cache	32 kB x 4	
L1 Code Cache	32 kB x 4	
L2 Cache	256 kB x 4	
L3 Cache	3072 kB	
		→←: Select Screen ↓↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit

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4.3.3 SATA Configuration

Access this submenu to view SATA device(s) information and also to configure SATA device(s).



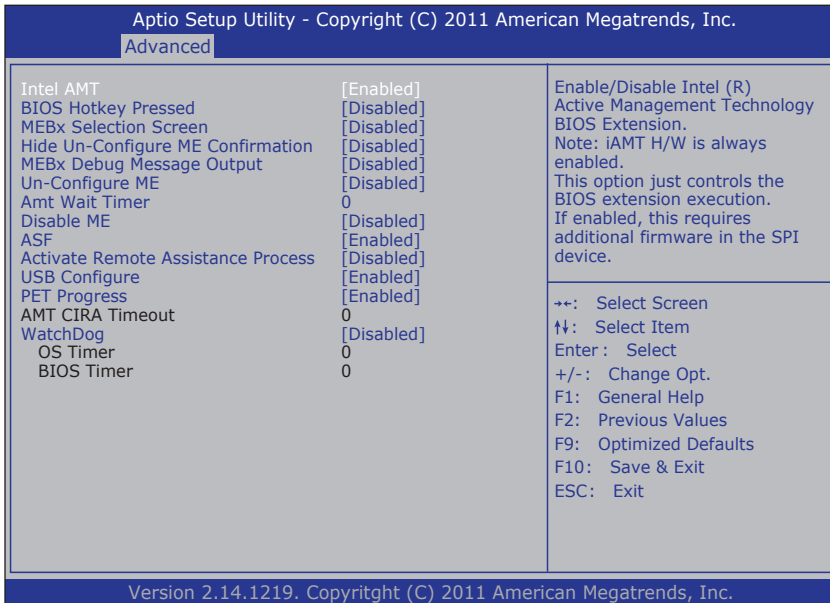
The **SATA Configuration** screen provides the following setting options:

Settings	Descriptions
SATA Controller(s)	Enables/disables the present SATA controller. Options: Enabled [default], Disabled
SATA Mode Selection	Configures how SATA controller(s) operate. Options: IDE and AHCI [default].
SATA Controller Speed	Sets the maximum speed for the SATA controller to support. This setting is available only when SATA Mode Selection is set to AHCI . Options: Default [default], Gen1 , Gen2 and Gen3 .

Settings	Descriptions
Serial ATA Port 0/1/2/3	<p>Displays the information detected on the installed SATA drive and its security mode.</p> <p>Serial ATA Port 0/1/2/3: Displays the information detected if a SATA device is connected to the indicated SATA port.</p> <p>Software Preserve: Indicates whether or not a connected device supports Software Setting Preservation (SSP).</p> <p>Port 0/1/2/3: Enables/disables the SATA port. This setting is available only when SATA Mode Selection is set to AHCI.</p> <p>SATA Device Type: Defines whether the SATA port is connected to a Hard Disk Drive or Solid State Drive. This setting is available only when SATA Mode Selection is set to AHCI.</p> <p>Options: Hard Disk Drive [default] and Solid State Drive.</p>

4.3.4 AMT Configuration

Intel® Active Management Technology (Intel® AMT) is a hardware-based solution that uses out-of-band communication for basic management of client systems, which allows a system administrator to monitor and manage the computers and other network equipment by remote control even if the hard drive is crashed, the system is turned off or the operating system is locked.



The **AMT Configuration** screen provides the following setting options:

Settings	Descriptions
Intel AMT	Enables/disables Intel® Active Management Technology BIOS extensions. Options: Enabled [default], Disabled Note. iAMT hardware is always enabled. This setting only controls BIOS extension execution. When enabled, additional firmware is required in the SPI device.

Settings	Descriptions
BIOS Hotkey Pressed	Enables/disables BIOS Hotkey Press function Options: Enabled , Disabled [Default]
MEBx Selection Screen	Enables/disables MEBx Selection Screen function. Options: Enabled , Disabled [Default]
Hide Un-Configure ME Confirmation	Enables/disables Hide Un-Configure ME without password Configuration Prompt function. Options: Enabled , Disabled [Default]
MEBx Debug Message Output	Enables/disables MEBx Debug Message Output function. Options: Enabled , Disabled [Default]
Un-Configure ME	Enables/disables Un-Configure ME without password function. Options: Enabled , Disabled [Default]
Amt Wait Timer	Sets time to wait before sending ASF_GET_BOOT_OPTIONS.
Disable ME	Sets ME to soft Temporary Disabled function Options: Enabled , Disabled [Default]
ASF	Enables/disables Alert Specification Format, a DMTF (Distributed Management Task Force) standard for remote monitoring, management and control of computer system in both OS-present and OS-absent environments. Options: Enabled [default], Disabled
Activate Remote Assistance Process	Enables/disables CIRA (Client-Initiated Remote Access) boot. Options: Enabled , Disabled [Default]
USB Configure	Enables/disables USB Configure function. Options: Enabled [default], Disabled
PET Progress	Enables/disables PET events progress to receive PET event or not. Options: Enabled [default], Disabled

Settings	Descriptions
AMT CIRA Timeout	<p>CIRA means “Client Initiated Remote Access”. Customizes the time-out for the establishment of MPS connection.</p> <p>This setting is only available when Activate Remote Assistance Process is enabled.</p> <ul style="list-style-type: none"> ▶ Set it to 0 to use the default time-out value of 60 seconds. ▶ Set it to 255 to have MEBx wait until the connection succeeds.
WatchDog	<p>Enables/disables WatchDog Timer. When set as [Enabled], the following sub-items will be available:</p> <ul style="list-style-type: none"> ▶ OS Timer: Sets OS watch dog timer. ▶ BIOS Timer: Sets BIOS watch dog timer.

4.3.5 USB Configuration

Access this submenu to view the USB device(s) enabled in the system. It also configures USB-related features.

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Main Advanced Chipset Boot Security Save & Exit

<p>USB Configuration</p> <p>USB Module version 8.10.28</p> <p>USB Devices: 1 Drive, 1 Keyboard, 1 Mouse, 1 Point, 6 Hubs, 2 SmartCard Readers</p> <p>Legacy USB Support [Enabled]</p> <p>USB3.0 Support [Enabled]</p> <p>XHCI Hand-off [Enabled]</p> <p>EHCI Hand-off [Disabled]</p> <p>USB Mass Storage Driver Support [Enabled]</p> <p>USB hardware delays and time-outs:</p> <p>USB transfer time-out [20 sec]</p> <p>Device reset time-out [20 sec]</p> <p>Device power-up delay [Auto]</p> <p>Mass Storage Devices:</p> <p>Generic STORAGE DEVICE 9454 [Auto]</p>	<p>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.</p> <hr/> <p>←→: Select Screen ↓ ↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</p>
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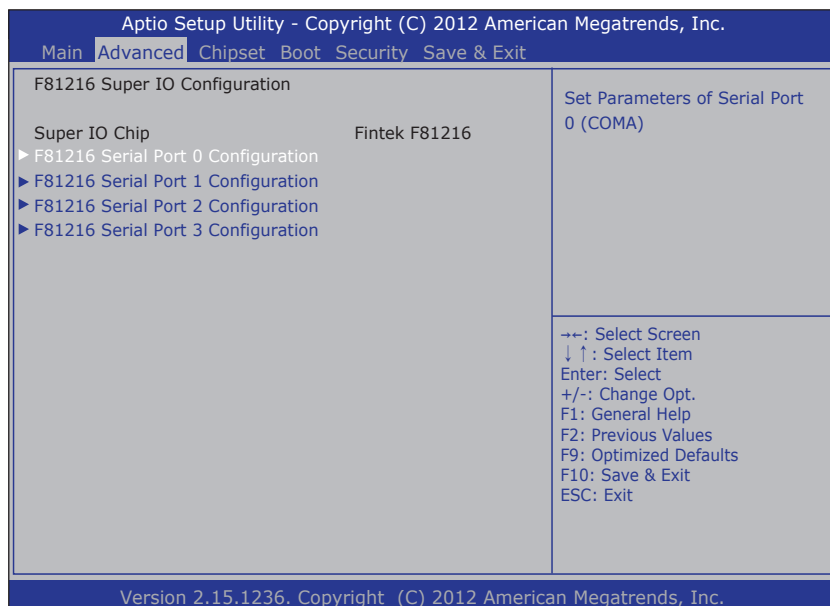
The **USB Configuration** screen provides the following setting options:

Settings	Descriptions
Legacy USB Support	<p>Enables/disables legacy USB support including USB flash drives and USB hard drives.</p> <p>Options:</p> <ul style="list-style-type: none"> ▶ Enabled [Default]: To enable legacy USB support. ▶ Disabled: To keep USB devices available only for EFI specification, ▶ Auto: To disable legacy support if no USB devices are connected.
USB3.0 Support	<p>Enables/disables USB 3.0 controller support.</p> <p>Options: Enabled [default], Disabled</p>
XHCI Hand-off	<p>This is a workaround for operating systems without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.</p> <p>Note: For Windows 7, this setting must be disabled.</p> <p>Options: Enabled [default], Disabled</p>
EHCI Hand-off	<p>This is a workaround for operating systems without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.</p> <p>Note: For Windows 7, this setting must be enabled.</p> <p>Options: Enabled, Disabled [Default]</p>
USB Mass Storage Driver Support	<p>Enables/disables USB Mass Storage Driver Support.</p> <p>Options: Enabled [default], Disabled</p>

Settings	Descriptions
USB hardware delay and time-out	<p>This is a submenu to configure the features of USB hardware delay and time-out. The settings include:</p> <p>USB Transfer time-out: Use this item to set the time-out value for control, bulk, and interrupt transfers. Options: 1 sec, 5 sec, 10 sec, 20 sec [default]</p> <p>Device reset time-out: Use this item to set USB mass storage device start unit command time-out. Options available are: 10 sec, 20 sec [default], 30 sec, 40 sec</p> <p>Device power-up delay: Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor. Options:</p> <ul style="list-style-type: none">▶ Auto [Default]▶ Manual: Select Manual you can set value for the following sub-item: 'Device Power-up delay in seconds', the delay range in from 1 to 40 seconds, in one second increments.
Mass Storage Devices	<p>Use this item to select mass storage device emulation type. Auto enumerates device according to their media format. Optical drives are emulated as "CD-ROM". Device with no Media will be emulated according to a drive type.</p> <p>Options: Auto [Default], Floppy, Forced FDD, Hard-Disk, CD-ROM</p>

4.3.6 F81216 Secondary Super IO Configuration

Access this submenu to configure the system's serial port.

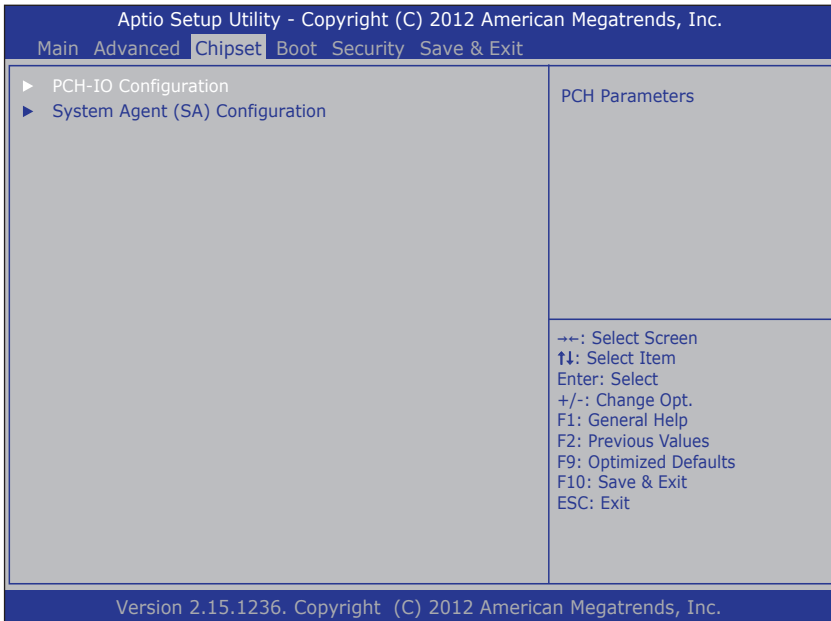


The **Super IO Configuration** screen provides the following setting options:

Settings	Descriptions
F81216 Serial Port 0 Configuration	<p>Configures the system's serial port (COM port). The settings include:</p> <p>Serial Port: Enables/disables the serial port. Options: Enabled [default], Disabled</p> <p>Device Settings: Displays the I/O and IRQ address of the COM port.</p> <p>Autoflow: Use this item to set serial port mode. Options: RS-232 [Default], RS-422, RS-485</p>
F81216 Serial Port 1/2/3 Configuration	<p>Serial Port: Enables/disables the serial port. Options: Enabled [default], Disabled</p> <p>Device Settings: Displays the I/O and IRQ address of the COM port.</p>

4.4 Chipset

Access this **Chipset** menu to configure the system’s chipset settings.



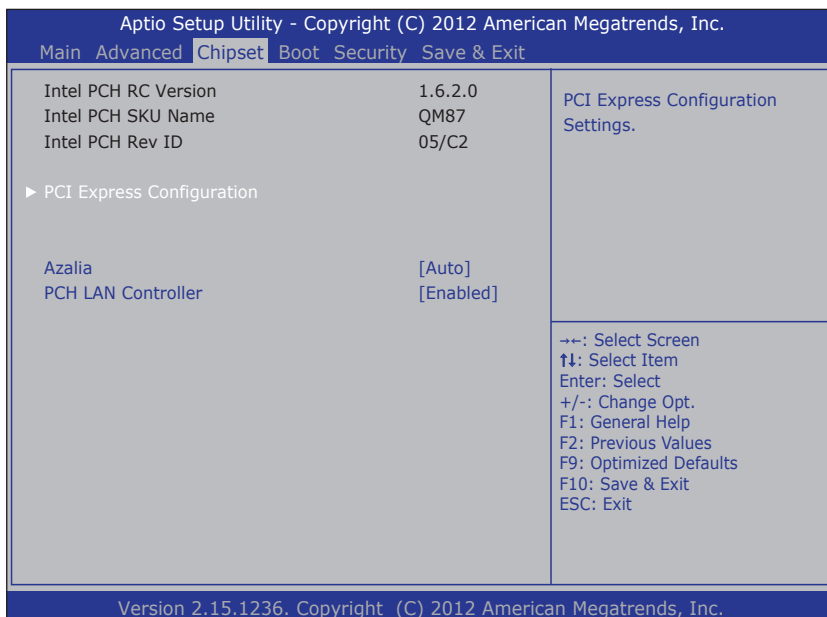
The **System Agent (SA) Configuration** setup screen shows the system agent information and allows you to configure the following setting options:

- [4.4.1 PCH IO Configuration](#) on page 63
- [4.4.2 System Agent \(SA\) Configuration](#) on page 64

Warning: Wrong settings in these submenus may cause system malfunction.

4.4.1 PCH IO Configuration

Access this submenu to configure PCH parameters.



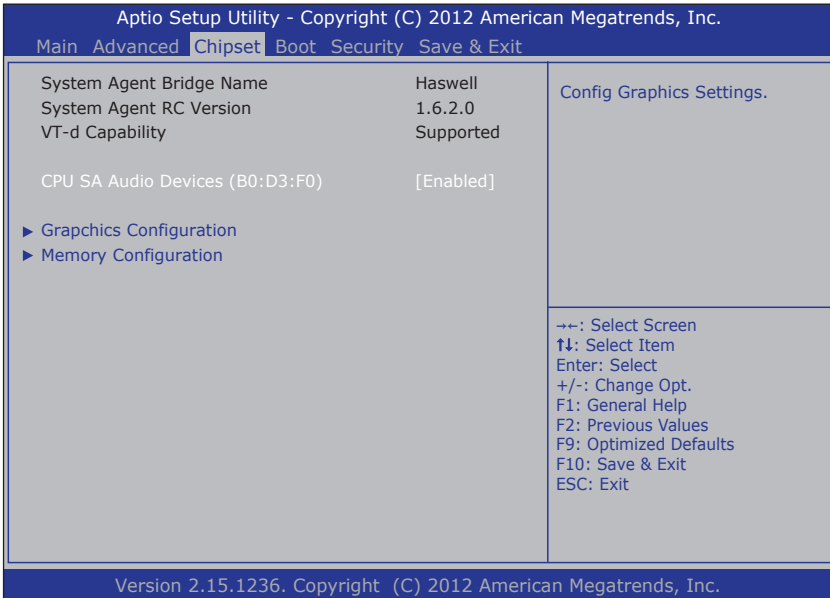
The **PCH IO Configuration** screen provides the following setting options:

Settings	Descriptions
PCI Express Configuration	Configures the PCI Express.
	<ul style="list-style-type: none"> ▶ PCI Express Root Port 5/6/7: Enables/disables the PCI Express port. Options: Enabled [default], Disabled ▶ ASPM Support: To set the ASPM level. Options: Disable: disables ASPM L0s: force all links to L0s state L1: force all links to L1 state L0sL1: force all links to L0s+L1 state Auto [default]: BIOS auto configure ▶ PCIe Speed: To set the PCI Express port speed. Options: Auto [default], Gen 1, Gen 2

Settings	Descriptions
Azalia	<p>Controls the detection of Azalia (Intel HD audio) device.</p> <p>Options are:</p> <ul style="list-style-type: none"> ▶ Auto: Enable the device if installed or disable it if none. ▶ Enabled : Enable it no matter Azalia device is installed or not. ▶ Disabled : Disable it no matter Azalia device is installed or not.
PCH LAN Controller	<p>Enables/disables the onboard network interface card (NIC).</p> <p>Options: Enabled [default], Disabled</p>

4.4.2 System Agent (SA) Configuration

Access this submenu to configure the system agent.

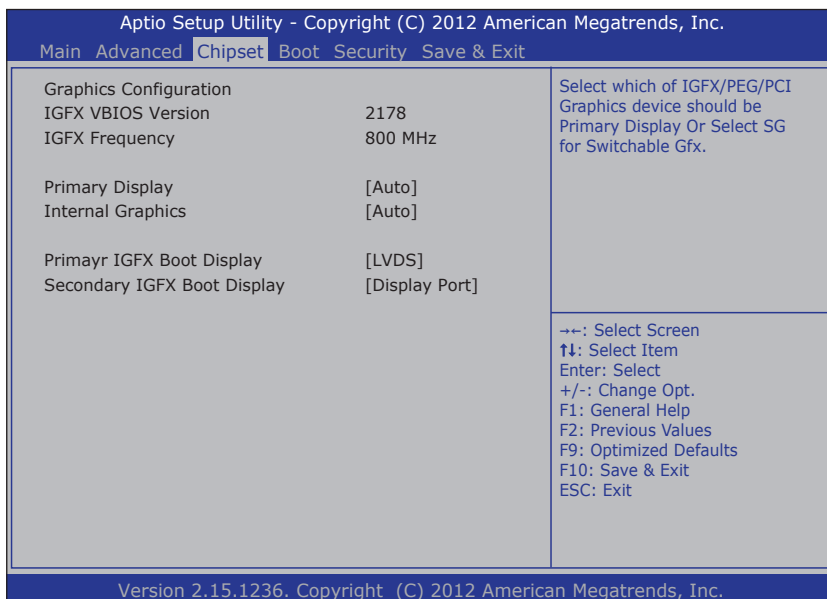


The **System Agent (SA) Configuration** setup screen shows the system agent information and allows you to configure the following setting options:

- **CPU SA Audio Devices (B0:D3:F0):** Enables/disables CPU SA Audio Device.
- [4.4.2.1 Graphics Configuration](#) on page 65
- [4.4.2.2. Memory Configuration](#) on page 66

4.4.2.1 Graphics Configuration

Access this menu to change the graphic settings.



The **Graphics Configuration** screen provides the following information and setting options:

Settings	Descriptions
IGFX VBIOS Version	Display the IGFX(internal VGA) VBIOS version.
IGFX Frequency	Display the IGFX frequency
Primary Display	Select which graphics devices to be the primary display Options: Auto [Default], IGFX , PEG , PCIE .

Settings	Descriptions
Internal Graphics	Enable or Disable the internal graphics. Options: Auto [Default], Enable , Disable .
Primary IGFX Boot Display	Select the video device which will be activated during POST. Note: This option won't be effective when external graphic is using. Secondary Boot display selection will appear based on your selection. VGA mode will be supported only on primary display. Options: LVDS [Default], Display Port .
Secondary IGFX Boot Display	Select the second video device which will be activated during POST. Options: LVDS , Display Port [Default]

4.4.2.2. Memory Configuration

The **Memory Configuration** screen provides the following memory information.

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Main Advanced **Chipset** Boot Security Save & Exit

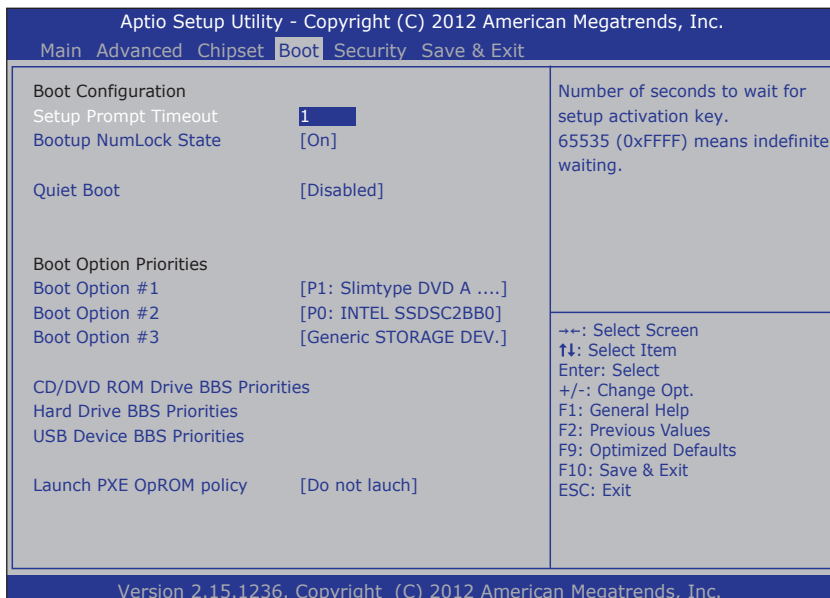
Memory Information		
Memory RC Version	1.6.2.1	
Memory Frequency	1600 Mhz	
Total Memory	4096 MB (DDR3)	
Memory Voltage	1.35v	
DIMM#0	Not Present	
DIMM#1	4096 MB (DDR4)	
CAS Latency (tCL)	11	
Minimum delay time		
CAS to RAS (tRCDmin)	11	
Row Precharge (tRmin)	11	
Active to Precharge (tRASMin)	28	
XMP Profile 1	Not Supported	
XMP Profile 2	Not Supported	

←→: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F9: Optimized Defaults
 F10: Save & Exit
 ESC: Exit

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4.5 Boot

Access this menu to change system boot settings.



The **Boot** screen provides the following setting options:

Settings	Descriptions
Setup Prompt Timeout	Sets how long to wait for the prompt for entering BIOS Setup to show. Set it to 65535 to wait indefinitely. The default setting is 1 (sec).
Bootup NumLock State	Sets whether to enable or disable the keyboard's NumLock state when the system starts up. Options: On [default], Off .
Quiet Boot	Sets whether to display the POST (Power-on Self Tests) messages or the system manufacturer's full screen logo during booting. Leave it as Disabled , which is the default, to display the normal POST message.
Boot Option Priorities	Sets the system boot order.

Settings	Descriptions
CD/DVD ROM Drive BBS Priority	Sets the very 1st boot device among the available CD/DVD drives. *BBS means "BIOS Boot Specification".
Hard Drive BBS Priorities	Sets the very 1st boot device among the available storage drives.
USB Device BBS Priorities	Sets the very 1st boot device among the available USB devices.
Launch PXE OpROM policy	Controls whether to launch UEFI and Legacy PXE OpROM. Options: Do not touch [Default], Legacy Only *PXE means "Preboot Execution Environment", a series of methods to get a typical Windows-based computer to boot up without a hard drive or boot diskette.

4.6 Security

The **Security** menu sets up the administrator password. Once an administrator password is set up, this BIOS Setup utility is limited to access and will ask for the password each time any access is attempted.

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Main Advanced Chipset Boot **Security** Save & Exit

<p>Password Description</p> <p>If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password must be in the following range:</p> <p>Minimum length 3 Maximum length 20</p> <p>Administrator Password</p>	<p style="text-align: center;">Set Administrator Password</p> <hr/> <p>←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</p>
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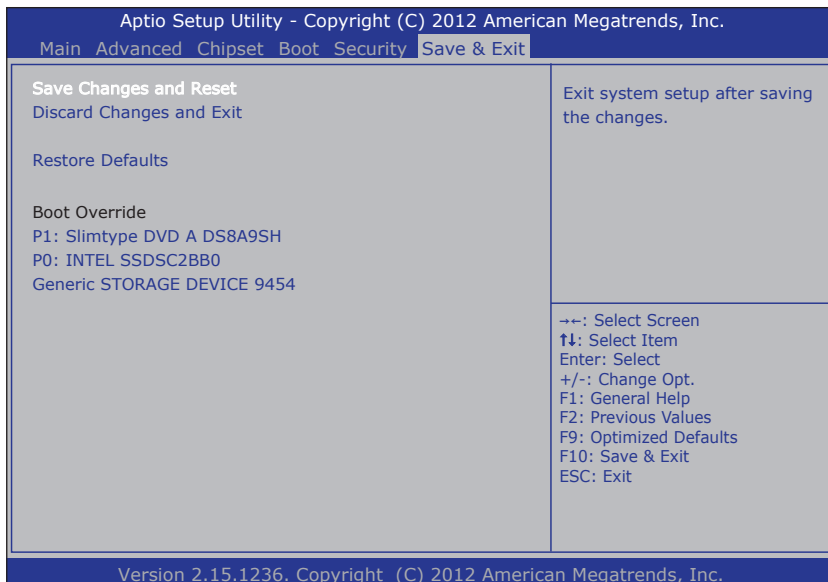
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The **Security** screen provides the following setting options:

Settings	Descriptions
Administrator Password	To set up an administrator password: <ol style="list-style-type: none"> 1. Select Administrator Password. 2. A Create New Password dialog then pops up onscreen. 3. Enter your desired password that is no less than 3 characters and no more than 20 characters. 4. Hit [Enter] key to submit.

4.7 Save & Exit

The **Save & Exit** menu features a handful of commands to launch actions from the BIOS Setup utility regarding saving changes, quitting the utility and recovering defaults.



The **Save & Exti** screen provides the following setting options:

Settings	Descriptions
Save Changes and Exit	<p>Saves the changes and quits the BIOS Setup utility.</p> <ul style="list-style-type: none">▶ This is a command to launch an action from the BIOS Setup utility.▶ When prompted for confirmation, select OK to save the changes and quit the BIOS Setup, or select Cancel to return to BIOS Setup.
Discard Changes and Exit	<p>Discards the changes and quits the BIOS Setup utility.</p> <p>This is a command to launch an action from the BIOS Setup utility.</p> <ul style="list-style-type: none">▶ When prompted for confirmation, select OK to quit BIOS Setup without saving the change(s), or select Cancel to return to the BIOS setup.
Restore Defaults	<p>Loads the defaults to all settings.</p> <p>This is a command to launch an action from the BIOS Setup utility.</p> <p>When prompted for confirmation, select OK to load the defaults, or select Cancel to return to the BIOS setup.</p>
Boot Override	<p>Boot Override presents a list in context with the boot devices installed in the system. Select the device to boot up the system regardless of the currently configured boot priority.</p> <p>This is a command to launch action from the BIOS Setup utility.</p>

Appendix

A. Maintaining the the Battery Pack (CTOS)

If your computer comes with the optional rechargeable battery pack, make sure to follow the instructions below to optimize the service life for your battery.

- The battery should be charged/discharged at temperature between 0 ~ 40°C (32 ~ 104°F).
- The battery should be stored at temperature between -20 ~ 60°C (-4 ~ 140°F).
- If the battery level is less than 10%, fully charge the battery to 100% within 24 hours.
- If the battery will not be in use for more than one week, fully charge the battery to 100% before storage. Also, make sure to charge the battery to 100% once a month during the storage period.
- If the computer is to be stored for a period of time or used infrequently, remove the battery from the computer to prevent leakage.