Legal Information

Warnings

Please pay attention to the tips within the manual so as to avoid personal injury or property losses. The tips for personal injury are indicated in warning triangles while the tips only related to property losses have no warning triangles. The warning tips are listed as follows with the hazardous scale from severe to slight.

⚠ **Danger**
If handled carelessly, death or severe human injury will occur.

⚠ **Warning**
If handled carelessly, death or severe human injury might occur.

⚠ **Caution**
Warning triangle indicates that slight human injury might occur if handled carelessly.

Note
Unexpected result or status might occur, if not handled according to the tips.

Professional Personnel

The product/system covered by the manual can only be handled by qualified and professional personnel. During operation, please follow the respective instructive manuals, especially the safety warnings. The professional personnel have been trained and possess relevant experiences; therefore, he/she could be aware of the risks of the product/system and avoid possible damages.

EVOC Product

Please pay attention to the following instructions:

⚠ **Warning**
EVOC product can only be used according to the descriptions within the manual, including the contents and the relevant technical documents. If the products or components from other companies are required, please get the recommendation and grant from EVOC first. Proper transportation, storage, assembly, installation, debugging, operation and maintenance are prerequisite to ensure product safety and normal operation; therefore, please ensure permitted environment conditions and pay attention to the tips within the manual.

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Trademarks

EVOC is a registered trademark of EVOC Intelligent Technology Co., Ltd. Other product names mentioned herein are used for identification purposes only and may be trademark and/or registered trademarks of their respective companies.

Warranty Terms:

The warranty on the product lasts for two years. If the user has additional requirements, the contract signed between the two sides shall prevail.

Please visit our website: http://www.evoc.com for more information,
or send an email to the Technical Support Mailbox support@evoc.com (International) or support@evoc.cn (Domestic) for consultation.

Hotline: 4008809666

About this manual

Scope of the Manual

The manual is appropriate for EVOC NPC-8128.

Convention

The term “the PC” or “the Product” within the manual usually stands for EVOC NPC-8128.

Instructions

Safety instructions

To avoid property losses or individual injury, please pay attention to the safety instructions within the manual. The warnings within the manual are marked with warning triangle ⚠, whose existence is dependent upon the scale of the potential hazard.

History

The version of this manual:

Version	Time
B00	2016.10
C00	2017.2
C01	2018.5
C02	2018.7

Safety Instructions

General Safety Instructions

⚠ **Caution**
Before you have read related safety instructions, please do not expand your device.

This device is compliant with related safety requirements. If you have any doubt about the effectiveness of installation in the planned environment, please contact your service representative.

Repair

The PC can only be repaired by authorized personnel.

⚠ Warning
Unauthorized opening of the PC and improper repair may cause serious damage to the PC or endanger users' personal safety.

System Expansion

Only system expansion devices designed for this PC can be installed. Installing other expansion devices may damage the system and violate regulations on radio interference suppression. To know the system expansion devices that can be installed, please contact technical support team or local distributor.

⚠ Caution!
If the PC is damaged due to improper installation or replacement of system expansion devices, the warranty for the product will become invalid.

Battery

The battery can only be replaced by qualified personnel.

⚠ Caution!
If the battery is not replaced according to the instructions, it may have the danger of explosion. It can only be replaced by the same type of battery or batteries recommended by the manufacturer. The used battery must be disposed according to local laws and regulations.

⚠ **Warning!**
Danger of explosion or release of hazardous substances may exist! Therefore, please do not put the Li-ion battery into fire, weld it onto cell body, open, short-circuit or reverse polarity of the battery, and do not heat it up to above 100℃. Dispose the battery according to the rules, and avoid direct sunlight, moisture and condensation.

ESD Instructions

The following label can be used to identify the modules that contain electrostatic sensitive devices:

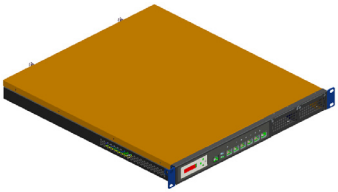
When operating the modules that contain electrostatic sensitive devices, please follow the instructions below:

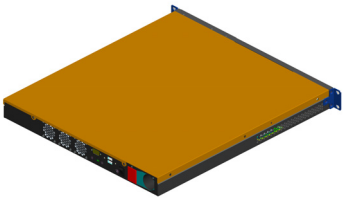
- When operating the modules that contain electrostatic sensitive devices, make sure to release static electricity on your body (for example, by touching a grounded object).
- All the devices and tools should not contain ESD.
- Before installing or removing modules that contain ESD, make sure to pull out the power plug and remove the battery.
- When assembling modules that contain ESD, always handle them by their edge.
- Please do not touch any connector pin or conductive part on the modules that contain ESD.

Contents

1. Product Introduction

1.1 Overview





NPC-8128 a high-performance network application platform based on X86 architecture. The PC contains Intel® H110/C236 chipset, supports LGA1151 package Intel 6th-generation and 7th-generation i3, i5, i7, Xeon E3-1200 v5/v6 family processors(Among them, H110 platform does not support Xeon E3-1200 v5/v6 family), onboard two DDR4 memory slots, and supports Windows 7 32bit/64bit, Windows 8.1 64bit, Windows10 64bit, and Linux (Kernel 2.6 above) operating systems.

The PC adopts standard 1U, 19-inch rack mount and modular structure design, onboard six Gigabit electrical ports, supports up to three-group ByPass, one PCIE X8 slot and one CFast card expansion (optional), also expandable to one (H110 chipset) or two (C236 chipset) ENS network modules. The PC can meet various network security application needs on the market.

NPC-8128 can be widely used in firewall, anti-virus wall, load balance, Internet access management and audit, application delivery, flow traffic management, VPN, DNS, IDS/IPS, UTM and etc.

1.2 Specifications

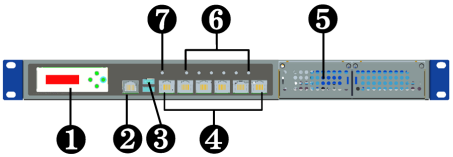
Item		Definition
Main Functional Index	Microprocessor	Supports LGA1151 package Intel 6th-generation and 7th-generation i3, i5, i7, Xeon E3-1200 v5/v6 family processors. Among them, H110 platform does not support Xeon E3-1200 v5/v6 family
	Chipset	Intel® C236/H110
	Memory	Provides two 288Pin DDR4 memory slots, supports Un-buffered, NON-ECC UDIMM memory, dual-channel function. A single memory module supports up to 16GB memory capacity, which brings the total memory capacity to 32GB.
	Display	➢ Supports VGA output display ➢ Under Windows10 64-bit system, the lowest resolution supported is 640×480 32bpp@60Hz, and the highest resolution supported is 1920×1200 32bpp@60Hz. Under other systems, the resolutions are fixed and cannot be adjusted
	Network	Provides six 10/100/1000Mbps LAN ports. LAN1 supports Wake-On-LAN function and network PXE boot. The motherboard itself supports up to 3-group network Bypass function. Depending on motherboard configurations, the network Bypass function has three options: 2-group, 3-group and Not-supported. 2-group Bypass corresponds to LAN3 and LAN4, LAN5 and LAN6; 3-group Bypass corresponds to LAN1 and LAN2, LAN3 and LAN4, LAN5 and LAN6. Note: When the models of motherboards have no (B) suffix, LAN1 of NET-1828VD6N-01 and NET-1828VD6N-02 do not support Wake-On-LAN.

	Storage	➢ Supports one 3.5″ HDD bay ➢ Supports one CFast card expansion (optional)
	Expansion bus	➢ When H110 chipset is used, it is expandable to one EVOC standard ENS modular card ➢ When C236 chipset is used, it is expandable to two EVOC standard ENS modular cards
	External IO ports	➢ 1 x COM port (RJ45), supporting serial port redirection. ➢ 6 x LAN ports ➢ 2 x USB 2.0 ports
Major Performance Index	**External dimensions (excluding mounting ear)**	440mm(W) × 43.6mm(H) × 500mm(D) (NPC-8128) 440mm(W)× 43.6mm(H)× 550mm(D) (NPC-8128-05)
	Net weight	About: 8 Kg (excluding package and accessories)
	Color	Color of the PC: Diamond black
	Temperature	➢ Operating temperature: 0℃～45℃ ➢ Storage temperature: -10℃～+60℃
	Humidity	Relative humidity: 40℃，30%～90%(non-condensing)
	EMC	➢ Radiation disturbance: GB 9254-2008 Class A ➢ Conduction disturbance: GB 9254-2008 Class A ➢ GB/T 17626.2.2006 ESD Level 2 ➢ GB/T 17626.4-2006 Burst Immunity Level 2 ➢ GB/T 17626.5-2008 Surge(impact) immunity Level 2
	RELIABILITY	➢ MTBF≥50000h ➢ MTTR≤0.5h
	Safety	Meets basic requirements for GB4943

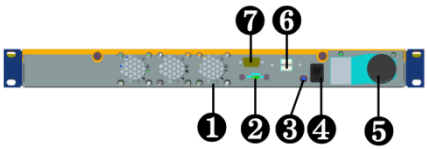
	Mechanical and environmental adaptability	➢ Anti-vibration: 5-200Hz/1.0g acceleration, amplitude: 0.5mm (non-power-on status) ➢ Anti-shock: 10g acceleration, 11ms duration ➢ Noise: ≤55dB
	Power feature	➢ Input voltage/frequency: 220VAC/50Hz ➢ Power consumption of the PC: 51.5W (H110 platform I3 6100 CPU standby status) Power consumption of the PC: 74.2W (H110 platform I3 6100 operating BurnIntest 100%)

1.3 Operating Instructions

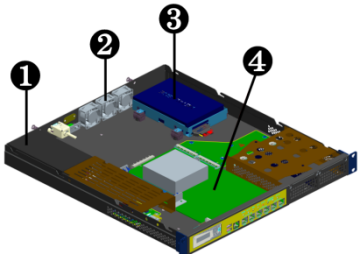
1.3.1 External Functions

Front View of the PC	Location	Description
	1	LCD module (optional)
	2	Console port
	3	USB port
	4	LAN
	5	ENS empty bracket
	6	LED (silk screen printing has function indication)
	7	Reset button

Note: When the models of motherboards equpped with the PC have no (B) suffix, locations of the Console port and USB port on the front panel are mutually exchanged. Please see the actual products for configurations.

Rear View of the PC	Location	Description
	1	Cooling fan
	2	Bypass switch
	3	Ground screw
	4	Power switch
	5	Power supply (optional)
	6	USB(optional)
	7	VGA port (optional)

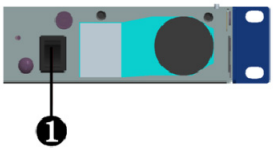
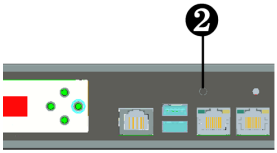
1.3.2 Internal Layout

Internal Layout of the PC	Location	Description
	1	Power module (optional)
	2	Cooling fan
	3	HDD bay
	4	Motherboard

1.3.3 Operation Control

⚠ **Warning**
Pressing On/Off button won't cut off the power of the PC!

⚠ **Caution**
When the PC executes hardware reset, data may be lost.

Control Button	Location	Description
	1	On/Off button used to switch on/off the PC
	2	Reset button A pointed object or a clip can be used to operate the reset button. Pressing this button will trigger hardware reset.

1.4 Status LED

Display	Meaning	LED	Description
PWR	Displaying PC status	Off	Disconnected from power
		Green	PC is operating
HDD	Displaying hard drive status	Off	No access
		Yellow	Being accessed
Bypass1	Bypass1 status indication	Off	Bypass1 disabled
		Red	Bypass1 enabled
Bypass2	Bypass2 status indication	Off	Bypass2 disabled
		Red	Bypass2 enabled
Bypass3	Bypass3 status indication	Off	Bypass3 disabled
		Red	Bypass3 enabled
USER DEFINE	User-defined LED	Off	User-defined
		Red	User-defined

2. Application Scheme

2.1 Transportation

Well-packaged products are suited for transportation by truck, ship, and plane. During transportation, products should not be put in open cabin or carriage. During transshipping, products should not be stored in open air without protection from the atmospheric conditions. Products should not be transported together with inflammable, explosive and corrosive substances and are not allowed to be exposed to rain, snow and liquid substances and mechanical force.

2.2 Storage

Products should be stored in package box when it is not used. And warehouse temperature should be 0°C ~ 40°C, and relative humidity should be 20% ~ 85%. In the warehouse, there should be no harmful gas, inflammable, explosive products, and corrosive chemical products, and strong mechanical vibration, shock and strong magnetic field interference. The package box should be at least 10cm above ground, and 50cm away from wall, thermal source, window and air inlet.

Caution!
Risk of destroying the device! **When shipping the PC in cold weather, please pay attention to the extreme temperature variation. Under this circumstance, please make sure no water drop (condensation) is formed on the surface or interior of the device. If condensation is formed on the device, please wait for over twelve hours before connecting the device.**

2.3 Opening the Box and Initial Examination

2.3.1 Opening the Box

Please pay attention to the following issues when opening the box:

- Do not discard the original packing material. Please keep the original packing material for re-transportation.
- Please keep the documentation at a safe place. The documentation, which is a part of the device, is required for initial device debugging.
- When doing the initial examination, please check whether there are distinct damages to the device caused during the transport.
- Please check whether the delivery contains the intact device and all of the independently ordered accessories. Please contact the customer service when any unconformity or transportation damages occur.

2.3.2 Markings for PC Identification

Attention
When the product needs to be repaired or after it has been stolen, these codes can be used to identify the PC. Please do not rip them off.

Serial number: located on the chassis body (as shown below)

2.4 External Environment Conditions

The following conditions should be considered when planning the project:

- The weather and mechanical environment conditions specified in the operation manual should be observed.

- Please avoid extreme environment conditions. The PC should be protected against dust, moisture and heat.
- Please avoid direct exposure to sunlight.
- Please make sure that other assemblies and side of cabinet are at least 50mm and 100mm away from the top and below the PC respectively.
- Please do not block the ventilation hole of the PC.
- The installation position requirement for the PC should be always observed.
- The connected or installed I/O should not generate reverse voltage of more than 0.5V inside the PC.

3. Product Installation

3.1 Installation Information

Before installing the PC, please read the installation instructions below:

Attention
When carrying out installation in the switch cabinet, please observe assembly guidelines and related DIN/VDE requirements, or specific regulations of the country/region.

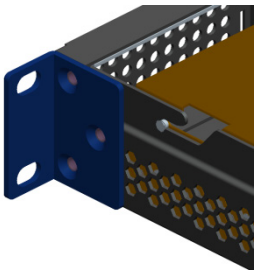
3.2 Mounting Method

■19″ Rack Mount □Desktop □Embedded Panel

□Wall Mount □VESA Standard Arm □Portable

□Others_____

3.2.1 19″ Rack Mount

	Step: As shown in the left picture, use screws to fasten the PC onto the cabinet. Note: The PC must be placed on the supporting board or guiding rail. Do not fasten the PC only by the screws on the front panel.

⚠Warning
Please make sure the total carrying capacity of the wall or ceiling is at least four times as much as the total weight of the PC (including cabinet bracket and accessory expansion modules).

4. PC Connection

4.1 Things to Know before Connection

⚠ **Warning**
The connected or built-in peripherals with opposite polarities are not allowed.

⚠ **Warning**
The device only operates when connecting with grounded power. No operation is allowed when the device power is ungrounded or only impedance is grounded.

⚠ **Warning**
Rated voltage of the device in use shall be in accord with power feature of the product.

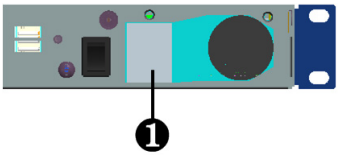
Note:
Only the peripheral devices approved for industrial application can be used. When operating the PC, hot swappable IO modules (USB) can be used. The IO devices without hot swap function can only be connected when the PC is powered off.

4.2 Product Grounding

Low impedance ground connection is more helpful to release the interference produced by the external cables, the signal cables or the cables connecting the IO module to the grounding system.

Ground Terminals	
The ground terminal ① (large surface and large area contact) shall be connected with the cabinet installed with the PC or the central grounding busbar on the device. The minimum cross section area of the cable shall be no less than 2.5mm^2, and the grounding resistance shall be no more than 0.1Ω.	

4.3 Connecting the Device to Power

Steps to connect the device to power	
Connect the power cable to the socket ①. Before insertion, please confirm that the input voltage complies with the power feature of this product.	

⚠ **Danger**
Disconnect the power source and data cable during a lightning storm.

Attention
The PC is completely isolated from the power supply only by disconnecting the power connector.

5. Debugging

5.1 Operating System

- Supported operating systems: Windows 7 32bit/64bit, Windows 8.1 64bit, Windows10 64bit, and Linux (Kernel 2.6 above) operating systems.

Notes: 1. Some systems cannot directly use USB device (USB optical drive, U disk, and etc.) for installation, such as Windows7 and WindowsServer2008/2008 R2, please use SATA optical drive for installation. As for Windows family, Win8 and above systems are needed to support driver of this platform USB controller. As for Linux, CentOS 6.4 or Linux and above systems of same level kernel environment is required to support driver of this platform USB controller.

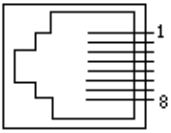
2. Display driver: Intel only provides Windows10 64bit display driver; other systems have no display driver;

3. Network card driver: Intel does not provide driver of network card I211 of Server system.

5.2 Port Definition

5.2.1 COM port

The PC provides one RJ45 COM port, supporting serial port redirection. Its pin definition is as follows:

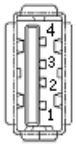


Console

Pin	Signal Name
1	RTS#
2	DTR#
3	TXD
4	GND
5	GND
6	RXD
7	DSR#
8	CTS#

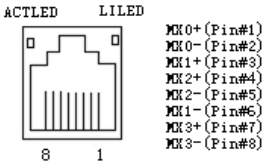
5.2.2 USB Port

Two USB2.0 ports on the front panel. Their pin definitions are as follows:

	Pin	Signal Name
 USB1, USB2	1	+5V_USB
	2	USB_Data-
	3	USB_Data+
	4	GND

5.2.3 LAN Port

ACTLED and LILED are the green and dual-color LEDs beside the Ethernet port, indicating LAN activity status and network speed.



(ETH-0, ETH-5)

ACTLED (single color: green)	Network Activity		LILED (two colors: orange and green)	1000Mbps network speed
			Green	1000Mbps
Flash	Data being transmitted		Orange	100Mbps
Off	No data being transmitted		Off	10Mbps

6. Software Introduction

Software Name	Description	Supported Range
BPI	BIOS programming interface specification, which provides unified interface for software to access hardware.	All supporting BPI motherboards and PCs of EVOC company
eManager	A platform management application software developed based on BPI, which enables users to check the status of embedded PCs, keep daily records, and basic functions commonly used by embedded computers, such as WDT, GPIO, Hardware monitoring, and etc.	All the motherboards/complete PCs that support BPI can run eManager, and the sub-functions depend on the specific motherboard. For those which do not support BPI, customization service can be provided. (Please consult customer service for the cost).

6.1 BPI Overview

EVOC BPI (BIOS Programming Interface) is a cross-platform, easy-to-maintain software interface specification, which supports access to hardware under the Protected Mode of 32-bit or 64-bit operating system and supports multi-process and multi-threading hardware access. BPI is a bridge between hardware and application software, and its purpose is to provide a unified standard interface for the application layer (in the form of library function, similar to library function of standard C). With BPI, application software engineer do not need to care about the specific hardware solution of the motherboard. The users can use BPI library to rapidly develop their own software products, and when the hardware of the motherboard is upgraded, there is no need to modify the application software or driver and the former software can operate on the new platform normally. BPI has greatly sped up the product development and reduced the maintenance cost. The BPI architecture is shown in the Figure 1 below:

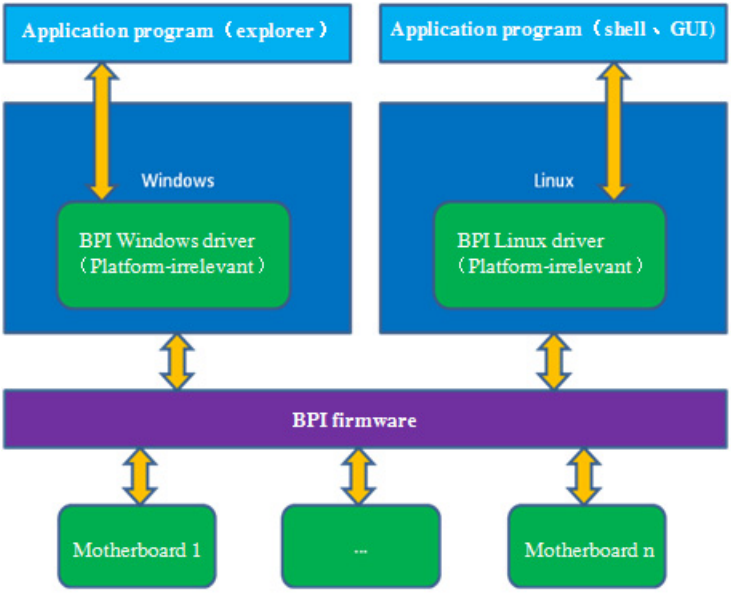


Figure 1 BPI architecture

1. Function Supported by BPI

1) Watchdog

Supports Watchdog boot, stop and feed Watchdog function.

2) GPIO

Supports GPIO input/output programming.

3) Hardware monitoring

Supports monitoring of motherboard CPU temperature, system temperature, fan rotation speed and motherboard core voltage detection, such as CPU Core voltage, V12.0, battery voltage, and etc.

The user can use BPI library for second development based on application requirement, for example:

a) Detecting CPU temperature: If the temperature is too high, a buzzer will be triggered to send alarm.

b) To control peripheral devices by GPIO programming.

2. Advantages of BPI

1) Platform Irrelevant

It is an interface provided by BPI to application layer, which means the BPI library function is platform-irrelevant, so the software developed by BPI function library can operate on a new hardware platform supporting BPI function normally without making any modification.

2) Security and High Reliability

The BPI function library accessing the hardware is programmed by the motherboard developer and is strictly tested; therefore, it can avoid system malfunction caused by improper operation of the system hardware.

3) Easy Maintenance

Traditional WDT and GPIO programming are closely related to the hardware with complicated test and debug process and software of different platforms; however, the software developed by BPI only requires one set of the maintenance software.

4) Low Cost

Developing the applications by BPI will not result in additional hardware and software cost. Application software engineer can conveniently use BPI library functions for second development, and do not need to pay attention to access information of specific hardware. So it will greatly reduce the development difficulty, shorten development cycle and boost time-to-market for the system integrator.

6.2 FMI Overview

FMI (Firmware Management Interface) is management software developed based on BPI specifications. Currently, FMI supports eLogo function. For its test program, please refer to the eManager software in the user manual CD.

1) eLog

eLog keeps operation records of the PC in details, such as the time for first boot, completion time of the test, date of production, time of each power-on/off, total times of power-on of the system, times of illegal power-off, total online time length of the PC, total heart beat times of the CPU. eLog management information can provide valuable reference for failure analysis and product upgrade.

BPI library address: please see “Software\Chinese\BPI”

Or “Software\English\BPI” in the enclosed CD

BPI Library Function Operating Manual

After installing “BPI X Setup.exe”, a BPI Library Function Operating Manual will be automatically generated, and the operation instructions can be found in “Start”→“Program”→“EVOC” →“evoc_bpi_x”.

6.3 eManager Software

eManager software is a device management platform software developed by EVOC. eManager software can be used for system operation abnormality monitoring, setup of GPIO input/output mode and electrical level, real-time monitoring of temperature, fan and voltage status. Among other functions, the eManager software can predict HDD life, helping users to use and manage the device effectively. The software has the following functions:

- Watchdog (WDT)
- GPIO
- Hardware detection
- Keep records for power-on/off time and draw the time data curve
- HDD SMART information

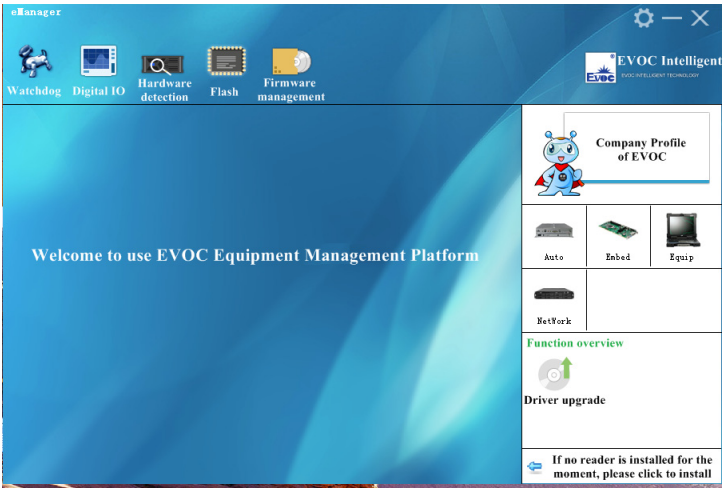
6.3.1 Operating Environment

Take Windows operating system as an example, if customer needs library function provided by BPI, self-developed application program, it only needs to include EVOC_BPI_DLL.dll, BPI32.sys and BPI64.sys. If the customer needs to operate, eManager software, directly unzip BPI3.0 installation packet we provided for installation and boot it up. **(Operation of win7 and above operating system needs administrator authority).**

6.3.2 Function

1. Welcome Interface

After the software is opened, the following welcome interface will appear:



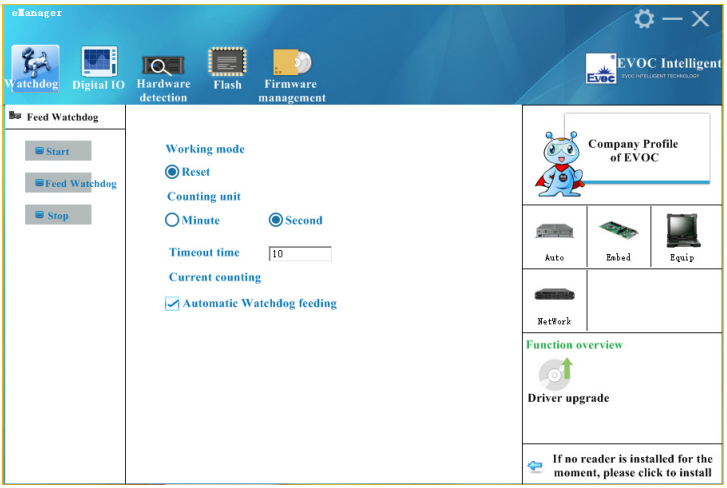
2. Watchdog (WDT)

The effect of Watchdog is shown in the picture below.

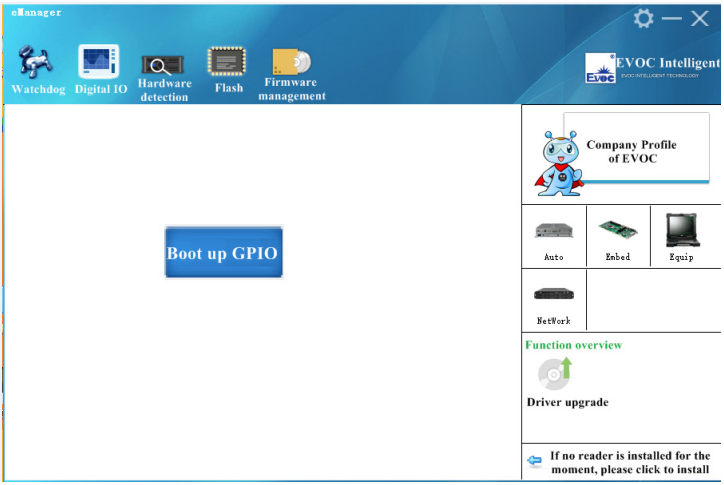
Using method: First carry out setup. The mode is reset mode; counting unit can be minute or second; timeout can be any figure within 1-255. After the setup is finished, press “Start” button on the left, and Watchdog starts counting down. “Current time” shows the current time for counting-down. Counting-down in reset mode means the PC reboots at 0. During counting-down, “Feed Watchdog” button can be pressed to restart counting-down from the set timeout time. Press “Stop” button to stop Watchdog. Exiting the program when Watchdog is counting down will also stop Watchdog. If “Automatically feed watchdog” option is selected, when the counted time is less than 3 seconds, Watchdog will be automatically fed.

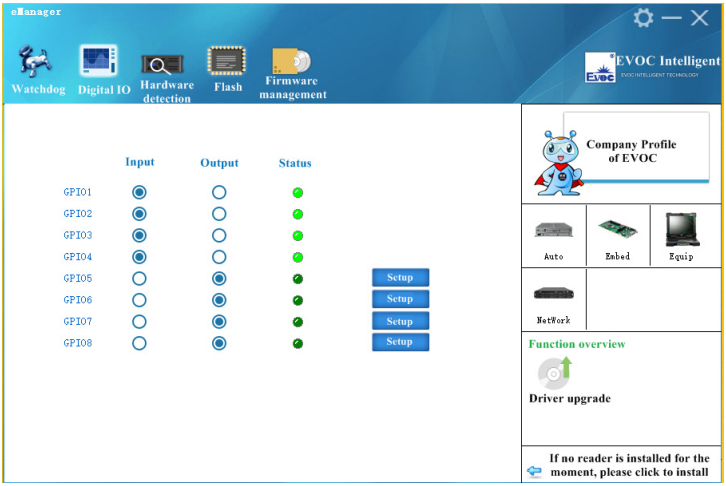
Function: Monitors whether the system can be normally operated, and carry out reset

for abnormality. When abnormality occurs to the system, Watchdog cannot be fed automatically. After counting-down is finished, the system will restart, and recover from system error.



3. GPIO



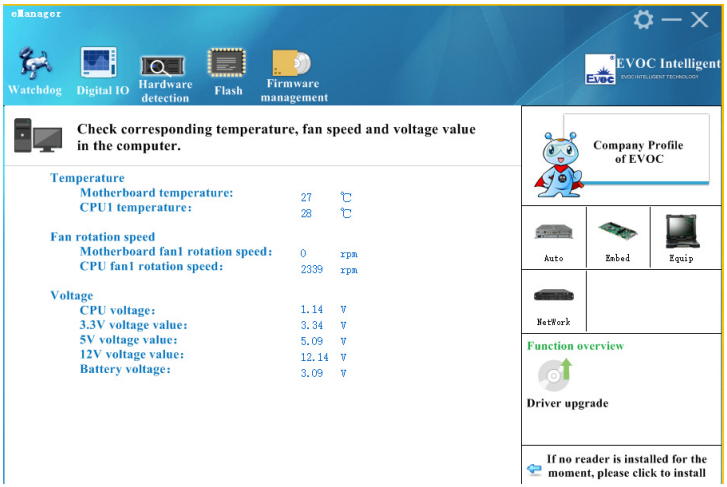


The effect of GPIO is shown in the above picture.

Using method: GPIO is not enabled by default, to avoid the conflict if there is also GPIO setup in the user program. GPIO supports up to 64Pin display. When it is more than 8Pin, there will be scroll bar on the interface. GPIO input/output mode can be set up in the corresponding single option box. The electrical level is indicated by green LED: On means high level; Off means low level. When GPIO is output mode, the electrical level status can be switched by corresponding “Setup” button on the right. If it is a network-type motherboard, the special LED of the motherboard will also be displayed and can be set up.

Function: Setup of GPIO and Network LED

4. Hardware Detection



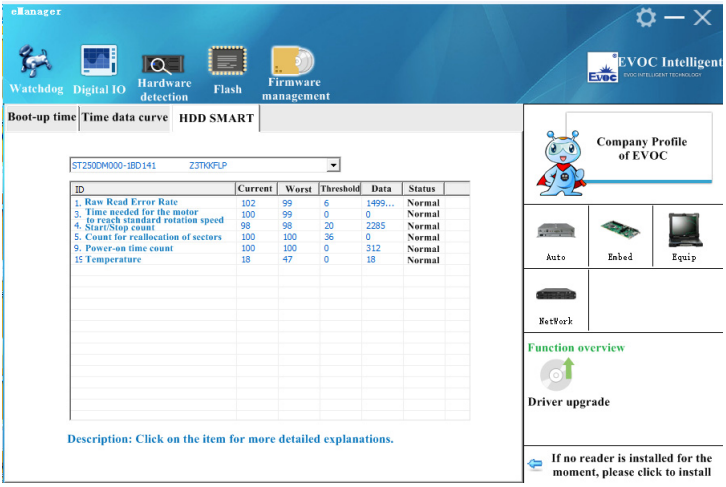
The effect of hardware detection is shown in the figure above.

Method: After the software switches to hardware detection interface, it will automatically acquire temperature, fan speed, voltage and other information, refreshing at a 2S interval.

Function: real-time acquisition of hardware operating status.

6.3.3 Firmware Management

1. HDD SMART

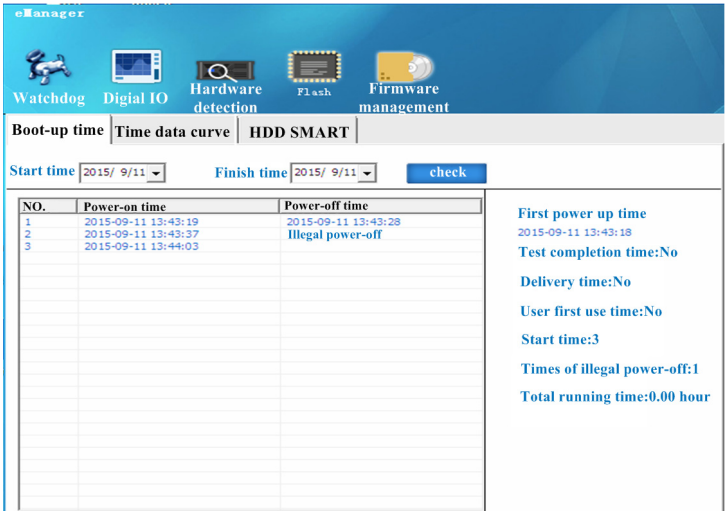


The effect of HDD SMART is shown in the picture above.

Using method: Select HDD in the dropdown list, then SMART information related to HDD performance will be displayed in the list box.

Function: To check SMART information related to HDD performance, which helps predict service life of HDD, and avoid data loss caused by damage to HDD.

2. Boot-up time



Boot-up time effect is shown in the above picture

Using method: Select start time and finish time to be checked, check them, and the listbox will single out the record for times of power-on/off within a specified time span. The times of illegal power-off and total operation time of the PC can also be displayed.

Function: To monitor operating status of the PC. To keep record for times of illegal power-off

3. User Programming

The user can directly use eManager software for management of the device. If users intend to program software by themselves. Please refer to the complete routine of VB, VC, C++Builder, Delphi and BPI Programming Interface Operation Manual in the enclosed CD.

7. Installing Expansion

7.1 Opening the PC

⚠Caution
Only authorized and qualified personnel is allowed to open the PC. During warranty period, the users are only allowed to install expansion memory and expansion card module.

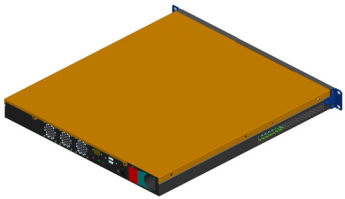
⚠Caution
The electronic components contained in the PC may be damaged by ESD. Therefore, please take preventative measures before opening the PC. Please see the "ESD Guideline" for regulations related to operation of ESD-sensitive components.

Notes: In following situations, Philip slot type screwdriver needs to be used:

1. The screws to tighten ENS empty bracket and chassis.
2. The screws to tighten shield board and chassis.
3. The screws to tighten LCM screen and chassis.

Preparation Work

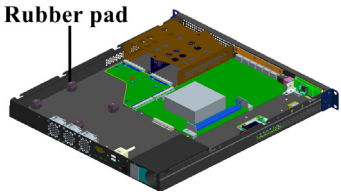
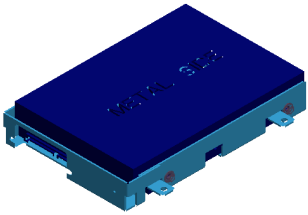
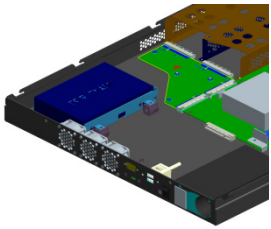
Disconnect the PC from the power source.

Steps to open the PC		
1	Loosen the sunkhead screws on the chassis cover	
2	Remove the chassis cover	

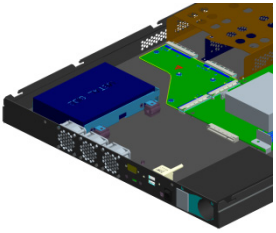
7.2 HDD Expansion

⚠Caution
The HDD can only be replaced by authorized personnel.

Installing the HDD module

Installation steps		
1	Opening the PC	
2	Tighten the shock-absorption rubber pad onto the chassis pressure riveting screws.	
3	Use screws to tighten HDD and HDD bracket.	
4	Fasten the HDD module to the shock-absorption pad.	

Removing the HDD module

Removal steps		
1	Open the PC	
2	Loosen the screws and take out the HDD module.	

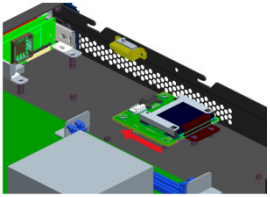
7.3 Installing/Removing CFast Card (optional)

Preparation Work

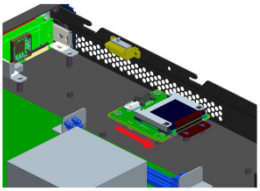
Disconnect the PC from power source.

⚠Caution
The electronic components on the PCB are extremely sensitive to ESD. When operating these components, make sure to take proper preventative measures. Please see the "ESD Guideline" for regulations related to operation of ESD-sensitive components.

Installing the CFast card

Installation steps		
1	Opening the PC	
2	Insert the CFast card, and use screws to fasten the CFast card bracket.	

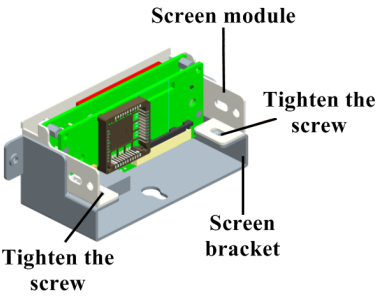
Removing the CFast card

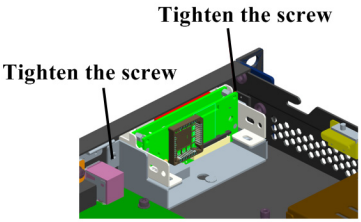
Removal steps		
1	Opening the PC	
2	Loosen the screws and the CFast card bracket. Take out the CFast card module.	

⚠Caution
If the CFast card meets obstruction, reverse it and try again. Do not insert the CFast card by force.

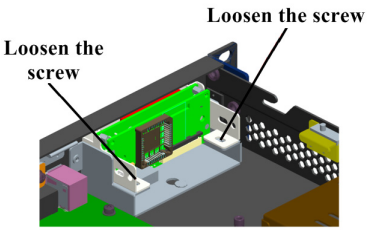
7.4 Installation/Removal of LCD Module (optional)

Installing LCD module

Installation steps		
1	Opening the PC	
2	Use screws to tighten the screen bracket and LCD module.	

3	Use screws to tighten the screen module.	

Remove the LCD screen module

Removal steps		
1	Opening the PC	
2	Loosen the screws on the screen module, take out the screen module, and close the top cover.	

8. PC Maintenance

8.1 Removal/Installation of Hardware Assembly

8.1.1 Carry out Maintenance

The PC can only be maintained or repaired by authorized personnel.

⚠Warning
Unauthorized operation or repair for the PC may cause damage to the PC or endanger safety of users.

Disconnect the PC from power source before opening the PC.

- Only the system expansion devices designed for the PC can be installed. If other expansion devices are installed, the PC may be damaged or safety requirements and regulations related to radio frequency suppression may be breached. Please contact technical support team or local distributor, to know the system expansion devices that can be safely installed.
- If the product is damaged due to installation or replacement of system expansion device, the warranty will become invalid.

Responsibility Range

Our company shall not be held responsible for functional damage caused by use of third-party device or assembly.

8.1.2 Preventative Maintenance

To maintain relatively high system availability, it is recommended to preventatively replace the quick-wear parts. The table below give the time interval for replacement:

Assembly	Time Interval for Replacement
HDD	3 years
CMOS backup battery	5 years

8.1.3 Replacing Backup Battery

Things to know before changing battery

⚠Caution
Damage may exist! Always use same type lithium battery or lithium batteries recommended by the manufacturer.

Disposal

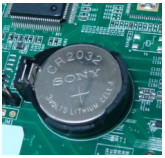
⚠Caution
Battery to be discarded should be disposed according to local laws.

Preparation Work

Notes: 1.Note down the current BIOS Setup or save the settings to the user profile in the BIOS Setup “Exit” menu. 2. BIOS Setup provides a list, where these information can be saved. 3. Disconnect the PC from power source.

Replacing Battery

Steps to replace battery		
1	Open the PC	
2	Remove the motherboard. Note: place the motherboard on a desktop with anti-electrostatic protection.	
3	Press the clamp which fasten the battery, and remove the battery.	

4	Place the new battery into the battery socket, and click it into place.	
5	Install the motherboard	
6	Close the PC.	

8.2 Installing the Drivers

Regarding the installation of the driver program and the detailed information of the motherboard, please refer to the enclosed CD of the PC.

When driver program cannot be installed, for example a yellow question mark or exclamation mark appears, it is recommended to install latest patch package of corresponding operating system, or directly install the operating system of latest release version before installing the driver program.

9. Dimensions Drawing

9.1 Dimensions Drawing Overview

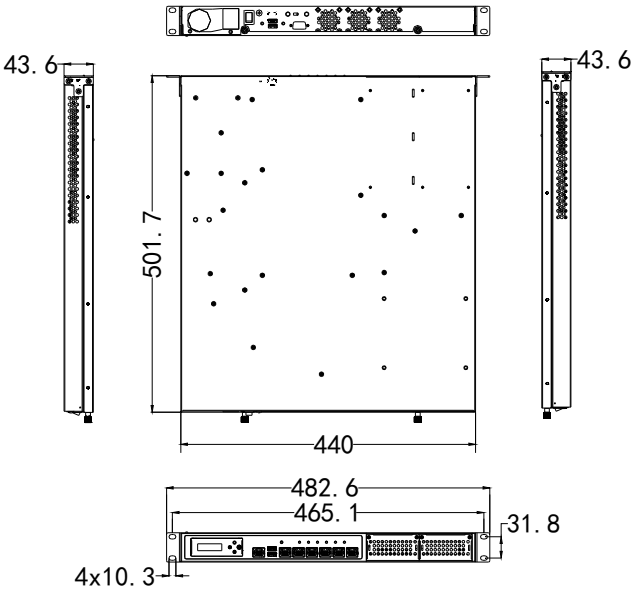
This section includes the following dimensions drawings:

Product Outline Dimensions Drawing

Product Installation Dimensions Drawing

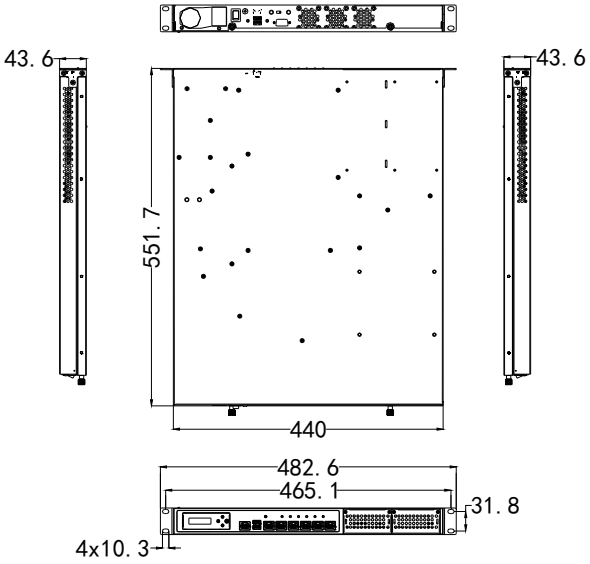
Note: The unit in the dimensions drawing is usually millimeter.

9.2 Product Outline Dimensions Drawing



NPC-8128

Unit: mm

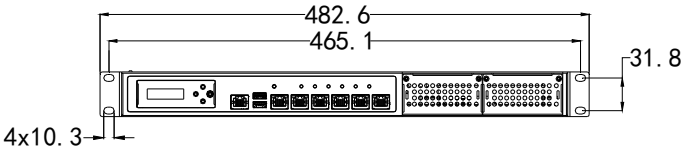


NPC-8128-05

Unit: mm

9.3 Installation Dimensions Drawing

9.3.1 Product Installation Dimensions Drawing



Unit: mm

10. Appendix

10.1 Troubleshooting and Solutions

Common Malfunctions	Possible Reasons	Troubleshooting and Solution
The device is not operating	No power supply	Please check the power supply and the power cable/connector.
	Improper device operating environment	1. Check the environment conditions; 2. Please wait for twelve hours before powering on the device shipped in cold weather.
The external display is black	The display has not been turned on	Turn on the display
	The display is under "power saving" mode	Press any key on the keyboard.
	The luminance control is set to "Black".	Increase the screen luminance by luminance control. Please refer to the instructions of the display for detailed information.
	Power cable or display cable is not connected	1. Please check whether the power cable is correctly connected with the display, the system unit or the ground port. 2. Please check whether the display cable is correctly connected with the display and the system unit. 3. Contact Technique Support if the screen remains black after implementing the above measures.

Incorrect time or date on PC	Incorrect BIOS setting	Follow the power-on prompt and press the key to enter the BIOS Setup; adjust the time and date in BIOS Setup.
BIOS setting is correct while the time and date are incorrect.	Insufficient backup battery capacity	Replace the battery
USB device has no response	USB port is disabled in BIOS	Use other USB ports or enable that port.
	USB 2.0 device is connected; however, USB 2.0 is disabled.	Enable USB 2.0.
	USB port is not supported by the operating system.	1. Enable USB Legacy Support for the mouse and keyboard (Legacy USB is supported); 2. For other devices, appropriate USB drivers are required.
The computer is not booted or displays “Boot device not found”	In booting priority of the BIOS setting, the device is not the first priority or the device is not include in the booting device.	Modify the booting priority of the device in the Boot menu of BIOS setting or include that device into the booting priority.
No system disk can be found when powering on	The HDD power cable or data cable is not connected well	Check whether the power cable and the data cable of the hard disk (the hard disk shall be installed with operating system and is bootable) are well connected.

	System files on the hard disk are damaged	Enter the system (usually WinPE system) with a bootable disk; check whether the system in the hard disk is damaged. Reinstall the system if necessary.
Plug and play I/O card, no IO card is detected or no IO card can be used when used again	Poor contact of the slot	Poor contact is usually caused by frequent installation/ uninstallation of the PCI or ISA card, unstable fixing or improper dust-proof measures; please remove and install the card for a few times or use another slot.

10.2 Common Alarm Information Analysis and Solution

Alarm Information	Meaning and Solution
EFI BIOS. After the product is booted, the screen displays yellow alarm information “Warning system time is invalid，please set it to right”.	Motherboard CMOS time setting error, which needs to be corrected.
After bootup of motherboard, the screen shows: “Reboot and Select proper Boot device or Insert Boot Media in selected Boot device and press a key”.	The current disk cannot be booted, and the system HDD cable needs to be rechecked, or use optical drive for reinstallation of operating system.
Award BIOS motherboard. During Power On Self Test (POST), the screen displays error information: “Keyboard error or no keyboard present”.	The motherboard or complete PC is not connected to PS/2 or USB keyboard, and keyboard needs to be connected properly.

EFI BIOS. During motherboard Power On Self Test (POST), “beep-beep-beep-beep-beep” five beeps can be heard.	The motherboard or complete PC is not connected to PS/2 or USB keyboard, and keyboard needs to be connected properly.
Redundant power supply equipped with the complete PC. After the PC is powered on, the PC power supply gives off piercing alarms.	The redundant power supply is not connected to two AC plugs. The PC should be powered off, and connect the two AC plugs.

10.3 ESD Guideline

Definition of ESD

All the electronic modules are equipped with large-scale integrated IC or assemblies. Due to their own design, these electronic components are extremely sensitive to over-voltage, so they are also extremely sensitive to any ESD.

ESD-sensitive assemblies/modules are usually called ESD devices. It is also the internationally universal abbreviation for this type of devices.

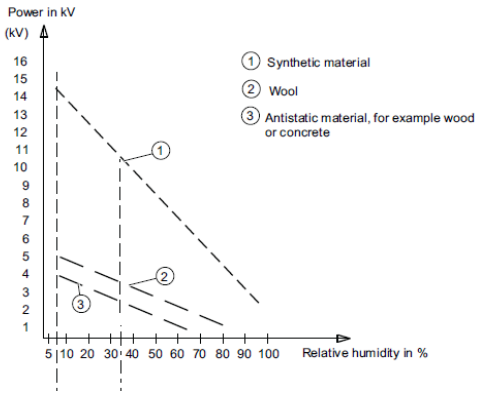
The following sign can be used to identify ESD module:

Caution
ESD device may be damaged by any voltage which is much lower than can be felt by human. If the component of the device you contact does not dissipate electrostatic charges in your body, a static voltage will be generated. ESD current may lead to potential problem of the module, or damage to the module which is not serious for the moment but may cause fault during operation.

Electrostatic Charge

Electrostatic charge phenomena may occur in the human body which is not connected to surrounding electrical level.

The following data shows the maximum electrostatic voltage which may be generated when human body contacts specified material. These values are compliant with IEC 801-2 specifications.



Electrostatic voltage on the body of operating personnel

Basic protective measures to prevent ESD:

- Ensure excellent equipotential connection:

When holding the ESD-sensitive device, please make sure your body, work area and package are grounded. This can prevent electrostatic charge.

- Avoid direct contact:

Usually, people only contact ESD-sensitive device in unavoidable circumstances (for example, for repair). When holding the module, do not touch any chip pin or PCB circuit. In this way, the dissipated electricity will not affect the ESD-sensitive device.

Before handling the module, dissipate the electrostatic charges on your body. They can be dissipated by contacting grounded metal part. Make sure to use grounded measuring instrument.

10.4 Abbreviations

Abbreviation	Terminology	Meaning
AC	Alternate current	Alternate current
ACPI	Advanced Configuration and Power Interface	
PLC	Programmable controller	
AGP	Accelerated Graphics Port	High-speed bus system
AHCI	Advanced Host Controller Interface	Standard control interface of serial ATA, Microsoft windows XP (above SP1 version) and IAA driver program supports the interface
APIC	Advanced Programmable Interrupt Controller	Extended programmable interrupt controller
APM	Advanced Power Management	A tool used to monitor and lower PC power consumption.
AS	Automation System	
ASIS	After-sales Information System	
AT	Advanced Technology	
ATA	Advanced Technology Attachment	
ATX	Advanced Technology Extended	
AWG	American wire gauge	An America standard to differentiate wire diameter
BIOS	Basic Input/Output System	BIOS code
CAN	Controller Area Network	

CD-ROM	Compact Disc Read-only Memory	Large data storage read-only disc
CD-RW	CD Read & Write	Burner disc
CE	Communate Europpene (European Conformity) (CE Certificate Mark)	Unified certificate mark of European Union products
CF	CF card	
CGA	Color Graphic Adapter	Standard monitor interface
CLK	Clock Pulse	Clock Signal
CMOS	Complementary Metal-oxide Semi-conductor	Complementary Metal-oxide Semi-conductor
COA	Certificate Of Authenticity	Microsoft Windows product key
COL	Certificate of License	License authorization
COM	Serial Communication Port	Serial Port
CP	Communications Processor	Communication PC
CPU	Central Processing Unit	CPU
CRT	Cathode Ray Tube	
CSA	Canada Standard Association	A Canada organization which carries out test and certification by the standard of Canada or the two countries (using UL/USA)
CTS	Clear to Send	Clear to Send
DRAM	Dynamic Random Access Memory	
DC	Direct Current	Direct Current
DCD	Data Carrier Detect	Data carrier signal detect
DMA	Direct Memory Access	Direct memory access
DOS	Disk Operating System	Operating system without graphic interface
DP	Distributed I/O	
DQS	German Certification body	

	for Quality and Environment Management Systems	
DDRAM	Double Data Rate SDRAM	Memory chip with high-speed interface
DSR	Data set ready	Set ready
DTR	Data terminal ready	Data terminal ready
DVD	Digital Versatile Disc	Digital Versatile Disc
DVI	Digital Video Interface	Digital Video Interface
DVI-I	Digital Video Interface-Integrated	Digital video port with digital and VGA signals
ECC	Error Correcting Code	Error Correcting Code
ECP	Enhanced Capability Port	Extended parallel port
EGA	Enhanced Graphics Adapter	Connector between PC and monitor
ESD	Electrostatic Discharge	
DM	Design Manual	
EIDE	Enhanced IDE	Enhanced electronic integrated drive
EISA	Extended Industry Standard Architecture	Extended ISA standard
EMM	Expanded Memory Manager	To manage expansion of memory
EM64T	Extended Memory 64 Technology	
EN	European Norm	
EPROM/EEPROM	Electrically Programmable Read -Only Memory/ Electrically Erasable Programmable Read-Only Memory	Use sub-module of EPROM/EEPROM chip
EPP	Enhanced Parallel Port	Two-way Centronics port

ESC	Character for exit	Control character
EWF	Enhanced Write Filter	
FAQ	Frequently Asked Question	FAQ
FAT 32	32-bit File Allocation Table	32-bit File Allocation Table
FBWF	File Based Write Filter	
FD	Floppy Disk	Disk drive, 3.5"
FSB	Front Side Bus	
GND	Grounding	Chassis grounded
HD	Hard Drive	Hard Drive
HDA	High Definition Audio	
HDD	Hard Disk Drive	HDD
HU	Height Unit	
HMI	Human Machine Interface	User interface
HORM	Hibernate once, resume many	
HT	Hyper-Thread technology	
HTML	HyperText Mark-up Language	Script language used to create Internet page
HTTP	Hypertext transfer protocol	Data transfer protocol on the Internet
Hardware	Hardware	
I/O	Input/Output	Data input/out of the computer
IAA	Intel(R) Application Accelerator	
IDE	Integrated Drive Electronics	
IEC	International Electrotechnical Commission	
IGD	Integrated Graphic Device	
IP	Ingress Protection	Protection level

IR	Infrared	Infrared
IRDA	Infrared Data Association	Used for the standard of data transmitted by IR module
IRQ	Interrupt Request	Interrupt Request
ISA	Industrial Standard Architecture	Used for bus of extended module
ITE	Information Technology Equipment	
L2C	Level2 Cache	
LAN	Local Area Network	Computer network confined for local communication
LCD	Liquid Crystal Display	Liquid Crystal Display
LED	Light Emitting Diode	Light Emitting Diode
LPT	Line Print Terminal	Line Print Terminal
LVDS	Low-Voltage Differential Signaling	
LW	Drive	
MAC	Media Access Control	Media Access Control
MC	Memory Card	Memory card in credit card format
MLFB	Machine-readable product designation	
MMC	Micro Memory Card	32*24.5mm format memory card
MPI	Multiple Point Interface Used for Programming Devices	
MS-DOS	Microsoft Disk Operating System	
MTBF	Meantime between Failure	
MUI	Multi-language User	Language localization of

	Interface	Windows
NA	Not Available	
NAMUR	Normenarbeitsgemeinschaft for Mess- und Regelungstechnik in der chemischen Industrie (Standardization association for measurement and control in chemical industries)	
NC	Not Connected	Not Connected
NCQ	Native Command Queuing	Automatically rearrange the files and disc access, to improve performance
NEMA	National Electrical Manufactures Association	An organization of U.S. electronic component manufacturers
NMI	Non Maskable Interrupt	Interrupt cannot be refused
NTFS	New Technology File System	Safety file system of Windows version (2000, XP, Vista)
ODD	Optical Disc Drive	
OPC	OLE for Process Control	Standardized interface of industrial process
PATA	Parallel ATA	
PC	Personal PC	
PCI	Peripheral Component Interconnect	High-speed expansion bus
PCIe	Peripheral Component Interconnect express	High-speed serial, differential full-duplex PtP interface with high-speed data transmission rate
PCMCIA	Personal Computer Memory Card International	

	Association	
PI	Protective Ground	Protective conductor
PEG	PCI Express for Graphics	
PG	Programming PC	
PIC	Programmable Interrupt Controller	Programmable Interrupt Controller
POST	Power On Self Test	
PXE	Pre-boot Execution Environment	Used to operate software without HDD data PC via network
RAID	Redundant Arrays of independent Disks	Redundant HDD array
RAL	Restricted Access Location	Install device in operation facility with restricted access (e.g. control cabinet with lock)
RAM	Random Access Memory	
RI	Ringing Input	Call in
ROM	Read-Only-Memory	
RS 485	Reconciliation Sublayer 485	Two-way bus system designed to be used for up to 32 nodes
RTC	Real Time Clock	Real Time Clock
RTS	Reliable Transmission Service	Request to send
RxD	Receive Data	Data transmission signal
SATA	Serial Advanced Technology Attachment	
SCSI	Small Computer System Interface	
SDRAM	Synchronous Dynamic Random Access Memory	
SELV	safety extra-low voltage	safety extra-low voltage circuit

	circuit	
SLC	Second Level Cache	
SMART	Self-Monitoring, Analysis and Reporting Technology	HDD error diagnosis procedure
SMS	Short Messaging Service	To transmit short message by telecommunication network
SNMP	Simple Network Management Protocol	Network protocol
SO-DIMM	Small Outline Dual Inline Memory Module	
SOM	Safety Card on Motherboard (SOM)	
SPP	Standard Parallel Port	Synonym to parallel port
SRAM	Static Radom Access Memory	Static RAM
SSD	Solid-State Drive	
SVGA	Super Video Graphics Array	Enhanced VGA standard using at least 256 colors
SVP	Serial number of the device	
SW	Software	
TCO	Total Cost of Ownership	
TFT	Thin Film Transistor	An LCD screen type
TTY	Teletypewriter	Asynchronous data transmission
TxD	Transmit Data	Data transmission signal
TWD	Watchdog Time	Monitoring time of Watchdog
UL	Underwriter Laboratories Inc.	A U.S. organization which carries out test and certification based on the standards of the country or two countries (using CSA/Canada)

UMA	Unified Memory Architecture	Video memory
URL	Unified Resource Locator	Complete address mark of Internet page
USB	Universal Serial Bus	
UXGA	Ultra eXtended Graphics Array	Graphics standard, with maximum resolution of 1600x1200 pixel
V.24		ITU-T standardization advice to transmit data by serial port
VCC		Positive supply voltage of integrated circuit
VDE	Verein deutscher Elektrotechniker (Prufstelle Testing and Certification Institute)	
VGA	Video Graphics Array	Video adapter which meets industrial standard
VRM	Voltage Regulator Module	
VT	Virtualization Technology	Simulated closed environment can be used by using Intel technology
VT-D	Intel Virtualization Technology for Directed I/O	To enable the function which directly assigns the device (e.g. network adapter) to virtual device.
W2k	Windows 2000	
WAV	Wavelength encoding	Loss-free file format used for audio data
WD	Watchdog	Monitoring program using error detection and alarm

WLAN	Wireless LAN	Wireless LAN
WoL	Wake-On-LAN	
WWW	World-Wide-Web	
XGA	Extended Graphics Array	Graphics standard, with a maximum resolution of 1024×768 pixel

10.5 Terminology Glossary

AHCI Mode

AHCI is a standard method for SATA controller to search address. AHCI describes the structure in RAM, containing a routine area to control status and a command list.

APIC Mode

Advanced Peripheral Interrupt Controller, with 24 interrupt lines in total.

ATAPI CD-ROM Drive

AT Attachment Packet Interface (connected to AT bus) CD-ROM drive.

CE Mark

Communauté Européene CE mark confirms that the product is compliant with related EC instructions, such as EMC instructions.

CF Card

CF card is a digital storage media in the card form, without mobile part. A CF card includes non-volatile memory and controller. The CF card socket is compliant with IDE port. CF card can be operated by connector and socket adapter, and other electronic components on the PCMCIA or IDE HDD controller are not needed. There are two kinds of design specifications: CF-I (42.6×36.4×3.3 mm) and CF-II (42.8×36.4×5 mm).

COM port

COM port is a serial V.24 port, which is suitable for asynchronous data transmission.

EMC Instructions

Instructions about Electromagnetic Compatibility. The compliance standard is confirmed by CE marking and EC conformity certificate.

ESD Instructions

Instructions for use of ESD-sensitive assemblies.

Intel VT

Intel Virtualization Technology (IVT) creates a safe and closed environment for application program. To use this function, special (virtualized) software and processors with VT function are needed.

LAN

Local Area Network: LAN means local area network, which contains a set of computer and other devices distributed across relatively limited scope and connected by communication cable. The devices connected to LAN are called node. The purpose of network is to share files, printers and other resources.

Wake-On-LAN (WoL)

This function supports bootup of the PC via LAN port.

LPT port

LPT port (Centronics port) is a parallel port used to connect printer.

PATA

The interface used for hard drive and optical drive, with up to 100Mbps parallel data

transmission rate.

PC card

Marking of Personal Computer Memory Card International Association (PCMCIA), which is the marking of support card compliant with PCMCIA specifications. PC cards of a credit card size can be inserted into PCMCIA slot. Version 1 defines 3.3mm thick Type I card, which is mainly used as external memory. PCMCIA standard Version 2 also defines 5mm thick Type II card and 10.5mm Type III card. The Type II card can realize modem, fax card, network interface card, among other devices. Type III card is equipped with devices which require more space (e.g. wireless communication module) or rotating storage media (e.g. hard drive).

PC/104 / PC/104-Plus

Two kinds of bus system architecture are currently popular in the industry: PC/104 and PC/104-Plus, both of which are of device type single board computer standard. The electrical and logical layout of these two bus systems are the same with ISA (PC/104) and PCI (PC/104-Plus). Software usually cannot detect the difference between them and common desktop bus system. Their advantages are compact design and space saving.

PCMCIA

The association is composed of about 450 company members in the computer industry. It focuses on providing international standards for miniaturization and flexible use of device expansion card, so as to provide basic technology for the market.

PEG Port

PCI Express used for graphics. A graphics port with 16 PCIe channels, used to expand graphics module.

PIC mode

Peripheral interrupt controller, having 15 interrupt lines.

POST

Self-test executed by BIOS after the PC is powered on. For example, RAM test and graphics controller test. If BIOS detects any error, the system will output audio signal (buzzer code); reason for the error and related information will be indicated on the screen.

PROFIBUS/MPI

Process Field Bus (standard bus system of process application program).

PROFINET

PROFINET is the standard name of industrial Ethernet developed and maintained by PROFIBUS users. PROFINET unifies the protocol and specifications of industrial Ethernet, to meet the requirement of industrial automation technology.

RAID

Redundant Array of Independent Disks: a data storage system, which usually stores data and corresponding error correction code (such as parity bit) on at least two hard disk volumes, so as to improve reliability and performance. Hard disk array is controlled by hard drive controller which manages program and corrects errors. RAID system is usually realized in network server.

ROM

ROM refers to Read-Only Memory. It can separately search each storage address. The program or data are permanently stored, so they will not be lost when power failure occurs.

S.M.A.R.T

Self-Monitoring, Analysis and Reporting Technology (SMART or S.M.A.R.T.) is an industrial standard integrated in memory media. This technology can be used to continuously monitor key parameters and detect upcoming problems at early stage.

SATA

Serial ATA interface of hard drive and optical drive, with up to 300Mbps transmission rate of serial data.

SCSI Interface

Small computer system interface use to connect SCSI device (such as hard drive or optical drive).

SETUP (BIOS Setup)

The program where information about device configuration (i.e. configuration of hardware on PC/PG) is defined. The device configuration of PC/PG is preset with default values. Therefore, if memory expansion, new module or new drive is added to hardware configuration, changes must be made in SETUP.

SSD (Solid-State Drive)

The installation method of solid-state drive is similar to any other drive. It only uses semi-conductor memory chip of similar capacity, so it does not include rotating disk or other mobile assembly. This design makes SSD more rugged and endurable, shortens access time and lowers energy consumption.

WLAN

Wireless LAN is a local area network, which transmit data by radio wave, infrared and other wireless technology. Wireless LAN is mainly used for portable PCs in offices or factory environment.

Backup

Copies of programs, data media or database, use to keep or protect key, irreplaceable, data, and prevent data loss when damage to a working copy occurs. Some application programs automatically generate backup copies of data files, and manage current or previous versions in the HDD.

Baud

Physical unit of stepping speed during signal transmission. It defines the number of signal status sent each second. Only in two statuses, one baud is equal to 1bps transmission rate.

Operating System

A general name describing all the functions in concerted operation with hardware, and control and monitoring of user program execution, system resource assignment in user program and operating mode. (e.g. Windows XP Professional).

Hyper-Threading

HT technology (multiple threads) allows multiple computing threads to run simultaneously. Only when all the related system assemblies (e.g. processor, operating system and application program) are supported, can HT be effective.

Legacy USB support

Not to use drivers to support USB devices on the USB port. (e.g. mouse, keyboard).

Legacy Boot Device

Traditional drive can be used as USB device.

Memory Card

Memory card of credit-card format, the storage to store user programs and parameters

(e.g. programmable module and CP).

Reset

Hardware reset: Using button/switch reset/reboot device.

Formatization

Storage space on the magnetic data media is primarily divided into magnetic track and sector. Formatization operation will delete all the data on the data media. All the data media must be formatized before first use.

Common Fault

Error reason, error analysis, corrective measures.

Cache

Used as a buffer for high-speed access of relay storage (buffer) of the requested data.

Plug and Play

It usually refers to the capability of automatic configuration system of the computer to communicate with peripheral devices (such as monitor, modem or printer). Users can insert a peripheral device and immediately use it without having to manually configure the system. Plug-and-Play devices need BIOS and expansion card which supports plug-and-play.

Hub

A jargon in network technology. It is a device in the network located in the center, and connected to multiple communication lines, to provide common connections for all the devices in the network.

Extensible Firmware Interface (EFI)

EFI refers to the central interface between firmware and each assembly of the computer and that among operating systems. Logically, EFI is located under the operating system, and is successive specification of device BIOS, mainly targeting 64-bit system.

Controller

Controller integrating hardware and software to control certain internal or peripheral devices (e.g. keyboard controller).

Cold Reset

Cold Reset is a boot sequence. When the PC is powered on, it is to be booted up. In the cold reset sequence, the system usually executes a couple of basic hardware checks, then load the operating system from hard drive to working memory -> boot.

Module

Modules refer to PLC, programming device or plug-in unit. These modules can be local modules, expansion modules, interfaces or mass storage (mass storage module).

Module Bracket

Module bracket is used to fix the module and ensure safe contact and transportation. Impact and vibration especially affects large and heavy modules. Therefore, it is recommended to use module bracket for this type of module. There are also short, light and compact modules on the market. Module bracket is not designed for these modules, because standard fixing measures are sufficient for them.

Warm Reset

Reboot the computer after the program is interrupted. Load and reboot the operating system again. Hot key CTRL+ ALT+ DEL can be used to execute warm reset.

Drivers

Program part of operating system. They modify user program data according to specific format required by I/O devices (e.g. hard drive, printer and monitor).

Hotswap

SATA interface provides hotswap function for hard drive system of the device. The prerequisite of the configuration is a RAID1 system with SATA RAID controller (onboard or slot module) and at least two SATA detachable supports. The advantage of hotswap is that faulty hard drive can be replaced without having to reboot the PC.

Dual-core CPU

Compared with last-generation single-core CPUs using hyper-threading technology, dual-core CPU remarkably improves the speed of computing and program execution.

Pixel

PixElement (Pixel) . Pixel means the smallest element which can be copied on the screen or printer.

Chipset

A chipset is located on the motherboard, to connect processor with RAM, graphics controllers, device I bus and external ports.

Ethernet

The transmission rate of text and data communication within local area network (bus structure) is 10/100/1000 Mbps.

Boot Disk

A boot disk is a boot program disk with boot sector. It can be used to load operating system from disk.

Image

It refers to image of hard drive partition, for example, saving to a file so that it can be recovered when necessary.

Reboot

Warm boot the computer (Ctrl + Alt + Del) without disconnecting power source.

Motherboard

Motherboard is the core part of a computer. Motherboard is used to process and store data, control and manage ports and device I/O.