

Ethernet\_to\_Serial Converter

# HMCE-103

## INSTRUCTION MANUAL

Thank you for purchasing HANYOUNG product.  
Please check whether the product is the exactly same as you ordered.  
Before using the product, please read this instruction manual carefully.  
Please keep this manual where you can view at any time

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※ Please refer to manual which is registered in website  
for more information ([www.eng.hynux.com](http://www.eng.hynux.com))

### Safety information

Please read warnings and safety carefully before using it.  
The manual is distinguished by danger, warning, and caution.

	<b>Danger</b>	It indicates an emergency situation which brings a death or serious injury if you don't follow it.
	<b>Warning</b>	It includes a content to indicate a possibility for death or a serious injury if you don't follow it.
	<b>Caution</b>	It includes a content to indicate a possibility to bring a slight wound or damage to property if you don't follow it.

#### Danger

Since input and output terminals have a possibility to bring an electric shock, please do not contact with water

#### Warning

- In a case of a serious accident by the device's malfunction, you must install a protection circuit outside.
- Since a power switch and fuse are not installed in this device, you must install them outside separately.
- In order to prevent from damage and malfunction, please supply a power voltage for the right rating.
- In order to prevent from electric shock and malfunction, please do not turn on the power until all wirings are terminated.
- Since its construction is not explosion-proof construction, please do not use it in the place where an explosive gas exists.
- Please do not disassemble, manufacture, reform, and fix it. There is a danger for disorder, electric shock, and fire.
- Please detach it after power is off. It can be a cause for electric shock, deflection, and false operation.
- If you are not using the way manufactures has indicated, it will bring a serious injury or damage for property.
- Because there is a danger for electric shock, please use it in a condition where panel is installed while current is flowing
- If you are using the device which could bring a wound or damage to the property, you should install safe device to prevent from the accident.
- It is necessary for having a proper back-up system and safe device to prevent damage from system's defect, death or property. It is a user's responsibility for protection about the result caused by the system's malfunction.
- The device is a product which is not approved as medical or life-support system

#### Caution

- The content of the manual can be changed without prior notice.
- Please check outspecifications of the product you order.
- Please check out if the product is broken out during the transport.
- Please use it within a temperature range from -10 to 60°C (Max 50°C when installed tightly)  
/ humidity 35~90% R.H.
- Please use it in a place where there is no corrosiveness gas (especially, noxious gas, ammonia etc.) and combustible gas.
- Please use it in a place where main body cannot be damaged or vibrated directly.
- Please use it in a place (pollution rate 1 or 2) where there are no water, oil, medicine, steam, dust, salt, and iron.
- Please avoid the place where induced lesion is large and static and magnetic noise appears.
- Please check when it got into the water because there is a danger of fire and short circuit.
- For input signal line, please avoid a load line, a power line and a power wire to protect from the impact of induction noise.
- Please separate input and output signal line each other, and if it cannot separate, please use a shield line for input signal line.
- When there is a lot of noise from power supply, we encourage you to use an insulation transformer and noise filter
- We encourage you to repair regularly for using this device safely and continuously.
- There are endurance oneand aged deterioration in the component of this device.
- The guarantee period for this device including the components is one year if you are using it regularly.
- A-class instrument (information and communication instrument for business use)

"This instrument for business use (A-class) is registered as an electromagnetic capability instrument so that users or sellers should pay a close attention to this and please use it outside the house."

### Outline

Serial communication is a standard device which can be used in almost all devices including PC. This is a way how one beat is transmitted in order at a time. It is simple but, it has a limit in transmission distance and it is hard to keep the maintenance.  
A product which can connect to the serial communication device through Internet is HMCE-103. TCP/IP Protocol should be used for data communication through Internet and HMCE-103 can deal with the transformation process.  
RS-232, RS-485, and RS-422 communication are available in HMCE-103. Also, it is easy for applying to user system since RJ45 connector is equipped in the device.

### Specification

- It is easy to set up and change a network configuration with using RS-232 (Serial Port)
- Serial devices without network connection function (RS-232/RS-485/RS-422) can be used with connecting to network so that telemanagement through network is possible for various serial devices.
- Internet's connecting function for HMCE-103 can support open type network protocol like TCP/IP, and it can be used in superhigh speed network or existing LAN.
- HMCE-103 is designed to have the general requirement such as all sorts of industrial automation device and medical market.
- HMCE-103 is Ethernet port 2 serial communication device with a high competitive price.  
(Up to maximum 3 clients are available for access)

### Components



Main body



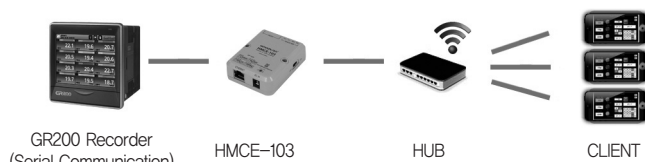
Power supply cable



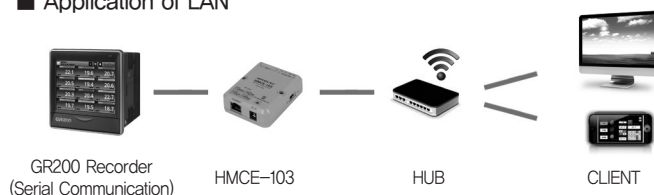
Communication cable

### Application Diagram

#### ■ Connection between Serial device and Client



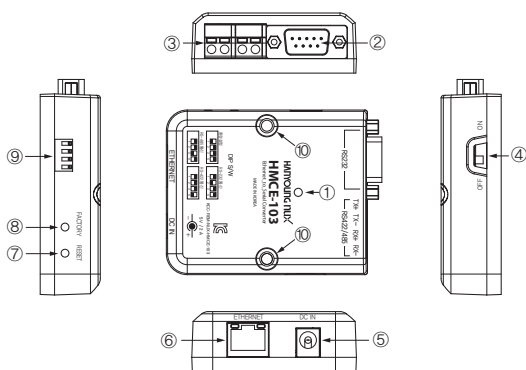
#### ■ Application of LAN



### Specification

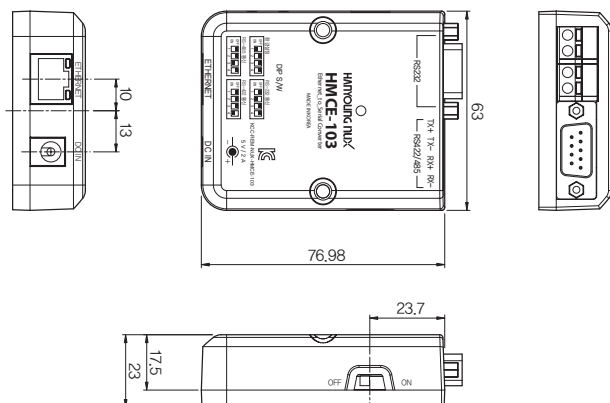
Model	HMCE-103
CPU	PIC32MX695F512L
Memory	SRAM : 128 Kbit, Flash : 512 Kbit
Input Voltage	5 V d.c. (±10 %)
Maximum Current	Maximum under 200 mA
RS-232 Communication	Data communication / Serial console Male DB9 Serial Port
	Communication speed : 2400 ~ 115200 bps
	Flow control : None Signal : TX, RX, GND
RS-485 Communication	For 2 and half wires and duplex method for data communication
	Communication speed : 2400 ~ 115200 bps
	Flow control : DE/RE Signal : TX+, TX-
RS-422 Communication	4 wires and duplex method for data communication
	Communication speed : 2400 ~ 115200 bps
	Flow control : None Signal : TX+, RX+, TX-, RX-
Ethernet Communication	10/100 Base-T Ethernet (RJ-45 Connector)
	Fixed and fluid IP support
	It is possible to access a lot of Clients (maximum 3 devices)
	ARP, IP/ICMP, TCP, Telnet, DHCP
Configuration	Telnet or Serial Console Interface
LED	Power Supply Input mark Activating Condition Mark
Weight	74g
Ambient Temperature	-10 °C ~ 60 °C
Storage temperature	-30 °C ~ 80 °C
Certification Standard	KCC-REM-NUX-HMCE-103
Warranty period	1 year

## Name of each parts and function



No	Name	Information
①	Power/State LED	Check whether power is on or not and Check the state of present movement
②	D-sub 9 pin connector	Serial Communication RS-232 connection terminal
③	RS-485/RS-422 Terminal	Serial communication RS-485/RS-422 communication connection terminal
④	Power switch	Hardware Power ON / OFF Switch
⑤	Power supply terminal	DC 5V Input terminal
⑥	Ethernet Port	Ethernet 10/100 Base-TX
⑦	Reset	System restart button
⑧	Factory Reset	System factory reset button
⑨	Mode select	Number 1 ON : Configuration mode Number 2 ON : RS-232 Communication mode Number 3 ON : RS-485 Communication mode Number 4 ON : RS-422 Communication mode
⑩	Hole on wall	Holes to fix the product

## Dimension



## Active mode

What is an Active mode?

HMCE-103's active mode is distinguished by following four types of activities.

### Mode Select

Select	Active Mode	Information
ON 1 2 3 4	Configuration mode	Mode that is able to modify a product in accordance with user environment
ON 1 2 3 4	RS-232 communication	Ethernet and RS-232 are only available for communication
ON 1 2 3 4	RS-485 communication	Ethernet and RS-485 are only available for communication
ON 1 2 3 4	RS-422 communication	Ethernet and RS-422 are only available for communication

## External interface

Connector types	Pin number	Pin information	RS-232
 D-SUB 9Pin Male	1	NC	
	2	RxD	Received Data
	3	TxD	Transmitted Data
	4	NC	
	5	GND	GND
	6	NC	
	7	NC	
	8	NC	
	9	NC	

Connector types	Pin number	Pin information	RS-485	RS-422
 RS-485/RS-422	1	TX+	TX+	TX+
	2	TX-	TX-	TX-
	3	RX+	NC	RX+
	4	RX-	NC	RX-

Connector types	Pin number	Pin information	Color of cable wire
 RJ-45	1	TX+	White/Orange
	2	TX-	Orange
	3	RX+	White/Green
	4		
	5		
	6	RX-	Green
	7		
	8		

## Configuration

I hope you will keep in mid that following configuration is a content to change the set-up with using the Tera Term. Tera Term is a free serial communication program that you can download on Internet. Please visit the following website to download.

Tera Term Download : <http://ttssh2.sourceforge.jp/>



### Caution

Serial communication program for changing the configuration can be changed without prior notice.

### Baud rate Configuration

The communication speed between the products should be the same for having a better communication.

```
Hynux Serial Converter Config Application (v5.41, Sep 11 2013)
Model name : HMCE103 V2.0.0
Hynux Network product number : 041631278952
HMCE103 MAC address : [00]:[04]:[a3]:[7f]:[59]:[34]

1: Change board baud rate : 19200
2: Change Server Port num: 6001
3: Change static IP address: 192.168.1.15
4: Change static subnet mask: 255.255.255.0
5: Change static Default gateway : 192.168.1.1
6: Change static primary DNS server: 0.0.0.0
7: Change static secondary DNS server: 0.0.0.0
8: Change Variable resistor: Resistor currently disabled
f: firmware download
0: Save & Quit.
Enter a menu choice: 1
```

When pushing a number 1 button on PC keyboard, "New setting" message will be added.

```
Hynux Serial Converter Config Application (v5.41, Sep 11 2013)
Model name : HMCE103 V2.0.0
Hynux Network product number : 041631278952
HMCE103 MAC address : [00]:[04]:[a3]:[7f]:[59]:[34]

1: Change board baud rate : 19200
2: Change Server Port num: 6001
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5: Change static Default gateway : 192.168.1.1
6: Change static primary DNS server: 0.0.0.0
7: Change static secondary DNS server: 0.0.0.0
8: Change Variable resistor: Resistor currently disabled
f: firmware download
0: Save & Quit.
Enter a menu choice: 1 New setting: 1
```

New setting: Please input Baud rate you want to change on this part.  
Baud rate of 9600/19200/38400/57600/115200 are mostly used.



### Caution

Not able to select several for communication mode at the same time.  
Please select only one mode for the correct operation.

EX) When changing Baud rate to 115200.

```
Hynux Serial Converter Config Application (v5.41, Sep 11 2013)
Model name : HMCE103 V2.0.0
Hynux Network product number : 041631278952
HMCE103 MAC address : [00]:[04]:[a3]:[7f]:[59]:[34]

1: Change board baud rate : 115200
2: Change Server Port num: 8001
3: Change static IP address: 192.168.1.15
4: Change static subnet mask: 255.255.255.0
5: Change static Default gateway : 192.168.1.1
6: Change static primary DNS server: 0.0.0.0
7: Change static secondary DNS server: 0.0.0.0
8: Change Variable resistor: Resistor currently disabled
f: firmware download
0: Save & Quit.
Enter a menu choice: 0
```

Check out if Baud rate is changed properly.

Please input "0" to save the changes

If you don't want to save the changes, please put "Reset" button or reboot a power switch not to affect to the changed content.

## ■ Port number Configuration

Port number is distinguished by well-known port, registered port, and dynamic or personal port.

- Well-known port is from 0 to 1023.
- The registered port is from 1024 to 49151.
- Dynamic or personal port is from 49152 to 65535.

## ■ Well-Known Port

Well-known port is allocated from IANA and only programs which system (or route) processor or authorizers use are available in most of systems. Port is used in TCP[RFC793] to indicate a logic connection's ending which makes a long time conversation. Service connection port is defined as a purpose to provide a service to unknown invoker. Connection port is also known as "Well known port" This type of port allocation within available range is used in UDP [RFC768]. Allocated port use the small part of available port numbers Allocated port for several years is within a range from 0 ~ 255. Recently, the range of allocated port which is managed by IANA extended a range from 0 ~ 1023.

## ■ Registered Port

Registered port can be arranged in IANA and it can be used in programs which general users use for most of systems or user process. Port is used in TCP[RFC793] to indicate a logic connection's ending which makes a long time conversation. Service connection port is defined as a purpose to provide a service to unknown invoker. Registers of IANA use this port in community for convenience. This kind of port allocation within available range is used in UDP[RFC768] Range of registered Port is within 1024~49151.

Please visit IANA website for more information.

<http://www.iana.org/assignments/service-names-port-numbers/service-names-port-numbers.xml>

EX )Change Port num to 7001.

```
Hynux Serial Converter Config Application (v5.41, Sep 11 2013)
Model name : HMCE103 V2.0.0
Hynux Network product number : 041631278952
HMCE103 MAC address : [00]:[04]:[a3]:[7f]:[59]:[34]

1: Change board baud rate : 115200
2: Change Server Port num: 6001
3: Change static IP address: 192.168.1.15
4: Change static subnet mask: 255.255.255.0
5: Change static Default gateway : 192.168.1.1
6: Change static primary DNS server: 0.0.0.0
7: Change static secondary DNS server: 0.0.0.0
8: Change Variable resistor: Resistor currently disabled
f: firmware download
0: Save & Quit.
Enter a menu choice: 0
```

When pushing "number 2" button in PC Keyboard, "New setting" message is added.

New setting: input Port num which you want to change in this part.

```
Hynux Serial Converter Config Application (v5.41, Sep 11 2013)
Model name : HMCE103 V2.0.0
Hynux Network product number : 041631278952
HMCE103 MAC address : [00]:[04]:[a3]:[7f]:[59]:[34]

1: Change board baud rate : 115200
2: Change Server Port num: 7001
3: Change static IP address: 192.168.1.15
4: Change static subnet mask: 255.255.255.0
5: Change static Default gateway : 192.168.1.1
6: Change static primary DNS server: 0.0.0.0
7: Change static secondary DNS server: 0.0.0.0
8: Change Variable resistor: Resistor currently disabled
f: firmware download
0: Save & Quit.
Enter a menu choice: 0
```

Please input "0" to save the changes

## ■ IP address Configuration

IP address means an inherent distinguishable address which is given to all communication networks to the Internet and the products that is connected to communication networks. When using HMCE-103 in user network environment, active IP address is needed. When IP address is not given, please make inquiries to the system administrator to get an active IP address for HMCE-103. When connecting to HMCE-103 to the network, you must have an inherent IP address.

When setting an IP address in HMCE-103, users support 2 following internet protocols.

- Static IP
- DHCP (Dynamic Host Configuration Protocol)

Static IP address, also known as fixed IP address, is an Internet address which can be accessed from Host or Router through Internet.

DHCP, also known as IP address, is used to send out notification from LAN in office to PC about set-up information regarding TCP/IP. It is also a protocol to set up remotely each of host of important network parameter and set up details with using the server setting.

※ When releasing from factory, IP address is set up as default "192.168.1.15" for HMCE-103.

Following items are user settings for variables and users use it by changing the setting value in accordance with network environment.

Static IP	IP address
	Subnet mask
	Default gateway
	Primary DNS / Secondary DNS
DHCP	Primary DNS / Secondary DNS(Optional)

① Static IP address can take a role as fixed and permanent distinguishable number. This number is assigned from computer and it is also a address It is possible for computer to distinguish and communicate in the network using this type of IP address. Thus, selected IP address should be absolutely inherent and valid in the network environment.



### Caution

The type of 192.168.1.x IP address is a private address but because ISP (Internet Service Provider) is not assigned. In order to apply HMCE-103, it should be able to exchange the data through public network like Internet, and official IP address should be assigned in this case. Official IP address is generally purchased or leased from local ISP

② Subnet mask means all network hosts in the same geographical location and one building or in the same LAN. When there is a packet going out through network, you should check on if there is a packet assigned from TCP/IP host in the local network area through subnet mask. When address is in the same network area as HMCE-103, it is directly connected through physical address. If it is not, it is connected through basic gateway.

③ Default gateway is a network contact which takes an entry role to other network. Computer which controls traffic within network or in the regional ISP is a gateway node. In order to connect to host outside the local network environment, Pro Series should know basic gateway computer's IP address. Please make inquiry to network administrator for detailed information about network Gateway IP address.

④ For Primary DNS / Secondary DNS, if users want to visit the website, computer will ask DNS (Domain Name System) Server about correct IP address and with using the answer from the question, it connects to the webserver. DNS is a way to convert to IP address by identifying the Internet domain name. DNS Server is a host that converts to numeral IP address in order for text based domain name to connect to TCP/IP If you use the HMCE-103's DNS function, you should set up the DNS server's IP address for connecting to host under the name of domain.

⑤ Network administrator centrally manages IP address's allocation in the organization's network for DHCP. Also, DHCP is a communication protocol which is available for automation. For DHCP, network administrator manages and allocates the IP address and if computer is plugged in the other network, the new IP address is automatically transmitted.



### Caution

In DHCP mode, variable is not automatically set up for all network related to HMCE-103 including DNS Server.

## ■ Terminating Resistance Configuration

It has a function to use terminating resistance 120 Ω which can prevent from the communication error caused by reflected wave when using a high-speed communication over 200,000 Bps for RS-485 communication.

HMCE-103 is in a state of default Disabled (non-use) when releasing out from factory

```
Hynux Serial Converter Config Application (v5.41, Sep 13 2013)
Model name : HMCE103 V2.0.0
Hynux Network product number : 041631278952
HMCE103 MAC address : [00]:[04]:[a3]:[7f]:[59]:[34]

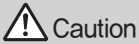
1: Change board baud rate : 115200
2: Change Server Port num: 7001
3: Change static IP address: 192.168.1.15
4: Change static subnet mask: 255.255.255.0
5: Change static Default gateway : 192.168.1.1
6: Change static primary DNS server: 0.0.0.0
7: Change static secondary DNS server: 0.0.0.0
8: Change Terminating resistor: Resistor currently disabled
f: firmware download
0: Save & Quit.
Enter a menu choice: [ ]
```

In order for terminating resistance 120 Ω to activate, please input number 8 key in PC.

```
Hynux Serial Converter Config Application (v5.41, Sep 13 2013)
Model name : HMCE103 V2.0.0
Hynux Network product number : 041631278952
HMCE103 MAC address : [00]:[04]:[a3]:[7f]:[59]:[34]

1: Change board baud rate : 115200
2: Change Server Port num: 7001
3: Change static IP address: 192.168.1.15
4: Change static subnet mask: 255.255.255.0
5: Change static Default gateway : 192.168.1.1
6: Change static primary DNS server: 0.0.0.0
7: Change static secondary DNS server: 0.0.0.0
8: Change Terminating resistor: Resistor currently enabled
f: firmware download
0: Save & Quit.
Enter a menu choice: [ ]
```

When changing from "disabled" to "enabled" as above, terminating resistance 120 Ω is activated.



### Caution

When activating terminating resistance in the low speed communication under 200,000 Bps, more communication error could be appeared so that you should use it after identifying the communication speed.

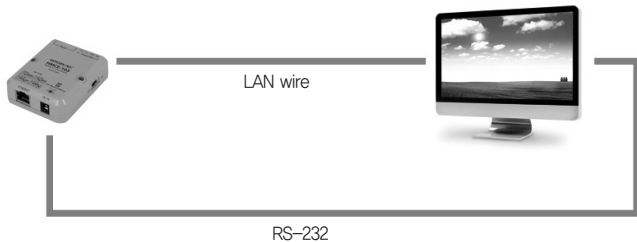
Please input "0" to save the changes

## ■ Firmware download Configuration

Firmware is a software to operate HMCE-103. When adding a new function or modifying the errors, a new version of firmware is produced and provided. It is always good to use the latest firmware.

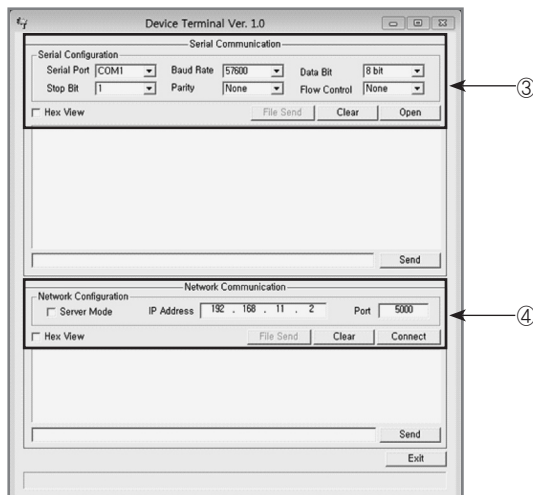
※ Please refer to the manual in the website for further information.

## ■ Test operating



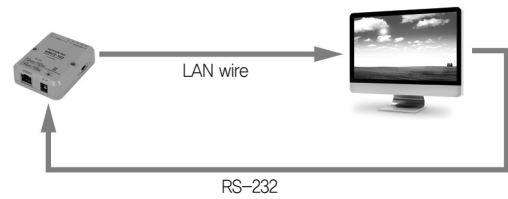
① Please play a communication test program after the connection is completed as a picture.  
(Communication test program can be changed without prior notification)

② After changing the DIP S/W which is in the left side of HMCE-103 to configuration mode, please restart the system.

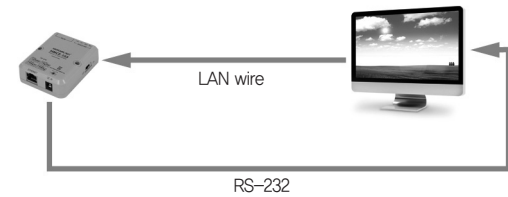


- ③ After setting up Serial port and Baud Rate, please activate Serial port by pushing the "open button".
- ④ Please set up IP address and port after identifying the product's setup value.
- ⑤ After changing the DIP S/W on the left side to RS-232 communication mode, please restart the system.
- ⑥ When LED on the center of product starts flickering, please connect to the socket by pushing the "connect button".
- ⑦ After inputting the data which is going to send out in the Serial and Network window and transmitting each of them, please check out if it is able to send and receive properly.

## ■ Flow chart of transmitting LAN data



## ■ Flow chart of transmitting RS232 data



## ■ System Reset

When restarting the system in use, there is a reset button switch in the left side of the product. Users can use this switch to restart the product's system.

## ■ Factory Reset

When you want to change a setting to factory reset, there is a factory button switch on the left of the product.

Users can change a setting to factory reset by using the factory button switch.



### Caution

- Factory reset is working normally when pushing the button for more than 3 seconds.
- After doing the factory reset, you must restart the system for using it.
- Factory reset is not working in the configuration mode.

## Introduction about quality warranty

- We don't have a responsibility and guarantee for the content not appointed by conditions of HanyoungNux's quality warranty for the product.
- When there is a defective which is unexpected by Hanyoung Nux and users or third person who is damaged by natural disasters, Hanyoung Nux does not have a responsibility for any loss and indirect damage etc.

## ■ About quality warranty terms for the product

- The warranty period is within one year of purchase. We repair the product for free if there is a trouble from normal use which is appointed by the instruction manual.
- After the expiration of warranty period, there is an actual expense by the standards from HanyoungNux for repairing the problems.
- There is an actual expense for the following problems even though they happened within the warranty period.
  - The malfunction arose from user's misuse
  - The malfunction from natural disaster
  - The malfunction caused by movement after installation
  - The malfunction by changing the product randomly or damage
  - The malfunction from problem in power supply
- If you want A/S about the malfunction of the product, please contact the store you purchase or Hanyoung Nux's Sales team.