LG
Life's Good

ENGLISH
ITALIANO
ESPAÑOL
FRANÇAIS
DEUTSCH
CHINESE
РУССКИЙ ЯЗЫК

INSTALLATION/OWNER MANUAL
AIR CONDITIONER

Please read this manual carefully before operating your set and retain it for future reference.

TYPE : BNU-BAC(BACnet Gateway)

P/NO : MFL37115823

www.lg.com

TABLE OF CONTENTS

Note : After the LC BACnet Gateway agreement part, please scrutinize with Companies specialized in BMS.

Safety Precautions

To prevent injury to the user or other people and property damage, the following instructions must be followed.

■ Incorrect operation due to ignoring instruction will cause harm or damage. The seriousness is classified by the following indications.

⚠WARNING	This symbol indicates the possibility of death or serious injury.
⚠CAUTION	This symbol indicates the possibility of injury or damage.

■ Meanings of symbols used in this manual are as shown below.

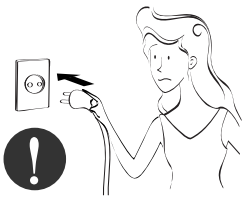
⃠	**Be sure not to do.**
❗	**Be sure to follow the instruction.**

⚠WARNING

■ Operation

Do not operate or stop the unit by inserting or pulling out the power plug.

- It will cause electric shock or fire due to heat generation.

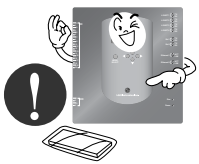


Ask for Product equipment at the service center or establishment certainly at the specialty store.

- It can cause an accident, electric shock, explosion or injury.

Use standard parts.

- Use of non standard parts can cause electric shock, explosion, injury, breakdown.



Standard Parts

While re-installing the established product, notify the service center or establishment specialty store.

- It can cause an accident, electric shock, explosion, injury.shock.

Do not use the power cord near Flammable gas or combustibles, such as gasoline, benzene, thinner, etc.

- It may cause an explosion or fire

Do not disjoint randomly or repair and remodel the product.

- It may cause fire and electric shock

If water enters the product, turn the power switch of the main body of appliance off.

- After taking the power-plug out from the socket, contact the service center.

Keep the product away from the places which can have moisture.

- Water may enter the unit and degrade the insulation. It may cause an electric shock.

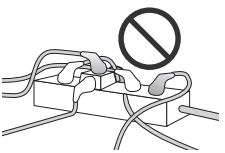
■ During usage

Do not change or extend the conductor at random.

- It can cause fire and electric shock.

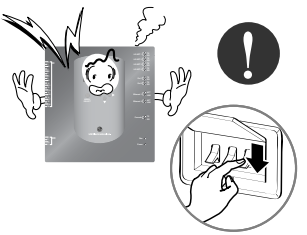
Do not use concert with in the octopus-like legs way.

- It can cause fire and electric shock



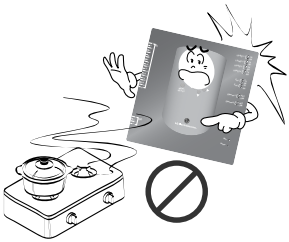
Unplug the unit if strange sounds, smell, or smoke comes from it.

- It may cause fire and electric shock accident.



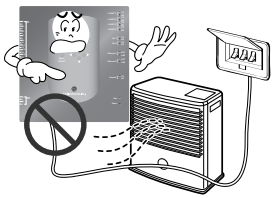
Do not put firearms near product.

• It can cause fire.



Do not put an electric heater or conductor near to the product.

• It can cause fire and electric shock.

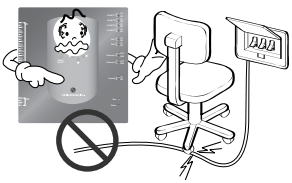


Do not spill water inside product.

• It can cause electric shock and breakdown.

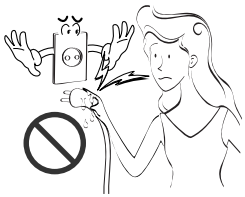
Do not place heavy goods on wire.

• It can cause fire and electric shock.



Hold the plug by the head of the power plug when taking it out.

• It may cause electric shock and damage.



Do not place heavy goods on product.

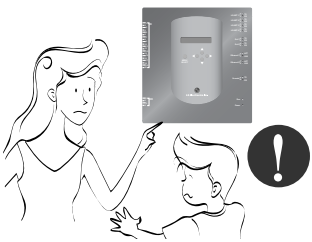
• It can cause product breakdown.

That increase in case of product was been flood certainly in the service center or establishment specialty store commit .

• I am responsible for fire and electric shock.

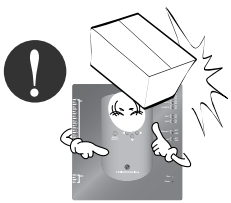
Protect the product from handling by a children.

• It can cause accident and product breakdown.



Do not apply shock to product.

• I am responsible for breakdown in case of shock to product.



⚠CAUTION

■ During usage

Clean by soft hands using a cleaning material like a soft cloth.

- It can result in fire and product transformation.

Use touch screen with a pen that product offers.

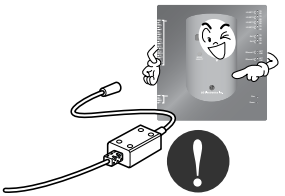
- Otherwise, there can be breakdown and damage to the product.

Do not place any live part on the surface having water.

- It can cause product breakdown.

Use recommended Adapter.

- Otherwise it can result in product breakdown

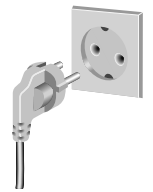


Avoid contact to the metallic goods such as necklace, coin, key, a watch which may touch the battery even for a short-time.

- It may cause product breakdown and injury.

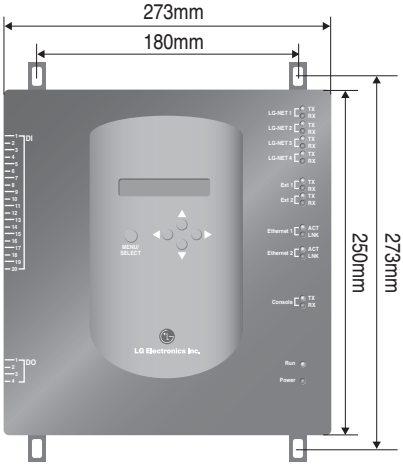
Hold the plug by the head of the power plug when taking it out.

- It may cause electric shock and damage.

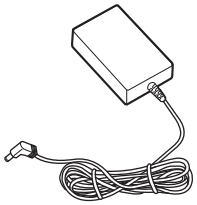


Main features & Specification

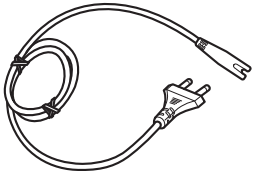
Components



BACnet Gateway dimension



DC adaptor for power supply
Input : 100~240V
AC 50/60Hz 1.5A
Output : DC 12V
3.33A, 40W MAX



Power Cord
250V AC, 3A

International
Standard
IEC320 C14 Type

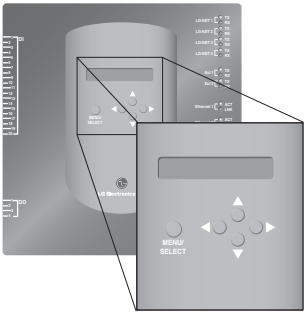
Notice :
In Australia, purchase the power code from local area.
The power code is not included in the package.

⚠ CAUTION

We are not liable for the problem caused by using the adaptor not supplied by us, so do not use the product not supplied by us. For more information about the applicable product, contact with the LG system air conditioner supporting division.

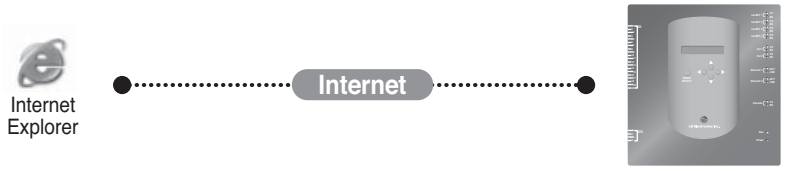
Main features

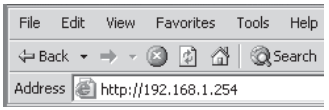
(1) Environment setup by using the BACnet Gateway button : Network environment setup



(2) Web server built-in features

Enter the IP address of the BACnet Gateway at the address window by using the Internet Explorer without installing a separate PC program to access the BACnet Gateway Web Server for controlling and monitoring the indoor unit/ventilator.





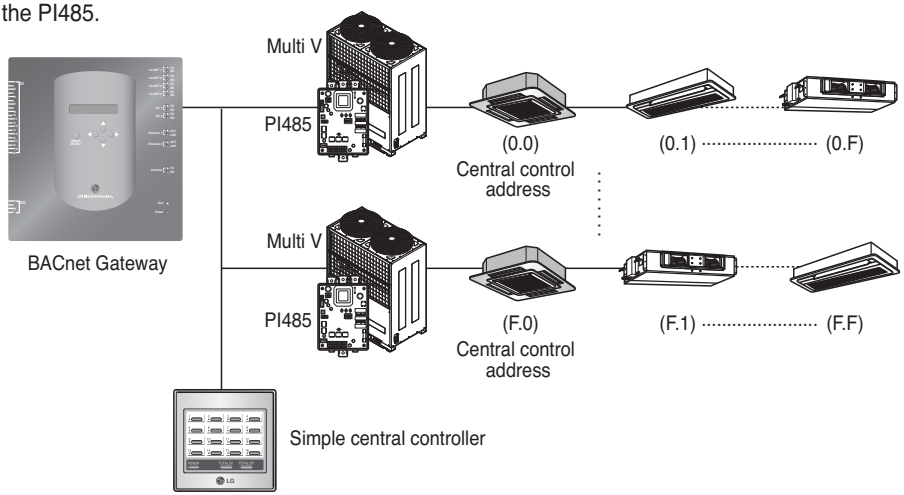
- Controlling 256 air conditioner indoor units and ventilators at maximum
- Monitoring the error and the operating status

Note: For more information about the detailed features, see the operation section.

Main features & Specification

(3) Possible to use together with the simple central controller

It is possible to use the BACnet Gateway by connecting the 16-room simple central controller to the PI485.



(4) Interlocking Fire feature

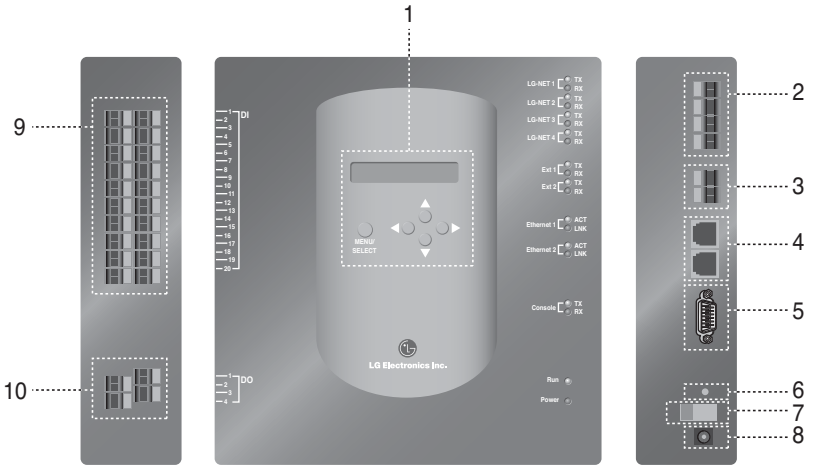
The fire is controlled via the extended DI port (DI Port 4). When a fire breaks out, all indoor units and ventilators on the LG-net are turned off.

Specification (hardware)

1. CPU: PXA256-400MHz Xscale
2. RAM: 128MB (32 x 4) SDRAM
3. ROM: 512KB NOR Flash – Boot image
   128MB (64 x 2) NAND Flash – Program image, database, etc.
4. RS-232 Console : For updating (developing) the program
5. Communication port
   - RS-485 port : PI485 communication port 4EA (connecting the air conditioner and the ventilator), RS-485 port 2EA for connecting the outdoor unit (reserved)
   - RS-232 communication port : Port 1EA for upgrading the program
   - LAN port : 1EA for the Internet connection (Ethernet 10Base-T Ethernet)
     1EA for reserved
6. External input port: 20EA (Pulse countable, DC 12V) extended to the external
   External output port : Digital output x 4EA (Relay output, 5V) – DO2~4 : reserved
7. LED: 20EA (RS-485 communication status display / Ethernet communication status display / RS-232 communication status display / Power & operation status display)
8. LCD : 16 x 2 character
   IP address setup and Network environment & information display

Note: This product conforms to the GPL (General Public License) for using the Embedded Linux.

Denomination for each component



Left side **Front** **Right side**

1. Button & LCD for setting the network environment and displaying the display
2. RS-485 communication port (4EA) for connecting the Air conditioner/Ventilator PI485
3. RS-485 communication terminal (reserved) for the external extension
5. RS-232 port : for updating the program
6. Reset switch : Software reset switch
7. Power On/Off switch
8. DC12V adaptor connection terminal
9. Terminals (20 ports) for connecting the external input signal - DC 0~24V input terminal
10. Terminals(4 port) for connecting the external ouput signal : port # 1 → fire interlocking , others → reserved

Note: It is possible to freely start or stop the indoor unit for corresponding to High or Low signal of each external input signal.

How to install

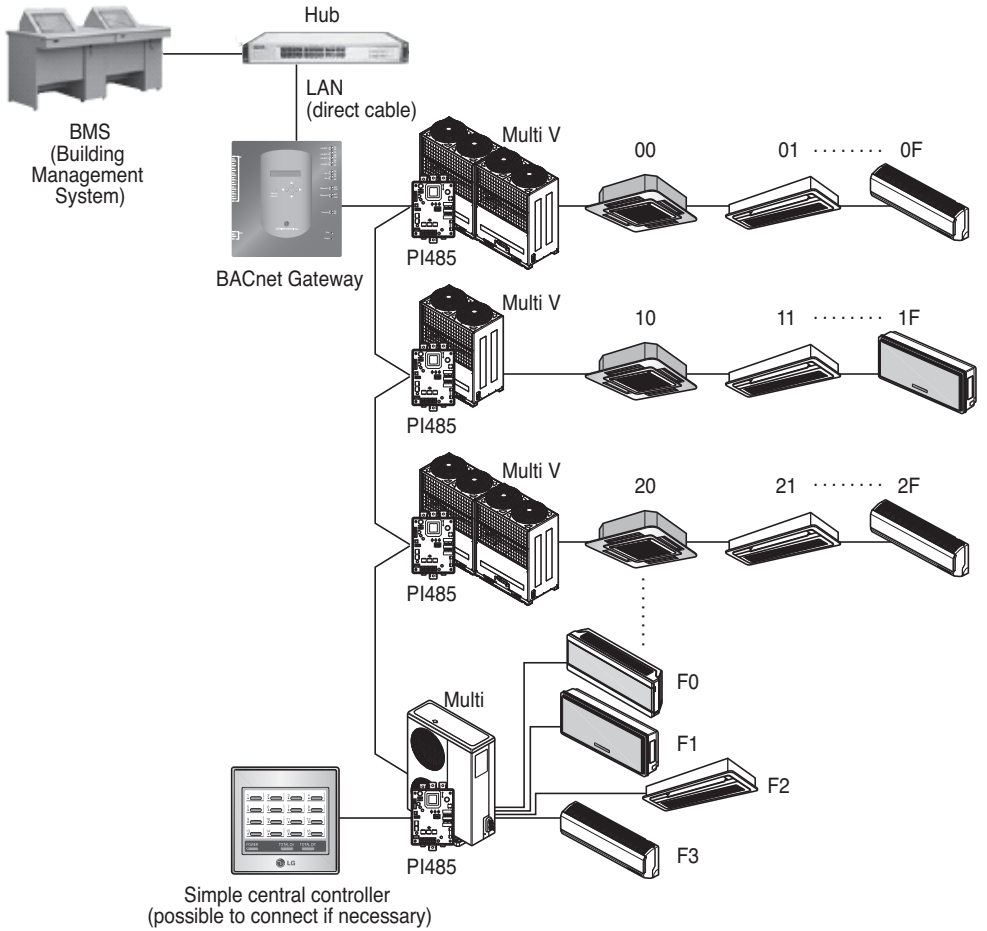
System diagram

Installation specification

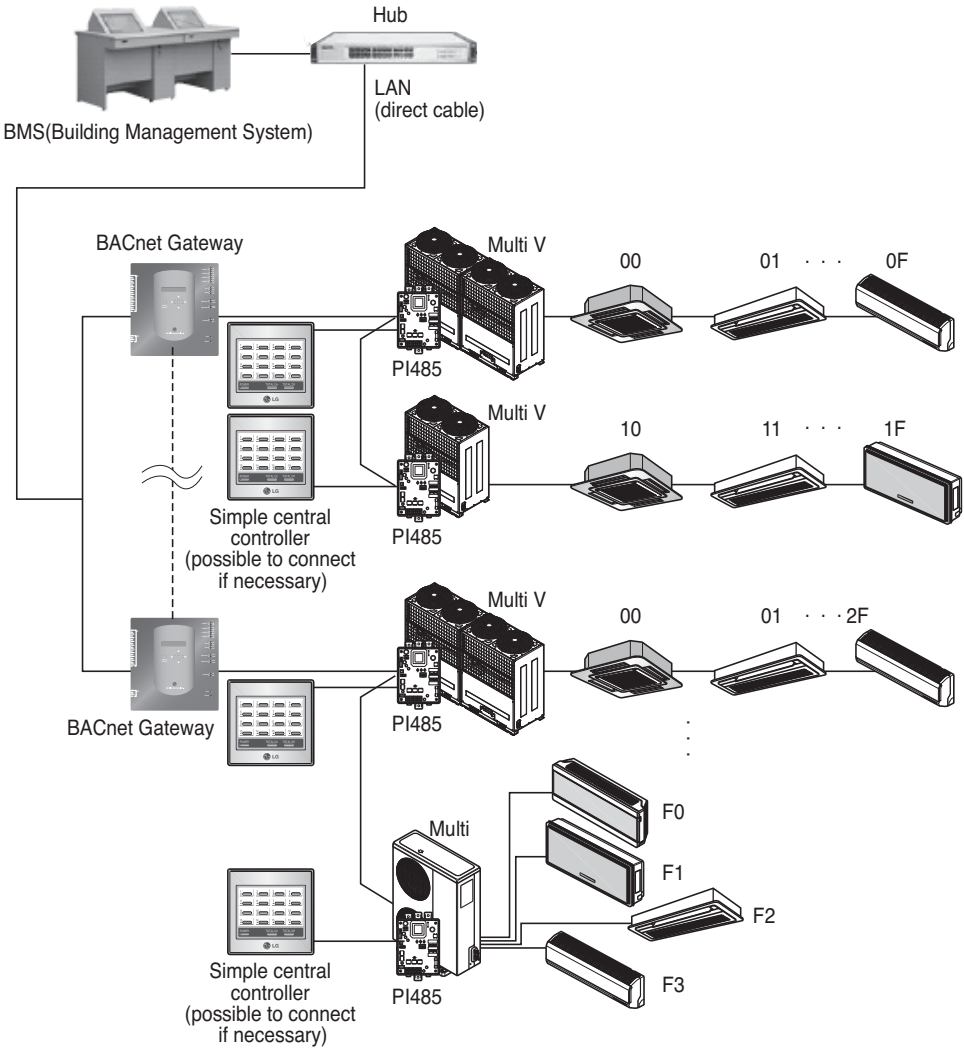
- 256 indoor units at maximum / 1 BACnet Gateway
- Total 256 units(Indoor unit/Vent/DXHRV/AHU) at maximum / 1 BACnet Gateway
- RS-485 ports 4 / 1 BACnet Gateway
- 64 PI485 units at maximum / 1 RS-485 port
- 256 indoor units at maximum / 1 RS-485 port. We recommend to connect them divided into 4 ports for improving the communication performance.

Note: However, when it should be necessary to change the above specification, contact to the LG System Air Conditioner supporting division.

(1) When connecting the BMS by using one BACnet Gateway



(2) When connecting the BMS by using more than one BACnet Gateway (possible to connect 16 units at maximum)



Installation Order

(1) Installing the hardware

■ Setting the indoor unit

Set the unique address for all indoor units connected to the BACnet Gateway.

Two hexadecimal digits 00~FF can be set to the address. The address can be set by the wired or wireless remote controller.

■ Installing the PI485

Install one PI485 for each outdoor unit and install the Dip switch correctly. Check the red LED blinking as many as the number of the indoor units.

■ Connecting the PI485-BACnet Gateway

Connect the PI485 A and B terminals of each outdoor unit to the RS-485 port of the BACnet Gateway.

■ Connecting the BACnet Gateway to the Internet

Connect the BACnet Gateway to the hub (Internet) or the PC via the LAN cable. And then, apply the power to the BACnet Gateway.

(2) Installing the software

■ How to set the BACnet Gateway

Set the BACnet Gateway by using the button and the LCD display.

■ Network environment setup of the BACnet Gateway

After getting the IP address of the BACnet Gateway assigned by the network administrator, set the network environment such as IP address of BACnet Gateway by using the button of the BACnet Gateway.

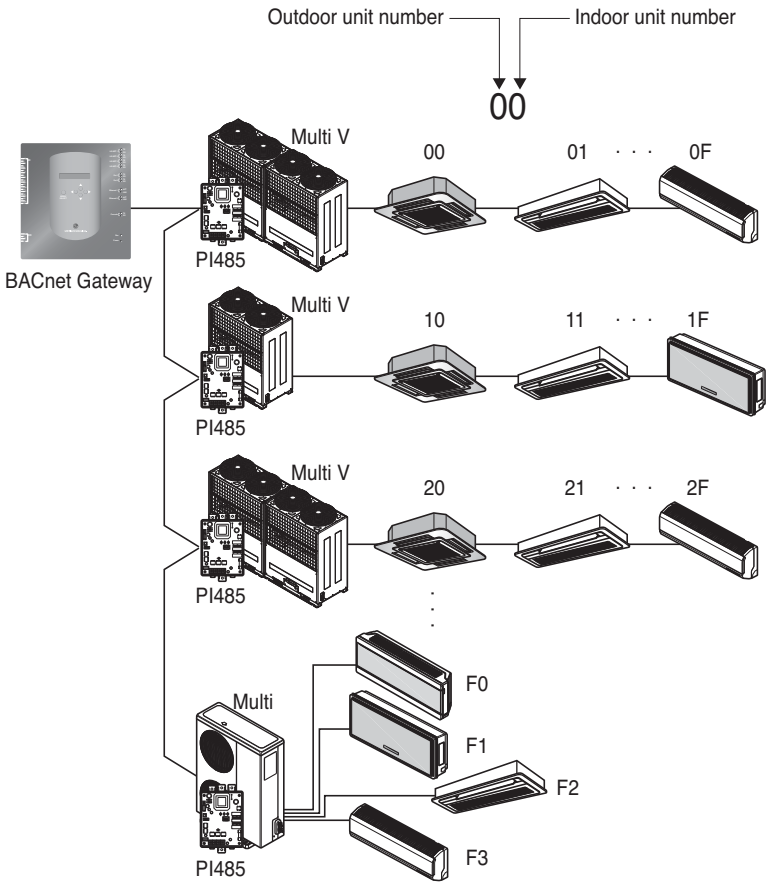
(3) Checking the installation

After installing the BACnet Gateway, it is possible to check the product communication status by using the Web controlling/monitoring feature.

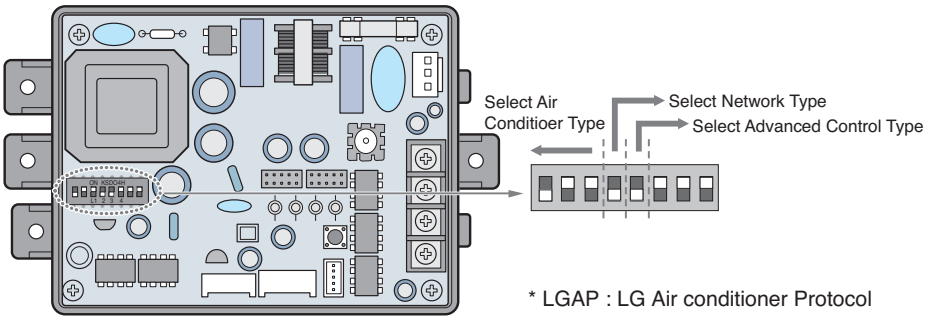
Hardware Installation

(1) Setting the indoor unit address

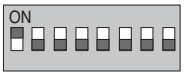
- By considering the entire installation configuration connecting to one BACnet Gateway, set the unique address for each indoor unit. (We recommend to reflect it to the installation drawing.)
- Two hexadecimal digits 00~FF can be set to the address of the indoor unit.
- For the Multi V product, in order to identify the system component, we recommend to set the outdoor unit number to the first digit of the address and the indoor unit number to the second digit.
- The ventilating product can be also installed and controlled by the BACnet Gateway. (However, the address of the ventilation product cannot be set to overlap the address of the air conditioner.)



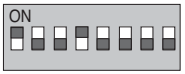
(2) Installation PI485



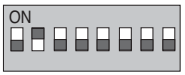
Multi V & Multi(LGAP applied) products Configuration Methods



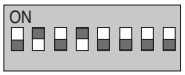
➔ **1 ON, All others OFF**: Multi V products(Except CRUN products) or Multi(Non-Inverter) Product applied Common PCB(Refer to NOTE) or Multi(Inverter) Product + Central Controller(All types) - Without LGAP



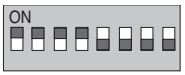
➔ **1 and 4 ON, All others OFF**: Multi V products(Except CRUN products) or Multi(Non-Inverter) Product applied Common PCB or Multi(Inverter) Product + Central Controller(All types) - Using LGAP



➔ **2 ON, All others OFF**: Multi(Non-Inverter) Product + Centroller(All types) - Without LGAP



➔ **2 and 4 ON, All others OFF**: Multi Non-Inverter Product + Central Controller(All Types) - Using LGAP



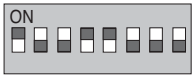
➔ **1,2,3,4 ON** : Multi V CRUN Product + Central Controller(All types) - Using LGAP

* Please refer the corresponding Central Controller installation manual if you want to know whether your Central Controller is compatible with LGAP or not.

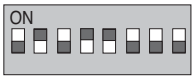
CAUTION:
The wrong setting of air-conditioner switch could cause malfunctioning.
Switch setting must be done carefully.
Push the Reset button after changing the Dip switch.

NOTE: Multi(Non-Inverter) Product applied Common PCB
PCB P/NO. : 6871A20917*
P/NO. : 6871A20918*
P/NO. : 6871A20910*

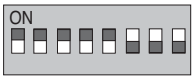
- To use the advanced lock function (Run Mode lock, Fan Speed lock, Temperature Lock, and Temperature Range lock; adjustable only within certain boundary) by central controller, Set up the fifth dip switch according to the type of outdoor product.
- In case of advanced lock function, it can use only the central controller applied to LGAP.



➔ **1, 4 and 5 ON, All others OFF :**
MultiV Products (Except CRUN products) or MPS Inverter Product + Central Controller (All types) - Using LGAP



➔ **2, 4 and 5 ON, All others OFF :**
Multi Standard Product + Central Controller (All types) - Using LGAP



➔ **1, 2, 3, 4and 5 ON, All others OFF :**
MultiV CRUN Product + Central Controller (All types) - Using LGAP

NOTE : The advanced lock setting

Some products do not support advanced lock function.
In this case, The fifth dip switch on PI485 must be on.

In case of product applied to advanced function, it can process the advanced lock function without fifth dip switch ON.

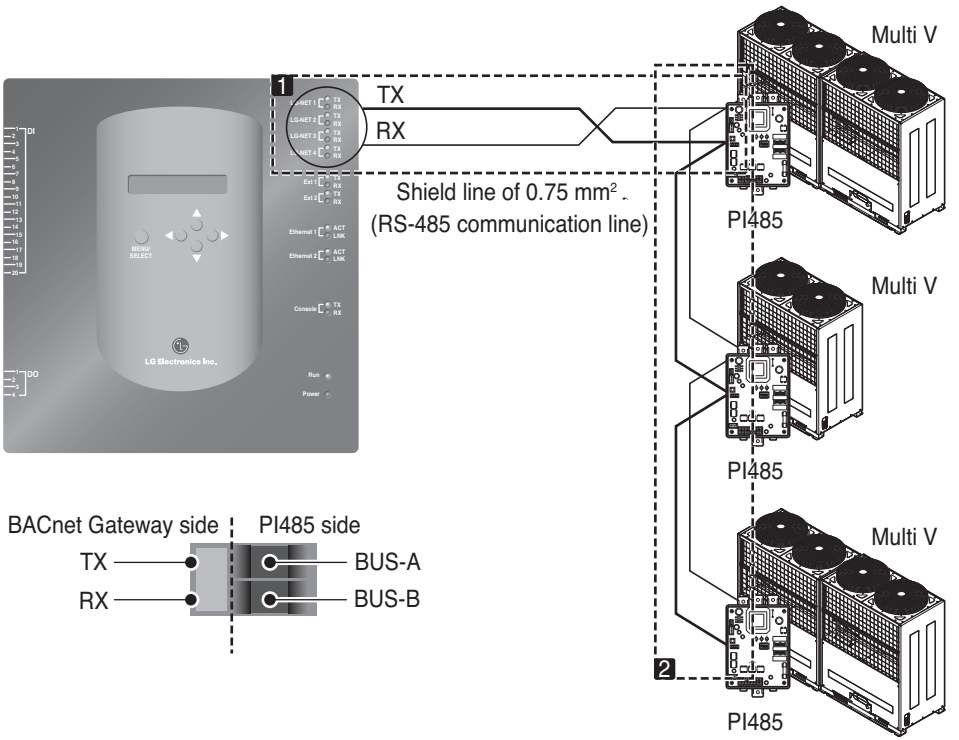
If all units support advanced lock function,
It is recommended that the fifth dip switch be off, so that advanced lock function is processed faster.

CAUTION:
The wrong setting of air-conditioner switch could cause malfunctioning.
Switch setting must be done carefully.
After setting the dip switch, PI485 must be reset

(3) Connecting PI485 – BACnet Gateway

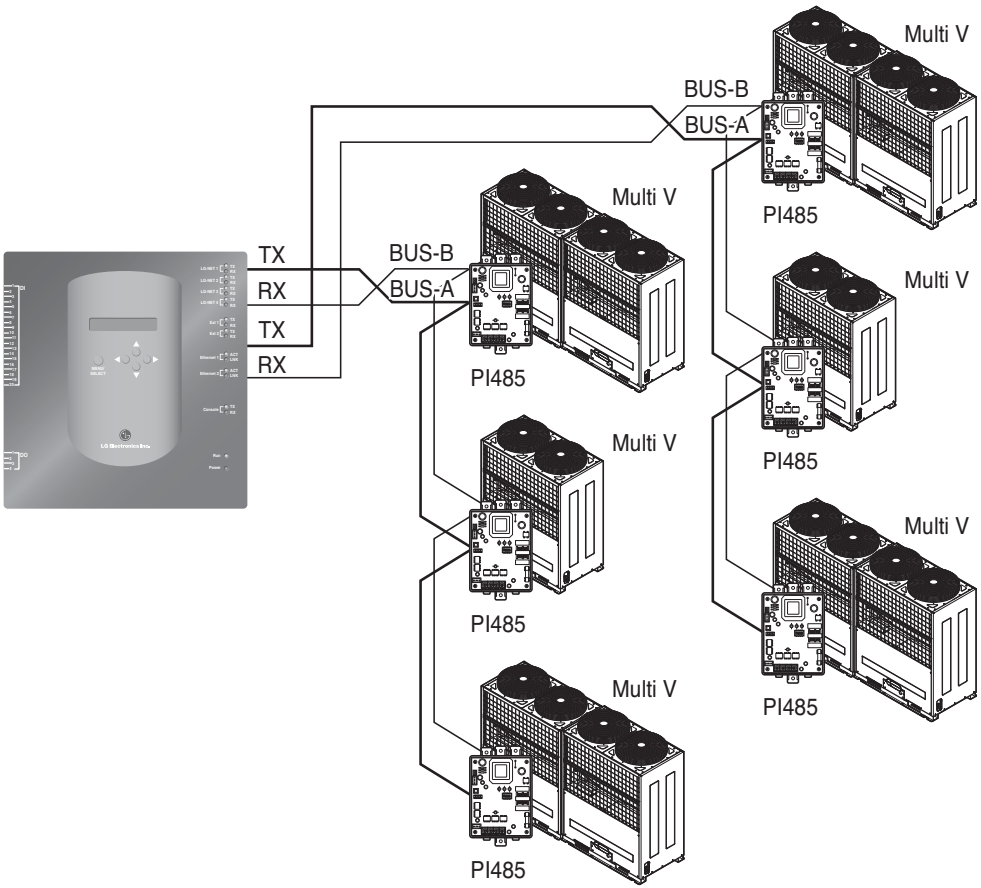
1. When connecting two or more PI485s to one BACnet Gateway, connect each BUS-A/BUS-B of other PI485s to be connected to BUS-A/BUS-B of the PI485.
2. Connect the BUS-A of the PI485 to the TX of the BACnet Gateway and the BUS-B to the RX.
   - Connect LG-NET 1~4 to any of the BACnet Gateway. (Connect the LG-NET to the RS-485 port)
   - 64 outdoor units at maximum can be connected to each 485 port of the BACnet Gateway and the number of indoor units to be connected to the BACnet Gateway is 256 at maximum.

Note: Disconnect the connector from the 485 port of the BACnet Gateway, connect the BUS-A to the TX and the BUS-B to the RX by using the (-) driver, and then connect the connector to the 485 port of the BACnet Gateway. Because the 485 communication line has a polarity, connect the line correctly.



• If there are many outdoor units, distribute the lines to LG-NET 1~4 to improve the control speed.

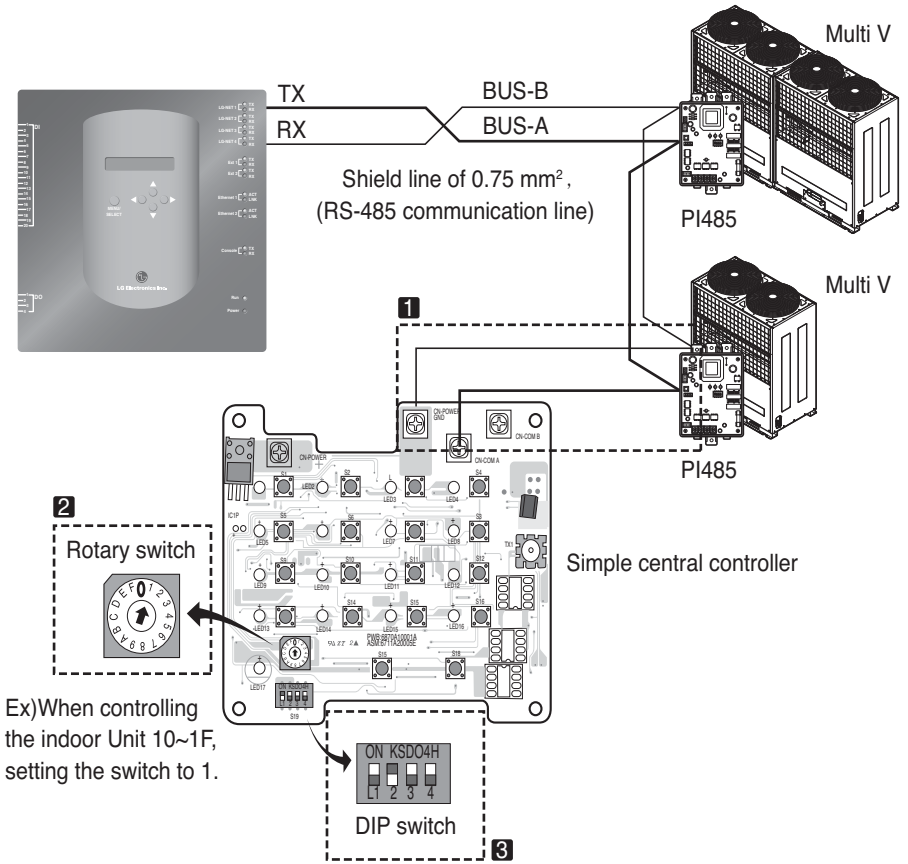
[Example for distributing the lines to LG-NET 1 and LG-NET 2]



• When using the simple central controller with the BACnet Gateway

1. Connect the BUS-A and the BUS-B of the PI485 to C and D of the simple central controller.
2. Set the rotary switch of the simple central controller to match with the group number of the indoor unit to control.
3. Set the dip switch number 1 of the simple central controller to Off as slave and set the dip switch number 2 to On as LGAP use mode.

Note: Check the LGAP label at the right side of the case of the simple central controller.
Only the product with the label can be connected to the BACnet Gateway at the same time.
Connect the VCC and the GND of the simple central controller from the P1485 or separately to the adaptor. (See the manual for the simple central controller.)



(4) Connecting Internet – BACnet Gateway

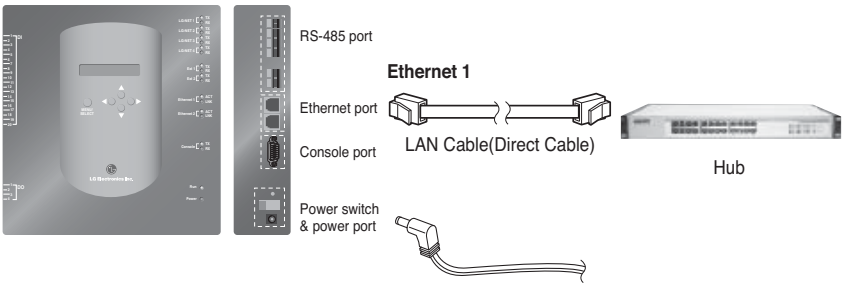
• In the case connecting a BACnet Gateway to the internet which is already installed in the site, there should be a HUB which is already installed.
In the case, being able to inter-work with the BMS system using the internet and connecting a BACnet Gateway to the internet which is already installed in the site : Use the HUB

Note: Through the test operation of BACnet Gateway, it can be judged whether the installation is properly done or not (instead of using the HUB, connecting the BACnet Gateway with a cross cable)

• Be aware the type of the cable you're using (the Direct cable or the Cross cable)
• Prior to the Connecting, Check whether the cable works properly or not through the LAN tester.
• After applying the power to the DC adapter provided, Turn on the power switch.

■ In the case using HUB

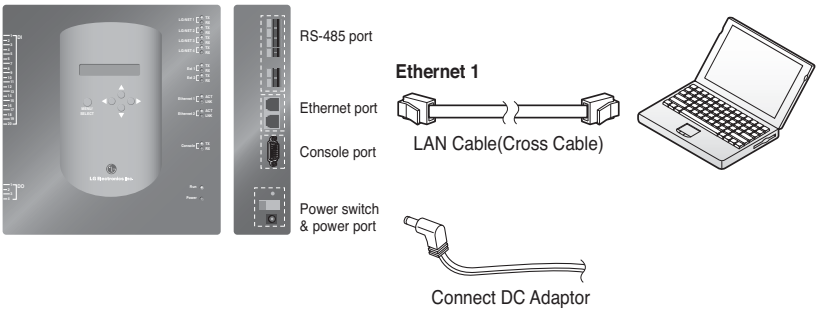
Use a LAN cable (Direct cable) and connect it to Ethenet1 of the BACnet Gateway
(Ethernet2 is reserved in case)



■ In the case NOT using HUB

(to check the communication status using web control/monitoring function in the site)

Use a LAN cable (Cross cable) and connect it to Ethenet1 of the BACnet Gateway
(Ethernet2 is reserved in case)



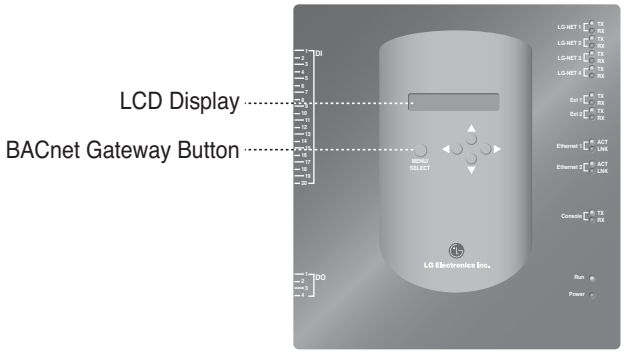
Note: If know Detail web control/monitoring function, refer web control/monitoring part

Software Installation

(1) How to set the BACnet Gateway

The following information should be set to use the BACnet Gateway

• BACnet Gateway network environment Setting IP address, Gateway address and Net mask address



■ Setup Order

1. Turn on the BACnet Gateway.
   (The following screen will be displayed on the BACnet Gateway LCD screen about 5 seconds after the power is turned on.)

[LCD screen]

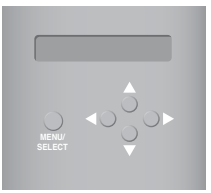
LG Electronics
wait for booting

[Start-up screen]

BACnet Gateway
SW Ver.1.0.0

• S/W Ver. No. may be different according to the manufactured date.

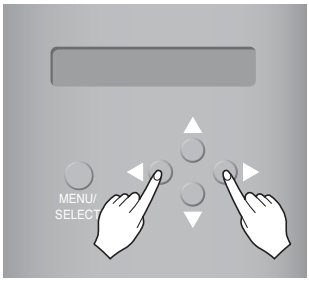
2.Press “MENU/SELECT” button of the BACnet Gateway to enter the environment setup mode.



Setting
Information

• Menu selection displayed on the screen.
When the "MENU/SELECT" button is pressed for the first time.
Select "Setting" mode to change setup. Select "Information" mode to confirm setup state.

3. After selection "Setting" mode using the up/down(▲, ▼) button, use the left/right(◀, ▶) button to select the desired function.



Enter the IP address

[MENU] → Set IP address

Enter the Gateway address

← [MENU] → Set GW address

Enter the Net mask

← [MENU] → Set Netmask

Enter the Set BACnet Type

← [MENU] → Set BACnet Type

4. Press the “MENU/SELECT” button at the desired function to enter into the setup window for the said mode.

Note: LG BACnet Gateway support two type Gateway depend on selection type "A" and type " B". Type "A" support multi device per one IP address and Type " B" support only one device per one IP address.
After asking BMS engineer about multi device or one device per one IP address, select LG BACnet Gateway's "Set BACnet Type".

(2) Network environment setup of the BACnet Gateway

• After getting the IP address of the BACnet Gateway assigned from the network administrator, use the button of the BACnet Gateway to set up the IP address and the network environment of the BACnet Gateway.

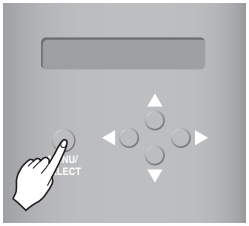
■ Setup procedure

• Set the IP address
• Enter the Gateway address
• Enter the net mask
• Enter the Set BACnet Type
• Check the network environment setting

Note: If the above items are not entered, it is impossible to control the BACnet Gateway or it causes the communication error, so make sure that all of them are correctly entered.

1. Setting the IP address

① First, press the "MENU/SELECT" button of the BACnet Gateway and selecting "Setting" menu. When the following menu is displayed on the BACnet Gateway LCD screen, press the “MENU/SELECT” button again to enter the IP address.

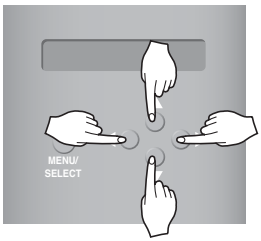


[LCD screen]

[MENU] Set IP address

[Set IP address] 192.168.000.000

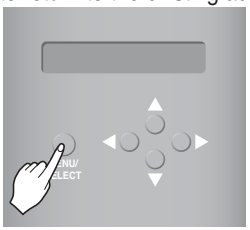
② Use the up/down/left/right button (▲, ▼, ◀, ▶) to select the desired address.



[Example for setting the Gateway address]

[Set IP address] 165.186.002.101

③ After entering the last address, press the “MENU/SELECT” button to set the entered address to the IP address. (When there is no “MENU/SELECT” button input for 5 seconds, the set value is ignored to return to the existing address.

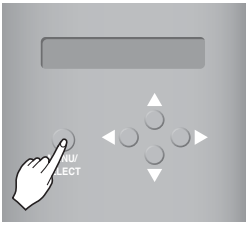


[LCD screen after completing the setup]

BACnet Gateway SW ver. 1.0.0

2. Setting the Gateway address

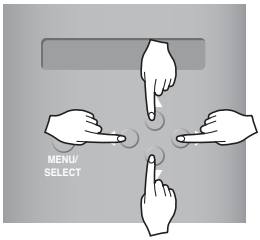
① Press the buttons by the following order. And then, when the following menu is displayed on the BACnet Gateway LCD screen, press the “MENU/SELECT” button to enter the Gateway address.



[LCD screen]

[MENU] Set GW address	[Set GW address] 192.168.000.000

② Use the up/down/left/right button (▲,▼,◀,▶) to select the desired address.

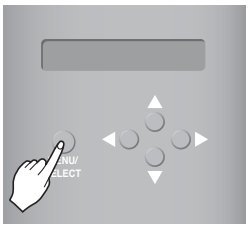


[Example for setting the Gateway address]

[Set GW address] 165.186.002.001

3 After entering the last address, press the “MENU/SELECT” button to set the entered address to the Gateway address.

(When there is no “MENU/SELECT” button input for 5 seconds, the set value is ignored to return to the existing address.

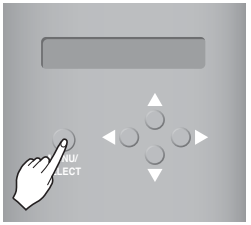


[LCD screen after completing the setup]

BACnet Gateway SW ver. 1.0.0

3.Setting the net mask address

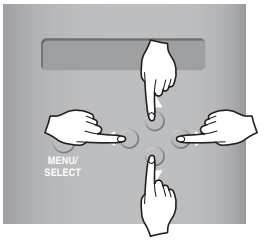
① Press the buttons by the following order. And then, when the following menu is displayed on the BACnet Gateway LCD screen, press the “MENU/SELECT” button to enter the net mask address.



[LCD screen]

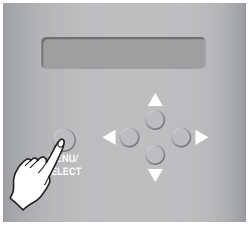
[MENU] Set Netmask	[Set Netmask] 192.168.000.000

② Use the up/down/left/right button (▲,▼,◀,▶) to select the desired address.



[Set Netmask] 255.255.255.000

3 After entering the last address, press the “MENU/SELECT” button to set the entered address to the net mask address. (When there is no “MENU/SELECT” button input for 5 seconds, the set value is ignored to return to the existing address.

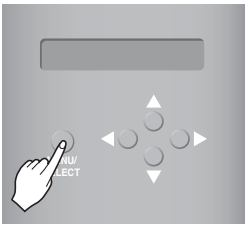


[LCD screen after completing the setup]

BACnet Gateway SW ver.1.0.0

4. Setting the Set BACnet Type

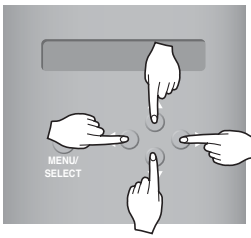
① Pres4s the button by the following order. When the following menu is displayed on the BACnet Gateway LCD screen, press the "MENU/SELECT" button to enter the Set BACnet Type.



[MENU]
Set BACnet Type

[Set BACnet Type]
A ‘

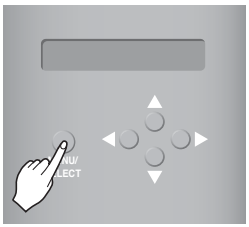
② Use the up/down/left/right button (▲,▼,◀,▶) to select the desired BACnet Type.



[Example for setting the gateway Set BACnet Type]

[Set BACnet Type]
A ‘ B

③ After selecting the BACnet Type, press the "MENU/SELECT" button to set the selected BACnet Type to the Set BACnet Type.

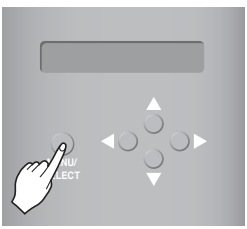


[LCD screen after completing the setup]

BACnet Gate way
SW ver.1.0.0

5. Checking the network environment setting

Press the buttons by the following order. And then, when the following menu is displayed on the BACnet Gateway LCD screen, press the “MENU/SELECT” button to check the set network information.
The other information is displayed on the screen every 3 seconds.
(Order to display the information : MAC address → IP address → Gateway address → Net mask address → Set BACnet Type)



[LCD screen]

Setting
Information

LG's BACnet Gateway Agreement

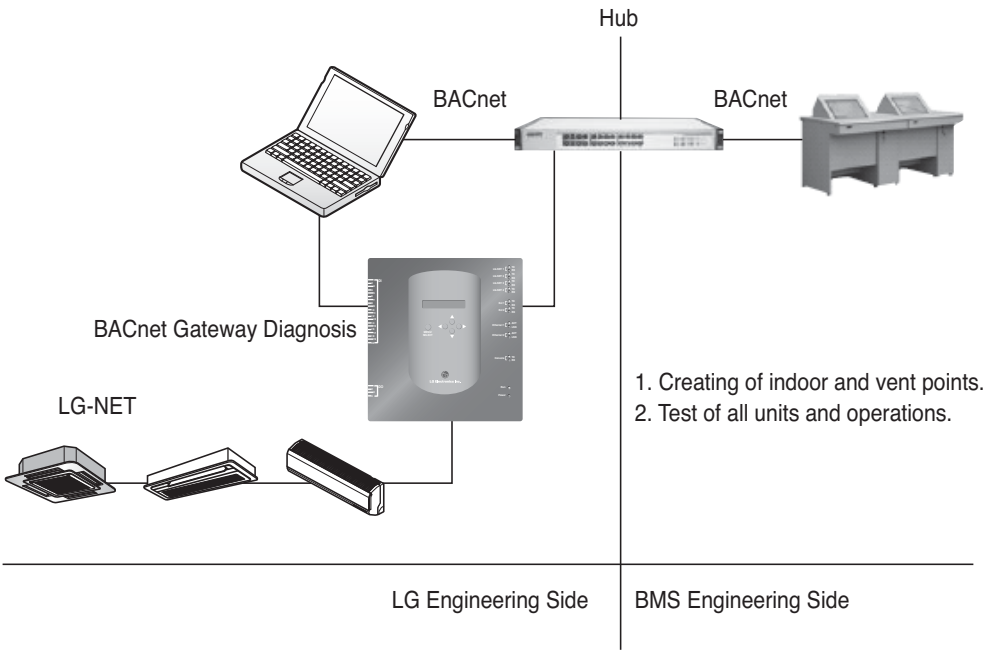
JMT (Joint Matching Test) – This is necessary for every independent BMS.
The case where a JMT is not necessary is where previously a successful JMT has been carried out and the BMS system has not been updated by software or hardware changes. In the case that the BMS has updated their system by either changes, a following JMT will be required.

BNU-BAC Diagnosis – Use of LG's BNU-BAC setup-tool is for confirming the operation/state of connected A/C units & address ID's, prior to connection with the BMS system.

BMS Engineering – Creating of the Points. This is NOT to be done by LG since it is directly related to the BMS side. The BMS engineer is to carry out the engineering of the Point, however LG is responsible for providing the method of how the Points are calculated.

Commission – First step, only using LG's BACnet Gateway, without connecting BMS. This is to be carried out by LG engineering staff with the use of the BNU-BAC set up tool.

Discrepancy of operation of Gateway by BMS - In the case that the BMS maker feels that the BACnet Gateway is not functioning correctly via the BACnet Protocol, a test with the use of LG's BACnet Client software can confirm this. (This test is generally not required)



Note : After the LC BACnet Gateway agreement part, please scrutinize with Companies specialized in BMS.

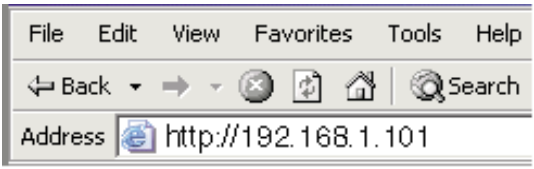
Test operation procedure

Web control and monitoring

The following procedure is BACnet Gateway test operation for remote control function.

■ Connecting to BACnet Gateway server.

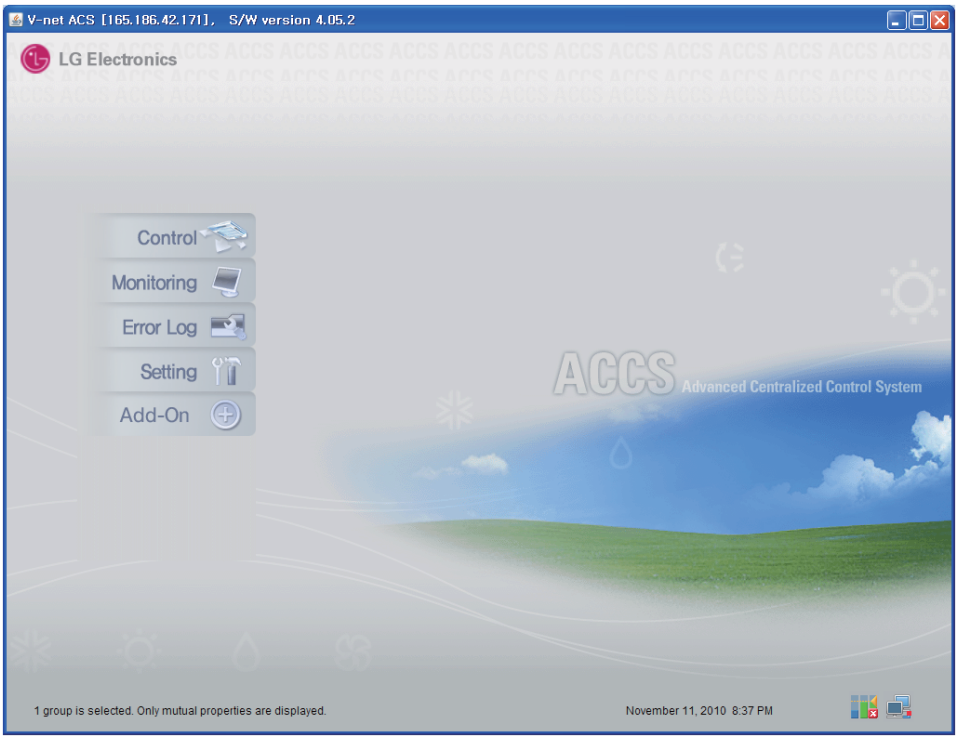
In order to connect to the BACnet Gateway server connect the Ethernet1 (LAN port) in the Gateway to the PC Input the default IP address on the URL address box for connection.
ID and PW are bacnet, bacnet.



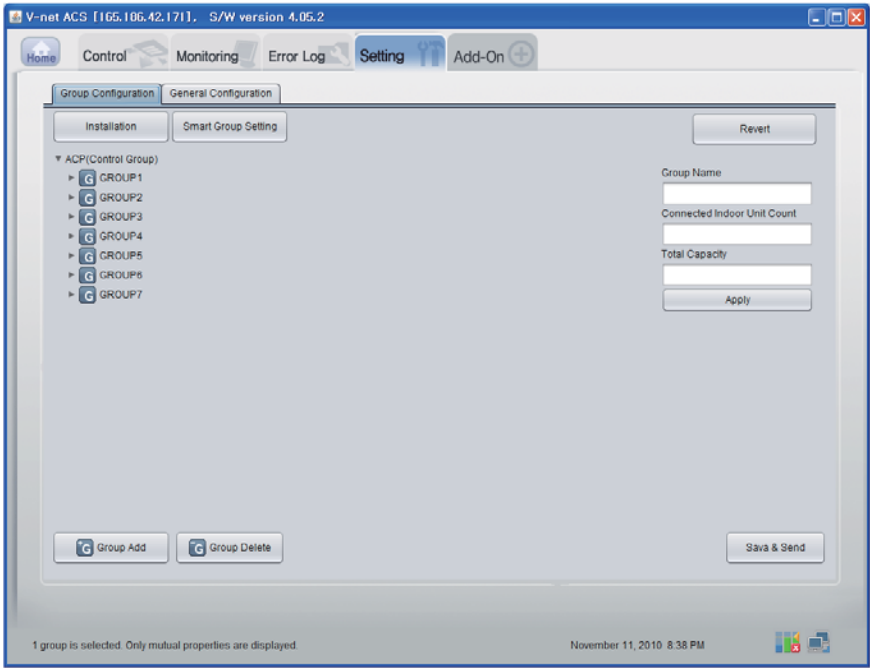
■ Auto address search

The address of the installed indoor unit can automatically be searched.
To search the indoor unit automatically, proceed as follows.

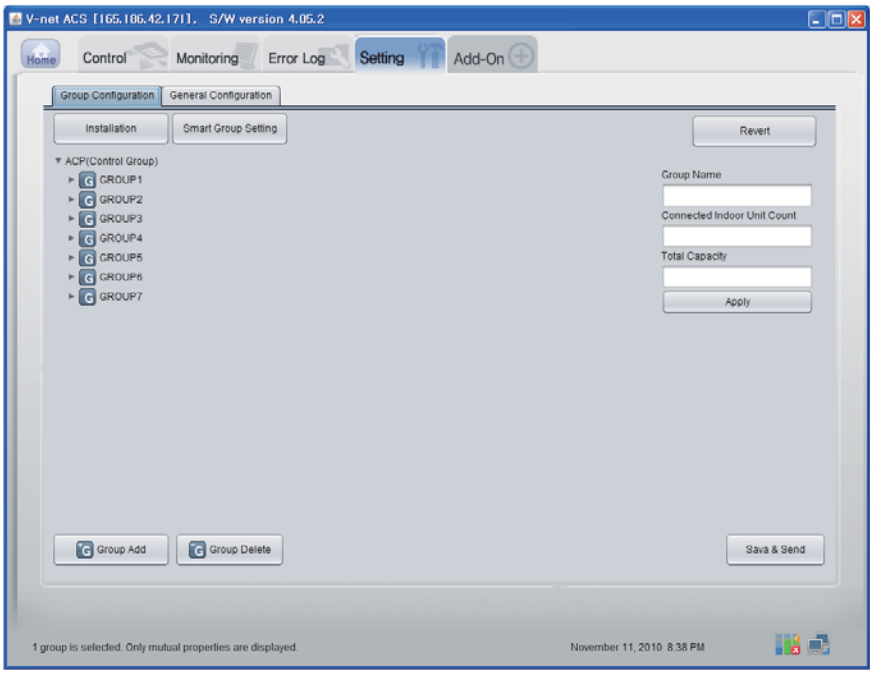
1. When the program is launched normally, the following screen will be displayed.
   Click “Setting” menu.



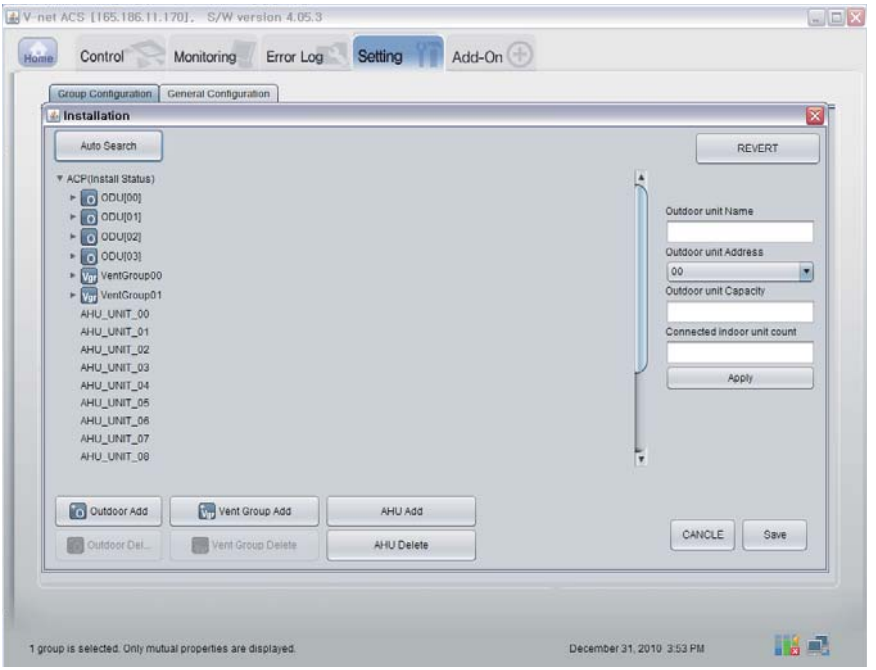
2. As shown below, Setting screen will be appeared



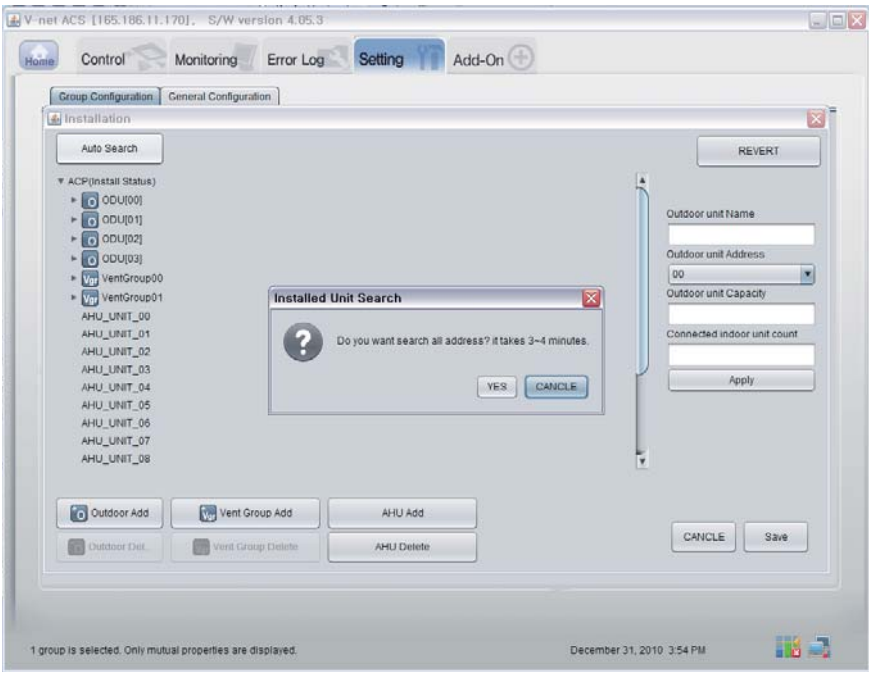
3. Click on 'Installation' button.



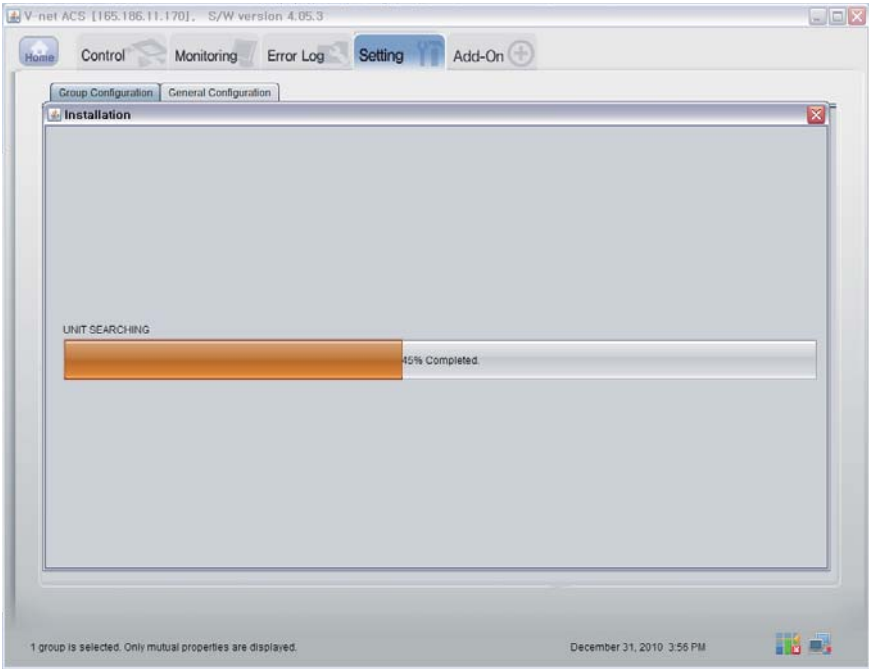
4. Click on ‘Auto search’ button.



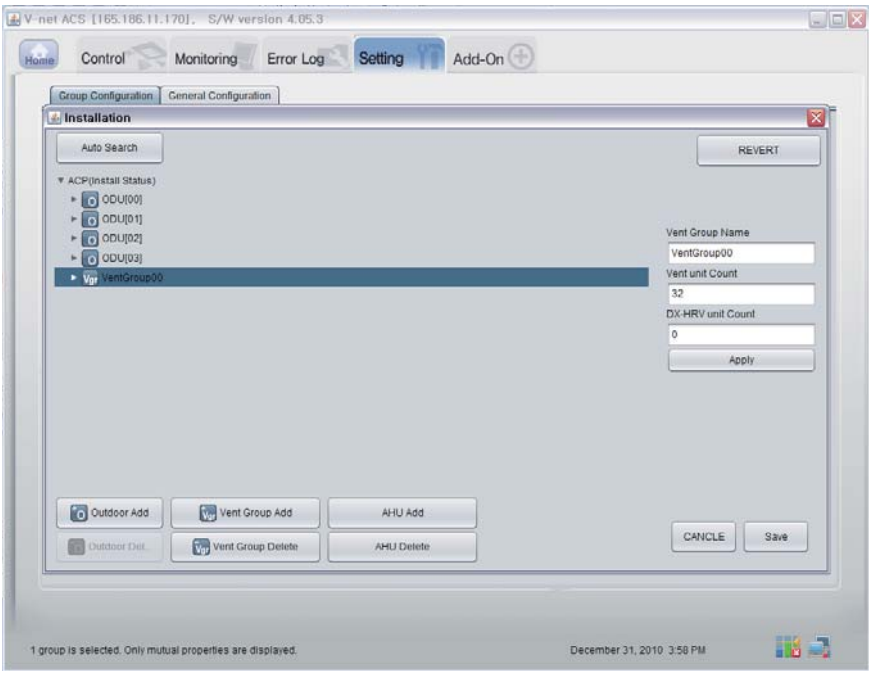
5. Click on ‘Yes’ button to search the address of the indoor unit.



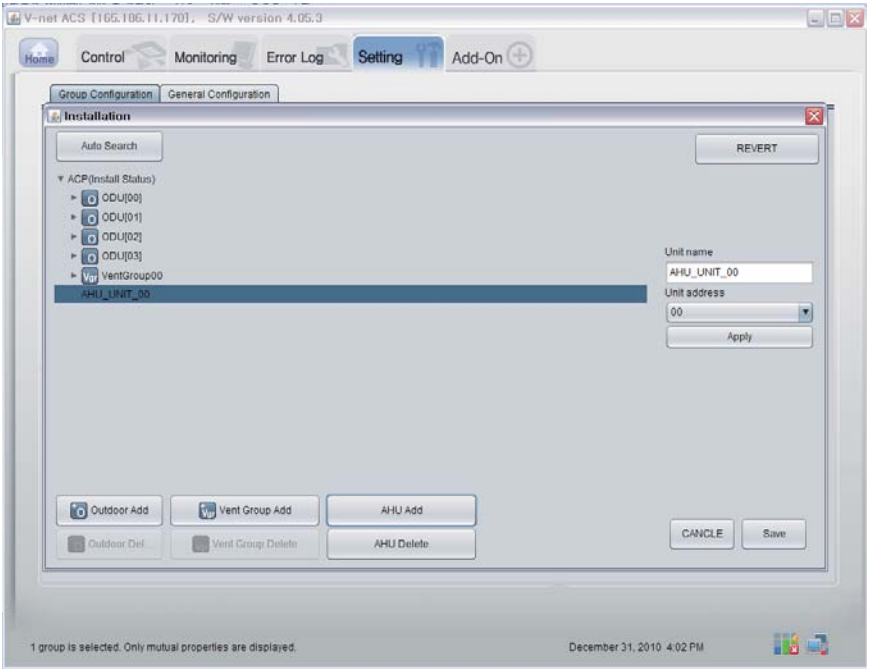
6. Screen when search is in progress.



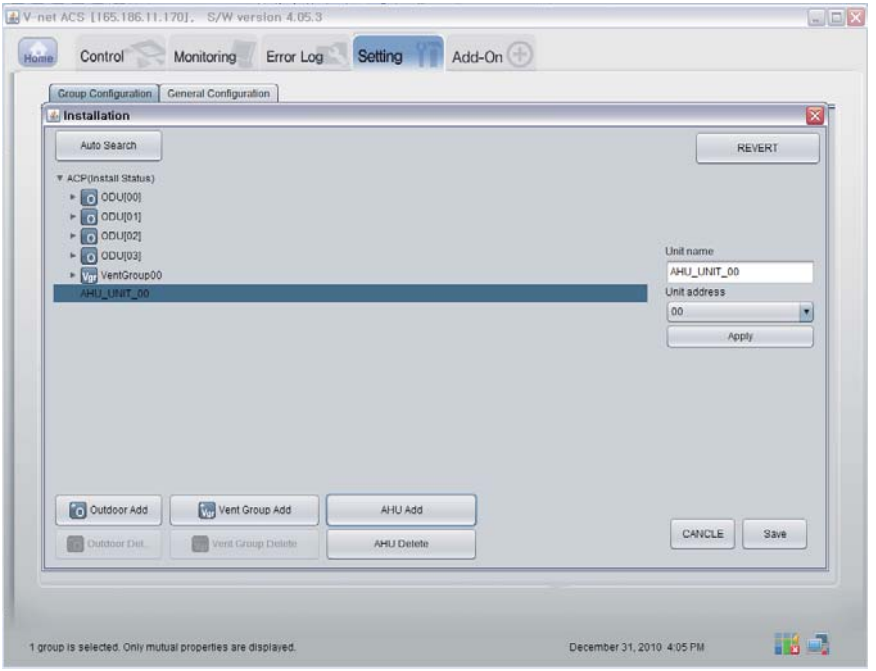
7. Screen when search is completed. If There is no AHU, go to the step 10.



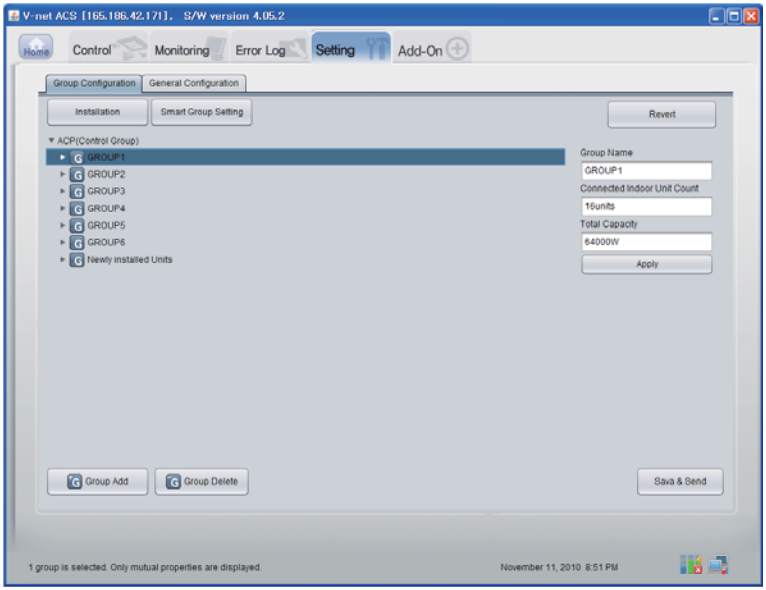
8. Click ‘AHU Add’ button.



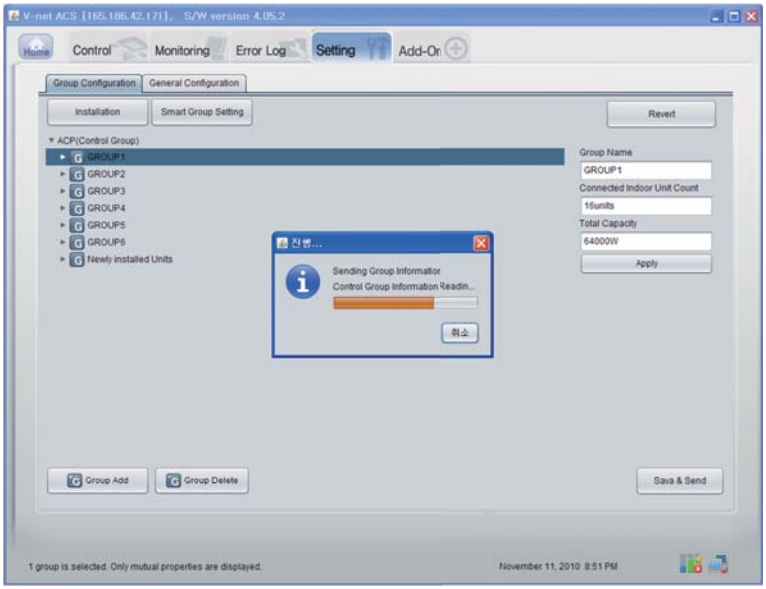
9. Click on “Save” button.



10. As shown below, Setting screen will appear.
    1) Click on ‘Smart Group Setting’ button to automatically create the group based on the outdoor unit.
    2) If you want to move the indoor unit to a different group, click the indoor unit with the mouse and drag.
    3) If you want to rename the group or indoor unit, change the name on the right window and click on the ‘Apply’ button.
    4) When the group setting is completed, click on the ‘Save & Send’ button.

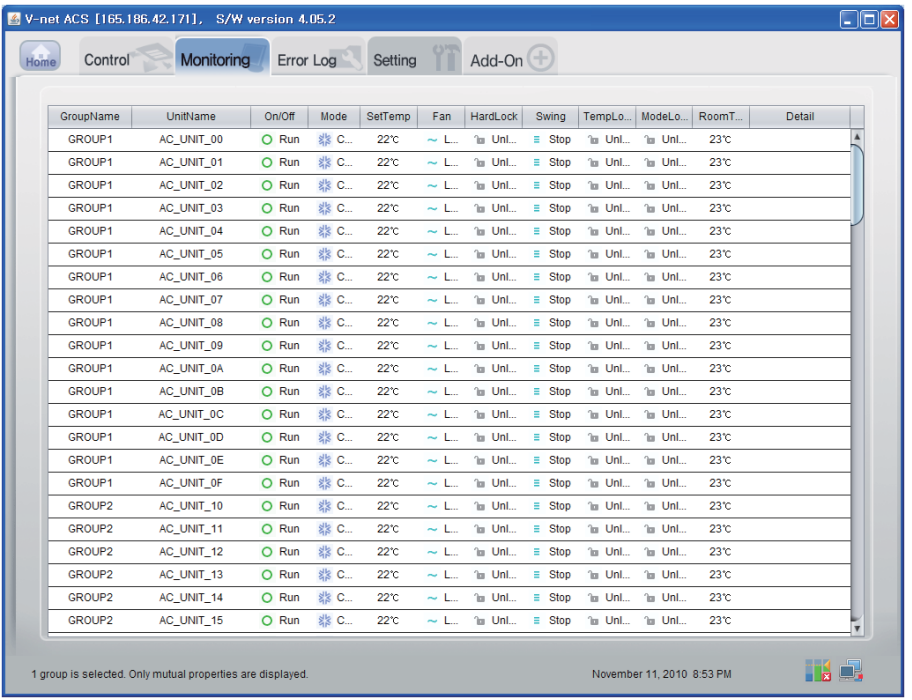


11. When all items are set, click “Save & Send” button to save.
    The saving process is performed.



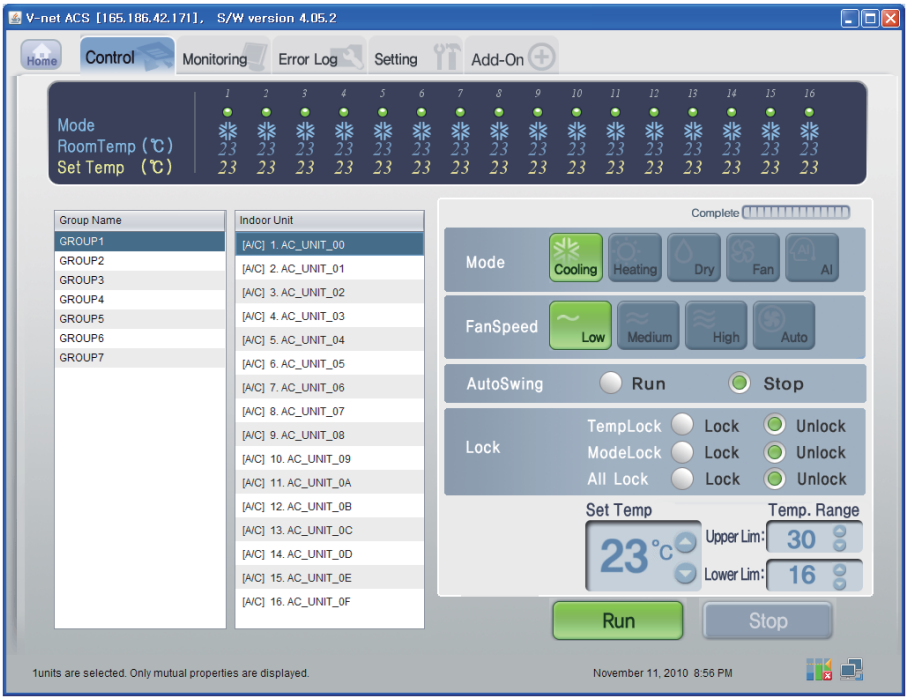
■ Confirmation of monitoring data function

Click the "Monitoring(Indoor Unit/Vent/AHU)" button at the top Remote Diagnosis page, and you can confirm the information of Indoor Unit/Vent/AHU.



■ Confirmation of Control Function (Indoor Unit/Vent/AHU)

Click the "Control(Indoor Unit/Vent/AHU)" button at the top Remote Diagnosis page, and you can confirm the data of Indoor Unit/Vent/AHU in real-time.

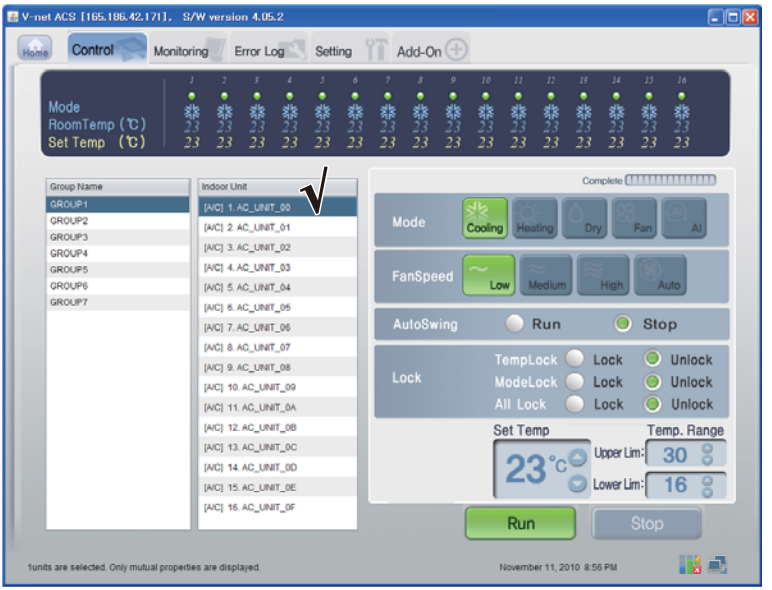


■ Indoor Control

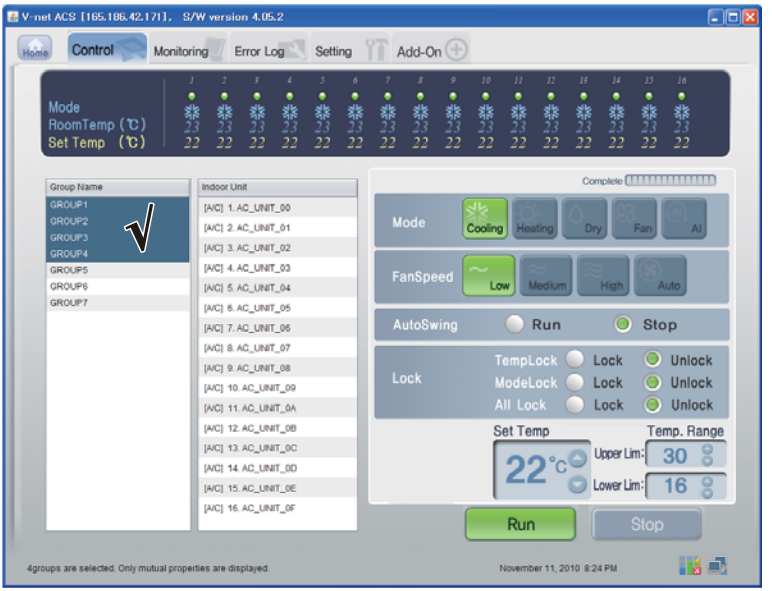
Click the Indoor's Control Group

- Individual / Total Control

Click the unit which will be controlled for individual control or click ALL for total control.



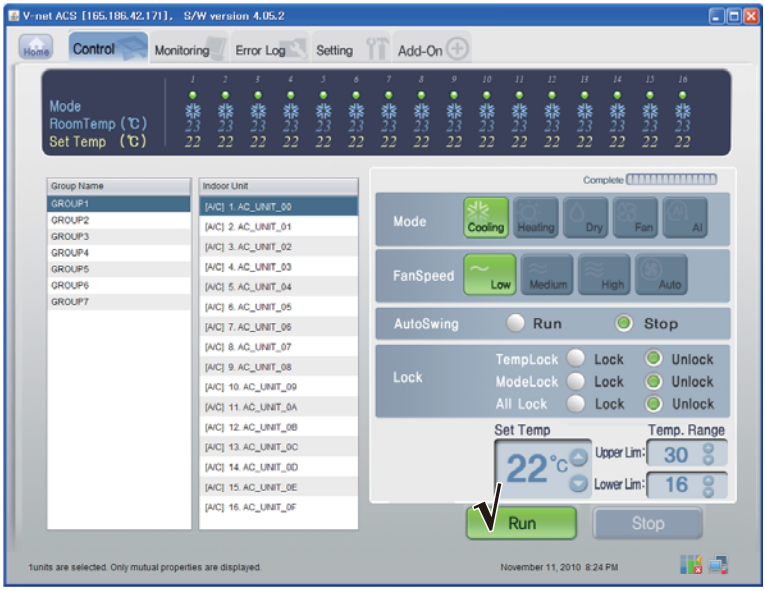
< Individual Control >



< Total Control >

- Control : Run/Stop

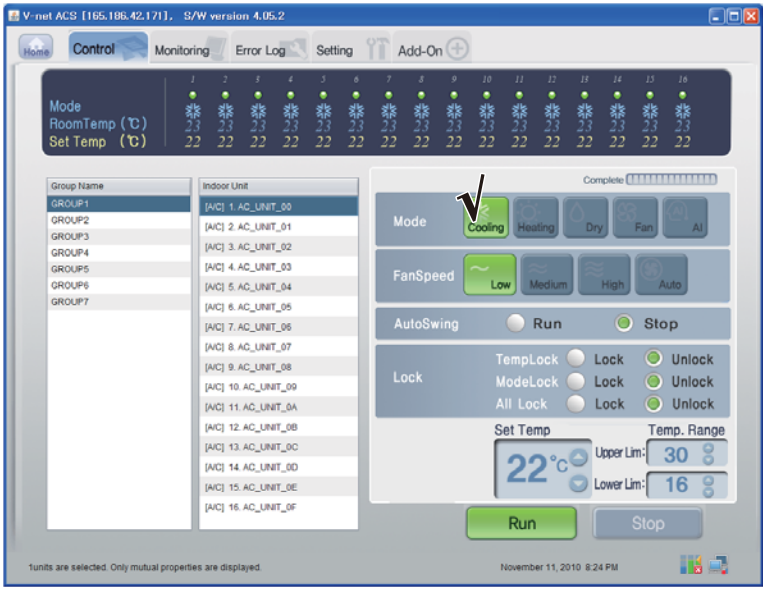
(1) Click the Run/Stop button.



< Run/Stop Control >

- Control :Mode

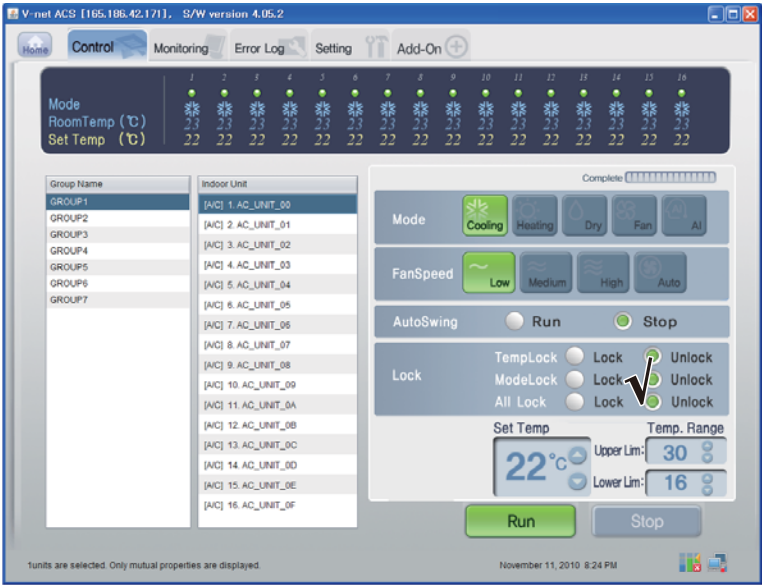
(1) Click the Mode button. (Cooling/Heating/Dry/Fan/AI)



< Mode Control >

- Control : Lock/Unlock

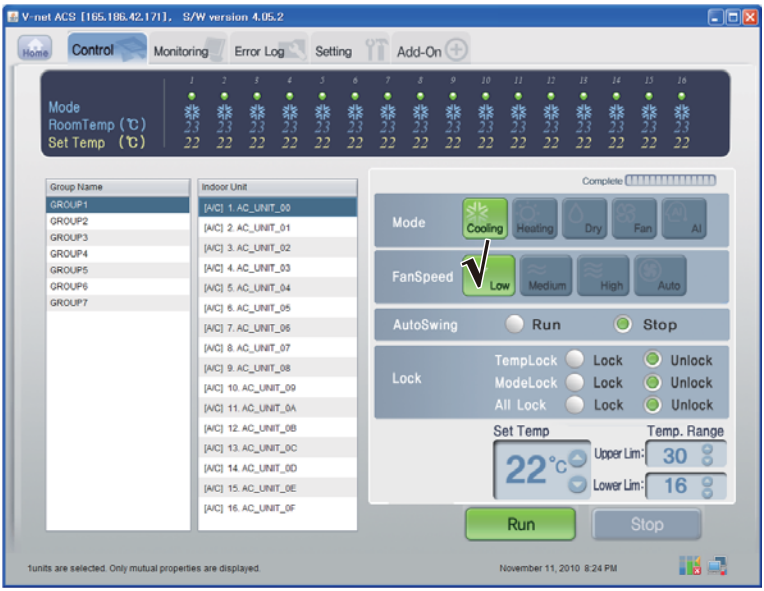
(1) Select the Lock button. (Temp Lock/Mode Lock/ All Lock)



< Lock/Unlock Control >

- Control : Fan Speed

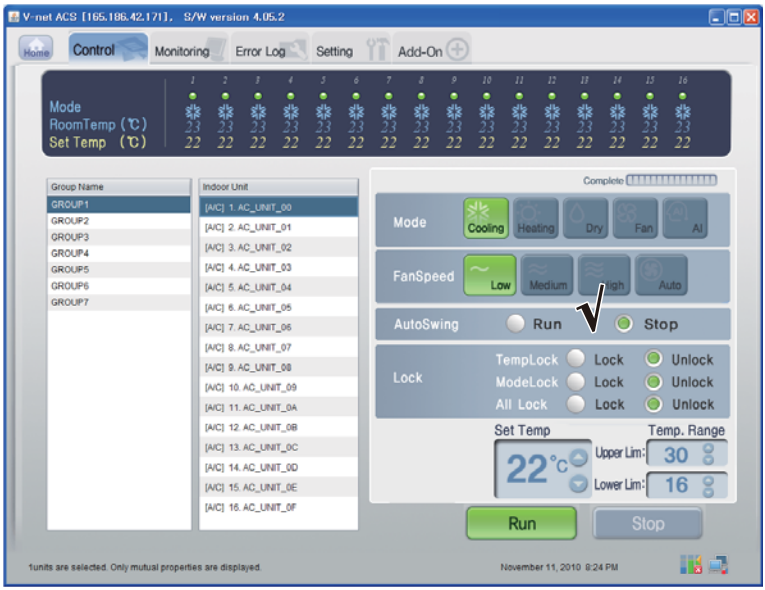
(1) Click the Fan Speed button. (Low/Medium/High/Auto)



< Fan Speed Control >

- Control : Swing

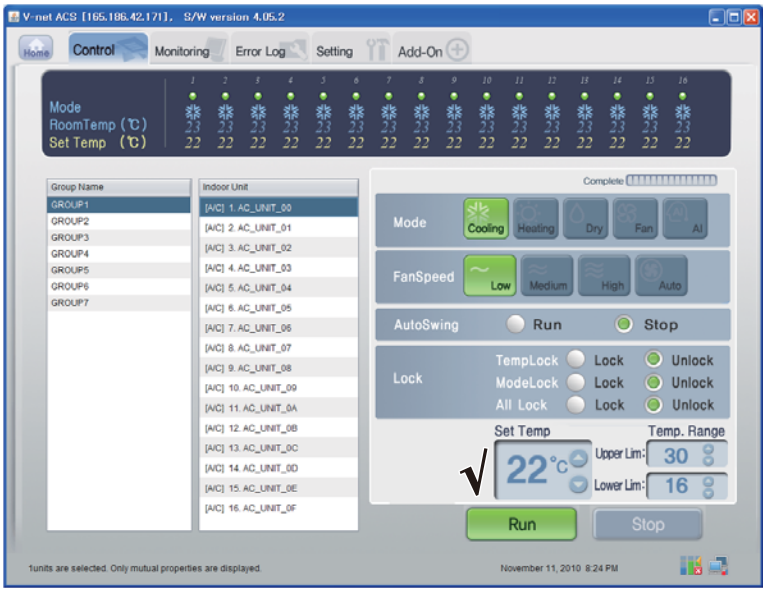
(1) Select the Auto Swing button. (Run/Stop)



< Swing Control >

- Control:Temp.

(1) Click the Up/Down button for Set Temp.



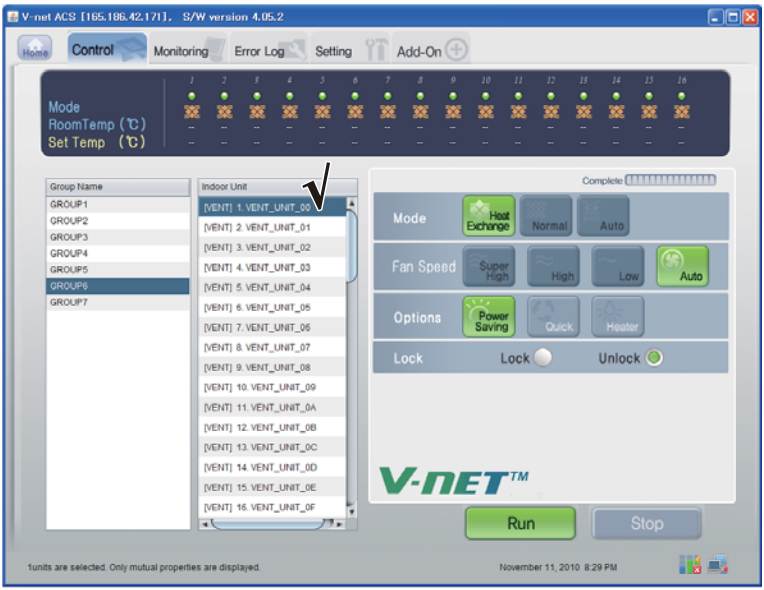
< Temp. Control >

■ Vent Control

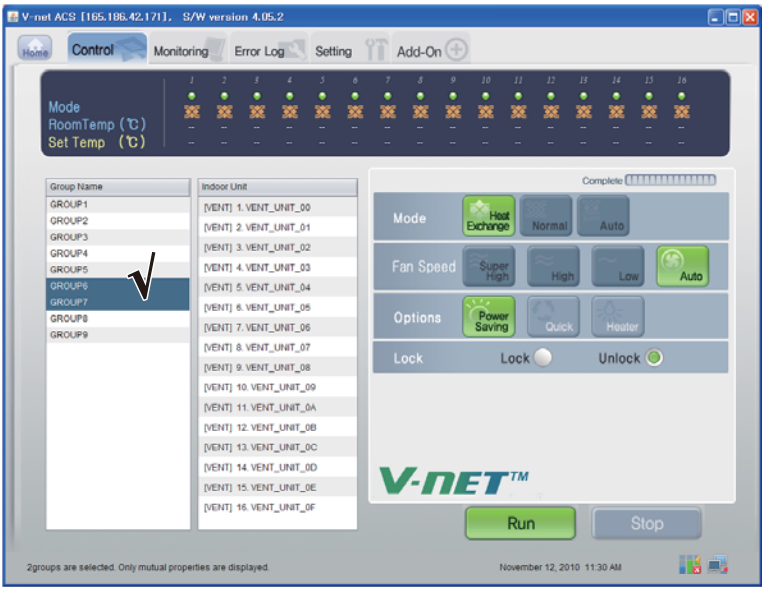
Click the Vent Control Group

- Individual Control / Total Control

Click the unit which will be controlled for individual control or Click ALL for total control.



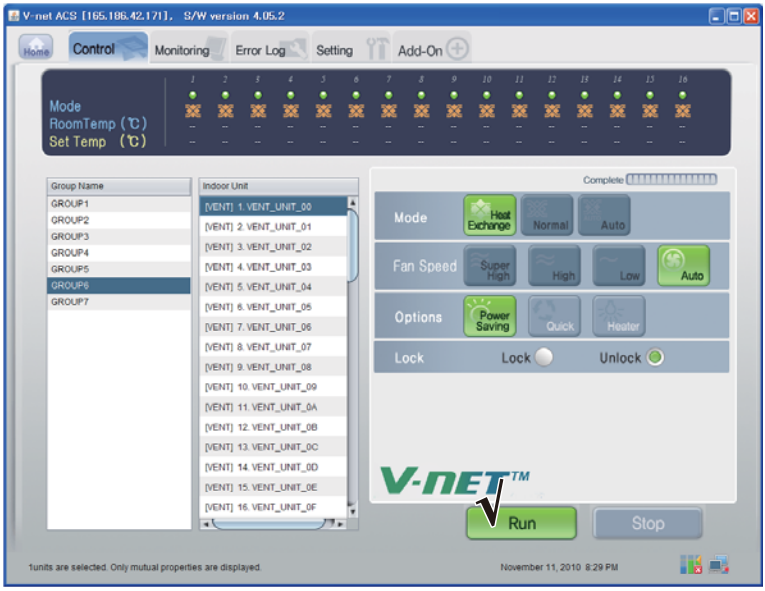
< Individual Control >



< Total Control >

- Control : Run/Stop

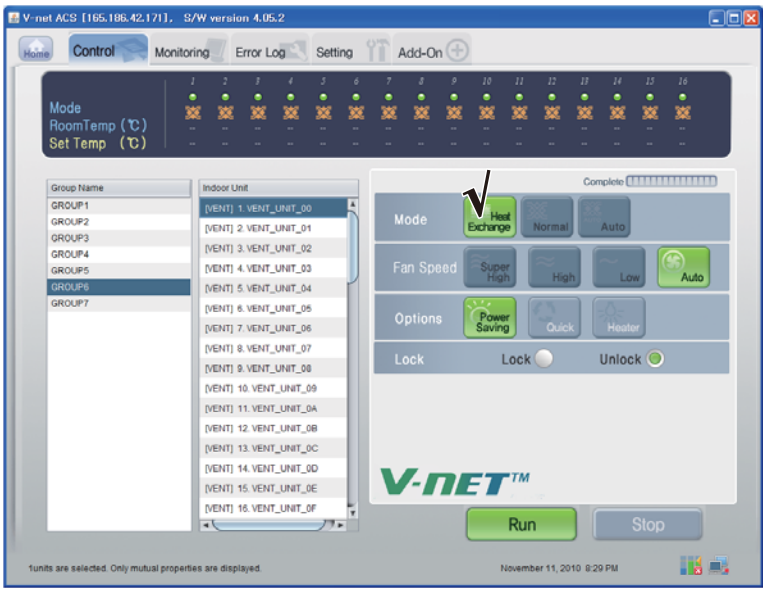
(1) Click the Run/Stop button.



< Run/Stop Control >

- Control : Mode

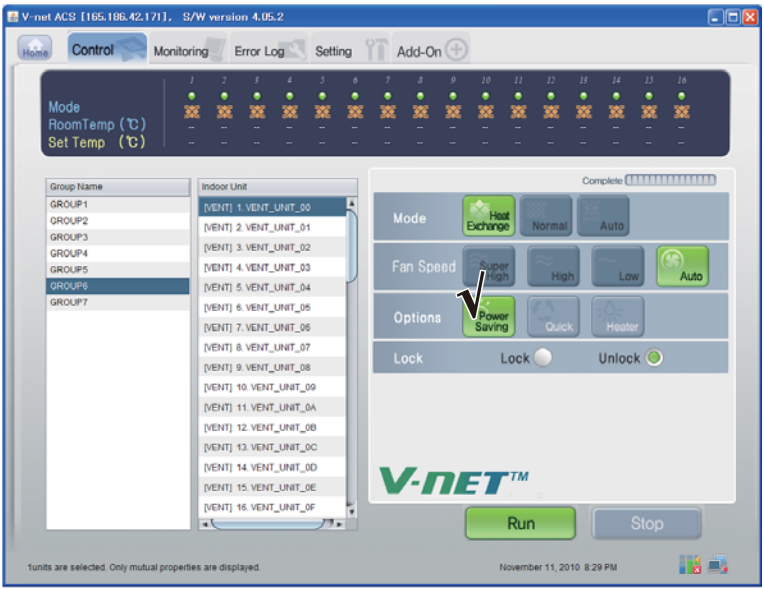
(1) Click the Mode button. (Heat Exchange/Normal/Auto)



< Mode Control >

- Control : User Mode

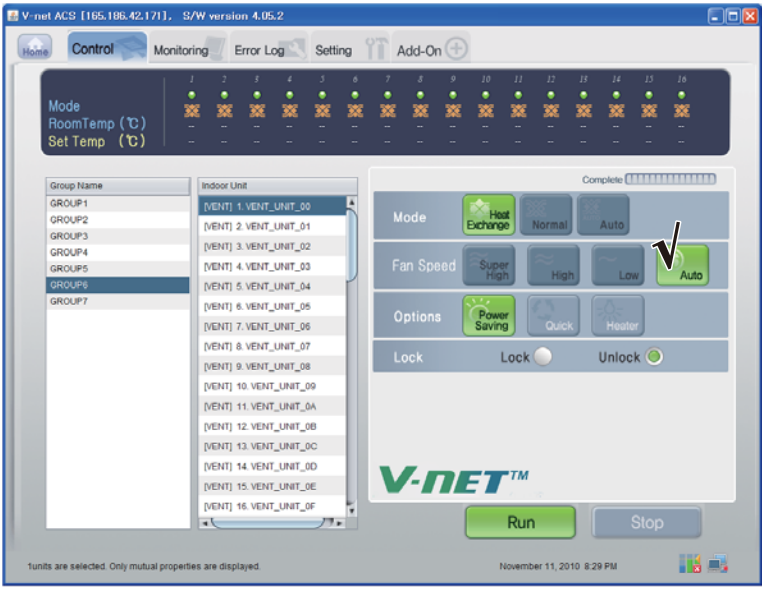
(1) Click the Options(User Mode) button. (Power Saving/Quick/Heater)



< User Mode Control >

- Control : Fan Speed

(1) Click the Fan Speed button. (Super High/High/Low/Auto)



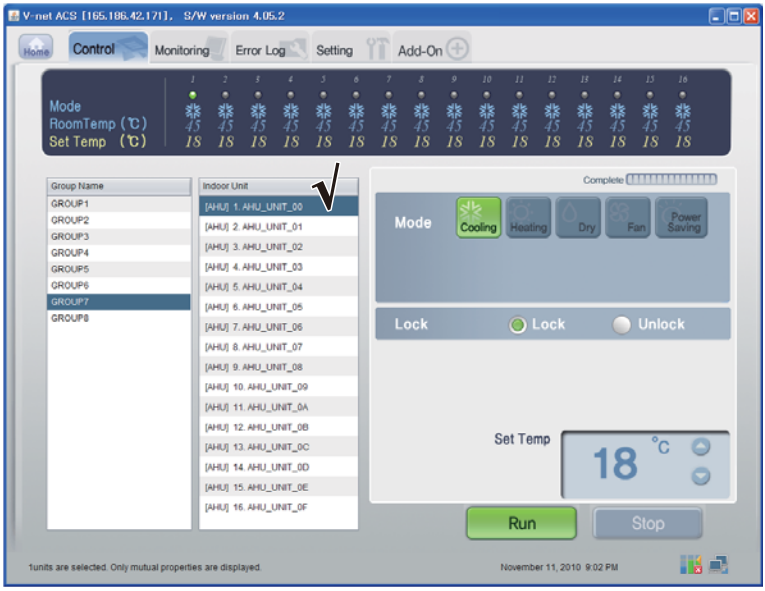
< Fan Speed Control >

■ AHU Control

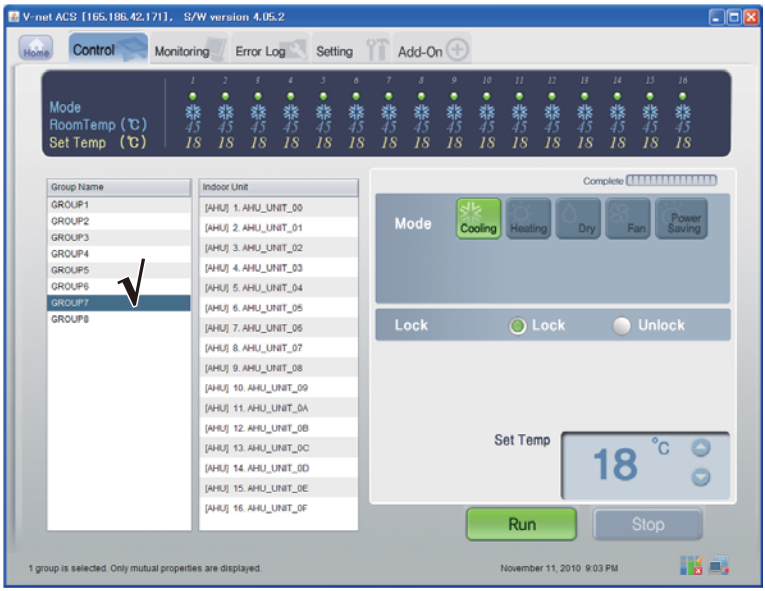
Click the AHU Control Group

- Individual Control / Total Control

Click the unit which will be controlled for individual control or Click ALL for total control.



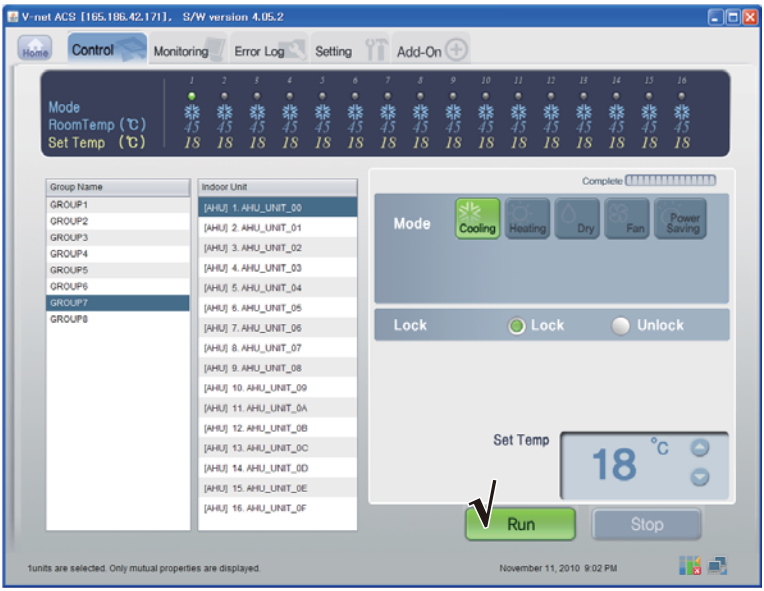
< Individual Control >



< Total Control >

- Control : Run/Stop

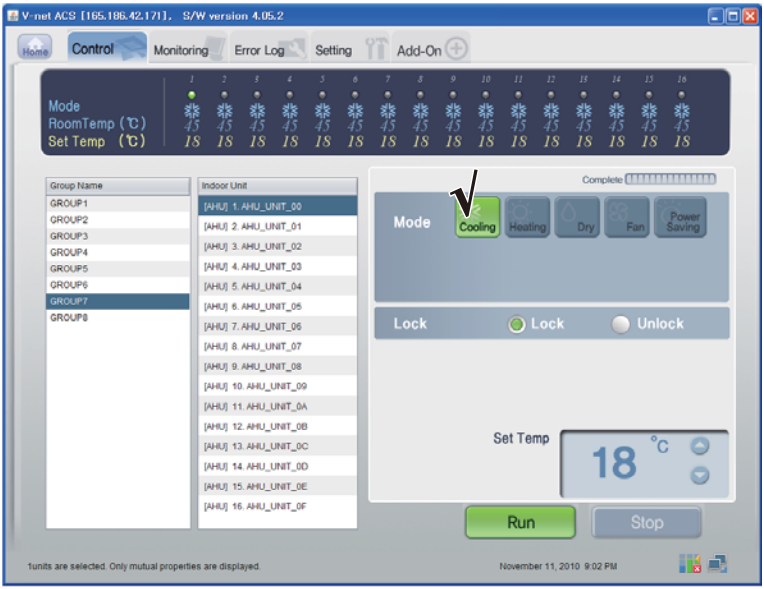
(1) Click the Run/Stop button.



< Run/Stop Control >

- Control : Mode

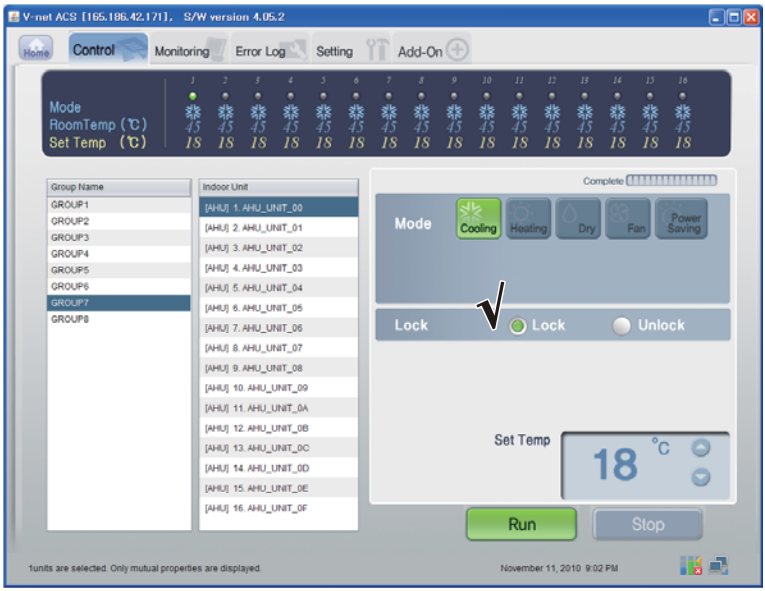
(1) Click the Mode button. (Cooling/Heating/Dry/Fan/Power Saving)



< Mode Control>

- Control : Lock/Unlock

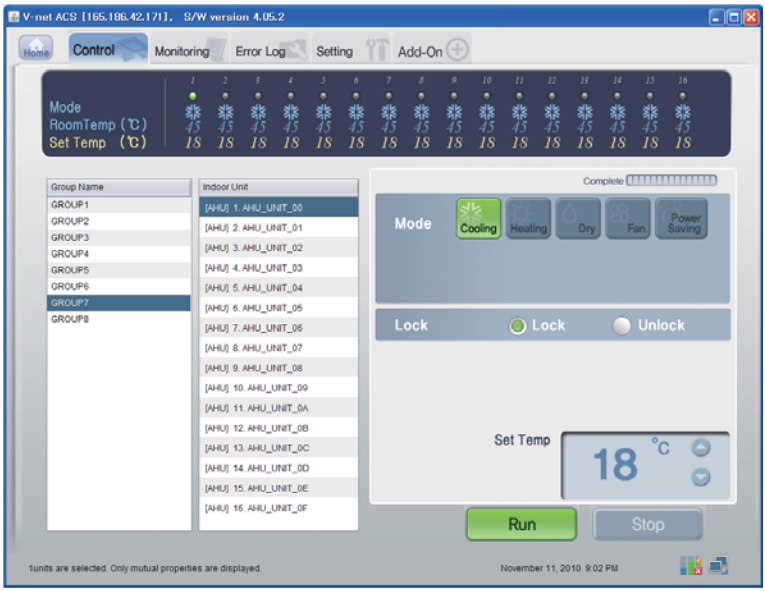
(1) Click the Lock button. (Lock/Unlock)



< Lock/Unlock Control >

- Control:Temp.

(1) Click the Up/Down button for Set Temp.

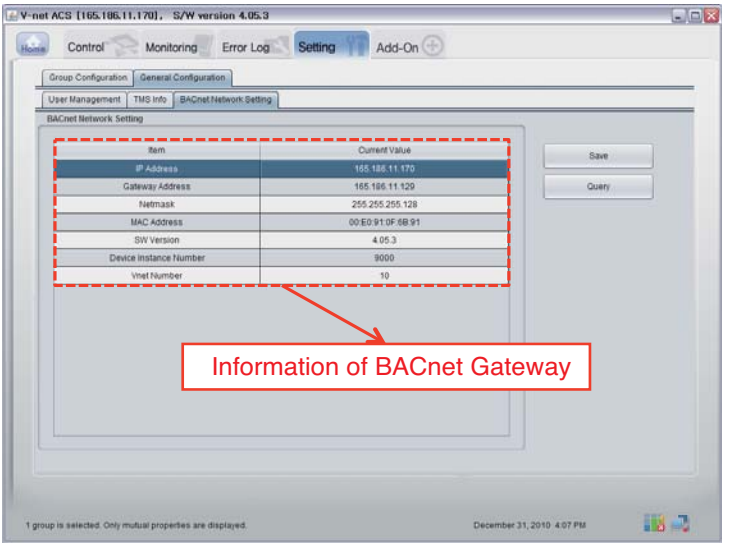


< Temp. Control >

■ Confirming and adjusting the System Setting Information

(1) Click the 'Setting' and General Configuration

(2) Confirm the BACnet Network Setting Information



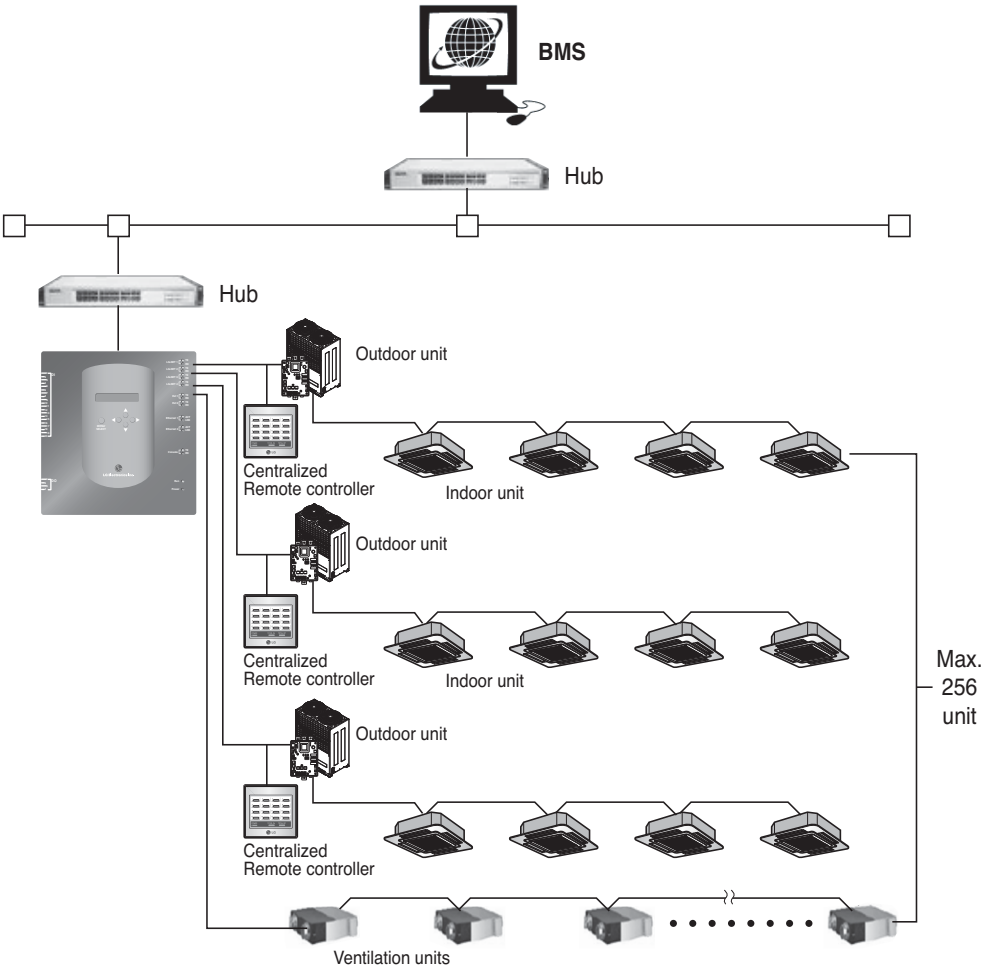
Functional Specifications BACnet Gateway

Summary

The BACnet G/W, in response to the requests from the BMS (Building management system which supports BACnet-ANSI/ASHRAE135 protocol), status information of A/C/vent that are connected to the BACnet G/W's internal LG-NET will be sent in BACnet service form, and BACnet client provides a function that transmits control command to the A/C/vent system.

Configuration of Connection

A BACnet client that supports BACnet-ANSI/ASHRAE135 protocol allows direct connection via generally used HUBs or Ethernet. The image of its connection configuration is as shown below.



Monitoring and Controlling Items of A/C

The items to monitor and control A/C from BACnet communication as well as descriptions of each item are listed below.

	Function	Description
Monitoring	Run/Stop (status)	Monitors Run/Stop status of each A/C.
	Operation Mode (status)	Monitors cooling, heating, and vent operation status.
	Lock (status)	Indicates whether LOCK function of the A/C is active.
	Set Temperature (status)	Monitors the status of set temperature for A/C
	Accumulator Power distribution (status)	Monitor the status of power distribution of A/C
	Set Upper Temperature (status)	Monitors the status of upper temperature for A/C
	Set Lower Temperature (status)	Monitors the status of lower temperature for A/C
	Mode Lock (status)	Indicates whether mode lock function of the A/C is active.
	Fan speed (status)	Monitors Fan speed of the functioning A/C.
	Swing (status)	Monitors swing mode of the indoor units.
	User Mode (status)	Monitors the operation status of user mode (Quickoperation/Power saving /Heater) while vent is functioning.
	Room Temperature	Monitors the room temperature and indicates the actual room temperature.
	Filter Sign	Monitors the status of the filters for vent
	Alarm	Monitors whether the A/C are operating properly and if not, alarm is set off.
	Error Code	Indicates the respective code for the errors occurred from the A/C system or the network.
Operation, Setting and Monitoring	Run/Stop (setting)	Starts and stops the respective A/C and monitors control results.
	Operation Mode (setting)	Sets the operation mode (cooling, heating, vent or auto mode) and monitors the setting results.
	User Mode (setting)	Sets the additional operation mode in vent (quick fresh, energy efficiency, heating)
	Swing (setting)	Sets the air direction of the indoor unit.
	Fan Speed (setting)	Sets the airflow of the A/C
	Lock (setting)	Sets the lock of the A/C's control authority.
	Set Upper Temperature (setting)	Sets upper temperature of the respective A/C
	Set Lower Temperature (setting)	Sets lower temperature of the respective A/C
	Mode Lock (setting)	Sets the mode lock of the A/C's control authority.
	Set Room Temperature	Sets room temperature of the respective A/C and monitors the setting results.
	Filter Sign Reset	Resets the ventilation's filter limit indication.

Monitoring and Controlling point of indoor and ventilator

Applicable monitoring and controlling point for the indoor and ventilator are listed below.

Object Name's XX is indoor's address number.

	Name	Object Name	Object Type	Indoor	Vent
1	Run/Stop (setting)	StartStopCommand_XXX	Binary Output	O	O
2	Run/Stop (status)	StartStopStatus_XXX	Binary Input	O	O
3	Lock (setting)	LockCommand_XXX	Binary Output	O	O
4	Lock (status)	LockStatus_XXX	Binary Input	O	O
5	Filter Sign	FilterSign_XXX	Binary Input	X	O
6	Filter Sign reset	FilterSignReset_XXX	Binary Value	X	O
7	Operation Mode (setting)	ModeCommand_XXX	Multistate Output	O	O
8	Operation Mode (status)	ModeStatus_XXX	Multistate Input	O	O
9	Swing (setting)	SwingCommand_XXX	Binary Output	O	X
10	Swing (status)	SwingStatus_XXX	Binary Input	O	X
11	Fan speed (setting)	FanSpeedCommand_XXX	Multistate Output	O	O
12	Fan speed (status)	FanSpeedStatus_XXX	Multistate Input	O	O
13	Set Room Temperature	SetRoomTemp_XXX	Analog Value	O	X
14	Room Temperature	RoomTemp_XXX	Analog Input	O	X
15	Alarm	Alarm_XXX	Binary Input	O	O
16	Error Code	MalfunctionCode_XXX	Analog Input	O	O
17	User Mode(setting)	UserModeCommand_XXX	Multistate Output	X	O
18	User Mode(status)	UserModeStatus_XXX	Multistate Input	X	O
19	Set Temperature (status)	SetTempStatus_XXX	Analog Input	O	X
20	Accumulator Power Distribution (status)	AccumPowerStatus_XXX	Analog Input	O	X
21	AC Operation Mode (setting)	Hrv_ModeCommand_XXX	Multistate Output	X	O
22	AC Operation Mode (status)	Hrv_ModeStatus_XXX	Multistate Input	X	O
23	AC ON/OFF (setting)	HrvStartStopCommand_XXX	Binary Output	X	O
24	AC ON/OFF (status)	HrvStartStopStatus_XXX	Binary Input	X	O
25	Humidify (setting)	HrvHumidifyCommand_XXX	Binary Output	X	O
26	Humidify (status)	HrvHumidifyStatus_XXX	Binary Input	X	O
27	Set Upper Temperature (setting)	SetUpperTempCommand_XXX	Analog Value	O	X
28	Set Lower Temperature (setting)	SetLowerTempCommand_XXX	Analog Value	O	X
29	Set Upper Temperature (status)	SetUpperTempStatus_XXX	Analog Input	O	X
30	Set Lower Temperature (status)	SetLowerTempStatus_XXX	Analog Input	O	X
31	Mode Lock (setting)	ModeLockCommand_XXX	Binary Output	O	X
32	Mode Lock (status)	ModeLockStatus_XXX	Binary Input	O	X

BACnet Protocol Implementation Conformance Statement (PICS)

BACnet Protocol Implementation Conformance Statement

Date: 2007.06.01

Vendor name: LG Electronics Co. Ltd

Product name: BNU-BAC BACnet Gateway

Product Model Number:

Application Software version: 1.0 Firmware Revision:1.0 BACnet Revision: 1.0

Product Description:

This Gateway supports BACnet/IP and has a built-in Web-server that does not need any program-install.

It is able to interlock with the fire alarm through the separated Input/Output ports

BACnet Standardized Device Profile (Annex L):

❑ BACnet Operator Workstation (B-OWS)

❑ BACnet Building Controller (B-BC)

❑ BACnet Advanced Application Controller (B-AAC)

■ BACnet Application Specific Controller (B-ASC)

❑ BACnet Smart Senor (B-SS)

❑ BACnet Smart Actuator (B-SA)

Additional BACnet Interoperability Building Blocks Supported (Annex K)

Reference of BIBBs List(Appendix 1)

Segmentation Capability:

■ Segmented requests supported Window Size 16

■ Segmented responses supported Window Size 16

Standard Object Types Supported:

An object type is supported if it may be present in the device. For each standard Object Type supported provide the following data:

1) Whether objects of this type are dynamically creatable

2) Whether objects of this type are dynamically deletable

Data Link Layer Options:

BACnet IP, (Annex J)

■ BACnet IP, (Annex J), Foreign Device

❑ ISO 8802-3, Ethernet (Clause 7)

❑ ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)

❑ ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s)

❑ MS/TP master (Clause 9), baud rate(s):

❑ MS/TP slave (Clause 9), baud rate(s):

❑ Point-To-Point, EIA 232 (Clause 10), baud rate(s):

❑ Point-To-Point, modem, (Clause 10), baud rate(s):

❑ LonTalk, (Clause 11), medium:

❑ Other:

Device Address Binding:

Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.) ❑ Yes ■ No

Networking Options:

❑ Router, Clause 6 - List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.

❑ Annex H, BACnet Tunneling Router over IP

❑ BACnet/IP Broadcast Management Device (BBMD)

Does the BBMD support registrations by Foreign Devices? ❑ Yes ■ No

Character Sets Supported:

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

■ ANSI x 3.4	❑ IBM™,/Microsoft¢, DBCS	❑ ISO 8859-1
❑ ISO 10646 (UCS-2)	❑ ISO 10646 (UCS-4)	❑ JIS C 6226

If this product is a communication Gateway, describe the types of non-BACnet equipment/networks(s) that the Gateway supports:

This Gateway converts BACnet protocol into LGAP(LG Aircon protocol), so that the outdoor unit of the A/C which is connected to the Gateway is able to communicate in 485-communication.

Objects (BACnet/IP)

Supported Object Type

Monitoring and controlling items of air conditioners supported are assigned with general object types specified by BACnet. Support status of each object type is shown in the table below.

(■ : Supported, ❑ : Unsupported)

Object Type		Supported	Description
Analog Input	0	■	Room Temperature, Error Code, Set Humidity, Supply/Outer/Vent/Mixing Temperature, Supply/Outer/Vent/Mixing Humidity, CO2 Value, Current OA/EA/Mix Damper, Cool OA/EA/Mix Damper, Heat OA/EA/Mix Damper, Fan OA/EA/Mix Damper
Analog Value	2	■	Set Humidity, Cool OA/EA/Mix Damper, Heat OA/EA/Mix Damper, Fan OA/EA/Mix Damper
Binary Input	3	■	Run/Stop, Lock, Filter Sign, Swing, Alarm, Humidity, Auto Ventilation, Humidifier, Heater, Ventilation Fan, Supply Fan
Binary Output	4	■	Run/Stop, Lock, Mode Lock, Set Upper/Lower Temperature, Swing, Humidity, Auto Ventilation
Binary-Value	5	■	Filter Sign Reset
Calendar	6	❑	
Command	7	❑	
Device	8	■	
Event-Enrollment	9	❑	
File	10	❑	
Group	11	❑	
Loop	12	❑	
Multistate-Output	13	■	Operation Mode(Setting), Fan Speed(Setting) User Mode(Setting)
Multistate-Input	14	■	Operation Mode(Status), Fan Speed(Status) User Mode(Status)
Notification-Class	15	❑	
Program	16	❑	
Schedule	17	❑	
Averagin	18	❑	
Multistate-Value	19	❑	
Trend-Log	20	❑	
Life-Safety-Point	21	❑	
Life-Safety-Zone	22	❑	

BACnet Point List : Indoor Unit

One indoor unit has the following 22 objects.

Point No.	Name	ObjectName Product Name (XXX : Unit address)	Object Type	Unit								
				Inactive	Active							
				Text-0	Text-1	Text-2	Text-3	Text-4	Text-5			
1	ON/OFF (Setting)	StartStopCommand_XXX	BO	Stop	Start							
2	ON/OFF (Status)	StartStopStatus_XXX	BI	Stop	Run							
3	Lock (Setting)	LockCommand_XXX	BO	Permit	Prohibit							
4	Lock (Status)	LockStatus_XXX	BI	Permit	Prohibit							
5	-	-	-									
6	-	-	-									
7	Mode (Setting)	ModeCommand_XXX	MO		Cool	Dry	Fan	Auto	Heat			
8	Mode (Status)	ModeStatus_XXX	MI		Cool	Dry	Fan	Auto	Heat			
9	Swing (Setting)	SwingCommand_XXX	BO	Stop	Run							
10	Swing (Status)	SwingStatus_XXX	BI	Stop	Run							
11	Fan Speed (Setting)	FanSpeedCommand_XXX	MO		Low	Middle	High	Auto				
12	Fan Speed (Status)	FanSpeedStatus_XXX	MI		Low	Middle	High	Auto				
13	Set Room Temperature	SetRoomTemp_XXX	AV	°C								
14	Room Temperature	RoomTemp_XXX	AI	°C								
15	Alarm	Alarm_XXX	BI	Normal	Abnormal							
16	Error Code	MalfunctionCode_XXX	AI	Reference LG Original Error Code								
17	-	-	-									
18	-	-	-									

Point No.	Name	ObjectName Product Name (XXX : Unit address)	Object Type	Unit					
				Inactive	Active				
				Text-0	Text-1	Text-2	Text-3	Text-4	Text-5
19	Set Temperature (status)	SetTempStatus_XXX	AI	℃					
20	-	-	-						
27	Set Upper Temperature (setting)	SetUpperTempCommand_XXX	AV	℃					
28	Set Lower Temperature (setting)	SetLowerTempCommand_XXX	AV	℃					
29	Set Upper Temperature (status)	SetUpperTempStatus_XXX	AI	℃					
30	Set Lower Temperature (status)	SetLowerTempStatus_XXX	AI	℃					
31	Mode Lock (setting)	ModeLockCommand_XXX	BO	Permit	Prohibit				
32	Mode Lock (status)	ModeLockStatus_XXX	BI	Permit	Prohibit				

BACnet Point List : Ventilation

One ventilation unit has the following 22 objects.

Point No.	Name	ObjectName Product Name (XXX : Unit address)	Object Type	Unit							
				Inactive	Active						
				Text-0	Text-1	Text-2	Text-3	Text-4	Text-5		
1	ON/OFF (Setting)	StartStopCommand_XXX	BO	Stop	Start						
2	ON/OFF (Status)	StartStopStatus_XXX	BI	Stop	Run						
3	Lock (Setting)	LockCommand_XXX	BO	Permit	Prohibit						
4	Lock (Status)	LockStatus_XXX	BI	Permit	Prohibit						
5	Filter Sign	FilterSign_XXX	BI	Off	On						
6	Filter Sign Reset	FilterSignReset_XXX	BV	-	Reset						
7	Mode (Setting)	ModeCommand_XXX	MO		Heat Exchange	Auto	Normal				
8	Mode (Status)	ModeStatus_XXX	MI		Heat Exchange	Auto	Normal				
9	-	-	-								
10	-	-	-								
11	Fan Speed (Setting)	FanSpeedCommand_XXX	MO		Low	High	Super High	Auto			
12	Fan Speed (Status)	FanSpeedStatus_XXX	MI		Low	High	Super High	Auto			
13	-	-	-								
14	-	-	-								
15	Alarm	Alarm_XXX	BI	Normal	Abnormal						
16	Error Code	MalfunctionCode_XXX	AI	Reference LG Original Error Code							
17	User Mode (Setting)	UserModeCommand_XXX	MO		Quick Fresh	Energy Saving	Heater				
18	User Mode (Status)	UserModeStatus_XXX	MI		Quick Fresh	Energy Saving	Heater				

Point No.	Name	ObjectName Product Name (XXX : Unit address)	Object Type	Unit					
				Inactive	Active				
				Text-0	Text-1	Text-2	Text-3	Text-4	Text-5
19	Set Temperature (status)	SetTempStatus_XXX	AI	°C					
20	-	-	-						
21	AC Operation Mode (setting)	HrvModeCommand_XXX	MO		Cool	Auto	Heat		
22	AC Operation Mode (status)	HrvModeStatus_XXX	MI		Cool	Auto	Heat		
23	AC ON/OFF (setting)	HrvStartStopCommand_XXX	BO	Stop	Run				
24	AC ON/OFF (status)	HrvStartStopStatus_XXX	BI	Stop	Run				
25	AC Humidify (setting)	HrvHumidifyCommand_XXX	BO	Off	On				
26	AC Humidify (status)	HrvHumidifyStatus_XXX	BI	Off	On				

BACnet Point List : AHU

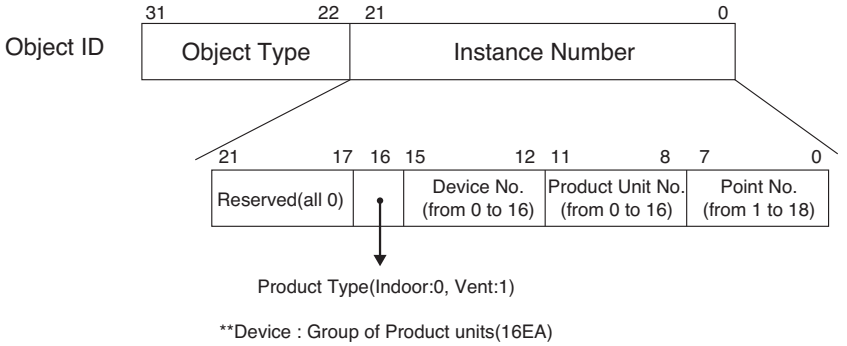
One AHU unit has the following 53 objects.

Point No.	Name	ObjectName Product Name (XXX : Unit address)	Object Type	Unit					
				Inactive	Active				
				Text-0	Text-1	Text-2	Text-3	Text-4	Text-5
1	ON/OFF (Setting)	StartStopCommand_XXX	BO	Stop	Start				
2	ON/OFF (Status)	StartStopStatus_XXX	BI	Stop	Run				
3	Lock (Setting)	LockCommand_XXX	BO	Permit	Prohibit				
4	Lock (status)	LockStatus_XXX	BI	Permit	Prohibit				
5	Filter Sign	FilterSign_XXX	BI	Off	On				
6	Filter Sign Reset	FilterSignReset_XXX	BV	-	Reset				
7	Mode (Setting)	ModeCommand_XXX	MO		Cool	Dry	Fan	Heat	
8	Mode (Status)	ModeStatus_XXX	MI		Cool	Dry	Fan	Heat	
9	-	-	-						
10	-	-	-						
11	-	-	-						
12	-	-	-						
13	Set Room Temperature	SetRoomTemp_XXX	AV	℃					
14	Room Temperature	RoomTemp_XXX	AI	℃					
15	Alarm	Alarm_XXX	BI	Normal	Abnormal				
16	Error Code	MalfunctionStatus_XXX	AI	Reference LG Original Error Code					
17	-	-	-						
18	-	-	-						
19	Set Temperature (Status)	SetTempStatus_XXX	AI	℃					
20	Fire Alarm (Setting)	FireAlarmCommand_XXX	BO	Stop	Run				

Point No.	Name	ObjectName Product Name (XXX : Unit address)	Object Type	Unit					
				Inactive	Active				
				Text-0	Text-1	Text-2	Text-3	Text-4	Text-5
21	Fire Alarm (Status)	FireAlarmStatus_XXX	BI	Stop	Run				
22	Set Humidify (Setting)	SethumidifyCommand_XXX	AV	40~60					
23	Set Humidify (Status)	SetHumidifyStatus_XXX	AI	40_60					
24	Humidify (Setting)	HumidifyCommand_XXX	BO	Stop	Run				
25	Humidify (Status)	HumidifyStatus_XXX	BI	Stop	Run				
26	Auto Ventilation (Setting)	AutoVentCommand_XXX	BO	Stop	Run				
27	Auto Ventilation (Status)	AutoVentStatus_XXX	BI	Stop	Run				
28	Supply Temperature (Status)	SupplyTempStatus_XXX	AI	-127~127					
29	Outdoor Temperature (Status)	OutdoorTempStatus_XXX	AI	-127~127					
30	Mix Temperature (Status)	MixTempStatus_XXX	AI	-127~127					
31	Supply Humidity (Status)	SupplyHumidifyStatus_XXX	AI	30~90					
32	Outdoor Humidity (Status)	OutdoorHumidifyStatus_XXX	AI	30~90					
33	Ventilation Humidity (Status)	VentHumidifyStatus_XXX	AI	30~90					
34	CO2 Value (Status)	CO2ValveStatus_XXX	AI	0~255 (Real Value = Value*10, Example : In case Value is 20, CO2 is 20*10=200ppm)					
35	Humidify Unit (Status)	HumidifyUnitStatus_XXX	BI	Stop	Run				
36	Heater Unit (Status)	HeaterUnitStatus_XXX	BI	Stop	Run				
37	Ventilation FAN (Status)	VentFANStatus_XXX	BI	Stop	Run				
38	Supply FAN (Status)	SupplyFANStatus_XXX	BI	Stop	Run				
39	Current OA Damper (Status)	CurOADamperStatus_XXX	AI	0~90					
40	Current EA Damper (Status)	CurEADamperStatus_XXX	AI	0~90					

Point No.	Name	ObjectName Product Name (XXX : Unit address)	Object Type	Unit					
				Inactive	Active				
				Text-0	Text-1	Text-2	Text-3	Text-4	Text-5
41	Current MIX Damper (Status)	CurMixDamperStatus_XXX	AI	0~90					
42	Cool OA Damper (Setting)	OADamperCoolCommand_XXX	AV	0~90					
43	Cool OA Damper (Status)	OADamperCoolStatus_XXX	AI	0~90					
44	Cool EA Damper (Setting)	EADamperCoolCommand_XXX	AV	0~90					
45	Cool EA Damper (Status)	EADamperCoolStatus_XXX	AI	0~90					
46	Cool MIX Damper (Setting)	MixDamperCoolComman_XXX	AV	0~90					
47	Cool MIX Damper (Status)	MixDamperCoolStatus_XXX	AI	0~90					
48	Heat OA Damper (Setting)	OADamperHeatCommand_XXX	AV	0~90					
49	Heat OA Damper (Status)	OADamperHeatStatus_XXX	AI	0~90					
50	Heat EA Damper (Setting)	EADamperHeatCommand_XXX	AV	0~90					
51	Heat EA Damper (Status)	EADamperHeatStatus_XXX	AI	0~90					
52	Heat MIX Damper (Setting)	MixDamperHeatCommand_XXX	AV	0~90					
53	Heat MIX Damper (Status)	MixDamperHeatStatus_XXX	AI	0~90					
54	Fan OA Damper (Setting)	OADamperFANCommand_XXX	AV	0~90					
55	Fan OA Damper (Status)	OADamperFANStatus_XXX	AI	0~90					
56	Fan EA Damper (Setting)	EADamperFANCommand_XXX	AV	0~90					
57	Fan EA Damper (Status)	EADamperFANStatus_XXX	AI	0~90					
58	Fan MIX Damper (Setting)	MixDamperFANCommand_XXX	AV	0~90					
59	Fan MIX Damper (Status)	MixDamperFANStatus_XXX	AI	0~90					

Local Definition of Object ID - The instance number is a pair, this consists of the indoor unit No. and item.



**Device : Group of Product units(16EA)

Example of Point Table

The point table below is passed to BMS, and BMS registers the object.

• Case Indoor

Address	Object Type	Device No.	Product No.	Point	Instance No.	Name
0	4	0	0	1	0 x 00001(1)	ON/OFF Setting
0	3	0	0	2	0 x 00002(2)	ON/OFF Seatus
1	4	0	1	1	0 x 00101(257)	ON/OFF Setting
1	3	0	1	2	0 x 00102(258)	ON/OFF Seatus
15	4	0	15	1	0 x 00F01(3841)	ON/OFF Setting
15	3	0	15	2	0 x 00F02(3842)	ON/OFF Seatus
16	4	1	0	1	0 x 01001(4097)	ON/OFF Setting
16	3	1	0	2	0 x 01002(4098)	ON/OFF Seatus
17	4	1	1	1	0 x 01101(4353)	ON/OFF Setting
17	3	1	1	2	0 x 01102(4354)	ON/OFF Seatus
31	4	1	15	1	0 x 01F01(7937)	ON/OFF Setting
31	3	1	15	2	0 x 01F02(7938)	ON/OFF Seatus
32	4	2	0	1	0 x 02001(8193)	ON/OFF Setting
32	3	2	0	2	0 x 02002(8194)	ON/OFF Seatus
33	4	2	1	1	0 x 02101(8449)	ON/OFF Setting
33	3	2	1	2	0 x 02102(8450)	ON/OFF Seatus
47	4	2	15	1	0 x 02F01(12033)	ON/OFF Setting
47	3	2	15	2	0 x 02F02(12034)	ON/OFF Seatus

• Case Vent

Address	Object Type	Device No.	Product No.	Point	Instance No.	Name
0	4	0	0	1	0 x 10001(65537)	ON/OFF Setting
0	3	0	0	2	0 x 10002(65538)	ON/OFF Seatus
1	4	0	1	1	0 x 10101(65793)	ON/OFF Setting
1	3	0	1	2	0 x 10102(65794)	ON/OFF Seatus
15	4	0	15	1	0 x 10F01(69377)	ON/OFF Setting
15	3	0	15	2	0 x 10F02(69378)	ON/OFF Seatus
16	4	1	0	1	0 x 11001(69633)	ON/OFF Setting
16	3	1	0	2	0 x 11002(69634)	ON/OFF Seatus
17	4	1	1	1	0 x 11101(69889)	ON/OFF Setting
17	3	1	1	2	0 x 11102(69890)	ON/OFF Seatus
31	4	1	15	1	0 x 11F01(73473)	ON/OFF Setting
31	3	1	15	2	0 x 11F02(73474)	ON/OFF Seatus
32	4	2	0	1	0 x 12001(73729)	ON/OFF Setting
32	3	2	0	2	0 x 12002(73730)	ON/OFF Seatus
33	4	2	1	1	0 x 12101(73985)	ON/OFF Setting
33	3	2	1	2	0 x 12201(73986)	ON/OFF Seatus
47	4	2	F	1	0 x 12F01(77569)	ON/OFF Setting
47	3	2	15	2	0 x 12F02(77570)	ON/OFF Seatus

Objects (Modbus-TCP)

Supported Function Code

Monitoring and controlling items of air conditioners supported are assigned with general function codes specified by Modbus-TCP.

Function Name	Code	Description
Read Coil Status	01h	Run/Stop(status), Lock(status), Swing(status), Alarm, Filter Sign(status), Mode Lock(status), Wind Flow Lock(status)
Read Holding Registers	03h	Operation Mode(status), Fan Speed(status), Room Temperature, Error Code, Set Room Temperature(status), Set Lower Temperature(status), Set Upper Temperature(status), User Mode(status)
Force Single Coil	05h	Run/Stop(setting), Lock(setting), Swing(setting), Filter Sign Reset, Mode Lock(setting), Wind Flow Lock(setting)
Preset Single Registers	06h	Operation Mode(setting), Fan Speed(setting), Set Room Temperature(setting), Set Lower Temperature(setting), Set Upper Temperature(setting), User Mode(setting)

Modbus Point List : Indoor Unit

Function Code : 0x01 and 0x05

Address	Register	Function	Name	Object Name (XXX : Unit address)	Inactive	Active
0x0000	1	Coil Read	ON/OFF	StartStopStatus_XXX	Stop	Run
0x0001	2		SWING	SwingStatus_XXX	Permit	Prohibit
0x0002	3		LOCK	LockStatus_XXX	Permit	Prohibit
0x0003	4		MODE LOCK	ModeLockStatus_XXX	Permit	Prohibit
0x0004	5		FAN LOCK	WindFlowLockStatus_XXX	Permit	Prohibit
0x0005	6		TEMP LOCK	SetTempStatus-XXX	Permit	Prohibit
0x0006	7		ALARM	Alarm_XXX	Normal	Abnormal
0x0000	1	Write Single Coil	ON/OFF	StartStopCommand_XXX	Stop	Run
0x0001	2		SWING	SwingCommand_XXX	Permit	Prohibit
0x0002	3		LOCK	LockCommand_XXX	Permit	Prohibit
0x0003	4		MODE LOCK	ModeLockCommand_XXX	Permit	Prohibit
0x0004	5		FAN LOCK	WindFlowLockCommand_XXX	Permit	Prohibit
0x0005	6		TEMP LOCK	SetTempCommand-XXX	Permit	Prohibit

Function Code : 0x03 and 0x06

Address	Register	Function	Name	Object Name (XXX : Unit address)	Text-0	Text-1	Text-2	Text-3	Text-4	Text-5
0x0000	1	Read Holding Registers	OPERATION MODE	ModeStatus_XXX		Cool	Dry	Fan	Auto	Heat
0x0001	2		FAN SPEED	FanSpeedStatus_XXX		Low	Middle	High	Auto	
0x0002	3		SET ROOM TEMPERATURE	SetTemp_XXX	°C					
0x0003	4		UP_SETTEMP	SetUpperTempStatus_XXX	°C					
0x0004	5		LO_SETTEMP	SetLowerTempStatus_XXX	°C					
0x0005	6		ROOM TEMPERATURE	RoomTemp_XXX	°C					
0x0006	7		ERROR CODE	MalfunctionCode_XXX	Reference LG original Error Code					
0x0000	1	Write Single Registers	OPERATION MODE	ModeStatus_XXX		Cool	Dry	Fan	Auto	Heat
0x0001	2		FAN SPEED	FanSpeedStatus_XXX		Low	Middle	High	Auto	
0x0002	3		SET ROOM TEMPERATURE	SetTemp_XXX	°C					
0x0003	4		UP_SETTEMP	SetUpperTempStatus_XXX	°C					
0x0004	5		LO_SETTEMP	SetLowerTempStatus_XXX	°C					

Modbus Point List : Ventilation

Function Code : 0x01 and 0x05

Address	Register	Function	Name	Object Name (XXX : Unit address)	Inactive	Active
0x0000	1	Coil Read	ON/OFF	StartStopStatus_XXX	Stop	Run
0x0001	2		LOCK	LockStatus_XXX	Permit	Prohibit
0x0002	3		FILTER SIGN	FilterSign_XXX	Off	On
0x0003	4		ALARM	HrvStartStopStatus_XXX	Stop	Run
0x0004	5		HRV_AC_OPER	HrvStartStopStatus_XXX	Stop	Run
0x0005	6		HRV_HUMIDIFY	HrvHumidifyStatus_XXX	Off	On
0x0000	1	Write Single Coil	ON/OFF	StartStopCommand_XXX	Stop	Run
0x0001	2		LOCK	LockCommand_XXX	Permit	Prohibit
0x0002	3		FILTER SIGN RESET	FilterSignReset_XXX	Reset(Off)	Void(On)
0x0004	5		HRV_AC_OPER	HrvStartStopCommand_XXX	Stop	Run
0x0005	6		HRV_HUMIDIFY	HrvHumidifyCommand_XXX	Off	On

Function Code : 0x03 and 0x06

Address	Register	Function	Name	Object Name (XXX : Unit address)	Text-0	Text-1	Text-2	Text-3	Text-4	Text-5
0x0000	1	Read Holding Registers	OPERATION MODE	ModeStatus_XXX		Heat Exchange	Auto	Normal		
0x0001	2		FAN SPEED	FanSpeedStatus_XXX		Low	High	Super High	Auto	
0x0002	3		USER MODE	UserModeStatus_XXX		Quick Operation	Energy Saving	Heat		
0x0003	4		ERROR CODE	MalfunctionCode_XXX	Reference LG original Error Code					
0x0004	5		HRV_AC_MODE	HrvModeStatus_XXX		Cool	Auto	Heat		
0x0005	6		HRV_SETTEMP	HrvSetTempstatus_XXX	℃					
0x0000	1	Write Single Registers	OPERATION MODE	ModeCommand_XXX		Heat Exchange	Auto	Normal		
0x0001	2		FAN SPEED	FanSpeedCommand_XXX		Low	High	Super High	Auto	
0x0002	3		USER MODE	UserModeStatus_XXX		Quick Operation	Energy Saving	Heat		
0x0004	5		HRV_AC_MODE	HrvModeStatus_XXX		Cool	Auto	Heat		
0x0005	6		HRV_SETTEMP	HrvSetTempstatus_XXX	℃					

Modbus Point List : AHU

Function Code : 0x01 and 0x05

Address	Register	Function	Name	Object Name (XXX : Unit address)	Inactive	Active
0x0000	1	Coil Read	ON/OFF	StartStopStatus_XXX	Stop	Run
0x0001	2		LOCK	LockStatus_XXX	Permit	Prohibit
0x0002	3		FILTER SIGN	FilterSign_XXX	Off	On
0x0003	4		SMOKE	FireAlarmStatus_XXX	Stop	Run
0x0004	5		HUMIDITY	HumidifyStatus_XXX	Stop	Run
0x0005	6		AUTO VENT	AutoVentStatus_XXX	Stop	Run
0x0006	7		HUMIDIFIER	HumidifiyUnitStatus-XXX	Stop	Run
0x0007	8		HEATER	HeaterUnitStatus_XXX	Stop	Run
0x0008	9		VENT FAN	VentFANStatus_XXX	Stop	Run
0x0009	10		SUPPLY FAN	SupplyFANStatus_XXX	Stop	Run
0x000A	11		ALARM	Alarm_XXX	Normal	Abnormal
0x0000	1	Write Single Coil	ON/OFF	StartStopCommand_XXX	Stop	Run
0x0001	2		LOCK	LockCommand_XXX	Permit	Prohibit
0x0003	4		SMOKE	FireAlarmCommand_XXX	Stop	Run
0x0004	5		HUMIDITY	HumidifyCommand_XXX	Stop	Run
0x0005	6		AUTO VENT	AutoVentCommand_XXX	Stop	Run

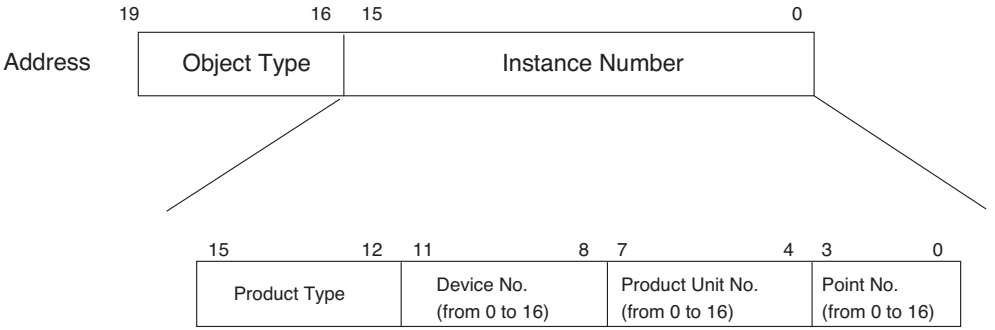
Function Code : 0x03

Address	Register	Function	Name	Object Name (XXX : Unit address)	Text-0	Text-1	Text-2	Text-3	Text-4	Text-5
0x0000	1	Read Holding Registers	MODE	ModeStatus_XXX		Cool	Dry	Fan	POWSAV	Heat
0x0001	2		SET TEMP	SetTempStatus_XXX	°C					
0x0002	3		SUPPLY TEMP	SupplyTempStatus_XXX	-127~127					
0x0003	4		OUTDOOR TEMP	OutdoorTempStatus_XXX	-127~127					
0x0004	5		VENT TEMP	VentTempStatus_XXX	-127~127					
0x0005	6		MIXING TEMP	MixingTempStatus_XXX	-127~127					
0x0006	7		SET HUMIDITY	SetHumidityStatus_XXX	40~60					
0x0007	8		SUPPLY HUMIDITY	SupplyHumidityStatus_XXX	30~90					
0x0008	9		OUTDOOR HUMIDITY	OutdootHumidityStatus_XXX	30~90					
0x0009	10		VENT HUMIDITY	VentHumidityStatus_XXX	30~90					
0x000A	11		CO2 VALUE	CO2ValueStatus_XXX	0 ~ 255					
0x000B	12		ERROR CODE	MalfunctionCode_XXX	Reference LG original Error Code					
0x0010	17		CURR_OA_DAMPER	CurOADamperStatus_XXX	0~90					
0x0011	18		CURR_EA_DAMPER	CurEADamperStatus_XXX	0~90					
0x0012	19		CURR_MIX_DAMPER	CurMixDamperStatus_XXX	0~90					
0x0013	20		COOL_OA_DAMPER	OADamperCoolStatus_XXX	0~90					
0x0014	21		COOL_EA_DAMPER	EADamperCoolStatus_XXX	0~90					
0x0015	22		COOL_MIX_DAMPER	MixDamperCoolStatus_XXX	0~90					
0x0016	23		HEAT_OA_DAMPER	OADamperHeatStatus_XXX	0~90					
0x0017	24		HEAT_EA_DAMPER	EADamperHeatStatus_XXX	0~90					
0x0018	25		HEAT_MIX_DAMPER	MixDamperHeatStatus_XXX	0~90					
0x0019	26		FAN_OA_DAMPER	OADamperFANStatus_XXX	0~90					
0x001A	27		FAN_EA_DAMPER	EADamperFANStatus_XXX	0~90					
0x001B	28		FAN_MIX_DAMPER	MixDamperFANStatus_XXX	0~90					

Function Code : 0x06

Address	Register	Function	Name	Object Name (XXX : Unit address)	Text-0	Text-1	Text-2	Text-3	Text-4	Text-5
0x0000	1	Write Single Registers	MODE	ModeCommand_XXX		Cool	Dry	Fan	POWSAV	Heat
0x0001	2		SET TEMP	SetTempCommand_XXX	°C					
0x0006	7		SET HUMIDITY	SetHumidityCommand_XXX	40~60					
0x0013	20		COOL_OA_DAMPER	CoolOADamperCommand_XXX	0~90					
0x0014	21		COOL_EA_DAMPER	CoolEADamperCommand_XXX	0~90					
0x0015	22		COOL_MIX_DAMPER	CoolMixDamperCommand_XXX	0~90					
0x0016	23		HEAT_OA_DAMPER	HeatOADamperCommand_XXX	0~90					
0x0017	24		HEAT_EA_DAMPER	HeatEADamperCommand_XXX	0~90					
0x0018	25		HEAT_MIX_DAMPER	HeatMixDamperCommand_XXX	0~90					
0x0019	26		FAN_OA_DAMPER	FANOADamperCommand_XXX	0~90					
0x001A	27		FAN_EA_DAMPER	FANEADamperCommand_XXX	0~90					
0x001B	28		FAN_MIX_DAMPER	FANMixDamperCommand_XXX	0~90					

Local Definition of Object ID - The instance number is a pair, this consists of the indoor unit No. and item.



* Object Type (Coil : 0, Register : 4)
* Product Type (Indoor : 0, Vent 4)
** Device : Group of Product units (16EA)

Example of Point Table

The point table below is passed to BMS, and BMS registers the object.

• Case Indoor

Function Code	Device No.	Product No.	Point	Instance No.	Name
1	0	0	0	0x00000	ON/OFF status
5	0	0	0	0x00000	ON/OFF setting
1	0	1	0	0x00010	ON/OFF status
5	0	1	0	0x00010	ON/OFF setting
1	1	0	0	0x00100	ON/OFF status
5	1	0	0	0x00100	ON/OFF setting
3	0	0	0	0x40000	Mode status
6	0	0	0	0x40000	Mode setting
3	0	1	0	0x40010	Mode status
6	0	1	0	0x40010	Mode setting
3	1	0	0	0x40100	Mode status
6	1	0	0	0x40100	Mode setting

• Case Vent

Function Code	Device No.	Product No.	Point	Instance No.	Name
1	0	0	0	0x04000	ON/OFF status
5	0	0	0	0x04000	ON/OFF setting
1	0	1	0	0x04010	ON/OFF status
5	0	1	0	0x04010	ON/OFF setting
1	1	0	0	0x04100	ON/OFF status
5	1	0	0	0x04100	ON/OFF setting
3	0	0	0	0x44000	Mode status
6	0	0	0	0x44000	Mode setting
3	0	1	0	0x44010	Mode status
6	0	1	0	0x44010	Mode setting
3	1	0	0	0x44100	Mode status
6	1	0	0	0x44100	Mode setting

• Case AHU

Function Code	Device No.	Product No.	Point	Instance No.	Name
1	0	0	0	0x08000	ON/OFF status
5	0	0	0	0x08000	ON/OFF setting
1	0	1	0	0x08010	ON/OFF status
5	0	1	0	0x08010	ON/OFF setting
1	1	0	0	0x08100	ON/OFF status
5	1	0	0	0x08100	ON/OFF setting
3	0	0	0	0x48000	Mode status
6	0	0	0	0x48000	Mode setting
3	0	1	0	0x48010	Mode status
6	0	1	0	0x48010	Mode setting
3	1	0	0	0x48100	Mode status
6	1	0	0	0x48100	Mode setting

Detailed Explanation of Object

1) Common to All Objects

Objects related to the air conditioner in communication are treated on the BACnet as described below.

- Air Conditioner in Normal Communication
  Other BACnet devices can access each object related to the air conditioner.
- Air Conditioner Unconnected
  It seems to other BACnet devices that no objects related to the air conditioner exist.
  Therefore, when the ReadProperty/WriteProperty service is received, the following ErrorPDU will be returned.
  Error class: OBJECT; Error type: UNKNOWN_PROPERTY
- Air Conditioner Communication Error
  Other BACnet device can access the objects related to the air conditioners, but the Present_Value Property will be read in a value immediately before the communication error.

2) Run/Stop (Setting)

Point number: 1

Object name: StartStopCommand_XXX (XXX: A/C unit address)

Object type: Binary Output

Meaning: This object is used to give Run/Stop commands to the air conditioner.

Present_Value property:

ACTIVE: Run command

INACTIVE: Stop command

Remarks: 1. The command executed is transmitted to the A/C regardless of the status of the A/C.
2. Present_Value property will not be used if a property has never been set in the past.

3) Run/Stop (Status)

Point number: 2

Object name: StartStopStatus_XXX (XXX: A/C unit address)

Object type: Binary Input

Meaning: This object is used to monitor the Run/Stop status of the air conditioner.

Present_Value property:

ACTIVE: Run

INACTIVE: Stop

Remarks: If there is an operation error, the Present_Value property will be set to ACTIVE regardless of whether the A/C is in operation or not.

4) Lock (setting)

Point number: 3
Object name: LockCommand_XXX (XXX: A/C unit address)
Object type: Binary Output
Meaning: This object is used to set the Lock of the A/C's control authority.
Present_Value property:
ACTIVE: Lock (Restricted)
INACTIVE: Unlock (Not restricted)

5) Lock (status)

Point number: 4
Object name: LockStatus_XXX (XXX: A/C unit address)
Object type: Binary Input
Meaning: This object is used to monitor the Lock of the A/C's control authority.
Present_Value property:
ACTIVE: Lock (Restricted)
INACTIVE: Unlock (Not restricted)

6) Filter Sign

Point number: 5
Object name: FilterSign_XXX (XXX: A/C unit address)
Object type: Binary Input
Meaning: This object is used to monitor the status of the filters for vent.
Present_Value property:
ACTIVE: Filter sign information is turned ON.
INACTIVE: Filter sign information is OFF.
Remarks: This object supports the Intrinsic Reporting function. When the Present_Value property changes, the corresponding Event will be transmitted if the Event has been registered.

7) Filter Sign Reset

Point number: 6
Object name: FilterSignReset_XXX (XXX: A/C unit address)
Object type: Binary Value
Meaning: This object is used to reset the vent°Øs limit indication.
Present_Value property:
INACTIVE: Filter indication information is reset.
Remarks: 1. During a read operation of the Present_Value property, the Fliter Limit Sign Reset will be always the same value as the Filter Limit Sign object.
2. Only if INACTIVE is written to the Present_Value property during a write operation, the filter sign information resets ON signs and nothing will be executed even if ACTIVE is written.
3. This object supports the Intrinsic Reporting function. When the Present_Value property changes, the corresponding Event will be transmitted if the Event has been registered.

8) Operation Mode (Setting)

Point number: 7
Object name: ModeCommand_XXX (XXX: A/C unit address)
Object type: Multistate Output
Meaning: This object is used to set the operation modes of the air conditioner.
Present_Value property:

	Indoor	Vent
1:	Cool	HEX
2:	Dry	Auto
3:	Fan	Normal
4:	Auto	-
5:	Heat	-

Remarks: 1. The Present_Value property will be set to "1: Cool" as the default value if property has never been set in the past.
2. The air conditioner will ignore the command to an object that does not have right to select operation mode. Therefore, the controlled/monitored system must not use this object for the air conditioner without the right to select operation mode.

9) Operation Mode (Status)

Point number: 8
Object name: ModeStatus_XXX (XXX: A/C unit address)
Object type: Multistate Input
Meaning: This object is used to monitor the operation modes of the air conditioner.
Present_Value property:

	Indoor	Vent
1:	Cool	HEX
2:	Dry	Auto
3:	Fan	Normal
4:	Auto	-
5:	Heat	-

10) Swing (Setting)

Point number: 9
Object name: SwingCommand_XXX (XXX: A/C unit address)
Object type: Binary Output
Meaning: This object is to set the air direction of the indoor unit.
Present_Value property:
ACTIVE: Run
INACTIVE: Stop

11) Swing (Status)

Point number: 10
Object name: SwingStatus_XXX (XXX: A/C unit address)
Object type: Binary Input
Meaning: This object is to monitor the air direction of the A/C.
Present_Value property:
ACTIVE: Swing_On
INACTIVE: Swing_Off

12) Fan Speed (Setting)

Point number: 11
Object name: FanSpeedCommand_XXX (XXX: A/C unit address)
Object type: Multistate Output
Meaning: This object is to set the airflow of the A/C.
Present_Value property:

	Indoor	Vent
1:	Low	Low
2:	Middle	High
3:	High	Super High
4:	Auto	Auto

Remarks: The A/C will disregard the command which the object which can't select the operation mode. Therefore, controlled/monitored system shouldn't use the object which can't select the operation mode.

13) Fan Speed (Status)

Point number: 12
Object name: FanSpeedStatus_XXX (XXX: A/C unit addresss)
Object type: Multistate Input
Meaning: This object is to monitor the airflow of the A/C.
Present_Value property:

	Indoor	Vent
1:	Low	Low
2:	Middle	High
3:	High	Super High
4:	Auto	Auto

Remarks: Present_value property will be set to "1:Low" as the default result if the property has not been set in the past.

14) Set Room Temperature

Point number: 13
Object name: SetRoomTemp_XXX (XXX: A/C unit address)
Object type: Analog Value
Meaning: This object is used to set the room temperature for the air conditioner.
Present_Value property:
Temperature(°C)
Remarks:
1. This unit is for indoor units only, and the approximate set temperature range is 18 ~ 35°C.
2. When COV registration is made, the COV will be reported the moment a temperature change of at least
1°C is detected.

15) Room Temperature

Point number: 14
Object name: RoomTemp_XXX (XXX: A/C unit address)
Object type: Analog Input
Meaning: This object is used to monitor room temperature which the indoor unit is placed.
Present_Value property:
Temperature(°C)
Remarks: This object is for indoor units only, and reports the room temperature data measured by the indoor units.

16) Alarm

Point number: 15
Object name: Alarm_XXX (XXX: A/C unit address)
Object type: Binary Input
Meaning: This object is used to monitor the Alarm.
Present_Value property:
ACTIVE: Alarm_On
INACTIVE: Alarm_Off

17) Error Code

Point number: 16
Object name: MalfunctionCode_XXX (XXX: A/C unit address)
Object type: Analog Input
Meaning: This object is used to monitor the details of the error status when the air conditioner has an error.
Present_Value property:
Error code(Range is 0 to 255)
Remarks: This object's error code descriptions should be referred to the corresponding table at the "Reference LG original Error Code".

18) User Mode (Setting)

Point number: 17
Object name: UserModeCommand_XXX (XXX: A/C unit address)
Object type: Multi-state Output
Meaning: This object is used to set the basic operation mode in vent and also additional operation mode (quick fresh, energy efficiency, and heating).
Present_Value property:
1: Quick
2: Saving
3: Heater
Remarks: This object is for vent only, and will not apply if the property has not been set in the past.

19) User Mode (Status)

Point number: 18
Object name: UserModeStatus_XXX (XXX: A/C unit address)
Object type: Multi-state Input
Meaning : This object is used to monitor the basic operation mode in vent
Property_Value property:
1: Quick
2: Saving
3: Heater
Reamark : This object is for vent only, and will not apply if the property has not been in the past.

20) Set Temperature (status)

Point number: 19
Object name: SetTempStatus_XXX (XXX: A/C unit address)
Object type: Analog Output
Meaning: This object is used to monitor the set temperature of the A/C's control authority.
Present_Value property:
Temperature(°C)
Remarks : This object is for indoor units only, and reports the room temperature data measured by the indoor units.

21) Accumulator Power Distribution (status)

Point number: 20
Object name: AccumPowerStatus_XXX (XXX: A/C unit address)
Object type: Analog Input
Meaning: This object is used to monitor the accumulator power distribution of the A/C's control authority.
Present_Value property:
Range is 0 to 255 (Power Distributiion : count * 100Watt)

22) AC Operation Mode (setting)

Point number: 21
Object name: HrvModeCommand_XXX (XXX: DXHRV unit address)
Object type: Multistate Output
Meaning: This object is used to set the A/C operation mode of the DXHRV.
Present_Value property:
1 : Cool
2 : Auto
3 : Heat

23) AC Operation Mode (status)

Point number: 22
Object name: HrvModeStatus_XXX (XXX: DXHRV unit address)
Object type: Multistate Input
Meaning: This object is used to monitor the A/C operation mode of the DXHRV.
Present_Value property:
1 : Cool
2 : Auto
3 : Heat

24) AC Run/Stop (setting)

Point number: 23
Object name: HrvStartStopCommand_XXX (XXX: DXHRV unit address)
Object type: Binary Output
Meaning: This object is used to set the A/C Run/Stop status of the DXHRV.
Present_Value property:
ACTIVE: Run command
INACTIVE: Stop command

25) AC Run/Stop (setting)

Point number: 24
Object name: HrvStartStopStatus_XXX (XXX: DXHRV unit address)
Object type: Binary Input
Meaning: This object is used to monitor the A/C Run/Stop status of the DXHRV.
Present_Value property:
ACTIVE: Run
INACTIVE: Stop

26) AC Humidify (setting)

Point number: 25
Object name: HrvHumidifyCommand_XXX (XXX: DXHRV unit address)
Object type: Binary Output
Meaning: This object is used to set the A/C humidify status of the DXHRV.
Present_Value property:
ACTIVE: ON command
INACTIVE: OFF command

27) AC Humidify (status)

Point number: 26
Object name: HrvStartStopStatus_XXX (XXX: DXHRV unit address)
Object type: Binary Input
Meaning: This object is used to monitor the A/C humidify status of the DXHRV.
Present_Value property:
ACTIVE: ON
INACTIVE: OFF

28) Set Upper Temperature (setting)

Point number: 27
Object name: SetUpperTempCommand_XXX (XXX: A/C unit address)
Object type: Analog Value
Meaning: This object is used to set the upper temperature for the air conditioner.
Present_Value property:
Temperature(°C)
Remarks:
1. This unit is for indoor units only, and the approximate set upper temperature range is 18 ~ 30°C.
1°C is detected.

29) Set Upper Temperature (status)

Point number: 28
Object name: SetUpperTempStatus_XXX (XXX: A/C unit address)
Object type: Analog Input
Meaning: This object is used to monitor set upper temperature which the indoor unit is placed.
Present_Value property:
Temperature(°C)
Remarks: This object is for indoor units only, and reports the set upper temperature data measured by the indoor units.

30) Set Lower Temperature (setting)

Point number: 29
Object name: SetLowerTempCommand_XXX (XXX: A/C unit address)
Object type: Analog Value
Meaning: This object is used to set the lower temperature for the air conditioner.
Present_Value property:
Temperature(°C)
Remarks:
1. This unit is for indoor units only, and the approximate set lower temperature range is 18 ~ 30°C. 1°C is detected.

31) Set Lower Temperature (status)

Point number: 30
Object name: SetLowerTempStatus_XXX (XXX: A/C unit address)
Object type: Analog Input
Meaning: This object is used to monitor set lower temperature which the indoor unit is placed.
Present_Value property:
Temperature(°C)
Remarks: This object is for indoor units only, and reports the set lower temperature data measured by the indoor units.

32) Mode Lock (setting)

Point number: 31
Object name: ModeLockCommand_XXX (XXX: A/C unit address)
Object type: Binary Output
Meaning: This object is used to set the mode lock of the A/C's control authority.
Present_Value property:
ACTIVE: Lock (Restricted)
INACTIVE: Unlock (Not restricted)

33) Mode Lock (status)

Point number: 32
Object name: ModeLockStatus_XXX (XXX: A/C unit address)
Object type: Binary Input
Meaning: This object is used to monitor the mode lock of the A/C's control authority.
Present_Value property:
ACTIVE: Lock (Restricted)
INACTIVE: Unlock (Not restricted)

Initialization at the Start Up

The system is designed to automatically recognize the connected air conditioners. Therefore, a period of approximately one minute will be required to recognize all the air conditioners after the system is turn on. During this period, the following error PDU may be returned when an object corresponding to an air conditioner is accessed.

ErrorClass = Object; ErrorCode = Unknown_Object

If an attempt is made to read the Object List property of the Device object from an air conditioner during the above period of recognition, the following error PDU will be returned, unless the air conditioner has been recognize:

ErrorClass = Device; ErrorCode = Configuration_In_Progress

Detail Error response refer to Appendix 3.

Clock Setting

The Timesynchronization service allows clock settings by the local time.

Furthermore, the UTCTimesycchronization allows clock settings by UTC

Report Function

Event Notification

1) Registration of Event Notification Destination

It is possible to use the AddListElement service to register notification destination information on the Recipient List property of the Notification Class object.

2) Deletion of Event Notification Destination

The RemoveListElement service can be used to delete notification destination information from the Notification
Class object.

3) Event Notification Destination in Memory

The registered event notification destination is stored in the memory. When the system is turned on, the event notification destination will be initialized with the stored information. The Event notification destination will
be stored five seconds after the registration or deletion.

COV(Change of Value) Notification

A request for COV registration is accepted through the SubscribeCOV service.

1) Setting of Confirmed or Unconfirmed COV

This item is supported according to the BACnet Specifications.

2) Setting of the desired lifetime of the subscription

This item is supported according to the BACnet Specifications.
When COV notification is made at the time of status change, the difference between the registered time and present time will be calculated. If the difference is greater than the registered lifetime of the subscription, the subscription will be judged expired and deleted. Therefore, if a clock time change is made, the lifetime of the subscription may differ from the value that has been set.

3) Memory after Interruption of Power Supply to System

This item is not supported. Registration information is not stored in the memory, and will be lost when the power is turned off. According to the BACnet Specifications, It is not required to guarantee preservation of subscriptions across power failure.

Supported COV service is shown in the follow table

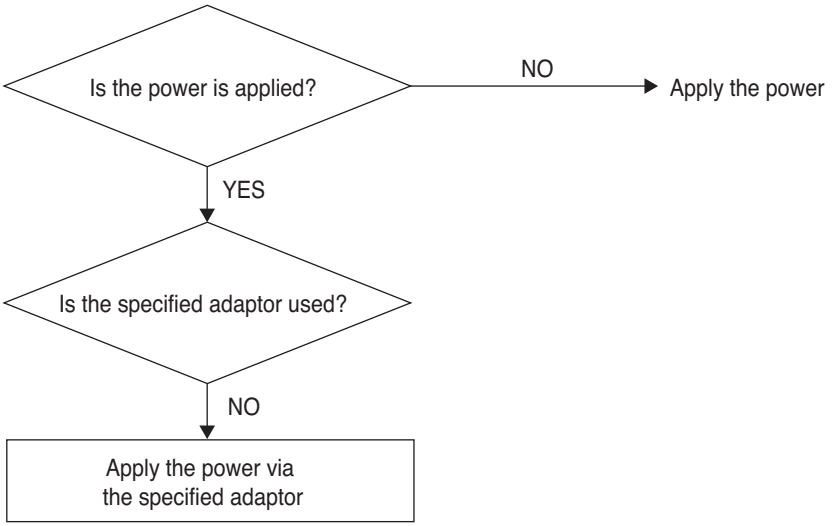
Service	Object	Product
On/Off (status)	Binary Input object property	Indoor, vent
Lock On/Off (status)	Binary Input object property	Indoor, vent
Mode Lock (status)	Binary Input object property	Indoor
Wind Flow Lock (status)	Binary Input object property	Indoor
Set Upper Temperature (status)	Analog Input object property	Indoor
Set Lower Temperature (status)	Analog Input object property	Indoor
Operation mode (status)	Multistate input object property	Indoor, vent
Swing (status)	Binary Input object property	Indoor
Filter Sign	Binary Input object property	Vent
Fan Speed (status)	Multistate Input object property	Indoor, vent
Set Room Temperature	Analog value object property	Indoor
Room Temperature	Analog input object property	Indoor
Alarm	Binary Input object property	Indoor, vent
Error Code	Analog Input object property	Indoor, vent
User mode	Multistate input object property	vent

Troubleshooting

- Problem : The Power LED of the BACnet Gateway is not lit.
→ If the power is normally applied, the Power LED is lit.

- Expected cause : The power is not applied
The specified adaptor is not used

- Diagnosis



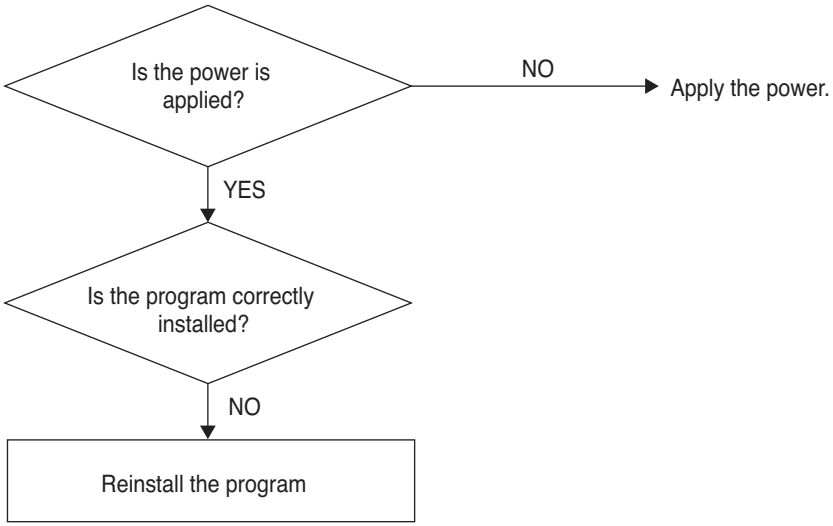
⚠ CAUTION

The power switch should be turned off when connecting/disconnecting the BACnet Gateway to/from the other device. Otherwise, it may cause to damage the part of the Gateway.

- Problem : The RUN LED of the BACnet Gateway is not blinked.
→ If the Gateway normally operates, the RUN LED periodically blinks.

- Expected cause : The power is not applied
The program is not correctly installed

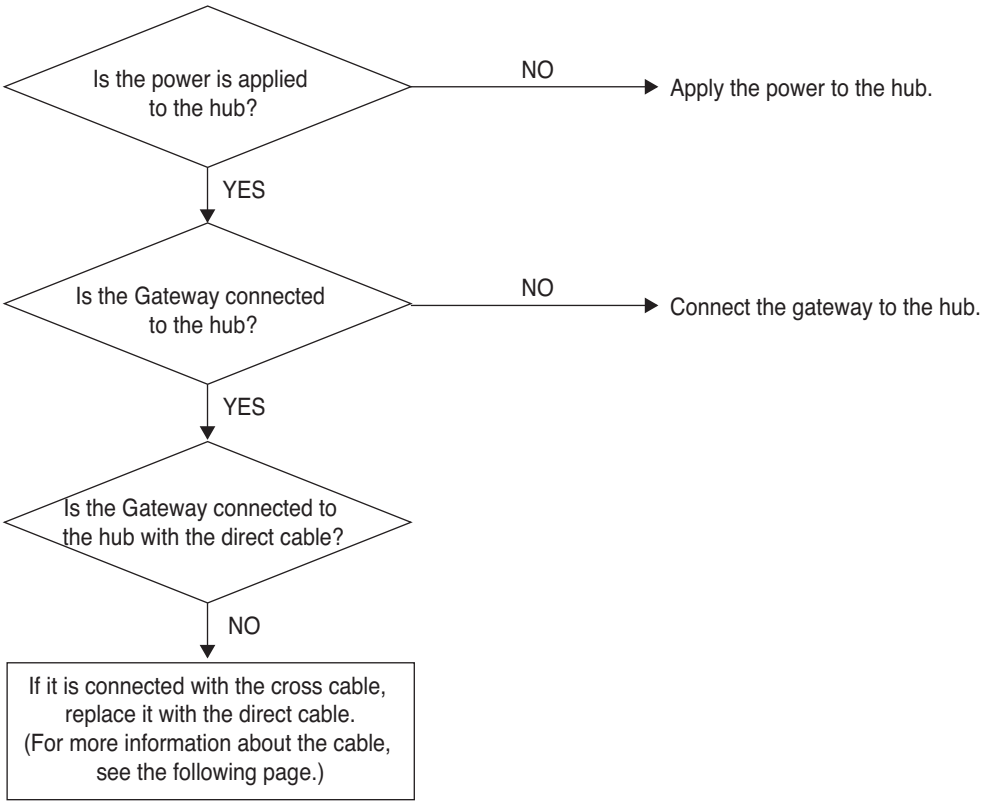
- Diagnosis



- Problem : The LNK/ACT LED of the Ethernet 1.2 of the BACnet Gateway is not lit/blinked.
→ The LNK LED is lit when the LAN communication of the Gateway correctly operates.

- Expected cause : The power is not applied to the hub
The Gateway is disconnected from the hub
The Gateway is not connected to the hub with direct cable

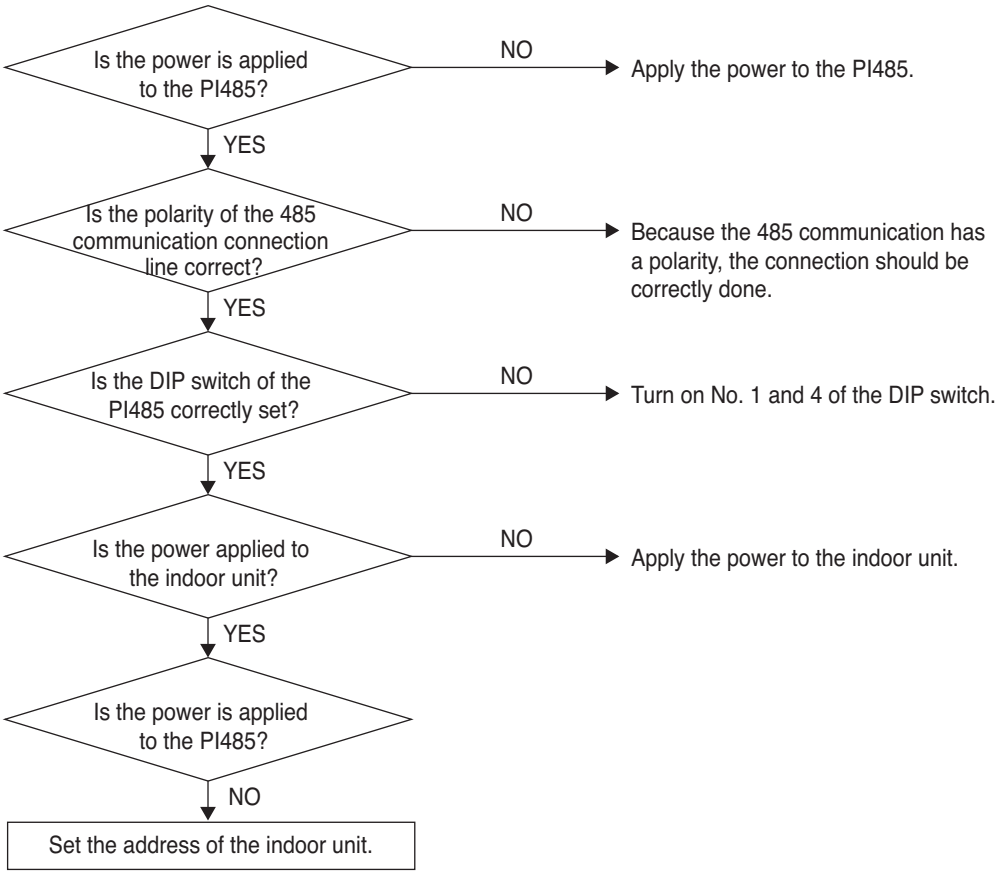
- Diagnosis



- Problem : The TX/RX LED of the LG-NET 1,2,3,4 of the BACnet Gateway is not blinked.
→ The TX/RX LED blinks if normal.

- Expected cause : The power is not applied to the 485 communication terminal
The RS-485 communication polarity is changed
The PI485 DIP switch is not correctly set
The power is not applied to the indoor unit
The address is not correctly set to the indoor unit

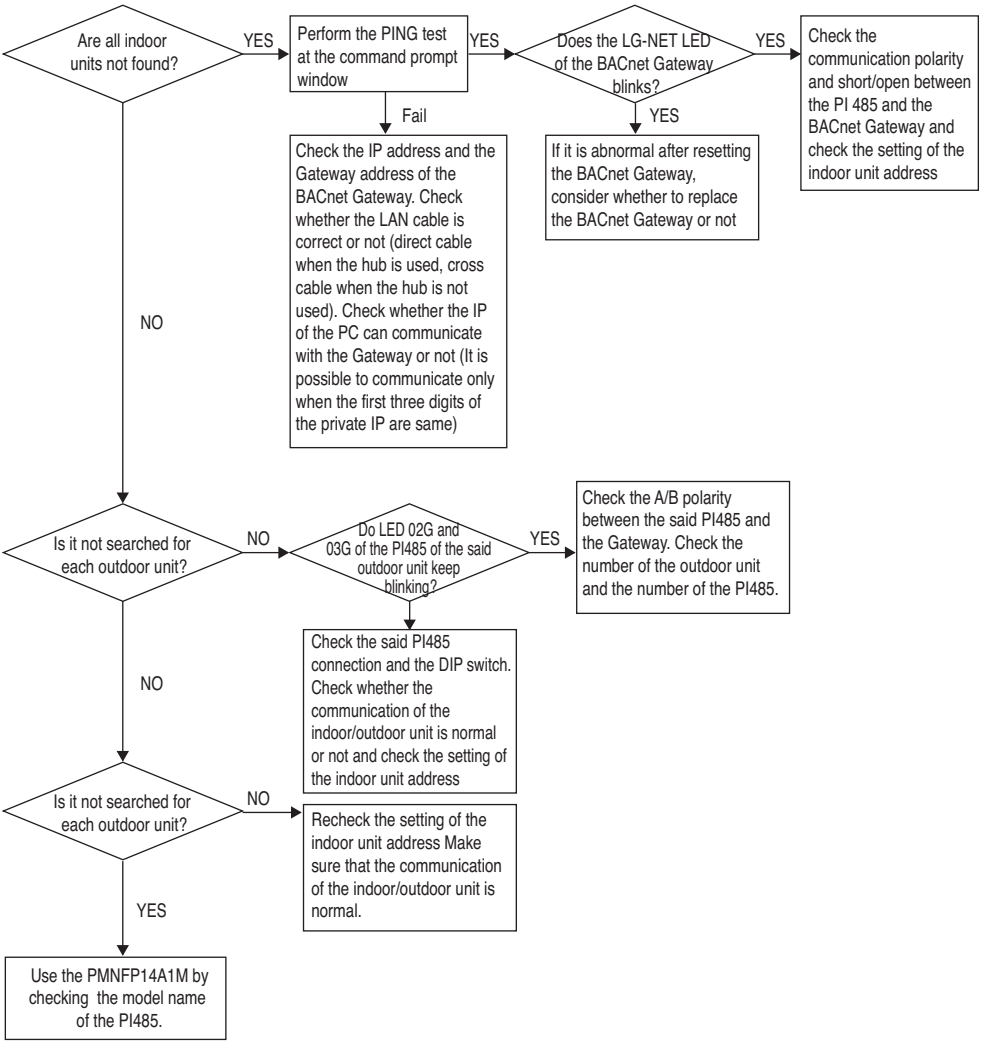
- Diagnosis



- Problem : The indoor unit is not found when checking whether the indoor unit is connected or not by using the Web Server function.
→ If normal, the indoor units are displayed on the Web Server as many as the number of the installed indoor units.

- Expected cause : The IP address and the Gateway address of the BACnet Gateway are not correctly set.
The LAN cable is used incorrectly
The polarity between the PI 485 and the Gateway is changed

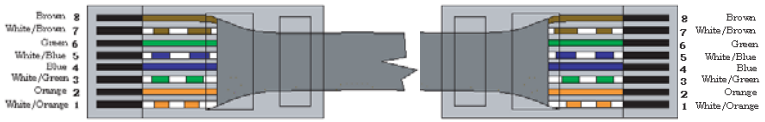
- Diagnosis



How to differentiate between Direct cable & Cross cable

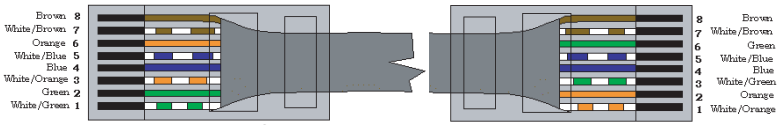
The UTP cable consists of 8 stripes of wire and the wire actually used for data transmission in the LAN environment is the reception (RX) No.1 and 2 wire and the transmission (TX) No.3 and 6, consisting of 4 strands. They are classified into two types depending on method to connect wire for reception and transmission.

Direct Cable - Also called as 1:1 straight cable and used for connecting other equipment from the network.



Direct cable connection method

Cross Cable – Used for 1:1 connection between same equipment in the network.



Cross cable connection method

Guide for the open source software

The following GPL/LGPL execution file and library used at this product conform to the GPL/LGPL license contract.

GPL execution files

Linux kernel 2.4	fdisk	lrzsz
Sysvinit	Inetutils	e2fsprogs
Bash	net-tools	boa http server
busybox	stupid-ftpd	
tinylogin	traceroute	

LGPL libraries

glibc	linuxthreads	ncurses	zlib

If you request the LG Electronics Co. for the source code via the following e-mail, we will supply them on the CD-ROM with the fee such as media price and deliverance cost necessary for supplying.

: da_opensource @lge.com

This proposal is effective for three years after getting this product distributed from the LG Electronics Co.

You can download the original copy of the GPL/LGPL license at http://www.systemaircon.com

Some of the software used at this product conforms to the following copyright.

Appendix 1

BACnet Interoperability Building Blocks Supported (BIBBs)

• Data Sharing BIBBs

(■ : Supported, ❑ : Unsupported)

BIBB Type		Supported	BACnet Service	Initiate	Execute
DS-RP-A	Data Sharing-ReadProperty-A	❑	ReadProperty	-	
DS-RP-B	Data Sharing-ReadProperty-B	■	ReadProperty		-
DS-RPM-A	Data Sharing-ReadPropertyMultiple-A	❑	ReadPropertyMultiple	-	
DS-RPM-B	Data Sharing-ReadPropertyMultiple-B	■	ReadPropertyMultiple		-
DS-RPC-A	Data Sharing-ReadPropertyConditiona-A	❑	ReadPropertyConditional	-	
DS-RPC-B	Data Sharing-ReadPropertyConditiona-B	❑	ReadPropertyConditional		-
DS-WP-A	Data Sharing-WriteProperty-A	❑	WriteProperty	-	
DS-WP-B	Data Sharing-WriteProperty-B	■	WriteProperty		-
DS-WPM-A	Sharing-WritePropertyMultiple-A	❑	WritePropertyMultiple	-	
DS-WPM-B	Data Sharing-WritePropertyMultiple-B	-	WritePropertyMultiple		-
			SubscribeCOV	-	
DS-COV-A	Data Sharing-COV-A	❑	ConfirmedCOVNotification		-
			UnconfirmedCOVNotification		-
			SubscribeCOV		-
DS-COV-B	Data Sharing-COV-B	■	ConfirmedCOVNotification	-	
			UnconfirmedCOVNotification	-	
			SubscribeCOV	-	
DS-COVP-A	Data Sharing-COVP-A	❑	ConfirmedCOVNotification		-
			UnconfirmedCOVNotification		-
			SubscribeCOV		-
DS-COVP-B	Data Sharing-COVP-B	❑	ConfirmedCOVNotification	-	
			UnconfirmedCOVNotification	-	
DS-COVU-A	Data Sharing-COV-Unsolicited-A	❑	UncofirmedCOVNotification		-
DS-COVU-B	Data Sharing-COV-Unsolicited-B	-	UncofirmedCOVNotification	-	

• Alarm and Event Management BIBBs

(■ : Supported, ❑ : Unsupported)

BIBB Type		Supported	BACnet Service	Initiate	Execute
AE-N-A	Alarm and Event-Notification-A	❑	ConfirmedEventNotification		-
			UnconfirmedEventNotification		-
AE-N-I-B	Alarm and Event-Notification Internal-B	■	ConfirmedEventNotificatioN	-	
			UnconfirmedEventNotification	-	
AE-N-E-B	Alarm and Event-Notification External-B	❑	ConfirmedEventNotification	-	
			UnconfirmedEventNotification	-	
AE-ACK-A	Alarm and Event-ACK-A	❑	AcknowledgeAlarm	-	
AE-ACK-B	Alarm and Event-ACK-B	❑	AcknowledgeAlarm		-
AE-ASUM-A	Alarm and Event-Summary-A	❑	GetAlarmSummary	-	
AE-ASUM-B	Alarm and Event-Summary-B	❑	GetAlarmSummary		-
AE-ESUM-A	Event-Summary-A	❑	GetEnrollmentSummary	-	
AE-ESUM-B	Event-Summary-B	❑	GetEnrollmentSummary		-
AE-INFO-A	Alarm and Event-Information-A	❑	GetEventInformation	-	
AE-INFO-B	Alarm and Event-Information-B	❑	GetEventInformation		-
AE-LS-A	Alarm and Event-LifeSafety-A	❑	LifeSafetyOperation	-	
AE-LS-B	Alarm and Event-LifeSafety-B	❑	LifeSafetyOperation		-

• Scheduling BIBBs

(■ : Supported, ❑ : Unsupported)

BIBB Type		Supported	BACnet Service	Initiate	Execute
SCHED-A	Scheduling-A	❑			
	(must support DS-RP-A and DS-WP-A)				
SCHED-I-B	Scheduling-Internal-B	❑			
	(shall support DS-RP-B and DS-WP-B)				
	(shall also support ether DM-TS-B or DS-UTC-B)				
SCHED-E-B	Scheduling-External-B	❑			
	(shall support SCHED-I-B and DS-WP-A)				

• Trending BIBBs

(■ : Supported, ❑ : Unsupported)

BIBB Type		Supported	BACnet Service	Initiate	Execute
T-VMT-A	Trending - Viewing and Modifying Trends-A	❑	ReadRange	-	
T-VMT-I-B	Trending - Viewing and Modifying Trends Internal-B	❑	ReadRange		-
T-VMT-E-B	Trending - Viewing and Modifying Trends External-B	❑	ReadRange		-
T-ATR-A	Trending - Automated Trend Retrieval-A	❑	ConfirmedEventNotification		-
			ReadRange	-	
T-ATR-B	Trending - Automated Trend Retrieval-B	❑	ConfirmedEventNotification	-	
			ReadRange		-

• Device Management BIBBs (1)

(■ : Supported, ❑ : Unsupported)

BIBB Type		Supported	BACnet Service	Initiate	Execute
DM-DDB-A	Device Management – Dynamic Device , Binding-A	■	Who-Is	-	
			I-Am		-
DM-DDB-B	Device Management - Dynamic Device , Binding-B	■	Who-Is		-
			I-Am	-	
DM-DOB-A	Device Management - Dynamic Object , Binding-A	❑	Who-Has	-	
			I-Have		-
DM-DOB-B	Device Management - Dynamic Object , Binding-B	■	Who-Has		-
			I-Have	-	
DM-DCC-A	Device Management - DeviceCommunicationControl-A	❑	DeviceCommunicationControl	-	
DM-DCC-B	Device Management - DeviceCommunicationControl-B	❑	DeviceCommunicationControl		-
DM-PT-A	Device Management - PrivateTransfer-A	❑	ConfirmedPrivateTransfer	-	
			UnconfirmedPrivateTransfer	-	
DM-PT-B	Device Management - PrivateTransfer-B	❑	ConfirmedPrivateTransfer		-
			UnconfirmedPrivateTransfer		-
DM-TM-A	Device Management - Text Message-A	❑	ConfirmedPrivateTransfer	-	
			UnconfirmedPrivateTransfer	-	
DM-TM-B	Device Management - Text Message-B	❑	ConfirmedPrivateTransfer		-
			UnconfirmedPrivateTransfer		-
DM-TS-A	Device Management - TimeSynchronization-A	❑	TimeSynchronization	-	
DM-TS-B	Device Management - TimeSynchronization-B	■	TimeSynchronization		-
DM-UTC-A	Device Management - UTCTimeSynchronization-A	❑	UTCTimeSynchronization	-	
DM-UTC-B	Device Management - UTCTimeSynchronization-B	■	UTCTimeSynchronization		-
DM-RD-A	Device Management - ReinitializeDevice-A	❑	ReinitializeDevice	-	
DM-RD-B	Device Management -ReinitializeDevice-B	❑	ReinitializeDevice		-

• Device Management BIBBs (2)

(■ : Supported, ❑ : Unsupported)

BIBB Type		Supported	BACnet Service	Initiate	Execute
DM-BR-A	Device Management - Backup and Restore-A	❑	AtomicReadFile	-	
			AtomicWriteFile	-	
			CreateObject	-	
			ReinitializeDevice	-	
DM-BR-B	Device Management - Backup and Restore-B	❑	AtomicReadFile		-
			AtomicWriteFile		-
			ReinitializeDevice		-
DM-R-A	Device Management - Restart-A	❑	UnconfimedCOVNotification		-
DM-R-B	Device Management - Restart-B	❑	UnconfimedCOVNotification	-	
DM-LM-A	Device Management - List Manipulation-A	❑	AddListElement	-	
			RemoveListElement	-	
DM-LM-B	Device Management - List Manipulation-B	■	AddListElement		-
			RemoveListElement		-
DM-OCD-A	Device Management - Object Creation and Deletion-A	❑	CreateObject	-	
			DeleteObject	-	
DM-OCD-B	Device Management - Object Creation and Deletion-B	❑	CreateObject		-
			DeleteObject		-
DM-VT-A	Device Management - Virtual Terminal-A	❑	VT-Open	-	
			VT-Close	-	-
			VT-Data	-	-
DM-VT-B	Device Management - Virtual Terminal-B	❑	VT-Open		-
			VT-Close	-	-
			VT-Data	-	-

• Network Management BIBBs

(■ : Supported, ❑ : Unsupported)

BIBB Type		Supported	BACnet Service	Initiate	Execute
NM-CE-A	Network Management - Connection Establishment-A	❑	Establish-Connection-To-Network	-	
			Disconnect-Connection-To-Network	-	
NM-CE-B	Network Management - Connection Establishment-B	❑	Establish-Connection-To-Network		-
			Disconnect-Connection-To-Network		-
NM-RC-A	Network Management - Router Configuration-A	❑	Who-Is-Router-To-Network	-	
			I-Am-Router-To-Network		-
			I-Could-Be-Router-To-Network		-
			Initialize-Routing-Table	-	
			Initialize-Routing-Table-Ack		-
NM-RC-B	Network Management - Router Configuration-B	❑	Who-Is-Router-To-Network	-	-
			I-Am-Router-To-Network	-	-
			Initialize-Routing-Table		-
			Initialize-Routing-Table-Ack	-	

Appendix 2

Obejct Property table

O : indicates that the property is optional.

R : indicates that the property is required to be present and readable using BACnet services.

W : indicates that the property is required to be present, readable, and writable using BACnet services.

• Analog Input Object Type (1)

Property Identifier	Property Datatype	BACnet	BNU-BAC
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	R
Object_Type	BACnetObjectType	R	R
Present_Value	Real	R1	R
Description	CharacterString	O	R
Device_Type	CharacterString	O	-
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	-
Out_Of_Service	BOOLEAN	R	R
Update_Interval	Unsigned	O	-
Units	BACnetEngineeringUnits	R	R
Min_Pres_Value	REAL	O	-
Max_Pres_Value	REAL	O	-
Resolution	REAL	O	-
COV_Increment	REAL	O2	-
Time_Delay	Unsigned	O3	-
Notification_Class	Unsigned	O3	-
High_Limit	Real	O3	-
Low_Limit	Real	O3	-
Deadband	Real	O3	-
Limit_Enable	BACnetLimitEnable	O3	-
Event_Enable	BACnetEventTransitionBits	O3	-
Acked_Transitions	BACnetEventTransitionBits	O3	-
Notify_Type	BACnetNotifyType	O3	-
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O3	-
Profile_Name	CharacterString	O	-

• Analog Value Object Type

Property Identifier	Property Datatype	BACnet	BNU-BAC
Object_Identifier	BACneObjectIdentifier	R	R
Object_Name	CharacterString	R	R
Object_Type	BACnetObjectType	R	R
Present_Value	Real	R4	W
Description	CharacterString	O	R
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	-
Out_Of_Service	Boolean	R	R
Units	BACnetEngineeringUnits	R	R
PriorityArray	BACnetPriorityArray	O1	-
RelinquishDefault	Real	O1	-
COV_Increment	Real	O2	-
Time_Delay	Unsigned	O3	-
Notification_Class	Unsigned	O3	-
High_Limit	REAL	O3	-
Low_Limit	REAL	O3	-
Deadband	REAL	O3	-
Limit_Enable	BACnetLimitEnable	O3	-
Event_Enable	BACnetEventTransitionBits	O3	-
Acked_Transitions	BACnetEventTransitionBits	O3	-
Notify_Type	BACnetNotifyType	O3	-
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O3	-
Profile_Name	CharacterString	O	-

• Binary Input Object Type

Property Identifier	Property Datatype	BACnet	BNU-BAC
Object_Identifier	BACneObjectIdentifier	R	R
Object_Name	CharacterString	R	R
Object_Type	BACnetObjectType	R	R
Present_Value	BACnetBinaryPV	R1	R
Description	CharacterString	O	R
Device_Type	CharacterString	O	-
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	-
Out_Of_Service	Boolean	R	R
Polarity	BACnetPolarity	R	R
Inactive_Text	CharacterString	O2	-
Active_Text	CharacterString	O2	-
Change_Of_State_Time	BACnetDateTime	O3	-
Change_Of_State_Count	Unsigned	O3	-
Time_Of_State_Count_Reset	BACnetDateTime	O3	-
Elapsed_Active_Time	Unsigned32	O4	-
Time_Of_Active_Time_Reset	BACnetDateTime	O5	-
Time_Delay	Unsigned	O5	-
Notification_Class	Unsigned	O5	-
Alarm_Value	BACnetBinaryPV	O5	-
Event_Enable	BACnetEventTransitionBits	O5	-
Acked_Transitions	BACnetEventTransitionBits	O5	-
Notify_Type	BACnetNotifyType	O5	-
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O5	-
Profile_Name	CharacterString	O	-

• Binary Output Object Type

Property Identifier	Property Datatype	BACnet	BNU-BAC
Object_Identifier	BACneObjectIdentifier	R	R
Object_Name	CharacterString	R	R
Object_Type	BACnetObjectType	R	R
Present_Value	BACnetBinaryPV	W	W
Description	CharacterString	O	R
Device_Type	CharacterString	O	-
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	-
Out_Of_Service	Boolean	R	R
Polarity	BACnetPolarity	R	R
Inactive_Text	CharacterString	O1	-
Active_Text	CharacterString	O1	-
Change_Of_State_Time	BACnetDateTime	O2	-
Chgange_Of_State_Count	Unsigned	O2	-
Time_Of_State_Count_Reset	BACnetDateTime	O2	-
Elapsed_Active_Time	Unsigned32	O3	-
Time_Of_Active_Time_Reset	BACnetDateTime	O3	-
Minimum_Off_Time	Unsigned32	O	-
Minimum_On_Time	Unsigned32	O	-
Priority_Array	BACnetPriorityArray	R	R
Relinquish_Default	BACnetBinaryPV	R	R
Time_Delay	Unsigned	O4	-
Notification_Class	Unsigned	O4	-
Feedback_Value	BACnetBinaryPV	O4	-
Event_Enable	BACnetEventTransitionBits	O4	-
Acked_Transitions	BACnetEventTransitionBits	O4	-
Notify_Type	BACnetNotifyType	O4	-
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O4	-
Profile_Name	CharacterString	O	-

• Binary Value Object Type

Property Identifier	Property Datatype	BACnet	BNU-BAC
Object_Identifier	BACneObjectIdentifier	R	R
Object_Name	CharacterString	R	R
Object_Type	BACnetObjectType	R	R
Present_Value	BACnetBinaryPV	R1	W
Description	CharacterString	O	R
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	R	-
Out_Of_Service	Boolean	R	R
Inactive_Text	CharacterString	O2	-
Active_Text	CharacterString	O2	-
Change_Of_State_Time	BACnetDateTime	O3	-
Chgange_Of_State_Count	Unsigned	O3	-
Time_Of_State_Count_Reset	BACnetDateTime	O3	-
Elapsed_Active_Time	Unsigned32	O4	-
Time_Of_Active_Time_Reset	BACnetDateTime	O4	-
Minimum_Off_Time	Unsigned32	O	-
Minimum_On_Time	Unsigned32	O	-
Priority_Array	BACnetPriorityArray	O5	-
Relinquish_Default	BACnetBinaryPV	O5	-
Time_Delay	Unsigned	O6	-
Notification_Class	Unsigned	O6	-
Alarm_Value	BACnetBinaryPV	O6	-
Event_Enable	BACnetEventTransitionBits	O6	-
Acked_Transitions	BACnetEventTransitionBits	O6	-
Notify_Type	BACnetNotifyType	O6	-
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O6	-
Profile_Name	CharacterString	O	-

• Device Object Type (1)

Property Identifier	Property Datatype	BACnet	BNU-BAC
Object_Identifier	BACneObjectIdentifier	R	R
Object_Name	CharacterString	R	R
Object_Type	BACnetObjectType	R	R
System_Status	BACnetDeviceStatus	R	R
Vendor_Name	CharacterString	R	R
Vendor_Identifier	Unsigned16	R	R
Model_Name	CharacterString	R	R
Firmware_Revision	CharacterString	R	R
Application_Software_Version	CharacterString	R	R
Location	CharacterString	O	R
Description	CharacterString	O	R
Protocol_Version	Unsigned	R	R
Protocol_Conformance_Class	Unsigned(1…6)	R	R
Protocol_Services_Supported	BACnetServiceSupported	R	R
Protocol_Object_Types_Supp orted	BACnetObjectTypesSupported	R	R
Object_List	BACnetARRAY[N] of BACnetObjectIdentifier	R	R
Max_APDU_Length_Accepted	Unsigtned	R	R
Segmentation_Supported	BACnetSegmentation	R	R
VT_Class_Supported	List of BACnetVTClass	_1	-
Active_VT_Sessions	List of BACnetVTSession	_2	-

• Device Object Type (2)

Property Identifier	Property Datatype	BACnet	BNU-BAC
Local_Time	Time	O3, 4	-
Local_Date	Date	O3, 4	-
UTC_Offset	Signed	O4	R
Daylight_Saving_Status	Boolean	O4	-
APDU_Segment_Timeout	Unsigned	O1	-
APDU_Timeout	Unsigned	R	R
Number_Of_APDU_Retries	Unsigned	R	R
List_Of_Session_Keys	List of BACnetSessionKey	O	-
Time_Synchronization_Recipients	List of BACnetRecipient	O5	-
Max_Master	Unsigned(1…127)	O6	-
Max_Info_Frames	Unsigned	O6	-
Device_Adress_Binding	List of BACnetAddressBinding	R	R
Database_Revision	Unsigned	R	R
Configuration_Files	BACnetARRAY[N] of BACnetObjectIdentifier	O7	-
Last_Restore_Time	BACnetDateTime	O7	-
Backup_Failure_Timeout	Unsigned16	O8	-
Active_COV_Subscriptions	List of BACnetCOVSubscription	O9	-
Profile_Name	CharacterString	O	R

• Multi-state Input Object Type

Property Identifier	Property Datatype	BACnet	BNU-BAC
Object_Identifier	BACneObjectIdentifier	R	R
Object_Name	CharacterString	R	R
Object_Type	BACnetObjectType	R	R
Present_Value	Unsigned	R1	R
Description	CharacterString	O	R
Device_Type	CharacterString	O	-
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O2	-
Out_Of_Service	Boolean	R	R
Number_Of_States	Unsigned	R	R
State_Text	BACnetARRAY[N] of CharacterString	O	-
Time_Delay	Unsigned	O3	-
Notification_Class	Unsigned	O3	-
Alarm_Values	List of Unsigned	O3	-
Fault_Values	List of Unsigned	O3	-
Event_Enable	BACnetEventTransitionBits	O3	-
Acked_Transitions	BACnetEventTransitionBits	O3	-
Notify_Type	BACnetNotifyType	O3	-
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O3	-
Profile_Name	CharacterString	O	-

• Multi-state Output Object Type

Property Identifier	Property Datatype	BACnet	BNU-BAC
Object_Identifier	BACneObjectIdentifier	R	R
Object_Name	CharacterString	R	R
Object_Type	BACnetObjectType	R	R
Present_Value	Unsigned	W	W
Description	CharacterString	O	R
Device_Type	CharacterString	O	-
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	-
Out_Of_Service	Boolean	R	R
Number_Of_States	Unsigned	R	R
State_Text	BACnetARRAY[N] of CharacterString	O	-
Priority_Array	BACnetPriorityArray	R	R
Relinquish_Default	Unsigned	R	R
Time_Delay	Unsigned	O1	-
Notification_Class	Unsigned	O1	-
Feedback_Value	Unsigned	O1	-
Event_Enable	BACnetEventTransitionBits	O1	-
Acked_Transitions	BACnetEventTransitionBits	O1	-
Notify_Type	BACnetNotifyType	O1	-
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O1	-
Profile_Name	CharacterString	O	-

Appendix 3

BACnet Gateway Error Response Table

• Error PDU

Error PDU	Error Class	Error Code
Reading of the object list during the initialization of the LG-NET	Device(0)	Configuration_In_Progress(2)
Request to access to an object not installed.	Object(1)	Unknown_Object(31)
Request to access to a property not installed.	Property(2)	Unknown_Property(32)
Request to write to a prohibited area.	Property(2)	Write_Access_Denied(40)
Request to write in a format different from the property.	Property(2)	Invalid_Datatype(9)
Request to access to a specified index outside the array index range.	Property(2)	Invalid_Array_Index(42)
Request to write a value outside the permissible range.	Property(2)	Value_Out_Of_Range(37)
A COV registration request of more than 10 registration items.	Resource(3)	Other(0)
An Event registration request of more than 10 registration items.	Resource(3)	No_Space_To_Add_List_Element(19)
Request for the deletion of an element not existing in the list.	Service(5)	Other(0)
Request for the execution of the AddListElement/RemoveListElement for a property that is not of List type.	Service(5)	Property_Is_Not_List(22)

• Reject PDU

Reject PDU	Reject Reason
A propertyID or value overflow or underflow occurred during WritePropertyMultiple operation.	Inconsistent_Parameter(2)
The type of parameter for the execution of the service is different in type.	Invalid_Parameter_Data_Type(3)
An error was detected during tag decoding.	Invalid_Tag(4)
A parameter shortage occurred during the execution of the service.	Missing_Required_Parameter(5)
Too many arguments for the execution of the service.	Too_Many_Arguments(7)
An attempt to execute an unsupported service with confirmation.	Unrecognized_Service(9)

• Abort PDU

Abort PDU	Abort Reason
Unable to process due to too many requests beyond the capacity.	Buffer_Overflow(1)
The processing of segments was aborted because an expected APDU was received.	Invalid_APDU_In_This_State(2)
The response side does not support the segment.	Segmentation_Not_Supported(4)


LG
Life's Good