

LG

BECONTM

HVAC Solution

0CAA0-06A (Replaces 0CAA0-05A)

TOTAL HVAC SOLUTION PROVIDER

ENGINEERING PRODUCT DATA BOOK

The logo for BECON HVAC Solution. It features the word "BECON" in a bold, italicized, sans-serif font, followed by a small trademark symbol (TM). To the right of "BECON" is the text "HVAC Solution" in a standard, bold, sans-serif font. The entire logo is positioned on a dark blue background that occupies the top portion of the page.

BECONTM HVAC Solution

- 1. General Information**
- 2. Individual Controller**
- 3. Central Controller**
- 4. Application Controller**

BECONTM HVAC Solution

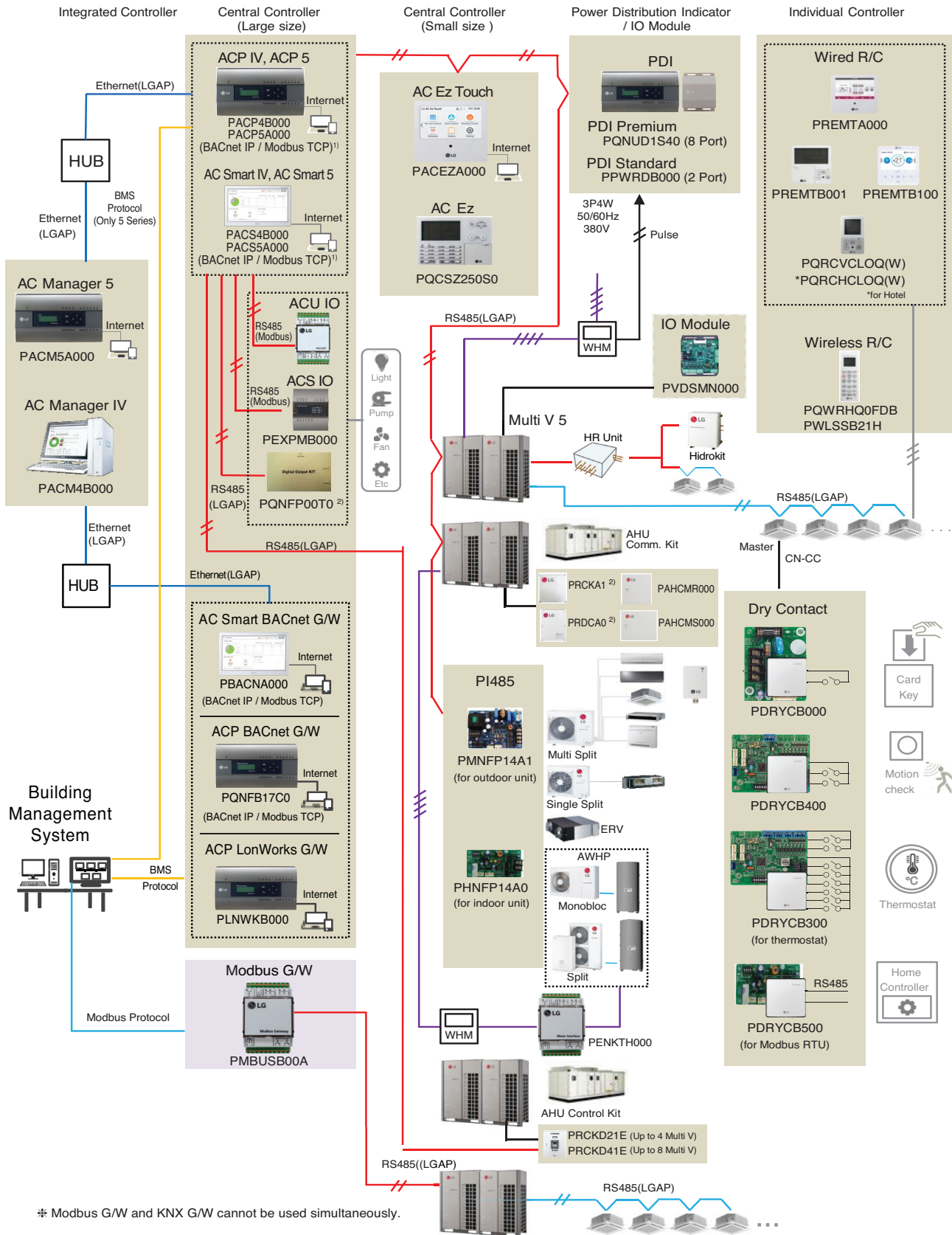
1. General Information

1.1 Solution Overview

1.2 Control System List

1.3 Nomenclature

1.1 Solution Overview










1) It is available 5 series controllers(ACP 5(PACP5A000), AC Smart 5(PACS5A000)) only.

* If more details, please refer to the manual of its product.

2) This product is discontinued.

1.2 Control System List

Category	Controller name	Model name	Compatible Product	Dimensions (W x H x D, mm)	Feature
Individual controller	Premium Wired Remote Controller	PREMTA000(A/B) 	All IDU ERV ¹⁾ ERV DX	137 x 121 x 16.5	<ul style="list-style-type: none"> • 5 inch color Display • Touch Screen • Group control (Max 16 indoor unit) • Temp./Humid sensing
	Standard Wired Remote Controller	PREMTB100 PREMTBB10 	All IDU ERV ¹⁾ ERV DX	120 x 120 x 16	<ul style="list-style-type: none"> • 4.3 inch color Display • Touch button • Group control (Max 16 indoor unit) • Temp./Humid sensing (will be applied from Mar. 2017) • 1 Digital Output available(on/off)
		PREMTB001 PREMTBB01 	All IDU ERV ¹⁾ ERV DX	120 x 120 x 16	<ul style="list-style-type: none"> • 4.3 inch mono Display • Hard button • Group control (Max 16 indoor unit) • 2 remote controller control • Temp. sensing • Basic / Advanced function* • schedule function
	Simple Wired Remote Controller	PQRCVCL0Q(W) 	All IDU	120 x 64 x 15	<ul style="list-style-type: none"> • 2.6 inch mono Display • Hard button • Group control (Max 16 indoor unit) • 2 remote controller control • Temp. sensing • Basic function*
		PQRCHCA0Q(W) 	All IDU	120 x 64 x 15	<ul style="list-style-type: none"> • 2.6 inch mono Display • Hard button • Group control (Max 16 indoor unit) • 2 remote controller control • Temp. sensing • Basic function* (except mode change)
	Wireless Remote Controller	PQWRHQ0FDB 	All IDU	153 x 51 x 26	<ul style="list-style-type: none"> • Heat Pump • 2 inch mono Display • Hard button • Temp. sensing • Basic function*
		PQWRCQ0FDB 	All IDU	153 x 51 x 26	<ul style="list-style-type: none"> • Cooling Only • 2 inch mono Display • Hard button • Temp. sensing • Basic function*

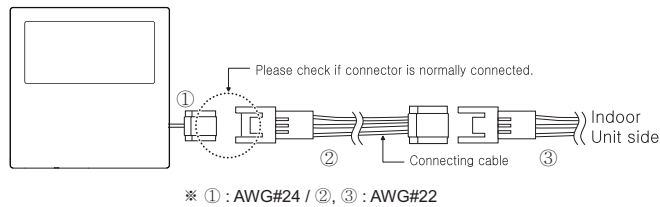
- 1) ERV : Energy Recovery Ventilation
- * Basic/Advanced function refer [Function List /Individual Controller].
- If you need more detail, please refer to the manual of product.
(<http://partner.lge.com>: Home> Doc.Library> Manual)

1.2 Control System List

Outline of system

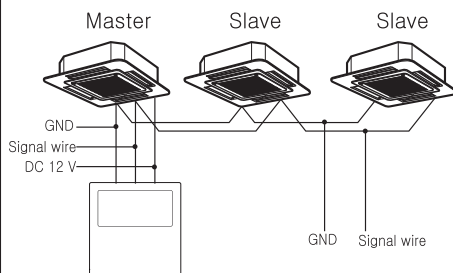
1. Installation Method

12 V	Red
Signal	Yellow
GND	Black



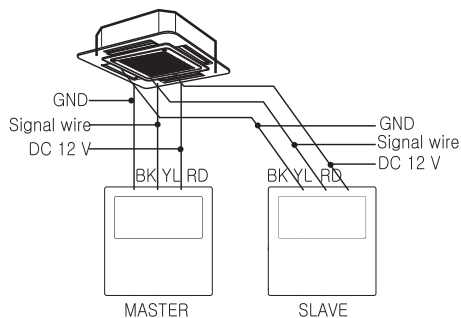
⇒ The total cable length must not exceed 50m. (It can cause communication error.)

2. Group Control



⇒ When controlling multiple indoor units with one remote controller, you must change the master/slave setting from the indoor unit.

3. 2 Remote Controller Control



⇒ When installing more than 2 units of wired remote controller to one air conditioner, set one wired remote controller as master and the others all as slaves.

• 2 Remote Controller Control cable

- Model name : PZCWRC2
- Length : 0.25m



Cable : 10EA

• Extension cable

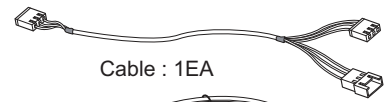
- Model name : PZCWRC1
- Length : 9.6m



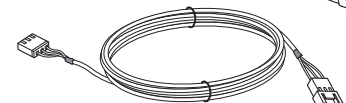
Cable : 2EA

• Group Control cable

- Model name : PZCWRCG3
- Length : 0.25m









Cable : 1EA



Cable : 1EA

- If you need more detail, please refer to the manual of product.
(<http://partner.lge.com>: Home> Doc.Library> Manual)

1.2 Control System List

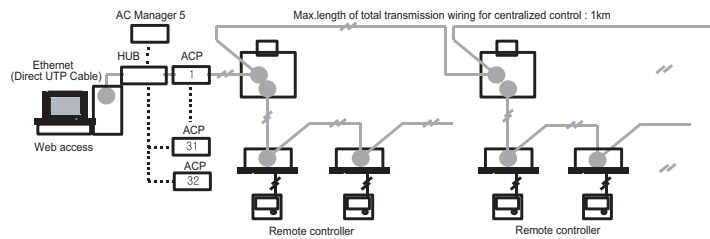
Category	Controller name	Model name	Compatible Product	Dimensions (W x H x D, mm)	Feature
Central controller	AC Manager 5	PACM5A000 	All IDU ERV ¹⁾ ERV DX Heating AHU ³⁾ Chiller	270 x 155 x 65	<ul style="list-style-type: none"> PC Access Controller 12 V=== Adaptor Max 8,192 indoor unit control (Supports 32 ACP 5 or AC Smart 5) 1,260 I/O Point Control Chrome browser is recommended for web control.
	AC Manager IV	PACM4B000 	All IDU ERV ¹⁾ ERV DX Heating AHU ³⁾ Chiller	-	<ul style="list-style-type: none"> PC installation SW Max 8,192 indoor unit control (Supports 32 ACP IV or AC Smart IV) 1,260 I/O Point Control Windows XP/7/8/8.1/10 OS support
	ACP 5	PACP5A000 	All IDU ERV ¹⁾ ERV DX Heating AHU ³⁾ Chiller*	270 x 155 x 65	<ul style="list-style-type: none"> PC Access Controller 12 V=== Adaptor Max 256 indoor unit control RS485 : 6 channels CH1~4 : Indoor unit ²⁾ CH5 : LGAP(AHU) or Modbus(AHU, Chiller, ACS IO) CH6 : Modbus(AHU, Chiller, ACS IO) DI 10EA, DO 4EA (DI1 : Emergency stop Only) In case of ACP 5, Chrome browser is recommended for web control.
	ACP IV	PACP4B000 			
	ACP BACnet	PQNFB17C0 	All IDU ERV ¹⁾ ERV DX Heating AHU ³⁾	270 x 155 x 65	<ul style="list-style-type: none"> PC Access Controller Max 256 indoor unit control 12 V=== Adaptor RS485 : 6 channels CH1~4 : indoor unit ²⁾ CH5 : LGAP(AHU) CH6 : Modbus(AHU, Chiller, ACS IO) DI 10EA, DO 4EA (DI1 : Emergency stop Only) BACnet IP Protocol Support Modbus TCP Protocol Support BTL Certified(B-ASC)
	ACP Lonworks	PLNWKB000 	All IDU ERV ¹⁾ ERV DX Heating AHU ³⁾	270 x 155 x 65	<ul style="list-style-type: none"> PC Access Controller Max 64 indoor unit control 12 V=== Adaptor RS485 : 6 channels Lon Comm. : 1 channel CH1~4 : indoor unit ²⁾ CH5 : LGAP(AHU) CH6 : Not use LON : Lon Talk Lonworks Protocol Support

- 1) ERV : Energy Recovery Ventilation
- 2) Indoor unit : IDU, ERV, DX ERV, Heating, DO Kit
- 3) AHU Control Kit, AHU Comm. kit(For AHU Comm. kit, please refer to Comm. kit PDB)
- * It needs to apply Chiller Option KIT.
- If you need more detail, please refer to the manual of product. (<http://partner.lge.com>: Home> Doc.Library> Manual)

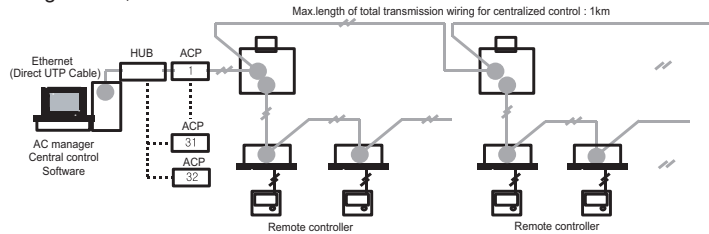
1.2 Control System List

Outline of system

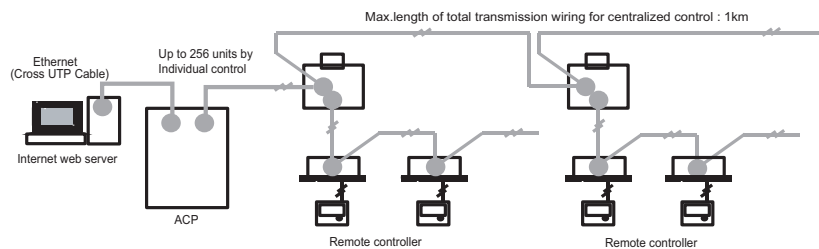
► When using a HUB, use Direct UTP Cable.



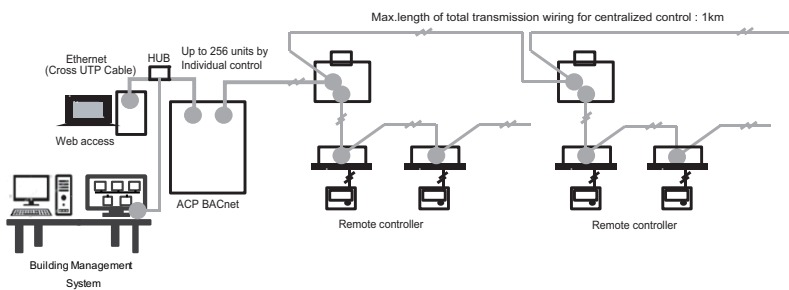
► When using a HUB, use Direct UTP Cable.



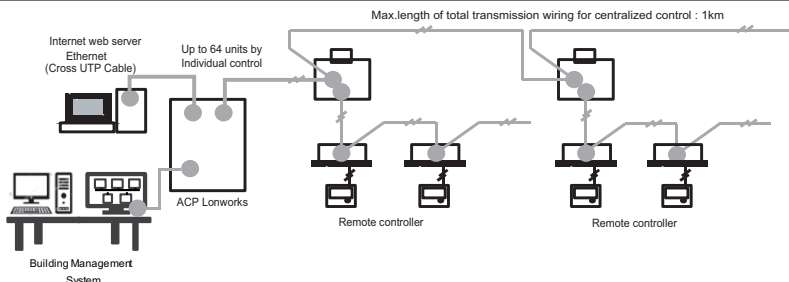
- Recommended PC Specifications for AC Manager IV
 - CPU : Dual Core 2.4GHz or faster
 - System Memory: 4 GB or more
 - Hard Disk Space : 100 GB or more
 - OS : Windows XP/7/8/8.1/10
 - Resolution : 1280 x 1024 or higher
 - Recommended Graphics:
 - VGA: For NVidia, Geforce or later.
 - For ATI, Radeon or later
 - ACP : ACP version 1.1.4p or higher



- Max. the number of connected node* in one RS485 Line : 32
- Communication cable
 - Types : shielding wire
 - Use wires of size : over 0.75 ~ 1.5 mm²
 - Max. allowable temperature of cable : 60 °C
 - Max. length of total transmission wiring (End to End) : 1 km










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- Communication cable
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- Node : (Multi V Outdoor count * 2) + PI485 count + Slave central controller count ≤ 32
- Ex) ACP 1ea + AC Smart 2ea + Multi V Outdoor unit 6ea = 1 + 2 + (6 x 2) = 16 nodes
- * The number of 32 nodes includes the central controller.
- If you need more detail, please refer to the manual of product. (<http://partner.lge.com>: Home> Doc.Library> Manual)

1.2 Control System List

Category	Controller name	Model name	Compatible Product	Dimensions (W x H x D, mm)	Feature
Central controller	AC Smart 5	PACS5A000 	All IDU ERV ¹⁾ ERV DX Heating AHU ⁴⁾ Chiller*	253.2 x 167.7 x 28.9	<ul style="list-style-type: none"> 10 inch type color Display Touch Screen 12 V --- Adaptor Max 128 indoor unit control RS485 : 2 channels CH1 : <ul style="list-style-type: none"> - LGAP(AHU) or - Modbus (AHU, Chiller, ACS IO) or - Indoor unit ²⁾ (AC Smart 5 only ³⁾) CH2 : Indoor unit ²⁾ DI 2EA, DO 2EA In case of AC Smart 5, Chrome browser is recommended for web control.
	AC Smart IV AC Smart BACnet	PACS4B000 PBACNA000 			
	AC Ez Touch	PACEZA000 	All IDU ERV ¹⁾ ERV DX Heating	137x 121 x 25	<ul style="list-style-type: none"> 5inch color Display Touch Screen 12 V --- Adaptor Max 64 indoor unit control RS485 : 1 channel DI 1EA (Emergency stop Only)
	AC Ez	PQCSZ250S0 	All IDU ERV ¹⁾ ERV DX	190 x 120 x 20	<ul style="list-style-type: none"> TN Mono Display & 18 LED Button Control 12 V --- Max 32 indoor unit control RS485 : 1 channel
	PDI Premium	PQNUD1S40 	All IDU ERV DX Heating	[Controller] 270 x 155 x 65 [Power Module] 120 x 155 x 65	<ul style="list-style-type: none"> EHP ODU 8EA (GHP 4EA) 128 EHP Indoor Units (64 GHP Indoor Units) 220-240 V~ Power Input 8port Pulse Input
	PDI Standard	PPWRDB000 	All IDU ERV DX Heating	[Controller] 270 x 155 x 65 [Power Module] 120 x 155 x 65	<ul style="list-style-type: none"> EHP ODU 2EA (GHP 1EA) 128 EHP Indoor Units (64 GHP Indoor Units) 220-240 V~ Power Input 2port Pulse Input
Interface Device	ACS IO Module	PEXPMB000 	ACP IV, ACP 5, AC Smart IV, AC Smart 5	126 x 155 x 65	<ul style="list-style-type: none"> 24 V~ Power Input AO 4EA (Voltage) UI 4EA (Voltage, Current, NTC 10k, PT1000, Ni1000, Dry Contact) DI 3EA (Dry Contact) DO 3EA (Relay Output / Normal Open) RS485 : 1 channel(Modbus)

*It needs to apply Chiller Option KIT.

1) ERV : Energy recovery ventilation

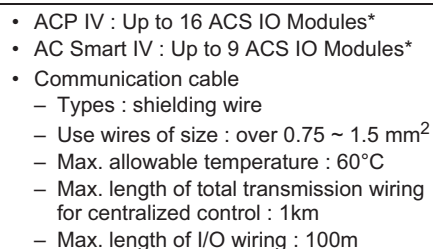
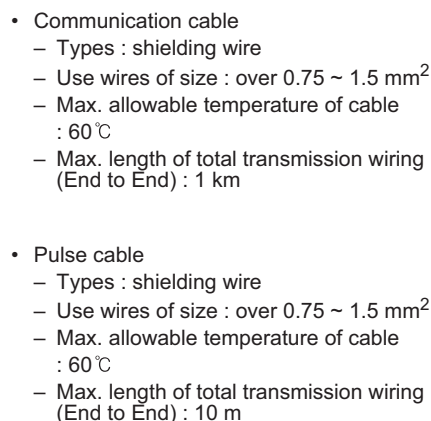
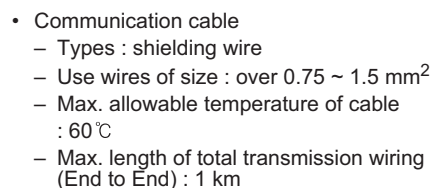
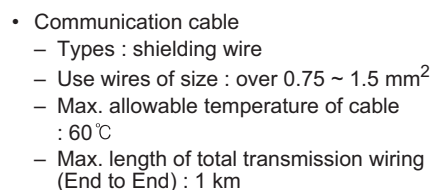
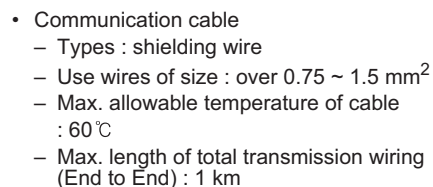
2) Indoor unit : IDU, ERV, DX ERV, Heating, DO Kit

3) In case of using AC Smart IV or AC Smart BACnet, can't use CH1 for Indoor unit.

4) AHU Control Kit, AHU Comm. kit(For AHU Comm. kit, please refer to Comm. kit PDB)






If you need more detail, please refer to the manual of product. (<http://partner.lge.com: Home > Doc.Library > Manual>)

Outline of system



- * The maximum quantity of connected indoor unit is different depending on the quantity of connected I/O modules
- * If you need more detail, please refer to the manual of product. (<http://partner.lge.com>: Home> Doc.Library> Manual)

1.2 Control System List

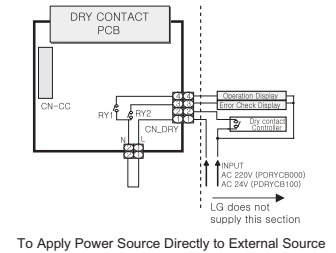
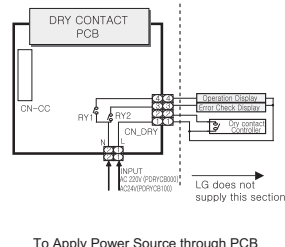
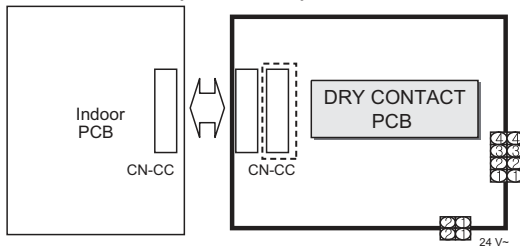
Category	Controller name	Model name	Objective /Use	Dimensions (W x H x D, mm)	Feature
Interface Device	Dry Contract	PDRYCB000 PDRYCB100 	For Connect indoor unit to other forced on/off controller	120 x 120 x 36.5	<ul style="list-style-type: none"> • 1SET / 1 IDU • 1 Contact point • Input power 220-240 V~ <ul style="list-style-type: none"> – PDRYCB000 : 220-240 V~ – PDRYCB100 : 24 V~ • 2 output contacts(operation, error)
		PDRYCB300 	For Connect Indoor unit to Other Thermostat Controller. (Available from Multi V 2 series)	120 x 120 x 36.5	<ul style="list-style-type: none"> • 1SET / 1 IDU • 8 Contact point • No need AC input • Target temperature setting is possible • 2 output contacts(operation, error) ※ Field supply power should not use more than DC 12 V, AC 24 V.
		PDRYCB400 	For Connect Indoor unit to other Forced on/off Controller. (Available from Multi V 2 series)	120 x 120 x 36.5	<ul style="list-style-type: none"> • 1SET / 1 IDU • 2 Contact point • No need AC input • Target temperature setting is possible • 2 output contacts(operation, error) ※ Field supply power should not use more than DC 12 V, AC 24 V.
		PDRYCB500 	For Connect Indoor unit to external controller. (Available from Multi V 2 series)	120 x 120 x 36.5	<ul style="list-style-type: none"> • 1SET / 1 IDU • 2 wire RS485 • MODBUS • Address range (01~08) - After 2018 (01~16)
	Remote Temperature Sensor	PQRSTA0 	Sensor for detecting the room temperature	70 x 120 x 14.8	<ul style="list-style-type: none"> • Cable 15 m

- If you need more detail, please refer to the Control PDB or the manual of product.
(<http://partner.lge.com>: Home> Doc.Library> Manual)

1.2 Control System List

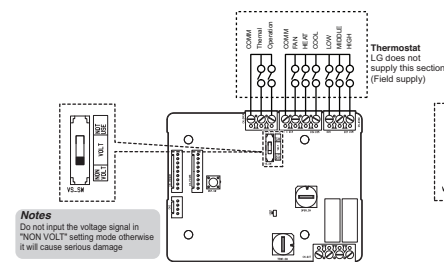
Outline of system

Connect CN-CC with Indoor PCB by the cable(provided)
- Connection of Dry contact only

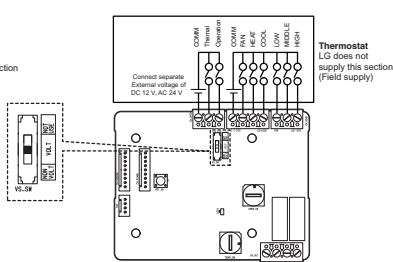


To Apply Power Source through PCB

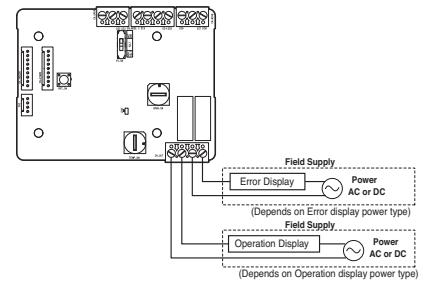
To Apply Power Source Directly to External Source



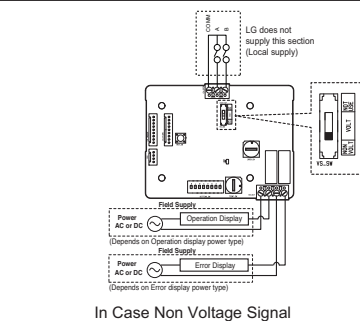
For no Power Contact Point signal Input



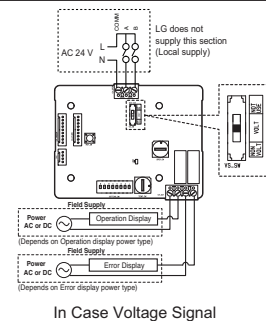
For Power Contact Point signal Input



Indoor Unit Monitoring

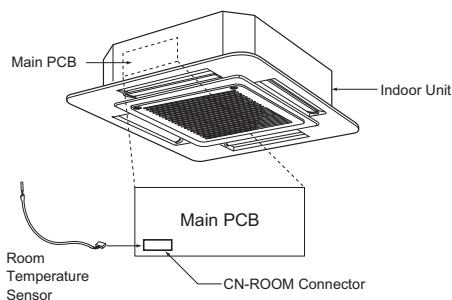
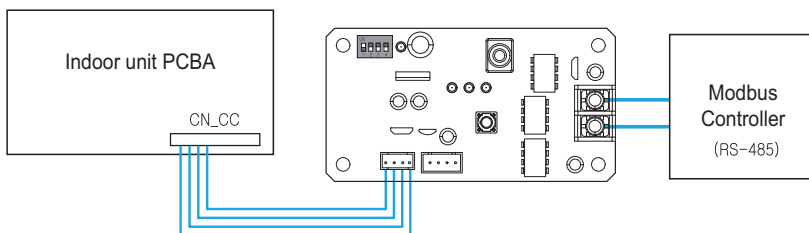


In Case Non Voltage Signal



In Case Voltage Signal

► When using with the central controller (Only when the indoor unit PCB is a non-communication model)



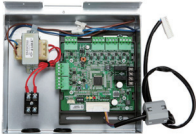
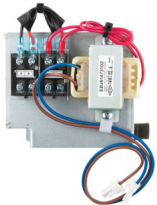


CAUTION

Remote temperature sensor only applied to Cassette and Duct products.

- If you need more detail, please refer to the manual of product.
(<http://partner.lge.com>: Home> Doc.Library> Manual)

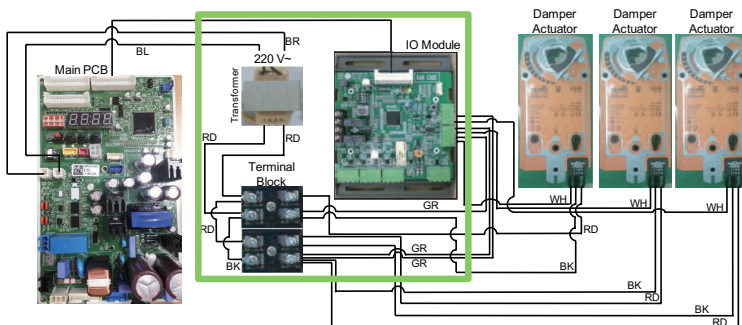
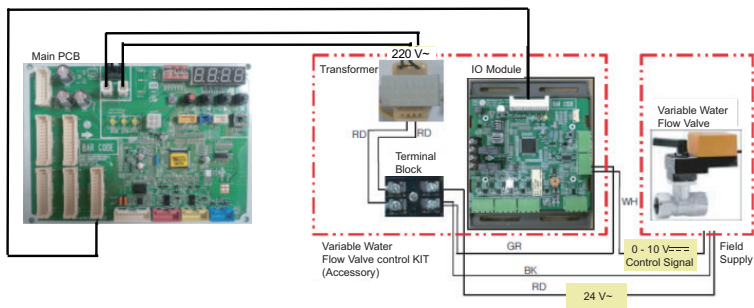
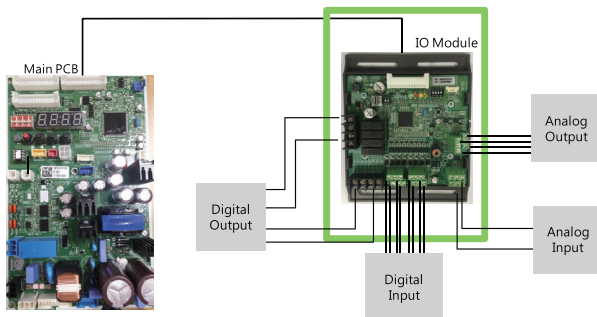
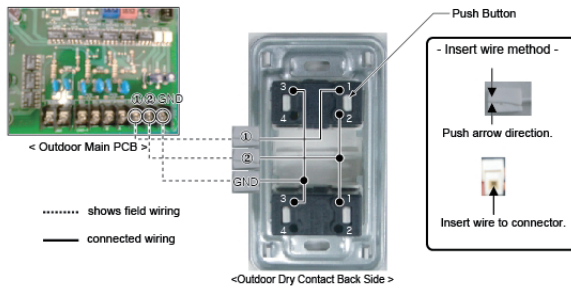
1.2 Control System List

Category	Controller name	Model name	Objective /Use	Dimensions (W x H x D, mm)	Feature
Interface Device	Cool/Heat Selector	PRDSBM 	To Select Operation Mode	74 x 120 x 103	<ul style="list-style-type: none"> • Push Button Type • Mode : Cooling, Heating, Fan
	IO(Input/Output) Module	PVDSMN000 	Expansion IO function (Available from Multi V 4 series)	126 x 155 x 33	<ul style="list-style-type: none"> • AO 4EA(0~10V) • AI 2EA(0~10V) • DI 8EA(Dry Contact) • DO 4EA(Relay / Normal Open)
	Variable Water Flow Valve Control Kit ¹⁾	PWFCKN000 	Variable Water Flow Valve (Available from Multi V Water 4 series)	218 x 200 x 85	<ul style="list-style-type: none"> • AO 2EA (Voltage) • AI 2EA (Voltage) • DI 6EA (DryContact) • DO 2EA (operation, error) Relay Output / Normal Open
	Low Ambient Control Kit	PRVC2 	Low Ambient (Available from Multi V 4 series)	126 x 155 x 33	<ul style="list-style-type: none"> • AO 2EA (Voltage) • AI 2EA (Voltage) • DI 6EA (DryContact) • DO 2EA (operation, error) Relay Output / Normal Open

- 1) It is available Multi V Water Outdoor unit only.
- If you need more detail, please refer to the manual of product.
(<http://partner.lge.com>: Home> Doc.Library> Manual)


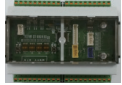
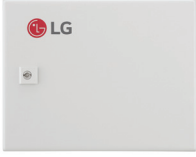

1.2 Control System List

Outline of system



- If you need more detail, please refer to the Control PDB or the manual of product.
(<http://partner.lge.com>: Home> Doc.Library> Manual)

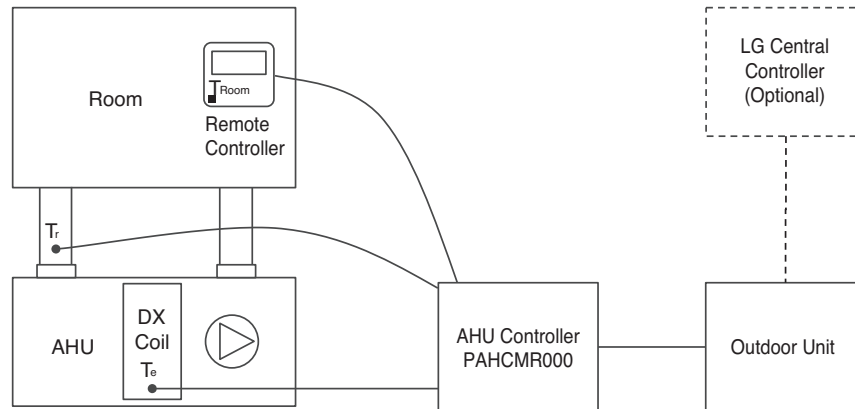
1.2 Control System List

Category	Controller name	Model name	Objective /Use	Dimensions (W x H x D, mm)	Feature
Interface Device	AHU Comm. Kit	PAHCMR000  <Product cover>  <Communication Module>	Return Air Temperature Control	300 X 300 X 155	<ul style="list-style-type: none"> • UI 4EA (AI/DI) • DO 3EA (Relay, A type) • T/B Spring Push Type
	AHU Comm. Kit	PAHCMS000  <Product cover>  <Main Module(left) and Communication Module(right)>	Discharge Air Temperature Control	380 X 300 X 155	<ul style="list-style-type: none"> • UI 15EA (AI/DI) • DI 3EA (Dry Contact) • DO 9EA (Relay, A type 8EA, C type 1EA) • AO 6EA (0~10V) • T/B Spring Push Type

- If you need more detail, please refer to the manual of product.
(<http://partner.lge.com>: Home> Doc.Library> Manual)

1.2 Control System List

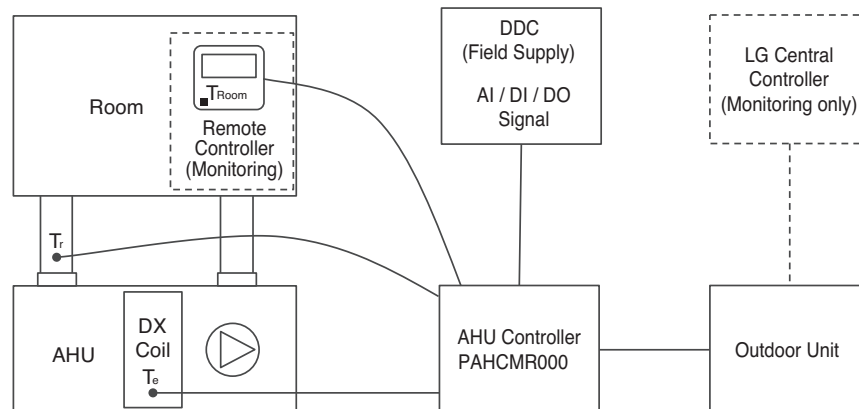
• **LG Control : Fixed T_e + T_r or T_{Room}**



A fixed evaporating or condensing temperature of a DX coil (T_e) can be controlled by either return air temperature (T_r) or room air temperature (T_{Room}). A fixed target evaporating or condensing temperature can be changed in MULTI V and Single outdoor unit setting.

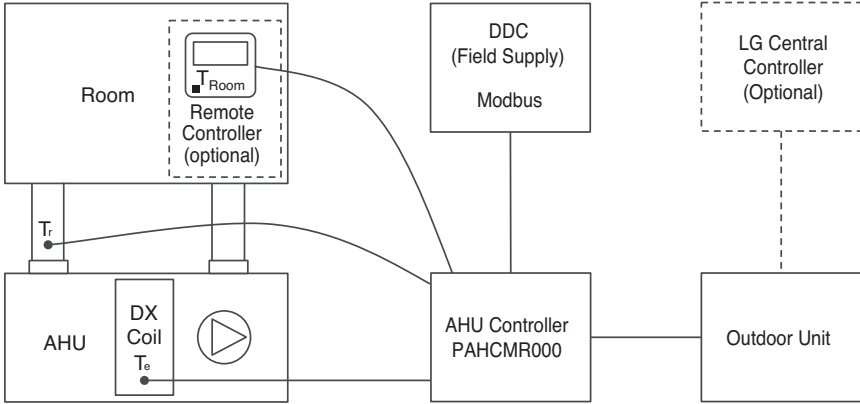
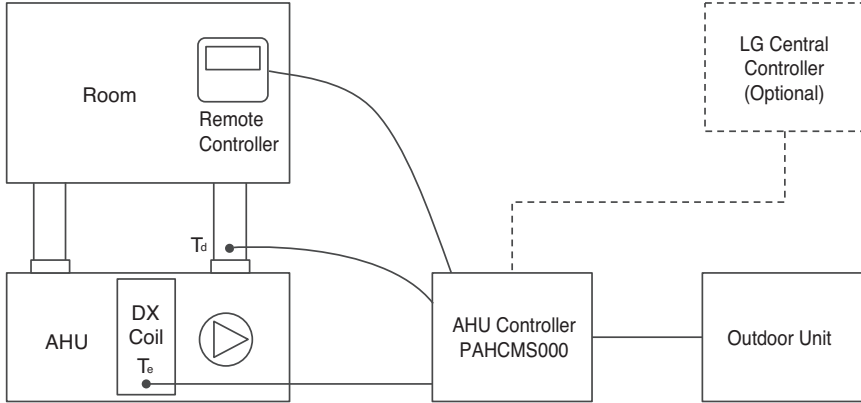
Return Air
Temperature
Control

• **DDC Control by Contact Signal : Fixed T_e + T_r or T_{Room}**



The DDC controls return air temperature (T_r) or room air temperature (T_{Room}) by transferring AI / DI / DO signal to the AHU Communication Kit for Return air control. A fixed target evaporator or condensing temperature (T_e) can be changed in MULTI V and Single outdoor setting. LG wired remote controller and LG Central Controller can be optionally applied, but only monitoring function is possible.

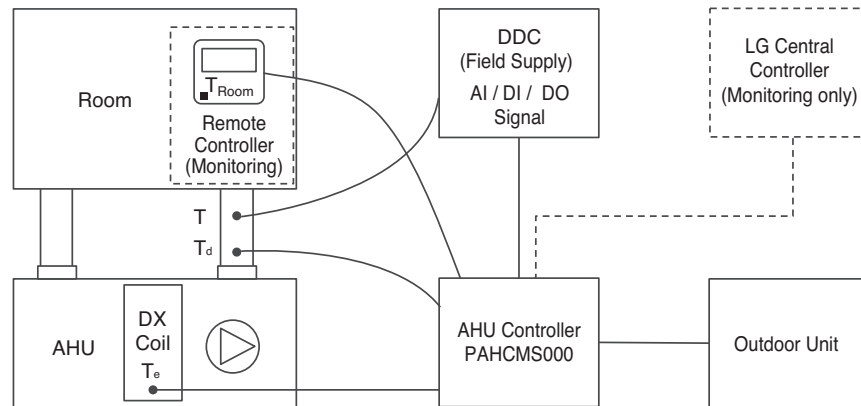
1.2 Control System List

Return Air Temperature Control	<p>• DDC Control by Modbus : Fixed T_e + T_r or T_{Room}</p>  <p>The DDC controls return air temperature (T_r) or room air temperature (T_{Room}) by transferring Modbus signal to the AHU Communication Kit for Return air control. To control room air, the LG wired controller can be purchased optionally. A fixed target evaporator or condensing temperature (T_e) can be changed in MULTI V and Single outdoor setting.</p>
Discharge Air Temperature Control	<p>• LG Control : Variable T_e + T_d</p>  <p>The Communication Kit for Discharge Air Temperature Control is single-handed able to cover this function. The Communication Kit adjusts the evaporating or condensing temperature (T_e) by monitoring the supplied air temperature (T_d) in order to meet the required set target (T_d).</p>

1.2 Control System List

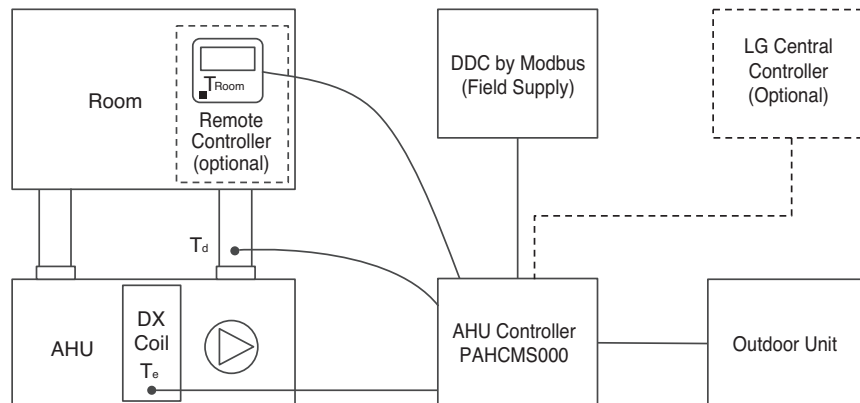
Discharge
Air
Temperature
Control

• DDC Control by Contact Signal : Variable $T_e + T_d$ (0~10 V)





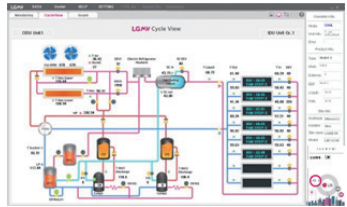
The DDC controls the discharge air temperature by sending an analog input (0 to 10V) to the AHU Communication Kit for Discharge Air Control which will adjust the targets (T_e) to which the outdoor unit is running hence increasing or decreasing the discharge air temperatures.

• DDC Control by Modbus : Variable $T_e + T_d$



The DDC controls the discharge air temperature (T_d) by sending modbus signal to the AHU Communication Kit which will vary the targets (T_e) to which the outdoor unit is running hence increasing or decreasing temperatures.

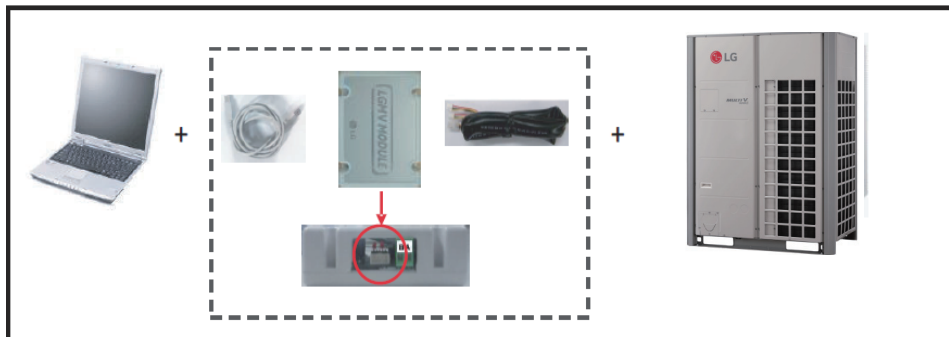
1.2 Control System List

Category	Controller name	Model name	Objective /Use	Dimensions (W x H x D, mm)	Feature
Maintenance Accessory	LGMV	PRCTILO 	LGMV data monitoring via Personal Computer	105 x 78 x 36	<ul style="list-style-type: none"> Length of cable : 1m (3m extension cable is included) RS232(ODU), RS485(IDU) support USB type of connection are possible.
	Connected device		Installation Method		Feature
	PC Program  		<ul style="list-style-type: none"> Web Install <ul style="list-style-type: none"> Connect to homepage (http://partner.lge.com) and select HVAC category then downloaded installation file on software menu. Automatic Install <ul style="list-style-type: none"> The accessory application program supports for automatic updates. CD Install <ul style="list-style-type: none"> It can be installed on from CD. 		<ul style="list-style-type: none"> Minimum Specification <ul style="list-style-type: none"> Windows XP MS Office 2003 Recommended Specification <ul style="list-style-type: none"> Windows7 (Win10 is possible) MS Office 2007 Resolution <ul style="list-style-type: none"> 2048 x 1536 (optimization) 1024 x 768 Basic specification <ul style="list-style-type: none"> CPU 1 GHz RAM 1 GB

- If you need more detail, please refer to the manual of product.
(<http://partner.lge.com>: Home> Doc.Library> Manual)

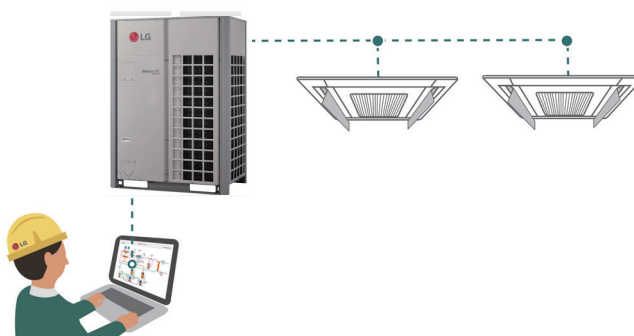
1.2 Control System List

Outline of system



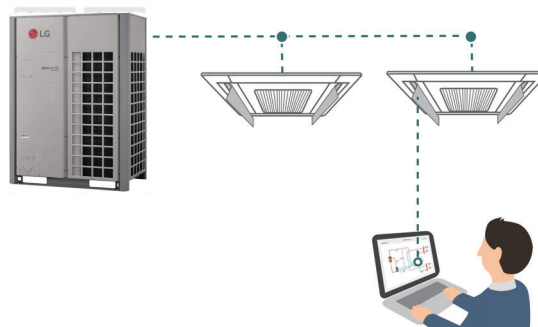
1. Outdoor connection

Connect LGMV cable to Multi V PCB LGMV port






2. Indoor unit connection

Connect LGMV cable to Multi V Indoor unit communication port



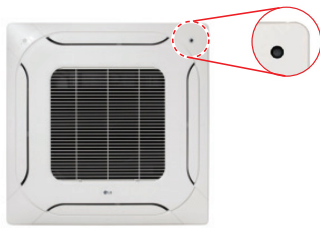
- If you need more detail, please refer to the manual of product.
(<http://partner.lge.com>: Home> Doc.Library> Manual)

1.2 Control System List

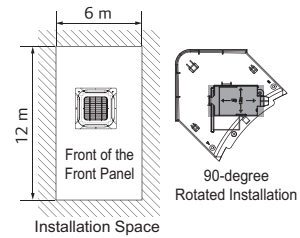
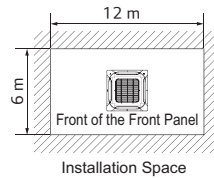
Category	Controller name	Model name	Objective / Use	Dimensions (W x H x D, mm)	Feature
Interface Device	Human detection sensor kit	PTVSMA0	To use Human detection mode by detecting the number of people through this human detection sensor kit.	188.7*188.7*90.1	<ul style="list-style-type: none"> Detection Range : ~ height 3.2 1) Installation Height 2.7 m → Detection area 12 m x 6 m 2) Installation Height 3.2 m → Detection area 15 m x 8 m Lumens : 200 Lux ~
	Wi-Fi Modem	PWFMDD200 	To interlock with Smart ThinQ Application	48*78*14.2	<ul style="list-style-type: none"> Frequency Range 2412~2462 MHz Input power :DC 12 V Output Power (Max) IEEE 802.11b : 19.29 dBm IEEE 802.11g : 25.43 dBm IEEE 802.11n : 25.30 dBm
	Meter interface	PENKTH000 	To transmit energy information	91*53.6*60.7	<ul style="list-style-type: none"> This module Interfaces between watt hour meter or heat meter and AWHP indoor unit.
	Modbus Gateway	PMBUSB00A 	To interlock with 3rd Party controller or BMS for Multi V 5 / ERV (DX) / AWHP,Hydrokit	53.6*89.7*60.7	<ul style="list-style-type: none"> Max. number of unit : 16 (64 IDUs when combining multiple modules) Comm. Type : 2 Channel RS485 *Channel 1 : To 3rd party controller *Channel 2 : To Outdoor unit / Other module comm.

1.2 Control System List

Outline of system

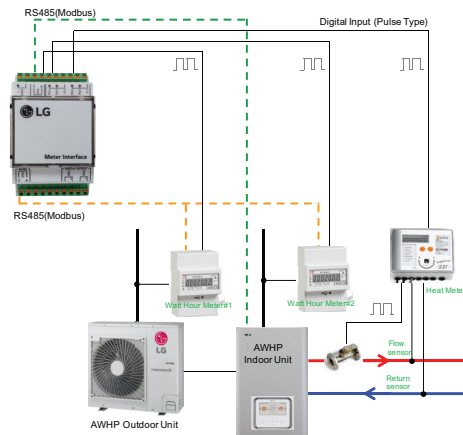
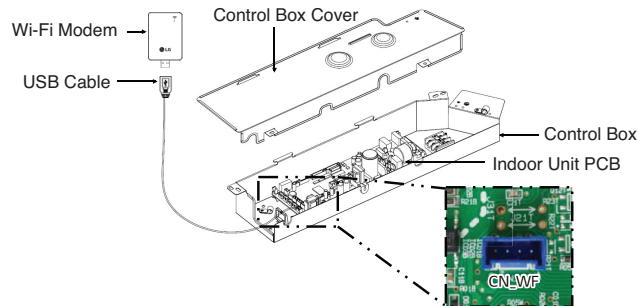


(Installation Examples)

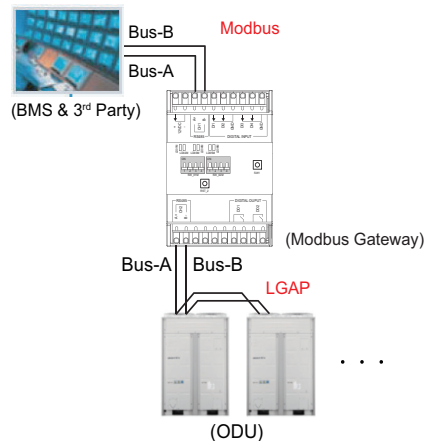


The horizontal width is greater than the vertical width.



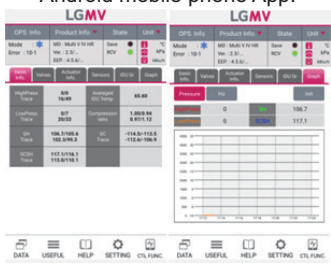
The vertical width is greater than the horizontal width.



(Installation Example)



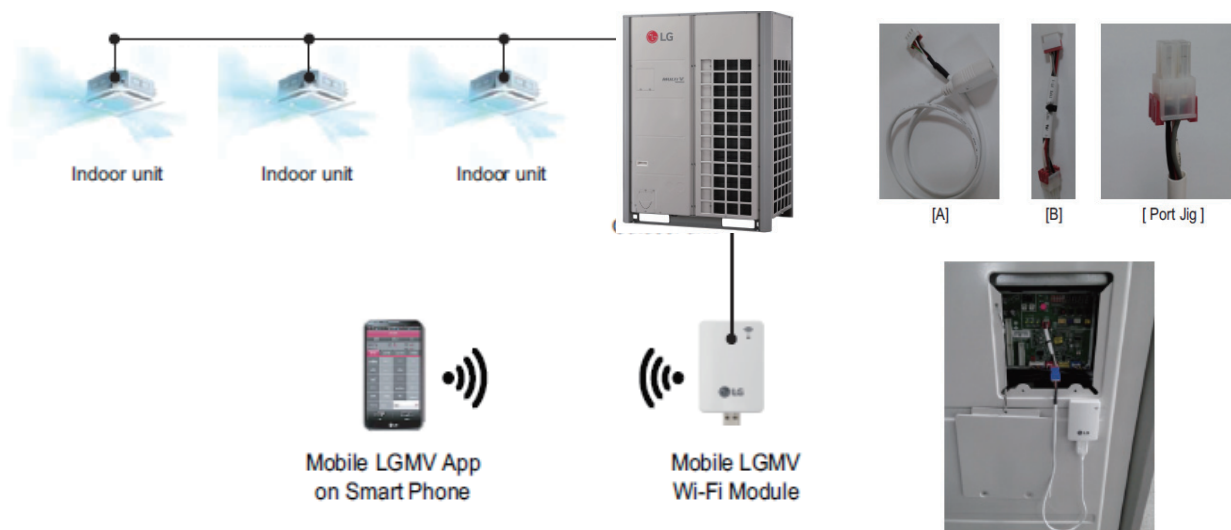
1.2 Control System List

Category	Controller name	Model name	Objective /Use	Dimensions (W x H x D, mm)	Feature
Maintenance Accessory	Mobile LGMV	PLGMVW100 	LGMV monitoring via mobile device	48*78*14.5	<ul style="list-style-type: none"> The effective distance for wireless communication is 10m The effective distance may be reduced by the communication environment.
	Connected device		Installation Method		Feature
	iOS App. (iPad only)		Tap the app Store icon on the screen. And then Search 'mobile lgmv'		<ul style="list-style-type: none"> Minimum Specification <ul style="list-style-type: none"> – iOS 7.1 Recommended Specification <ul style="list-style-type: none"> – iOS 7.1/8.0/8.1 Resolution <ul style="list-style-type: none"> – 2048 x 1536 (optimization) – 1024 x 768
	Android mobile phone App.		Tap the Play Store icon on the screen. And then Search 'mobile lgmv'		<ul style="list-style-type: none"> Basic specification <ul style="list-style-type: none"> – Phone: Android OS 2.2 – Pad: Android 4.4.2(Kitkat) – CPU 1 GHz – RAM 1 GB Recommended Specification <ul style="list-style-type: none"> – Android OS 4.4.2(Kitkat) or higher, CPU 1 GHz Dual Core or higher, RAM 1 GB or higher 1280 x 720, 800 x 480 resolution (Optimized)

- If you need more detail, please refer to the manual of product.
(<http://partner.lge.com>: Home> Doc.Library> Manual)

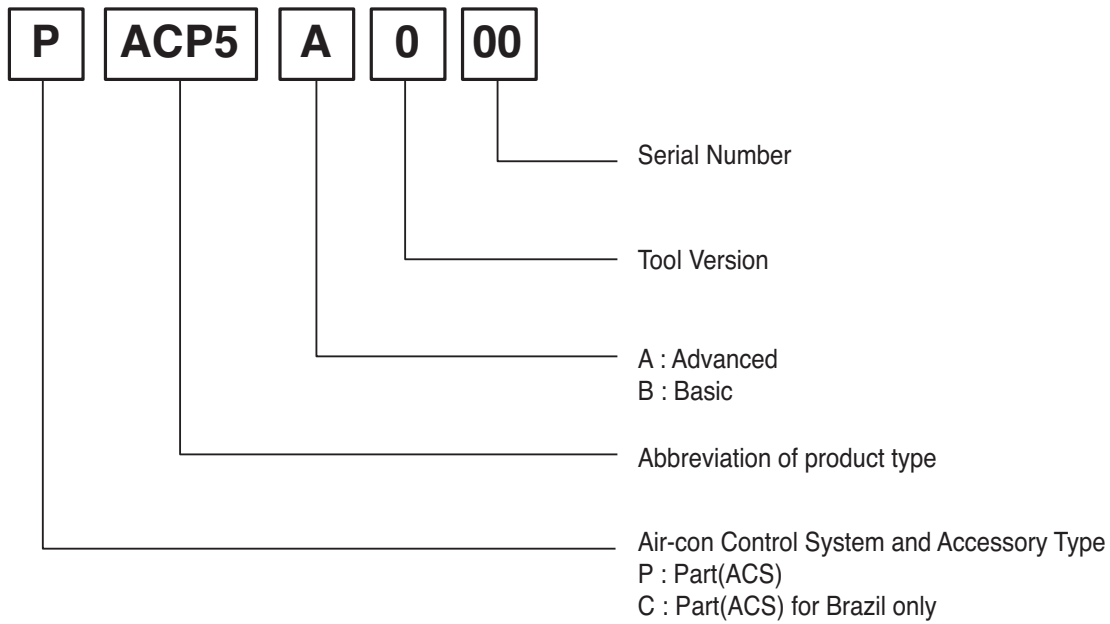
1.2 Control System List

Outline of system



- If you need more detail, please refer to the manual of product.
(<http://partner.lge.com>: Home> Doc.Library> Manual)

1.3 Nomenclature



※ The product images and descriptions included in this PDB are stated based on basic model (Model Name: PXXXXXXXX).

※ Some old models may not be applied.

2. Individual Controller

2.1 List of Function







2.2 Installation

2.3 Specifications

2.4 Compatibility Table

2.1 List of Function

2.1.1. Feature functions

Controller Name		Premium Wired Remote Controller	Standard Wired Remote Controller		Simple Wired Remote Controller	Simple(Hotel) Wired Remote Controller	Wireless Remote Controller
Product Image							
Model Name		PREMTA000 PREMTA000A PREMTA000B	PREMTB100 PREMTBB10	PREMTB001 PREMTBB01	PQRCVCL0Q PQRCVCL0QW	PQRCHCA0Q PQRCHCA0QW	PQWRH(C)Q0FDB PWLSSB21H(C)
Basic	On / Off	O	O	O	O	O	O
	Fan Speed Control	O	O	O	O	O	O
	Temperature Setting	O	O	O	O	O	O
	Mode Change	O	O	O	O	X	O
	Auto Swing	O	O	O	O	O	O
	Vane Control (Louver Angle)	O	O	O	O	O	O
	E.S.P (External Static Pressure)	O	O	O	O	O	X
	Electric Failure Compensation	O	O	O	O	O	X
	Indoor Temperature Display	O	O	O	O	O	O
	ALL Button Lock (Child Lock)	O	O	O	O	O	X
Advanced	Schedule / Timer	O	O	O	X	X	O
	Additional Mode Setting*	O	O	O	X	X	X
	Time Display	O	O	O	X	X	O
	humid. Display	O	O	X	X	X	X
	Advanced Lock (mode, set point, set point range, on/off Lock)	Advanced Lock	Advanced Lock	X	X	X	X
	Filter Sign	O	O	O	X	X	X
	EnergyManagement **	O	O	O	X	X	X
	Dual Set point	O	O	X	X	X	X
	Human detection	X	O	X	X	X	X
	Temp, Humidity compensation	O	O	X	X	X	X
	Wi-Fi pairing	O	O	O	O	O	O
ETC	Operation StatusLED	O	O	O	O	O	X
	Wireless Remote Controller Receiver	O***	X	O***	O***	O***	X
	Display	5 inch Color Display	4.3 inch Color Display	4.3 inch mono Display	2.6 inch mono Display	2.6 inch mono Display	2 inch mono Display
	Size (W x H x D, mm)	137 x 121 x 16.5	120 x 120 x 16	120 x 120 x 15	64 x 120 x 15	64 x 120 x 15	51 x 153 x 26
	Black Light Control for Screen Saver	O	O	X	X	X	X

• O : Applied X : Not applied

• * It might not be indicated or operated at the partial product

• ** Centralized control (PACS5A000 / PACS4B000 / PACP5A000 / PACP4B000 / PQNFB17C0 / PLNWK000) and PDI (PQNUD1S40 / PPWRDB000) should be installed for this function

• *** For ceiling type duct

• Indoor unit should have functions requested by the controller

• If you need more detail, please refer to the manual of product. (<http://partner.lge.com>: Home> Doc.Library> Manual)

2.1 List of Function

2.1.2. Restriction function when using group control

Function		Setting for extended fuctions on group control (Installer setting code : 19)	
		Not use (19:00)	Use (19:01)
On/Off	On/Off	●	●
Mode	Cool/Heating/Fan/Dehumidification	●	●
	Auto	Operation based on Master indoor unit	Operation based on Master indoor unit
	Power cooling/Heating	X	X
Fan Speed	Slow	X	X
	Low/Med/High	●	●
	Power	X	X
	Auto	Operation based on Master indoor unit ¹⁾	Operation based on Master indoor unit ¹⁾
Wind direction	Up Down / Left Right / Comfort	X	Operation based on Master indoor unit
Sub function	Air purification (Plasma Purification)	X	X
	Energy saving cooling	X	Operation based on Master indoor unit
	Auto dry / Robot Cleaning	X	X
	Ventilation device kit	X	X
	Heater	X	Operation based on Master indoor unit ¹⁾
	Humidification	X	X
	Fan Auto	X	Operation based on Master indoor unit
	Comfort cooling	X	X
	Vane Angle	X	Only can be set on Vane ALL
Function / User setting	Elevation grill control	X	X
	Auto dry / Robot Cleaning	X	X
	Filter alarm	●	●
	Time setting	●	●
	changeover temperature setting	●	●
	Dead band setting	●	●
	Override timer setting	●	●
	Setback setpoint setting	●	●

1) It is only applied for PREMTB100, PREMTBB10.

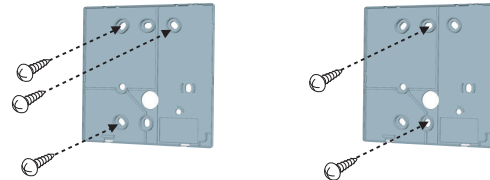
2.2 Installation

2.2.1 1:1 connection

Installation step PQRCVSL0 / PQRCVSL0QW / PQRCVCL0Q / PQRCVCL0QW / PQRCHCA0Q / PQRCHCA0QW

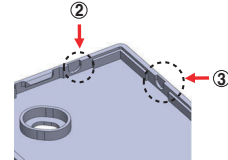
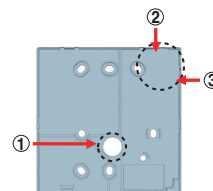
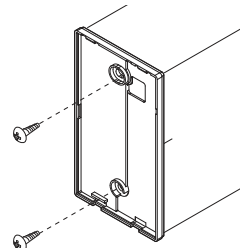
1. Please fix tightly using provided screw after placing remote controller setup board on the place where you like to setup.

- Please set it up not to bend because poor setup could take place if setup board bends.
- Please set up remote controller board fit to the reclamation box if there is a reclamation box.



2. Can set up Wired remote controller cable into three directions.

- Setup direction: the surface of wall reclamation, upper, right
- If setting up remote controller cable into upper and right side, please set up after removing remote controller cable guide groove.



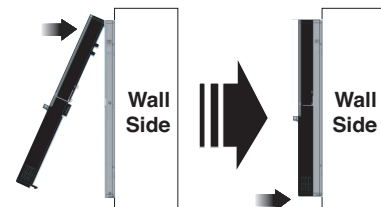
<Wire guide grooves>

- ※ Remove guide groove with long nose.
- ① Reclamation to the surface of the wall
- ② Upper direction guide groove
- ③ Right part guide groove

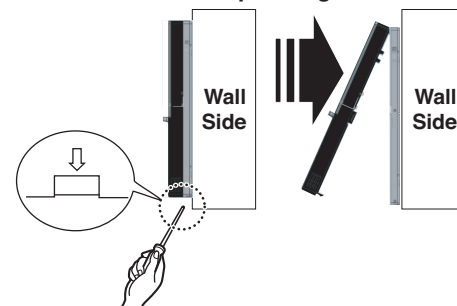
3. Please fix remote controller upper part into the setup board attached to the surface of the wall, as the picture below, and then, connect with setup board by pressing lower part.

- Please connect not to make a gap at the remote controller and setup board's upper and lower, right and left part.

<Connecting order>



<Separating order>

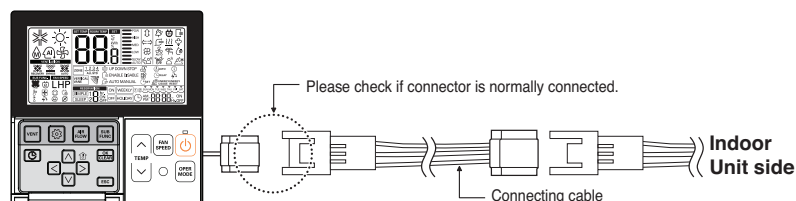


When separating remote controller from setup board, as the picture below, after inserting into the lower separating hole using screw driver and then, spinning clockwise, remote controller is separated.

- There are two separating holes. Please individually separate one at a time.
- Please be careful not to damage the inside components when separating.

4. Please connect indoor unit and remote controller using connection cable.

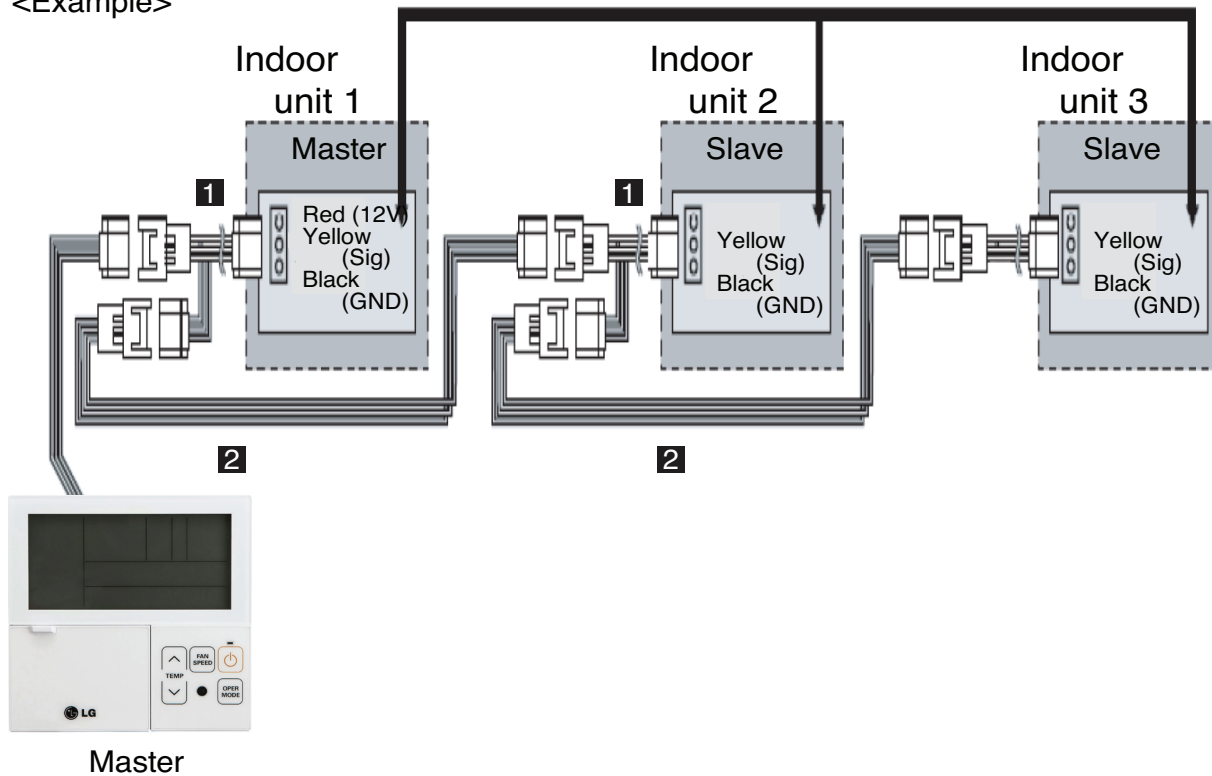
12V	Red
Signal	Yellow
GND	Black



2.2 Installation

2.2.2 Group connection

<Example>

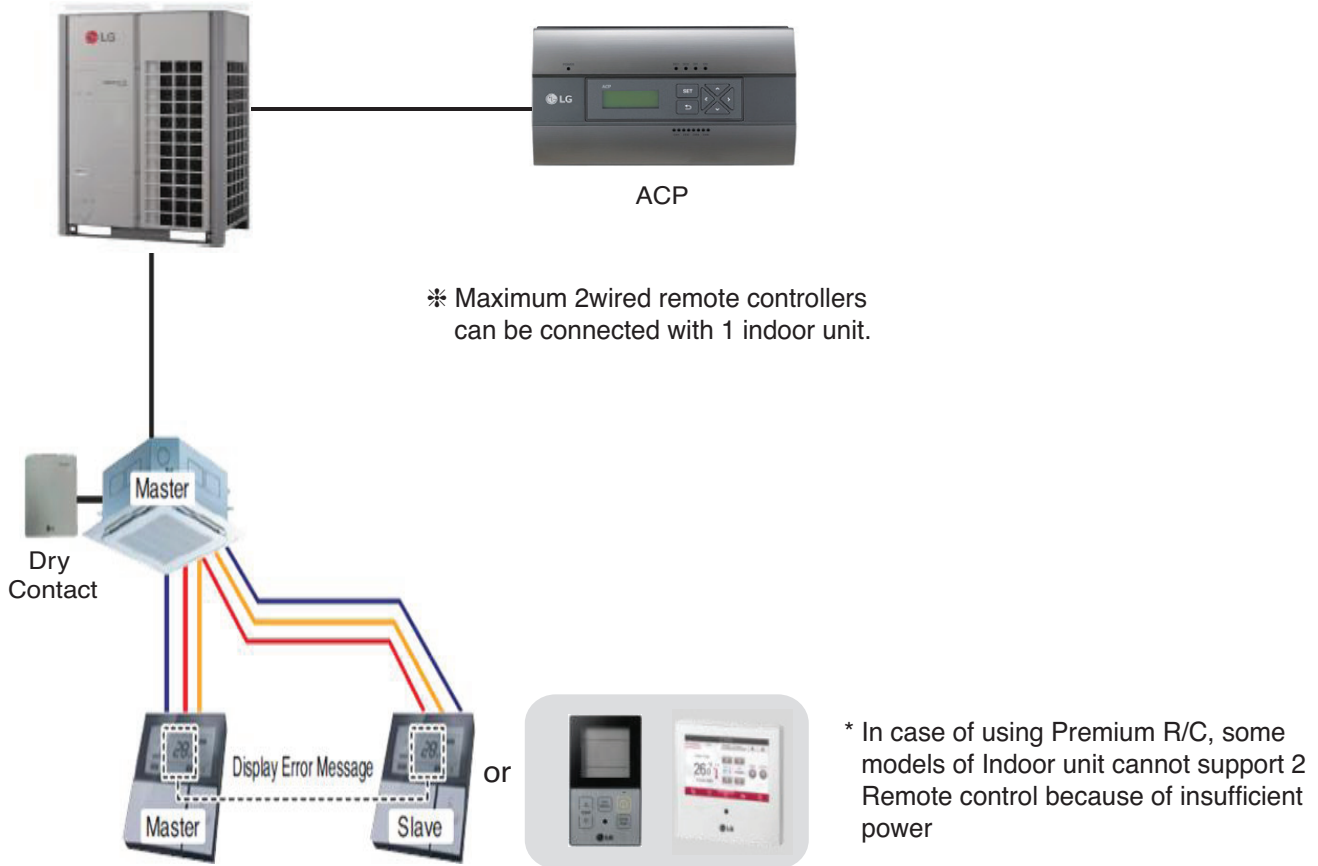


1. Max. 16 Indoor units by one remote controller.
2. Only one indoor unit to Master and others to Slave.
3. Except basic function(On/Off, Operation mode, Set temp., Fan speed) and reservation function, some of other functions may not be possible.
4. In case of using Central controller, the Central controller can control indoor units which has the address of master indoor unit. (Slave indoor unit can not be individually controlled by Central controller)
5. Dry contact can be allowed only in master indoor unit.
6. It is possible to use wireless remote controller at the same time.
7. In case that the group's indoor unit has an abnormal problem, an error code will be displayed on the wired remote controller.

2.2 Installation

2.2.3 2-Remote controller connection

■ Wired remote controller 2 + Indoor unit 1



1. It is possible to connect two wired remote controllers with one indoor unit.
 - Set one indoor unit to Master and other one to Slave.
2. It is possible to use wireless remote controller at the same time.
3. It is possible to connect with Dry Contact and Central controller at the same time.
4. In case that the indoor unit has an abnormal problem an error code will be displayed on the wired remote controller.
5. There isn't limits of indoor unit function.

2.3 Specifications

2.3.1 Premium Wired Remote Controller

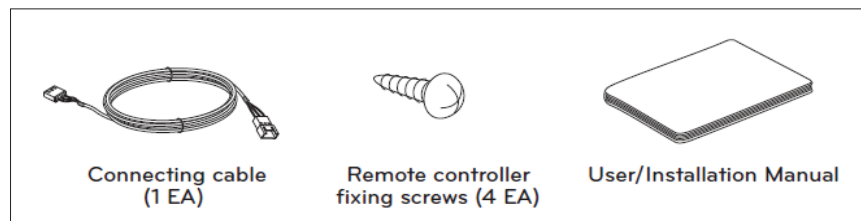
■ Model name : PREMTA000, PREMTA000A, PREMTA000B



- Dimensions: 137 X 121 X 16.5 mm
- Screen : 5 inch full color TFT LCD (480 X 272)
- Unit types : Air conditioner, Ventilator, DX ventilator
- Sensor : Temperature / Humidity
- Language : PREMTA000 : English, French, Spanish, Portuguese
PREMTA000A : English, Italian, Russian, Chinese
PREMTA000B : English, German, Polish, Czech

Appearance		Functions (Button Descriptions)		
		No.	Name	Function
	1		Operation display window	Displays operation and setting status
			Touch screen	Control of product operation and setting status
	2		Back button	Move to the previous setting screen
	3		Home button	Move to the default screen
	4		Wireless reception port	Receives wireless remote controller signal
	5		Reset button	Reset wired remote controller

■ Accessory



2.3 Specifications

■ Description of Function

Item	Description
ON/OFF	Air conditioner and ventilator will be turned on or off.
Power Cooling	It performs a strong cooling in a short period of time.
Heating Operation	Provides warm air to the space.
Dehumidification Operation	Removes moisture from the air.
Monsoon Dehumidifying Mode	This is monsoon region-specific dehumidification function.
Fan Only Operation	Only fan will circulate air.
Artificial Intelligence Automatic Operation	Operation provides heating and cooling to satisfy space requirements.
Fan speed Control	It moves to the fan speed selection screen.
Airflow Control	It moves to the direction of air flow selection screen.
Override control	Override master/slave selection function is, since Multi V III Heat Pump series model, the function to prevent product's different mode operation. If it setup as the slave, It blocks to change opposite run mode to outdoor unit cycle (cooling/heating)
Home leave (Unoccupied Mode)	The "Home Leave " function enables proper operation of indoor unit when a space is left for a period of time.
Hold	It is a function that holds the current mode of operation.
Zone Control	A function to control zone with duct type indoor units.
Check Room Temperature	It is a function that displays the room temperature.
Up/Down Vane Angle Setting	Used to set each vane angle
Plasma Purification	Improves indoor air quality
Energy-Saving Cooling	Energy-Saving cooling function enhances the comfort of the user and to improves the Energy-Saving performance by controlling the desired temperature during the cooling operation.
Fan Auto	Fan operation keeps on after thermal operation of indoor units.
Robot Cleaning	The robot cleaning function is a function to automatically clean the filter with the cleaner installed in the product after using the air conditioner for certain time period.
Ventilation kit	Function enables operation of an optional ventilation kit with indoor units.
Humidifier	Function enables a humidifier if one is installed to maintain space comfort.
Mosquito Away	Mosquito Away is a device to radiate frequency which mosquitoes don't like.
Himalaya Cooling	Power Cooling + Auto swing
Comfort Saving	Only products with Comfort Saving function can use this.
General Ventilation Operation Mode	You can select the ventilation mode when it is connected to a ventilation product.
Ventilator with DX Operation Mode	It uses the heat exchanger inside the ventilation product to perform the ventilation operation function at the same time of cooling or heating operation.
Simple Reservation	Simple reservation function can be scheduled to stop while the system is in operation or to run while the system is not in operation.
Sleep Reservation	Sleep Reservation is a function that the air-conditioner runs in the sleep mode or stops after certain period of time while you are sleeping.
Turn-On Reservation	The unit is instructed to turn on at a set time automatically.
Turn-Off Reservation	The indoor unit is automatically turned off at the a set time.
Weekly Schedule	You can set the weekly schedule events in the unit of a week.
Yearly Schedule	You can set yearly schedules that can be applied by month.
Holiday ENERGY	It automatically stops on the set date.

2.3 Specifications

Item	Description
Check Energy Usage	You can check energy usage (operation time, power consumption).
Target Energy Consumption	This function is that user can set daily amount target usage.
Operation Time Limit	This function is that user can set daily amount target usage.
Time Limit Control	It is the function to save energy by operating the product only for the set time and automatically stopping the operation after starting the product operation.
Alarm Popup	This function allows you to set up a popup notice message for the Power Consumption and Operation Time Restriction feature.
Lock Setting	This function locks the remote controller's button operation to prevent the unauthorized operation by children or others.
Temperature Lock	The Temperature Lock function locks the ability to set the temperature beyond a preset value setting.
All Lock	It locks all button operation of the remote controller.
On/Off Lock	It locks the On/Off button operation of the remote controller.
Mode Lock	It locks the operation mode button operation of the remote controller.
Filter Sign Check	This function gives you the option to view a "Filter Sign" message so that you can check the status of the condition of the filter and gauge when it should be changed.
Elevation Grill Setting	This function allows you to operate the elevation grill for indoor unit filter cleaning.
Auto Dry	Auto dry removes moisture by drying the inside of the indoor unit after cooling operation once the indoor unit is turned OFF.
Wi-Fi pairing	It is the function to perform the pairing function of the Wi-Fi module connected to the indoor unit.
Temperature compensation	It is the function to apply the offset to the temperature value detected from the remote control.
Humidity compensation	It is the function to apply the offset to the humidity value detected by the remote control.

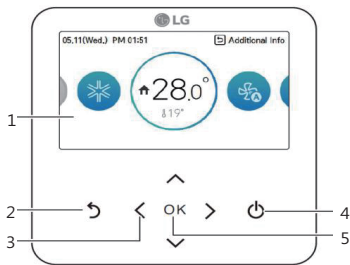
2.3 Specifications

2.3.2 STANDARD III Wired Remote Controller



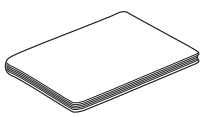

■ Model name : PREMTB100, PREMTBB10



- Dimensions: 120 X 120 X 16 mm
- Screen : 4.3 inch color display
- Unit types : Air conditioner, Ventilator, DX ventilator
- Sensor : Temperature / Humidity
- Language : English, French, Spanish, Portuguese, Italian, Russian, Chinese, German, Polish, Czech, Korean
- Button : Touch
- Digital output(on/off) : 1EA

Appearance	Functions (Button Descriptions)		
	No.	Name	Function
	1	Operation display window	Displays operation and setting status
	2	Back button	When you move to the previous stage from the menu's setting stage
	3	Up/down/left/ right button	When you change the menu's setting value
	4	OK button	When you save the menu's setting value
	5	On/Off button	When you turn ON/OFF the air conditioner

■ Accessory

 <p>Connecting cable (1 EA)</p>	 <p>Remote controller fixing screws (4 EA)</p>	 <p>User/Installation Manual</p>	 <p>DO cable (1EA)</p>
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2.3 Specifications

■ Description of Function

Item	Description
ON/OFF	Air conditioner and ventilator will be turned on or off.
Power Cooling	It performs a strong cooling in a short period of time.
Heating Operation	Provides warm air to the space.
Dry Operation	Removes moisture from the air.
Fan Only Operation	Only fan will circulate air.
AI / Auto Operation	Operation provides heating and cooling to satisfy space requirements.
Fan speed Control	It moves to the fan speed selection screen.
Airflow Control	It moves to the direction of air flow selection screen.
Hold	It is a function that holds the current mode of operation.
Zone Control	A function to control zone with duct type indoor units.
Check Room Temperature	It is a function that displays the room temperature.
Up/Down Vane Angle Setting	Used to set each vane angle
Plasma Purification	Improves indoor air quality
Energy-Saving Cooling	Energy-Saving cooling function enhances the comfort of the user and to improves the Energy-Saving performance by controlling the desired temperature during the cooling operation.
Fine dust status	It is the function to monitor dust value measured by the dust sensor mounted inside the air conditioner.
External equipment control	It is the function to set the contact point output of the external equipment control mode.
Fan Auto	Fan operation keeps on after thermal operation of indoor units.
Robot Cleaning	The robot cleaning function is a function to automatically clean the filter with the cleaner installed in the product after using the air conditioner for certain time period.
Ventilation kit	Function enables operation of an optional ventilation kit with indoor units.
Humidifier	Function enables a humidifier if one is installed to maintain space comfort.
Mosquito Away	Mosquito Away is a device to radiate frequency which mosquitoes don't like.
Electric Heater	It is the function to reinforce the heating capability by turning on the electric heater during the heating operation.
Himalaya Cooling	Power Cooling + Auto swing
Comfort Cooling	The comfort cooling is the function to automatically control the cooling strength to maintain the pleasant feeling without turning off the product after the indoor temperature reached the desired temperature.
Smart load control	Smart load control is the function to calculate the indoor air temperature, outdoor air temperature, and humidity to operate effectively.
Defrost mode setting	Change the outdoor unit's defrost mode operation.
Wi-Fi pairing	It is the function to perform the pairing function of the Wi-Fi module connected to the indoor unit.
Low noise mode	It is the function to set the start and end time of the outdoor unit's low noise mode operation.
Advanced fan speed "Auto"	It is the function to automatically change the fan speed according to the difference between the indoor temperature and the desired temperature.
Delay time (exclusive for ventilation)	It is the function to set the ventilation operation to start after the delay time.

2.3 Specifications

Item	Description
Midnight air cooling (ventilation interface)	It is the function to discharge indoor air and supply cool outdoor air into the indoor during summer nights to save energy.
Language	Set the language to be displayed on the remote controller.
Screen saver timer	Adjust the screen Off time of the remote controller.
LCD brightness in idle	Adjust the remote controller's screen brightness.
Password	Set the password to prevent unauthorized change to remote controller settings.
Theme setting	Set the theme of the remote controller screen.
Simple timer	You can easily set the timer in the range of 1~7 hours in the units of 1 hour.
Sleep timer	Sleep timer is the function to operate the air conditioner in sleep mode before going to sleep for certain hours and stop the operation.
Turn-On Reservation	The unit is instructed to turn on at a set time automatically.
Turn-Off Reservation	The indoor unit is automatically turned off at the a set time.
Daily Schedule	It is the function that can check the status of the timer (schedule) saved in the remote controller.
Exception day	It is the function to automatically stop the operation on the set timer day.
Weekly Schedule	You can set the weekly schedule events in the unit of a week.
Yearly Schedule	You can set yearly schedules that can be applied by month.
Instantaneous power check	It is the function that can check the product's instantaneous power.
Energy consumption	You can check the energy consumption (operation time, power consumption).
Temperature Setback Timer	It is the function to return to the desired temperature after the set time after the product operation for energy saving.
Time Limit Control	It is the function to stop the product operation after the set time after starting the product operation for the energy saving.
Outdoor unit capacity setting	It is the function that can set the outdoor unit capacity.
Target instantaneous power setting	It is the function that can set the Instantaneous power's target value.
Target power consumption	It is the function to set the target power consumption per hour.
Target operation time	It is the function that can set the Instantaneous power's target value.
Alarm Popup	It is the function to set whether to use the target power consumption and the target operation time notice popup window.
All Lock	It locks all button operation of the remote controller.
On/Off Lock	It locks the On/Off button operation of the remote controller.
Mode Lock	It locks the operation mode button operation of the remote controller.
Temperature range lock	It is the function that can limit the range of the desired temperature that can be set in the wired remote controller. It works as soon as you press the [▲,▼(up/down)] Lower limit: 16°C~30°C Upper limit: 18°C~30°C
Filter Sign Check	When it becomes the time for the indoor unit filter cleaning, the filter cleaning message appears
Elevation Grill Setting	This function allows you to operate the elevation grill for indoor unit filter cleaning.
Auto Dry	Auto dry removes moisture by drying the inside of the indoor unit after cooling operation once the indoor unit is turned OFF.
Wi-Fi pairing	It is the function to perform the pairing function of the Wi-Fi module connected to the indoor unit.

2.3 Specifications

Item	Description
Temperature compensation	It is the function to apply the offset to the temperature value detected from the remote control.
Humidity compensation	It is the function to apply the offset to the humidity value detected by the remote control.
Human Detection function	You can save the energy consumption by using Human detection mode. <ul style="list-style-type: none">- Power saving mode (On-Off / Temperature control)- Wind direction control (Direct / Indirect)

2.3 Specifications

2.3.3 STANDARD II Wired Remote Controller

■ Model name : PREMTB001 / PREMTBB01



- Dimensions: 120 X 120 X 16 mm
- Screen : 4.3 inch mono display
- Unit types : Air conditioner, Ventilator, DX ventilator
- Sensor : Temperature
- Language : English

Appearance		Functions (Button Descriptions)		
		No.	Name	Function
		1	Operation display window	Displays operation and setting status
		2	Sub function Button	To select the additional operations function
		3	Airflow Button	To select the airflows
		4	Function Setting Button	To select the additional operations function
		5	Ventilation Button	For interlocking operations of air-conditioner and ventilator
		6	Reservation Button	To program the schedule
		7	Up/Down/Left/Right Button	To change the settings in the menu
		8	Room temperature	To check the indoor temperature
		9	ESC Button	To exit from the menu
		10	Set/Cancel Button	To save the settings in the menu
		11	Temperature Control Button	To change the desired temperature
		12	On/Off Button	To turn on/off with a remote controller
		13	Operation Mode Selection Button	To select the operating mode
		14	Wireless Remote Controller Receiver	Wireless Remote Controller Receiver
		15	Fan Speed Button	To select the fan speed

■ Accessory

Connecting Cable 1 EA, 10m	Screw (4 EA)	Owner's / Installation manual	Inform label (8EA-8Languages)

2.3 Specifications

■ Description of Function

Item	Description
ON/OFF	Air conditioner and ventilator will be turned on or off.
Power Cooling	It performs a strong cooling in a short period of time.
Heating Operation	Provides warm air to the space.
Dehumidification Operation	Removes moisture from the air.
Monsoon Dehumidifying Mode	This is monsoon region-specific dehumidification function.
Fan Only Operation	Only fan will circulate air.
Auto Operation	It automatically selects an operating mode.
Fan speed Control	It moves to the fan speed selection screen.
Airflow Control	It moves to the direction of air flow selection screen.
Override control	Override master/slave selection function is, since Multi V III Heat Pump series model, the function to prevent product's different mode operation. If it setup as the slave, It blocks to change opposite run mode to outdoor unit cycle (cooling/heating)
Check Room Temperature	It is a function that displays the room temperature.
Vane Angle Control	It can adjust the angles of air flow.
Plasma Purification	Improves indoor air quality
Energy-Saving Cooling	Energy-Saving cooling function enhances the comfort of the user and to improves the Energy-Saving performance by controlling the desired temperature during the cooling operation.
Electric Heater	It is the function to reinforce the heating capability by turning on the electric heater during the heating operation.
Fan Auto	Fan operation keeps on after thermal operation of indoor units.
Robot Cleaning	The robot cleaning function is a function to automatically clean the filter with the cleaner installed in the product after using the air conditioner for certain time period.
Ventilation kit	Function enables operation of an optional ventilation kit with indoor units.
Humidifier	Function enables a humidifier if one is installed to maintain space comfort.
Zone Control	A function to control zone with duct type indoor units.
Auto Cleaning	Auto cleaning is a function to remove moisture or mold after turning off the cooling system by drying the inside of indoor unit.
Mosquito Away	Mosquito Away is a device to radiate frequency which mosquitoes don't like.
Himalaya Cooling	Power Cooling + Auto swing
Comfort Cooling	The comfort cooling is the function to automatically control the cooling strength to maintain the pleasant feeling without turning off the product after the indoor temperature reached the desired temperature.
Power Consumption	You can check energy usage (operation time, power consumption).
Wi-Fi pairing	It is the function to perform the pairing function of the Wi-Fi module connected to the indoor unit.
Smart Load Control	Smart Load Control is the function to operate by calculating the necessary efficiency from the indoor and outdoor air temperature and humidity.
Simple Reservation	Simple reservation function can be scheduled to stop while the system is in operation or to run while the system is not in operation.
Sleep Reservation	Sleep Reservation is a function that the air-conditioner runs in the sleep mode or stops after certain period of time while you are sleeping.
On Reservation	It turns ON automatically at the time programmed.

2.3 Specifications

Item	Description
Off Reservation	It turns OFF automatically at the time programmed.
Weekly Reservation	You can program daily schedule by week.
Holiday Reservation	The system will stop automatically on a set day.
Fast/Energy Saving	This function is to facilitate the ventilation function more efficiently by setting quick/energy-saving mode in the additional functions of ventilator.
Different Mode Drive	Different mode drive appears when the Indoor Unit have different operating modes if several Indoor Unit are installed for a single outdoor unit.
Self-diagnosis for Trouble Mode	It automatically runs a self-diagnosis when there is a trouble detected in the system.
Oil Change Warning	Only products with GHP(Gas Heat Pump) Product can use this.

2.3 Specifications

2.3.4 Simple Wired Remote Controller

■ Model name : PQRVCVCL0Q / PQRVCVCL0QW



- Dimensions: 120 X 64 X 15 mm
- Screen : 2.6 inch mono display
- Unit types : Air conditioner
- Sensor : Temperature
- Language : English

Appearance	Functions (Button Descriptions)		
	No.	Name	Function
	1	Operation display window	Displays operation and setting status
	2	Temperature Control Button	To change the desired temperature
	3	Fan Speed Button	To select the fan speed
	4	On/Off Button	To turn on/off with a remote controller
	5	Operation Mode Selection Button	To select the operating mode

■ Accessory

<p>Connection Cable (1EA, 10m)</p>	<p>Screw (2 EA)</p>	<p>Owner's / Installation manual</p>
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■ Description of Function

Item	Description
Cooling Mode	It cools the room by comfortable and Clean wind.
Heating Mode	It supplies warm wind to the indoor.
Auto Operation Mode	It makes the room cool using pleasant and fresh air quickly
Dehumidification Mode	It removes humidity while air-cooling Weakly.
Fan Mode	It blows the air as it is in the indoor, not the cold wind.
Fan Speed	It can easily control the fan speed.
Room Temperature Check	It displays the room temperature.
Child Lock	It is the function to use preventing children or others from careless using.
Auto Swing	This function is to adjust angle at which airflow is blow out.
Vane Angle Control	This function is to adjust angle at which airflow is blow out.
Wi-Fi pairing	It is the function to perform the pairing function of the Wi-Fi module connected to the indoor unit.

2.3 Specifications

2.3.5 Simple(Hotel) Wired Remote Controller

■ Model name : PQRCHCA0Q / PQRCHCA0QW



- Dimensions: 120 X 64 X 15 mm
- Screen : 2.6 inch mono display
- Unit types : Air conditioner
- Sensor : Temperature
- Language : English
- No mode Change

Appearance	Functions (Button Descriptions)		
	No.	Name	Function
	1	Operation display window	Displays operation and setting status
	2	Temperature Control Button	To change the desired temperature
	3	Fan Speed Button	To select the fan speed
	4	On/Off Button	To turn on/off with a remote controller
	5	Room temperature	To check the indoor temperature

■ Accessory

<p>Connection Cable (1EA, 10m)</p>	<p>Screw (2 EA)</p>	<p>Owner's / Installation manual</p>
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■ Description of Function

Item	Description
Cooling Mode	It cools the room by comfortable and Clean wind.
Heating Mode	It supplies warm wind to the indoor.
Auto Operation Mode	It makes the room cool using pleasant and fresh air quickly
Dehumidification Mode	It removes humidity while air-cooling Weakly.
Fan Mode	It blows the air as it is in the indoor, not the cold wind.
Fan Speed	It can easily control the fan speed.
Room Temperature Check	It displays the room temperature.
Child Lock	It is the function to use preventing children or others from careless using.
Auto Swing	This function is to adjust angle at which airflow is blow out.
Vane Angle Control	This function is to adjust angle at which airflow is blow out.
Wi-Fi pairing	It is the function to perform the pairing function of the Wi-Fi module connected to the indoor unit.

2.3 Specifications

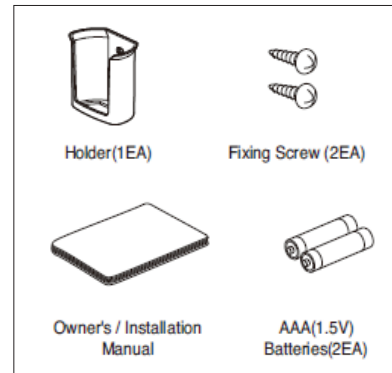
2.3.6 Wireless Remote Controller

■ **Model name :** PQWRHQ0FDB / PQWRCQ0FDB
PWLSSB21H / PWLSSB21C *



- Dimensions: 153 X 51 X 26 mm
- Screen : 2 inch mono display
- Unit types : Air conditioner
- Sensor : Temperature

■ Accessory



* For some product, you can use the “Slow Fan speed” function.

■ Description of Function

Appearance	Functions (Button Descriptions)		
	No.	Name	Function
	1	Vane angle Button	Used to set each vane angle.
	2	Function setting Button	Used to set or clear Auto Clean, Smart Clean, Electric heater or Individual vane angle control.
	3	ON/OFF Button	Used to turn on/off the unit.
	4	JET COOL Button	Speed cooling operates super high fan speed.
	5	LEFT/RIGHT AIRFLOW Button (OPTIONAL)	Used to set the desired left/right(horizontal) airflow direction.
	6	UP/DOWN AIRFLOW Button	Used to stop or start louver movement and set the desired up/down airflow direction.]
	7	ON TIMER Button	Used to set the time of starting operation.
	8	SLEEP TIMER Button	Used to set the time of sleeping operation.
	9	SET / CLEAR Button	Used to set/clear the timer. Used to set the current time(if it input for 3 s)
	10	PLASMA Button (OPTIONAL)	Used to start or stop the plasma-purification function.
	11	ROOM TEMPERATURE SETTING Button	Used to select the room temperature.
	12	OPERATION MODE SELECTION Button	Used to select the operation mode.
	13	INDOOR FAN SPEED SELECTION Button	Used to select fan speed in four steps low, medium, high and chaos.
	14	ROOM TEMPERATURE CHECKING Button	Used to check the room temperature.
	15	OFF TIMER Button	Used to set the time of stopping operation.
	16	TIMER SETTING(Up/Down)/ LIGHT Button	Used to set the timer. Used to adjust the brightness. (if it is not time adjust mode)
	17	RESET Button	Used to reset the remote controller.

2.4 Compatibility Table

























2.4.1 Compatibility Table with Multi V indoor units

⊙ : Compatibility is available but more detailed functions refer to MULTI V 4series IDU features.

● : Compatibility is available.

X : Compatibility is unavailable.

▲ : Need to set-up the IR Receiver product

			Premium	RS3		RS2		RS2 Simple		RS2 Simple Hotel		Better
			PREMTA000	PREMTBB10	PREMTB100	PREMTBB01	PREMTB001	PQRCVCL0Q	PQRCVCL0QW	PQRCHCA0Q	PQRCHCA0QW	PQWRH(C)Q0FDB PWLSSB21H(C)
												
Cassette		before Gen4	●	●		●		●		●		●
		from Gen4	⊙	⊙		⊙		●		●		●
		before Gen4	●	●		●		●		●		●
		from Gen4	⊙	⊙		⊙		●		●		●
Duct		Gen4	⊙	⊙		⊙		●		●		▲
		before Gen4	●	●		●		●		●		▲
		from Gen4	⊙	⊙		⊙		●		●		▲
		before Gen4	●	●		●		●		●		▲
		from Gen4	⊙	⊙		⊙		●		●		▲
		before Gen4	●	●		●		●		●		▲
FAU		before Gen4	●	●		●		●		●		▲
		from Gen4	⊙	⊙		⊙		●		●		▲
Ceiling Suspend ed		Gen2	●	●		●		●		●		▲
		before Gen4	●	●		●		●		●		●
Console		from Gen4	⊙	⊙		⊙		●		●		●
		before Gen4	●	●		●		●		●		●
floor Standing		Gen2	●	●		●		●		●		●
		before Gen4	●	●		●		●		●		●
		from Gen4	⊙	⊙		⊙		●		●		●
		before Gen4	●	●		●		●		●		●
Wall Mounted		Gen2	●	●		●		●		●		●
		before Gen4	●	●		●		●		●		●
		from Gen4	⊙	⊙		⊙		●		●		●
		before Gen4	●	●		●		●		●		●
		Gen4	⊙	⊙		⊙		●		●		●
		before Gen4	●	●		●		●		●		●
Hydro Kit			X	X		X		X		X		X
Eco V			●	●		●		X		X		X
Eco V DX			●	●		●		X		X		X

2.4 Compatibility Table

2.4.2 Compatibility Table with Multi and Single indoor units

● : Compatibility is available. X : Compatibility is unavailable ▲ : Need to set-up the IR Receiver product.

			Premium	RS3		RS2		RS2 Simple		RS2 Simple Hotel		Better
			PREMTA000	PREMTBB10	PREMTB100	PREMTBB01	PREMTB001	PQRCVCL0Q	PQRCVCL0QW	PQRCHCA0Q	PQRCHCA0QW	PQWRH(C)Q0FDB PWLSSB21H(C)
												
Single Split (H-Inverter)		Cassette	●	●		●		●		●		●
		Duct	●	●		●		●		●		▲
		Ceiling Suspended	●	●		●		●		●		●
Single Split (Standard Inverter)		Cassette	●	●		●		●		●		●
		Duct High	●	●		●		●		●		▲
		Duct Mid	●	●		●		●		●		▲
		Duct Low	●	●		●		●		●		▲
		Ceiling Suspended	●	●		●		●		●		●
		Console	●	●		●		●		●		●
		Wall Mounted	●	●		●		●		●		●
		Floor Standing	●	●		●		●		●		●
Multi		4way	●	●		●		●		●		●
		1way	●	●		●		●		●		●
		Duct Mid	●	●		●		●		●		▲
		Duct Low	●	●		●		●		●		▲
		Ceiling Suspended	●	●		●		●		●		●
		Console	●	●		●		●		●		●
		Wall Mounted	●	●		●		●		●		●
			●	●		●		●		●		●
Therma V		Split Mid Temp	X	X		X		X		X		X
		Split High Temp	X	X		X		X		X		X
		mono block	X	X		X		X		X		X

3. Central Controller

3.1 Product Feature List

3.2 Functions

3.3 Example of installing

3.4 Product Description

3.4.1 AC Ez

3.4.2 AC Ez Touch

3.4.3 AC Smart IV, AC Smart 5

3.4.4 ACP IV, ACP 5

3.4.5 BACnet

3.4.6 ACP Lonworks

3.4.7 AC Manager IV

3.4.8 AC Manager 5

3.4.9 PDI

3.4.10 ACS IO Module

3.4.11 Chiller Option Kit

3.1 Product Feature List

3.1.1 Centralized Controller Feature List

			AC Ez	AC Ez Touch	AC Smart IV AC Smart BACnet AC Smart 5 ⁶⁾	ACP IV ACP 5 ⁶⁾	ACP BACnet	ACP Lonworks	AC Manager IV ³⁾	AC Manager 5 ³⁾
Product	Air conditioner		O ¹⁾	O	O	O	O	O	O	O
	Ventilation (ERV/ERV DX)		O ²⁾	O	O	O	O	O	O	O
	Heating		-	O	O	O	O	O	O	O
	AHU ⁷⁾		-	-	O	O	O	O	O	O
	Chiller		-	-	O ⁴⁾	O ⁴⁾	O ⁴⁾	O ⁴⁾	O	O
	ACS IO		-	-	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
	ACU IO		-	-	O ⁵⁾	O ⁵⁾	-	-	-	O
	DO		-	-	2	4	4	2	-	-
	DI		-	1	2	10	10	2	-	-
Additional function	Add Drawing		-	-	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
	Group management		-	-	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
	ACO		-	O	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
	SET BACK		-	O	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
	2 SET		-	O	O	O	O	O ⁴⁾	-	O
	Change alarm		-	Filter, Oil	Filter, Oil	Filter, Oil	Filter, Oil	Filter, Oil	Filter, Oil	Filter, Oil
	Cycle		-	-	O	O	O	O ⁴⁾	O	O
Schedule			O	O	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
Auto control	Peak control	Priority control	-	O	O	O	O	O ⁴⁾	O	O
		Outdoor unit capacity control	-	-	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
	Time limit control		-	-	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
	InterLocking		-	-	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
Energy Navigation			-	-	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	-	O
Energy report	Power		-	O	O	O	O	O ⁴⁾	O	O
	GAS		-	-	O	O	O	O ⁴⁾	O	O
	Run time		-	-	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
	Email		-	-	-	-	O ⁴⁾	O ⁴⁾	-	-
	PC/USB		-	-	-	-	O ⁴⁾	O ⁴⁾	PC	-
Trend reporting			-	-	-	-	-	-	O	O
History	Report items (Control/Error)		-	Error	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
	Send email		-	-	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
	Save to PC/USB		-	-	-	-	O ⁴⁾	O ⁴⁾	PC	-
etc	Summer time		-	O	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	-	O
	Outdoor Unit Oil-Return Operation		-	-	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	-	-
	User Authority		-	Password	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O
	PC Access		-	O	O ⁴⁾	O	O ⁴⁾	O ⁴⁾	O	O

- 1) Except for some feature (individual lock, limit temp, etc...)
- 2) Except for some feature (user mode, additional function, etc...)
- 3) AC Manager is needed ACP or AC Smart.
- 4) This Function is possible to use in Web Only. (BMS Point is not applied)

- 5) Only AC Smart 5 and ACP 5 support this function
- 6) Without additional device, ACP 5 and AC Smart 5 provide BACnet IP and Modbus TCP interface for BMS
- 7) AHU Control Kit, AHU Comm.kit (For AHU Comm.kit, please refer to Comm.kit PDB)

3.1 Product Feature List

3.1.2 Centralized Controller Compatibility List

■ Compatibility between Controllers

Slave (B) Master (A)	AC Ez	AC Ez Touch	AC Smart IV AC Smart 5	ACP IV ACP 5	ACP BACnet	ACP Lonworks	PDI
AC Ez	O	X	X	X	X	X	X
AC Ez Touch	O	O	X	X	X	X	O
AC Smart IV, AC Smart 5	O	O	O	X	X	X	O
ACP IV, ACP 5	O	O	O	X	X	X	O
ACP BACnet	O	O	O	X	X	X	O
ACP Lonworks	O	O	O	X	X	X	O
PDI	X	X	X	X	X	X	X

■ Compatibility with Integrator

Controller Integrator	AC Ez	AC Ez Touch	AC Smart IV AC Smart 5	ACP IV ACP 5	ACP BACnet	ACP Lonworks	PDI
AC Manager IV	X	X	O	O	O	O	X
AC Manager 5	X	X	O	O	O	O	X

■ Compatibility with Product

Product Controller	MULTI V	ERV	Heating	GHP	MULTI	SINGLE	AHU	CHILLER
AC Ez	O	O	-	O	O	O	-	-
AC Ez Touch	O	O	O	O	O	O	-	-
AC Smart IV, AC Smart 5	O	O	O	O	O	O	O	O ²⁾
ACP IV, ACP 5	O	O	O	O	O	O	O	O ²⁾
AC Manager IV, AC Manager 5	O	O	O	O	O	O	O	O
ACP BACnet	O	O	O	O	O	O	O	-
ACP Lonworks	O	O	O	O	O	O	O	-
PDI Standard	O	O ³⁾	O	O	O	O	-	-
PDI Premium	O	O ³⁾	O	O	O	O	-	-
Dry contact	Contact	O	-	O	O	O ¹⁾	-	-
	Comm.	O	-	O ¹⁾	O	O	-	-

1) It depends on product and need to check PDB about central control supporting

2) Required Chiller option kit (PCHLLN000)

3) Only direct cooling ventilation

3.1 Product Feature List

■ Connectable Indoor units count

Product	Max. No. of IDUs	Possible IDU Address	Max. No. of ERV Units	Possible ERV Address	Max. No. of A/C+ERV	Max. No. of AHU	Possible AHU Address	Max. No. of Chiller
AC Ez	32	00-FF	32	00-FF	32	NA	-	NA
AC Ez Touch	64	00-FF	64	00-FF	64	NA	-	NA
AC Smart IV AC Smart 5	128	00-FF	128	00-FF	128	16	00-1F	5 Optional ¹⁾
AC Smart BACnet	128	00-FF	128	00-FF	128	16	00-1F	5 Optional ¹⁾
ACP IV ACP 5	256	00-FF	256	00-FF	256	16	00-1F	10 Optional ¹⁾
ACP BACnet	256	00-FF	256	00-FF	256	16	00-1F	10 Optional ¹⁾
ACP Lonworks	64(48) ²⁾	00-FF	64	00-FF	64	16 ³⁾	00-1F	NA
PDI Standard	128	00-FF	-	-	128	NA	-	NA
PDI Premium	128	00-FF	-	-	128	NA	-	NA

1) Needs chiller option kit. But that not supporting BMS.

2) ACP Lonworks for North America can supporting 48 IDUs.

3) ACP Lonworks only supporting LGAP.

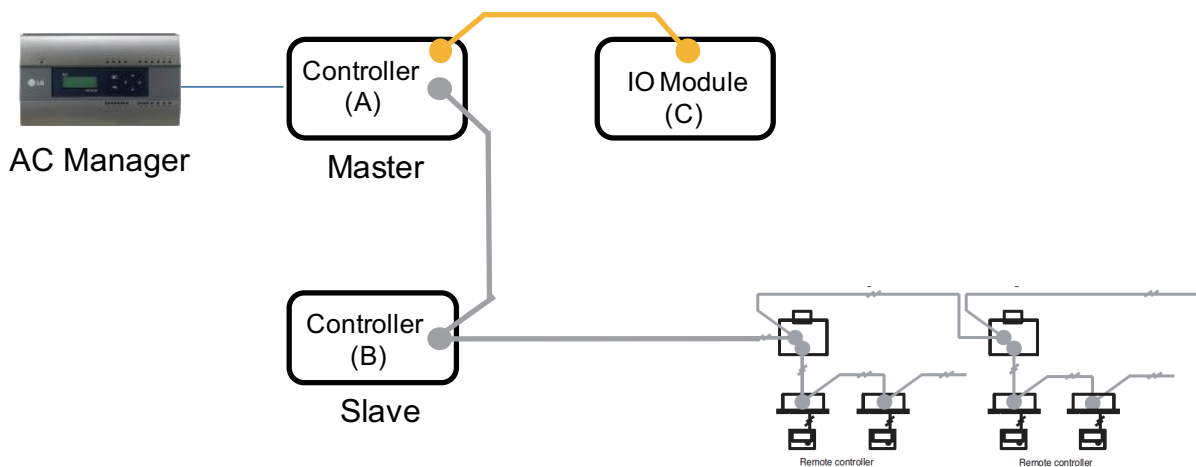
3.1 Product Feature List

■ Compatibility with ACS IO Module

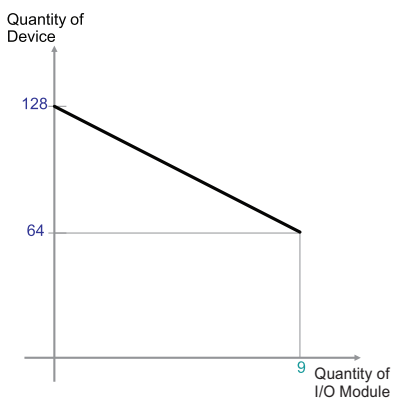
1) ACS IO Module linkable

Controller IO Module (C)	AC Ez	AC Ez Touch	AC Smart IV AC Smart 5	AC Smart BACnet	ACP IV ACP 5	ACP BACnet	ACP Lonworks
ACS IO Module	X	X	O	O ¹⁾	O	O ¹⁾	O ¹⁾

¹⁾ This Function is possible to use in Web Only. (BMS Point is not applied)

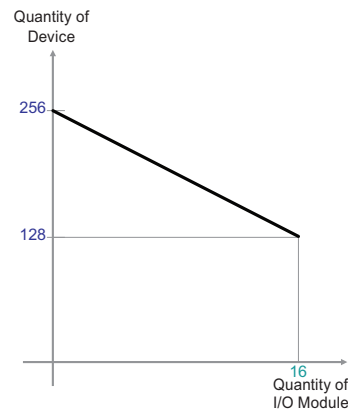


2) Maximum number of linkable devices



Quantity of I/O Module	Quantity of Device
0	128
1	121
2	114
3	107
4	100
5	93
6	86
7	79
8	72
9	64

<AC Smart>



Quantity of I/O Module	Quantity of Device
0	256
1	248
2	240
3	232
4	224
5	216
6	208
7	200
8	192
9	184
10	176
11	168
12	160
13	152
14	144
15	136
16	128

<ACP>

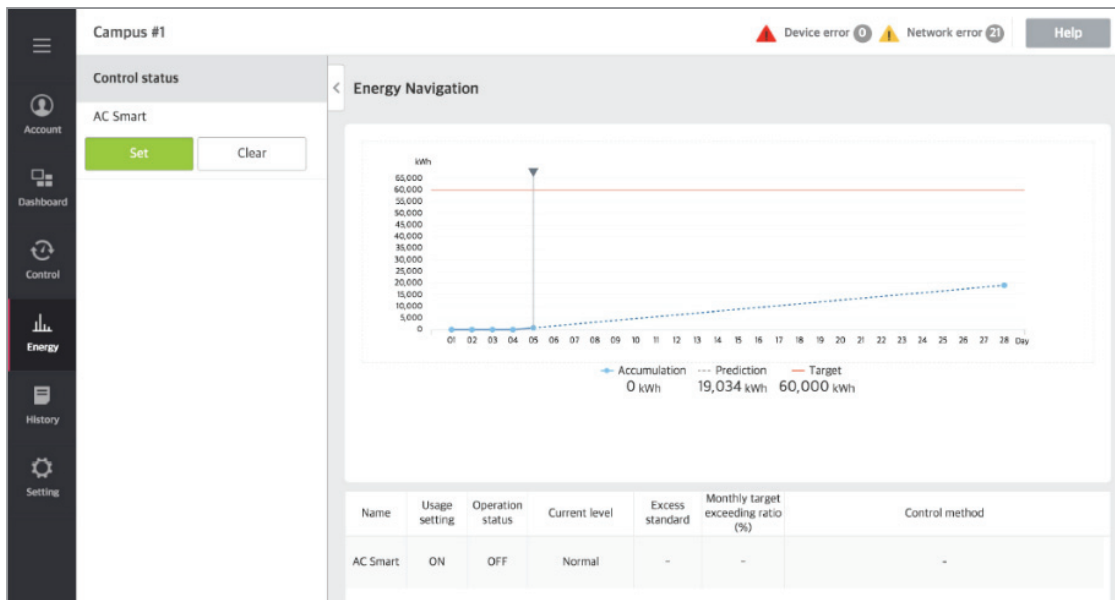
* Devices: Indoor units, Heating, ERV, DI/DOs, DOKITs, AHUs

✳ If more details, please refer to the manual of its product.

3.2 Functions

■ Energy navigation

Energy navigation is the function to set the target usage amount to limit the monthly power consumption and to control so that the total accumulated power consumption does not exceed the target usage amount. It performs total of 7 control levels with the estimated/actual usage amount exceeding ratio compared to the monthly target usage amount. For the control method, there are indoor unit operation ratio, outdoor unit capacity control, and indoor unit operation control.



[Control Level]

Supports the level of the set control level, exceeding condition, monthly target exceeding ratio (%), and control method

- Level: maximum of 7 levels
- Excess standards
 - Predicted usage amount: estimated period usage amount of 1 month starting from the base date
 - Actual usage amount: actual period usage amount until today from the base date
- Monthly target excess (%)
 - Ratio of the excess standard compared to the monthly target usage amount (%)
 - You can set in the unit of 10% from minimum 70% to maximum 130%
- Control type
 - IDU Operation Rate: Set the 0~100% target operation ratio and control peak according to the priority of the group
 - ODU capacity: Set the 0~100% target operation ratio and control peak according to the outdoor unit capacity operation ratio
 - IDU: Control according to the indoor unit control setting (refer to Indoor unit operation control setting)

3.2 Functions

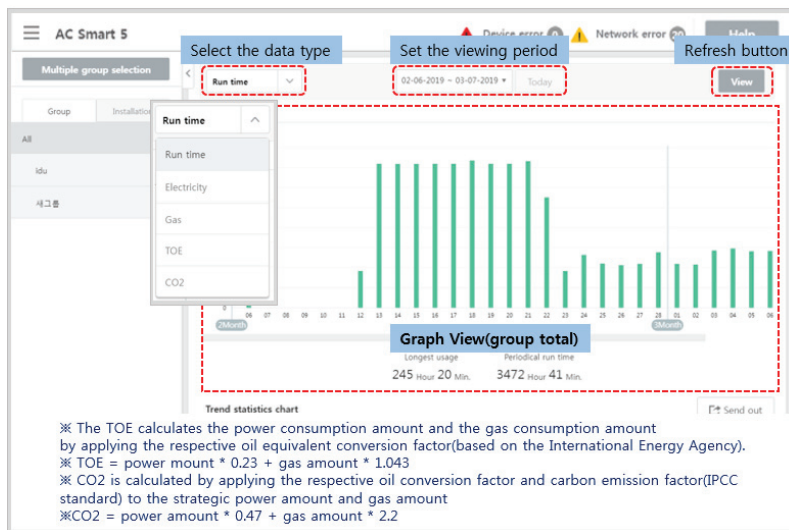
■ Energy Usage

Energy usage sets the target usage to control the energy navigation and checks the device's power usage and operation time with graph and table.

[How to read the energy usage graph]

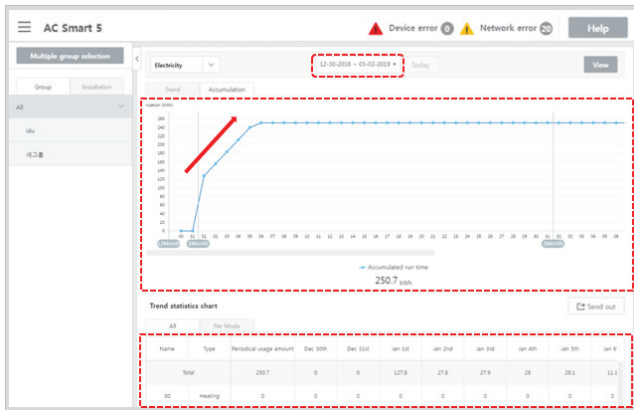
The method to read the energy usage graph is as follows.

1. In the main menu, click (touch) [Energy] > [Energy Usage] menu.
 - Energy usage amount screen is displayed.
2. In the viewing period setting area, click (touch) period setting area to set the viewing period corresponding to the current month.
 - The start date is set as the base date.
3. To view the set contents, click [View] button.
 - Energy usage amount of the set period is displayed.
4. In the energy usage information display area, check the energy usage contents.
 - You can check the daily usage and periodical usage amount.
 - Read the daily value at the left side of the daily usage.
 - To check the accumulated value, click (touch) [Accumulation] tab.



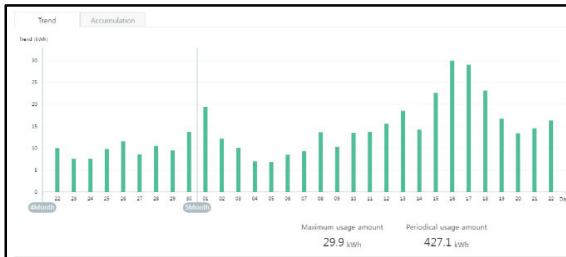
3.2 Functions

■ Energy Report



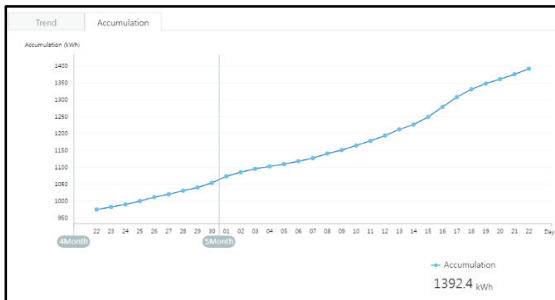
• Graph Types

Trend



Daily or hourly Usage

Accumulation

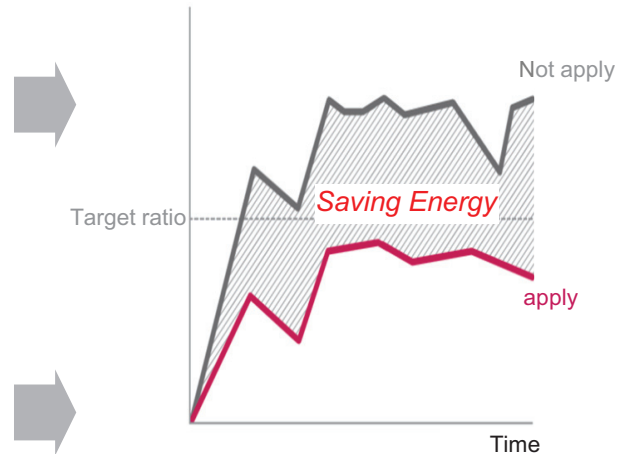
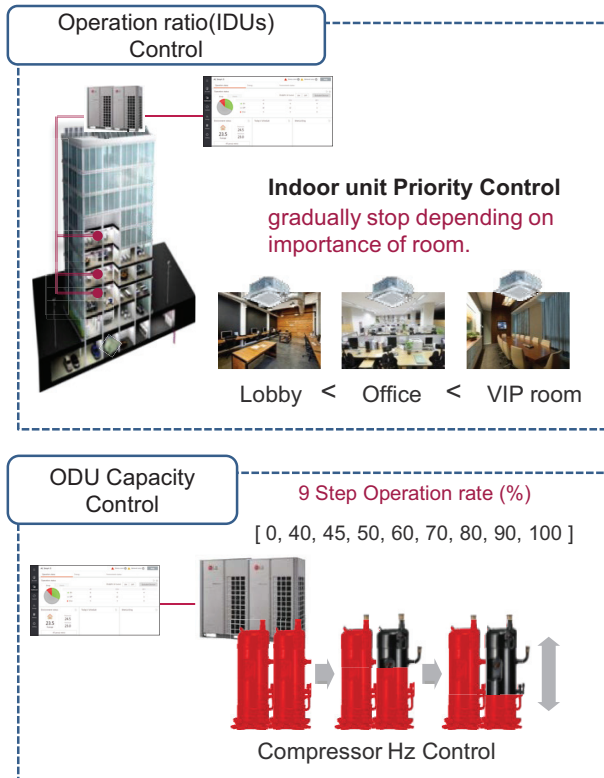


Accumulated usage transition

3.2 Functions

■ Peak control

Peak control limits peak power consumption. You can set the target operating rate so that total power consumption does not exceed the set limit. To prevent power consumption from exceeding the limit, the system will switch automatically between cooling and fan modes. Also it will limit heating operation by switching automatically between Heat and OFF modes.



[Control Configuration]

- 1) Priority Control
Control based on group priority. Refer to below for detail behavior.
 - Switched between cooling and fan modes by priority.
 - Switched between Heat and OFF modes by priority.
 - Cycles every set time.
- 2) Outdoor Unit Control
Controls based on outdoor unit capacity limit.

3.2 Functions

■ 2 Setpoint

- Auto Changeover

Set the auto change over function to switch the operation mode automatically to keep the proper room temperature. When Room Temp. > Upper, request Cool operation mode. When Room Temp. < Lower, requests Heat operation mode. When Room Temp. \leq (Upper - Temperature difference) or Room Temp. \geq (Lower + Temperature difference), requests Fan operation mode.

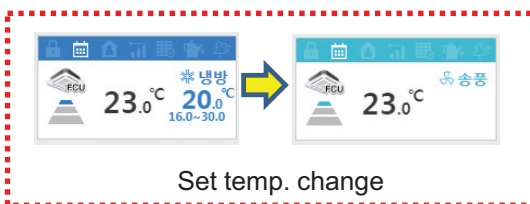
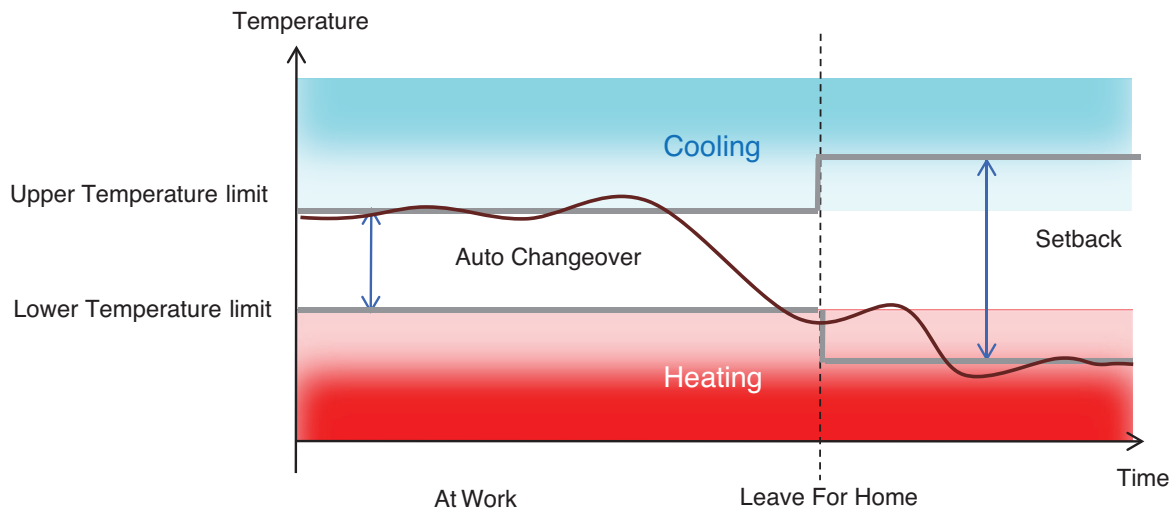
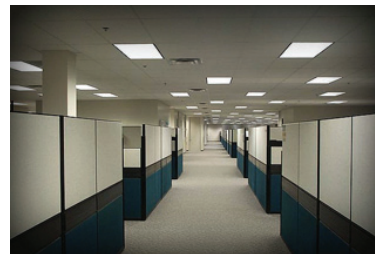
- Setback

Set the setback function to control the proper room temperature when the indoor unit is turned off.

<Occupied : Auto Changeover>



<Unoccupied : Setback>



• Temperature Range

- Auto Changeover

: 18°C ~30°C / 64°F ~86 °F

- Setback

Cooling Start : 21°C ~40 °C / 70°F ~104 °F

Heating Start : 1°C ~20 °C / 34°F ~68 °F

! NOTES

This function is for Heat Recovery system or Single heat pump. Otherwise correctly working is not guaranteed.

Temp.

CT

(CT - DT)

(HT + DT)

HT

Cooling

Cooling or Fan

Fan

Heating or Fan

Heating

Cooling Start (Set Temp. = CT)

Cooling → Fan

Heating Start (Set Temp. = HT)

Heating → Fan

Room temp. transition

Time

Operation Mode

Fan

Cooling

Fan

Cooling

Fan

Heating

Fan

- CT : Cooling Start Temp.
(18°C~30°C / 64°F~86°F)
- HT : Heating Start Temp.
(18°C~30°C / 64°F~86°F)
- DT : Differential Temp.
(0.5°C ~3°C / 1°F~6°F)

Example) CT : 25°C, HT : 20°C, DT : 1°C

- ☞ Cooling Start : Higher than 25°C
- ☞ Heating Start : Lower than 20°C
- ☞ Cooling → Fan : 24°C (CT - DT)
- ☞ Heating → Fan : 21°C (HT + DT)

The graph illustrates the room temperature transition over time. The vertical axis represents Temperature (Temp.) and the horizontal axis represents Time. The graph shows three main regions: Cooling (blue shaded area), Off (grey shaded area), and Heating (orange shaded area). The Cooling Start Temp. (CT) is defined as the minimum value of CT and 30°C. The Heating Start Temp. (HT) is defined as the maximum value of HT and 18°C. The Differential Temp. (DT) is the difference between CT and HT.

- Cooling Cycle:** When the room temperature reaches CT, the system enters the Cooling mode. It continues to cool until it reaches CT - DT, at which point it turns Off.
- Heating Cycle:** When the room temperature reaches HT, the system enters the Heating mode. It continues to heat until it reaches HT + DT, at which point it turns Off.

Example values provided:

- CT : Cooling Start Temp. (21°C~40°C / 70°F~104°F)
- HT : Heating Start Temp. (1°C~20°C / 34°F~68°F)
- DT : Differential Temp. (0.5°C ~3°C / 1°F~6°F)

Example calculation:

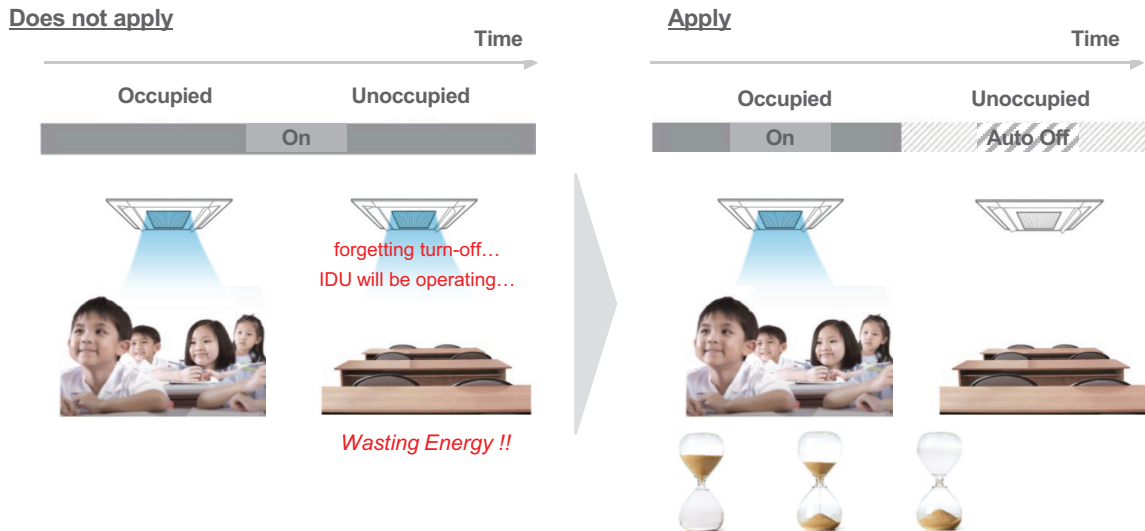
- Example) CT : 33°C, HT : 5°C, DT : 3°C
- Cooling Start : Higher than 33°C
- Heating Start : Lower than 5°C
- Cooling → Off : 30°C (CT - DT)
- Heating → Off : 8°C (HT + DT)

Central Controller

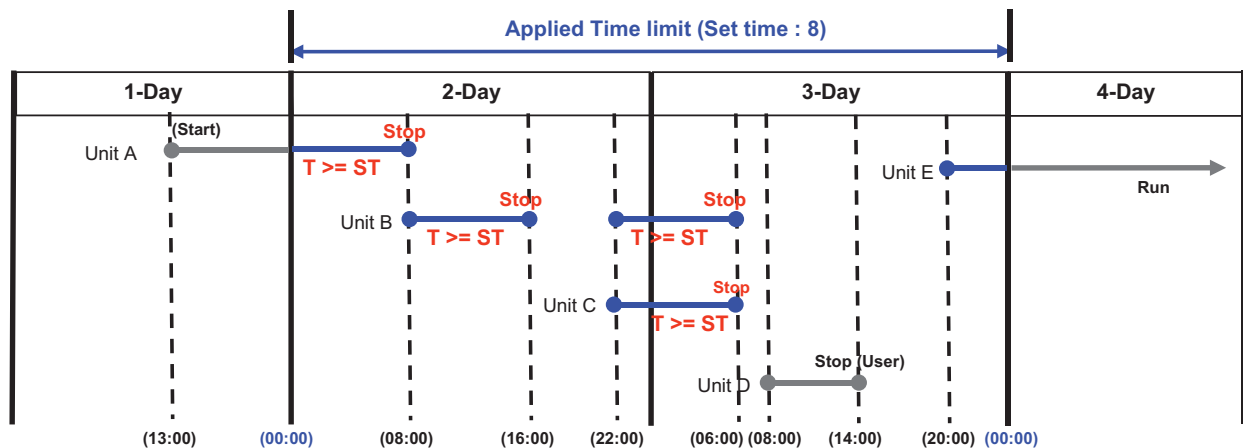
3.2 Functions

■ Time-limit Operation

The time-limit operation is to limit the amount of time the devices (indoor unit, Heating, ERV, DOKIT, and some AHU) are running individually. By setting the device operation time in advance, you can control for how long a device works and have it stop automatically.



- Hours to Off(Hour)
 - Select the operation time limit of an operation group. The devices included in the group operate for the selected time then stop automatically.
- Days: Select which day(s) of the week to run the time-limit operation.



! NOTES

For the time-limit operation, you cannot register chiller, AHU(Modular Fresh Air, Modular Heat Recovery, DOAS), DI/DO, Expansion I/O.

3.2 Functions

■ Interlocking

Associated device control is a function which interlocks more than one device and then controls output movements when the input conditions are met.

In order to operate associated device control, you shall arrange the devices to be interlocked in a single pattern and then apply the control setting. It is described here how to create and manage a pattern and then proceed with associated device control.

• Pattern type

Category	Description
General pattern	<ul style="list-style-type: none"> The pattern that output control command is executed when the input condition is satisfied
Copy pattern	<ul style="list-style-type: none"> The pattern that the output device follows the input device's status (Some control functions may not be copied.) You can add only 1 device to input condition, and only the device with the same attribute with the added input device is registered to the output device
Emergency pattern	<ul style="list-style-type: none"> The pattern that it recognizes as emergency situation when input condition is satisfied When the input condition is satisfied, it tells the alarm with screen and sound
1:1 program	<ul style="list-style-type: none"> Pattern to conveniently register many devices if input device is the same as output device

! NOTES

Maximum number of patterns is 40.
Maximum number of groups is 40.

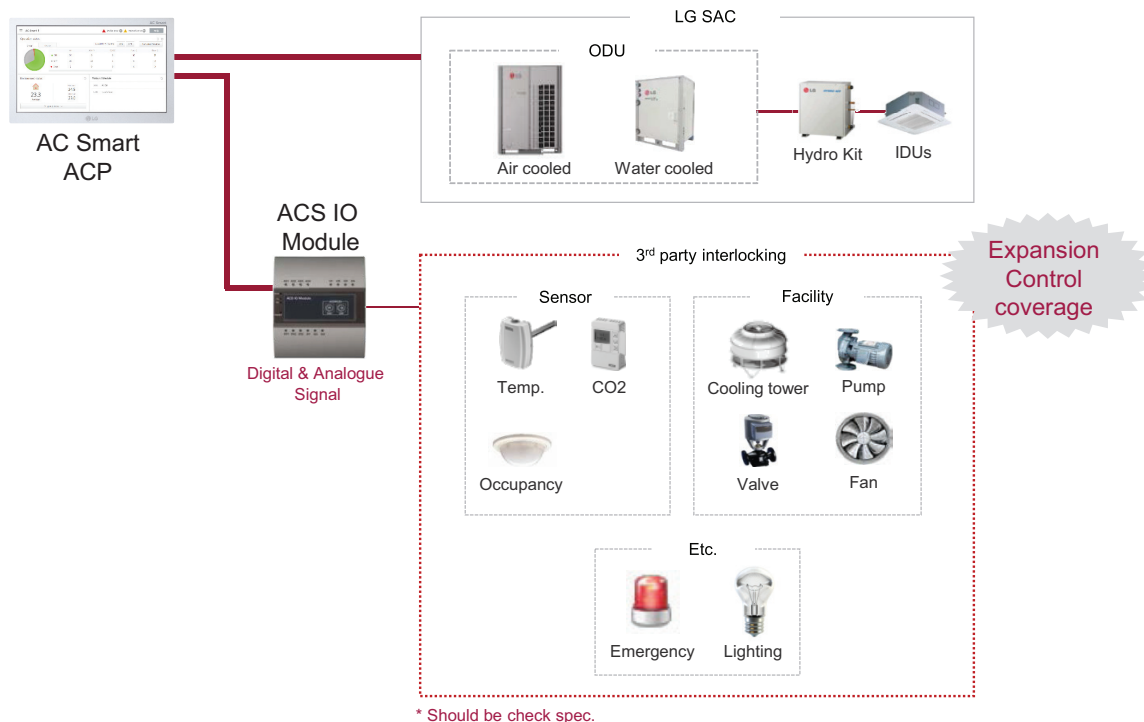
3.2 Functions

1) General pattern

IF "CONSTANT < AI(temperature, etc...) < CONSTANT" THEN "Control command"

Ex)

- Interlocking with 3rd party equipment (Sensors, Fans, Switches...)



How to set)

Pattern 1: IF "AI < 5" THEN "AO = 0"

Pattern 2: IF "5 <= AI < 10" THEN "AO = 15"

Pattern 3: IF "10 <= AI < 15" THEN "AO = 30"

Pattern 4: IF "15 <= AI < 20" THEN "AO = 45"

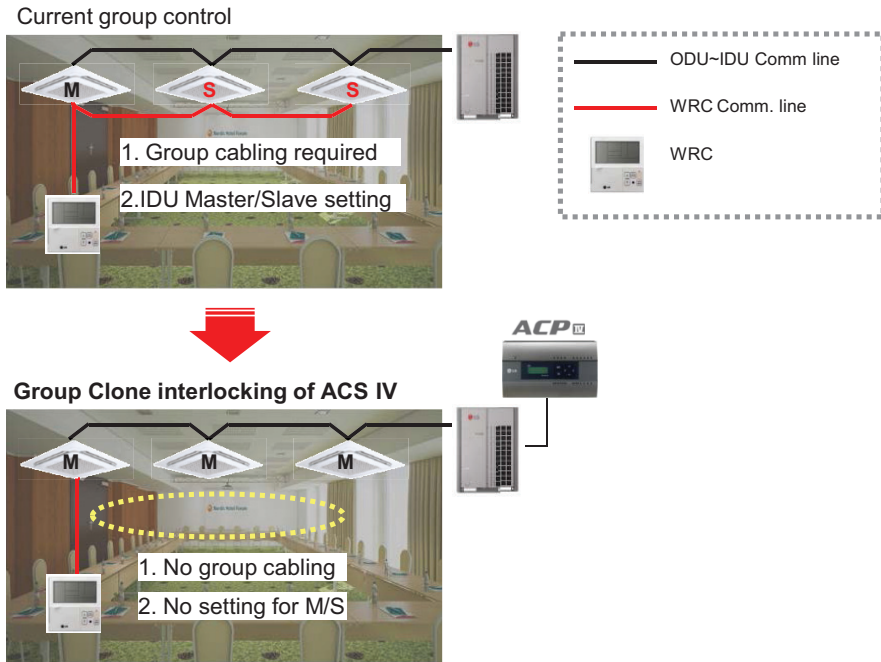
Pattern 5: IF "20 <= AI < 25" THEN "AO = 60"

3.2 Functions

2) Copy pattern

Pattern that output device follows the input device state as it is.

Ex)



How to set)

Name: Interlocking

Copy pattern: Pattern that output device follows the input device status

Input Condition: Start Output Immediately

Output Condition: Start Output Immediately

Status: and OR NAND NOR

Maintenance Time: Cancel Setting 1Min. later

ERV (1)

Name	Address	Group	Condition	Batch
DISHRV_UNIL...	02	세그먼트		Condition

*For Group Clone, only one unit can be Input device

! NOTES

In this case, output device can control by input devices only.

3.2 Functions

3) Emergency pattern

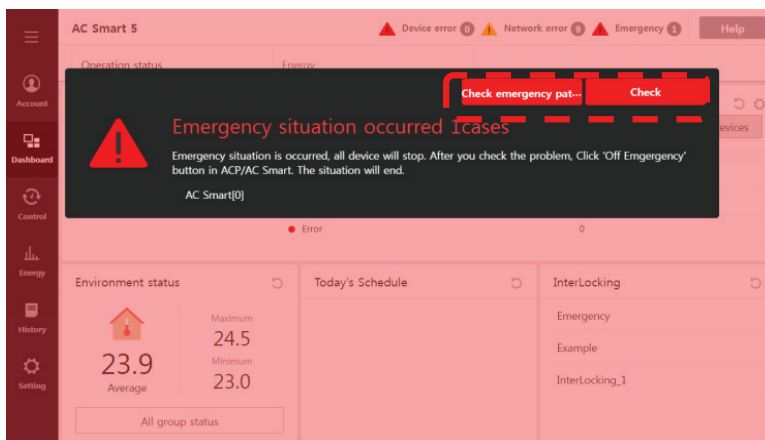
When emergency condition is occurred, building manager can take action quickly.

- When pre-set emergency pattern is occurred, red alert is appeared at main page.
- Output condition of Emergency pattern will be executed and No one can control before emergency clear.

Ex)

If a situation set as emergency pattern occurs, entire home screen turns red for alarm, and other control signals are blocked.

*You can set only 1 emergency pattern.



*Emergency situation notice may be generated again until the cause of emergency situation is removed.

How to set)

+ Add new pattern

All (4)

Set all

Clear all

InterLocking_1

Set

Clear

Emergency

Set

Clear

Example

Set

Clear

Emergency pattern

Set

Clear

InterLocking

Emergency pattern AND, emergency pattern

Delete

Edit

Input Condition

Start Output Immediately

Output Condition 1

Start Output Immediately

Input (1)

Type	Name	Address	Group	Condition
IDU	IDU_00	00	ODU	Operation(ON) Fan speed(LOW)

Output Condition 1 (3)

Type	Name	Address	Group	Condition
IDU	IDU_00	00	ODU	Operation(ON) Fan speed(HIGH)
IDU	IDU_01	01	ODU	Operation(ON) Fan speed(HIGH)
IDU	IDU_02	02	ODU	Operation(ON) Fan speed(HIGH)

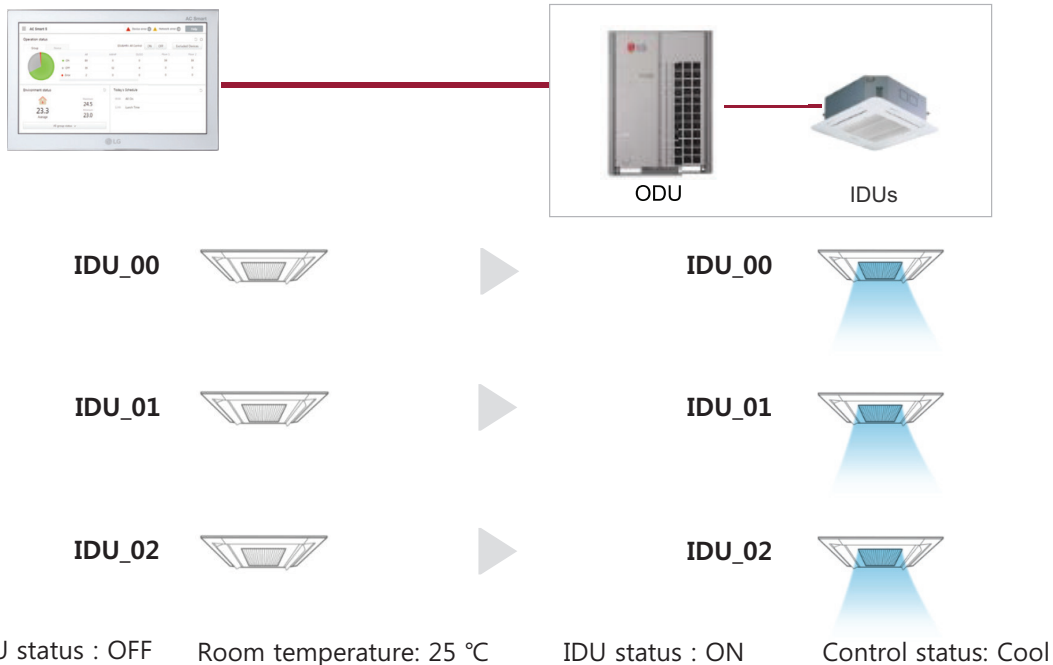
3.2 Functions

4) 1:1 Program

Program to set output device same to input device.

Ex)

IF Indoor unit 0's room temperature is upper 25 °C, THEN set Indoor unit 0 to turn on and cooling
 IF Indoor unit 1's room temperature is upper 25 °C, THEN set Indoor unit 1 to turn on and cooling
 IF Indoor unit 2's room temperature is upper 25 °C, THEN set Indoor unit 2 to turn on and cooling



How to set)

Name: Interlocking

1:1 Program

The input device is the same as the output device. AND/OR/NAND/NOR and the lasting time of the input conditions as well as the delay time of the output conditions are not applied.

Input Condition: Start Output Immediately

Output Condition 1: Start Output Immediately

Status: ☒ and ☐ OR ☐ NAND ☐ NOR

Maintenance Time: ☒ Cancel ☐ Setting 1Min. ☐ later

Edit Unit

Air purifier (2)

Name	Address	Group	Condition
aircare_00	00	Idu	
aircare_01	01	Idu	

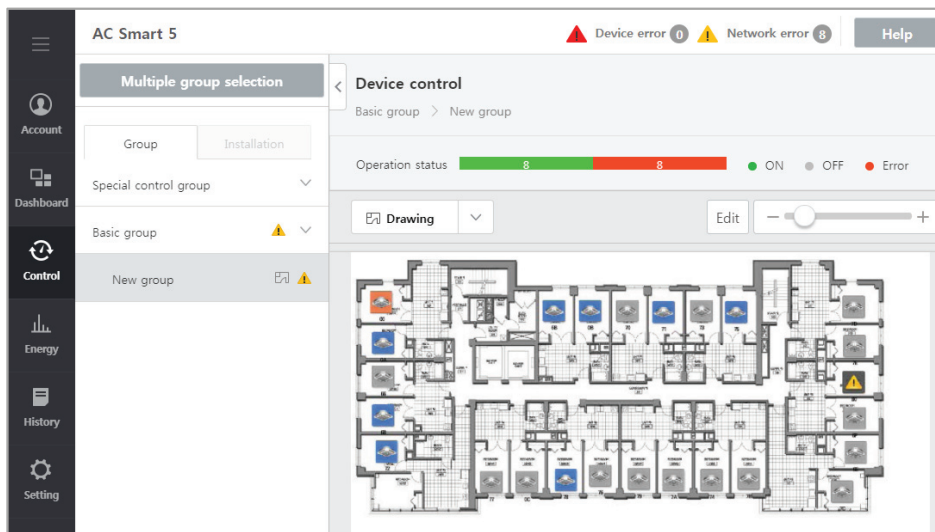
Batch

Condition

Condition

3.2 Functions

■ Map Viewing (Visual Navigation)



* In case of AC Smart 5 and ACP 5, it is possible to Edit floor plan only in the Web browser.

3.2 Functions

■ Remote Access by web

Chrome browser is recommended for accessing AC Smart 5 / ACP 5

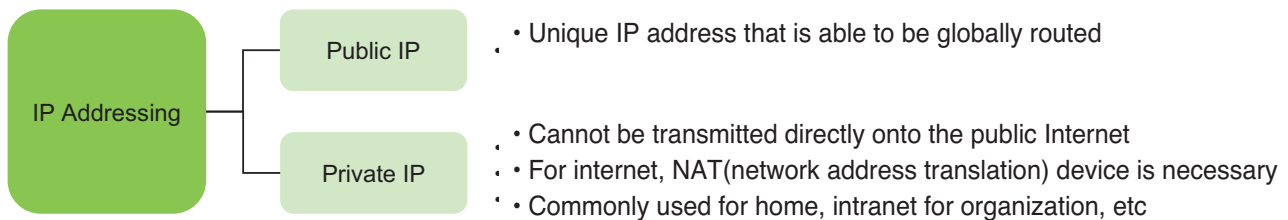
Web browser supporting Flash player is required for accessing AC Smart IV / ACP IV



* Public IP allocation is required for internet access

• IP Network

For external access to central controller through internet, basically public IP network is necessary



• Private IP

- Definition

These addresses are characterized as private because they are not globally delegated, meaning they are not allocated to any specific organization, and IP packets addressed by them cannot be transmitted onto the public Internet.

- Private IP address spaces (IPv4)

RFC1918 name	IP address range	number of addresses	classful description	largest CIDR block (subnet mask)	host id size
24-bit block	10.0.0.0 – 10.255.255.255	16,777,216	single class A	10.0.0.0/8 (255.0.0.0)	24 bits
20-bit block	172.16.0.0 – 172.31.255.255	1,048,576	16 contiguous class Bs	172.16.0.0/12 (255.240.0.0)	20 bits
16-bit block	192.168.0.0 – 192.168.255.255	65,536	256 contiguous class Cs	192.168.0.0/16 (255.255.0.0)	16 bits

! NOTES

IP address/Subnet mask/Gateway is activated when IP address allocation type is Using Static IP address.

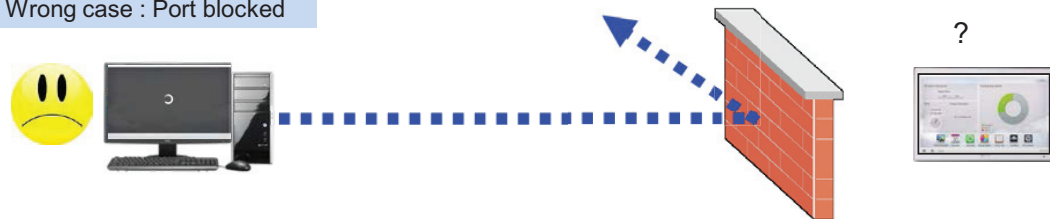
3.2 Functions

TCP Port used for AC Smart IV /ACP IV : 80, 9300

Right case : Port opened



Wrong case : Port blocked



* If required ports are blocked because of security policy, it's necessary to open them by IT administrator in the site

TCP Port used for AC Smart 5 / ACP 5 : HTTPS port 443 (it can be modified)

Right case : Port opened



Wrong case : Port blocked



* If the essential ports are blocked because of the security policy, it's necessary to ask network administrator in the building to open them

3.2 Functions

■ Cycle Monitoring

For Outdoor unit : Master/slave outdoor unit information is displayed.

AC Smart 5

ODU Chiller

AC Smart

ODU_00

Device error Network error Help

< Cycle

ODU_00 Cycle information

Master

Address	00	DeviceType	HF_GHP_ELPER
Refrigerant type	R407C	Mode	STOP
Error code	0	MCOM version	0.0
Fan1 Frequency	0	Fan2 Frequency	0
Air temp.	22.0 °C	High pressure	0
Low pressure	0	Compressor suction temperature	20.0 °C
Liquid pipe temperature	22.0 °C	Over-cooler outlet temperature	22.0 °C
Outdoor unit EEV	0	Over-cooler EEV	0
Inverter1 discharge temperature	30.0 °C	Current number of engine rotations	0
Operation time	0	Oil replacement time	0
Pilot 3Way valve	0	Engine 3Way	0
Hot gas valve	Close	Engine coolant temperature	0
ECU MAP value	0	ECU ETC angle	0

Indoor unit cycle information

Name	Group name	Operation	Mode	Set temperature	Fan speed	Lock	Wind direction	Air temp.	LEV	Pipe in temperature	Pipe out temperature	Error code
EDU_00	ODU	OFF	COOL	20.0 °C	LOW	Clear	Clear	23.0 °C	0	22.0 °C	22.0 °C	0
EDU_01	ODU	ON	HEAT	20.0 °C	LOW	Clear	Clear	23.0 °C	0	22.0 °C	22.0 °C	0

For Indoor unit : Information on all indoor units connected to the outdoor unit is displayed

! NOTES

Some categories of the corresponding menu may not be displayed or menu name may be different according to the function of the product.

! NOTES

A central control address value is a number between 00 and FF. You can use only 1 device per address.

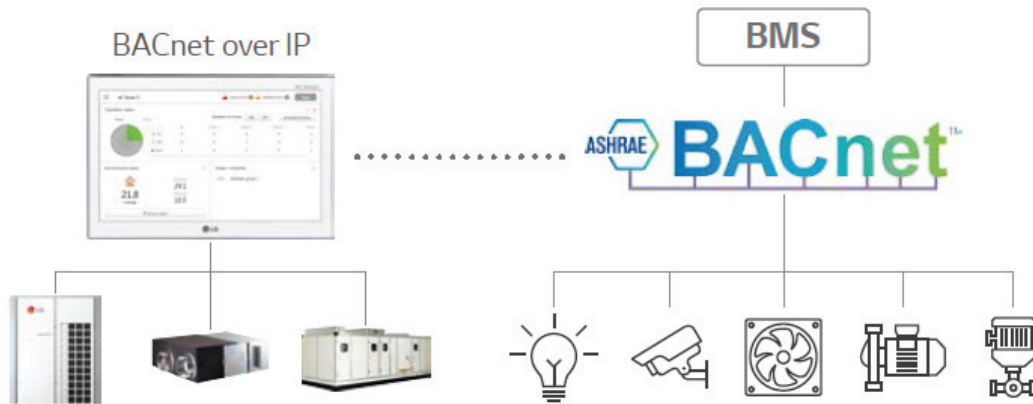
3.2 Functions

■ AC Smart 5, ACP 5 new features

BMS Integration (BACnet IP and Modbus TCP)

It is available to expanded control with other BMS Company

Without additional device, AC Smart 5 provides BACnet IP and Modbus TCP interface for BMS(Building Management System) integration as well as its own management function.



- Interface between BACnet IP BMS and LG HVAC unit
- Modbus TCP support
- Product list offering BMS Points

Unit type	BACnet IP	Modbus TCP
IDU	O	O
ERV, DX ERV	O	O
ODU	Monitoring Only	X
Heating	O	O
AHU	O	O

3.2 Functions

Support IPv6

Advanced network accessibility

AC Smart 5 reflects the state of the art of network technology trend.

IPv6 (Internet Protocol version 6), which is the most recent version of the Internet Protocol, provides accessibility to the IPv6 compatible network environment HTML5 makes the web access to AC Smart 5 easier and look good on all devices, especially for mobile.



! NOTES

What is the IPv6 ?

Internet Protocol version 6 (IPv6) is the most recent version of the Internet Protocol (IP), the communications protocol that provides an identification and location system for computers on networks and routes traffic across the Internet.

3.2 Functions

Smart Management (Control/Monitor)

You can compose the groups according to the site composition to comfortably check device operation status and use major functions of the product.



1. Multi level group composition

You can freely apply layer structure such as building, floor, zone, etc. and set the group as the same as the site composition to control and monitor the devices.

2. Special control group

You can additionally compose frequently used groups such as VIP Room, executive room, etc. regardless of the building structure.

3. Web control

If PC or smart phone is connected to the same network as AC Smart 5 or if AC Smart 5 is connected to internet line that can be accessed from outside, it can be connected from any place in the world.

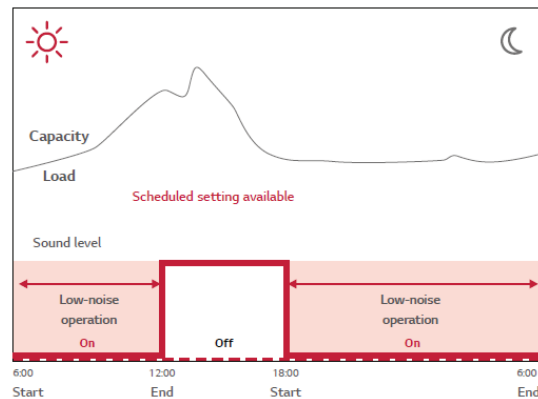
3.2 Functions

Advanced function for ODU

Support to various function for ODU application

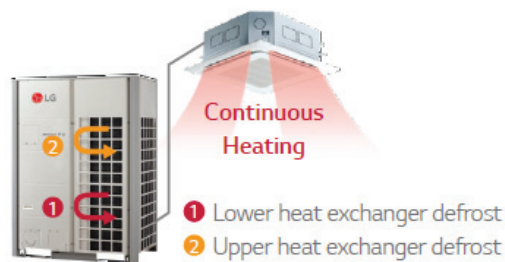
1. Low noise operation

It provides the function regardless of the time at the noise sensitive areas from AC Smart 5.



2. Outdoor unit defrost Mode

There are 3 defrost mode stage for defrost of Outdoor unit. (0 stage, 1 stage, 2 stage, 3 stage)



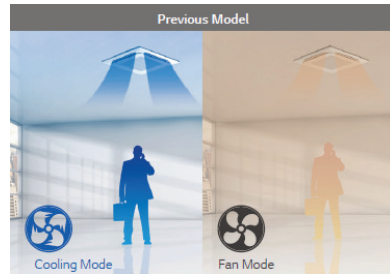
3.2 Functions

Advanced function for IDU

Support to various function for IDU application

1. Comport cooling

Without cooling operation stopping, this function allows MULTI V 5 to maintain operation at mild cooling mode.



* Available setting on each Indoor Unit

2. Human detect sensor

It can save the energy to detect human, also offers comfort ability.

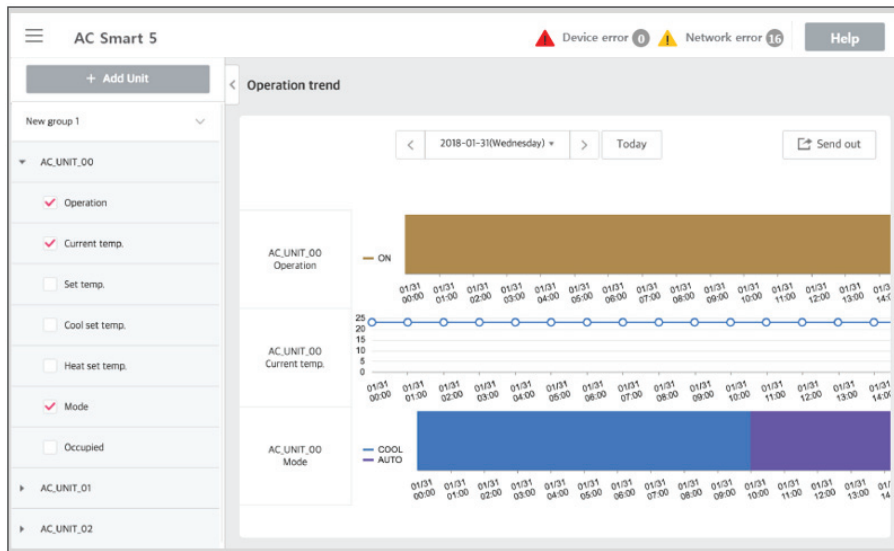


3.2 Functions

Operation Trend

Support to analysis the operation trend

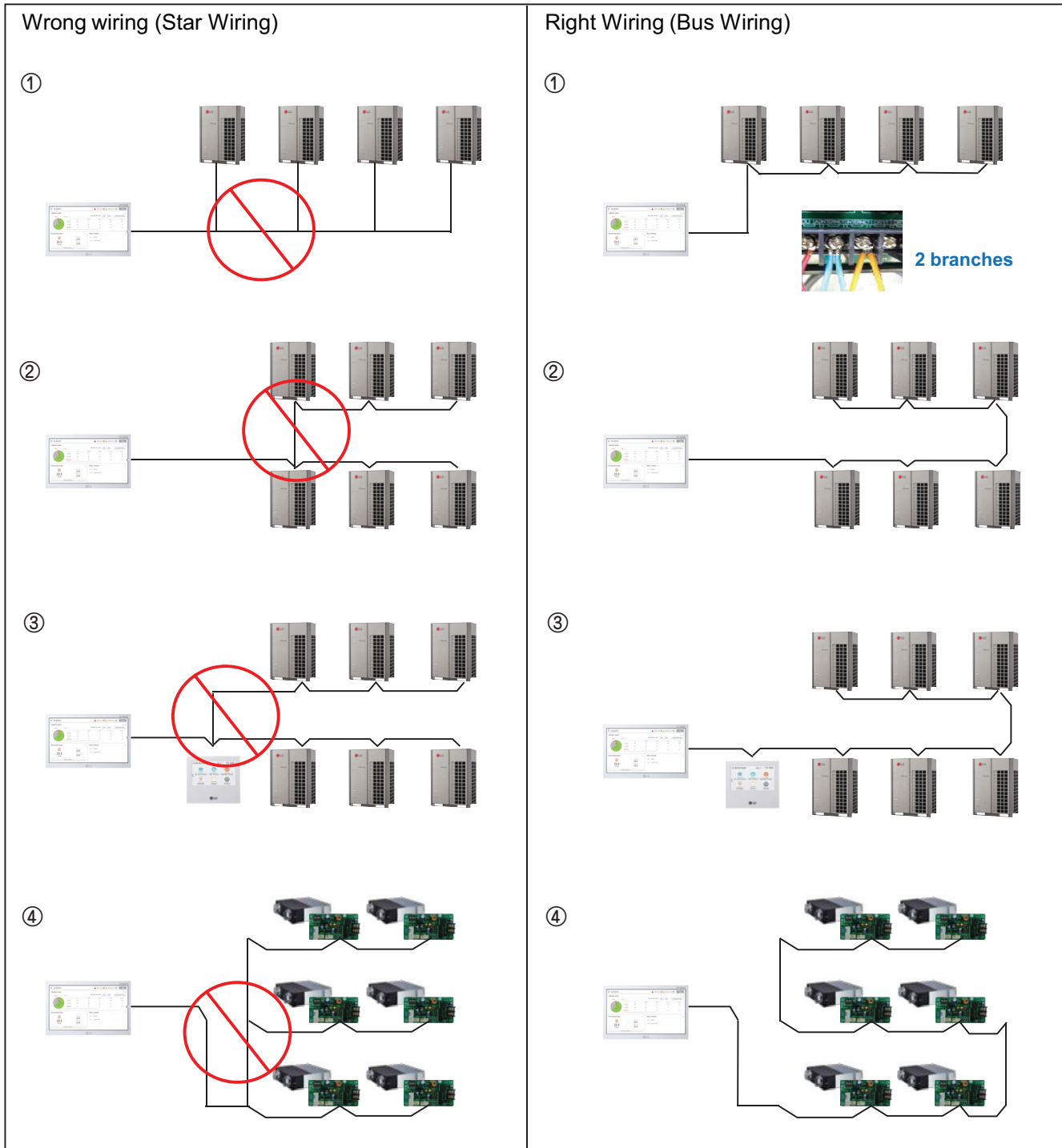
Changed unit's operation status in the past can be traced to help establishing reasonable operation plan of the site.



3.3 Example of installing

■ BUS wiring

- BUS wiring is required for LGAP communication

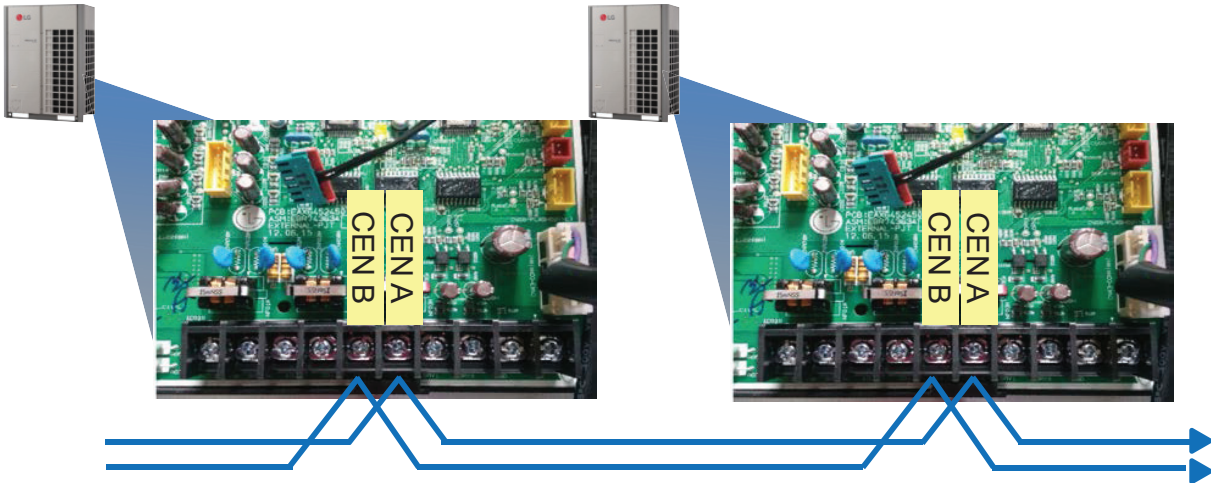


3.3 Example of installing

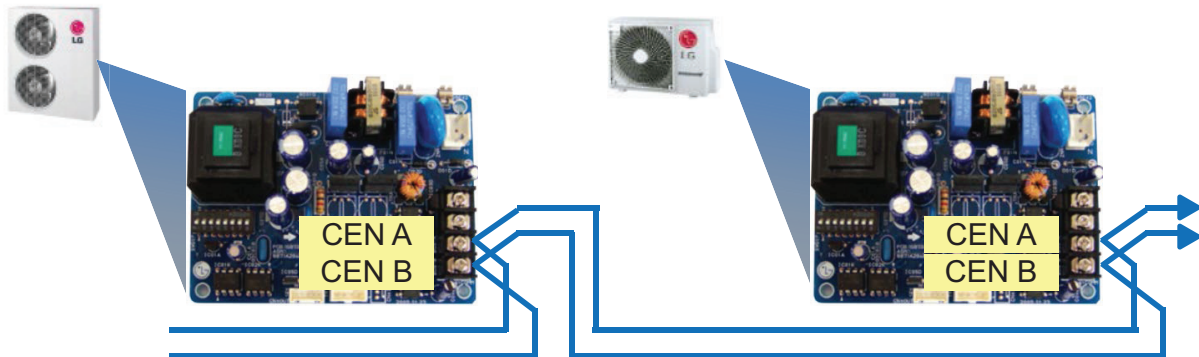
■ 485 Communication Port

- BUS wiring is required for LGAP communication
- Checking disconnection/short/polarity of cable
- PI485 G/W Setting for Multi/Single & ERV
- ※ Be careful not to confuse the CEN A and B terminals.

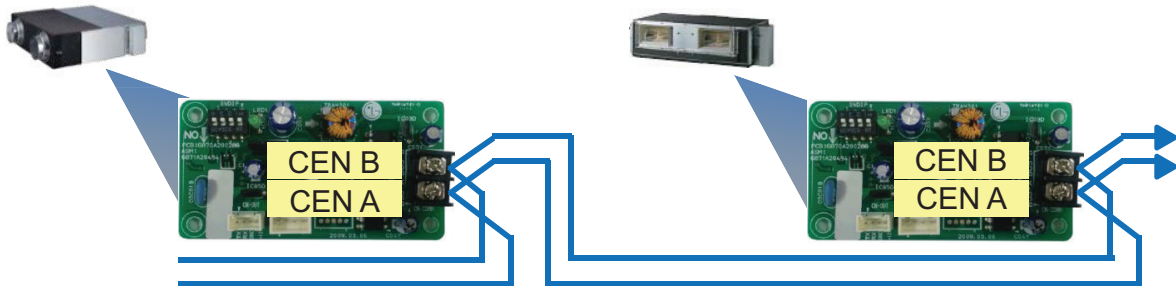
Multi V



Multi/Single(ODU connection type)



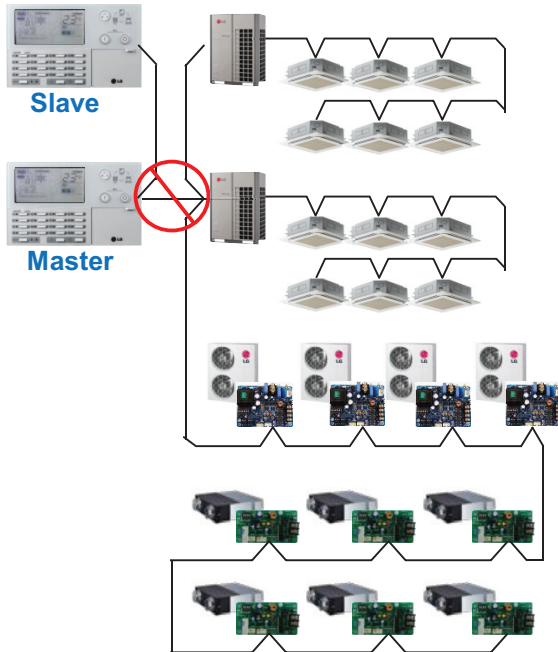
ERV/Single(IDU connection type)



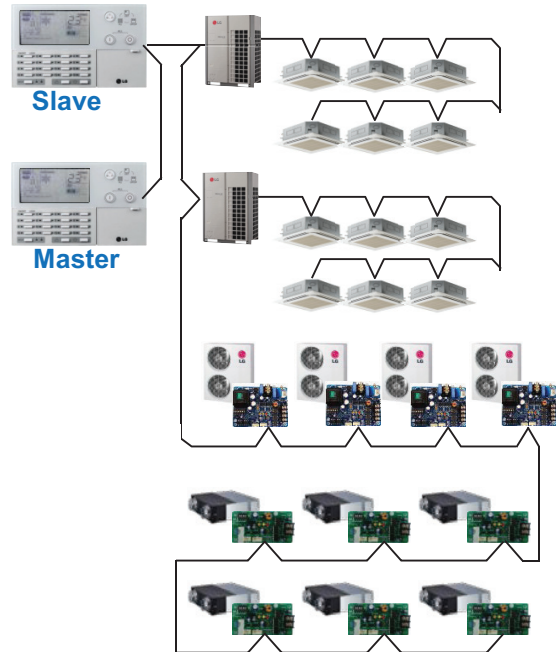
3.3 Example of installing

■ Comm. wiring case - AC Ez + AC Ez

Wrong wiring

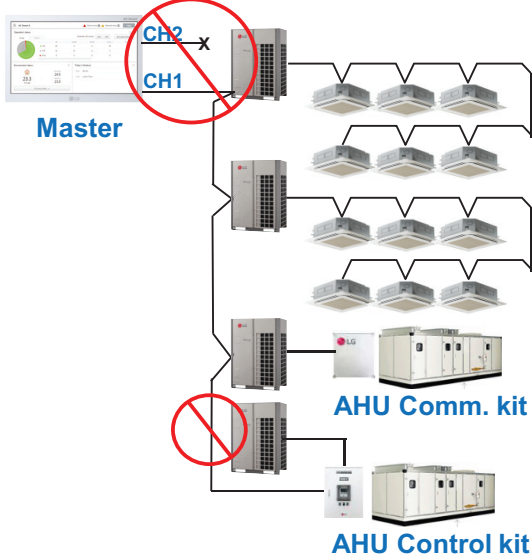


Right Wiring

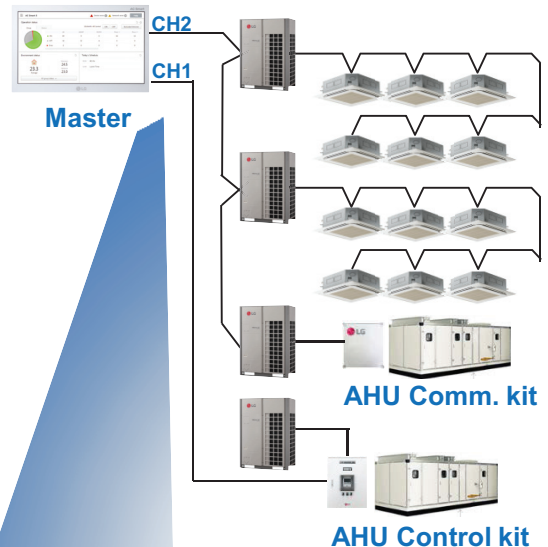


■ Installation case - AC Smart IV with AHU

Wrong wiring



Right Wiring



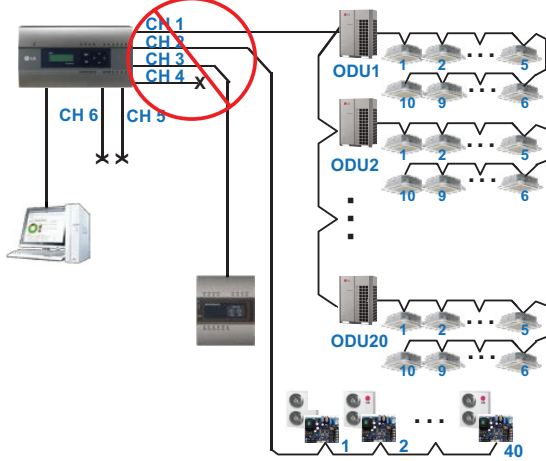
- CH1 : LGAP(AHU) or Modbus(AHU, Chiller, ACS IO)
- CH2 : IDU, ERV, DX ERV, Hydro kit

3.3 Example of installing

■ Installation case - AC Manager IV + ACP IV + ACS IO

Wrong wiring

CH1 : 20 ODU x 10 IDU
CH2 : 40 PI485(Single)

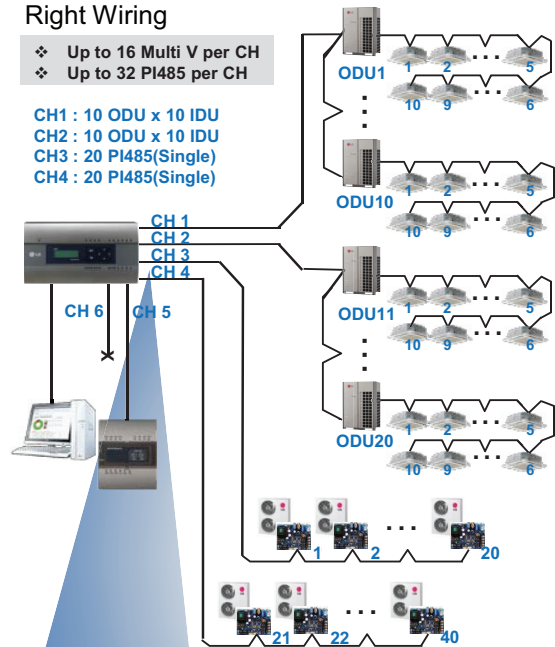


- As the number of ACS IO modules increases, the number of controllable units decreases.

Right Wiring

- Up to 16 Multi V per CH
- Up to 32 PI485 per CH

CH1 : 10 ODU x 10 IDU
CH2 : 10 ODU x 10 IDU
CH3 : 20 PI485(Single)
CH4 : 20 PI485(Single)

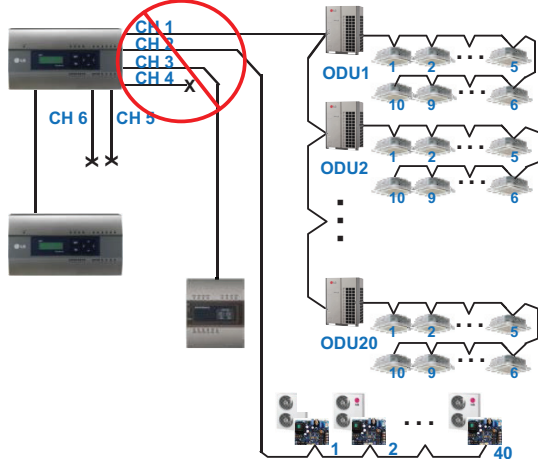


- CH1~4 : IDU, ERV, DX ERV, Hydro kit
- CH5 : LGAP(AHU) or Modbus(AHU, Chiller, ACS IO)
- CH6 : Modbus(AHU, Chiller, ACS IO)

■ Installation case - AC Manager 5 + ACP IV + ACS IO

Wrong wiring

CH1 : 20 ODU x 10 IDU
CH2 : 40 PI485(Single)

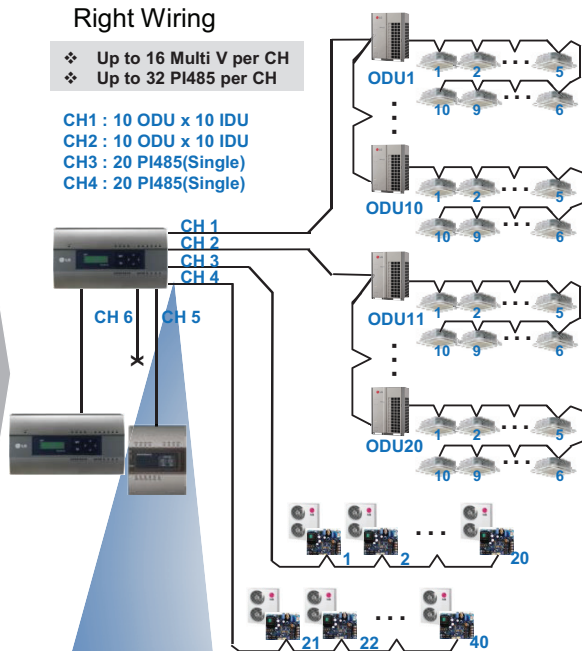


- As the number of ACS IO modules increases, the number of controllable units decreases.

Right Wiring

- Up to 16 Multi V per CH
- Up to 32 PI485 per CH

CH1 : 10 ODU x 10 IDU
CH2 : 10 ODU x 10 IDU
CH3 : 20 PI485(Single)
CH4 : 20 PI485(Single)

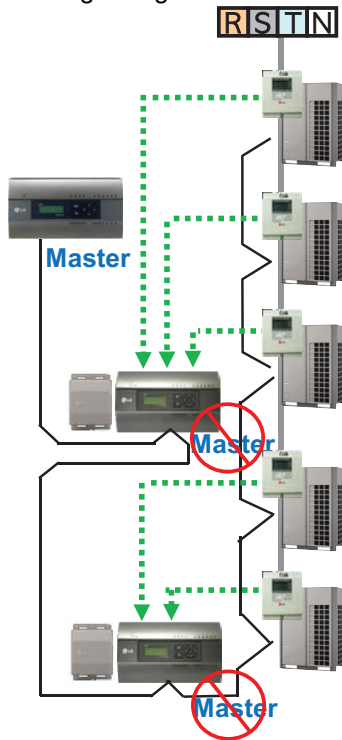


- CH1~4 : IDU, ERV, DX ERV, Hydro kit
- CH5 : LGAP(AHU) or Modbus(AHU, Chiller, ACS IO)
- CH6 : Modbus(AHU, Chiller, ACS IO)

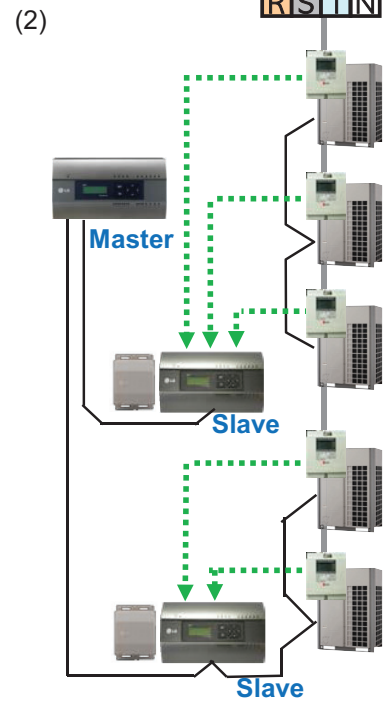
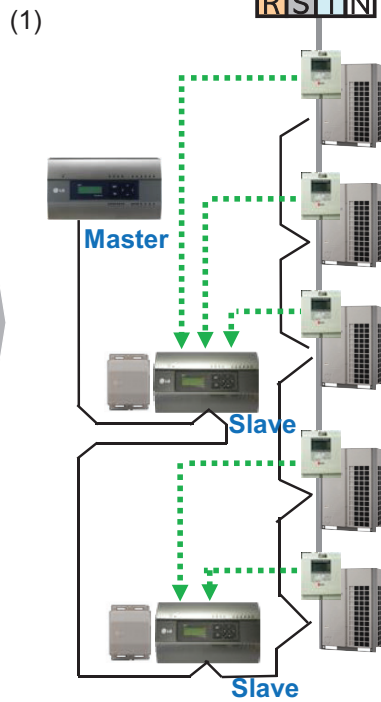
3.3 Example of installing

■ Installation case - ACP IV + PDI + PDI

Wrong wiring

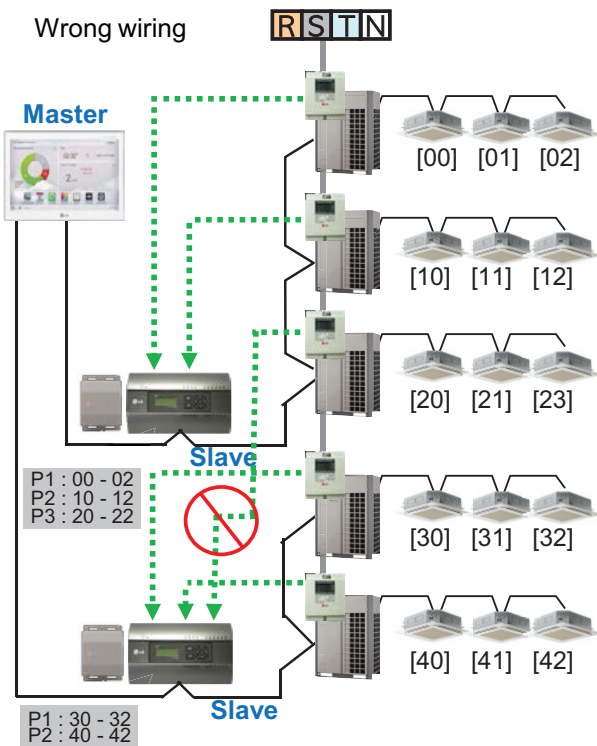


Right Wiring

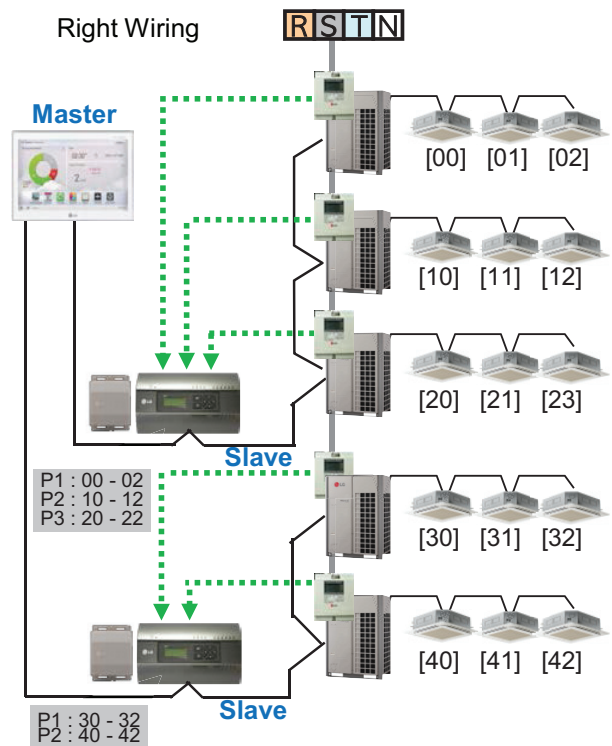


❖ Separate the channels properly. Communication performance is improved.

Wrong wiring



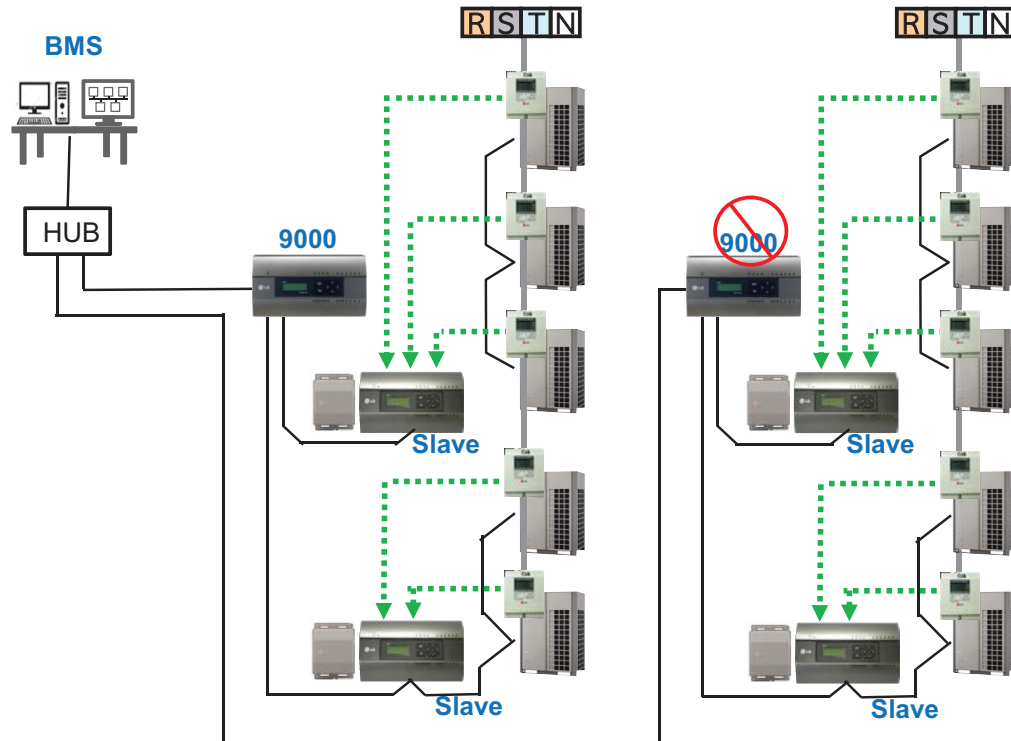
Right Wiring



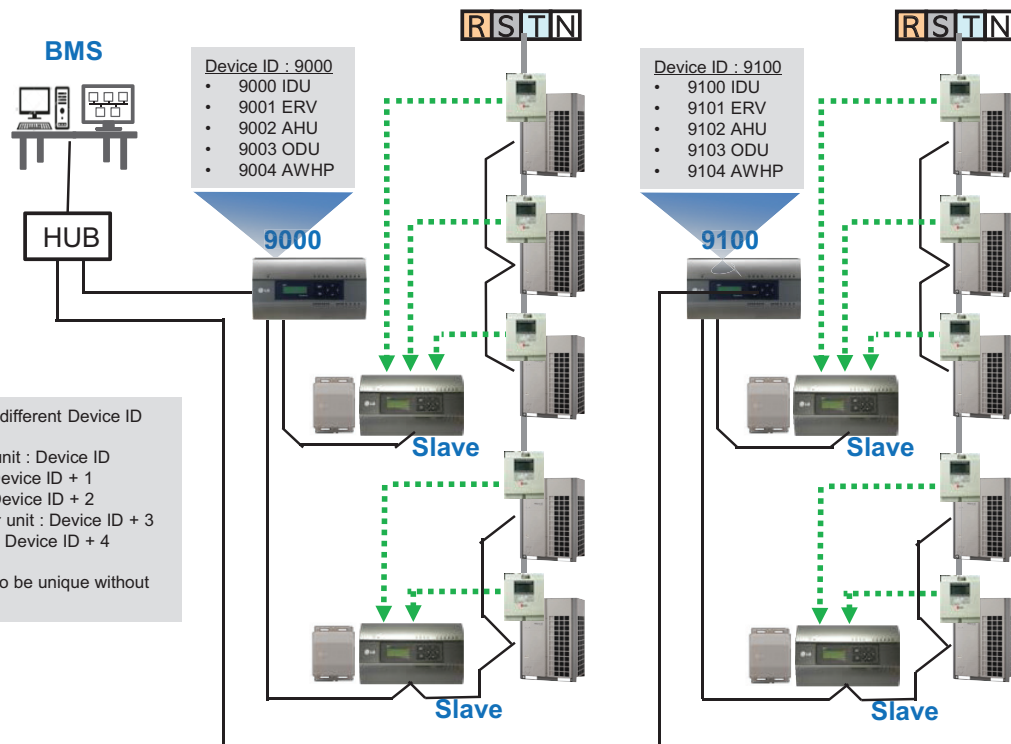
3.3 Example of installing

■ Installation case - BMS + ACP BACnet G/W + PDI

Wrong wiring



Right Wiring



3.4 Product Description

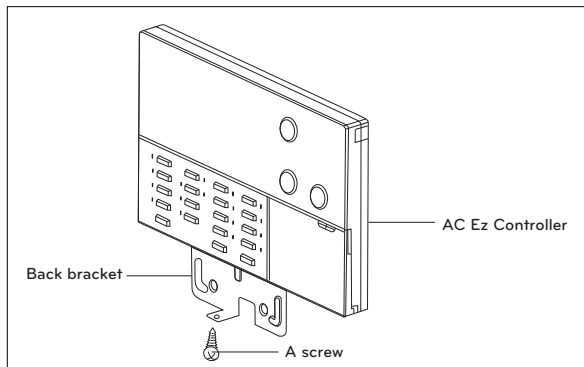
3.4.1 AC Ez

- Model name : PQCSZ250S0

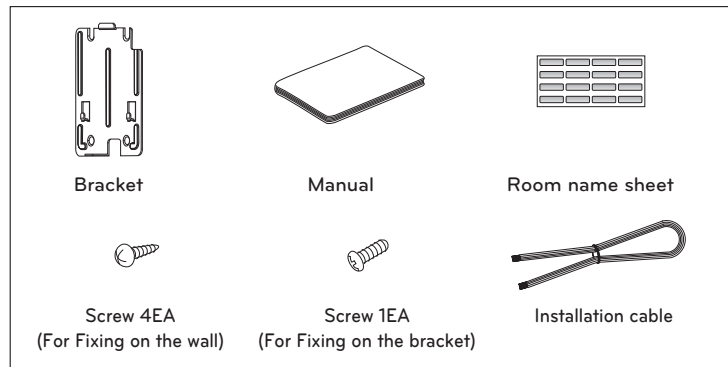
- Apart from On/Off control, operation mode, fan speed, scheduling, additional functions can be displayed and easily controlled.
- Mode control, temperature control etc and monitoring of up to 32 units (Indoor unit & ERV) is possible by Group/Unit.
- Linked control is possible total 8 AC Ez controller can be connected together.
(Max 256 indoor units can be controlled in same time)
- Schedule(8 events per day) function is possible by Group/Unit.

3.4.1.1 Specifications & Dimensions

■ Features



■ Accessory

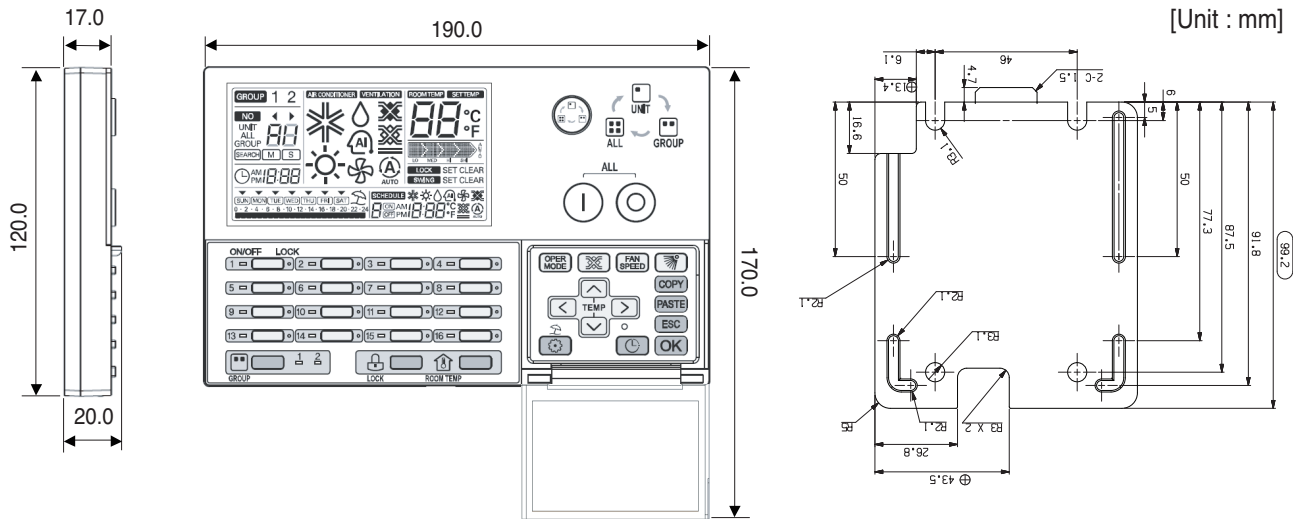


■ Product Specifications

Categories	Specifications
Max. Indoor unit to control	32 indoor units
Individual Control	On,Off / Operation Mode / Fan Speed / Temp. Control
Lock function	Central
Mode change	Cooling / Heating / Fan / Dehumidifications / Auto
Schedule	8 event schedule / day
Ventilation control	On,Off / Ventilation Mode / Fan Speed
Display (All Indoor status indication)	Operation / Set Temp. / Room Temp. / Schedule
Dimensions (mm)	190 x 120 x 17
Power Source	12 V $\overline{---}$, 1A

3.4 Product Description

■ Dimensions



3.4.1.2 Function

Display LCD Screen

- Display the present operation status by each unit
- Operation status/schedule information

Lock status display LED by each unit

On/Off display LED (TOTAL 16EA)

- Display the present operation state by each unit.
- Cool/Dry/Fan : Green.
- Heat : Orange
- Error mode : Red
- Stop : Off

Group Select button

Change control and display group

Individual On/Off button

Lock Set/Clear button

Room Temp. Display button

Control Range button

- UNIT : Individual indoor unit
- GROUP : Connected indoor units of corresponding group
- ALL : Connected indoor units of all groups (same type product only)

Detail Control & Setting Panel

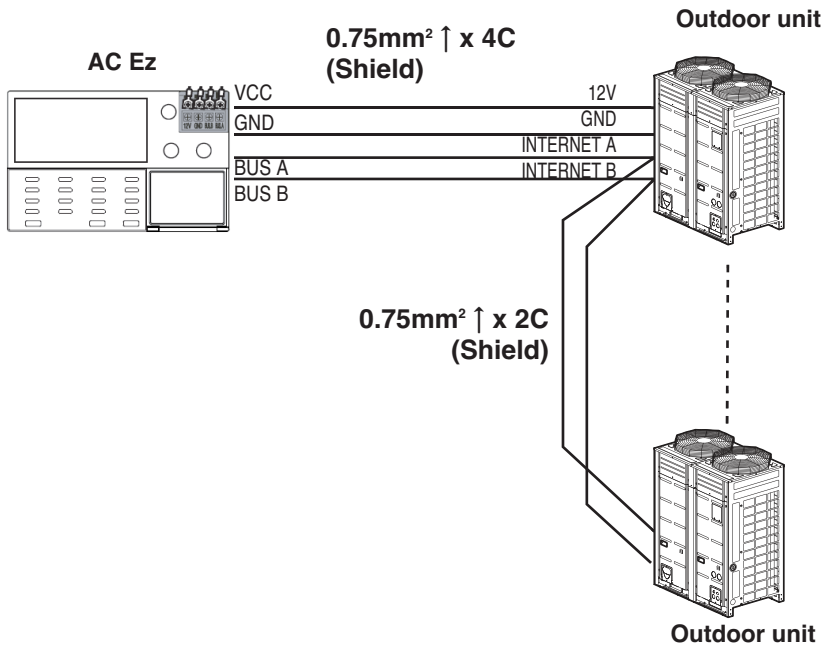
- Mode/Fan/Ventil mode control
- Installation / Schedule / Time setting

3.4 Product Description

Control panel	Display screen	Description
		Control select button : Adjusts selected indoor unit range.
		Total On/Off button : Turns the power on/off condition of selected indoor units.
		Individual On/Off button : Turns the power on/off condition of individual indoor unit.
		Group selection button : Change control and display group
		Lock set/clear button : Turns the lock set/clear
		Room temperature button : Display the room temperature
		Operation mode button : Change operation mode of air conditioner
		Ventilation mode button : Change ventilation mode of ventilator
		Fan speed button : Change fan speed
		Air flow button : Turns swing set/clear of air flow
		Set temperature button : Change desired operation temperature of air conditioner
		Indoor select button : Select desired indoor unit to control
		Function setting button : Enter installation mode to installation setup
		Current time setting button : Setup the current time
		Schedule setting button : Enter the schedule setup mode to setup desired schedule
		Schedule copy button : Copy former set schedule
		Schedule paste button : Paste copied schedule
		Esc button : Cancel the changed content
		OK button : Setup the changed content
		Holiday setting button : Turns holiday schedule application set/clear

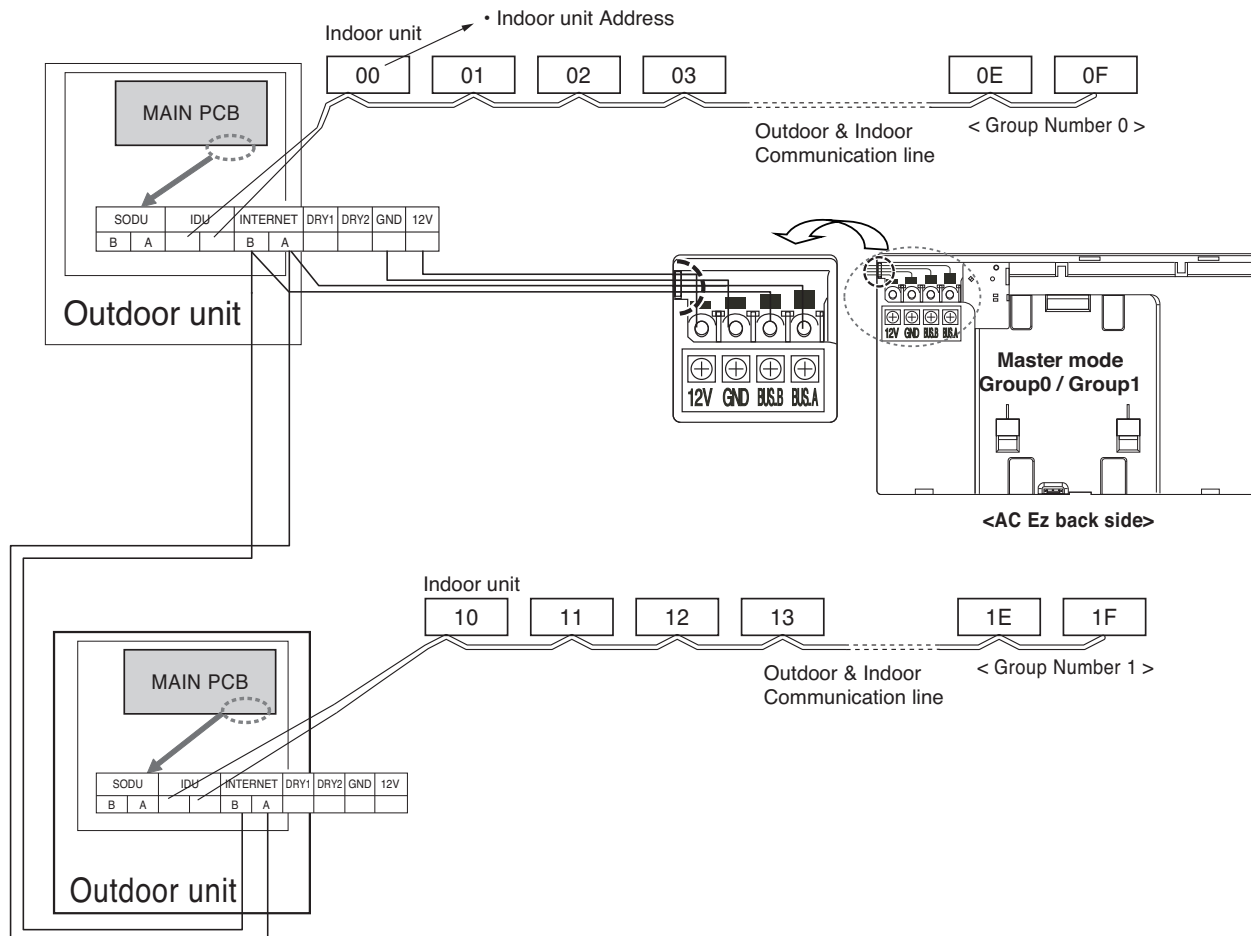
3.4 Product Description

3.4.1.3 Field Wiring Diagram



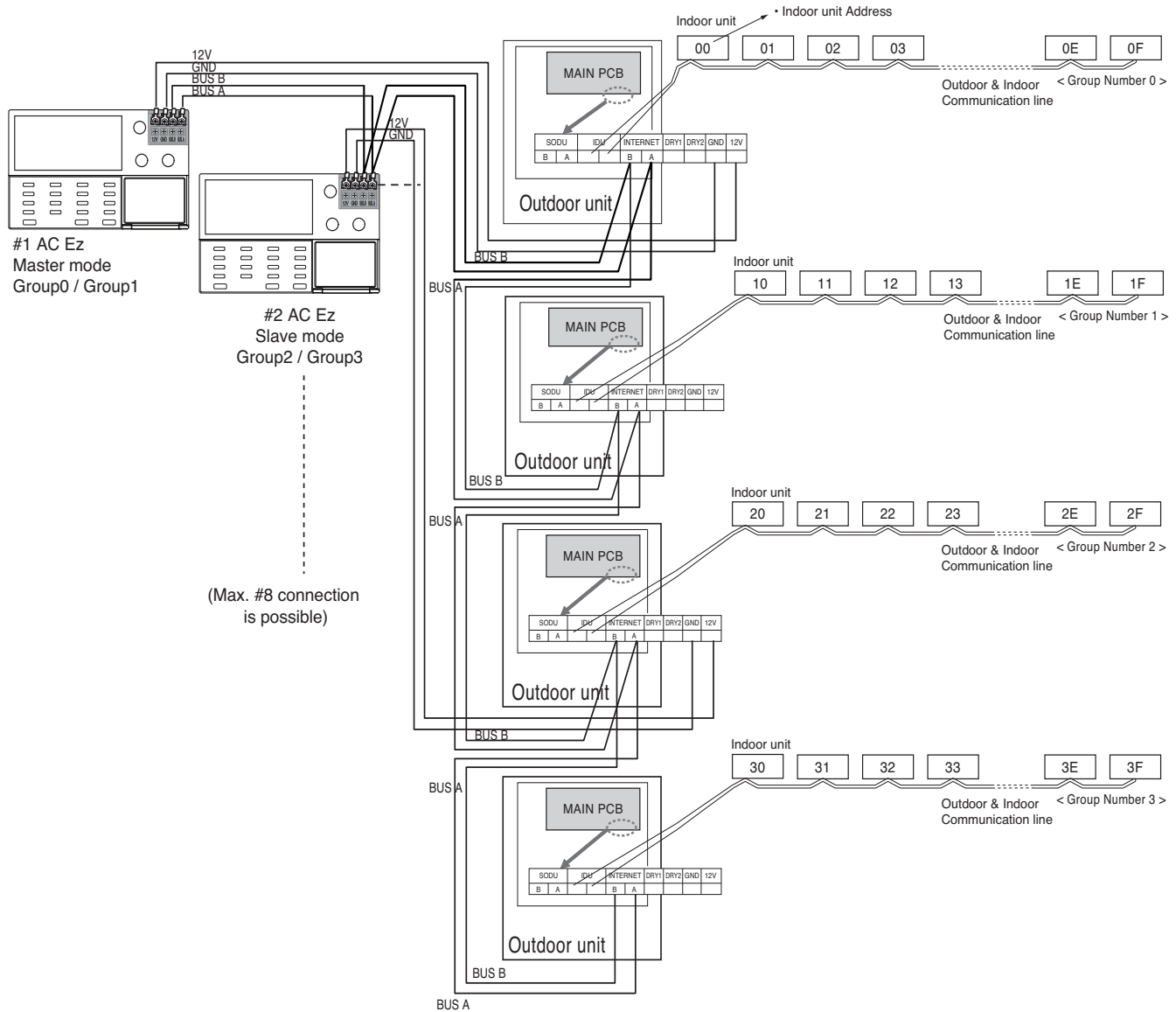
- 32 indoor units at maximum can be connected to one AC Ez.
- When there are many outdoor units to connect, connect the outdoor units with the BUS form. Otherwise, the simple central controller may cause the malfunction.
- The following figure shows the example for connecting with the BUS form.

■ One AC Ez Connection



3.4 Product Description

■ 2 or more AC Ez Connection



3.4 Product Description

Installer Setting Code Table

No.	Function	Code	Value
1	Master/Slave Setting	1	<input type="checkbox"/> M : Master <input type="checkbox"/> S : Slave
2	Group 1 product Select	2	Air conditioner / Ventilator
	Group Number Setting		0~F : Group Address - : No use of this group
3	Group 2 product Select	3	Air conditioner / Ventilator
	Group No. Setting		0~F : Group Address - : No use of this group
4	Indoor units searching (Master controller only)	4	Indoor unit searching
5	°C / °F setting	5	°C : Celsius
			°F : Fahrenheit

! NOTE

In each installation mode, if you press the button, it is operated or saved current setting condition.
If you press the button, it is returned before setting condition and exits from installation mode.

	Item	Control	Schedule
Air conditioner	ON/OFF	0	0
	Operation mode	0	0
	Set temp	0	0
	Fan speed	0	-
	Swing	0	-
	Lock	0	-
Ventilation (ERV/ERV DX)	ON/OFF	0	0
	Mode	0	0
	Co-Air conditioner	0	0
	Set temp	0	0
	Fan speed	0	-
	Lock	0	-

3.4 Product Description

Schedule display

By setting schedule day, it indicates schedule overview of the day and executed next schedule time as same as following figure.



Schedule Priority

If two more schedules are setup at the same time, it operates higher priority schedule. Lower number schedule has higher priority.



Ex) In case of the same schedule time of schedule 1 and 2, as the schedule time of schedule 1 has higher priority than schedule 2, corresponding indoor unit will stop the operation at AM 11:00.

Schedule caution

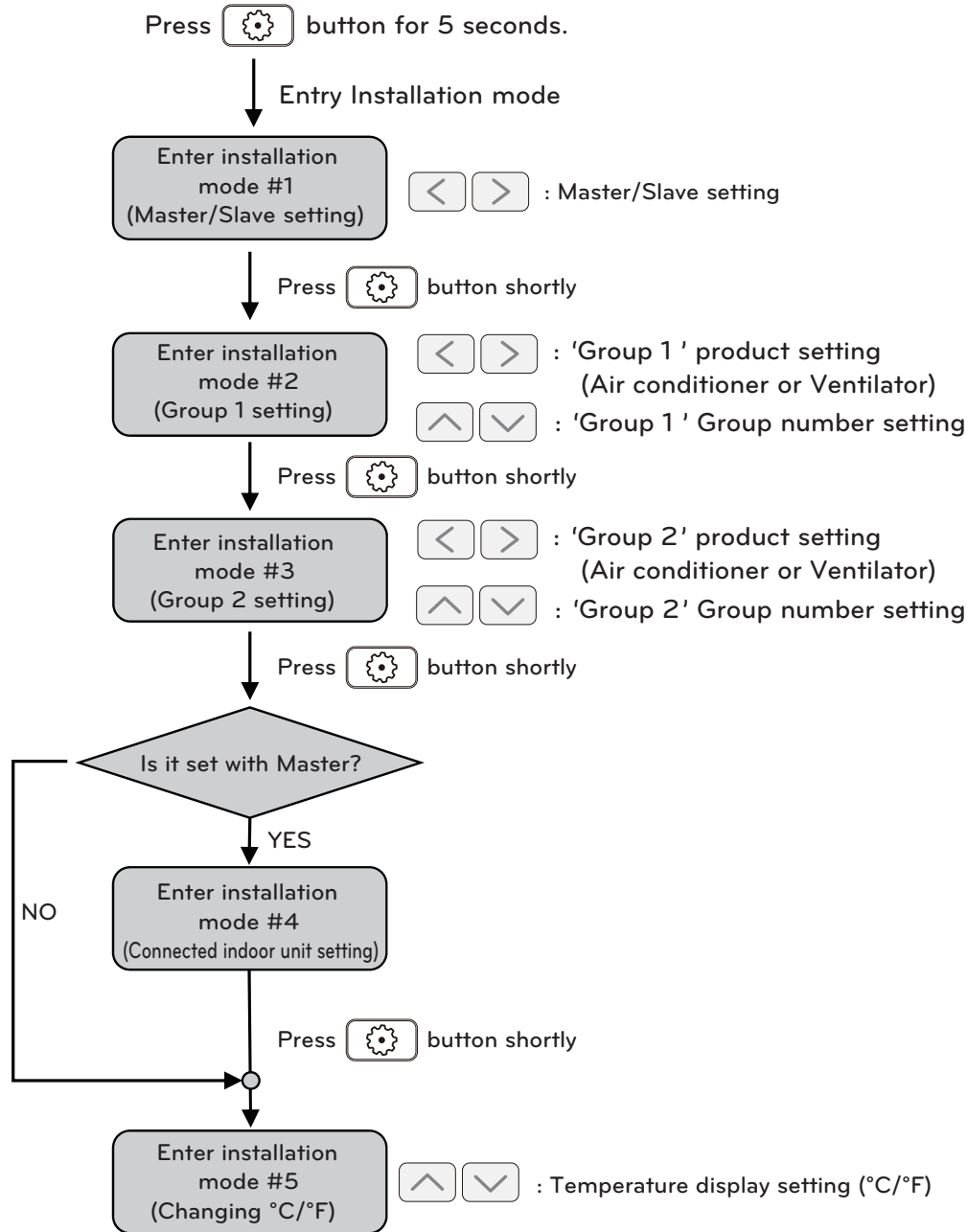
During executing schedule(s), Indoor units doesn't take any other command for several minutes (Remote controller and AC Ez may not operate normally during this period.)

During the Blackout

- 1 If a blackout lasts longer than 2 hours, the already set schedule will not be executed after the blackout. (The current time must be set again.)
- 2 During the blackout, the set schedule will not be executed.

3.4 Product Description

Flow chart for Installer setup mode



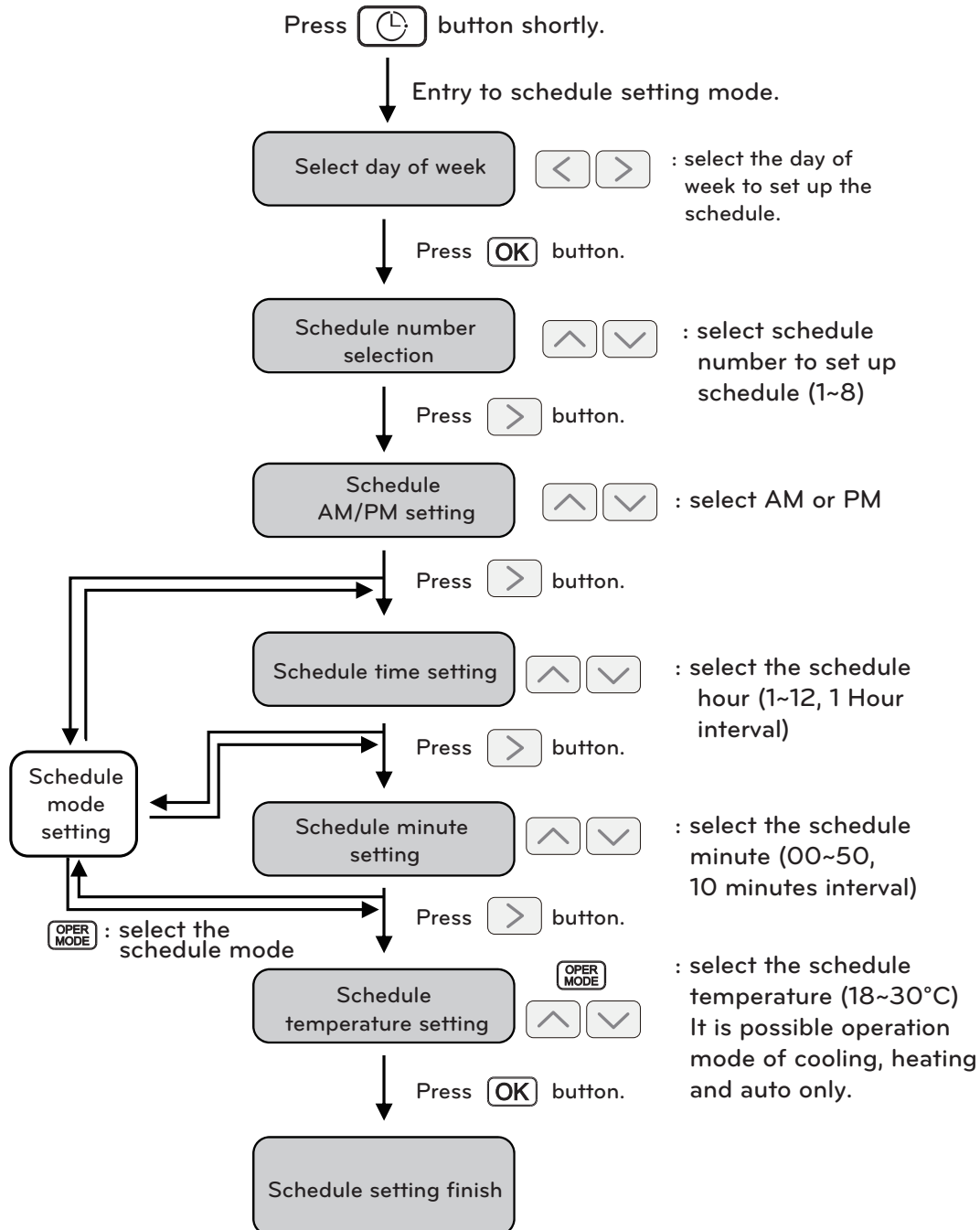
! NOTE

In each installation mode, if you press the **OK** button, it is operated or saved current setting condition.
 If you press the **ESC** button, it is returned before setting condition and exits from installation mode.

3.4 Product Description

Flow chart for schedule setting

• Schedule setting



! NOTE

- If you press **ESC** button, the schedule setting condition is changed back to previously configured condition and it exits from schedule setting mode.

3.4 Product Description

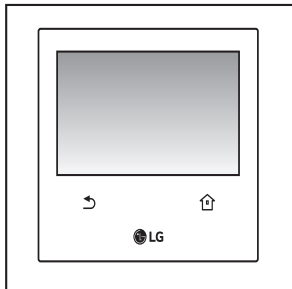
3.4.2 AC Ez Touch

- Model name : PACEZA000

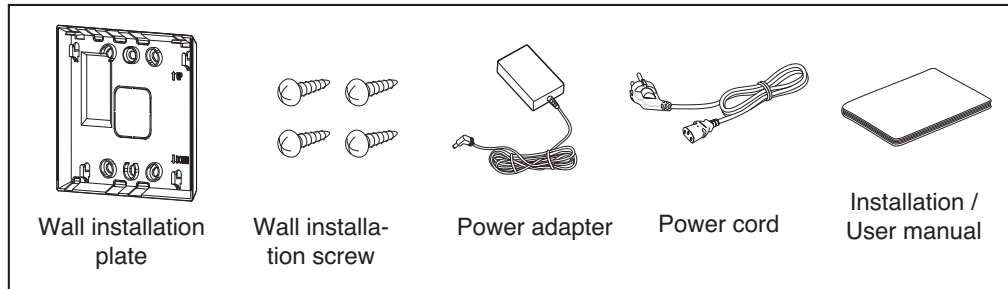
- AC Ez Touch is a central controller installed in the management with 5 inch TFT LCD and touch screen for small site.
- Mode control, temperature control etc and monitoring of up to 64 units (Indoor unit, ERV & Hydro kit) is possible by Group/Unit.

3.4.2.1 Specifications & Dimensions

■ Features



■ Accessory



■ Product Specifications

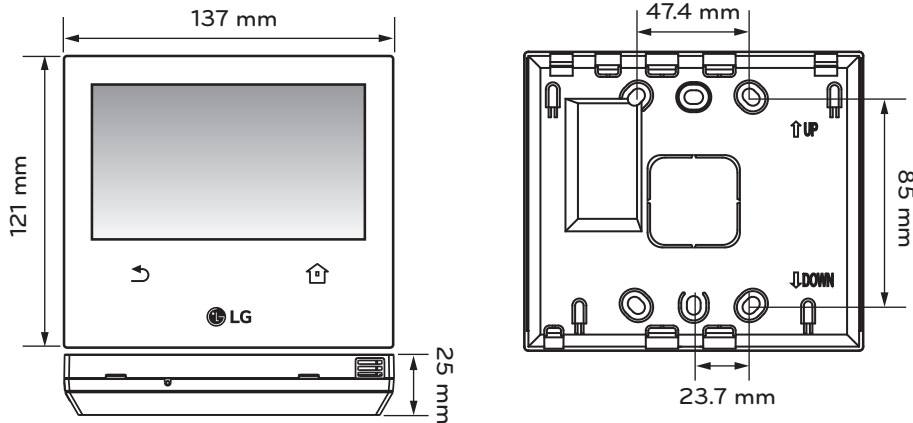
Item	Specification	Etc
Power	12 V--- (Adapter)	-
MCU	ARM® Cortex™-A8 600MHZ 324P TI	-
RAM	DDR3 2GBIT(128MX16)	-
Flash	2GBIT (256X8)	-
LCD	5 inch color LCD (800 * 480)	-
Touch	C-Type Touch Panel	-
LAN	1Port	100 Mbps
DI/DO	DI 1EA	Max 100 m Dry contact (N/O) For Emergency
RS485	1EA	Max 1 km
Keyboard	Korean/English/Number	-
Size(mm)	137 * 121 * 25	-
OS	Linux	-
IP rating	IP20	-

! NOTE

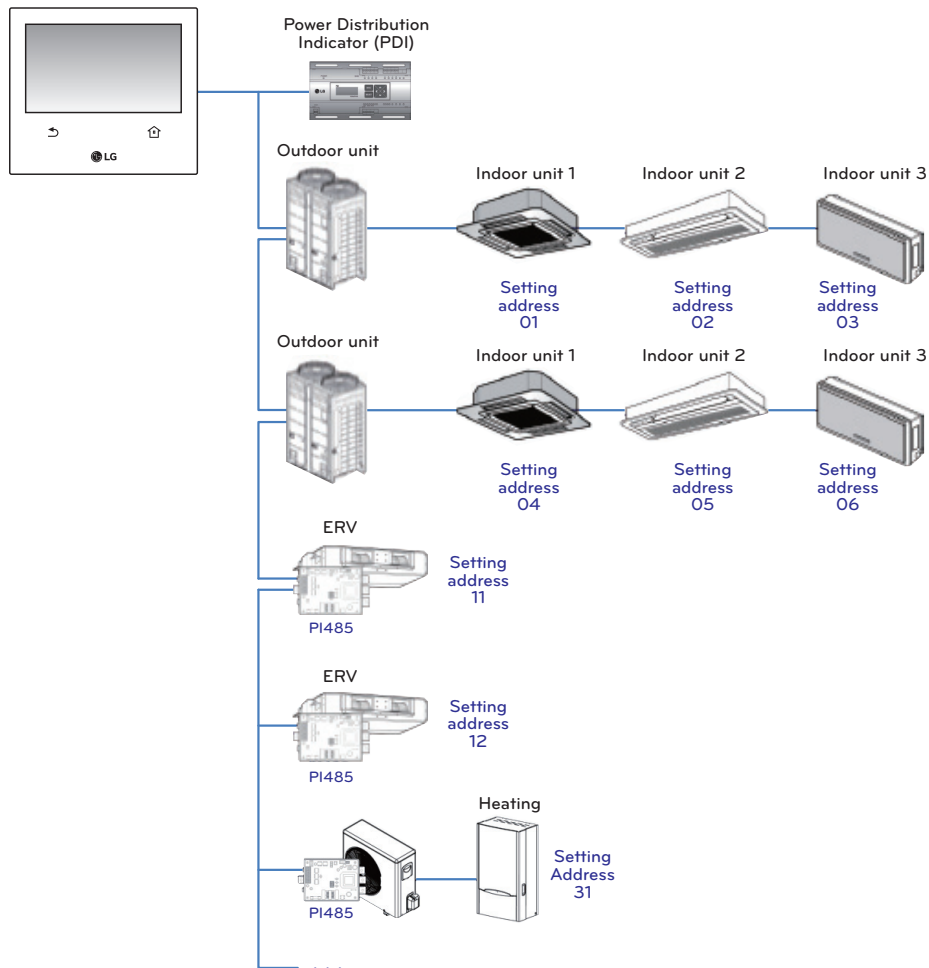
Product specifications may be different depending on the S/W version.

3.4 Product Description

■ Dimensions



3.4.2.2 Field Wiring Diagram



3.4 Product Description

3.4.2.3 Function

■ Access rights for each menu

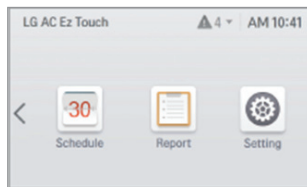
User	Menu
General User	Aircon control, Vent control, Heating Control, Schedule, Report
Manager & Install	Aircon control, Vent control, Heating Control, Schedule, Report, Setting

! NOTE

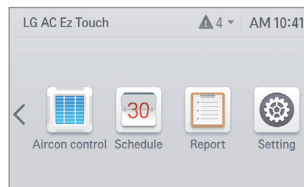
Manager and installer: When it enters the setting, the manger and installer are verified by password.

■ Menu screen

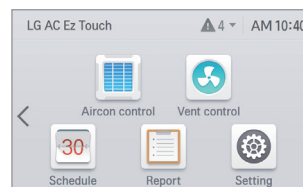
- In case of the menu screen, the location of the menu changes according to the connected product.



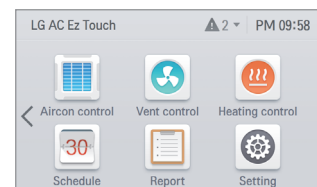
<Empty device>



<In case when Only air conditioner is connected>



<When air conditioner and ventilation are connected>



< When air conditioner, ventilation, Heating are connected>

■ Control screen

Item	Description
Group	On state(Yellow), Off state(Gray)
Individual Air conditioner	Cool(blue), Heat(orange), Fan(green), Dry(dark blue), Auto(purple), Off(Gray)
Individual Ventilation(ERV/ERV DX)	Normal(blue), HEX(orange), Auto(purple), Off(Gray)
Individual Heating device	Cool(blue), Heat(orange), Auto(purple), Off(Gray)

3.4 Product Description

■ Product specification

Product		AC	ERV	DX ERV
Mode		Heat, Cool, Dry, Fan, Auto	Heat exchange, Normal, Auto	Heat exchange, Normal, Auto
Fan speed		Low, Mid, High, Auto	Very High, High, Low, Auto	Very High, High, Low, Auto
Swing		Auto, Cancel	-	-
Lock	Entire	All	All	All
	Individual	Temperature, Mode, Fan speed	-	-
Temperature setting		18~30 °C	-	18~30 °C
		Upper: 16~30 °C Lower: 18~30 °C	-	-
Humidifier setting		-	-	-
Additional function		Function to cancel filter alarm	Power save, Quick, Heater	Power save, Quick, Heater, Humidifier
Air Conditioner		-	-	Cool, Heat, Auto, Off

Product		HEATING			
		AWHP	Heating only	Hydrokit	Cascade
Mode		Heat, Cool, Auto	Heat, Auto	Heat, Cool, Auto	Heat, Auto
Lock	Entire	O	O	O	O
	Individual	X	X	X	X
Hot water		O	O	O	O
Set temperature	Room temp	Cool(18~30 °C, Optionally 16 °C) Heat(16~30 °C)	Heat(16~30 °C)	Cool(18~30 °C, Optionally 16 °C) Heat(16~30 °C)	Heat(16~30 °C)
	Outlet water temp	Cool(5~27 °C) Heat(15~65 °C)	Heat(15~55 °C)	Cool(6~25 °C) Heat(20~50 °C)	Heat(30~80 °C)
	Inlet water temp	30~80°C	30~80 °C	30~50 °C	30~80 °C
Etc		-	-	Hot water + Heating + Cooling	Hot water+Heating

3.4 Product Description

■ Max character

Item	Max character(alphabet/numeric)
Group name	20
Schedule name	50
Indoor unit name	20
Controller of AC Ez Touch name	20
Password	6~16

! NOTE

Allowed special character are . (period) and – (hyphen)

■ Schedule

Item	Description
Maximum schedule number	200
Schedule control setting information	Name, date, time, repeat setting, device, control command

■ Report

Item		Description
Reported information		Error, filter / oil change alarm, energy
Error	Report error history	Supporting view each error report of Air conditioner/ERV/Heating
	Maximum error history storage count	5000
	Maximum error checkable period	1 year
	Error history contents	Date / time / device name / error code / message
Change alarm	Report error history	Supporting view each alarm(filter/oil change) report
	Maximum alarm history storage count	5000
	Maximum alarm history checkable period	1 year
	Alarm history contents	date / time / device name / message
Energy	Report energy history	Supporting power consumption of group / individual equipment.
	Maximum energy history checkable period	4 month
	Energy history contents	Group name(Indoor unit name)/power consumption/accumulated power consumption

3.4 Product Description

■ Energy save mode

The air conditioner energy save mode is turned on, and it repeats the operation state change control in sequence according to the set energy save mode cycle.



[Energy save mode OFF]



[Energy save mode ON]

When [Energy save mode] icon in the Air conditioner control screen is pressed, the energy save mode becomes on.

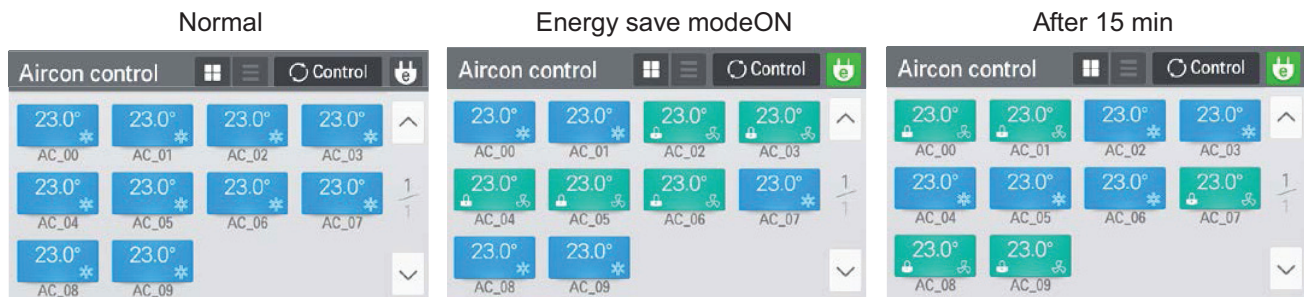
When the energy save mode is on, the [Energy save mode] icon is lighted in green, and the operation state change control is repeated according to the setting of energy save mode cycle.

✳ Energy save mode operates the air conditioner only.

- In cooling operation: Cool ↔ Fan, lock all
- In heating operation: Heat ↔ OFF, lock all

- Setting : time setting(5min / 10min / 15min)

Ex) Set 15 min



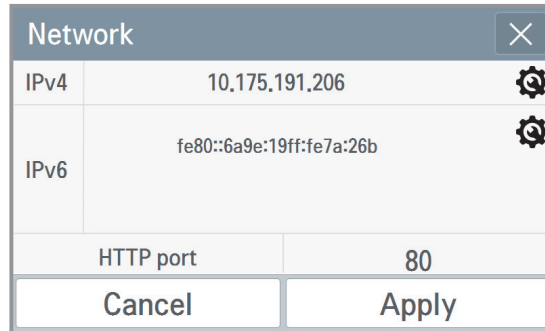
! NOTE

In slave state, you cannot use each equipment's lock setting, set temp range, 2set point, IDU 2set, auto search device function, energy report and energy save mode.

3.4 Product Description

■ Network setting

In this screen, you can save or change the network setting information to use when you wish to connect to ethernet.



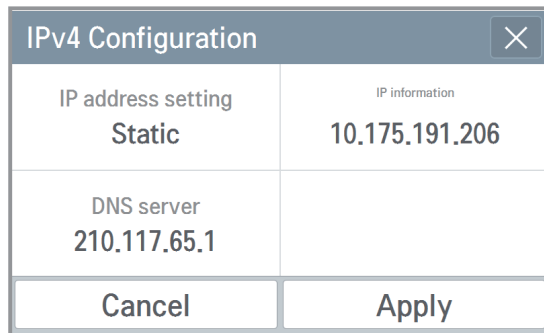
The 'Network' dialog box contains the following fields:

IPv4	10.175.191.206	
IPv6	fe80::6a9e:19ff:fe7a:26b	
HTTP port		80
Cancel		Apply

1. IPv4 setting

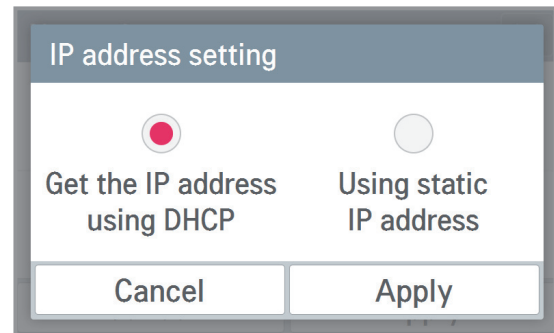
1) IP address setting

IP address setting methods are using DHCP to get IP address and designating IP address.



The 'IPv4 Configuration' dialog box contains the following fields:

IP address setting Static	IP information 10.175.191.206
DNS server 210.117.65.1	
Cancel	Apply



The 'IP address setting' dialog box contains two radio buttons:

- ☒ Get the IP address using DHCP
- ☐ Using static IP address

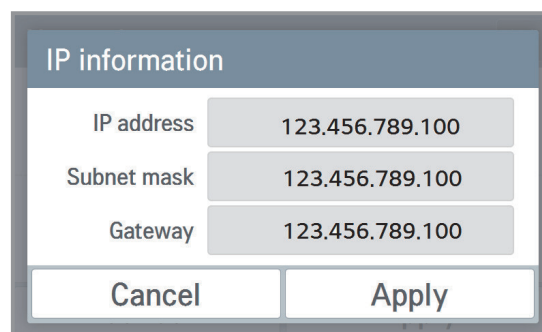
Buttons: Cancel, Apply

- Get the IP address using DHCP

You can use DHCP to automatically set dynamic IP in the currently connected internet network. (If it is DHCP, IP information setting category is deactivated.)

- Using static IP address

You can set the network using the user input IP information. If you select the IP address designation, IP information is activated, and you can input the IP information.



The 'IP information' dialog box contains the following fields:

IP address	123.456.789.100
Subnet mask	123.456.789.100
Gateway	123.456.789.100
Cancel	Apply

3.4 Product Description

2) DNS server designation

You can set main DNS / sub DNS address.

DNS Server

Main DNS 123.456.789.100

Sub DNS 123.456.789.100

Cancel Apply

2. IPv6 setting

1) IP address setting

You can assign the IPv6 address using Auto Configuration, DHCPv6, or Manual Setup. When you modify the IP address setting, please contact your Network Administrator.

IPv6 Configuration

IP address setting
Auto Configuration

DNS server

IP information
fe80::6a9c:19ff:fe7a:26b

Cancel Apply

IP address setting

☒ Auto Configuration

☐ DHCPv6

☐ Manual Setup

Cancel Apply

2) DNS server designation

You can set main DNS / sub DNS address.

DNS server

Main DNS

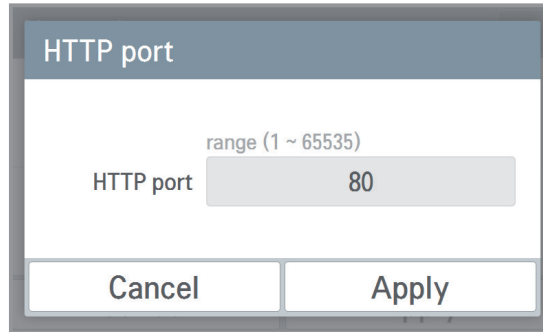
Sub DNS

Cancel Apply

3.4 Product Description

3. HTTP port designation

You can change HTTP port setting information for the ethernet connection (for service).
User can freely set HTTP port according to the network environment.
(Input boundary is 1~65535.)



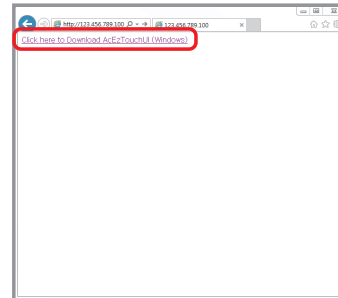
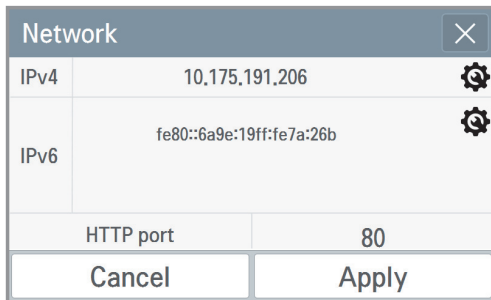
The screenshot shows a dialog box titled "HTTP port". Inside the dialog, there is a text input field labeled "HTTP port" with the value "80" entered. Above the input field, the text "range (1 ~ 65535)" is displayed. At the bottom of the dialog, there are two buttons: "Cancel" and "Apply".

3.4 Product Description

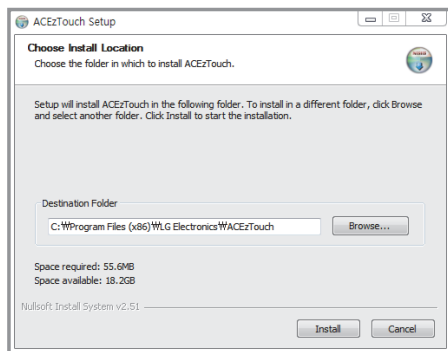
■ PC Access

It supports the function that you can control and monitor connected devices via the web application.

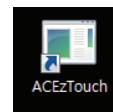
1. Set the IP in the network setting screen.
2. Connect by entering the IP set in the web browser. Click the download link.



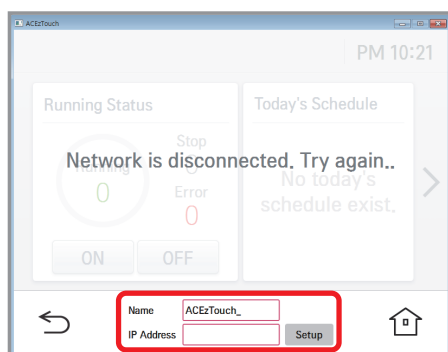
3. Install the program.



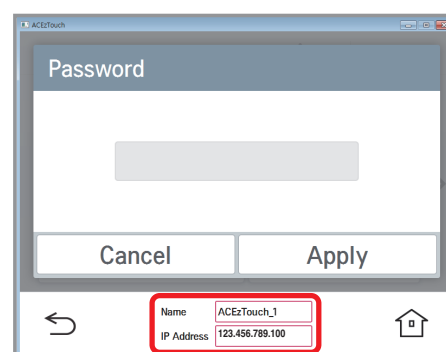
4. Run the installed program.



5. Enter the Name and IP.
Click on the "Setup" button.
(Enter the name after 'ACEzTouch_')



6. Connected.



<Requirements>

Hardware	
CPU	Dual core 2.4GHz or more
Main memory	4GB or more
Hard disk	At least 1GB of free space on the disk
Main OS	Windows XP/7/8/8.1/10 (32/64bits)

3.4 Product Description

■ Language setting

GUI

Supporting Korean, English, Italian, Spanish, Portuguese, Russian, French, German, Turkish, Polish, Chinese.



Keyboard

Korean/English/Number

3.4 Product Description

■ Password setting

In this screen, you can initialize or change the password, and when you enter the setting screen, you can set whether to use password.

1. If password is used

1) Select to use the password.

Password	
Use password OFF	Change password Change
Cancel	Apply

2) Input the previously set password, and press button.

Password	
<input type="password"/>	
Cancel	Apply

3) It displays that the password is set, and the password is displayed as used. You need to press button to finally apply the set password.

Password	
Use password ON	Change password Change
Cancel	Apply

4) It displays that the password set-up is completed.

System		
Advance		
Network	TMS	Wi-Fi
DHCP	-	-
Password	Version information	Open source license
ON	Password setting is done.	

3.4 Product Description

2. When you change the password

1) Select password change.

Password	
Use password	Change password
ON	Change
Cancel	Apply

2) Input the current password and the new password, and press button.

Change Password (6~16)	
Current P/W	
New P/W	
Re-type P/W	
Cancel	Apply

3) It displays that the password is set, and the password is displayed as used. You need to press button to apply the changed password.

Password	
Use password	Change password
ON	Change
Cancel	Apply

4) It displays that the password set-up is completed.

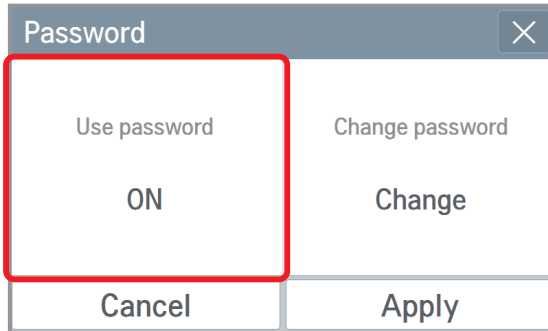
System		
Network	TMS	Wi-Fi
DHCP	-	-
Password	Version information	Open source
ON	ON	ON

Password setting is done.

3.4 Product Description

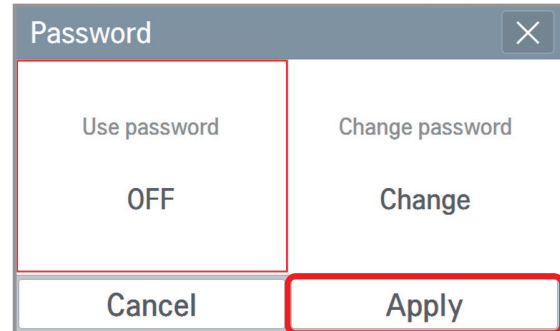
3. If you do not use the password

1) Select password usage.



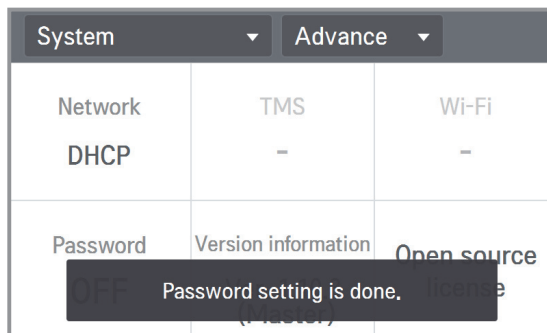
The screenshot shows a 'Password' dialog box with a close button (X) in the top right corner. It contains two columns: 'Use password' and 'Change password'. Under 'Use password', the value 'ON' is displayed. Under 'Change password', the text 'Change' is displayed. At the bottom, there are two buttons: 'Cancel' and 'Apply'. A red rectangular box highlights the 'Use password' column.

2) It displays that the password is cleared, and the password is displayed as not used. You need to press button to apply password not used.



The screenshot shows the same 'Password' dialog box. In this state, the value under 'Use password' is 'OFF'. The 'Change password' column still shows 'Change'. The 'Apply' button at the bottom right is highlighted with a red rectangular box.

3) It displays that the password set-up is completed.



The screenshot shows a table with system settings. The table has two tabs: 'System' and 'Advance'. The 'System' tab is selected. The table contains the following data:

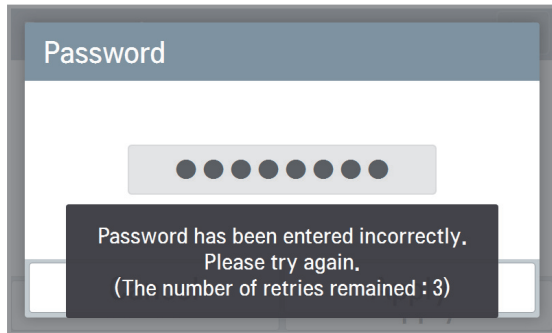
System		Advance
Network	TMS	Wi-Fi
DHCP	-	-
Password	Version information	Open source
OFF	Password setting is done.	license

A dark grey tooltip or notification box is overlaid on the 'Password' row, displaying the text 'Password setting is done.'.

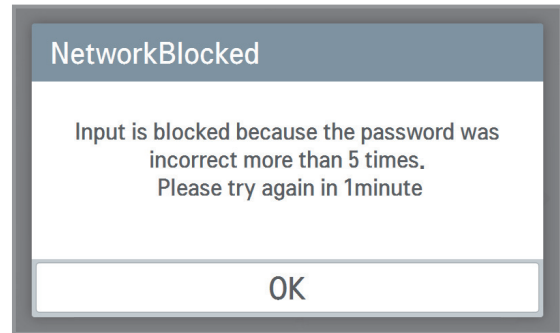
3.4 Product Description

4. In case of wrong password input,

- 1) In case of wrong password input, it displays the phrase saying that the password input is wrong as follows.
- 2) In case of 5 repeated wrong password input, the message that the input was blocked due to incorrect password lasts for 1 minute.



<In case of wrong password input>

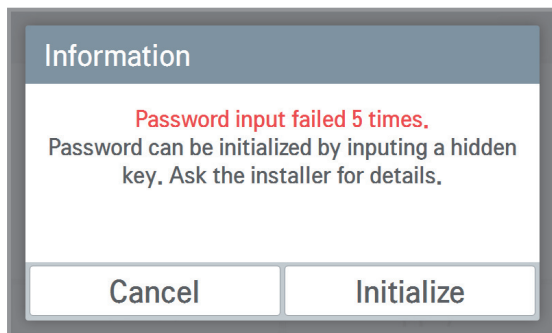


<In case of 5 repeated wrong password input>

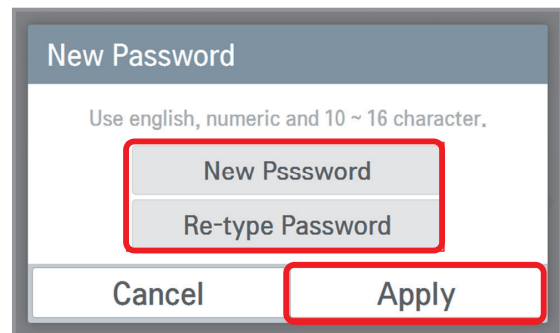
3) After 1 minute, it verifies whether to initialize the password.(Only in device)

When you press button, the password input screen appears again.

✱ For the password initialization, please contact the installation store or service center.



< After 1minutes block in Ez Touch Device>

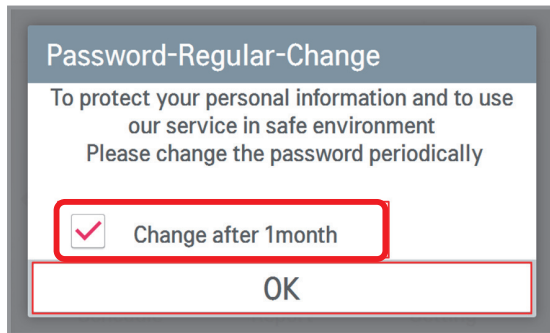


<In case of register new password>

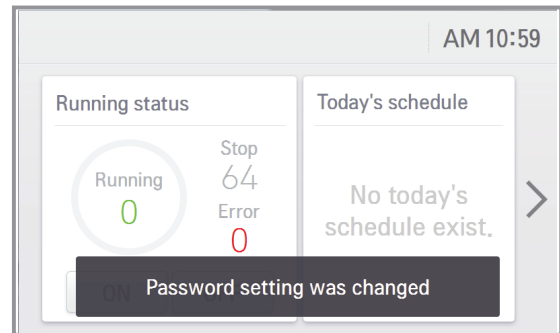
3.4 Product Description

5. Your password is expired about every three month. If you want to extend your password for one month,

1) Select the checkbox and press the OK button.

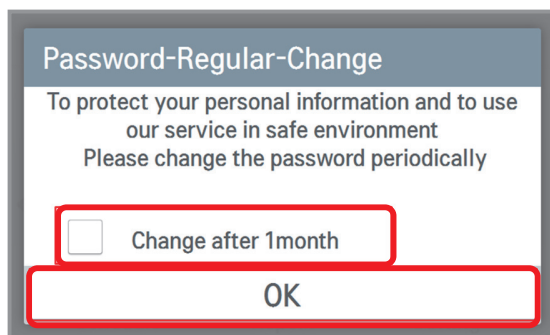


2) It displays that the password extension is completed.

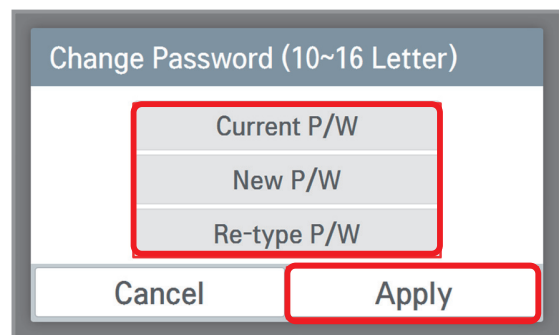


6. If you want to change your password immediately,

1) Do not select the checkbox and press the OK button.



2) Input the current password and the new password, and press Apply button.



3.4 Product Description

✓ Centralized Controller product specification

			AC Smart IV	ACP IV	ACP BACnet	ACP Lonworks
Max character	Group name		50			
	Schedule name		50			
	Indoor unit name		20			
	Controller name		50			
	Password		20			
Schedule	Maximum schedule number		200			
	Schedule period setting		Time, period, repeat program, select day			
	Schedule control command		Operating, operation mode, desired temperature, fan speed, swing, lock, limit temperature, auto change over, temperature limit (based on indoor unit)			
Event log	Log contents		Operating, operation mode, desired temperature, error code, controller			
	Error	Supportable of error log	O			
		Maximum number of storable error log	You can query up to 200 events and email/save to PC, USB memory up to 300 events. Up to 5000 events are stored total.			
		Maximum period to get error log	3 month from the start date			
		Error log contents	Error code			
	Control	Supportable of control log	O			
		Maximum number of storable control log	You can query up to 200 events and email/save to PC, USB memory up to 300 events. Up to 5000 events are stored total.			
		Maximum period to get control log	3 month from the start date			
		Control log contents	Operating, operation mode, desired temperature, controller			
Energy Report	Power	Supportable of power history	O			
		Maximum period to get power history	2 year			6 month
		Power history contents	Daily usage, Monthly usage and accumulated usage by each group or individual equipment			
	Gas	Supportable of gas history	O			
		Maximum period to get gas history	2 year			6 month
		Gas history contents	Daily usage, Monthly usage and accumulated usage by each group or individual equipment			
	Run time	Supportable of run time history	O			
		Maximum period to get run time history	1 year			5 month
		Run time history contents	Daily and Monthly usage by each group or individual equipment			

3.4 Product Description

			AC Smart IV	ACP IV	ACP BACnet	ACP Lonworks
Auto control	Peak control	Priority	0~100% (1% degree)			
		Outdoor unit capacity	9 step (0, 40, 45, 50, 60, 70, 80, 90, 100) %			
	Demand control	Priority	0~100% (1% degree)			
		Outdoor unit capacity	9 step (0, 40, 45, 50, 60, 70, 80, 90, 100) %			
	Time limit	Maximum group number	40			
		Setting time	30 min, 1 hour, 2 hour, 3 hour, 4 hour			
		Supporting device	Indoor unit, ventilator, Direct Expansion Ventilator, Heating, AHU			
	Device interlocking	Maximum pattern number	40			
		Pattern type	General pattern, copy pattern, emergency pattern, 1:1 program			
		Supporting device	Indoor unit, ventilator, Direct Expansion Ventilator, Heating, AHU, Chiller, ACS IO, DOKIT ¹⁾			Indoor unit, ERV, ERV DX, Heating, AHU, ACS IO, DOKIT ¹⁾
		Input condition	Operating, error status, operation mode, fan speed, swing, room temperature (based on indoor unit)			
		Output condition	Operating, set temperature, operation mode, fan speed, swing (based on indoor unit)			
Energy management	Energy navigation	Supporting	O			X
		Graph	Daily usage, Monthly usage, Period+Predicted usage amount, Monthly target excess rate, usage in the previous year, yearly target amount			
		Excess standard	Predicted usage amount/Actual usage amount			
		Control level	7 levels			
		Control type	indoor unit operation rate, outdoor unit capacity control, indoor unit operation control			
		Control type setting	Auto/Manual			

1) This product is discontinued.

3.4 Product Description

			AC Smart 5	ACP 5
Max character	Group name		20	
	Schedule name		50	
	Indoor unit name		20	
	Controller name		20	
	Password		20	
Schedule	Maximum schedule number (Recommended specification)		100 (50)	
	Schedule period setting		Time, period, repeat program, select day, exception date	
	Schedule control command		Operating, operation mode, set temperature, fan speed, swing, lock, limit temperature, auto change over, temperature limit (based on indoor unit)	
Event log	Log contents		Operating, operation mode, set temperature, fan speed, swing, lock, limit temperature, auto change over, temperature limit (based on indoor unit)	
	Error	Maximum period to get error log	3 month from the start date	
		Error log contents	Error code	
	Control	Supportable of control log	O	
		Maximum period to get control log	3 month from the start date	
		Control log contents	Operating, operation mode, set temperature, fan speed, swing, lock, limit temperature, auto change over, temperature limit (based on indoor unit)	
Operation Trend	Supporting device		Indoor unit, ERV, ERV DX, Heating, AHU, Chiller, ACS IO, DOKIT ¹⁾ , DI/DO	
	Operation Trend contents	Indoor unit	Operation, current temperature, set temperature, cooling set temperature, heating set temperature, operation mode, occupancy	
		Ventilator	Operation, mode, current temperature (only for direct cooling type ventilation), set temperature (only for direct cooling type ventilation)	
		AHU	Operation, Ventilation temperature, air supply temperature, set temperature, mode, air supply humidity, ventilation humidity	
		Heating	Operation, Water inlet temperature, Water outlet temperature, Hot water temperature, Set temperature, Hot water set temperature, Mode, Hot water operation	
		Chiller	Operation, Water inlet temperature, Water outlet temperature, Mode	
		DOKIT	Operation	
		DI/DO	Operation	
		ACS IO	Value	
	Maximum period to get operation trend		3 month from the start date	
Energy Report	Power	Supportable of power history	O	
		Maximum period to get power history	2 year	
		Power history contents	Daily usage, Monthly usage and accumulated usage by each group or individual equipment	
	Gas	Supportable of gas history	O	
		Maximum period to get gas history	2 year	
		Gas history contents	Daily usage, Monthly usage and accumulated usage by each group or individual equipment	

1) This product is discontinued.

3.4 Product Description

			AC Smart 5	ACP 5
Energy Report	Run time	Supportable of run time history	0	
		Maximum period to get run time history	2 year	
		Run time history contents	Daily and Monthly usage by each group or individual equipment	
Auto control	Peak control	Priority	0~100% (1% degree)	
		Outdoor unit capacity	9 step (0, 40, 45, 50, 60, 70, 80, 90, 100) %	
	Demand control	Priority	-	0~100% (1% degree)
		Outdoor unit capacity	-	9 step (0, 40, 45, 50, 60, 70, 80, 90, 100) %
	Time limit	Setting time	30 min, 1 hour, 2 hour, 3 hour, 4 hour	
		Supporting device	Indoor unit, Ventilator, Direct Expansion Ventilator, Heating, AHU	
	Device interlocking	Maximum pattern number (Recommended specification)	40 (20)	
		Pattern type	General pattern, copy pattern, emergency pattern, 1:1 program	
		Supporting device	Indoor unit, ERV, ERV DX, Heating, AHU, Chiller, ACS IO, DOKIT ¹⁾	
		Input condition	Operating, error status, operation mode, fan speed, swing, room temperature(or humidity) (based on indoor unit)	
		Output condition	Operating, set temperature, operation mode, fan speed, swing (based on indoor unit)	
		Maintenance Time (Input condition)	1~60 min. (by min.)	
		Delay Time (Output condition)	1~60 min. (by min.)	
		Status	AND, OR, NAND, NOR	
Energy management	Energy navigation	Supporting	0	
		Graph	Daily usage, Monthly usage, Period+Predicted usage amount, Monthly target excess rate, usage in the previous year, yearly target amount	
		Excess standard	Predicted usage amount/Actual usage amount	
		Control level	7 levels	
		Control type	indoor unit operation rate, outdoor unit capacity control, indoor unit operation control	
		Control type setting	Auto/Manual	
Login	Concurrent login		10	
Group	Max. Unit per group		40	256
	Group Composition		10	
Error notice	Max. Receiving e-mail address		20	

1) This product is discontinued.

3.4 Product Description

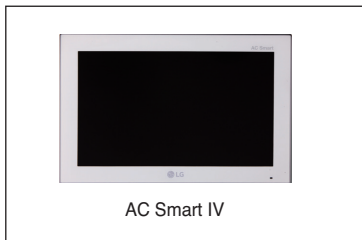
3.4.3 AC Smart IV, AC Smart 5

- Model name : PACS4B000, PACS5A000

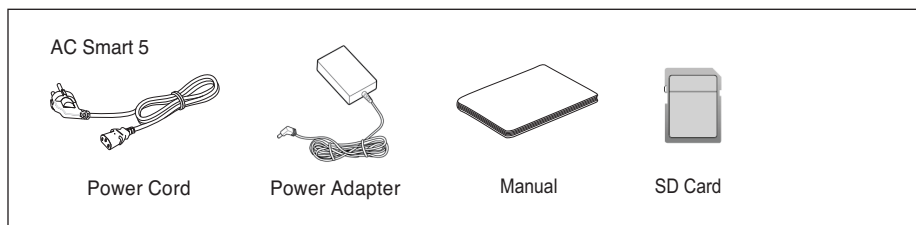
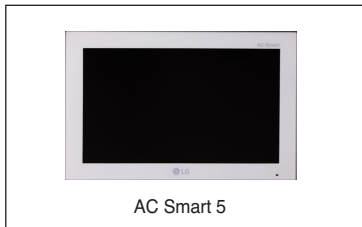
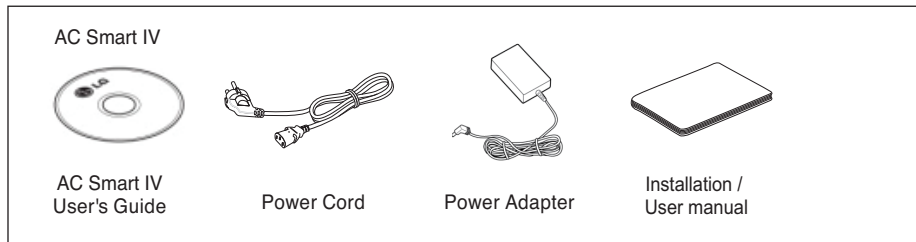
- AC Smart is a central controller installed in the management office of a building, or in the administration office of a school, to monitor and operate, via touch screen or Web access, the indoor units, ERV (ERV: Energy Recovery Ventilator, ERV DX: Direct Expansion Energy Recovery Ventilator), Heating, DI/DOs, DOKITs, AHUs and I/O Modules installed inside the building.
- AC Smart can manage, collectively or individually, the indoor units, ERV, Heating, DI/DOs, DOKITs and AHUs for up to 128 devices. (Or the indoor units, ERV, Heating, DI/DOs, DOKITs and AHUs for up to 64 devices and 9 I/O Modules)

3.4.3.1 Specifications & Dimensions

■ Features



■ Accessory



■ Product Specifications

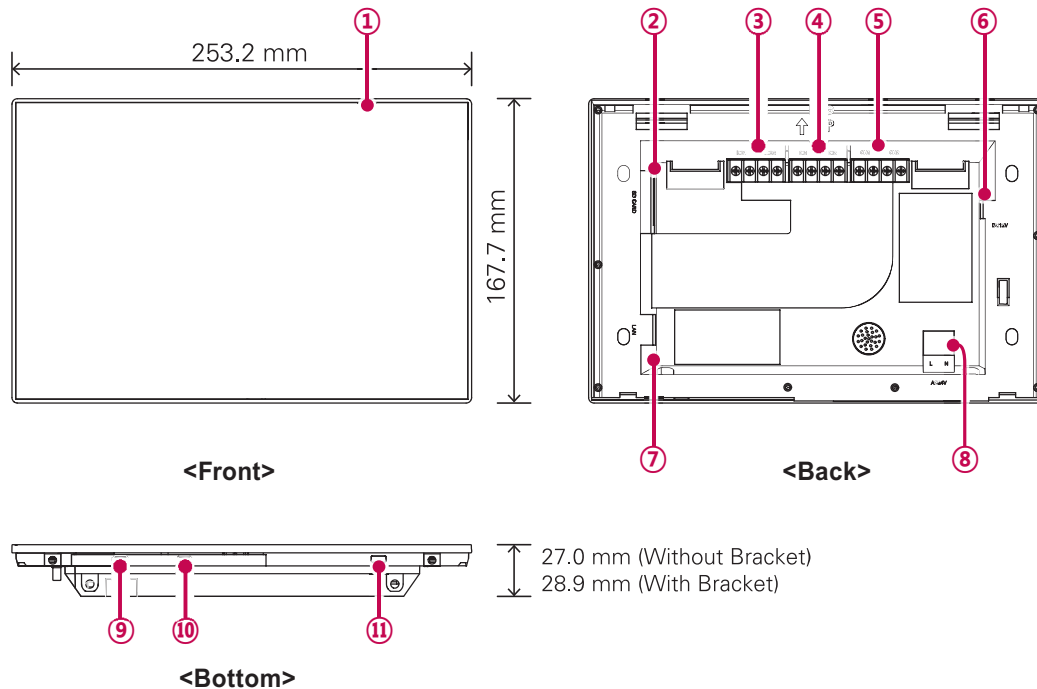
Item	Specifications
LCD	10 inch type WSVGA (1024 x 600) TFT LCD
Speaker	MONO 300 mW
RS485	2 Ports
USB/SD	<ul style="list-style-type: none"> • MICRO USB 1EA (for external USB memory, for service) • MINI USB 1EA • SD Card 1EA
DI	2 Ports
DO	2 Ports
Touch Screen	C-Type Touch Panel
Button Key	Less than 9 seconds (LCD POWER ON/OFF), 10 seconds (SYSTEM RESET)
POWER	12 V $\overline{=}$ (3.33 A), 24 V \sim
OS	Linux
IP rating	IP20

! NOTE

Product specifications may be different depending on the S/W version.

3.4 Product Description

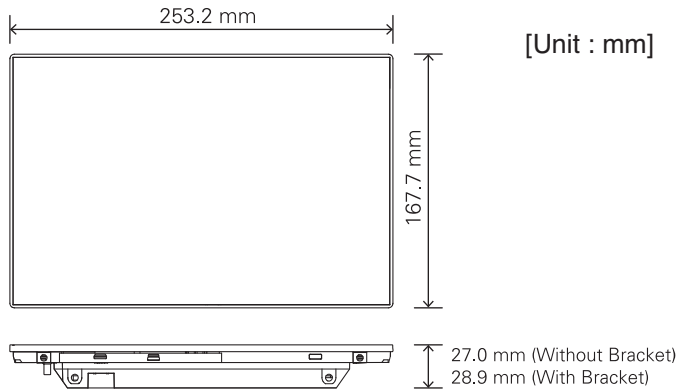
3.4.3.2 Name and Functions



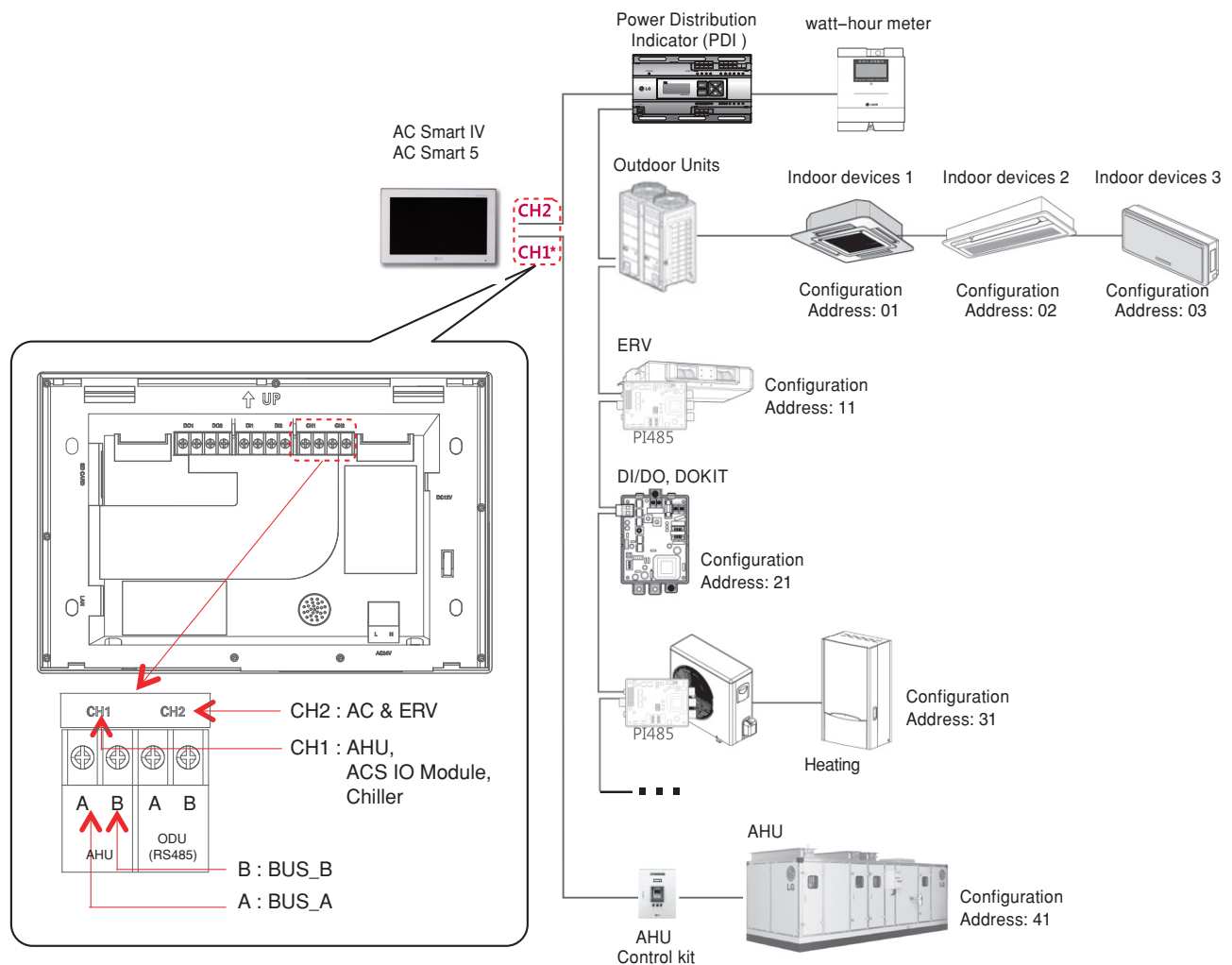
Number	Item	Description
①	Touch Screen	<ul style="list-style-type: none"> • 10 inch type LCD control panel • AC Smart control and information display
②	SD Memory Slot	SD card memory slot
③	DO Port	2CH DO port
④	DI Port	2CH DI port
⑤	485 Port	2CH 485 port (CH1: AHU and MODBUS communication device, CH2: devices other than AHU and MODBUS communication device)
⑥	12 V _{DC} Input Port	12 V _{DC} power input port
⑦	LAN Port	LAN cable port for Ethernet connection (100Mbps/10Mbps)
⑧	24 V _{AC} Input Port	24 V _{AC} power input port
⑨	Micro USB Port (for service)	Port for upgrading software and storing floor plans, reports, statistics, etc. (It needs cable to connect USB memory sticks, supporting USB 2.0 or later)
⑩	Mini USB Port	PC port for debugging software
⑪	Power ON/OFF	<ul style="list-style-type: none"> • Push less than 9 seconds to control AC Smart LCD backlight. • Push 10 seconds to reset AC Smart. • If you are not going to use AC Smart for a long time, it is recommended that the product be turned off to prolong the LCD backlight's life.

3.4 Product Description

■ Dimensions



3.4.3.3 Field Wiring Diagram



! NOTE

* AC Smart5 can be linked with AC & ERV in CH1 according to the setting.

3.4 Product Description

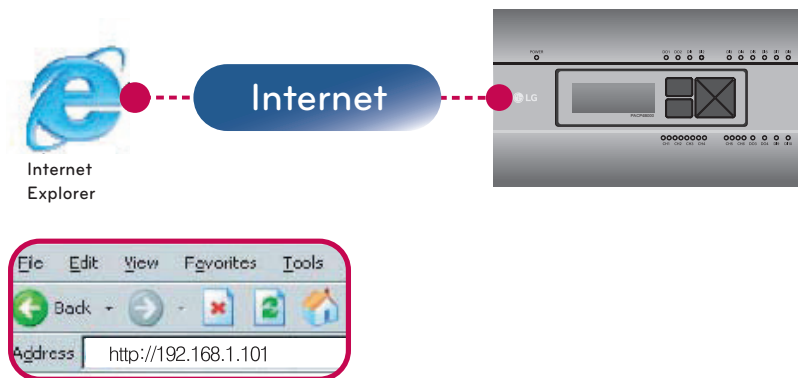
3.4.4 ACP IV, ACP 5

- Model name : PACP4B000, PACP5A000

ACP is the central controller that can manage up to 256 equipments in one space individually or as combined. ACP can monitor or control the equipments installed in each room of the building from the places such as the management office of a building or the administration office of a school.

■ Embedded web server function

Without an installation of a separate PC program, when IP address of ACP is input in the address window using Internet Explorer, the central control program in ACP is web server is automatically run, and the functions of various contents can be used.



Controlling of up to 256 air conditioner indoor units (ACS IO Interlocking : Control up to 128 indoor units and 16 I/O modules)

- Monitoring of error and operation status
- Controlling the peak power / demand power
- System setting function
- Up to 16 AHU can be interlocked

■ Devices that can interface with ACP IV, ACP 5

Device	ACP IV, ACP 5
AC Ez	O
AC Smart IV, AC Smart 5	O
AC Manager IV	O
Air Conditioner	O
ERV	O
Heating	O
Remote Shutdown	O
Demand Controller	O
Chiller	O (with chiller option S/W applied)
AHU	O
ACS IO	O
IP rating	IP20

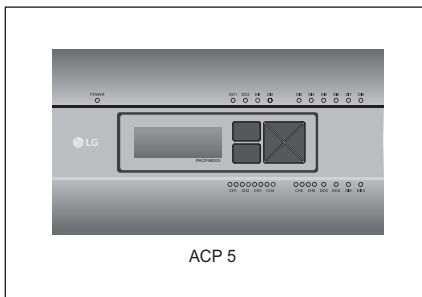
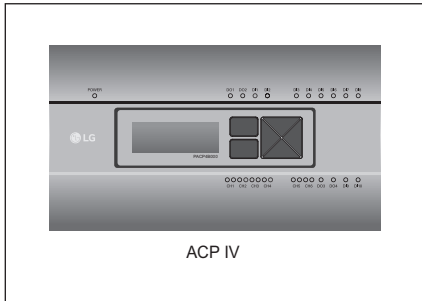
! NOTE

Product specifications may be different depending on the S/W version.

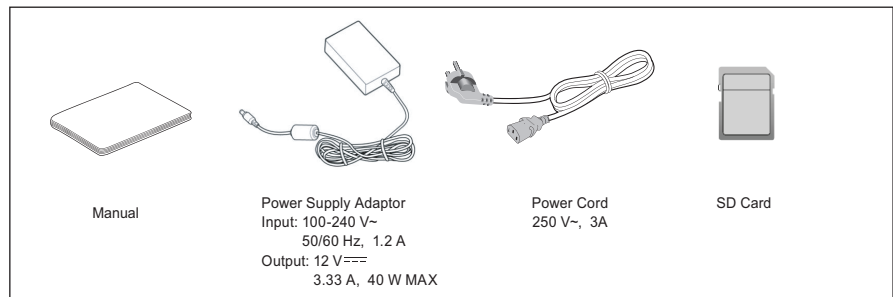
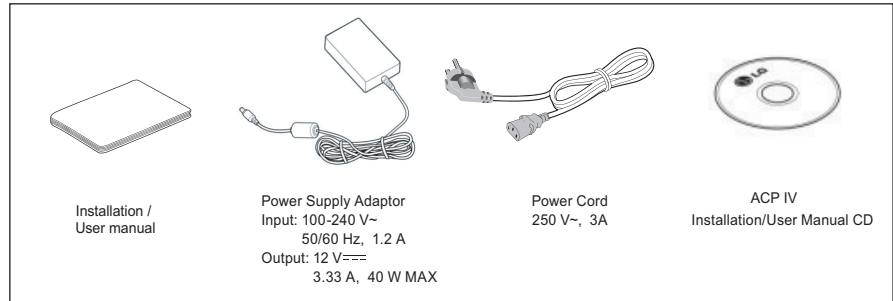
3.4 Product Description

3.4.4.1 Specifications & Dimensions

■ Features



■ Accessory



! NOTE

Components or options may differ from the actual product picture.

■ Product Specifications

Categories	Description
Boundary of usage temperature	0°C~40°C
Communication ports	<ul style="list-style-type: none"> - Ethernet 10 / 100 BASE-T - USB : USB Host (SW upgrade, data backup) mini USB Device (Debug) - RS485 communication ports 6EA - SD card slot (RS485 communication logging)
External input/output ports	- DI 10EA-Dry contact(N/O), DO 4EA-Relay Output(N/O, Max 30 V=== / 1A)
LED	27EA (RS communication status, Ethernet communication status, power status, operation status)
LCD	20 ×4 Character-LCD (network environment setting and information display)

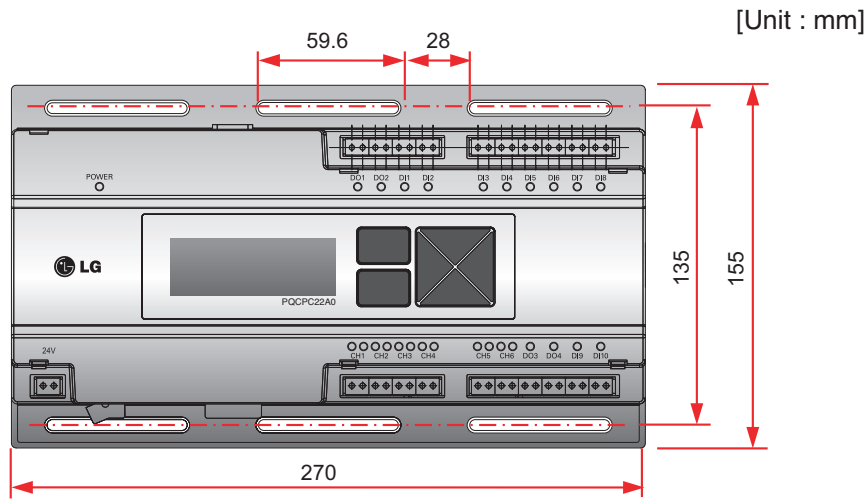
! NOTE

License policy

This product follows GPL (General Public License) for the use of Embedded Linux.

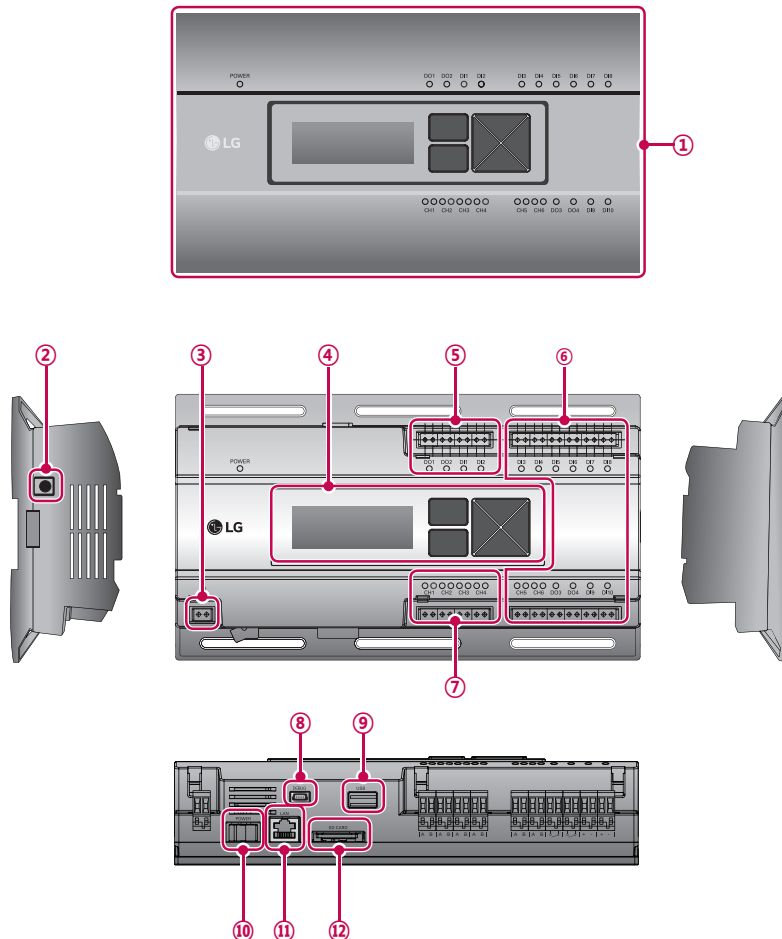
3.4 Product Description

■ Dimensions



※ Detailed figures are slightly different, depending on each Model.

■ Names of each part of ACP



3.4 Product Description

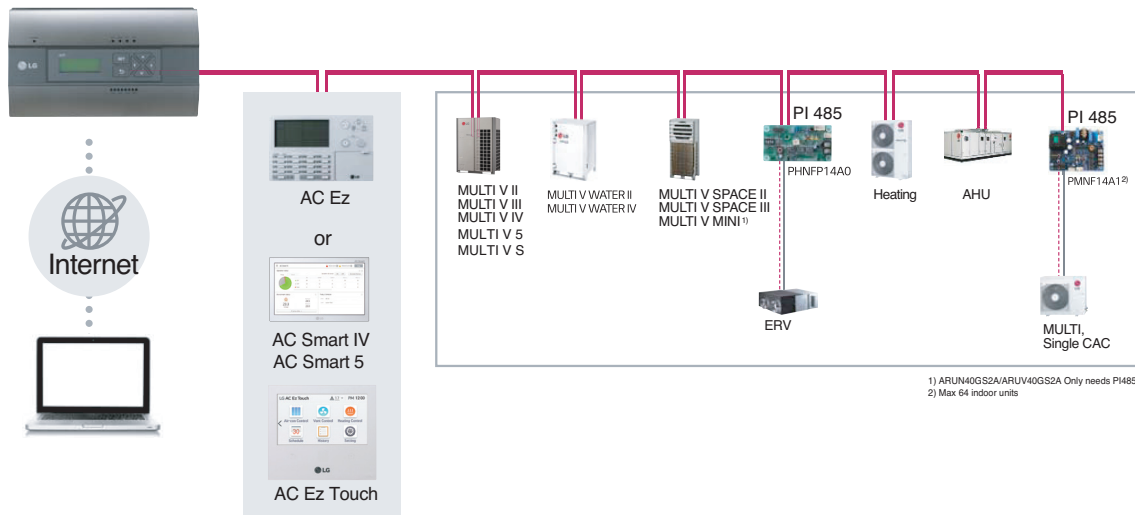
Number	Item	Description
①	Cover	Front cover of the ACP
②	Adaptor connection jack	Jack for 12 V _{DC} to connect to the power supply adaptor
③	Power port	24 V _{AC} port for power connection (not supported by 12 V _{DC} model)
④	Buttons and LCD	Buttons and LCD to set network environment and to display other information
⑤	Basic external input/output signal connectors	Connection ports to connect to external input/output signals (DI:2, DO:2)
⑥	Optional input/output and RS485 communication port.	8 DI's & 2 DO's are available to connect external I/O. CH5 & CH6 are Modbus Channels (Not used in US)
⑦	RS485 communication port	RS485 communication ports to connect to air conditioner and ERV equipment (4 in total)
⑧	Mini USB port	USB to Serial port for software debugging
⑨	USB port	For software update and data backup
⑩	Power switch	Switch to turn on or off the power of the ACP
⑪	Ethernet port	Ethernet port to connect to internet and AC Manager
⑫	SD card slot	For RS485 communication data backup.

NOTE

Product specifications may be different depending on the S/W version.

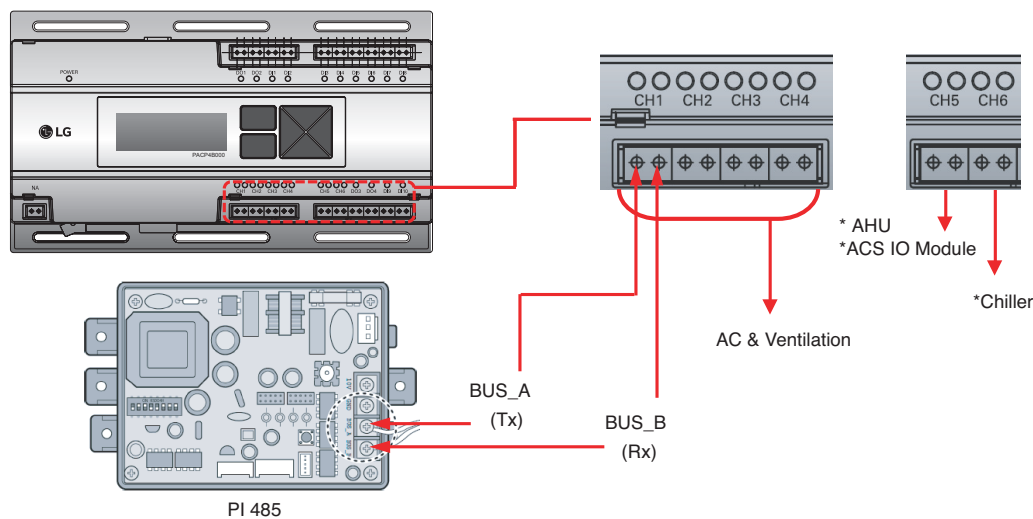
3.4 Product Description

3.4.4.2 Field Wiring Diagram



Connecting RS485 cable to the ACP

Up to 16 outdoor units can be connected to one RS485 port of the ACP, and up to 256 indoor units can be connected to one ACP. If there are many outdoor units to connect, the outdoor unit connections shall be appropriately connected to CH1 to CH4 in BUS format. Otherwise, the ACP may malfunction.



* Detailed figures are slightly different, depending on each Model.

* Chiller is optional. It can be activated by installing additional CHILLER OPTION program.

• RS485 communication cable connection

There is a polarity in RS485 communication cable connection, so be careful not to reverse the connection of the two cables. Do not let the length of RS485 communication cable exceed total of 1 km. RS485 communication cable must be connected with BUS type.

• IP address of the ACP

IP address of the ACP, address of Gateway, and Net mask must be requested to the person in charge of the network of the corresponding site.

! NOTE

Product specifications may be different depending on the S/W version.

3.4 Product Description

3.4.5 BACnet

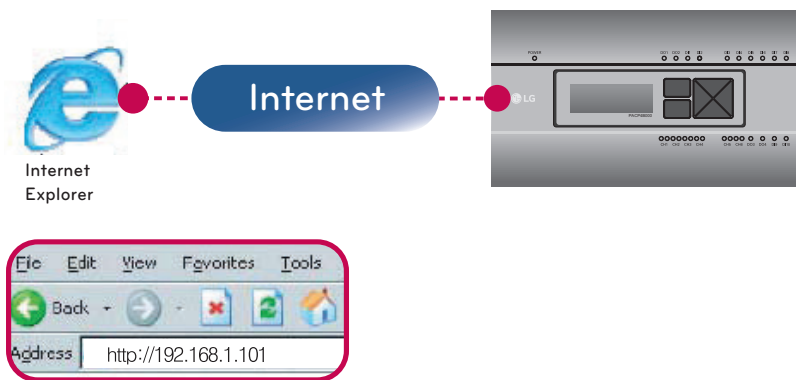
3.4.5.1 ACP BACnet, ACP 5

ACP BACnet is the central controller that can manage up to 256 equipments in one space individually or as combined. ACP BACnet can monitor or control the equipments installed in each room of the building from the places such as the management office of a building or the administration office of a school.

- Model name : PQNFB17C0, PACP5A000

■ Embedded web server function

Window using internet Explorer, the central program in ACP BACnet web server is automatically run, and the functions of various contents can be used.



- Controlling of up to 256 air conditioner indoor units
- Monitoring of error and operation status
- Controlling the peak power / demand power
- System setting function

■ Devices that can interface with ACP BACnet

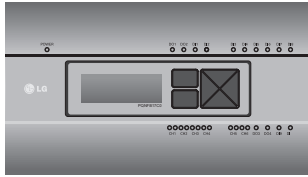
Device	ACP BACnet
AC Ez	O
Simple Central Controller	O
AC-Smart	O
AC Manager	O
Air Conditioner	O
ERV	O
Heating	O
Remote shutdown	O
Chiller	O ¹⁾
AHU	O
IP rating	IP20

1) It is possible to use in Web Only. (BMS Point is not applied)

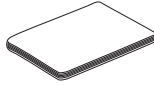
! NOTE

Product specifications may be different depending on the S/W version.

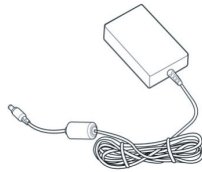
3.4 Product Description



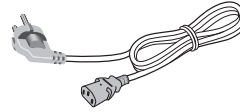
ACP BACnet



Installation
manual



*** Power Supply Adaptor
Input: 100-240 V~
50/60 Hz, 1.2 A
Output: 12 V---
3.33 A, 40 W MAX



Power Cord
250 V~, 3 A



ACP BACnet Installation/User
Manual CD

! NOTE

Power Supply Adaptor and Power Cord are not included in PQNFB17C1, PQNFB17C2.

*** North America model requires 24 V~ external power supply.

(Select an insulating transformer that complies with IEC61558-2-6 and NEC Class 2.)

■ ACP BACnet hardware specification

ACP BACNET HARDWARE SPECIFICATION IS AS FOLLOWS.

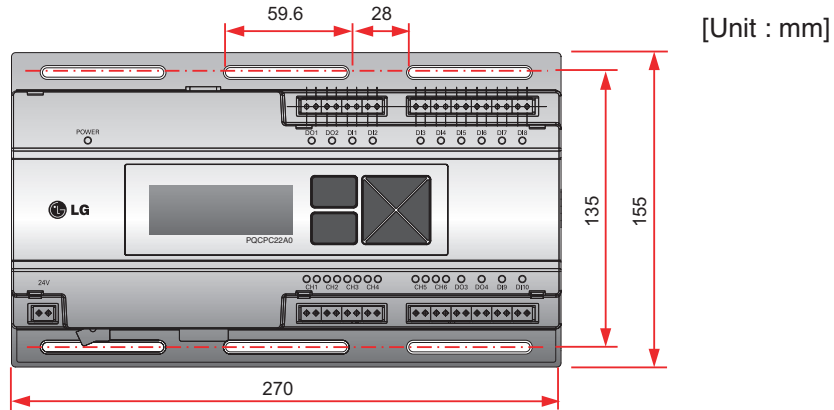
Category	Description
Boundary of usage temperature	0 °C ~ 40 °C (32 °F ~ 104 °F)
Rated Voltage	12 V--- & 24 V~ Depending on Model
Rated Current	Max 2.3 A
Communication ports	<ul style="list-style-type: none"> • Ethernet 10 / 100 BASE-T • USB : USB Host (SW upgrade, data backup) mini USB Device (Debug) • RS485 communication ports 6EA • SD card slot (RS485 communication logging)
External input/output ports	DI 10EA-Dry contact(N/O), DO 4EA-Relay Output(N/O, Max 30 V--- / 1A)
LED	27EA (RS communication status, Ethernet communication status, power status, operation status)
LCD	20 x4 Character-LCD (network environment setting and information display)

! NOTE

Product specifications may be different depending on the S/W version.

3.4 Product Description

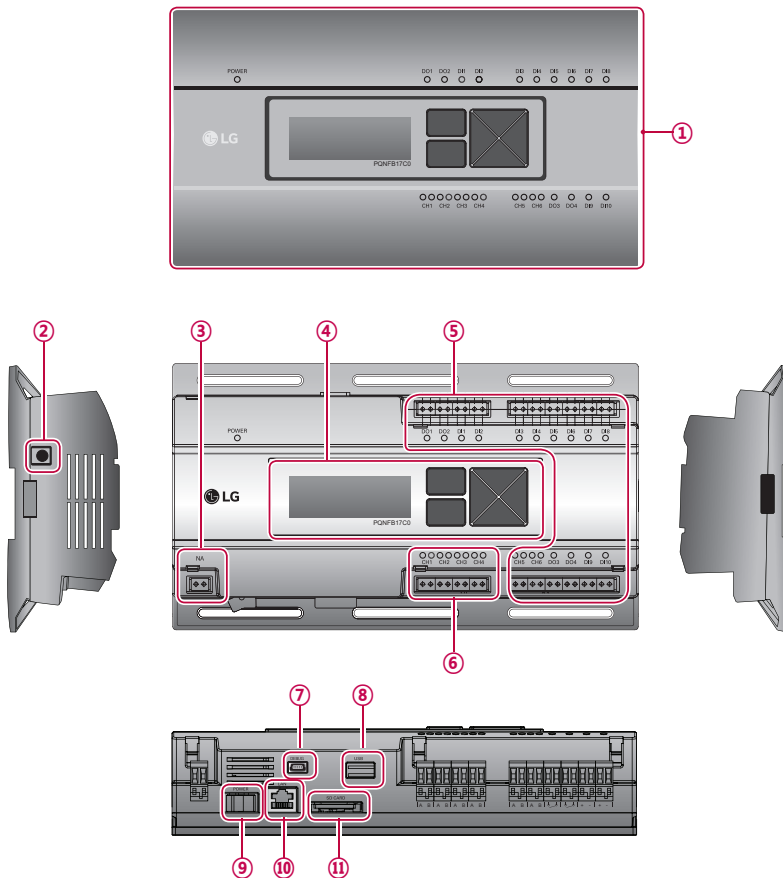
■ Dimensions



※ Detailed figures are slightly different, depending on each Model.

■ Names of each part of ACP BACnet

ACP BACnet is composed as follows.



3.4 Product Description

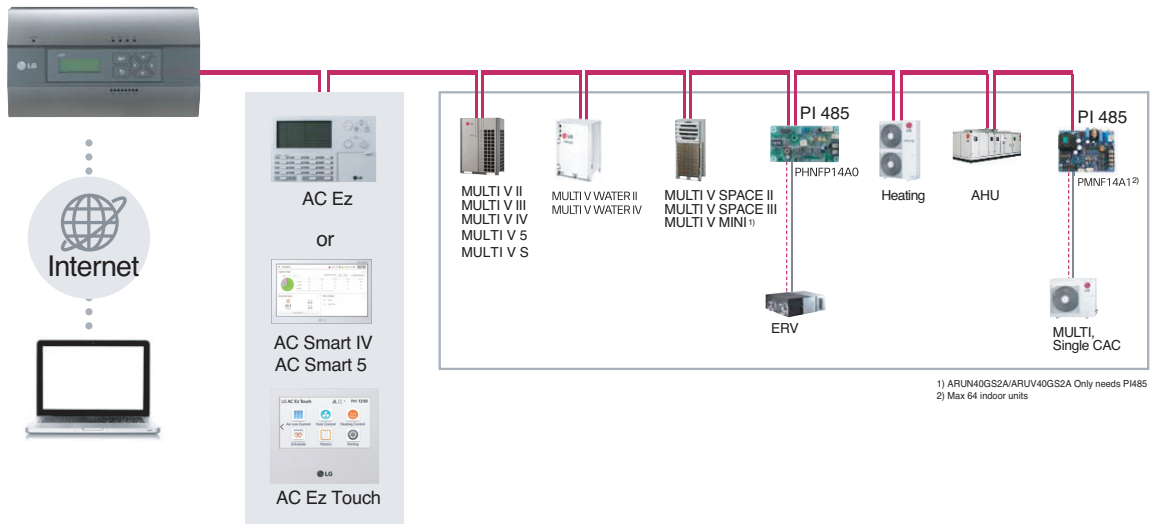
Number	Item	Description
①	Cover	Front cover of the ACP BACnet
②	Adaptor connection jack	Jack for 12 V--- to connect to the power supply adaptor (not supported by PQNFB17C1, PQNFB17C2)
③	Power port	24 V~ port for power connection (not supported by PQNFB17C0)
④	Buttons and LCD	Buttons and LCD to set network environment and to display other information
⑤	Optional input/output and RS485 communication port	10 DI's & 4 DO's are available to connect external I/O. CH5 & CH6 are Modbus Channels (Not used in US)
⑥	RS485 communication port	RS485 communication ports to connect to air conditioner and ERV equipment (4 in total)
⑦	Mini USB port	USB to Serial port for software debugging
⑧	USB port	For software update and data backup
⑨	Power switch	Switch to turn on or off the power of the ACP BACnet
⑩	Ethernet port	Ethernet port to connect to internet and AC Manager (AC Manager IV on version 4.0.0 or later)
⑪	SD card slot	For RS485 communication data backup.

NOTE

Product specifications may be different depending on the S/W version.

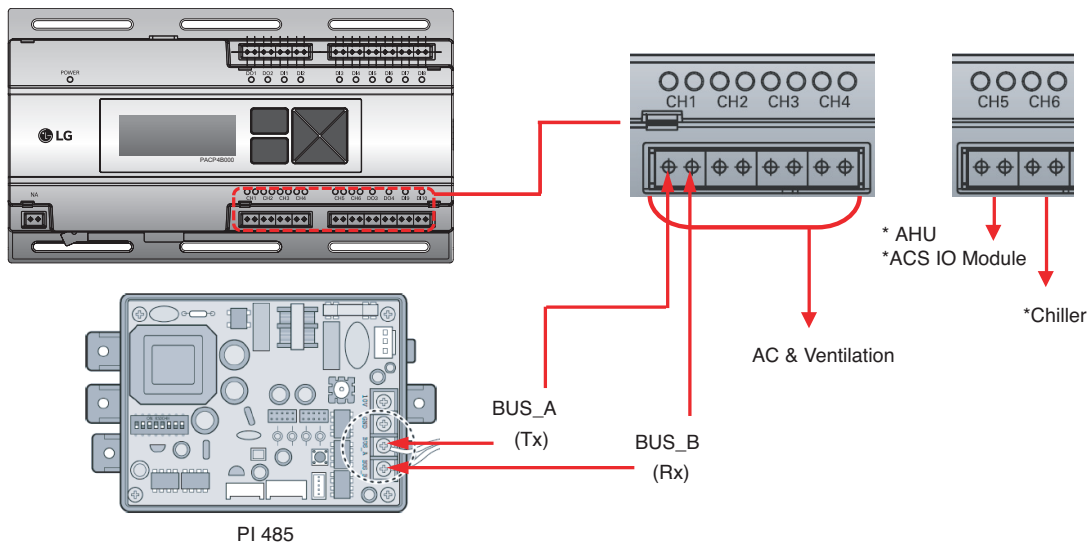
3.4 Product Description

■ Field Wiring Diagram



■ Connecting RS485 cable to the ACP BACnet

Up to 16 outdoor units can be connected to one RS485 port of the ACP BACnet, and up to 256 indoor units can be connected to one ACP BACnet. If there are many outdoor units to connect, the outdoor unit connections shall be appropriately connected to CH1 to CH4 in BUS format. Otherwise, the ACP BACnet may malfunction.



* Detailed figures are slightly different, depending on each Model.

* Chiller is optional. It can be activated by installing additional CHILLER OPTION program.

! NOTE

Product specifications may be different depending on the S/W version.

3.4 Product Description

■ Applicable Unit

BACnet IP	Modbus TCP
<ul style="list-style-type: none"> - Indoor unit - ERV, ERV DX - AHU - Outdoor unit (monitoring only) - Heating 	<ul style="list-style-type: none"> - Indoor unit - ERV, ERV DX - AHU - Heating

■ Switch between using BACnet and Modbus?

- They function simultaneously, so there is no specific setting to switch between them.

■ Differences between according to the model

Model	ACP IV	AC Smart IV	ACP BACnet (*New)	ACP Lonworks
Email Alarm	O	O	O	O
Setup Master/Slave	X	O	X	X
Save statistics	O	O	O	O
Save Report	O	O	O	O
Channel setting (For Chiller)	O	O	X	O
Network setting by GUI	O	O	O	X (Front LCD only)
Screen setting	X	O	X	X

O : Supported

X : Not supported

*ACP BACnet information is based on 5.14.1 version

3.4 Product Description

■ Comparison between Old and New PQNFB17C0

Items	Old (~ Nov. 2015)	New (Dec. 2015 ~)
Difference Of Design		
CPU	ARM Cortex A8 800Mhz	ARM Cortex A9 1Ghz
RAM	DDR2 128MB x 2	DDR2 256MB x 2
S/W Ver.	V3.1.5.	V5.14.1
LCD Display		
Email / Save to PC in Report / Log Menu	X 	O 
E-mail Setting in Environment Menu	X 	O 
Update S/W, DB Backup / Recovery in Environment Menu	X 	O 

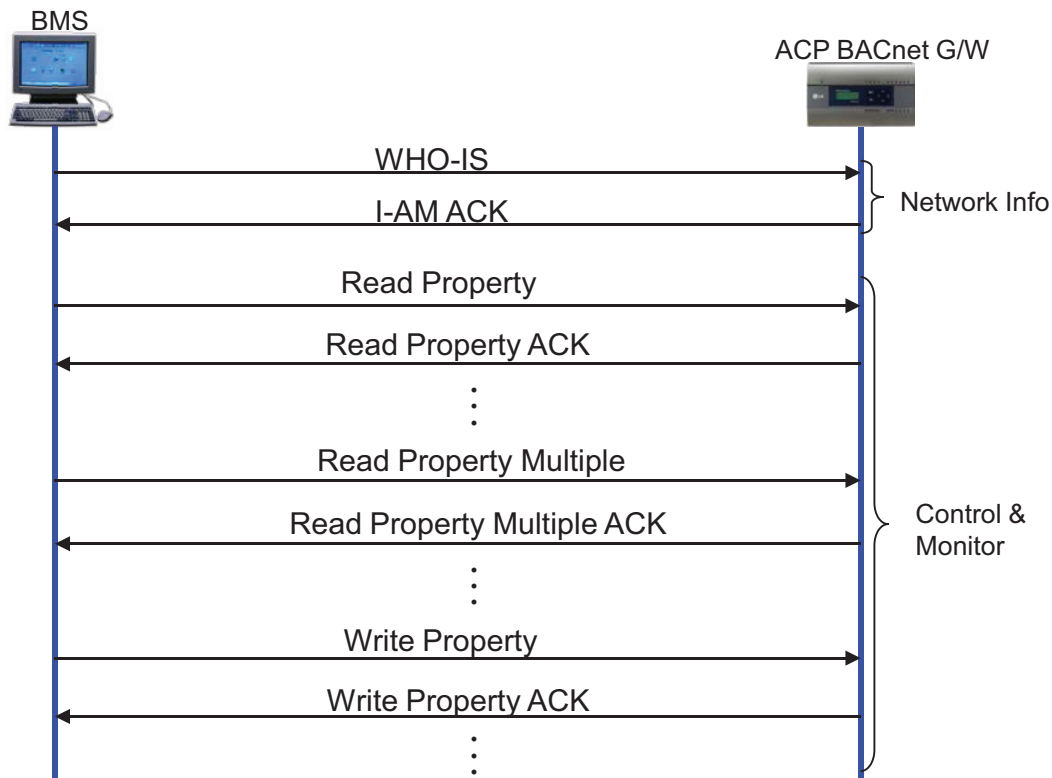
3.4 Product Description

■ Preparation – BACnet Service

• Main services of ACP BACnet

Service	Contents
Who-Is Service	Used to determine the device object identifier and network addresses of all devices on the network
I-Am Service	Used to respond to Who-Is service requests (device number)
ReadProperty	Request the value of one property of one BACnet Object
ReadPropertyMultiple	Request the values of one or more specified properties of one or more BACnet objects.
WriteProperty	Modify the value of a single specified property of a BACnet object
WritePropertyMultiple	Modify the value of one or more specified properties of a BACnet object.

• Sequence

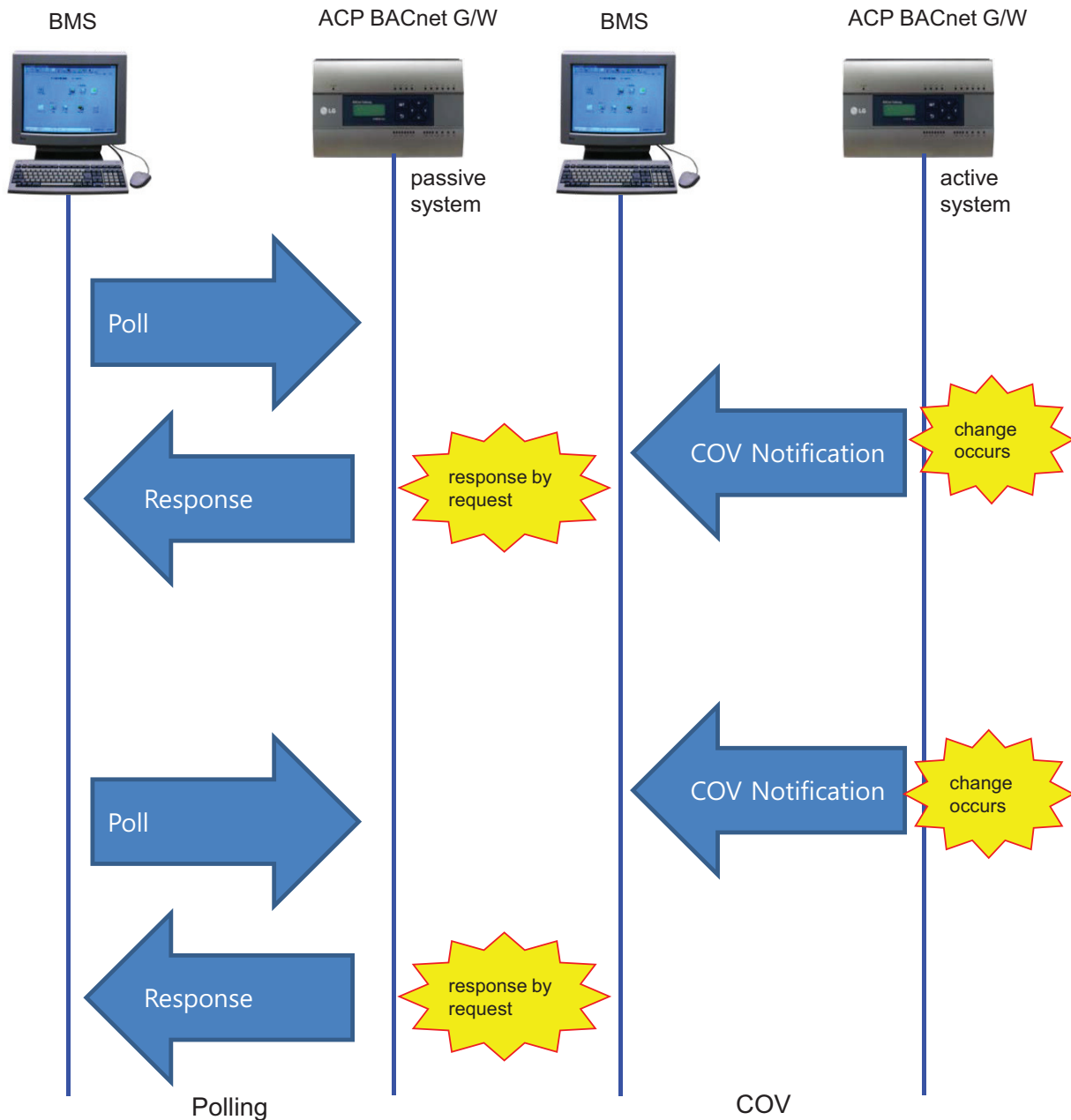


3.4 Product Description

■ Preparation – BACnet Communication

• Data transmission type : Polling vs COV (Change of Value)

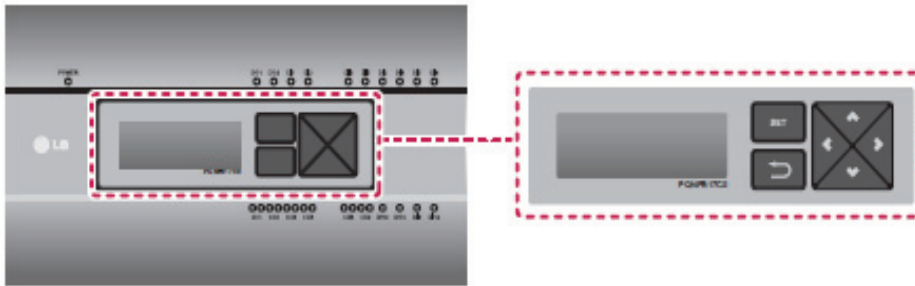
- Polling : ACP BACnet waits passively for BMS to poll them for data, and only then do the respond
- COV : When a value change has occurred, BACnet G/W sends notifications to the subscribers(BMS)



3.4 Product Description

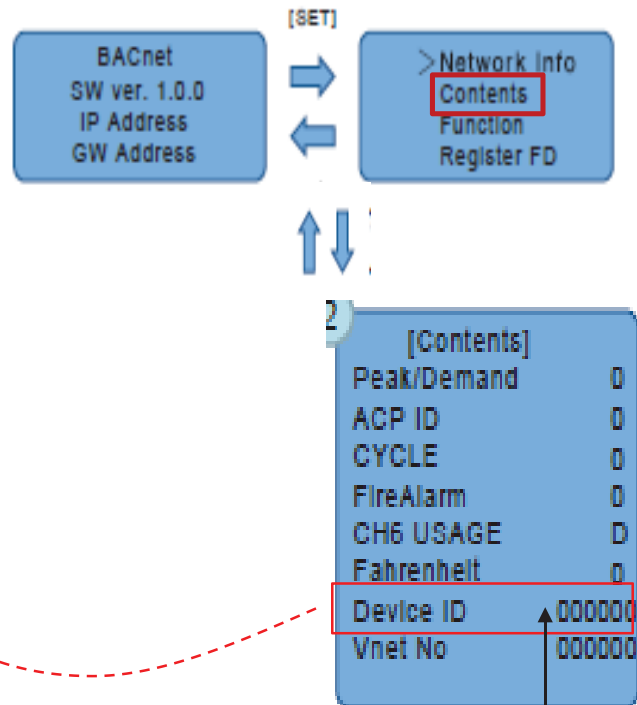
■ System Setting

- Each unit type has different Device instance no.
 - Default(first device instance number) is 9000
 - Change device instance number to be unique if necessary



Device instance No	Product type
9000	Airconditioner
9001	Ventilation
9002	AHU
9004	AWHP

*9003 : ODU
status points



Device instance
number setting
(default = 9000)

3.4 Product Description

■ Commissioning Step

1. Check all of LG unit status by using Web server S/W



2. Offering information of BACnet points to BMS

Item	Object Name	Unit	Address	Value	Unit	Address	Value	Unit	Address	Value
1	Chiller Status	Chiller	1000	0	Chiller	1001	0	Chiller	1002	0
2	Chiller Setpoint	Chiller	1003	0	Chiller	1004	0	Chiller	1005	0
3	Chiller Alarm	Chiller	1006	0	Chiller	1007	0	Chiller	1008	0
4	Chiller Fault	Chiller	1009	0	Chiller	1010	0	Chiller	1011	0
5	Chiller Stop	Chiller	1012	0	Chiller	1013	0	Chiller	1014	0
6	Chiller Start	Chiller	1015	0	Chiller	1016	0	Chiller	1017	0
7	Chiller Run	Chiller	1018	0	Chiller	1019	0	Chiller	1020	0
8	Chiller Stop	Chiller	1021	0	Chiller	1022	0	Chiller	1023	0
9	Chiller Start	Chiller	1024	0	Chiller	1025	0	Chiller	1026	0
10	Chiller Run	Chiller	1027	0	Chiller	1028	0	Chiller	1029	0
11	Chiller Stop	Chiller	1030	0	Chiller	1031	0	Chiller	1032	0
12	Chiller Start	Chiller	1033	0	Chiller	1034	0	Chiller	1035	0
13	Chiller Run	Chiller	1036	0	Chiller	1037	0	Chiller	1038	0
14	Chiller Stop	Chiller	1039	0	Chiller	1040	0	Chiller	1041	0
15	Chiller Start	Chiller	1042	0	Chiller	1043	0	Chiller	1044	0
16	Chiller Run	Chiller	1045	0	Chiller	1046	0	Chiller	1047	0
17	Chiller Stop	Chiller	1048	0	Chiller	1049	0	Chiller	1050	0
18	Chiller Start	Chiller	1051	0	Chiller	1052	0	Chiller	1053	0
19	Chiller Run	Chiller	1054	0	Chiller	1055	0	Chiller	1056	0
20	Chiller Stop	Chiller	1057	0	Chiller	1058	0	Chiller	1059	0
21	Chiller Start	Chiller	1060	0	Chiller	1061	0	Chiller	1062	0
22	Chiller Run	Chiller	1063	0	Chiller	1064	0	Chiller	1065	0
23	Chiller Stop	Chiller	1066	0	Chiller	1067	0	Chiller	1068	0
24	Chiller Start	Chiller	1069	0	Chiller	1070	0	Chiller	1071	0
25	Chiller Run	Chiller	1072	0	Chiller	1073	0	Chiller	1074	0
26	Chiller Stop	Chiller	1075	0	Chiller	1076	0	Chiller	1077	0
27	Chiller Start	Chiller	1078	0	Chiller	1079	0	Chiller	1080	0
28	Chiller Run	Chiller	1081	0	Chiller	1082	0	Chiller	1083	0
29	Chiller Stop	Chiller	1084	0	Chiller	1085	0	Chiller	1086	0
30	Chiller Start	Chiller	1087	0	Chiller	1088	0	Chiller	1089	0
31	Chiller Run	Chiller	1090	0	Chiller	1091	0	Chiller	1092	0
32	Chiller Stop	Chiller	1093	0	Chiller	1094	0	Chiller	1095	0
33	Chiller Start	Chiller	1096	0	Chiller	1097	0	Chiller	1098	0
34	Chiller Run	Chiller	1099	0	Chiller	1100	0	Chiller	1101	0
35	Chiller Stop	Chiller	1102	0	Chiller	1103	0	Chiller	1104	0
36	Chiller Start	Chiller	1105	0	Chiller	1106	0	Chiller	1107	0
37	Chiller Run	Chiller	1108	0	Chiller	1109	0	Chiller	1110	0
38	Chiller Stop	Chiller	1111	0	Chiller	1112	0	Chiller	1113	0
39	Chiller Start	Chiller	1114	0	Chiller	1115	0	Chiller	1116	0
40	Chiller Run	Chiller	1117	0	Chiller	1118	0	Chiller	1119	0
41	Chiller Stop	Chiller	1120	0	Chiller	1121	0	Chiller	1122	0
42	Chiller Start	Chiller	1123	0	Chiller	1124	0	Chiller	1125	0
43	Chiller Run	Chiller	1126	0	Chiller	1127	0	Chiller	1128	0
44	Chiller Stop	Chiller	1129	0	Chiller	1130	0	Chiller	1131	0
45	Chiller Start	Chiller	1132	0	Chiller	1133	0	Chiller	1134	0
46	Chiller Run	Chiller	1135	0	Chiller	1136	0	Chiller	1137	0
47	Chiller Stop	Chiller	1138	0	Chiller	1139	0	Chiller	1140	0
48	Chiller Start	Chiller	1141	0	Chiller	1142	0	Chiller	1143	0
49	Chiller Run	Chiller	1144	0	Chiller	1145	0	Chiller	1146	0
50	Chiller Stop	Chiller	1147	0	Chiller	1148	0	Chiller	1149	0
51	Chiller Start	Chiller	1150	0	Chiller	1151	0	Chiller	1152	0
52	Chiller Run	Chiller	1153	0	Chiller	1154	0	Chiller	1155	0
53	Chiller Stop	Chiller	1156	0	Chiller	1157	0	Chiller	1158	0
54	Chiller Start	Chiller	1159	0	Chiller	1160	0	Chiller	1161	0
55	Chiller Run	Chiller	1162	0	Chiller	1163	0	Chiller	1164	0
56	Chiller Stop	Chiller	1165	0	Chiller	1166	0	Chiller	1167	0
57	Chiller Start	Chiller	1168	0	Chiller	1169	0	Chiller	1170	0
58	Chiller Run	Chiller	1171	0	Chiller	1172	0	Chiller	1173	0
59	Chiller Stop	Chiller	1174	0	Chiller	1175	0	Chiller	1176	0
60	Chiller Start	Chiller	1177	0	Chiller	1178	0	Chiller	1179	0
61	Chiller Run	Chiller	1180	0	Chiller	1181	0	Chiller	1182	0
62	Chiller Stop	Chiller	1183	0	Chiller	1184	0	Chiller	1185	0
63	Chiller Start	Chiller	1186	0	Chiller	1187	0	Chiller	1188	0
64	Chiller Run	Chiller	1189	0	Chiller	1190	0	Chiller	1191	0
65	Chiller Stop	Chiller	1192	0	Chiller	1193	0	Chiller	1194	0
66	Chiller Start	Chiller	1195	0	Chiller	1196	0	Chiller	1197	0
67	Chiller Run	Chiller	1198	0	Chiller	1199	0	Chiller	1200	0
68	Chiller Stop	Chiller	1201	0	Chiller	1202	0	Chiller	1203	0
69	Chiller Start	Chiller	1204	0	Chiller	1205	0	Chiller	1206	0
70	Chiller Run	Chiller	1207	0	Chiller	1208	0	Chiller	1209	0
71	Chiller Stop	Chiller	1210	0	Chiller	1211	0	Chiller	1212	0
72	Chiller Start	Chiller	1213	0	Chiller	1214	0	Chiller	1215	0
73	Chiller Run	Chiller	1216	0	Chiller	1217	0	Chiller	1218	0
74	Chiller Stop	Chiller	1219	0	Chiller	1220	0	Chiller	1221	0
75	Chiller Start	Chiller	1222	0	Chiller	1223	0	Chiller	1224	0
76	Chiller Run	Chiller	1225	0	Chiller	1226	0	Chiller	1227	0
77	Chiller Stop	Chiller	1228	0	Chiller	1229	0	Chiller	1230	0
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79	Chiller Run	Chiller	1234	0	Chiller	1235	0	Chiller	1236	0
80	Chiller Stop	Chiller	1237	0	Chiller	1238	0	Chiller	1239	0
81	Chiller Start	Chiller	1240	0	Chiller	1241	0	Chiller	1242	0
82	Chiller Run	Chiller	1243	0	Chiller	1244	0	Chiller	1245	0
83	Chiller Stop	Chiller	1246	0	Chiller	1247	0	Chiller	1248	0
84	Chiller Start	Chiller	1249	0	Chiller	1250	0	Chiller	1251	0
85	Chiller Run	Chiller	1252	0	Chiller	1253	0	Chiller	1254	0
86	Chiller Stop	Chiller	1255	0	Chiller	1256	0	Chiller	1257	0
87	Chiller Start	Chiller	1258	0	Chiller	1259	0	Chiller	1260	0
88	Chiller Run	Chiller	1261	0	Chiller	1262	0	Chiller	1263	0
89	Chiller Stop	Chiller	1264	0	Chiller	1265	0	Chiller	1266	0
90	Chiller Start	Chiller	1267	0	Chiller	1268	0	Chiller	1269	0
91	Chiller Run	Chiller	1270	0	Chiller	1271	0	Chiller	1272	0
92	Chiller Stop	Chiller	1273	0	Chiller	1274	0	Chiller	1275	0
93	Chiller Start	Chiller	1276	0	Chiller	1277	0	Chiller	1278	0
94	Chiller Run	Chiller	1279	0	Chiller	1280	0	Chiller	1281	0
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96	Chiller Start	Chiller	1285	0	Chiller	1286	0	Chiller	1287	0
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99	Chiller Start	Chiller	1294	0	Chiller	1295	0	Chiller	1296	0
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101	Chiller Stop	Chiller	1300	0	Chiller	1301	0	Chiller	1302	0
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103	Chiller Run	Chiller	1306	0	Chiller	1307	0	Chiller	1308	0
104	Chiller Stop	Chiller	1309	0	Chiller	1310	0	Chiller	1311	0
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106	Chiller Run	Chiller	1315	0	Chiller	1316	0	Chiller	1317	0
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108	Chiller Start	Chiller	1321	0	Chiller	1322	0	Chiller	1323	0
109	Chiller Run	Chiller	1324	0	Chiller	1325	0	Chiller	1326	0
110	Chiller Stop	Chiller	1327	0	Chiller	1328	0	Chiller	1329	0
111	Chiller Start	Chiller	1330	0	Chiller	1331	0	Chiller	1332	0
112	Chiller Run	Chiller	1333	0	Chiller	1334	0	Chiller	1335	0
113	Chiller Stop	Chiller	1336	0	Chiller	1337	0	Chiller	1338	0
114	Chiller Start	Chiller	1339	0	Chiller	1340	0	Chiller	1341	0
115	Chiller Run	Chiller	1342	0	Chiller	1343	0	Chiller	1344	0
116	Chiller Stop	Chiller	1345	0	Chiller	1346	0	Chiller	1347	0
117	Chiller Start	Chiller	1348	0	Chiller	1349	0	Chiller	1350	0
118	Chiller Run	Chiller	1351	0	Chiller	1352	0	Chiller	1353	0
119	Chiller Stop	Chiller	1354	0	Chiller	1355	0	Chiller	1356	0
120	Chiller Start	Chiller	1357	0	Chiller	1358	0	Chiller	1359	0
121	Chiller Run	Chiller	1360	0	Chiller	1361	0	Chiller	1362	0
122	Chiller Stop	Chiller	1363	0	Chiller	1364	0	Chiller	1365	0
123	Chiller Start	Chiller	1366	0	Chiller	1367	0	Chiller	1368	0
124	Chiller Run	Chiller	1369	0	Chiller	1370	0	Chiller	1371	0
125	Chiller Stop	Chiller	1372	0	Chiller	1373	0	Chiller	1374	0
126	Chiller Start	Chiller	1375	0	Chiller	1376	0	Chiller	1377	0
127	Chiller Run	Chiller	1378	0	Chiller	1379	0	Chiller	1380	0
128	Chiller Stop	Chiller	1381	0	Chiller	1382	0	Chiller	1383	0
129	Chiller Start	Chiller	1384	0	Chiller	1385	0	Chiller	1386	0
130	Chiller Run	Chiller	1387	0	Chiller	1388	0	Chiller	1389	0
131	Chiller Stop	Chiller	1390	0	Chiller	1391	0	Chiller	1392	0
132	Chiller Start	Chiller	1393	0	Chiller	1394	0	Chiller	1395	0
133	Chiller Run	Chiller	1396	0	Chiller	1397	0	Chiller	1398	0
134	Chiller Stop	Chiller	1399	0	Chiller	1400	0	Chiller	1401	0
135	Chiller Start	Chiller	1402	0	Chiller	1403	0	Chiller	1404	0
136	Chiller Run	Chiller	1405	0	Chiller	1406	0	Chiller	1407	0
137	Chiller Stop	Chiller	1408	0	Chiller	1409	0	Chiller	1410	0
138	Chiller Start	Chiller	1411	0	Chiller	1412	0	Chiller	1413	0
139	Chiller Run	Chiller	1414	0	Chiller	1415	0	Chiller	1416	0
140	Chiller Stop	Chiller	1417	0	Chiller	1418	0	Chiller	1419	0
141	Chiller Start	Chiller	1420	0	Chiller	1421	0	Chiller	1422	0
142	Chiller Run	Chiller	1423	0	Chiller	1424	0	Chiller	1425	0
143	Chiller Stop	Chiller	1426	0	Chiller	1427	0	Chiller	1428	0
144	Chiller Start	Chiller	1429	0	Chiller	1430	0	Chiller	1431	0

3.4 Product Description

■ Certification & PICS

Link → <http://www.bacnetinternational.net/btl/index.php?m=97>



Global Testing for the Global BAS Standard



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BTL Listing of Tested Products

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LG Electronics

kic.lgeatron.com

BACnet Advanced Operator Workstation (B-AWS)

Product	Model	Version	PICS	BTL Listing	Certificate
LG BECON Manager	All models	2.4			

BACnet Operator Workstation (B-OWS)

Product	Model	Version	PICS	BTL Listing	Certificate
LG Building Management	VQC-A1Q15	1.5	PICS not provided		

BACnet Building Controller (B-BC)

Product	Model	Version	PICS	BTL Listing	Certificate
LG Building Controller	VDQ-00QA2	2.0			
LG Building Controller	VDQ-00QA1	2.1.1	PICS not provided		

BACnet Advanced Application Controller (B-AAC)

Product	Model	Version	PICS	BTL Listing	Certificate
LG Smart Lighting Manager	9LH00N5VXX1	3.5			

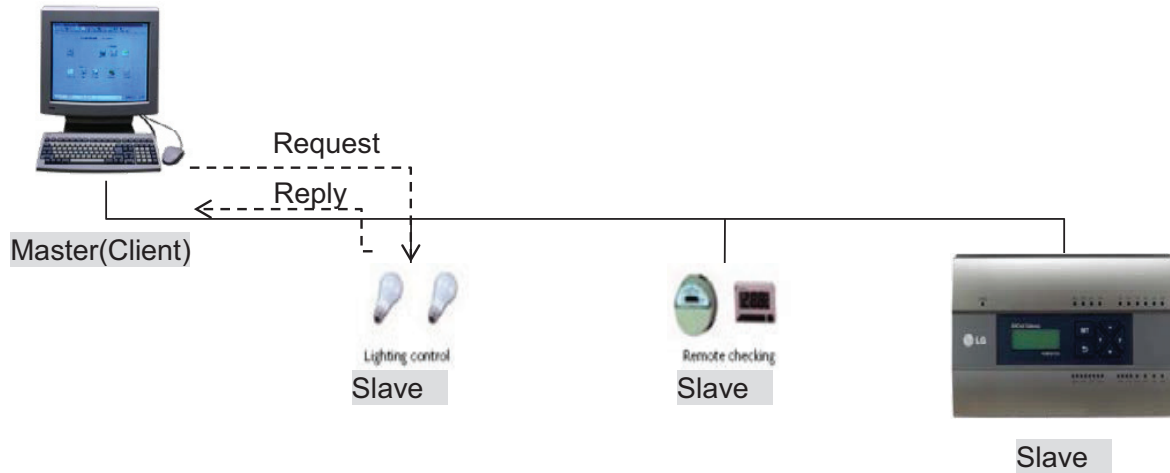
BACnet Application Specific Controller (B-ASC)

Product	Model	Version	PICS	BTL Listing	Certificate
AC Smart 5	PACSSA000	1.50.4 (BACnet 1.30.2f)			
AC Smart BACnet	PBACNA000	4.01.2c			
ACP BACnet	PQNF817C2, PQNF817C1, PQNF817C0, PNF-B17C0	5.08.1 (Tested 3.0.1f)			
BNU-BAC (BACnet Gateway)	PQNF817B0	4.0			

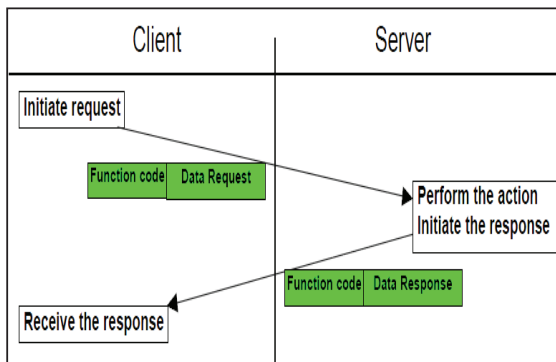
3.4 Product Description

■ Preparation – Modbus Concept

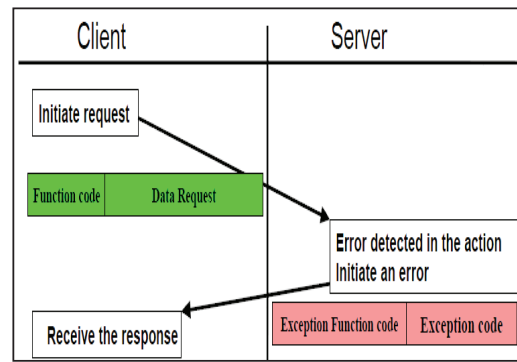
• Master / Slave Communication Architecture



• Modbus transaction



Modbus transaction (error free)



Modbus transaction (error response)

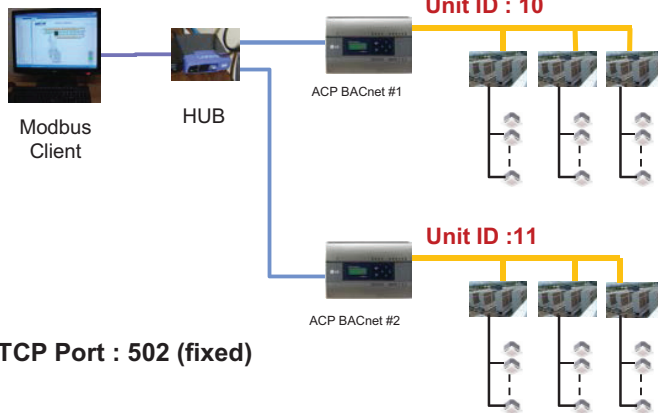
3.4 Product Description

■ System Setting

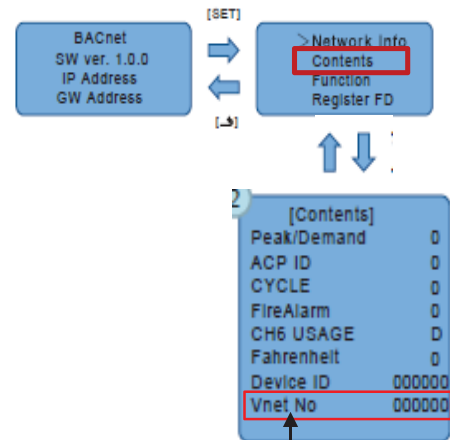
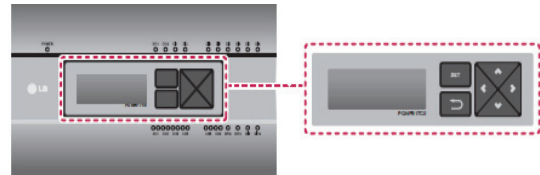
• Set the Unit ID

- 'Vnet No' setting on the LCD (default value is 10)
- Each ACP BACnet must have unique ID.

ex)



- TCP Port : 502 (fixed)

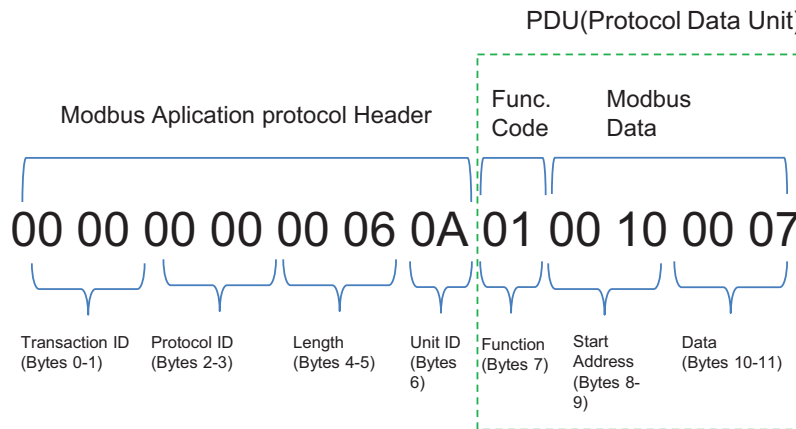


Vnet No setting
(default = 10)

3.4 Product Description

■ Message Frame

• Request



* Protocol ID : 0 (fixed) / Length : remaining bytes in this frame

1. Unit ID : 'Vnetno' setting value (default:10 (0x0A))

2. Function Code

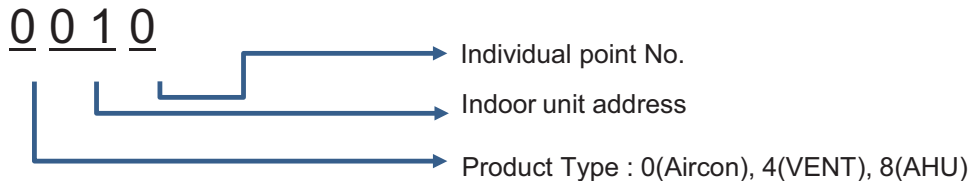
→ 01 : Read Coils,

03 : Read Holding Register,

05 : Write Single Coils,

06 : Write Single Register

3. Starting Address structure



4. Data : Count to read

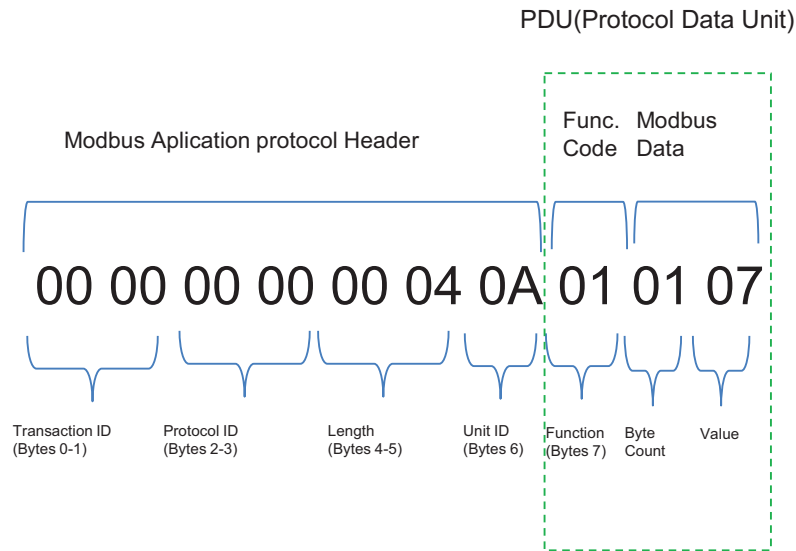
→ ex) 00 07 : read 7 points

In case of Read Coils (Function Code : 01), up to 2000 addresses can be read at a time

In case of Read Holding Registers (Function Code : 03), up to 125 addresses can be read at a time

3.4 Product Description

• Response



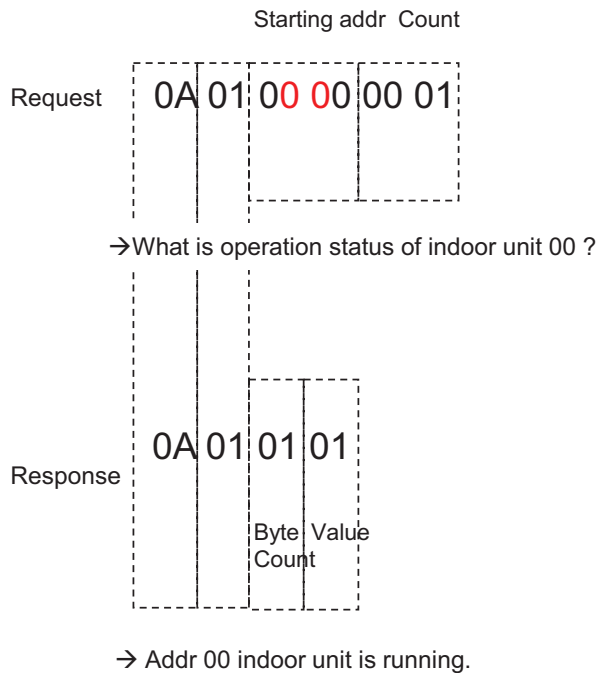
* Protocol ID : 0 (fixed) / Length : remaining bytes in this frame

1. Unit ID : 'Vnet no' setting value (default : 10 (0x0A))
2. Function Code
 - 01 : Read Coils,
 - 03 : Read Holding Register,
 - 05 : Write Single Coils,
 - 06 : Write Single Register
3. Byte Count : bytes to read
4. Value

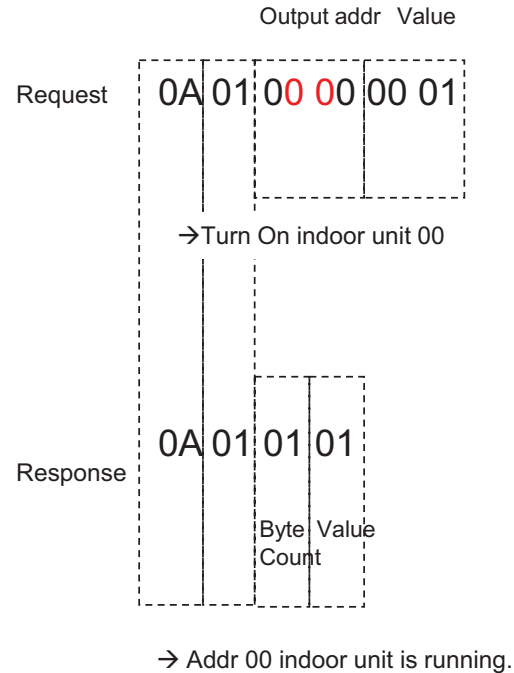
3.4 Product Description

• Example

Read Coils(0x01)



Write single Coils(0x05)



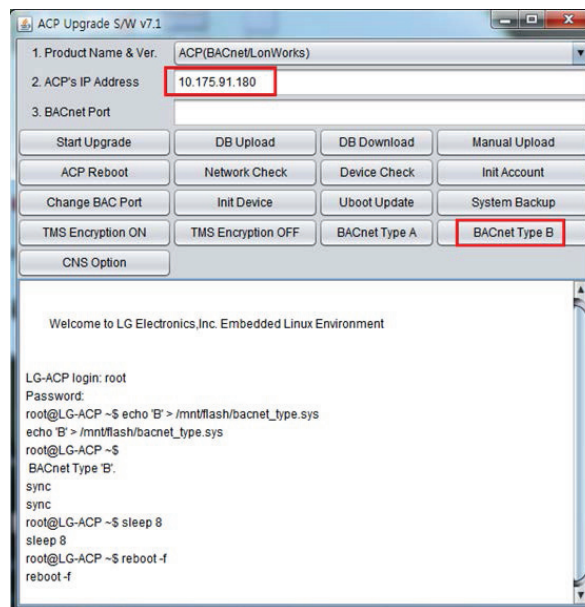
■ BACnet Type Setting

ACP BACnet has 2 kinds of response type. It can be selected with Service Tool.

- A Type : When responding to the BACnet protocol, the MAC address is the same regardless of the Device ID.
- B Type : When responding to the BACnet protocol, the MAC address depends on the Device ID

How to set Type B

1. Input IP address of ACP BACnet
2. Click BACnet Type B button



3.4 Product Description

3.4.5.2 AC Smart BACnet, AC Smart 5

- Model name : PBACNA000, PACS5A000

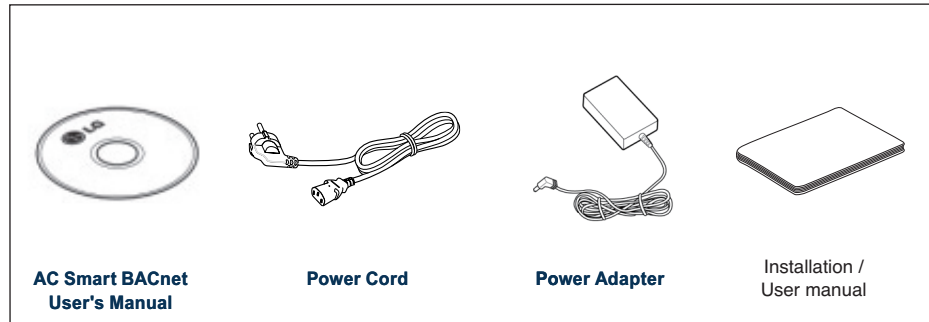
AC Smart BACnet is a central controller installed in the management office of a building, or in the administration office of a school, to monitor and operate, via touch screen or Web access, the indoor units, ERV (ERV: Energy Recovery Ventilator, ERV DX: Direct Expansion Energy Recovery Ventilator), Heating, DI/DOs, DOKITs, AHUs and I/O Modules installed inside the building. AC Smart BACnet can manage, collectively or individually, the indoor units, ERV, Heating, DI/DOs, DOKITs, and AHUs for up to 128 devices. (Or the indoor units, ERV, Heating, DI/DOs, DOKITs, and AHUs for up to 64 devices and 9 I/O Modules)

● Specifications & Dimensions

■ Features



■ Accessory



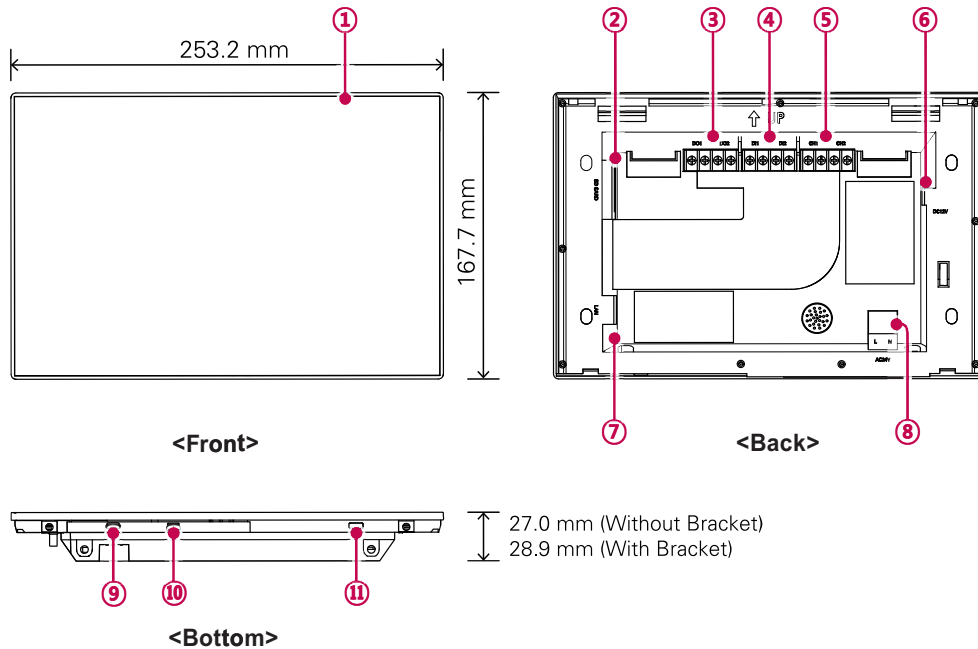
■ Product Specifications

Item	Specifications
LCD	10 inch type WSVGA (1024 x 600) TFT LCD
Speaker	MONO 300 mW
RS485	2 Ports
USB/SD	<ul style="list-style-type: none"> • MICRO USB 1EA (for external USB memory, for service) • MINI USB 1EA • SD Card 1EA
DI	2 Ports
DO	2 Ports
Touch Screen	C-Type Touch Panel
Button Key	Less than 9 seconds (LCD POWER ON/OFF), 10 seconds (SYSTEM RESET)
POWER	12 V--- (3.33 A), 24 V~
OS	Linux
IP rating	IP20

3.4 Product Description

■ Features and Functions

The features and functions of AC Smart BACnet are as follows.



Number	Item	Description
①	Touch Screen	<ul style="list-style-type: none"> • 10 inch type LCD control panel • AC Smart BACnet control and information display
②	SD Memory Slot (for service)	SD card memory slot for software upgrade
③	DO Port	2CH DO port
④	DI Port	2CH DI port
⑤	485 Port	2CH 485 port (CH1: AHU, CH2: devices other than AHU)
⑥	12 V --- Input Port	12 V --- power input port
⑦	LAN Port	LAN cable port for Ethernet connection (100Mbps/10Mbps)
⑧	24 V \sim Input Port	24 V \sim power input port
⑨	Micro USB Port (for service)	USB 2.0 to connect USB memory sticks storing floor plans, reports, statistics, etc.
⑩	Mini USB Port	PC port for software upgrade
⑪	Power ON/OFF	<ul style="list-style-type: none"> • Push less than 10 seconds to control AC Smart BACnet LCD backlight. • Push 10 seconds or more to reset AC Smart BACnet. • If you are not going to use AC Smart BACnet for a long time, it is recommended that the product be turned off to prolong the LCD backlight's life.

3.4 Product Description

3.4.6 ACP Lonworks

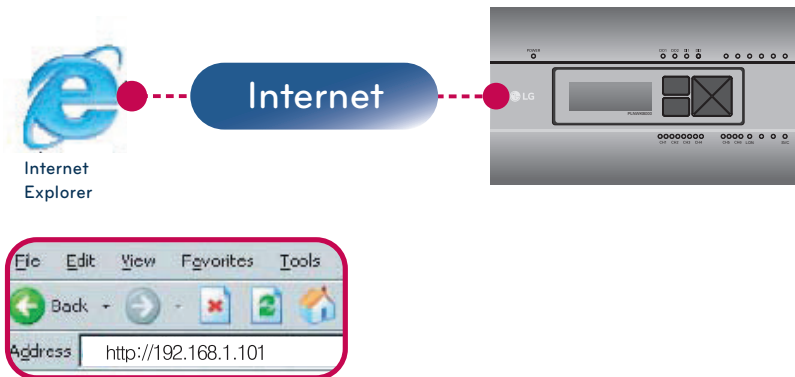
ACP Lonworks(ACP Lonworks Gateway) is the central controller that can manage up to 64 equipments in one space individually or as combined.

- In case of air conditioner indoor unit, up to 64 indoor units
 - In case of AHU unit, up to 16 units
 - * It is required a separate ACP Lonworks for each other product type(air conditioner, AHU).
- ACP Lonworks can't connect air conditioner indoor unit, AHU unit at the same time.

- Model name : PLNWKB000

■ Embedded web server function

Without an installation of a separate PC program, when IP address of ACP Lonworks is input in the address window using Internet Explorer, the central control program in ACP Lonworks web server is automatically run, and the functions of various contents can be used.



- Controlling of Up to 64 indoor units (up to 48 indoor units on PLNWKB100 version 2.2.0 or later)
- Monitoring of error and operation status
- Controlling the peak power / demand power
- System setting function

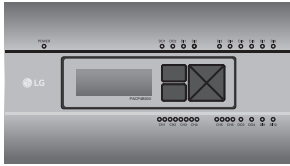
■ Devices that can interface with ACP Lonworks

Device	ACP Lonworks
AC Ez	O
Simple Central Controller	O
AC Smart	O
AC Manager	O
Air Conditioner	O
ERV	O
Heating(AWHP)	O
Remote Shutdown	O
Demand Controller	O
AHU	O
IP rating	IP20

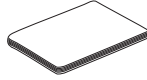
! NOTE

Product specifications may be different depending on the S/W version.

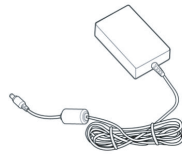
3.4 Product Description



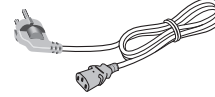
ACP Lonworks



Installation /
User manual



Power Supply Adaptor
Input: 100-240 V~
50/60 Hz, 1.2 A
Output: 12 V===
3.33 A, 40 W MAX



Power Cord
250 V~, 3A



ACP Lonworks
Installation/User Manual CD

! NOTE

- May be different from the image that has been shown and items sold separately parts.
- Power Supply Adaptor and Power Cord are not included in PLNWKB100 (24 V~ power use)

■ ACP Lonworks hardware specification

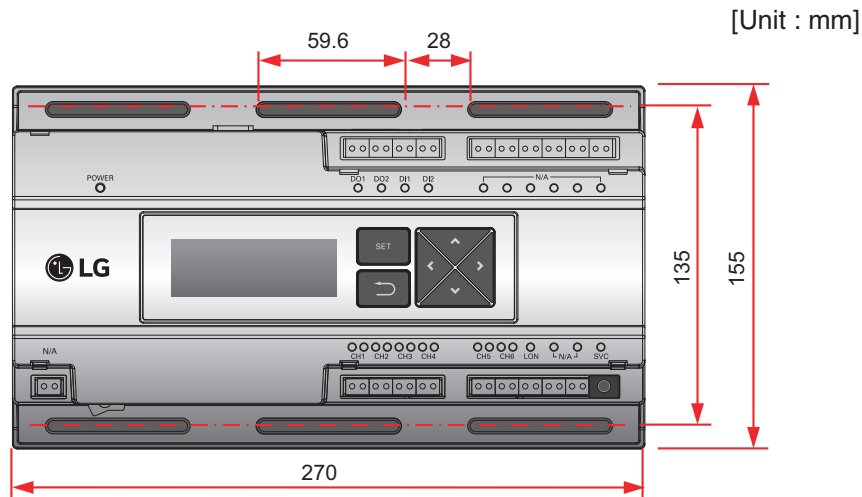
Category	Description
Boundary of usage temperature	0 °C ~ 40 °C
Rated Voltage	12 V=== (PLNWKB000), 24 V~(PLNWKB100)
Rated Current	Max 2.3 A
CPU	i.MX515 – 32Bit 800 MHz speed(Option:MPC5668G, 116 MHz)
RAM	128MB DDR2 SDRAM * 2EA
ROM	4GB i-NAND Flash
Communication ports	<ul style="list-style-type: none"> • Ethernet 10 / 100 BASE-T • USB: USB Host (SW upgrade, data backup) mini USB Device (Debug) • RS485 communication ports 6EA • Lon communication port 1EA • SD card slot (RS485 communication logging) • RS-232 Console Port (HMI)
External input/output ports	DI 2EA-Dry contact(N/O), DO 2EA-Relay Output(N/O, Max 30 V=== / 1A)
LED	27EA (RS communication status, Ethernet communication status, power status, operation status)
LCD	20 x4 Character-LCD (network environment setting and information display)

! NOTE

Product specifications may be different depending on the S/W version.

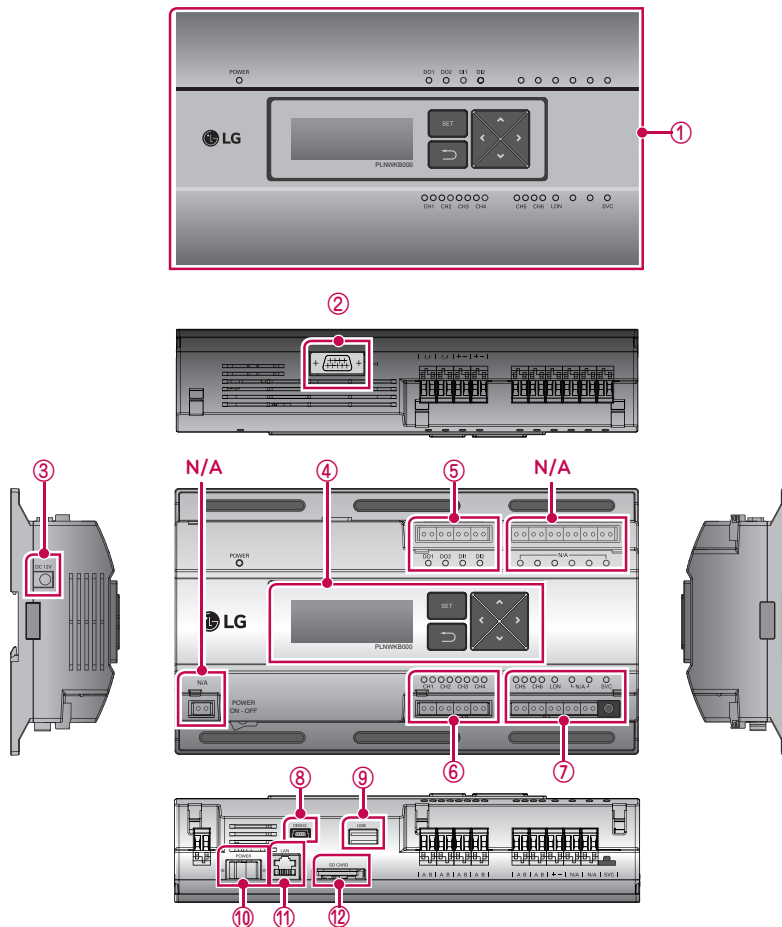
3.4 Product Description

■ Dimensions



✳ Detailed figures are slightly different, depending on each Model.

■ Names of each part of ACP Lonworks



3.4 Product Description

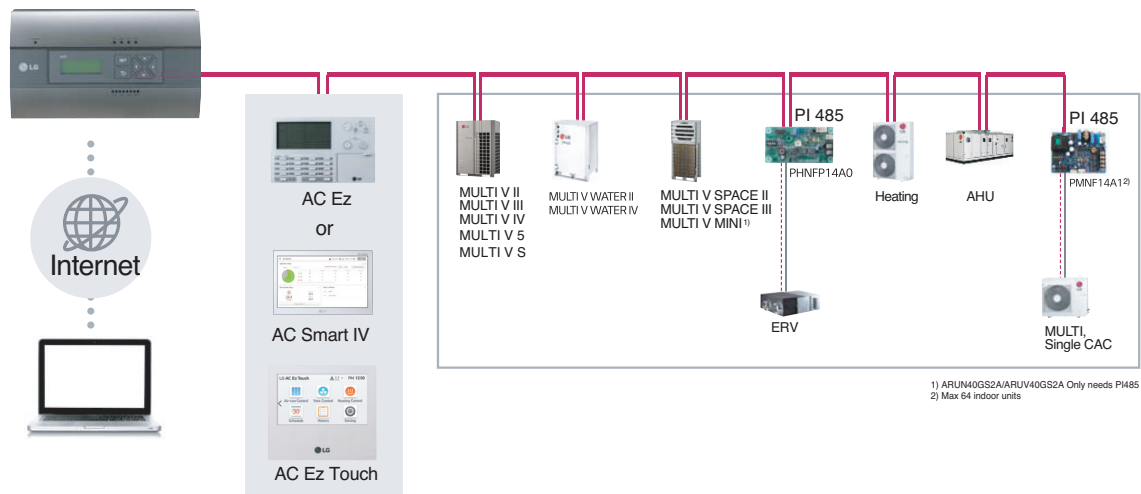
Number	Item	Description
①	Cover	Front cover of the ACP Lonworks
②	RS-232 console port	Reserved communication port
③	Adaptor connection jack	Jack for DC 12 V \equiv to connect to the power supply adaptor
④	Power port	24 V \sim port for power connection (not supported by 12 V \equiv model)
⑤	Buttons and LCD	Buttons and LCD to set network environment and to display other information
⑥	Basic external input/output signal connectors	Connection ports to connect to external input/output signals (DI:2, DO:2)
⑦	RS-485 communication port	RS-485 communication ports to connect to air conditioner and ERV equipment (4 in total)
⑧	RS-485, LON communication ports and BMS connection button(SERVICE SWITCH)	RS-485 communication ports(2EA) and LON communication port(1EA)
⑨	Mini USB port	USB to Serial port for software debugging
⑩	USB port	For software update and data backup
⑪	Power switch	Switch to turn on or off the power of the ACP Lonworks
⑫	Ethernet port	Ethernet port to connect to internet and AC Manager
⑬	SD card slot	For RS-485 communication data backup.

NOTE

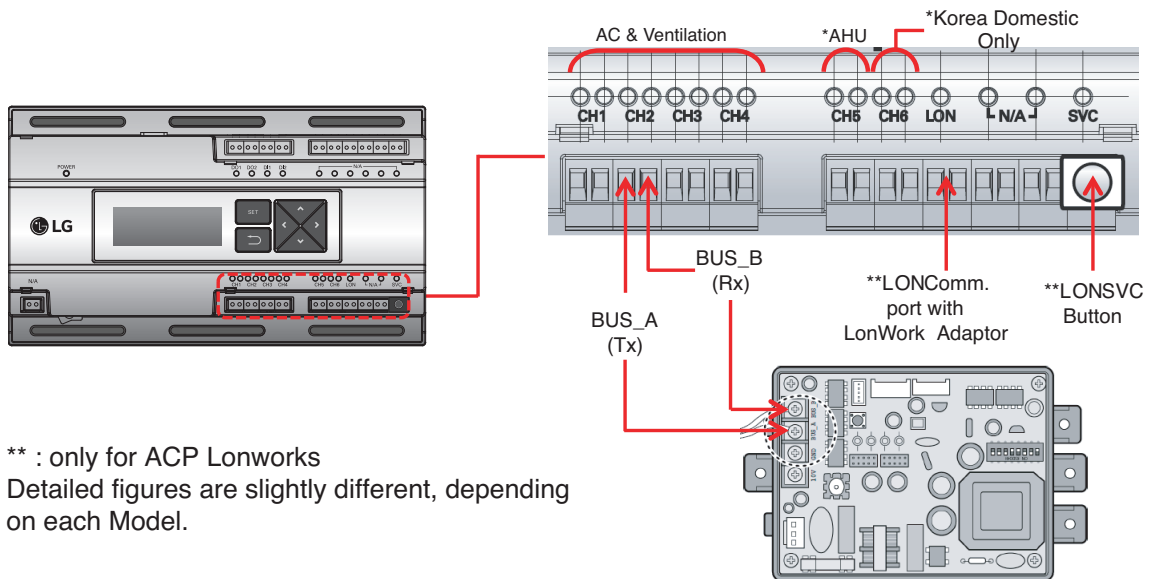
Product specifications may be different depending on the S/W version.

3.4 Product Description

3.4.6.1 Field Wiring Diagram



■ ACP Lonworks



! NOTE

Product specifications may be different depending on the S/W version.

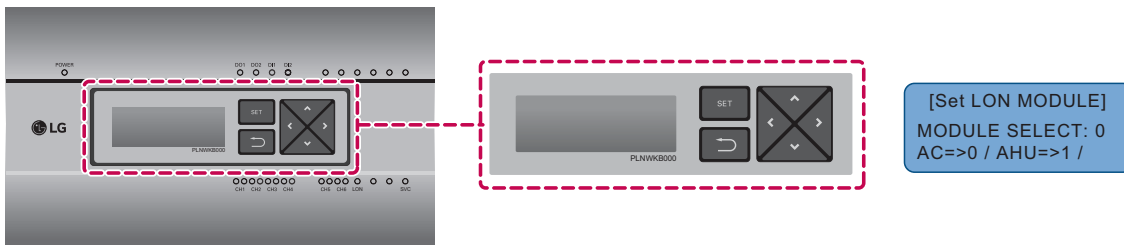
3.4 Product Description

■ Remarks

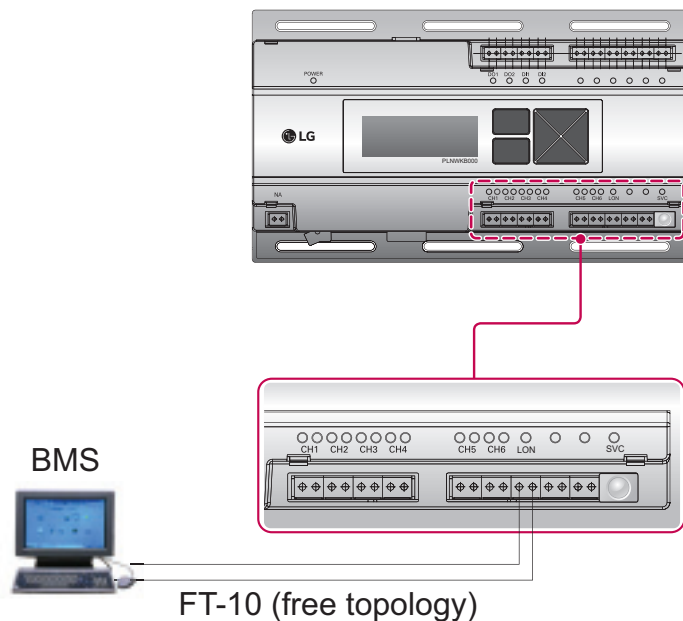
- Applicable Unit
 - AC, ERV, ERV DX, Heating, AHU
 - AHU and other units cannot be supported at one ACP Lonworks (ACP Lonworks dedicated AHU is necessary)
- Addressing Range is '00~FF'
 - For Lonworks BMS, only 64 units are allowed
 - : It chooses the units from lowest unit address to Higher unit address up to 64 units
 - : All addresses don't need to be continuous number
 - Max. 256 units are allowed by own interface, same like normal ACP

■ System Setting

- Set Lonworks type
 - 0 : AC, ERV, ERV DX, Heating
 - 1 : DX AHU



- System Setting



3.4 Product Description

■ Commissioning

Commissioning with XIF file

Commissioning is to get device information of Lonworks G/W

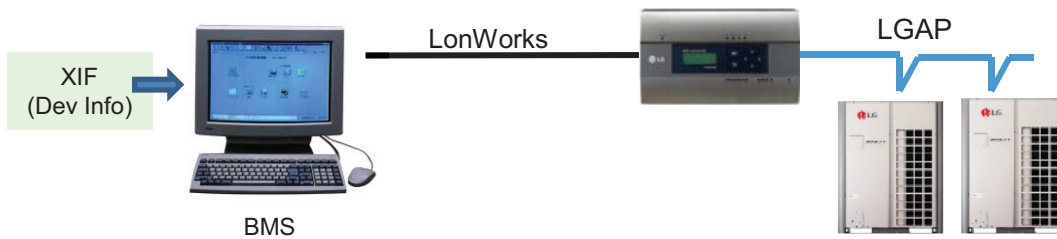
There are 2 commissioning methods

- One is “upload from device”, the other one is using “XIF file”

1) Using “Upload from device”



2) Using “XIF File” for pre-engineering



3.4 Product Description

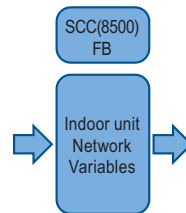
■ Air conditioner Objects

Control	
On/Off	Operation Mode
Lock	Temperature
Fan Level	Fan Direction Auto
Mode Lock	Fan Level Lock
Temperature Lock	Temperature Lower Limit
Temperature Higher Limit	Peak Convert Cycle
Peak Setting	Temperature Unit
Total Temperature Lock	Total OnOff
Total Temperature	

Monitoring	
On/Off	Operation Mode
Lock	Temperature
Fan Level	Fan Direction Auto
Mode Lock	Fan Level Lock
Temperature Lock	Temperature Lower Limit
Temperature Higher Limit	Product Type
Product Address	Current Temperature
Alarm	Power
Error Code	Peak Convert Cycle
Peak Setting	Temperature Unit
Peak Current Operating Percent	Total Accumulate Power
Total Accumulate Power	

① Standard Function Block

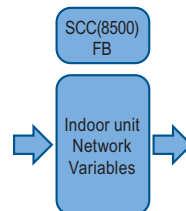
Standard Function Block	
SNVT_switch	nviOnOff
SNVT_hvac_mode	nviHeatCool
SNVT_switch	nviLock
SNVT_temp_p	nviSetTemp
SNVT_switch	nviFanSpeedCmd
SNVT_switch	nviSwing_Heater
SNVT_switch	nviModlok
SNVT_switch	nviFanlok
SNVT_switch	nviTmplek_Humid
SNVT_temp_p	nviLow_HW_Tmp
SNVT_temp_p	nviUp_Tmp



Standard Function Block	
SNVT_switch	nvoOnOff
SNVT_hvac_mode	nvoHeatCool
SNVT_switch	nvoLock
SNVT_temp_p	nvoSetTemp
SNVT_switch	nvoFanSpeed
SNVT_switch	nvoSwing_Heater
SNVT_switch	nvoModlok
SNVT_switch	nvoFanlok
SNVT_switch	nvoTmplek_Humid
SNVT_temp_p	nvoLow_HW_Tmp
SNVT_temp_p	nvoUp_Sol_Tm
SNVT_count	nvoPType
SNVT_count	nvoPAddr
SNVT_temp_p	nvoSpaceTemp
SNVT_hvac_status	nvoUnitStatus
SNVT_elec_kwh_l	nvoAccuPw
SNVT_count	nvoErrorCode

② General Function Block

General Function Block	
SNVT_count	nviPeakSwTime
SNVT_lev_percent	nviPeakTgtRate
SNVT_Switch	nviTempUnit
SNVT_switch	nviAllTemplock
SNVT_switch	nviTotalOnOff
SNVT_temp_p	nviTotalTemp



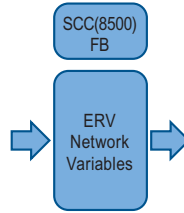
General Function Block	
SNVT_count	nvoPeakSwTime
SNVT_lev_percent	nvoPeakTgtRate
SNVT_Switch	nvoTempUnit
SNVT_lev_percent	nvoPeakCurRate
SNVT_elec_kwh_l	nvoTotalAccuPw

3.4 Product Description

■ ERV Objects

① Standard Function Block

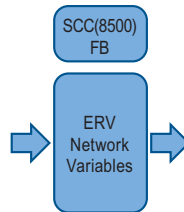
Standard Function Block	
SNVT_switch	nviOnOff
SNVT_hvac_mode	nviHeatCool
SNVT_switch	nviLock
SNVT_switch	nviFanSpeedCmd
SNVT_switch	nviSwing_Heater
SNVT_count	nviUsrmod



Standard Function Block	
SNVT_switch	nvoOnOff
SNVT_hvac_mode	nvoHeatCool
SNVT_switch	nvoLock
SNVT_switch	nvoFanSpeed
SNVT_switch	nvoSwing_Heater
SNVT_count	nvoUsrmod
SNVT_count	nvoPType
SNVT_count	nvoPAddr
SNVT_hvac_status	nvoUnitStatus
SNVT_count	nvoErrorCode

② General Function Block

General Function Block	
SNVT_Switch	nviTotalOnOff



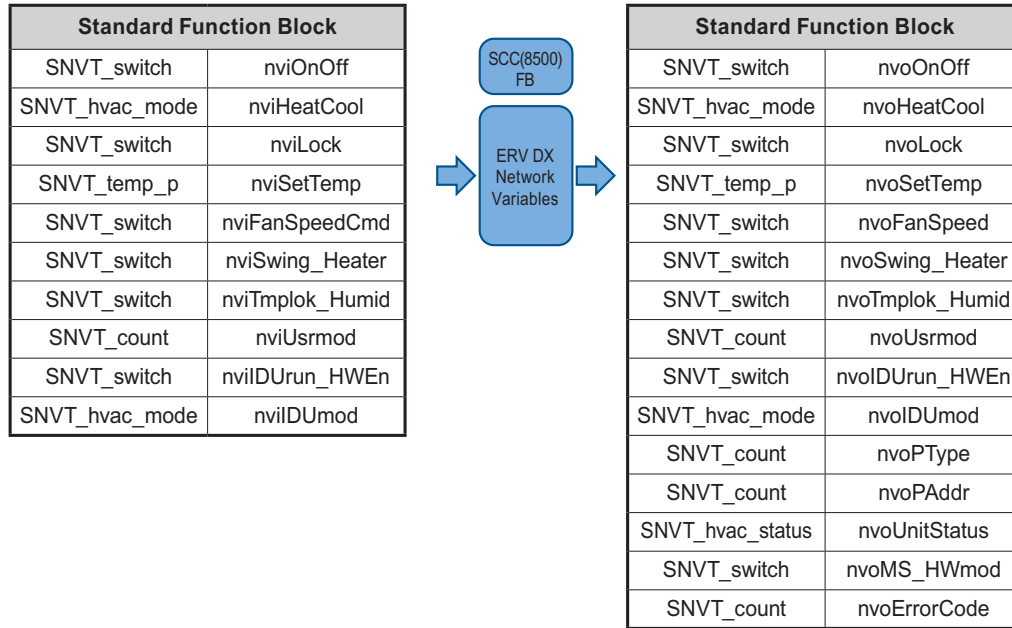
Control	
On/Off	Operation Mode
Lock	Fan Level
Heater	Additional Functionality
Total OnOff	

Monitoring	
On/Off	Operation Mode
Lock	Fan Level
Heater	Additional Functionality
Product Type	Product Address
Alarm	Error Code

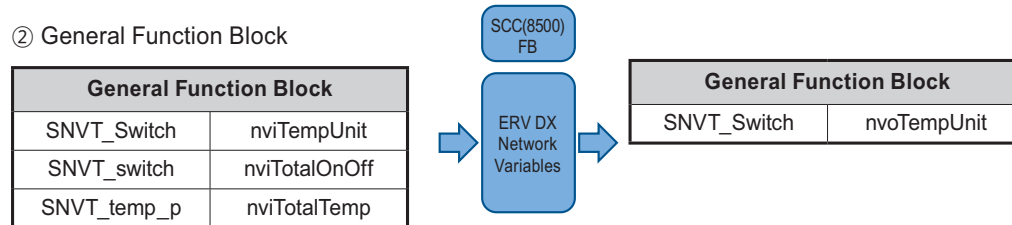
3.4 Product Description

■ ERV DX Objects

① Standard Function Block



② General Function Block



Control	
On/Off	Operation Mode
Lock	Temperature
Fan Level	Heater
Humidity	Additional Functionality
AC Mode	AC Operation Mode
Temperature Unit	Total OnOff
Total Temperature	

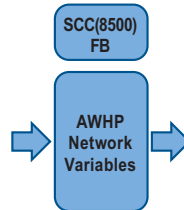
Monitoring	
On/Off	Operation Mode
Lock	Temperature
Fan Level	Heater
Humidity	Additional Functionality
AC mode	AC Operation Mode
Product Type	Product Address
Alarm	Master/Slave
Error Code	Temperature Unit

3.4 Product Description

■ AWHP(Heating) Objects

① Standard Function Block

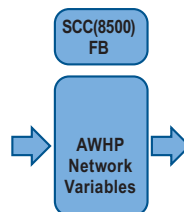
Standard Function Block	
SNVT_switch	nviOnOff
SNVT_hvac_mode	nviHeatCool
SNVT_switch	nviLock
SNVT_temp_p	nviSetTemp
SNVT_temp_p	nviLow_HW_Tmp
SNVT_switch	nviDURun_HWEEn



Standard Function Block	
SNVT_switch	nvoOnOff
SNVT_hvac_mode	nvoHeatCool
SNVT_switch	nvoLock
SNVT_temp_p	nvoSetTemp
SNVT_temp_p	nvoLow_HW_Tmp
SNVT_temp_p	nvoUp_Sol_Tmp
SNVT_switch	nvoFilt_Tmpsel
SNVT_switch	nvoDURun_HWEEn
SNVT_count	nvoPType
SNVT_count	nvoPAddr
SNVT_temp_p	nvoSpaceTemp
SNVT_hvac_status	nvoUnitStatus
SNVT_temp_p	nvoTankTmp
SNVT_temp_p	nvoInTmp
SNVT_temp_p	nvoOutTmp
SNVT_switch	nvoMS_Hwmod
SNVT_count	nvoErrorCode

② General Function Block

General Function Block	
SNVT_switch	nviTempUnit
SNVT_switch	nviTotalOnOff
SNVT_temp_p	nviTotalTemp



General Function Block	
SNVT_switch	nviTempUnit

Control	
On/Off	Operation Mode
Lock	Temperature
Hot Water Operation	Hot Water Supply Temperature
Solar heat Source Temperature	Temperature Unit
Total OnOff	Total Temperature

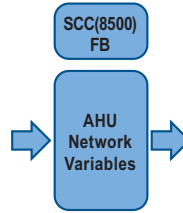
Monitoring	
On/Off	Operation Mode
Lock	Temperature
Hot Water Operation	Hot Water Supply Temperature
Solar heat Source Temperature	Temperature Select
Product Type	Product Address
Current Temperature	Alarm
Hot Water Only Mode	Hot Water Tank Temperature
Pipe In Temperature	Pipe Out Temperature
ErrorCode	

3.4 Product Description

■ AHU Objects

① Standard Function Block

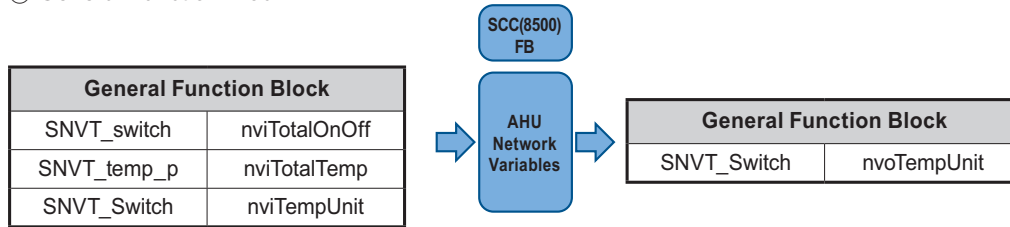
Standard Function Block	
SNVT_switch	nviOnOff
SNVT_hvac_mode	nviHeatCool
SNVT_switch	nviLock
SNVT_switch	nviSetRH
SNVT_switch	nviEconEnable
SNVT_switch	nviEmergencySensor
SNVT_temp_p	nviSetTemp
SNVT_lev_percent	nviSpaceRH
SNVT_lev_percent	nviOAD_C
SNVT_lev_percent	nviEAD_C
SNVT_lev_percent	nviMXD_C
SNVT_lev_percent	nviOAD_H
SNVT_lev_percent	nviEAD_H
SNVT_lev_percent	nviMXD_H
SNVT_lev_percent	nviOAD_F
SNVT_lev_percent	nviEAD_F
SNVT_lev_percent	nviMXD_F



Standard Function Block	
SNVT_switch	nvoOnOff
SNVT_hvac_mode	nvoHeatCool
SNVT_switch	nvoLock
SNVT_switch	nvoSetRH
SNVT_switch	nvoAutoVent
SNVT_switch	nvoEmergencySensor
SNVT_temp_p	nvoSetTemp
SNVT_lev_percent	nvoSpaceRH
SNVT_lev_percent	nvoOAD_C
SNVT_lev_percent	nvoEAD_C
SNVT_lev_percent	nvoMXD_C
SNVT_lev_percent	nvoOAD_H
SNVT_lev_percent	nvoEAD_H
SNVT_lev_percent	nvoMXD_H
SNVT_lev_percent	nvoOAD_F
SNVT_lev_percent	nvoEAD_F
SNVT_lev_percent	nvoMXD_F
SNVT_hvac_status	nvoUnitStatus
SNVT_temp_p	nvoSupplyTemp
SNVT_temp_p	nvoOutdoorTemp
SNVT_temp_p	nvoVentTemp
SNVT_temp_p	nvoMixTemp
SNVT_lev_percent	nvoSupplyRH
SNVT_lev_percent	nvoOutdoorRH
SNVT_lev_percent	nvoVentRH
SNVT_lev_percent	nvoMixRH
SNVT_switch	nvoFilter
SNVT_ppm	nvoSpaceCO2
SNVT_ppm	nvoSpaceVOC
SNVT_lev_percent	nvoOAD_P
SNVT_lev_percent	nvoEAD_P
SNVT_lev_percent	nvoMXD_P
SNVT_switch	nvoSupplyFAN
SNVT_switch	nvoVentFAN
SNVT_switch	nvoHeater
SNVT_switch	nvoHumid
SNVT_count	nvoProductType
SNVT_count	nvoProductAddr
SNVT_count	nvoErrorCode

3.4 Product Description

② General Function Block



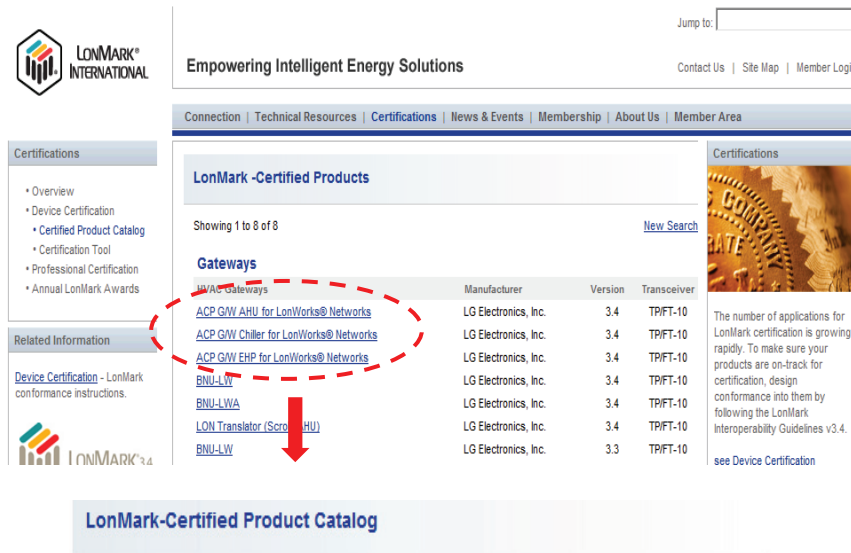
Control	
On/Off	Operation Mode
Lock	Humidification
AutoVent	Emergency Sensor
Temperature	Humidity
Cool OA Damper	Cool EA Damper
Cool MIX Damper	Heat OA Damper
Heat EA Damper	Heat MIX Damper
Fan OA Damper	Fan EA Damper
Fan MIX Damper	Total OnOff
Total Temperature	Temperature Unit

Monitoring	
On/Off	Operation Mode
Lock	Humidification
AutoVent	Emergency Sensor
Temperature	Humidity
Cool OA Damper	Cool EA Damper
Cool MIX Damper	Heat OA Damper
Heat EA Damper	Heat MIX Damper
Fan OA Damper	Fan EA Damper
Fan MIX Damper	Alarm
Supply Temperature	Outer Temperature
Vent Temperature	Mixing Temperature
Supply Humidity	Outer Humidity
Vent Humidity	Mixing Humidity
Filter Clean	CO2 Concentration
VOC Concentration	Current OA Damper
Current EA Damper	Current MIX Damper
Supply FAN	Vent FAN
Heater	Humidification
Product Type	Product Address
Error Code	Temperature Unit

3.4 Product Description

■ .XIF File download

Link → http://www.lonmark.org/certifications/device_certification/product_catalog/search?categoryID=-1&deviceClassID=-1&Submit=Search&manID=825



LonMark -Certified Products

Showing 1 to 8 of 8 [New Search](#)

Gateway	Manufacturer	Version	Transceiver
ACP G/W AHU for LonWorks® Networks	LG Electronics, Inc.	3.4	TPFT-10
ACP G/W Chiller for LonWorks® Networks	LG Electronics, Inc.	3.4	TPFT-10
ACP G/W EHP for LonWorks® Networks	LG Electronics, Inc.	3.4	TPFT-10
BNJ-LW	LG Electronics, Inc.	3.4	TPFT-10
BNJ-LWA	LG Electronics, Inc.	3.4	TPFT-10
LON Translator (Screening Unit)	LG Electronics, Inc.	3.4	TPFT-10
BNJ-LW	LG Electronics, Inc.	3.3	TPFT-10

LonMark-Certified Product Catalog

[New Search](#)

ACP G/W EHP for LonWorks® Networks

Company Name: [LG Electronics, Inc.](#)

Standard Program ID: 8 000CC 4850 04 04 02

LonMark Version: 3.4

Category: Gateways

LonMark Format: 8

Manufacturer ID: 000CC - LG Electronics

Device Class: 4850 - HVAC Gateways

Usage Class: 04 - Industrial-Commercial

Media Channel: 04 - TP/FT-10

SPID Model Number: 02

Datasheet: [LG-ACP-GW.pdf](#)

XIF/DRFs Download: [8000CC4850040402.zip](#)

XIF available: Yes, included in the above ZIP file

DRFs available: Yes, included in the above ZIP file

LonMark Profiles: 0000 - Node Object (1)

1) Click EHP or AHU

2) Click *.zip file



Each Unit type (EHP, AHU, Chiller) has different .XIF
- LGAC.XIF, LGAHU.XIF, LGChil.XIF

ACP G/W EHP for LonWorks® Networks
- PLNWKB000, PLNWKB100 : under 2.1.0d version

ACP G/W EHP for LonWorks® Networks v2
- PLNWKB000 : 2.1.0e, 2.1.X version
- PLNWKB100 : 2.1.0e, 2.2.X version

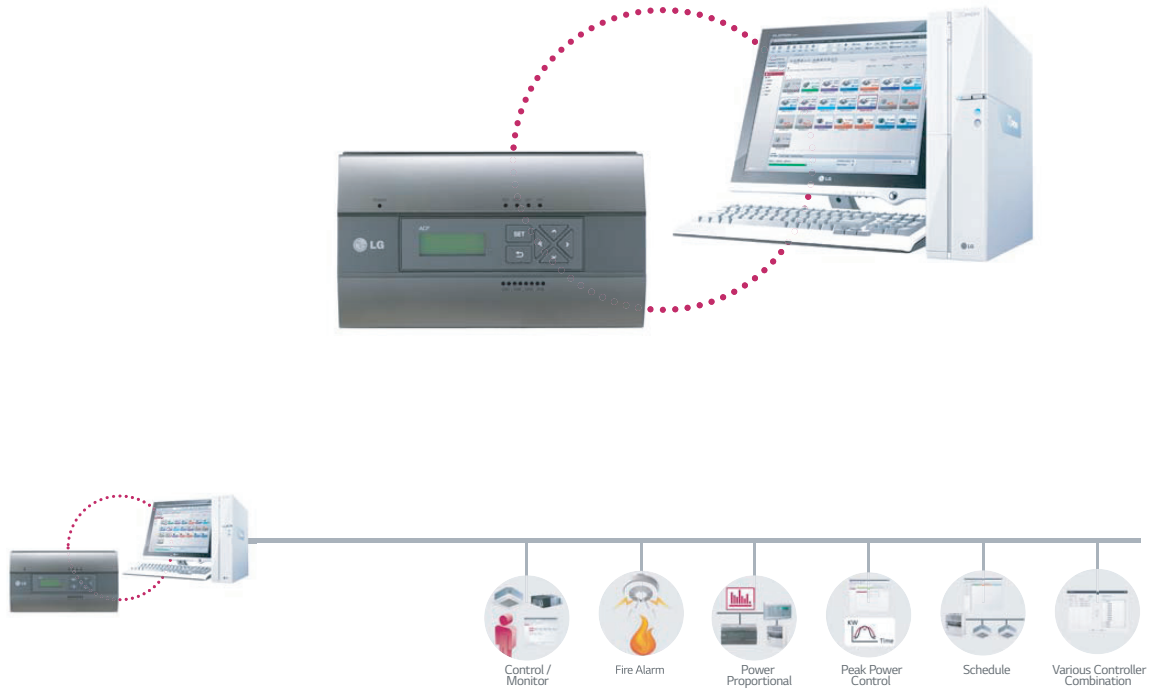
ACP G/W AHU for LonWorks® Networks
- All units, All version

3.4 Product Description

3.4.7 AC Manager IV

Up to 32 ACP can be connected so that 8,192 indoor units can be controlled and monitored

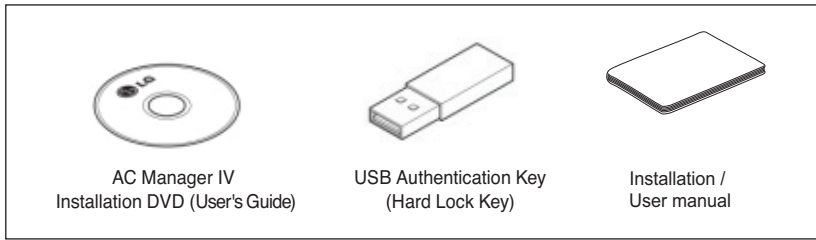
- Model name : PACM4B000



3.4 Product Description

3.4.7.1 Specifications

■ Components



CAUTION

If any product is used other than our standard product and a problem occurs, we don't take any responsibility regarding the problem. Please keep away from using other products.

■ Recommended Specifications

The recommended specifications for the PC of AC Manager IV.

Hardware	
CPU	Dual Core 2.4GHz or faster
System Memory	4 GB or more
Hard Disk Space	100 GB or more
OS	Windows XP/7/8/8.1/10
Resolution	1280 x 1024 or higher
Recommended Graphics	VGA: For NVidia, Geforce or later. For ATI, Radeon or later
ACP	ACP version 1.1.4p or higher

■ Feature

ModelName	PQCSSA21E0 ¹⁾	PACM4B000
Maximum Number of Indoor Units	8,192 (supports 32 ACP)	8,192 (supports 32 ACP IV)
Individual / Group Control	●	●
Ventilation Control	●	●
Individual Controller Lock	● (Temperature / Mode / Fan / All)	● (Temperature / Mode / Fan / All)
Error Check	Self Diagnosis	Self Diagnosis
Mode Change	Cooling / Heating / Auto / Dehumidification / Fan	Cooling / Heating / Auto / Dehumidification / Fan
Schedule	Daily / Weekly / Monthly / Yearly / Exception Day	Daily / Weekly / Monthly / Yearly / Exception Day
Operation History	●	●
Visual Navigation	●	●
Temperature range limit	●	●
Remote Access	●	●
Auto Changeover	● (1 set)	● (2 set)
Setback	● (2 set)	● (2 set)
Power Consumption Monitoring (with PDI)	●	●
Interlock Control	●	●
Virtual Group Control		●
Emergency Alarm Display	-	●
ACS IO Module Interlocking	-	●

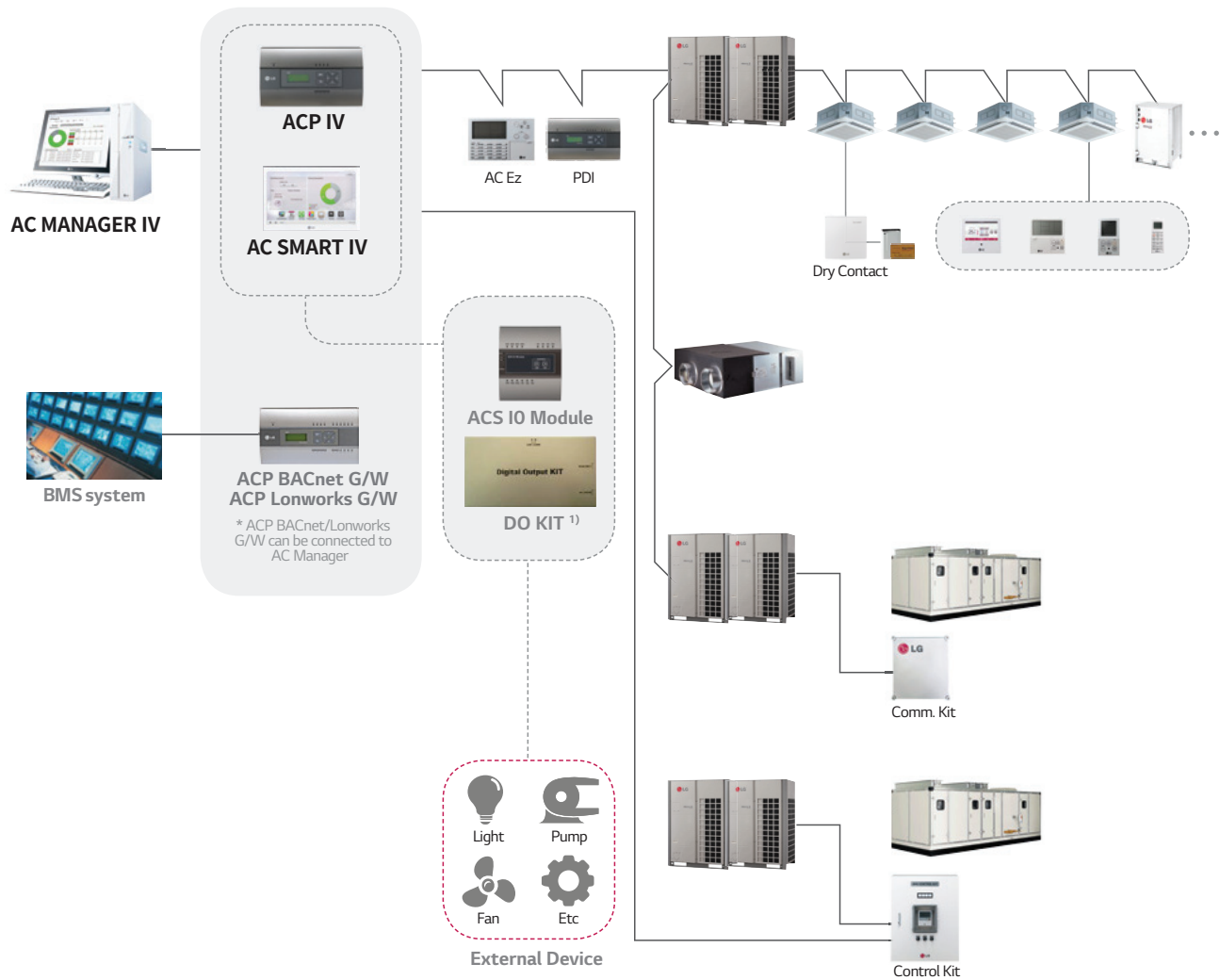
1) This product is discontinued.

※ Assignment of public IP address is required to access central controller through internet.

3.4 Product Description

3.4.7.2 Installing AC Manager IV

■ System Diagram

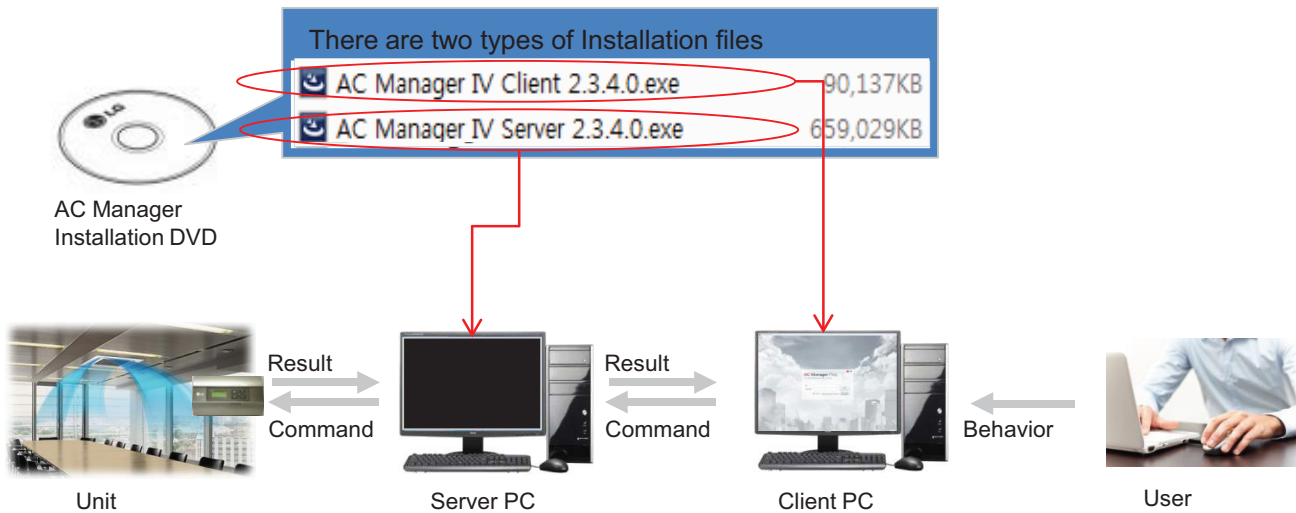


1) This product is discontinued.

3.4 Product Description

■ Server & Client

AC Manager has Server and Client structure



Server

- Invisible middleware running in background
- Core program to control and manage the units
- Server has to be unique in one site.

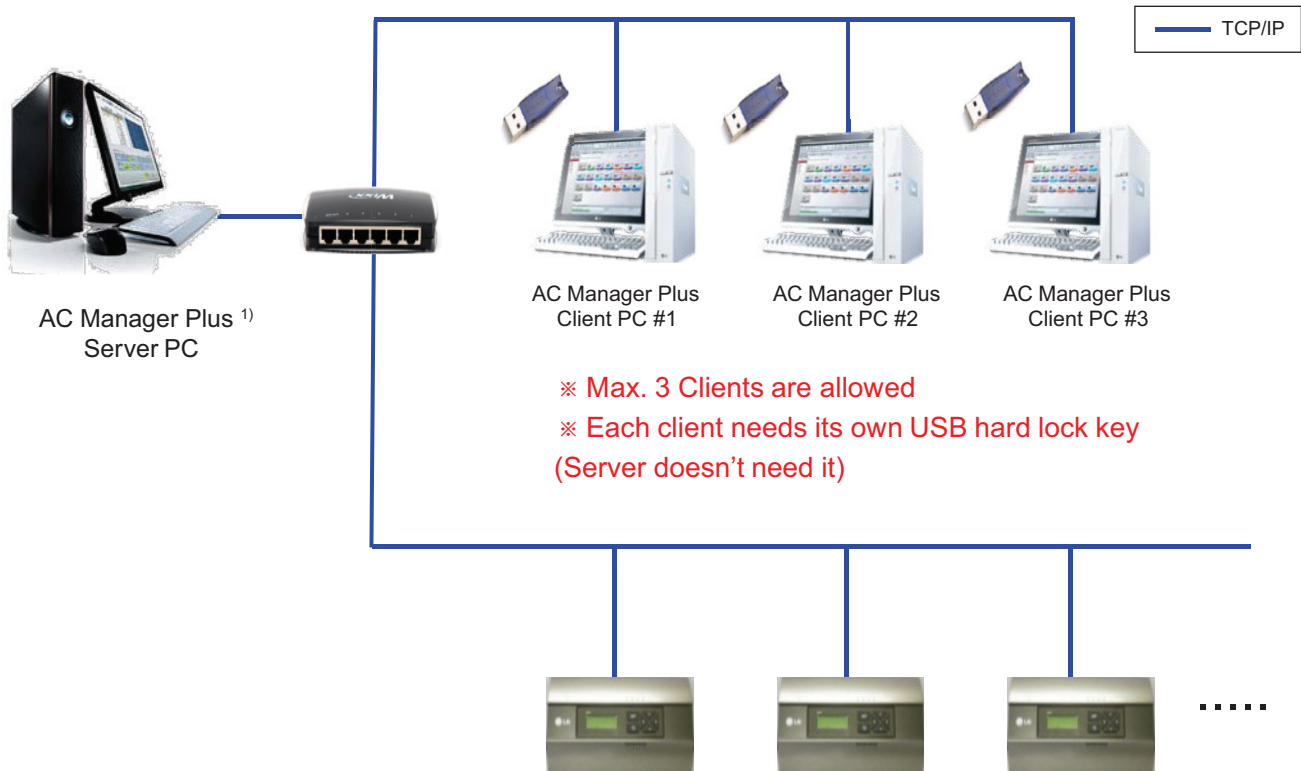
Client

- Visible interface application for user
- It is a mediator between User and Server
- Maximum 3 clients are allowed in one site

3.4 Product Description

3.4.8 AC Manager Plus

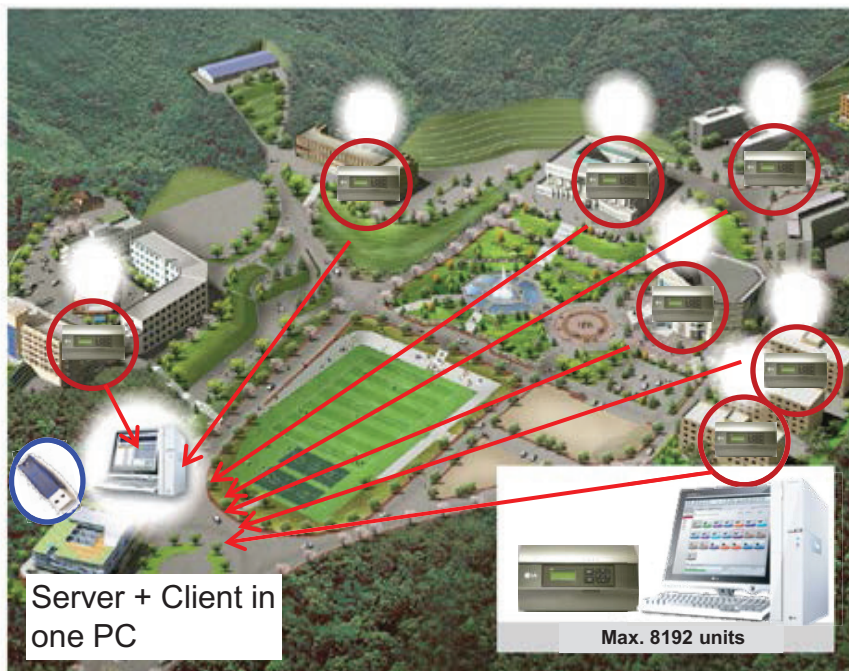
Control in multiple place through Server/Client Structure



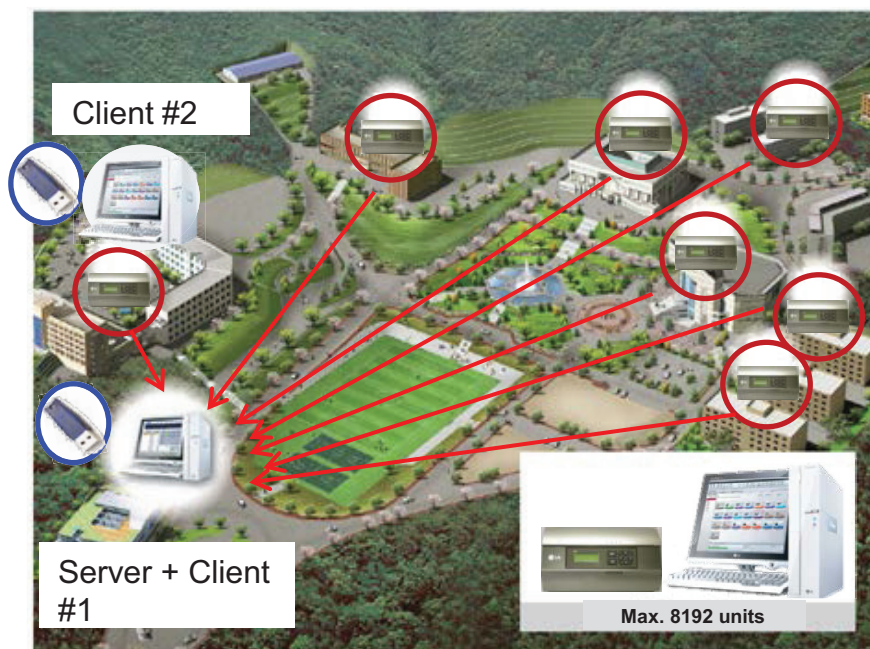
1) This product is discontinued.

3.4 Product Description

Usual Case : Server and Client in one PC



Applied Case : 1 Server and 2 Clients in two places



3.4 Product Description

3.4.8 AC Manager 5

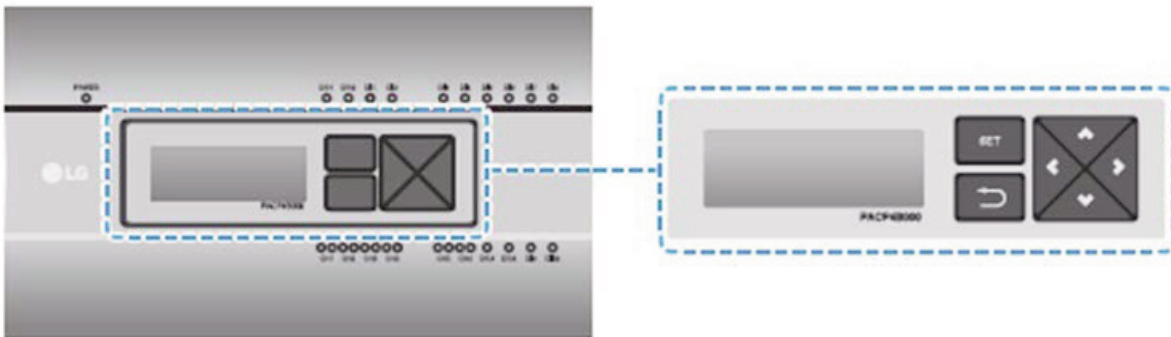
AC Manager 5 is a central controller that can manage individual or group of maximum of 8192 units in one space.

AC Manager 5 can monitor or control the units installed in each room of a building from a place such as building management office or school administration office.

■ Environment Setting Function using External Buttons

AC Manager 5 can set the following functions using the externally mounted buttons.

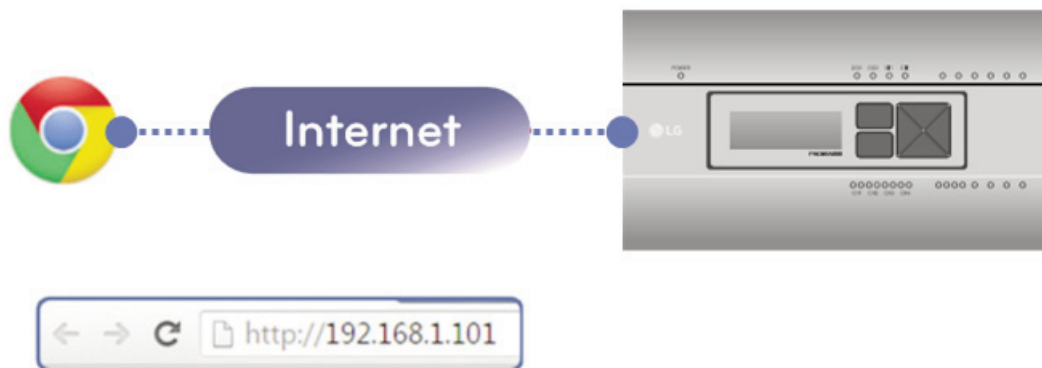
- Network Environment (IP Address, Netmask, Gateway) Setting
- SW Upgrade Function
- Data Backup Function
- Data Recovery Function



■ Web Server Embedded Function

Without installing a separate program, you can use web browser to input IP address of AC Manager 5 in the address window to access AC Manager 5 web server for device control and monitoring.

- Control of Max. of 8192 air conditioner units (32 central controller)
- Error and Operation Status Monitoring
- Peak/Demand Power Control
- System Setting Function



3.4 Product Description

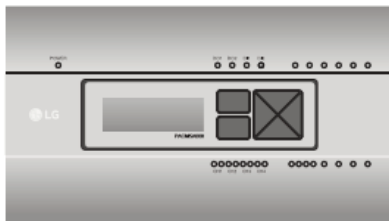
■ Devices that can be interfaced

The devices of AC Manager 5 that can be interfaced are as follows.

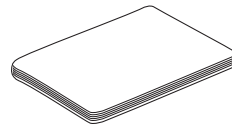
Product type	Interfacing product	Remark
Central controller	ACP Standard	It shall be connected to AC Manager 5 through TCP/IP
	ACP Premium	It shall be connected to AC Manager 5 through TCP/IP
	ACP IV, ACP 5	It shall be connected to AC Manager 5 through TCP/IP
	AC Smart Premium	It shall be connected to AC Manager 5 through TCP/IP
	AC Smart IV, AC Smart 5	It shall be connected to AC Manager 5 through TCP/IP
	ACP Lonworks	It shall be connected to AC Manager 5 through TCP/IP
	ACP BACnet	It shall be connected to AC Manager 5 through TCP/IP
Remote control	PC	Needs web browser supporting HTML5
	Tablet PC	Needs web browser supporting HTML5
	Smart Phone	Needs web browser supporting HTML5

■ Components

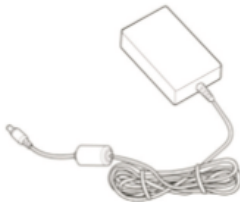
The components of the following figure are included in AC Manager 5 package box.
Open the package box, and check if all corresponding components are included.



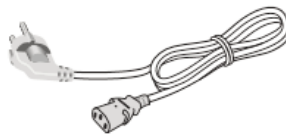
AC Manager 5



Installation /
User manual



Power Supply Adaptor
Input: 100-240 V~50/60 Hz, 1.2 A
Output: DC 12 V
3.33 A, 40 W MAX



Power Cord
250 V~, 3 A

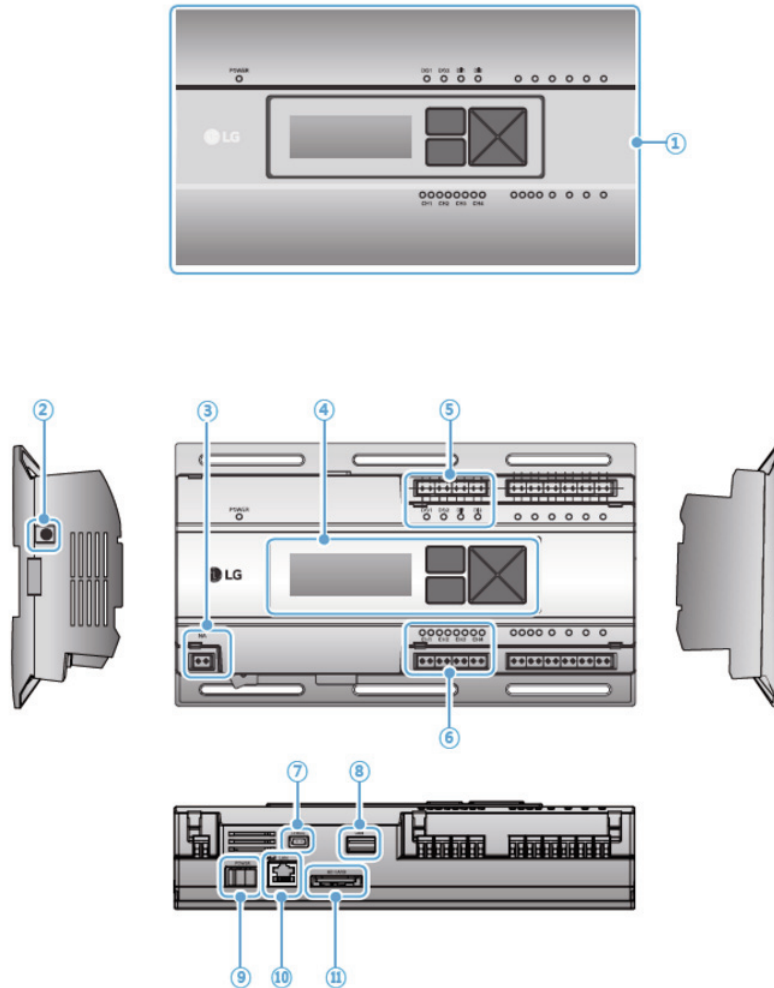


SD Card 8 GB

3.4 Product Description

■ Name of Each Part

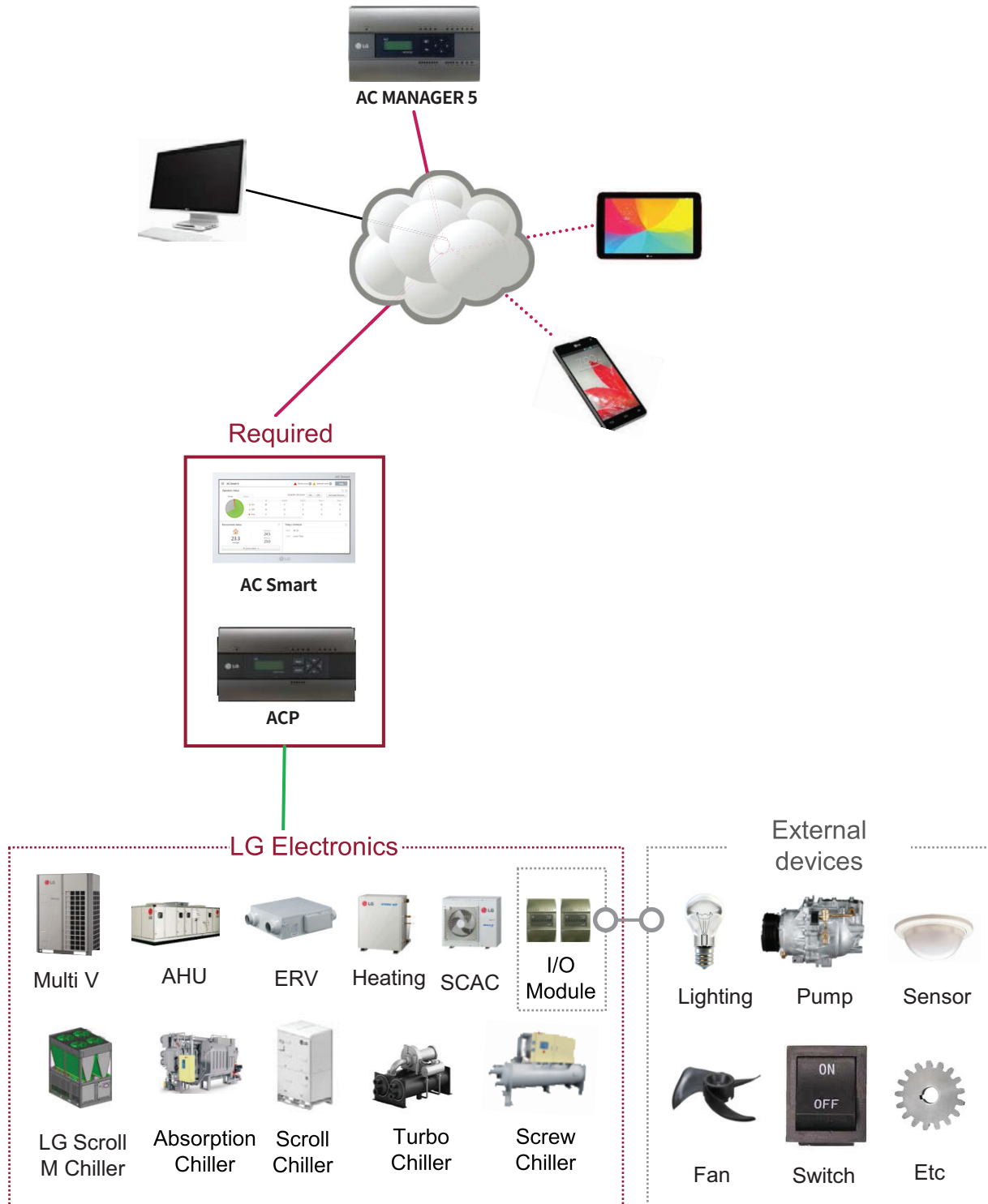
AC Manager 5 is composed as the following form.



Number	Interfacing product	Remark
①	Cover	Front cover of AC Manager 5
②	Adaptor connection jack	Jack for 12 V --- to connect to the power supply adaptor
③	Power port	24 V \sim port for power connection (not supported by 12 V --- model)
④	Buttons and LCD	Buttons and LCD to set network environment and to display other information
⑦	Mini USB port	USB to Serial port for software debugging
⑧	USB port	For software update and data backup
⑨	Power switch	Switch to turn on or off the power of AC Manager 5
⑩	Ethernet port	Ethernet port to connect to internet
⑪	SD card slot	For data backup

3.4 Product Description

■ System Structure



3.4 Product Description

■ Hardware Specification

Category	Description
Boundary of usage temperature	0°C~40°C
Rated Voltage	12 V _{DC}
Rated Current	Max 2.3A
Communication ports	<ul style="list-style-type: none">• Ethernet 10 / 100 BASE-T• USB : USB Host (SW upgrade, data backup)• SD card slot (RS485 communication logging)
LED	13 EA (Power and communication status) 14 EA (Reserved)
LCD	20 x4 Character-LCD (network environment setting and information display)

■ Order of Installation

To use AC Manager 5, it shall be installed in the following order.

STEP 1. AC Manager 5 Installation and Cable Connection

Install AC Manager 5 and connect network and other cables.

STEP 2. AC Manager 5 Network Address Setting

Set network address to be able to access AC Manager 5 through internet.

STEP 3. Central Controller (ACP, AC SMART) Information Input

Input and save device information in Web GUI, which is AC Manager 5 operating program.

STEP 4. Check Web GUI Control/Monitoring

Access to Web GUI, which is AC Manager 5 operating program, and check if control/monitoring are properly carried out.

! NOTE

• AC Manager 5 Installation

AC Manager 5 installation work requires specialized technique. Therefore, the installation contents mentioned in this chapter must be carried out by installation technician with qualification.

For questions and requests with regard to the installation, please contact the service center or installation specialty store approved by LG.

3.4 Product Description

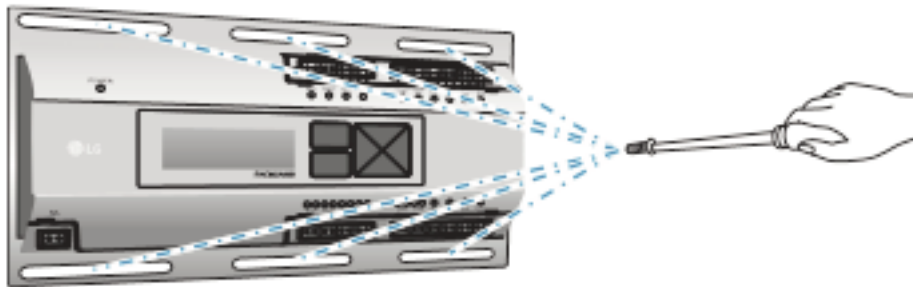
■ Fixing to Wall

AC Manager 5 can be installed by fixing to the wall.

To install AC Manager 5 in adequate place, proceed according to the following instructions.

Here, it describes the installation method of AC Manager 5 with the example of installing AC Manager 5 on the wall.

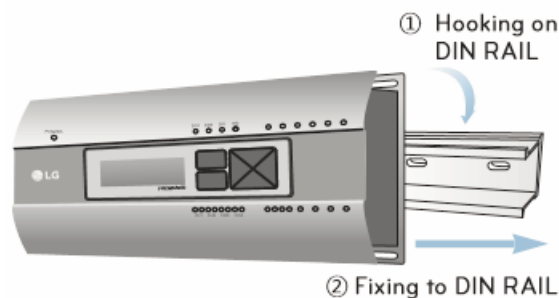
- Decide the space to install AC Manager 5.
Before installing AC Manager 5, check if it is an adequate place for the connection of AC Manager 5, power, and LAN cable.
- Use driver to fix on the wall. According to the installation location, you can fix it as in the following figure.



■ Mounting on DIN RAIL

AC Manager 5 can be installed in DIN RAIL with width 35 mm and height 7.5 mm. To install AC Manager 5 in adequate place, proceed according to the following instructions. Here, it describes the installation method with the example of installing on DIN RAIL.

- Decide the space to install AC Manager 5.
Before installing AC Manager 5, check if it is an adequate place for the connection of AC Manager 5, power, and LAN cable.
- Install DIN RAIL.
- Hook the top part of AC Manager 5 on DIN RAIL.
- Push the main body of AC Manager 5 until you hear the sound of installation.
- Pull AC Manager 5 to check if it is fixed.



! NOTE

- After installing to DIN RAIL, do not fix to the wall using screws. AC Manager 5 may be damaged.
- DIN RAIL fixing screw spec: M3, screw head height 1.75 ~ 2.0 mm, screw head diameter 5.5~7.0 mm.

3.4 Product Description

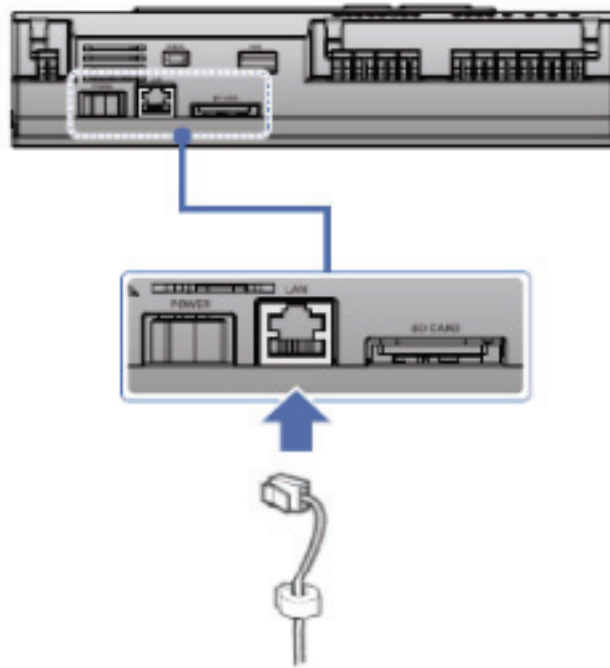
■ Connecting Ethernet Cable (LAN cable)

You need to connect Ethernet cable to AC Manager 5. AC Manager 5 can be connected to hub or ACP through Ethernet cable.

It is the case of connecting AC Manager 5 to the basic internet network installed at the site, and it is connected to general hub. Use Ethernet cable to connect to AC Manager 5's LAN port.







For this initial Ethernet connection, you can use either:

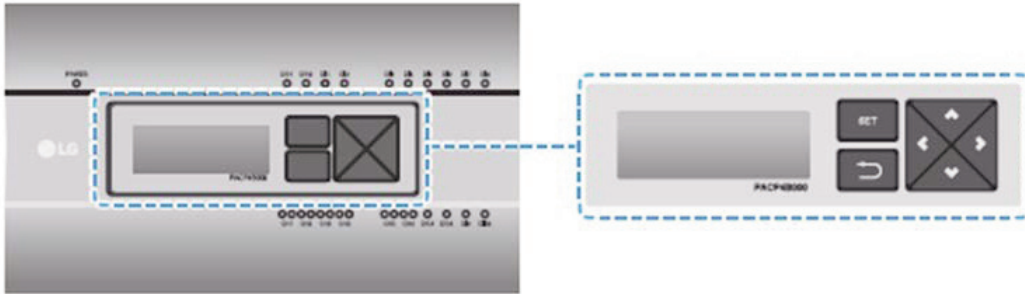
- An Ethernet patch cable connected directly between your PC and the AC Manager 5 (if your PC Ethernet port is not “auto-sensing”, you will need an Ethernet crossover cable), or
- A normal LAN connection, meaning that both your PC and the AC Manager 5 are physically connected to the same Ethernet hub or switch.



3.4 Product Description



■ LCD Environment Setting

The network environment of AC Manager 5 can be set by the LCD and the buttons at the front side of AC Manager 5. The current AC Manager 5 information and the menu are displayed on the LCD, and you can press ,  button and , , ,  buttons to change and select menu.

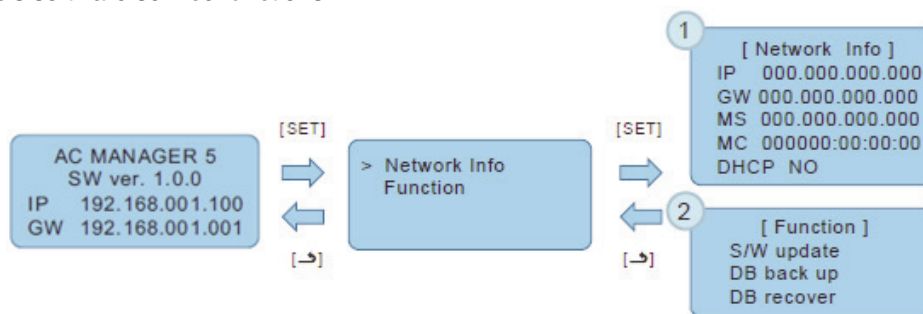


When you press AC Manager 5's [SET] button, it enters Environment Setting mode. When you press [SET] button for the first time, the menu to set the IP address is displayed as shown below.

> Network Info
Function

Press ,  button to locate the arrow on the desired function.

- Select [Network Info], and press [SET] button to enter No.1 menu in the following figure. In [Network Info] menu, input the network information such as AC Manager 5's IP address.
- Select [Function], and press [SET] button to enter No.2 menu in the following figure. In [Function] menu, it supports AC Manager 5's software service functions.



! NOTE

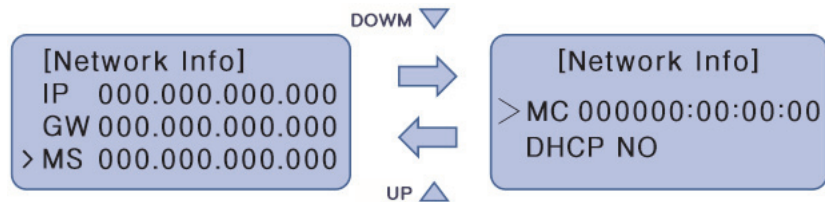
- [Function] menu is used by the system air conditioner service technician, and user shall not use this function. If this function is used incorrectly, it may cause failure of AC Manager 5.

3.4 Product Description

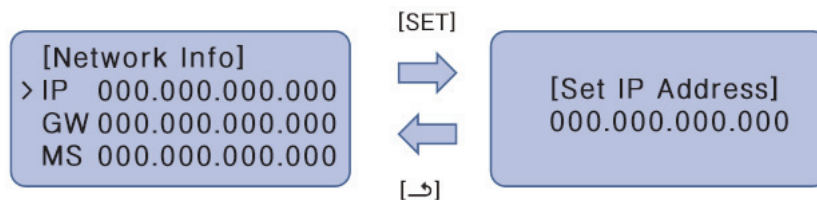
■ Network Address Setting Method

In [Network Info] menu, select the category to set using [▲], [▼] button.

In the first screen on [Network Info] menu, IP, Gateway, and Netmask settings are displayed, and you can use [▼] button to check MAC address and DHCP setting.



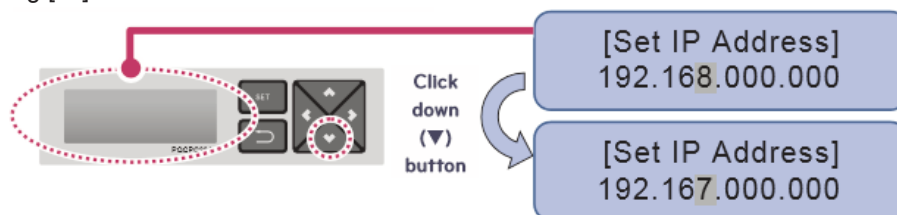
To change the network setting, locate the arrow on the corresponding setting position and press [SET] button to enter the corresponding setting screen.



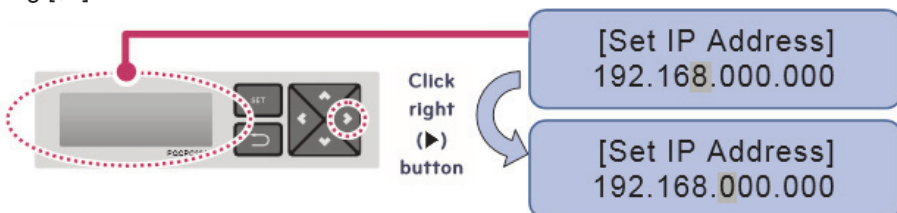
The network address consists of four 3-digit numbers. In case of setting the network address, the name of the related address is displayed on the LCD of AC Manager 5, and you need to press [▲], [▼], [◀], [▶] button for the setting.

When you press [▲], [▼] button, the number of the digit where cursor is on increases/decrease, and when you press [◀], [▶] button, it moves to the left/right digit of the network address.

Example of pressing [▼] button



Example of pressing [▶] button



3.4 Product Description

! NOTE

- Network Address Setting
The network address can be separated to 4 digits based on '.', and each number shall be 255 or less. Number exceeding 255 may not be input.

! NOTE

Assigning Network Address

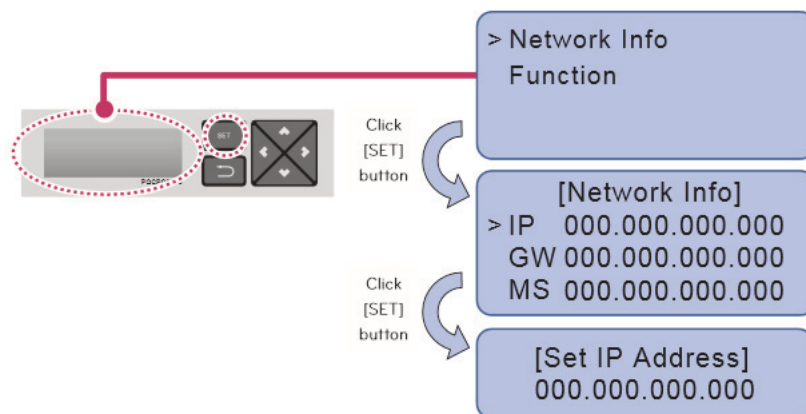
- Network shall be assigned by the person in charge of the network of the corresponding site.
(IP address, Gateway address, Netmask)
- AC Manager 5 can use both fixed IP type and dynamic IP type, but fixed IP type is recommended, and if dynamic IP type is used, it may cause inconvenience to the user.
- When fixed IP type is used, you need to receive network (IP address, gateway address, Netmask) from the person in charge of the network of the corresponding site.

■ IP Address Setting

For user to use the functions of AC Manager 5 through the web, a unique IP address may be assigned to AC Manager 5 or dynamic IP setting may be used.

The next is how to set fixed IP address. Please proceed according to the order.

1. Press AC Manager 5's [SET] button. The following menu screen will be displayed.
 - When you press [SET] button again, [Network Info] setting screen is displayed.



2. While IP is selected, if you press [SET] button, screen to input IP address is displayed.



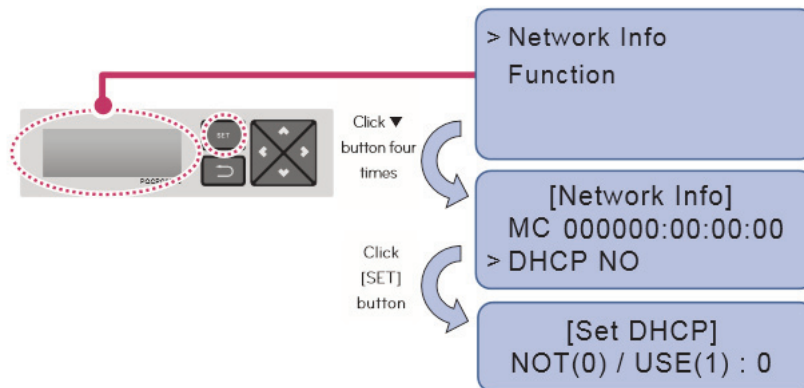
3.4 Product Description

■ Using Dynamic IP with DHCP

For user to use the functions of AC Manager 5 through the web, a unique IP address may be assigned to AC Manager 5 or dynamic IP setting may be used.

The next is how to set dynamic IP address. Please proceed according to the order.

1. Press AC Manager 5's [SET] button. The following menu screen will be displayed.
 - When you press [SET] button again, [Network Info] setting screen is displayed.
 - While DHCP is selected, if you press [SET] button, you can input whether to use DHCP function.



2. Use [▲], [▼] button to set whether to use DHCP function.
When you press [▲] button, DHCP function is set to use, and when you press [▼] button, DHCP function is set to no-use.
3. To use dynamic IP, set to use DHCP function.



! NOTE

- When dynamic IP type is used, the IP in use is returned to DHCP server, and you may not be able to access AC Manager 5. In such case, you can check newly set IP address in the front LCD of AC Manager 5.

3.4 Product Description

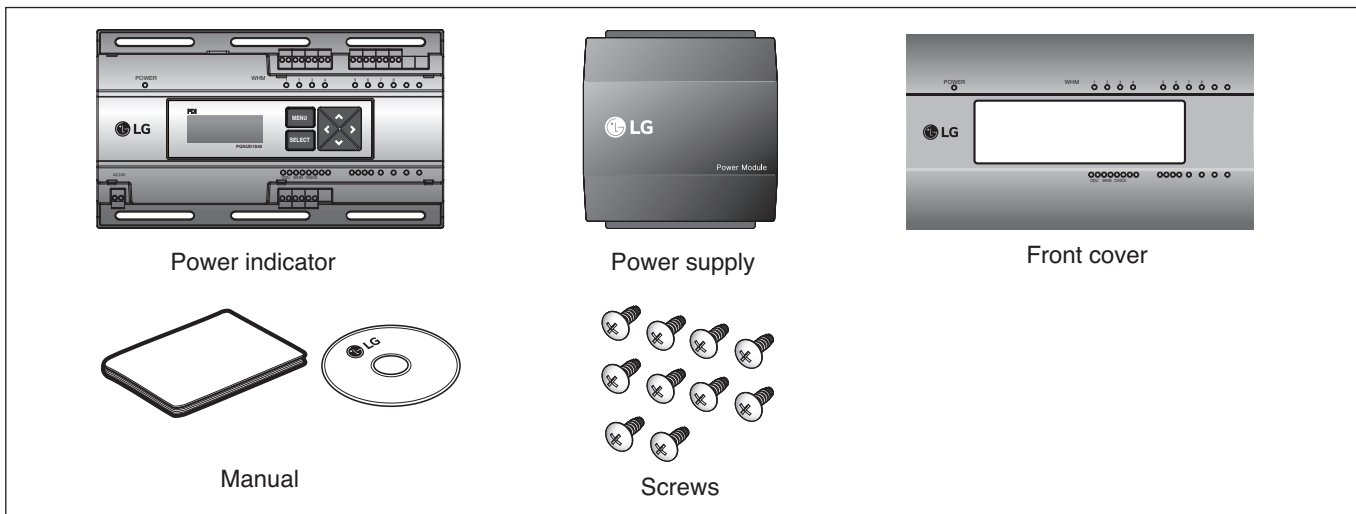
3.4.9 PDI

When using an air conditioner outdoor unit at the efficiency apartment or multipurpose building in common, power consumption of each air conditioner indoor unit can be displayed for efficiency management.

3.4.9.1 Specifications & Dimensions

- Model name : PQNUD1S40(PDI Premium)
PPWRDB000 (PDI Standard)

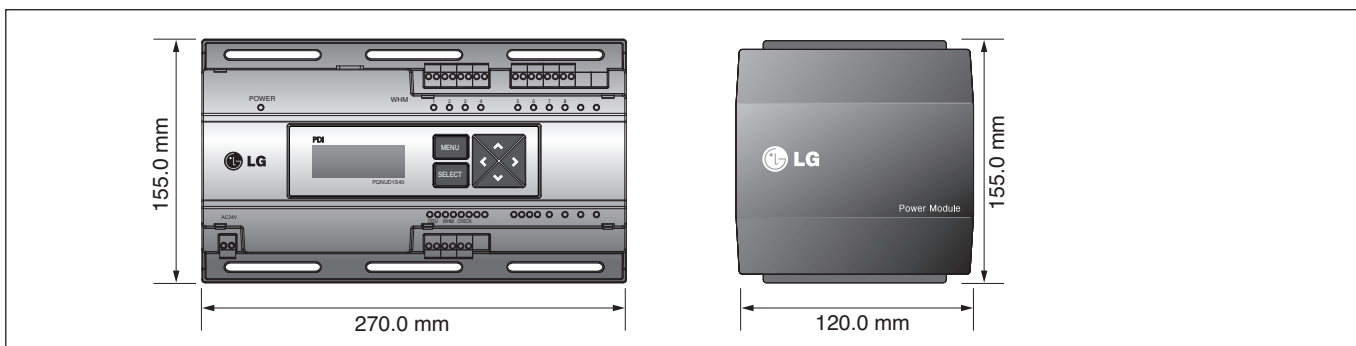
■ Components



■ Product Specifications

Categories	PDI Premium	PDI Standard
Power Supply	220-240 V~ 50/60 Hz 1Ø	220-240 V~ 50/60 Hz 1Ø
Max IDUs	128EA (EHP ODU), 64EA (GHP ODU)	128EA (EHP ODU), 64EA (GHP ODU)
Max ODU	8EA (EHP ODU) / 4EA (GHP ODU)	2EA(EHP ODU)/1EA(GHP ODU)
Controlled Product type	Air Conditioner, ERV DX, Hydro-kit	Air Conditioner, ERV DX, Hydro-kit
Connectable Wattmeter	Pulse : 8 / 485 type : 1	Pulse : 2
LCD Display	4 Lines	4 Lines
LED Display	Power/Comm./Pulse status	Power/Comm./Pulse status
IP rating	IP20	IP20

■ Dimensions



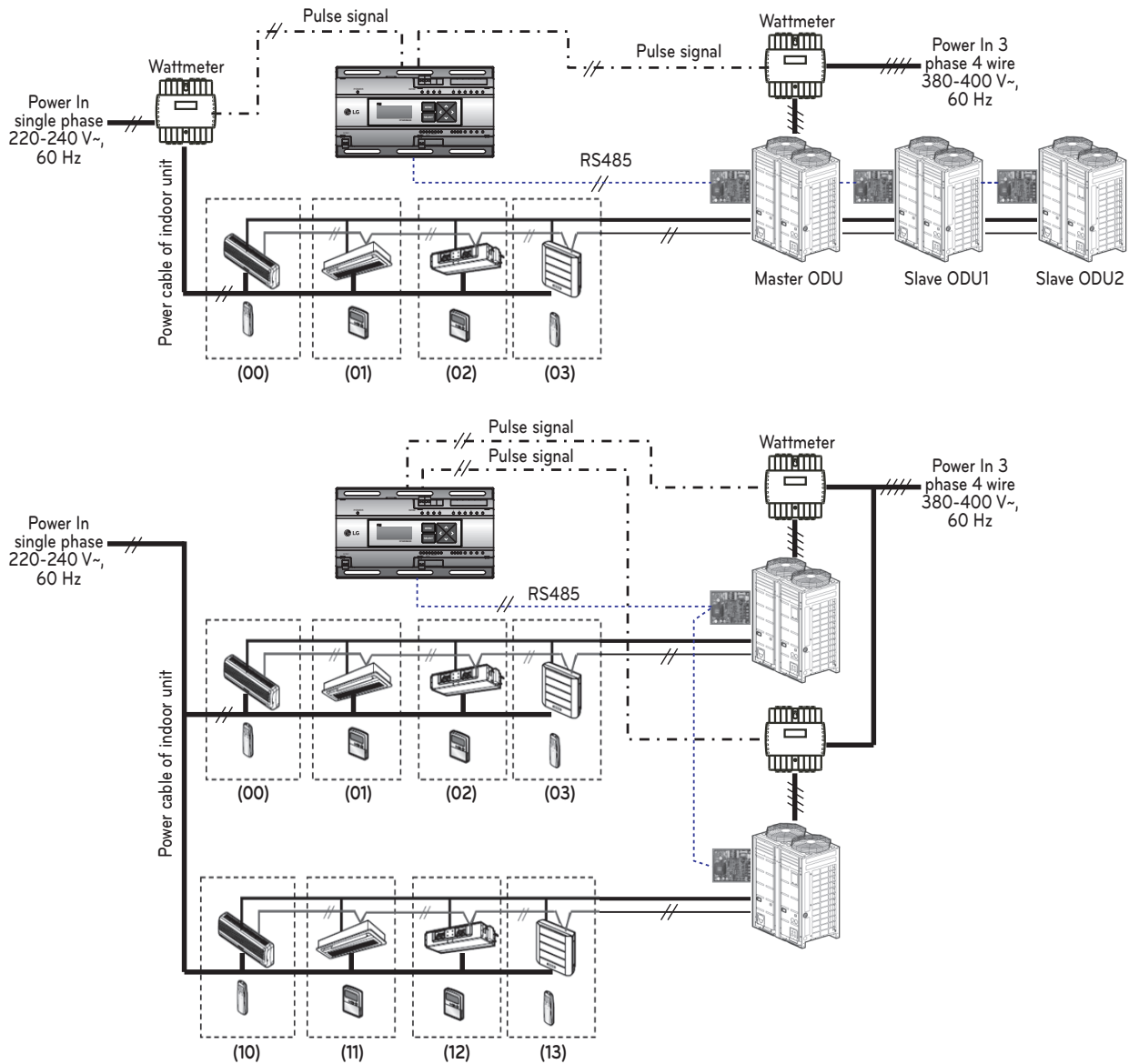
3.4 Product Description

3.4.9.2 Field Wiring Diagram

When interlocked to pulse type wattmeter

• **When interlocked to EHP product**

- Independent Operation of Power Indicator (interlocked to EHP products)



- | | |
|----------------|--|
| //// | : Power cable for 3 phase 4 wire |
| // | : Power cable for single phase |
| | : Communication cable (2 wire shielded cable): Between outdoor unit and central controller |
| --- | : Communication cable (2 wire shielded cable): Between indoor unit and outdoor unit |
| - . / . | : Pulse signal wire |
| — | : Refrigerant pipe |

3.4 Product Description

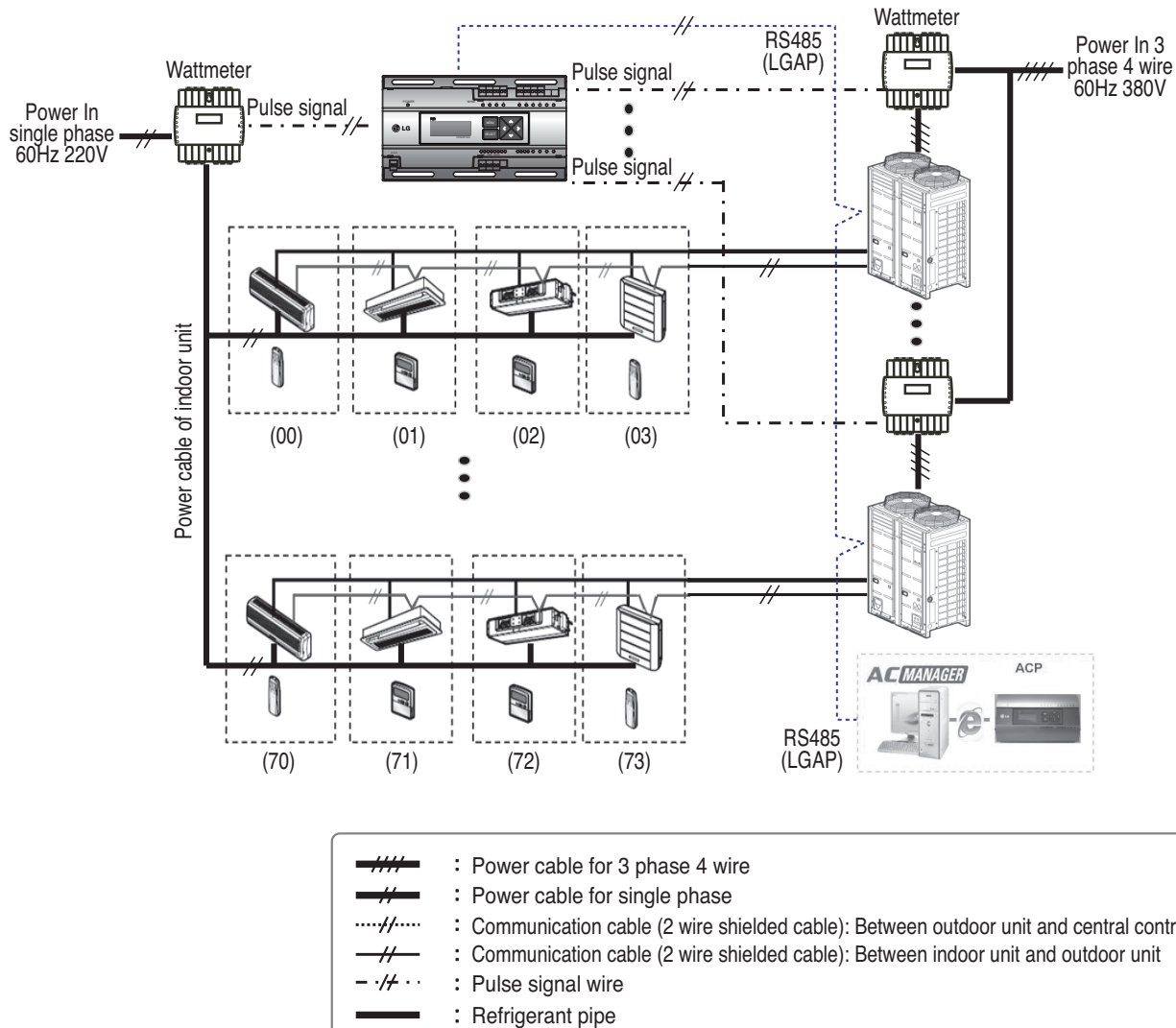
CAUTION

- Depending on the electric power, use the wattmeter for remote reading by sending the pulse signal.
- Use the wattmeter with the pulse width of 50 - 400 ms.
- The wattmeter pulse must be able to sink at least 3mA or more of current in the power indicator.
- Use the wattmeter of 1W/pulse, 2W/pulse, 4W/pulse, 6W/pulse, 8W/pulse, 10W/pulse, 100W/pulse and PT/CT (1-50,000).
- When setting the wattmeter, set it to Master Mode.
- Maximum of 8 wattmeters(PQNUD1S40) or 2 wattmeteres(PPWRDB000) can be installed.
- The distance between power indicator and wattmeter should be shorter than 10m in normal circumstance.
- When electrical or mechanical noise is expected, more shorter wiring is needed.

* EHP (Electric Heat Pump): It is an electric air conditioner to drive the compressor by electric power.

3.4 Product Description

• Interlocked Operation with Central Controller (interlocked to EHP product)



⚠ CAUTION

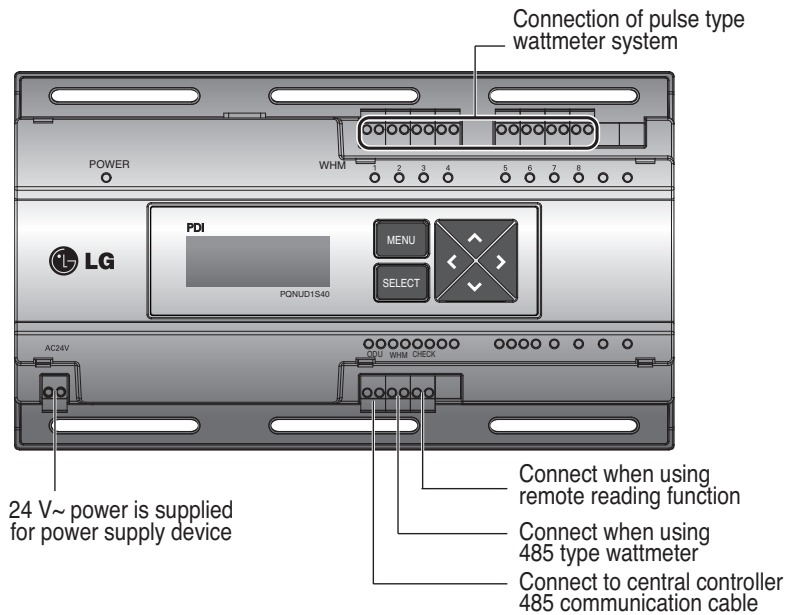
- Depending on the electric power, use the wattmeter for remote reading by sending the pulse signal.
- Use the wattmeter with the pulse width of 50 - 400 ms.
- The wattmeter pulse must be able to sink at least 3mA or more of current in the power indicator.
- Use the wattmeter of 1W/pulse, 2W/pulse, 4W/pulse, 6W/pulse, 8W/pulse, 10W/pulse, 100W/pulse and PT/CT (1-50,000).
- When setting the wattmeter, set it to Slave Mode.
- Maximum of 8 wattmeters(PQNUD1S40) or 2 wattmeteres(PPWRDB000) can be installed.
- The distance between power indicator and wattmeter should be shorter than 10m in normal circumstance.
- When electrical or mechanical noise is expected, more shorter wiring is needed.

3.4 Product Description

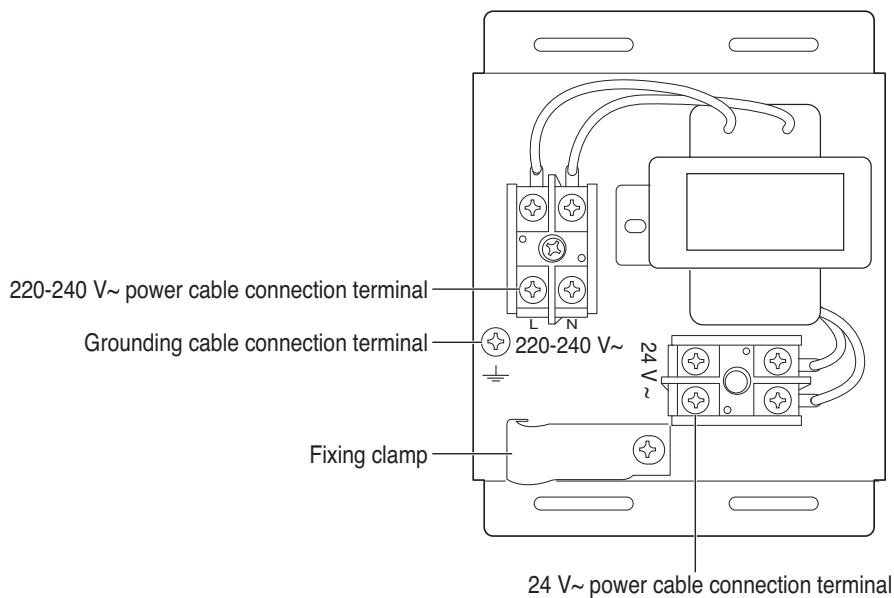
3.4.9.3 Installation

How to wire the product (when EHP product is connected)

Wiring Power Indicator



Wiring Power Supply



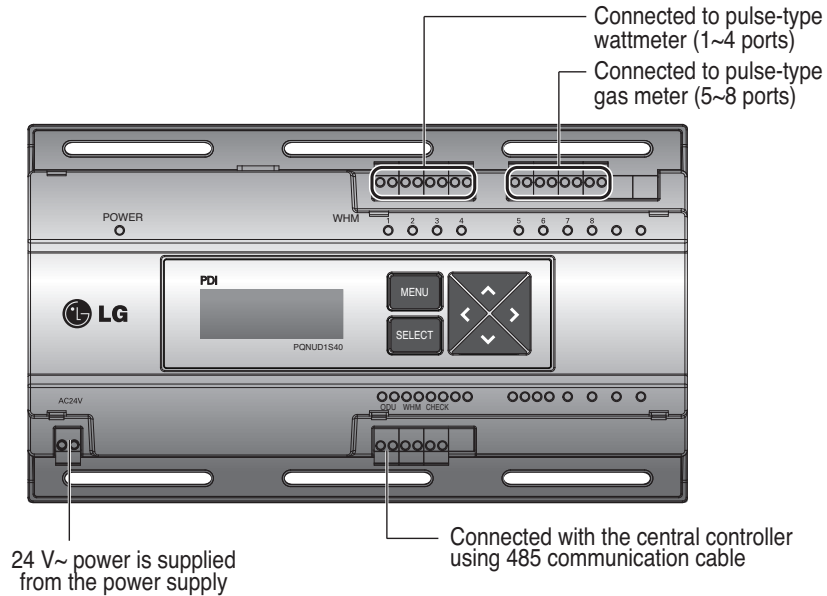
CAUTION

- Power must be turned on after the product is wired completely.

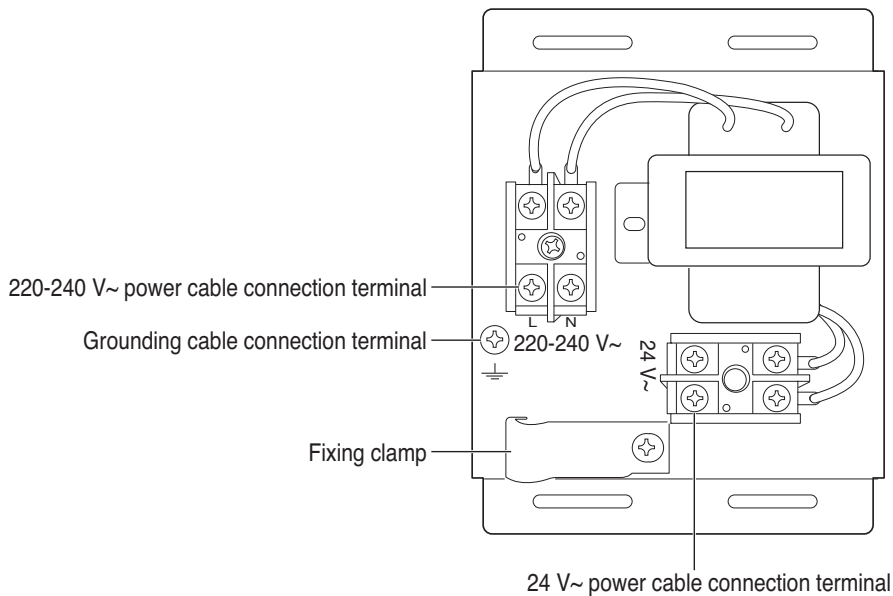
3.4 Product Description

How to wire the product (when GHP product is connected)

Wiring Power Indicator



Wiring Power Supply



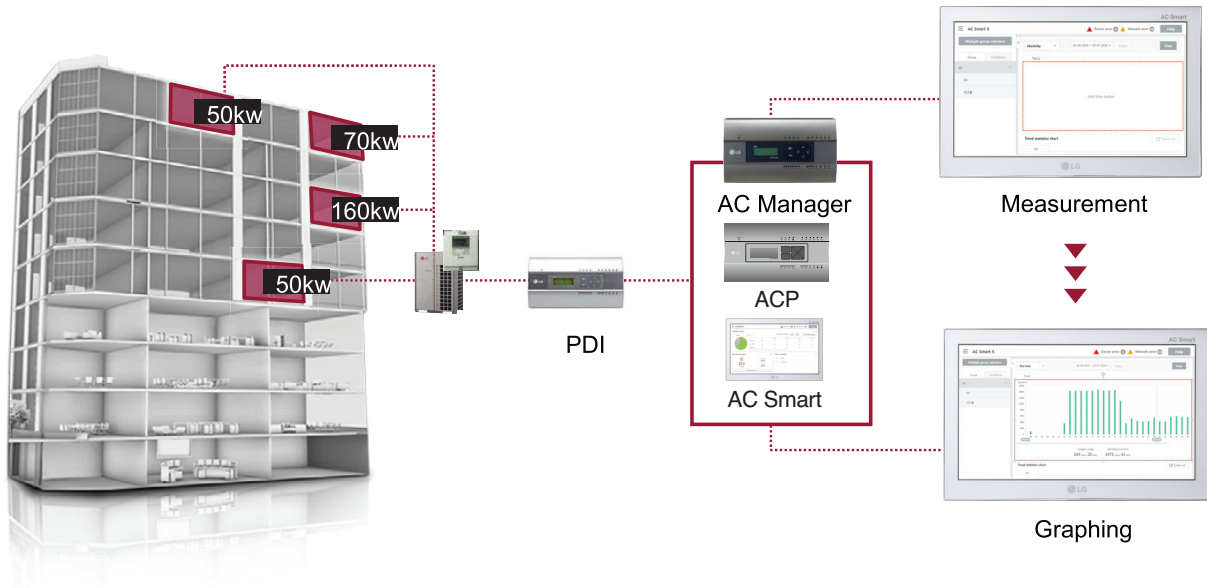
⚠ CAUTION

- Power supply must be applied after wiring the product is completed, if applicable.

3.4 Product Description

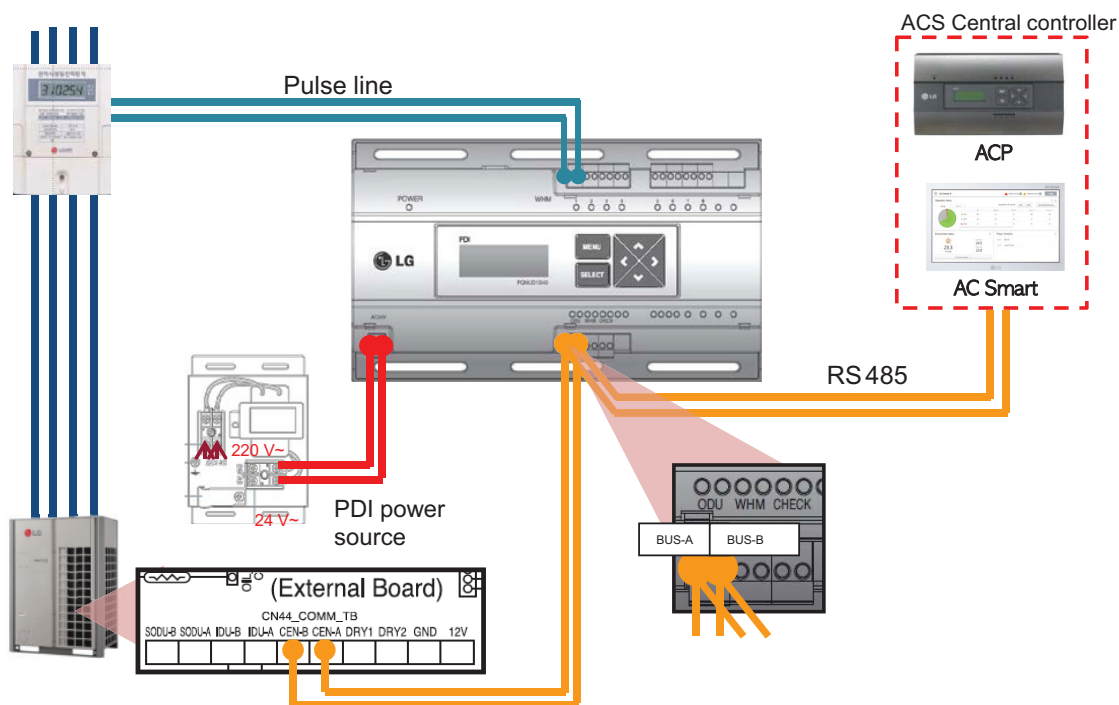
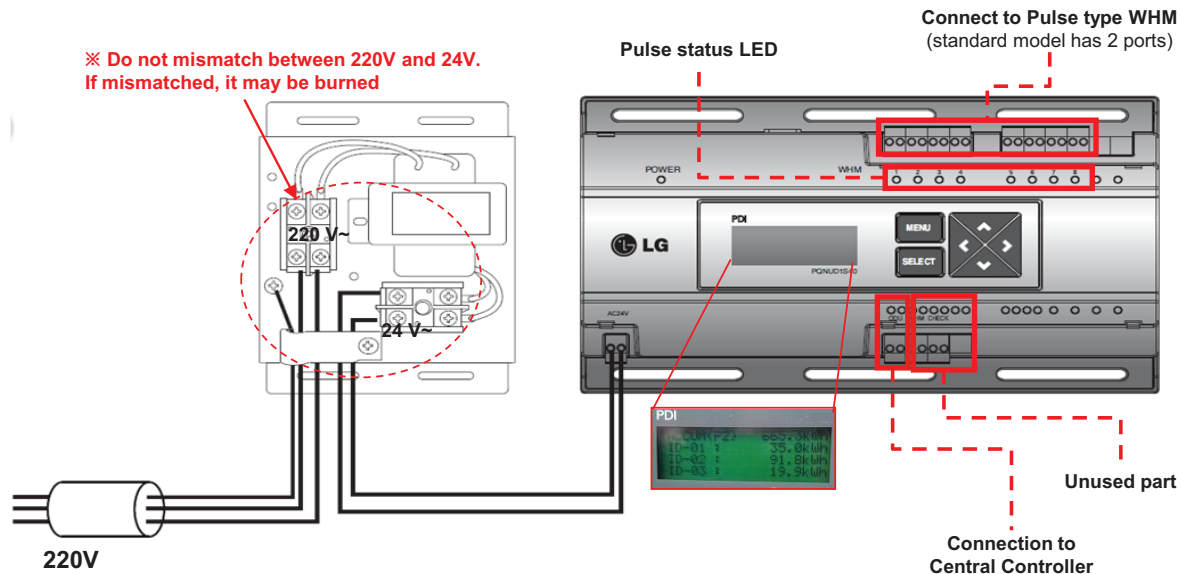
■ Overview

PDI(Power Distribution Indicator) calculates power consumption of each unit connected to the central controller. Collected data is displayed on the central controller GUI as a report and graph.



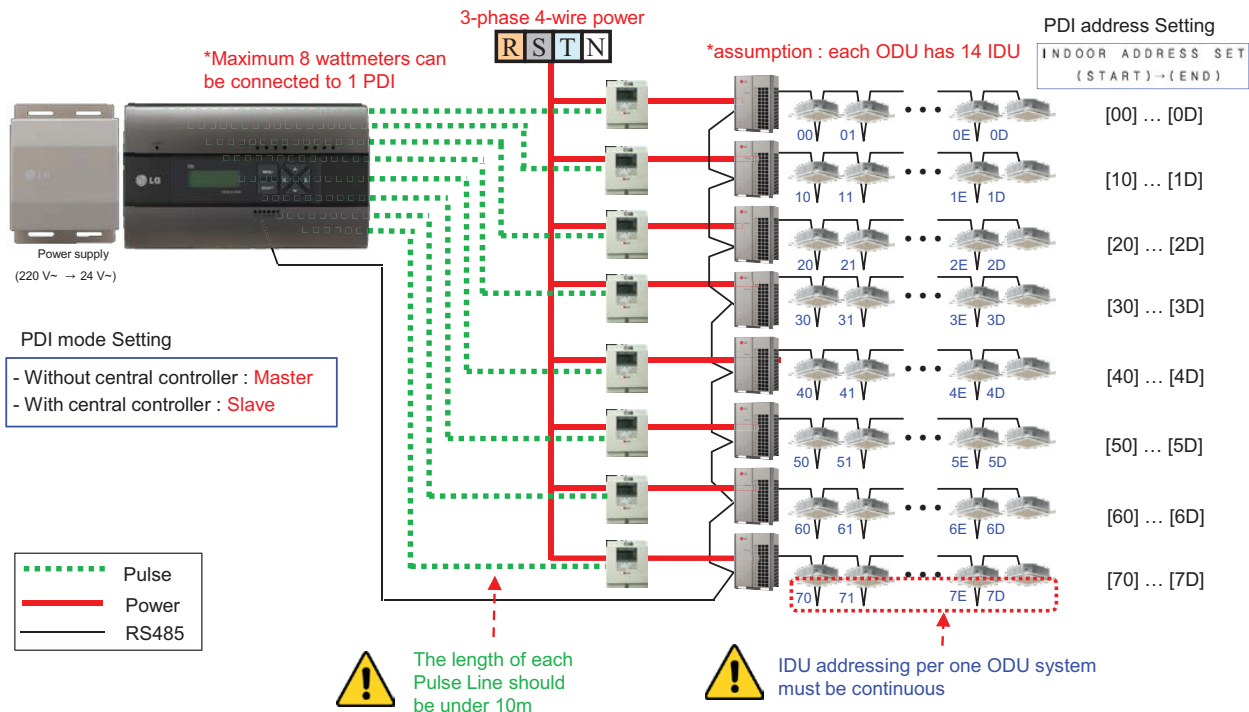
3.4 Product Description

■ Components

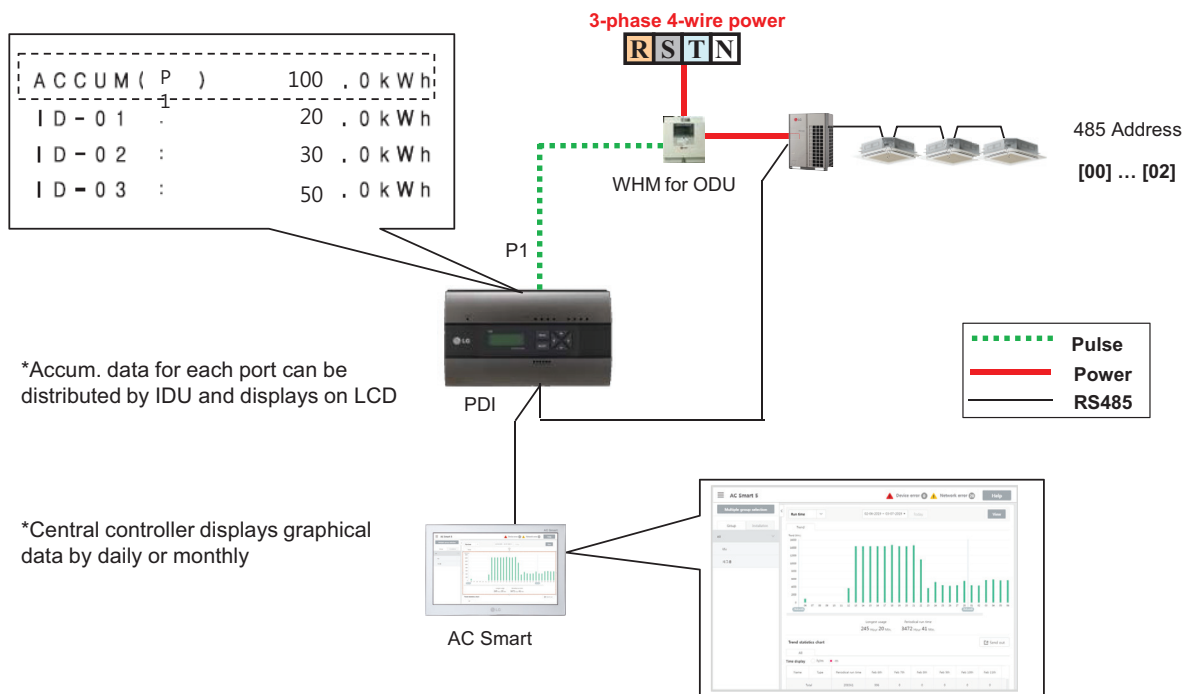


3.4 Product Description

■ Installation – Multiple WHM



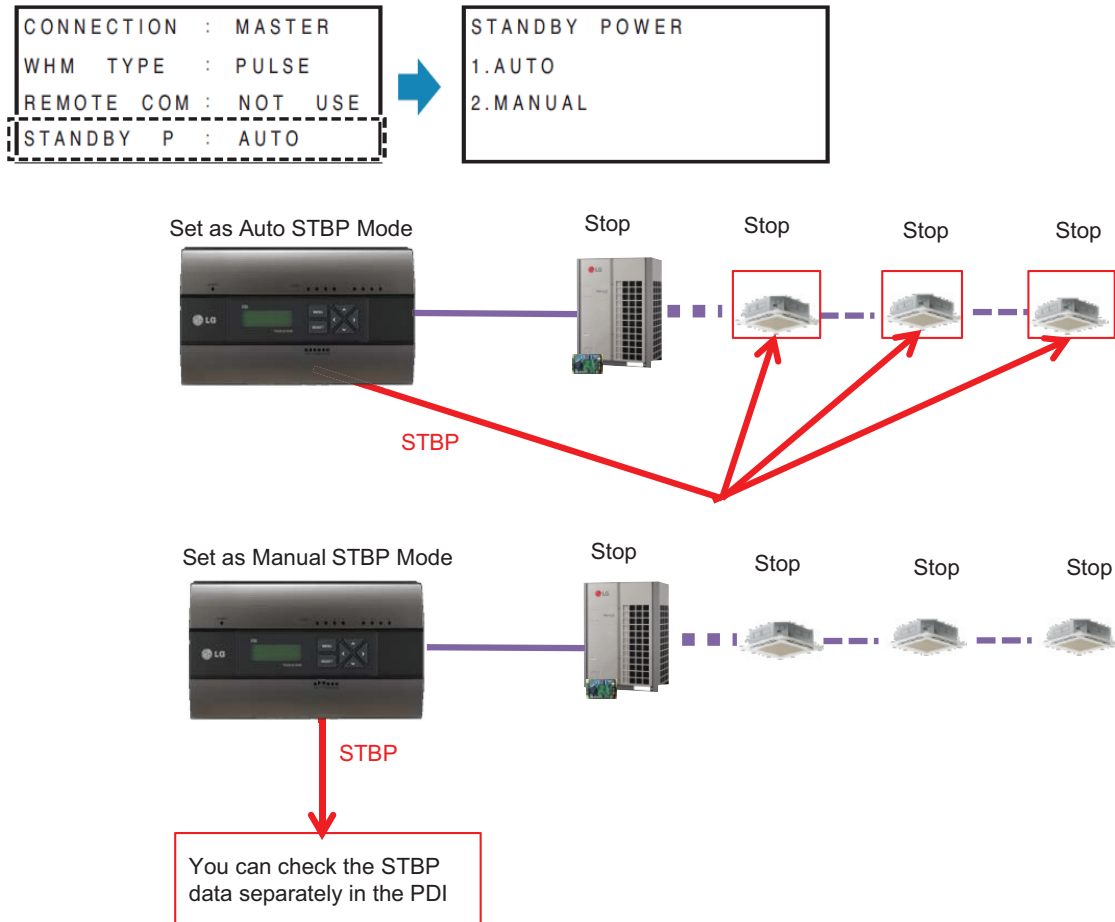
■ Power Distribution display



3.4 Product Description

■ Power Distribution – STBP(Stand-by Power)

- Auto STBP : In this mode, PDI distributes the STBP to the each IDU unit equally
- Manual STBP : In this mode, PDI saves separately the STBP in PDI STBP's page



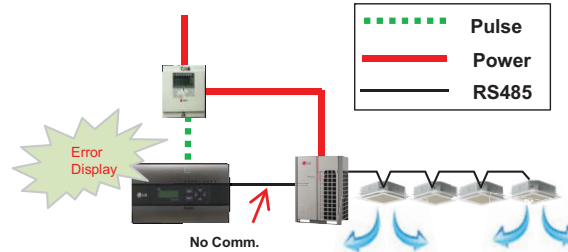
3.4 Product Description

■ Error Display

ERROR-01
NO COMMUNICATION
WITH AIRCONDITIONER
IDU ADDRESS [00-07]

<Communication error display>

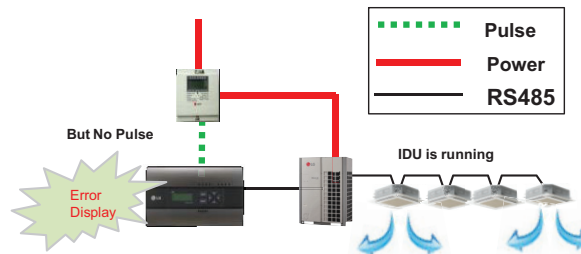
- If there is no communication signal from ODU~IDU for 3 minutes, this error is displayed



ERROR-02
NO SIGNAL FROM WHM1

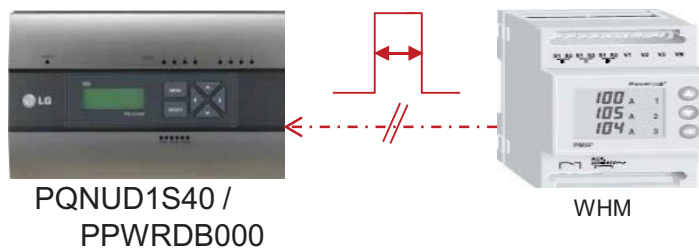
<No signal from Wattmeter error>

- If there is no pulse signal from the wattmeter even while IDU is running, this error is displayed



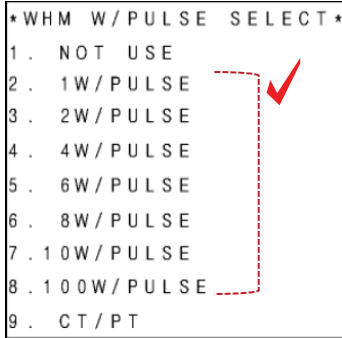
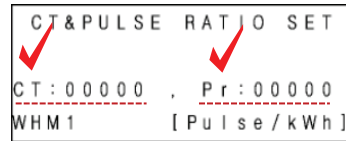
■ Requirement for WHM

- Use the WHM(Watt Hour Meter) for remote reading by sending the pulse signal.
 - Pulse width : 50~400 ms
 - Minimum sink current capability from power indicator : 3mA
 - 1W/pulse, 2W/pulse, 4W/pulse, 6W/pulse, 8W/pulse, 10W/pulse, 100W/pulse and PT/CT (1-50,000)

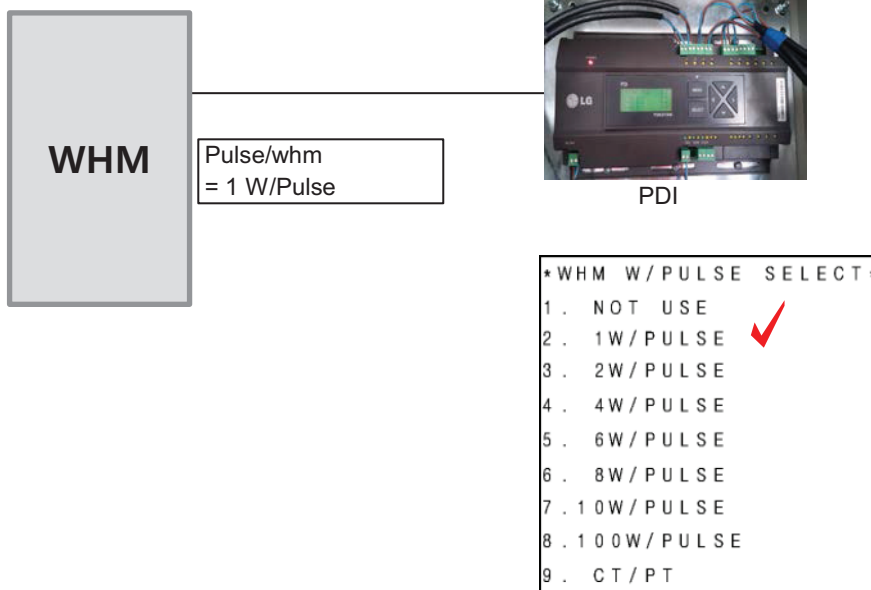


3.4 Product Description

■ Pulse/CT Type setting

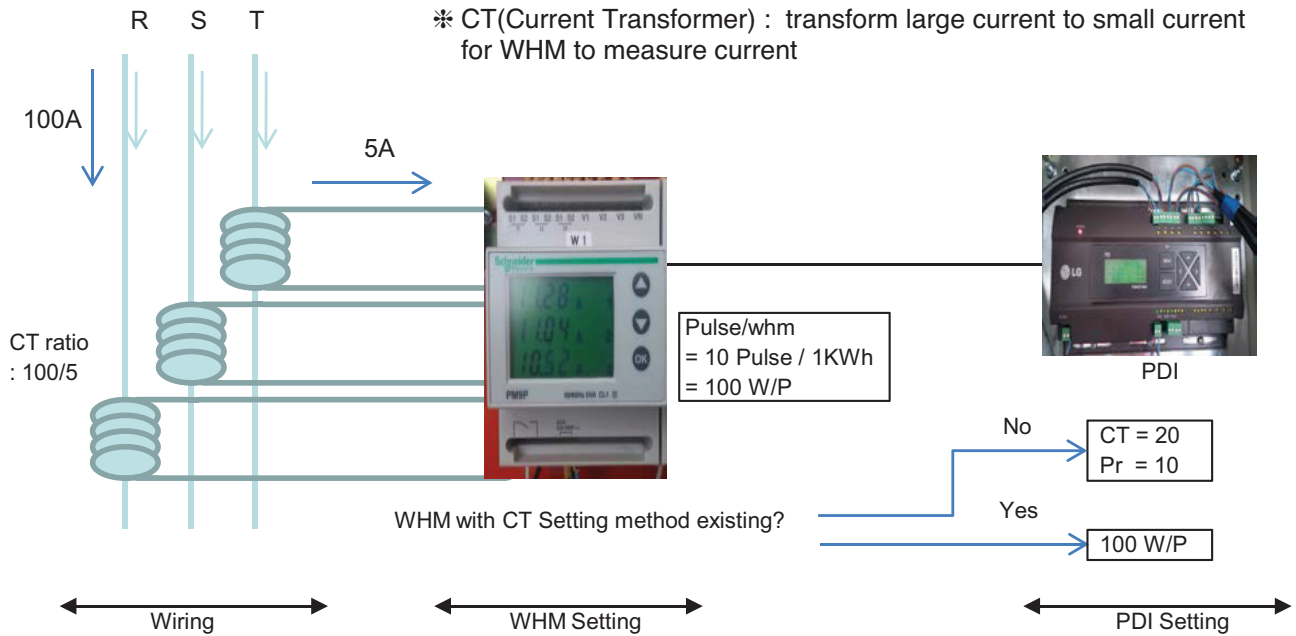
Pulse type	CT(Current Transformer) type
<p>◆ WHM W/PULSE SELECT</p> <ul style="list-style-type: none"> Enter the value displayed on the wattmeter as power consumption per pulse. 	<p>◆ Set CT and device constant value</p> <ul style="list-style-type: none"> CT : As the device to reduce the current so that the measuring device can take the measurement, enter the rate indicated on the product to the CT item. → When using 100:5 CT, enter 20 to the CT item. Pr : As the device constant value, it is displayed as ratio of output pulse per power consumption of WHM. → When using 2500 Pulse/kWh WHM, enter 2500 to Pr item. → When using 1 W/P WHM, enter 1000 to Pr item.  <p>※ CAUTION : If CT ratio is already set by WHM, Please set as Pulse type.</p>

- Example) Pulse Type



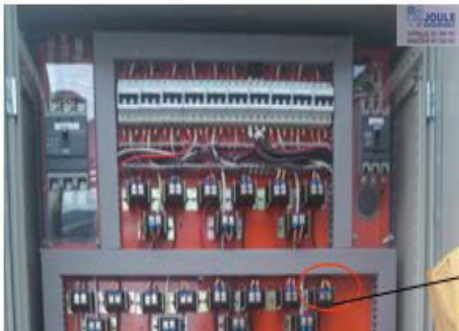
3.4 Product Description

- Example) CT Type



* each phase (R,S,T) have CT

* CT has a ratio spec.



CT Ratio : 20





100:5

3.4 Product Description

■ PDI Installation (How to select WHM)

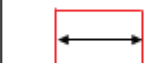
Recommended WHM which is noticed on T/B(B-179)

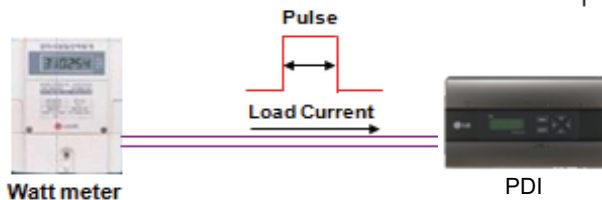
Global WHM(Watt-Hour Meter)

No	Maker	Spec				Image	Reference Site
		Model	Type	A (Max Current)	Pulse Output Width W/Pulse		
1	Schneider	Power Logic PM200P	3P4W	6A(CT Type)	10, 50, 100, 300, 500, or 1000ms 0.1, 1, 10, 100, 1000, 10000, or 100000kWh/P		May, 2012 Brazil
2	Schneider	PM9P	3P4W	6A(CT Type)	50, 100, 200, 300ms 0.1, 1, 10, 100kWh/P		May, 2012 Brazil
3	ABB (Sweden)	OD4165	3P4W	65A	100ms 100P/kWh (10W/P)		Oct, 2010 Czech
4	XIZI	DTS 601	3P4W	40A	- 200P/kWh (5W/P)		June 2013 China (singapore tech)
5	Kohler	AEL TF-10	3P4W	100A	- 1000P/kWh (1W/P)		April, 2013 Turkey
6	Sala-burgess	AAE3DSF 10 PR3A00, ALE3DSF 10	3P4W	65A	50ms 1W/P, 10W/P		Jun, 2013 Swiss
7	Ziegler	3430	3P4W	5A(CT Type)	60ms, 100ms or 200ms Programmable		May, 2015 Iran
8	ABB	B24	3P4W	6A(CT Type)	Programmable: 10-990ms Programmable		May, 2015 Kenya
9	ABB	A43	3P4W	80A	Programmable: 10-990ms Programmable		Feb, 2014 Singapore

If have to use WHM the other Brand from WHM on T/B. The WHM should be satisfied with below specification.

• Specification of WHM(Watt Meter) interlocked to PDI

Digital Pulse Output Width	Watt / 1Pulse	Load Current
50~400msec 	1W / 2W / 4W / 6W 8W / 10W / 100W (w/pulse) CT/PT (1~50,000pulse / kwh) <u>*100w/pulse only PQNUD1 S40</u>	7~8mA



Outputs

Current	2 - 100 mA
Voltage	5 - 240 V AC/DC. For meters with only 1 output, 5 - 40 V DC.
Pulse output frequency	Programmable: 1 - 999999 imp/kWh
Pulse length	Programmable: 10 - 990 ms
Terminal wire area	0.5 - 1 mm²
Recommended tightening torque	0.25 Nm

< Example of Watt meter Specification >

3.4 Product Description

■ PDI Installation

(How to select WHM : The WHM Model Selection Capacity Wise)

The WHM model should be chosen which cover the corresponding ELCB capacity.

If exceed the Max current, have to use CT and CT Type WHM.

	CT Type		CT Type	
	A41	A42	A43	A44
Voltage/current inputs				
Nominal voltage	230 V AC		5x230/400 V AC	
Voltage range	57.7 - 288 V AC (-20% - +15%)		5x57.7/100 ... 288/500 V AC (-20% - +15%)	
Power dissipation voltage circuits	0.8 VA (0.8 W) total			
Power dissipation current circuits	0.007 VA (0.007 W) at 230 VAC	0.001 VA (0.001 W) at 230 VAC	0.007 VA (0.007 W) per phase at 230 VAC and I _n	0.001 VA (0.001 W) per phase at 230 VAC and I _n
Base current I _b	5 A		5 A	
Rated current I _n	-	1 A		1 A
Reference current I _{ref}	5 A	-	5 A	-
Transitional current I _t	0.5 A	0.05 A	0.5 A	0.05 A
Maximum current I _m	80 A	16 A	80 A	16 A
Minimum current I _{min}	0.25 A	0.02 A	0.25 A	0.01 A
Starting current I _{st}	< 20 mA	< 1 mA	20 mA	< 1 mA
Terminal wire area	1 - 25 mm ²	0.5 - 10 mm ²	1 - 25 mm ²	0.5 - 10 mm ²
Recommended tightening torque	3 Nm	1.5 Nm	3 Nm	1.5 Nm
Communication				
Terminal wire area	0.5 - 1 mm ²		0.5 - 1 mm ²	
Recommended tightening torque	0.25 Nm			
Transformer ratios				
Configurable voltage ratio (VT)	-	1/999 - 999999/1		1/999 - 999999/1
Configurable current ratio (CT)	-	1/9 - 9999/1		1/9 - 9999/1
Pulse indicator (LED)				
Pulse frequency	1000 imp/kWh	5000 imp/kWh	1000 imp/kWh	5000 imp/kWh
Pulse length	40 ms	40 ms	40 ms	40 ms
General data				
Frequency	50 or 60 Hz ± 5%			
Accuracy Class	B (Cl.1) or Reactive Cl. 2	B (Cl.1), C (Cl. 0,5 S) or Reactive Cl. 2	A (Cl.2), B (Cl.1) or Reactive Cl. 2	B (Cl.1), C (Cl. 0,5 S) or Reactive Cl. 2

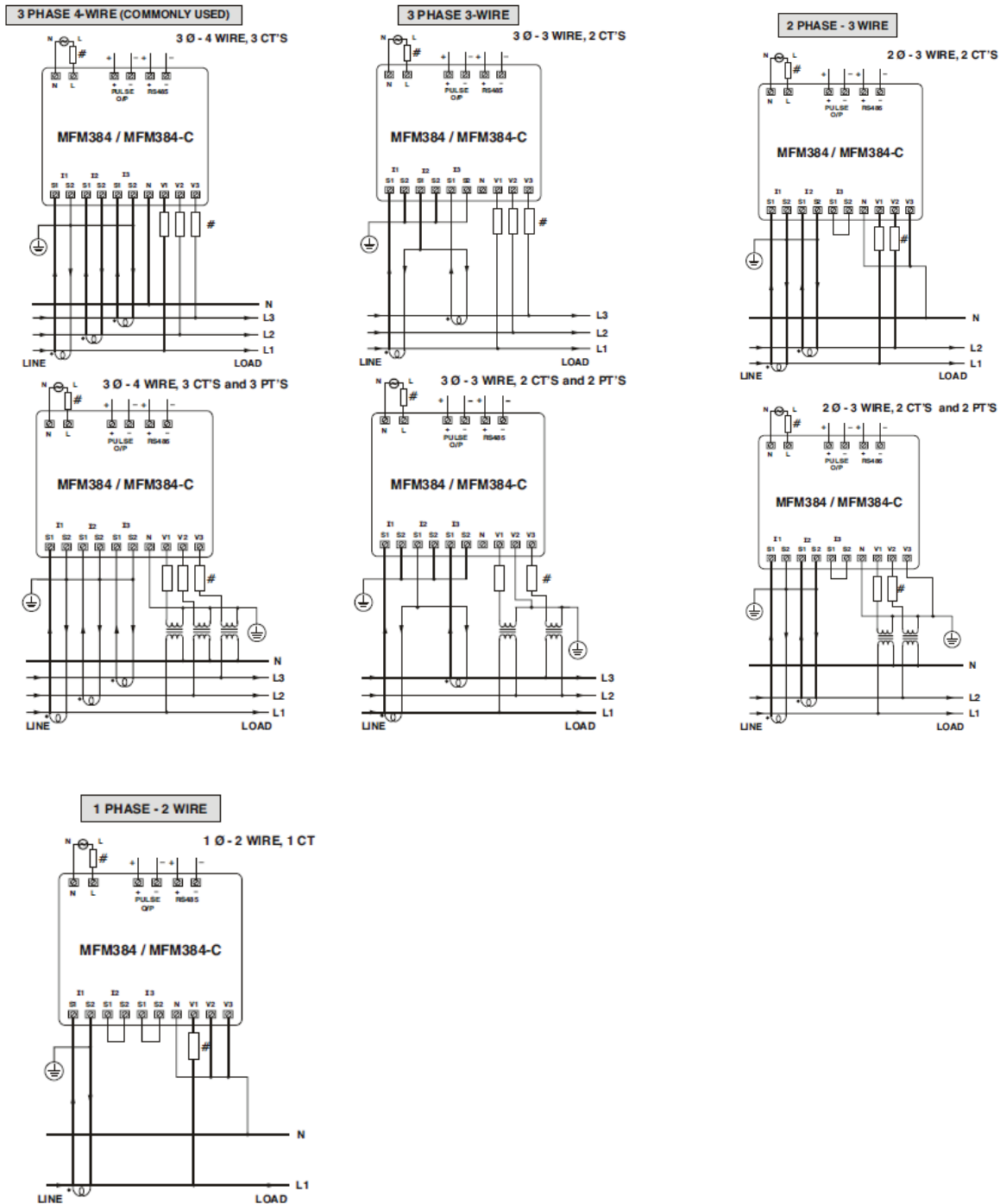
3.4 Product Description

■ PDI Installation (How to WHM Select : Installation of WHM)

Refer to the wiring diagram of WHM manual.

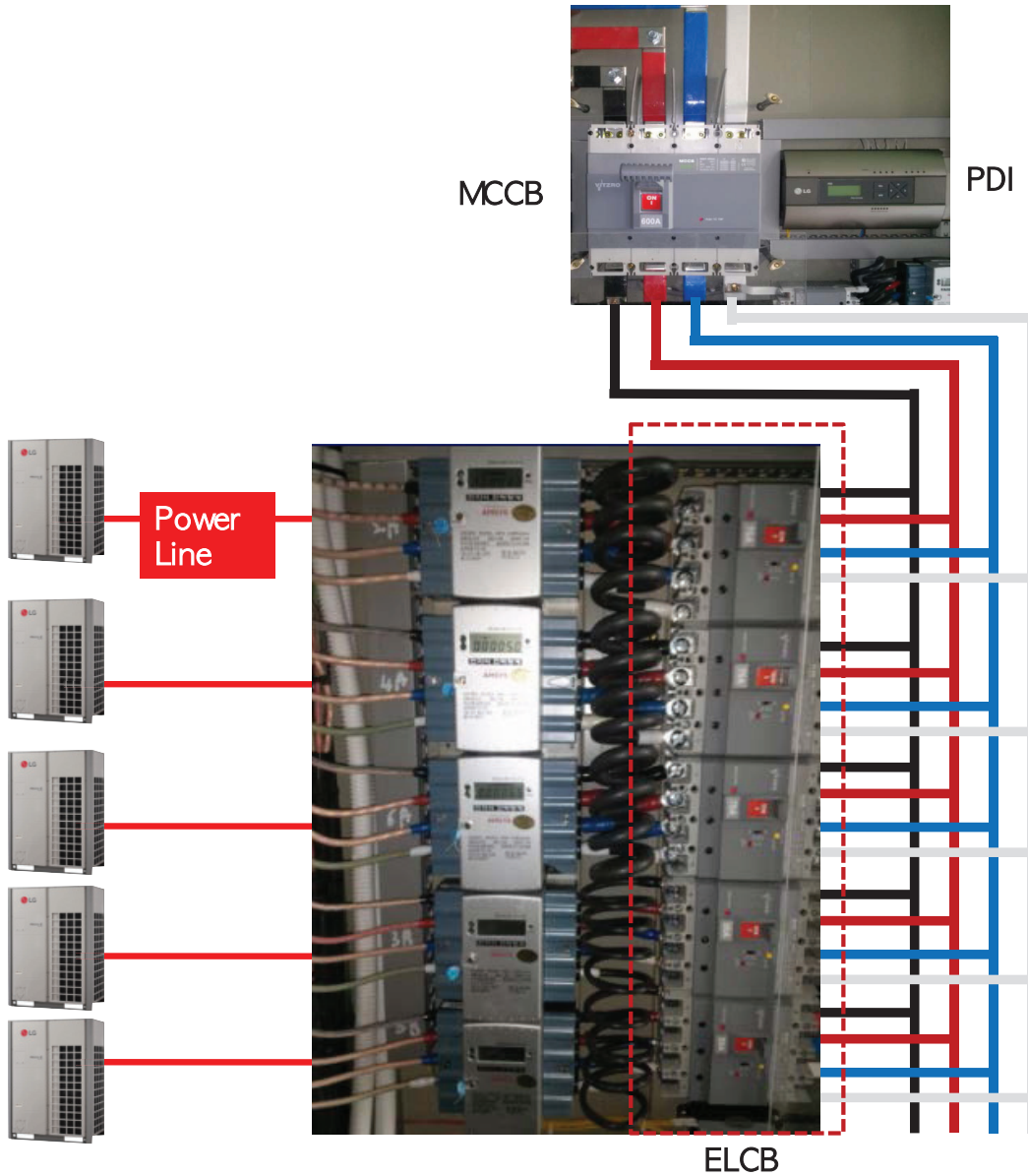
After installation, It is mandatory to be check if it operate correctly by WHM manufacturer.

Example) “Select” WHM Installation Manual



3.4 Product Description

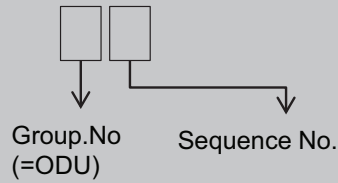
■ PDI Installation (How to WHM Select : Actual Photo)



3.4 Product Description

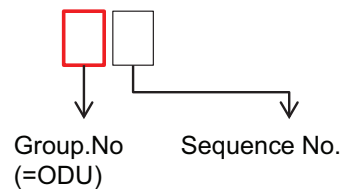
■ PDI Installation (IDU Addressing Setting)

*Structure of IDU Address
for using Central Control

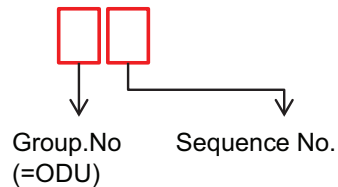


1. Set and Put the IDU Address on floor plan

1. Set the Group. Number to each ODU System



2. Set IDU Address according to ODU Group. No.



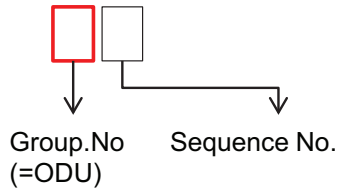
3. Put the IDU Address to floor plan.

2. Set the Address to IDU

4. Set the address to IDU according to the Floor plan address map. (Using Remote Controller).

3.4 Product Description

1. Set the Group. Number to **each** ODU System

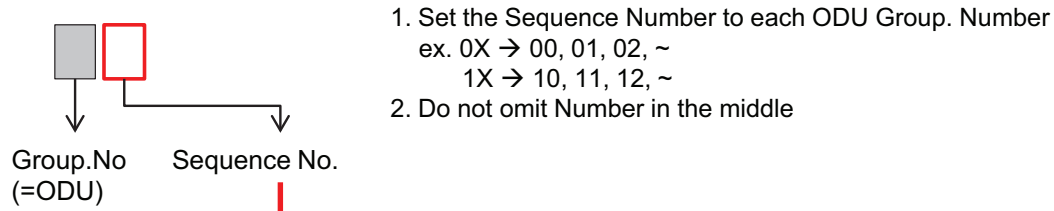


1. For PDI site, please make address table on the floor plan, not to make any mistake
2. Do not omit Number in the middle



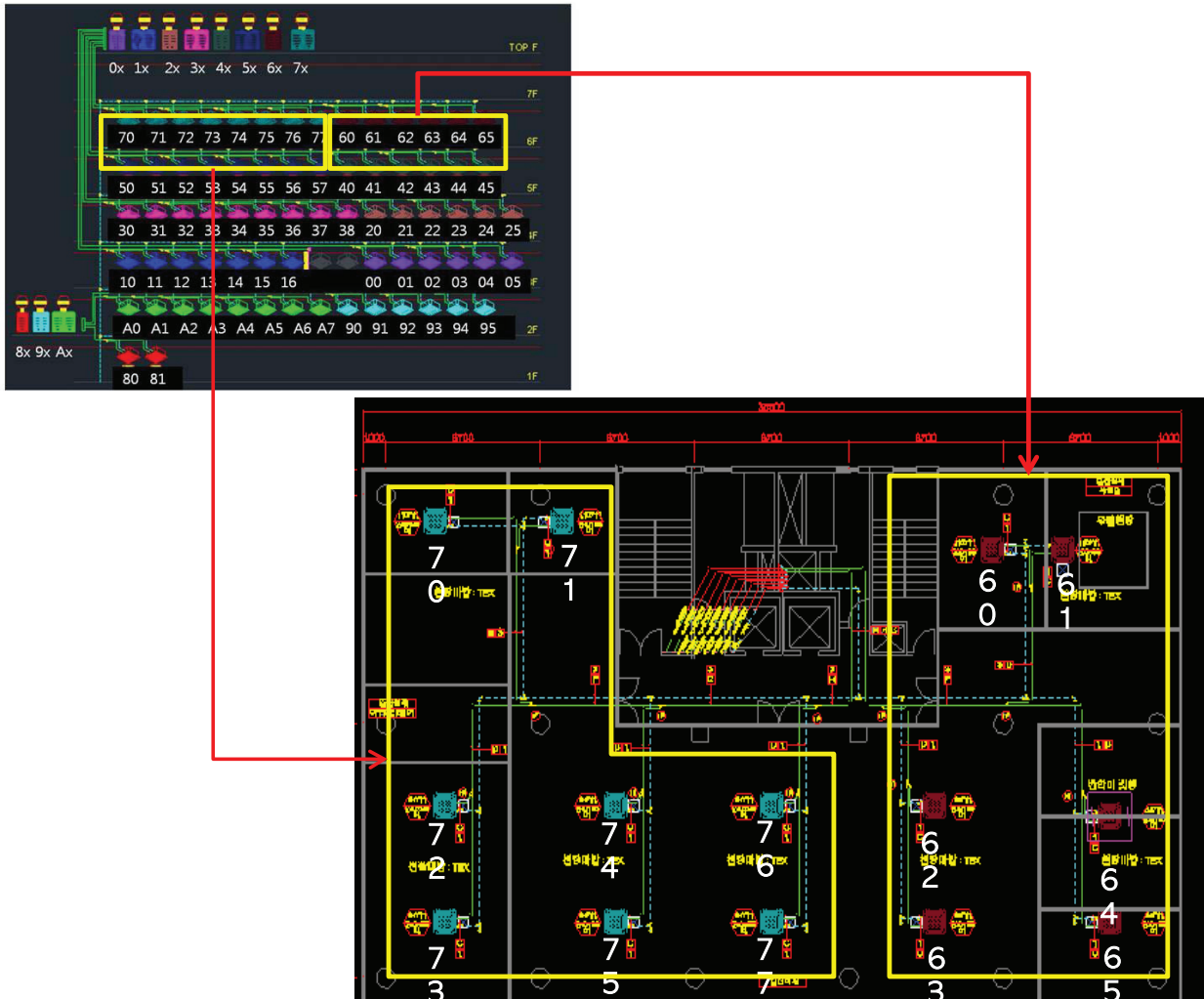
3.4 Product Description

2. Set IDU Address according to ODU Group. Number



3.4 Product Description

3. Put the IDU Address to floor plan : ex. 7th Floor



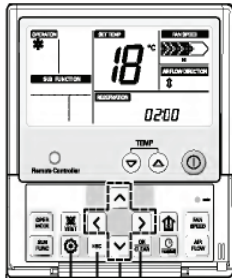
→ As following this process, you will be able to avoid the wattage error that is happen when you are setting omit address or duplicate address



3.4 Product Description

4. Set the IDU address according to the Floor plan address map. (Using Remote Controller).

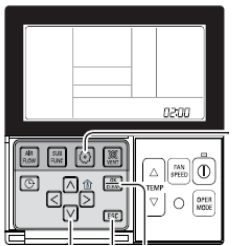
※ Do not set the same address to different IDUs connected to the same Central Controller



Wired Standard(Old)



Press  button(3 s)
 → Repeat Pressing  button
 (Function code 02 : XX)
 → Set address with Up/Down
 → Press ok/Clear
 (saved)
 → Press ESC

Wired Standard



Press  button(3 s)
 → Repeat Pressing  button
 (Function code 02 : XX)
 → Set address with Up/Down
 → Press ok/Clear
 (saved)
 → Press ESC

Wireless



※ For Checking Address
 Press Set + Reset
 → Set address with
 Up/Down
 → Run/Stop Button
 (Saved)
 → Press Reset (Exit)



※ For Checking Address
 Press Plasma+Reset
 (Toward the IDU)
 → Press Start/Stop button
 (count the number of
 blinking)
 → Press Reset (Exit)

3.4 Product Description

■ PDI Installation (PDI Wiring : Connection Reminders)

1. Pulse Line Connection

- Length Limit : Under 10m From WHM to PDI
- Polarity Limit : WHM's (+/-) & PDI's (+/-) Polarity match

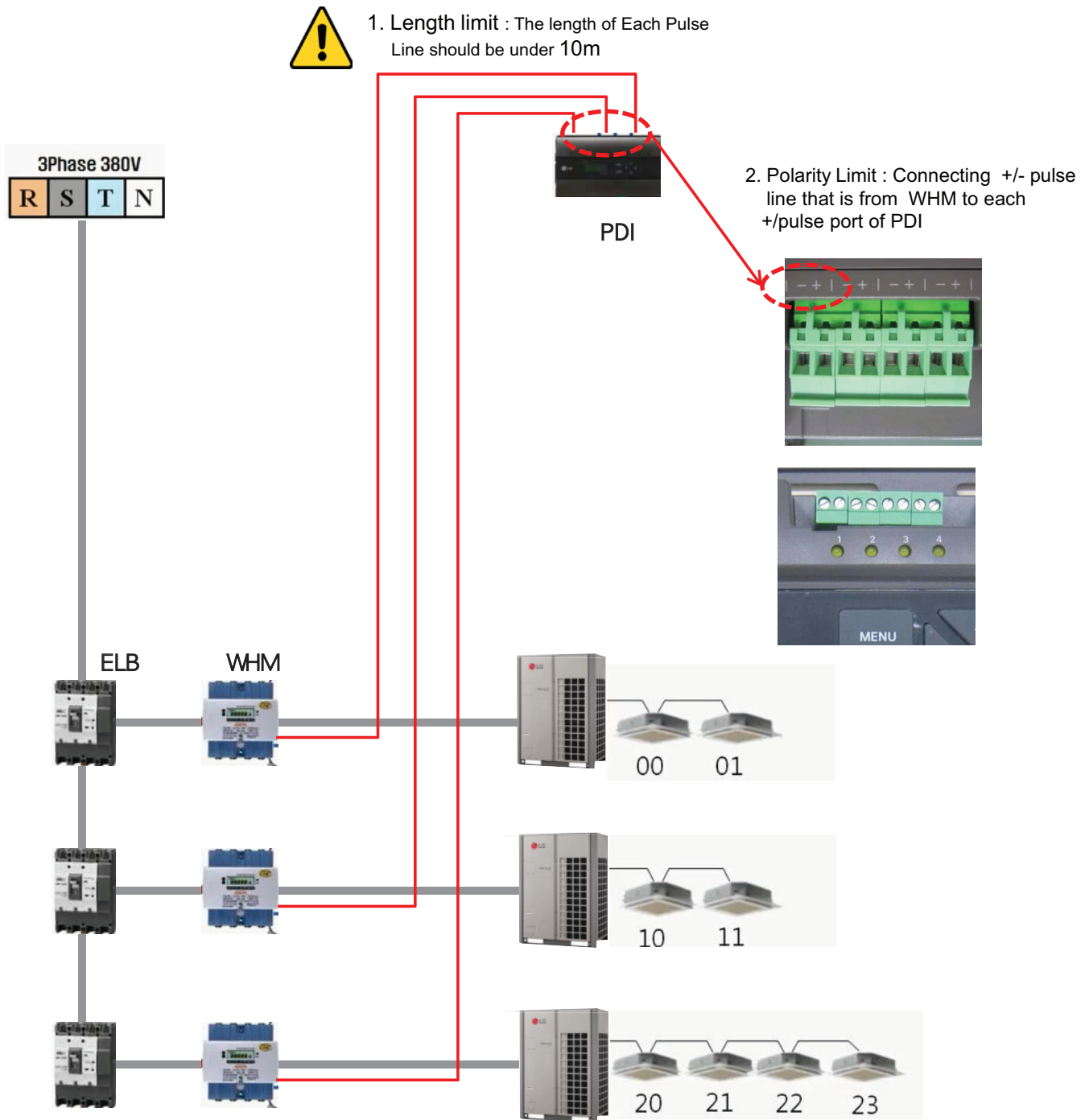
2. Communication Line(RS485) Connection

- Length Limit : Between ODU → Under 200 m, Total Under 1 km
- Polarity Limit : ODU's (A/B) & PDI's (A/B) & ACP's (A/B) Polarity match
 - * All Polarity A/B between ODU and ACP should be matched
- Node(Connect) Limit : Max 32 EA
 - Including Slave central controller & (Multi V ODU * 2) & PI485, the number of device connected between central control device and ODU should not exceed 32 EA

Cf. Total Number of IDU that you can control : 128 EA

3.4 Product Description

■ PDI Installation (PDI Wiring : Pulse line Connecting Method & Reminders)



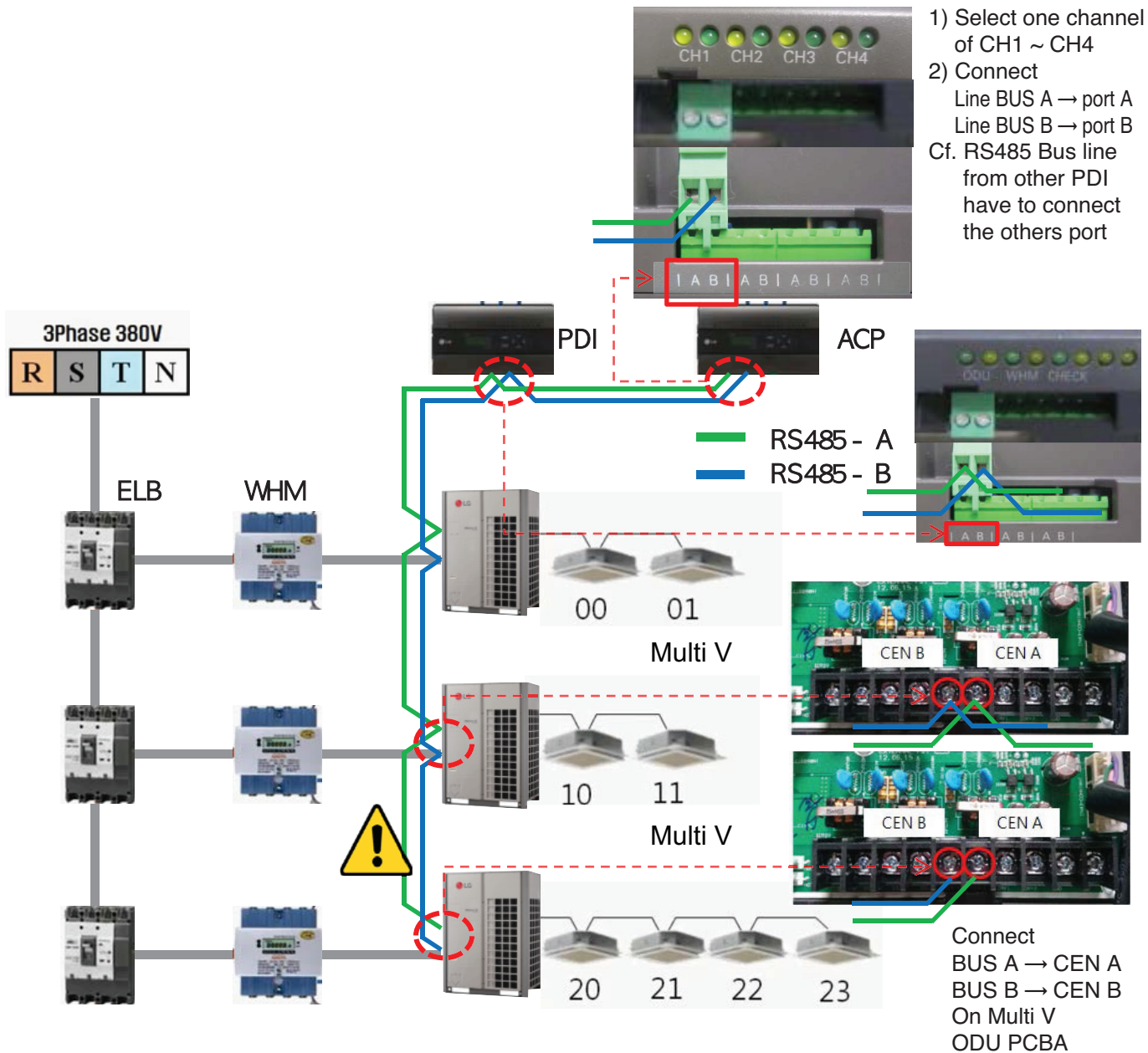
3.4 Product Description

■ PDI Installation (PDI Wiring : Pulse line Connecting Method & Reminders)



1. Length limit
 - The length of between each Outdoor unit ≤ 200 m
 - Maximum Length of 1 RS485 Line ≤ 1 km
2. Node limit
 - Maximum node of 1 RS485 Line ≤ 32
 - (Multi V Outdoor count * 2) + PI485 count + Slave central controller count ≤ 32
3. RS485 A/B Polarity Limit
 - When connecting RS485 line(Communication) all lines should be matched to each A/B port

- 1) Select one channel of CH1 ~ CH4
- 2) Connect
Line BUS A → port A
Line BUS B → port B
Cf. RS485 Bus line from other PDI have to connect the others port



3.4 Product Description

■ PDI Installation (PDI Setting method)



You have to set in 20 minutes after turning power on.

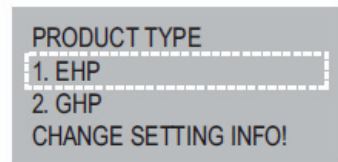
* Description of button function

Use for change display showing that : Main → instant power → Accumulative

Use for entering applicable set menu and saving

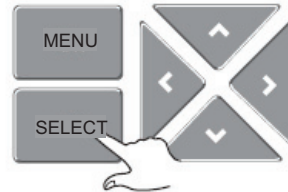


①



• Using up&down direction button, select product type

②

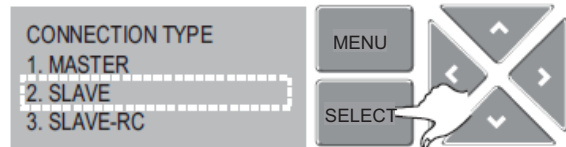


• After select product type, Press the 'SELECT' button

③



④



* Master : When using without central control Unit
 * Slave : When using with central control Unit
 * SLAVE-RC: When using with central control Unit.
 If the master is stopped, This mode can be operated as a single master.

⑤



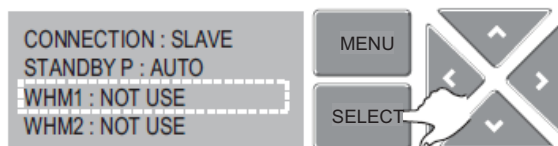
⑥



* AUTO : Automatically distribute the standby power
 * MANUAL : Does not distribute the standby power

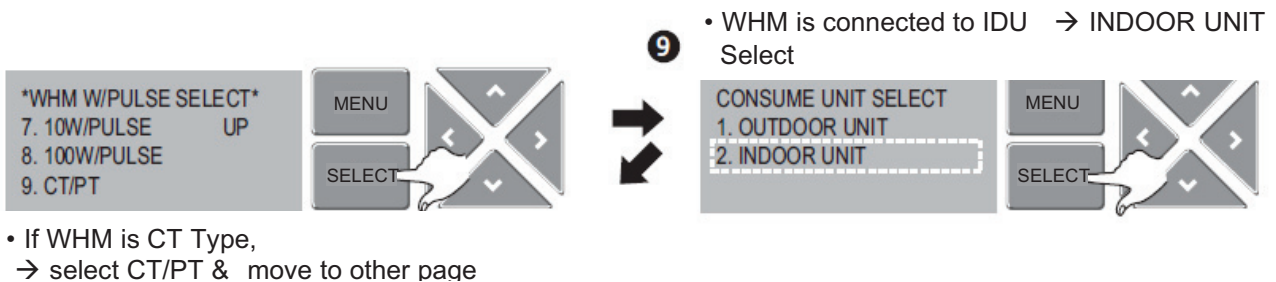
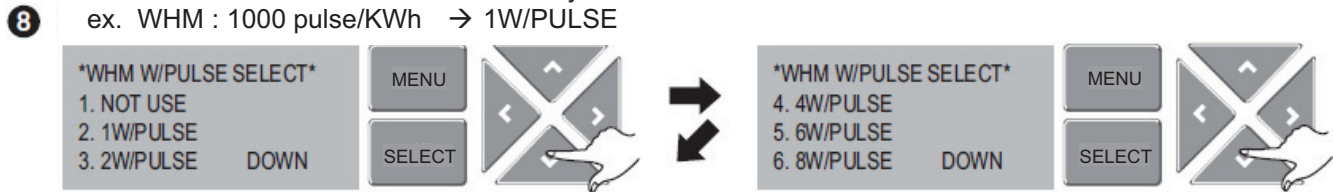
• Select Port of PDI connected WHM
 ex. WHM Connected Port 1 of PDI → Select WHM1

⑦

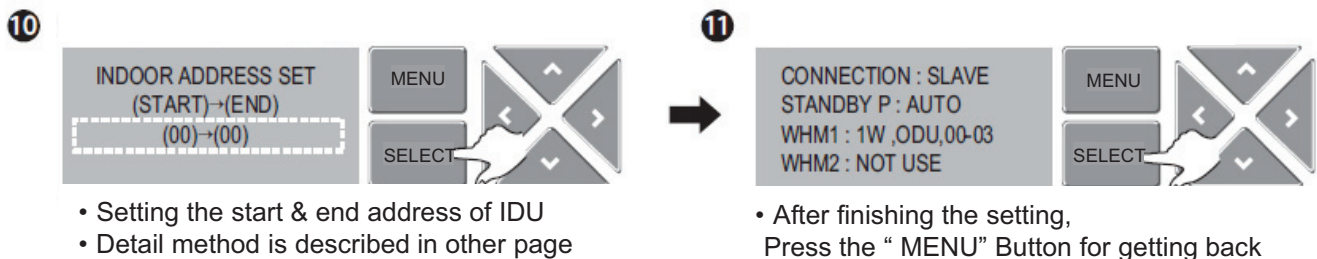


3.4 Product Description

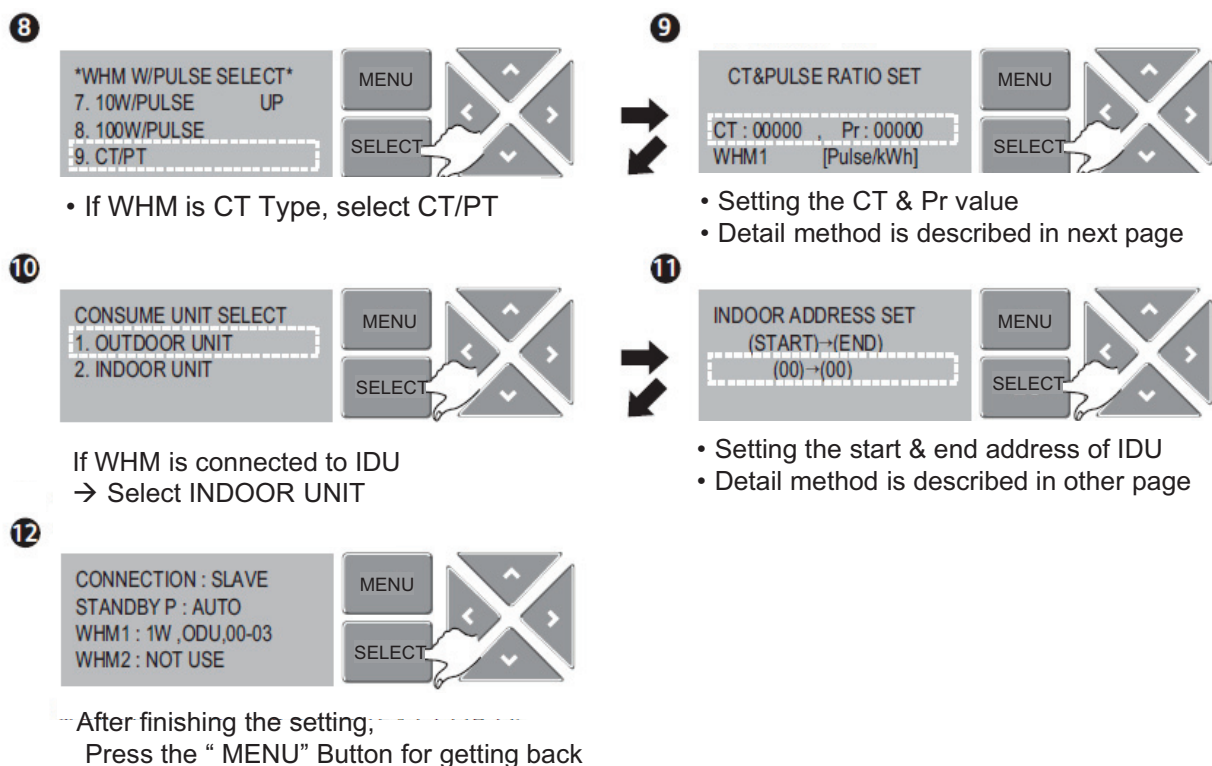
- Select value that should be calculated by WHM info.
ex. WHM : 1000 pulse/KWh → 1W/PULSE



- If WHM is CT Type,
→ select CT/PT & move to other page

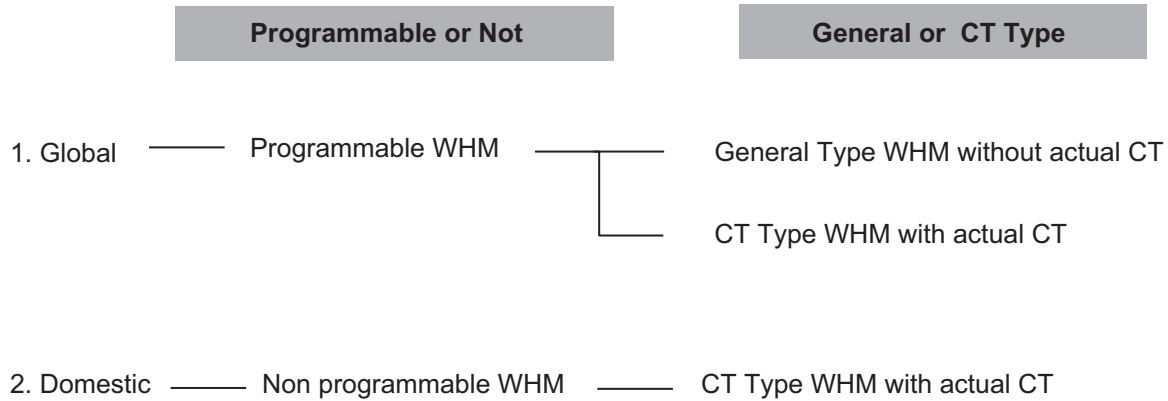


■ PDI Installation (PDI Setting method, When using CT Type WHM)



3.4 Product Description

■ PDI Installation (PDI Setting method, When using General Type or CT type WHM)



Why use the CT TYPE WHM(purpose)

: When the WHM model doesn't cover the ELCB capacity, turn down the current
 (100A → 5A, CT Ratio=20=100/5)

3.4 Product Description

■ PDI Installation (PDI Setting method, Case 1(Global) : Programmable & General Type WHM)

1. Put CT Ratio to WHM

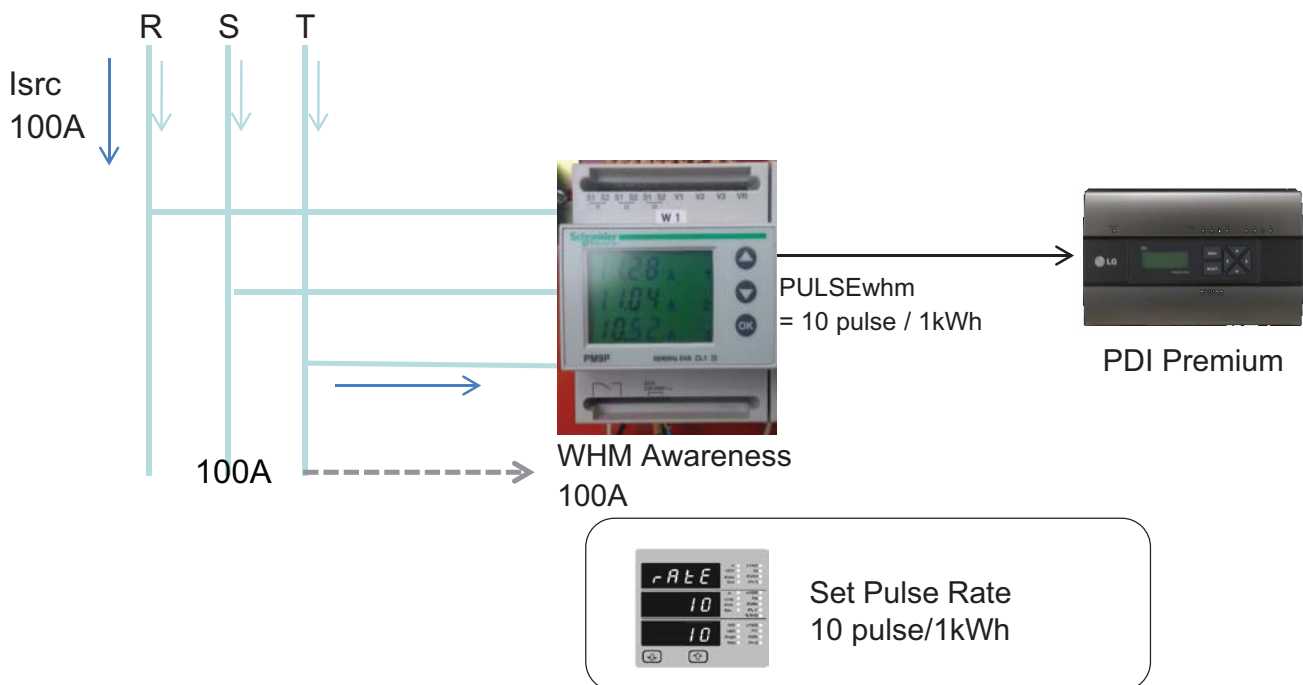
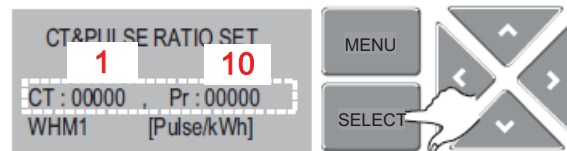
- ① Putting CT Set value
= primary : secondly = 1 : 1

2. Set & Put the Pulse Ratio to WHM

- ② Setting the Pulse Ratio
→ You can set this value within the WHM Spec
. ex WHM Spec = 1~99999 impulses
if you choice 10 pulse/1kWh
→ ③ Putting Pulse Ratio : 10

3. PDI Setting

- ④ Putting CT ratio =1
& Pulse value



Isrc(current) : large current (difficult to measure)

3.4 Product Description

■ PDI Installation (PDI Setting method, Case 2(Global) : Programmable & Need to install actual CT)

1. Set CT Ratio

- ① Set Actual CT Ratio
 - * Cover WHM capacity (ex. 5A)
 - (EX. 5A= $I_{src}/CT \text{ ratio} = 100A/20=5A$)
 - Set Actual CT :
 - = primary : secondly = 1 : 1 = 100:5

2. WHM Setting

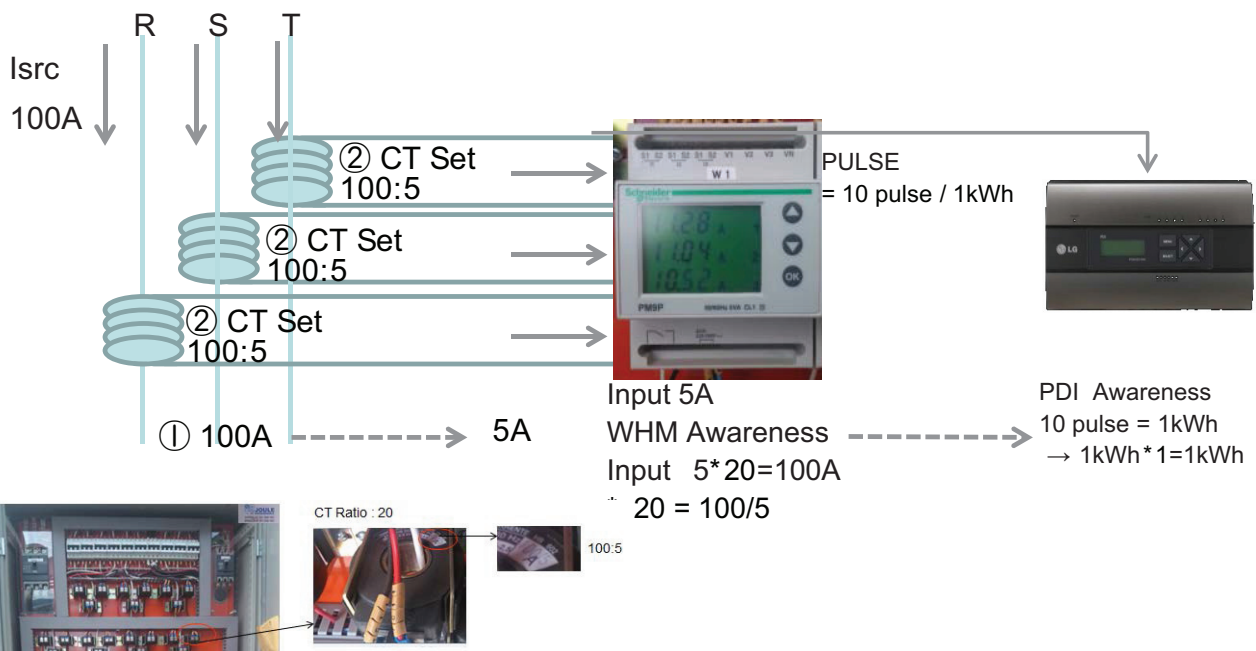
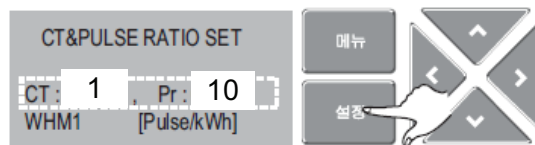
- ② Putting CT Set value
 - = primary : secondly = 1 : 1 = 100 : 5
- ③ Setting & Putting
 - Pulse value : 10
 - (if you set 10 pulse/1kWh)



※ Set "1" in CT : []
Because CT Ratio was already reflected
In Programmable WHM (100:5)
If you set the CT Ration(CT=20) in PDI,
Consumption data is x 20

3. PDI Setting

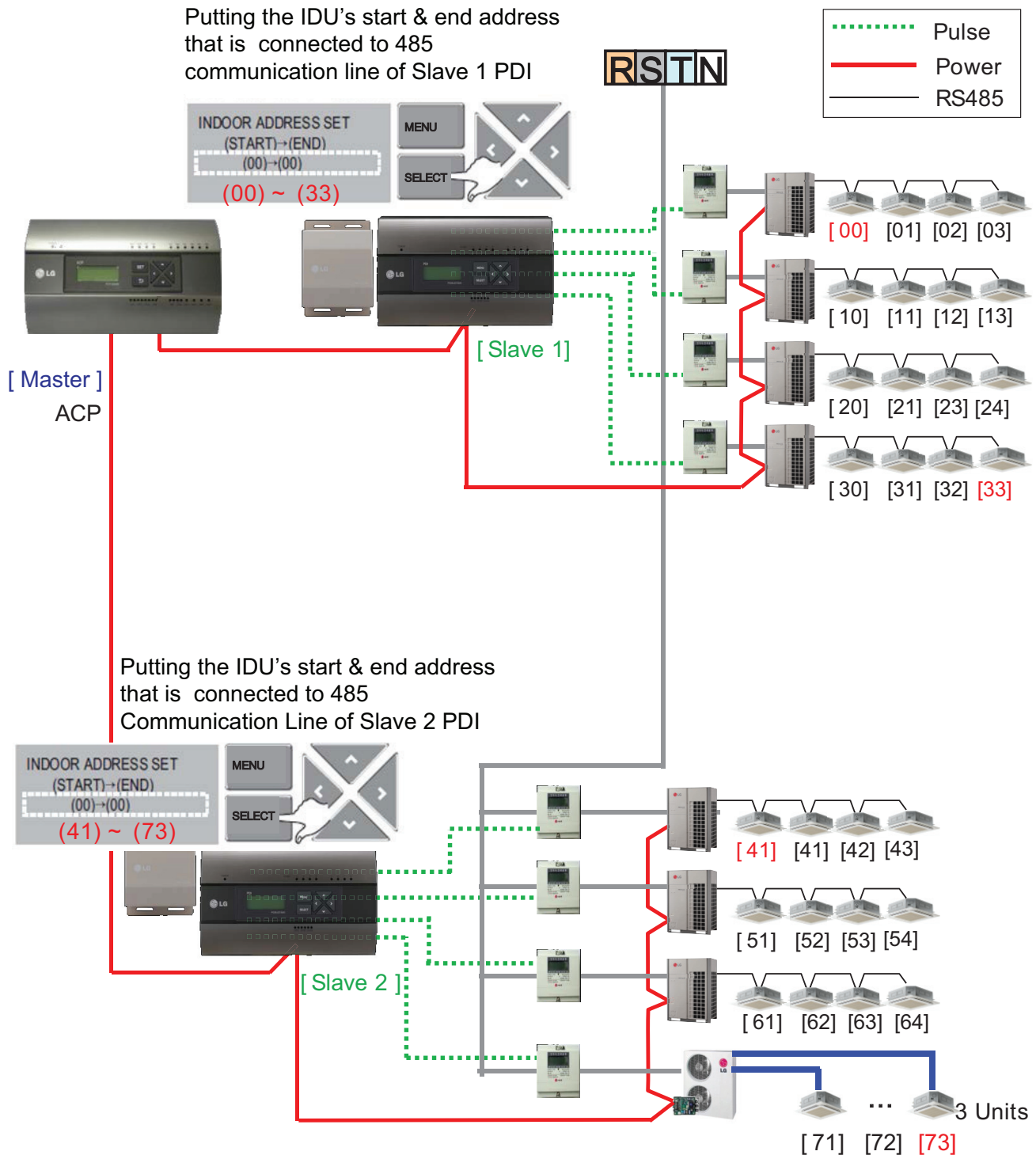
- ④ Putting CT ratio & Pulse value



I_{src} (current) : large current (difficult to measure)

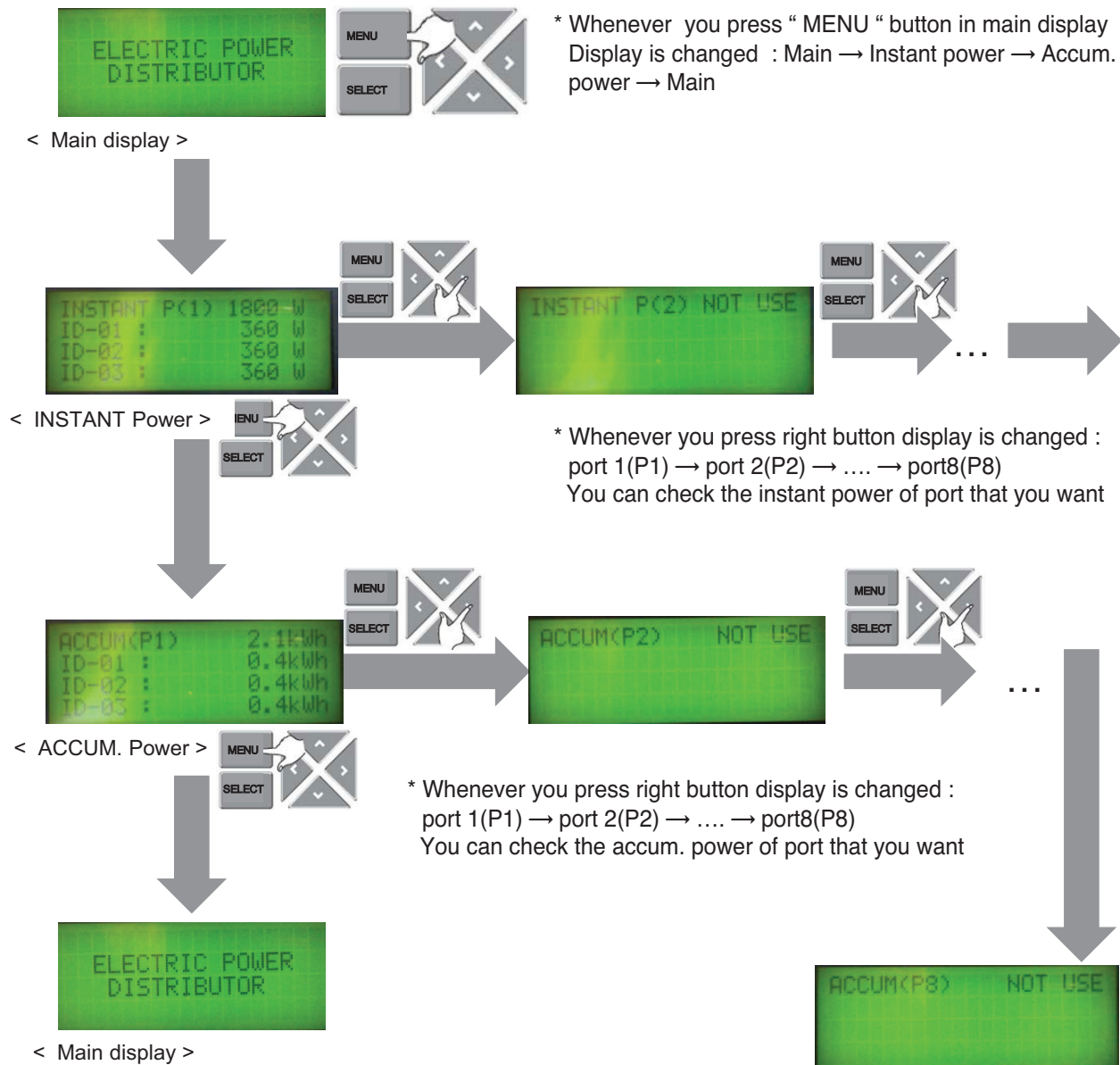
3.4 Product Description

■ PDI Installation (PDI Setting method, Addressing setting method)



3.4 Product Description

■ PDI Installation (PDI Setting method, Power consumption check _In PDI)

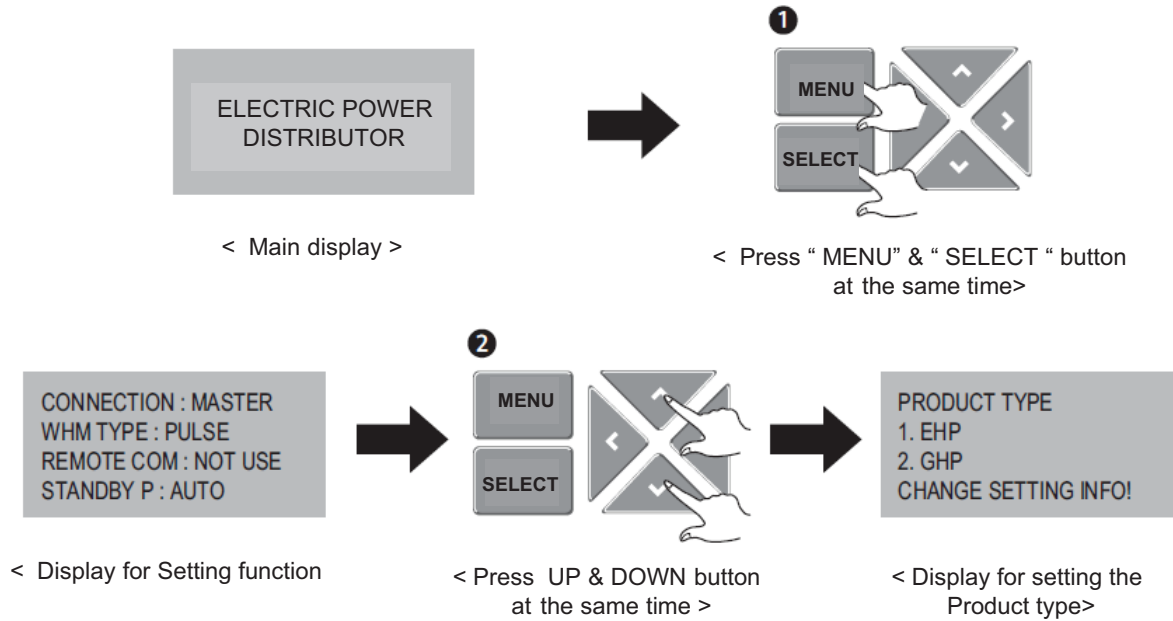


3.4 Product Description

■ PDI Installation (PDI Setting method, Method to change product type)

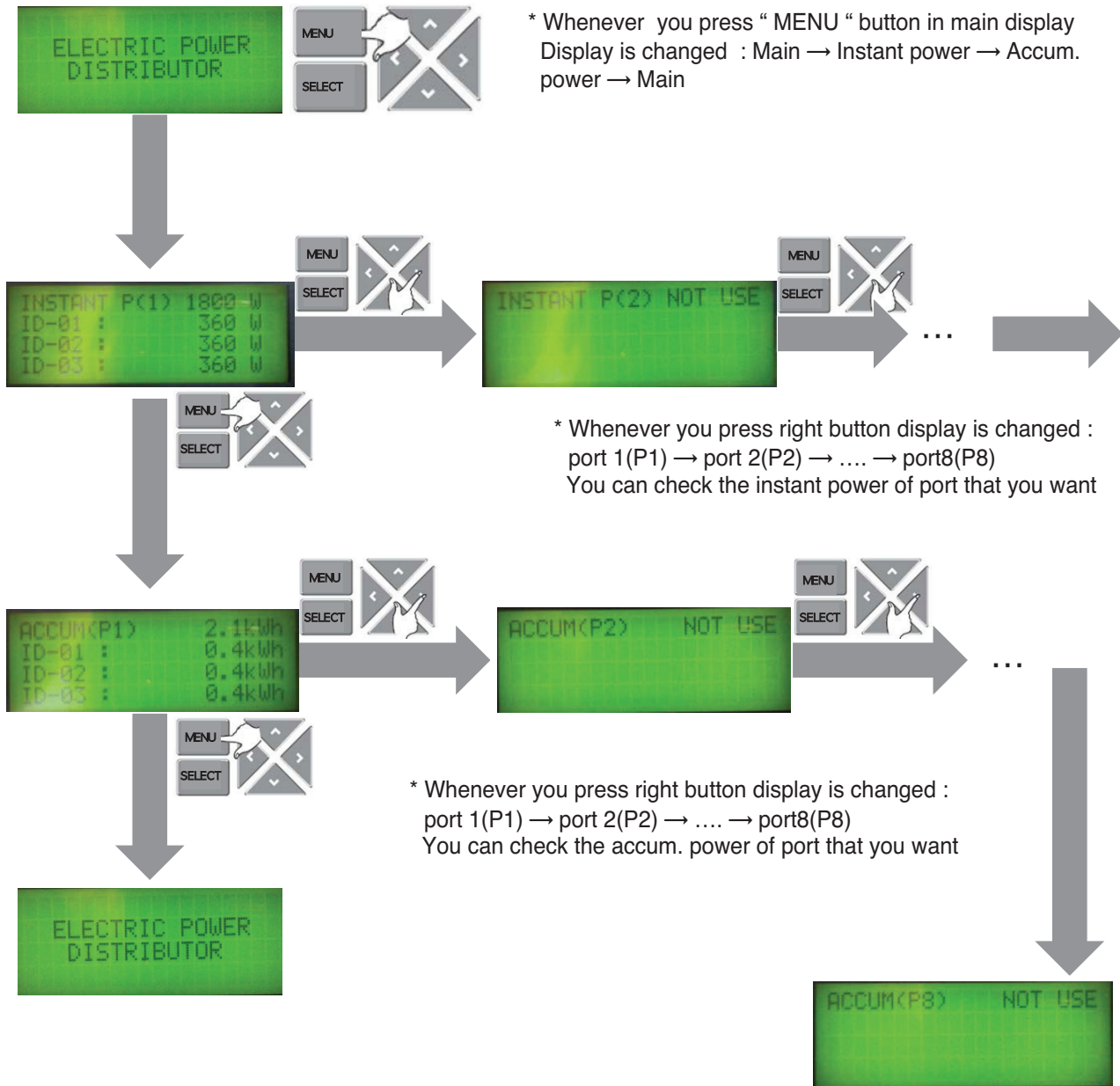
You have to set in 20 minutes after turning power on

→ So. You should turn PDI off and on to change the product type



3.4 Product Description

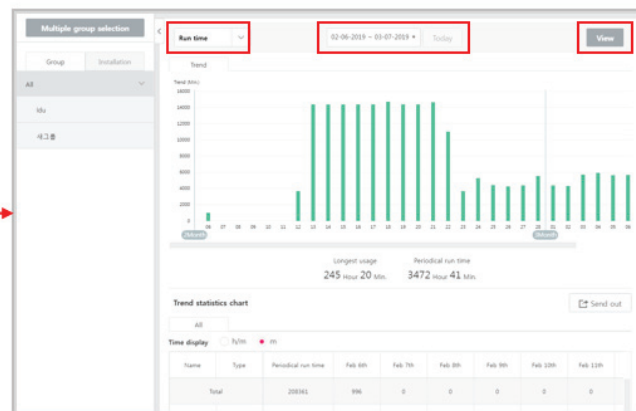
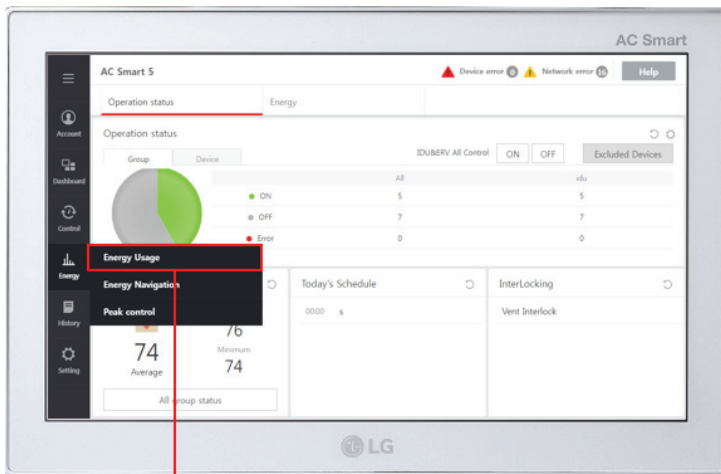
■ PDI Installation (Power consumption check)



3.4 Product Description

■ PDI Installation (Power consumption check in ACP)

1. Main GUI → Click Energy Report
2. Click “Power”, “Daily”, “ View All “
3. Setting the month that you need to confirm
→ After this process, you can watch the power data(kWh)



3.4 Product Description

■ Major Logic (STBP - Standby Power Consumption)

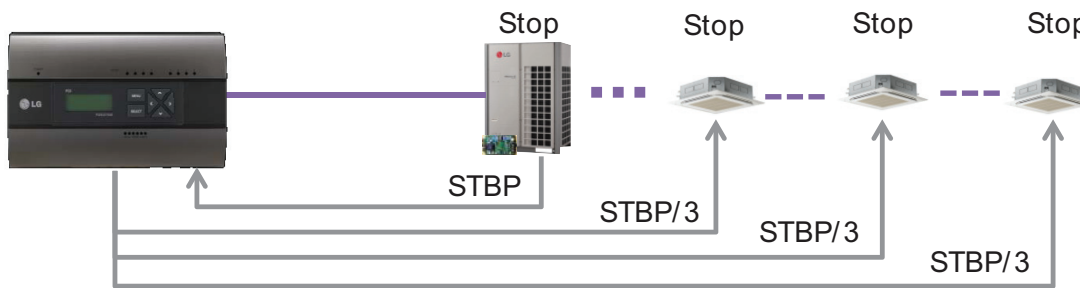
1) Set as AUTO : In this mode, PDI distributes the STBP to the each IDU unit

① Mode setting



* In 20 minutes after turning on

② STBP operating



③ Check result



3.4 Product Description

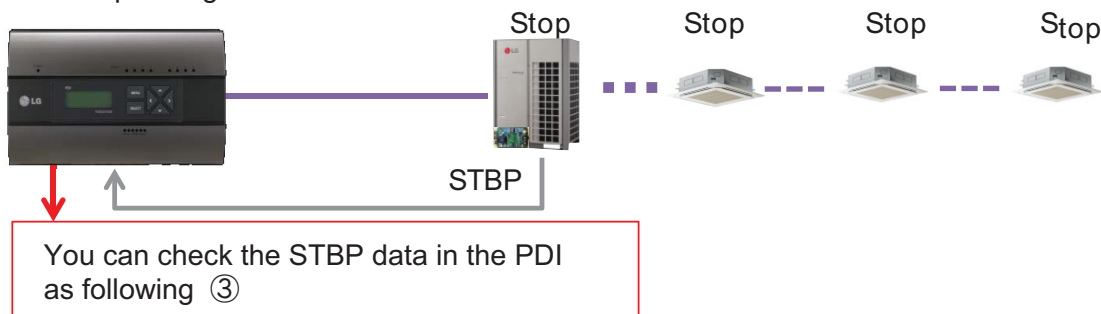
2) Set as Manual : In this mode, PDI saves the STBP in PDI STBP's page , do not distribute to each IDU

① Mode setting

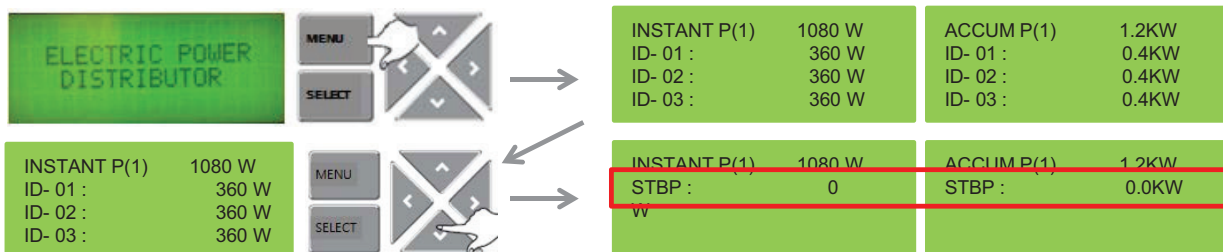


* In 20 minutes after turning on

② STBP operating

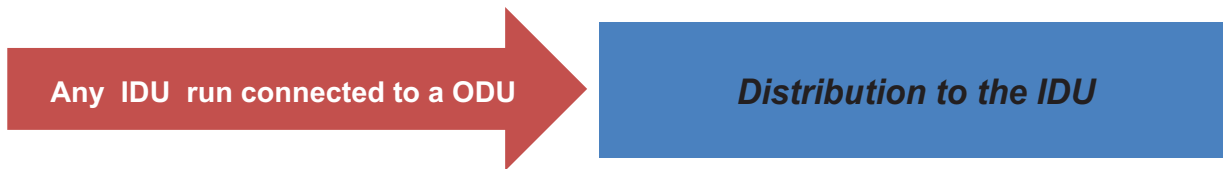


③ Check result



3.4 Product Description

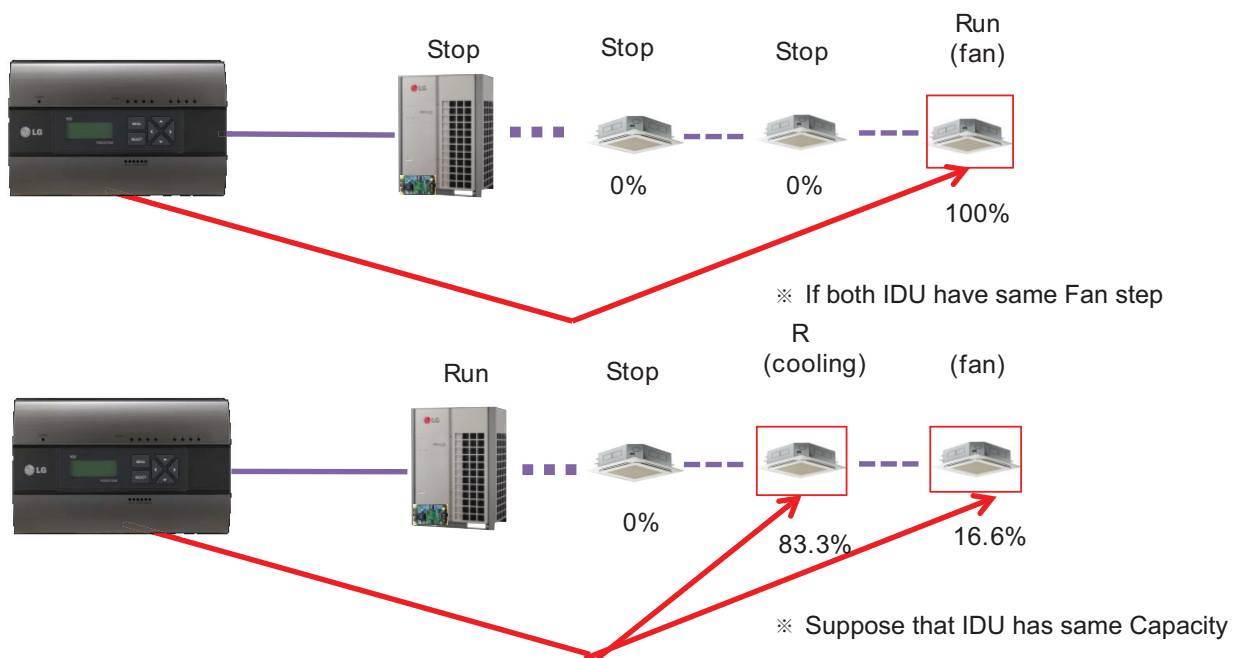
■ Major Logic (PDI Distribution Logic)



$$\frac{\text{Power Consumption of each IDU}}{\text{Power Consumption of ODU}} \times \frac{\text{Weighting Power of each IDU}}{\text{Weighting Power of total Indoor Units}}$$

$$\text{Weighting Power of each Indoor Unit} = \text{Operation (On/Off)} \times \text{Capacity of IDU} [\text{Comp On/OFF (80\%)} + \text{Fan step of IDU (20\%)}]$$

※ This distribution logic has no legal basis. Use this formula internal use only.



3.4 Product Description

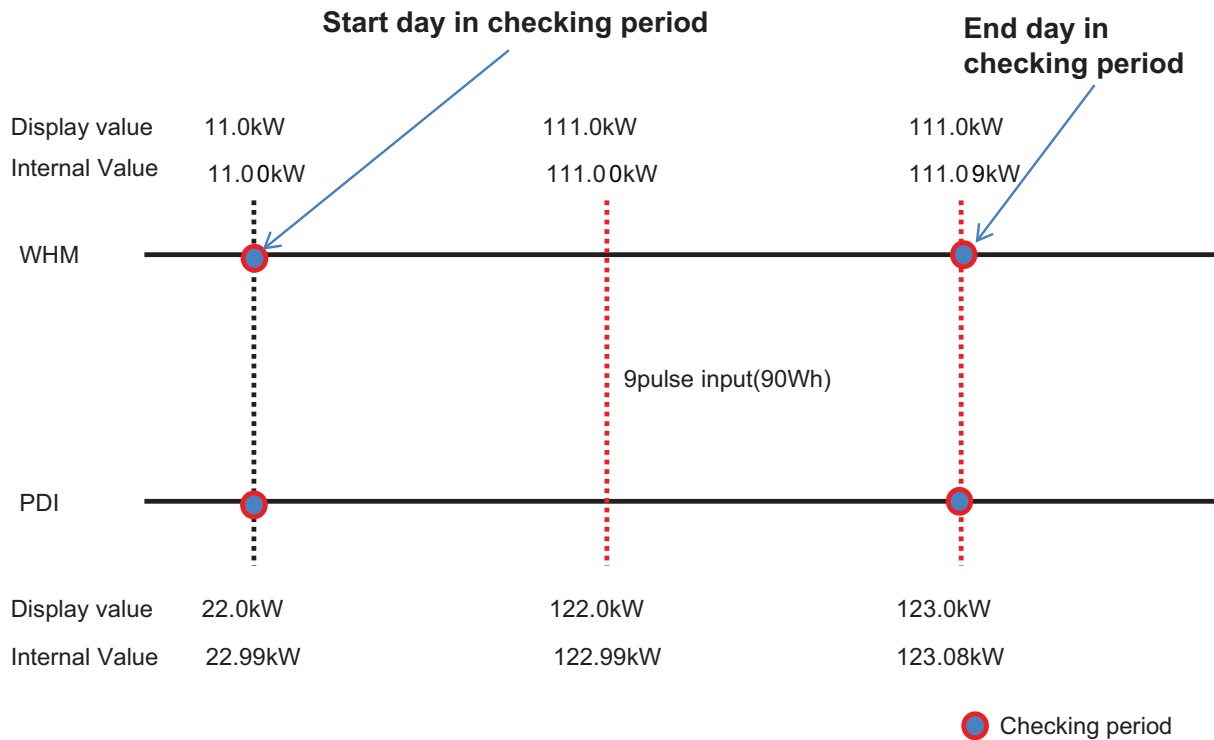
■ Major Logic (Difference due to WHM Displaying Logic)

WHM's minimum displayable value is 0.1kW(100W)

In case of 100pulse/1kWh(10W/P) setting, last digit(marked with red color) is not be shown on WHM LCD panel.

It can cause maximum 1kwh difference in checking period.

The actual value is counted and memorized internally (the checking period is extended, it doesn't increase)



Internal Count Value

= Power of End day – Power of start day

WHM = 111.09-11.00=100.09

PDI = 123.08-22.99=100.09

→ Same value!

LCD Display

= Power of End day – Power of start day

WHM = 111.0-11.0=100

PDI = 123.0-22.0=101

→ 1kw Difference.

3.4 Product Description

■ Major Logic (Error display Logic)

1. ERROR - 01 : Central controller 485 communication error
 - It happen when PDI can't communicate with IDU set as IDU address
 - For 3 minutes
 - It displayed with IDU address of IDU that get problem
2. ERROR - 02 : Pulse line no signal error
 - Error is displayed when there is no signal from the pulse detection in the option-set wattmeter(WHM1~8).
 - For 3 minutes(even when 1 or more unit doors are operating)
 - When Pulse width is over the spec (25 ms ~ 500 ms)
3. Error display Sequence
 - ① When two or more error is happened
 - ② PDI display the Error that was happened early in that mix
 - ③ When the first error is terminated, the other error is displayed

■ When IDU is off vs. shut down ?

- 1) When IDU is off
(ex. using the Run/Stop button of Remote Controller)
 - PDI is communicating with IDU that is off, and PDI aware that IDU's status is off, so
 - ① when some IDU is On : Power is distribute to IDU that is On
 - ② when all IDUs is Off : Change the mode from distribution to STBP(Standby Power Consumption),
If STBP is set 'AUTO'.
- 2) When the power of IDU is shut down
 - PDI doesn't communicate with IDU, so PDI aware that there is no IDU
 - PDI will be piling up the power that ODU is using
 - when Power is recovered, the value piled up is distributed to each IDU

3.4 Product Description

3.4.10 ACS IO Module

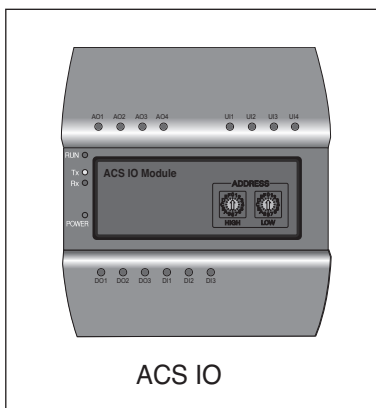
The module can be connected with ACS IV central control if additional control points are needed other than not only DI/DO but also AI/AO port of ACS IV central control unit.

ACS IV can control 3rd party device as pump, security, lighting and so on through DI/O and AI/O.

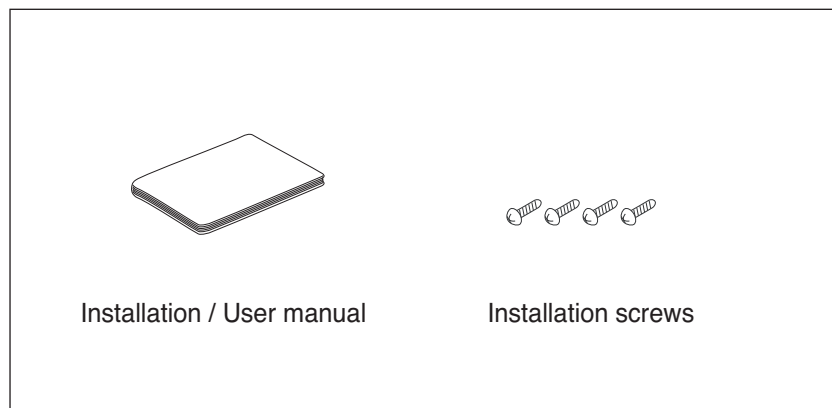
- Model name : PEXPMB000

3.4.10.1 Specifications & Dimensions

■ Features



■ Accessory

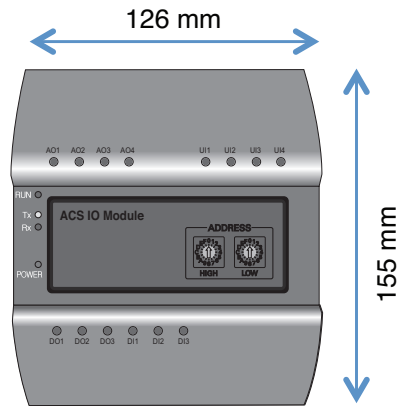


■ Product Specifications

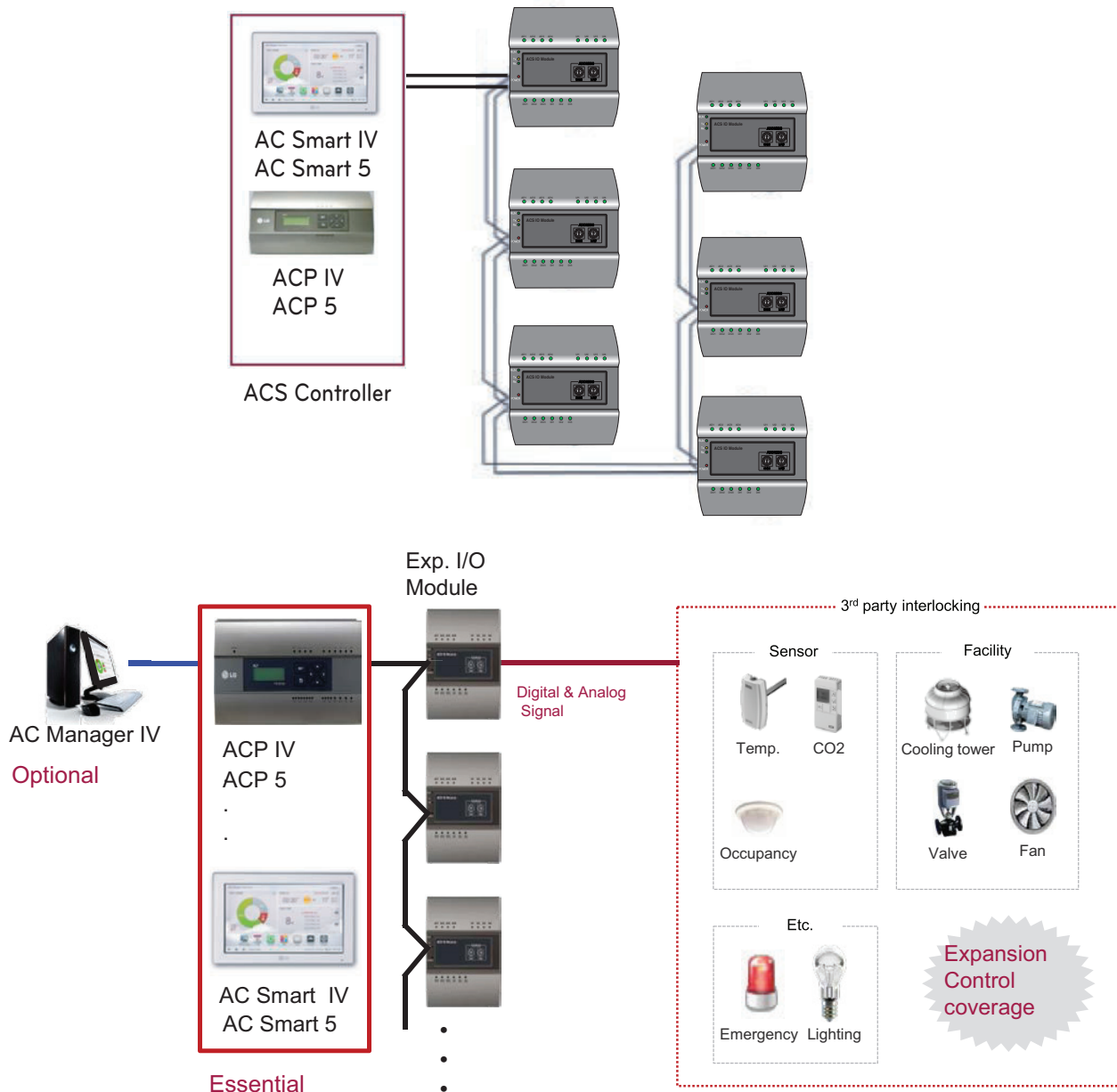
Item	Description
Rotary Switch	2EA (ACS IO Address creation)
Dip Switch	1EA (Not used)
LED	18EA (485 communication status x2, power source status x1, operation status x1, IO input status x14)
Product size and weight	155 x 126 x 64.8(width x length x height mm), 250 g
DIN Rail Specifications	Standard size width 35 mm DIN Rail
Communication port	1 channel RS485 communication, 1 channel CAN communication
External input/output port	DI x 3EA, DO x 3EA, UI x 4EA, AO x 4EA
Rated voltage	24 V~, 60 Hz / 500 mA
Range of service temperature	-20 ~ 60 °C

3.4 Product Description

■ Dimensions



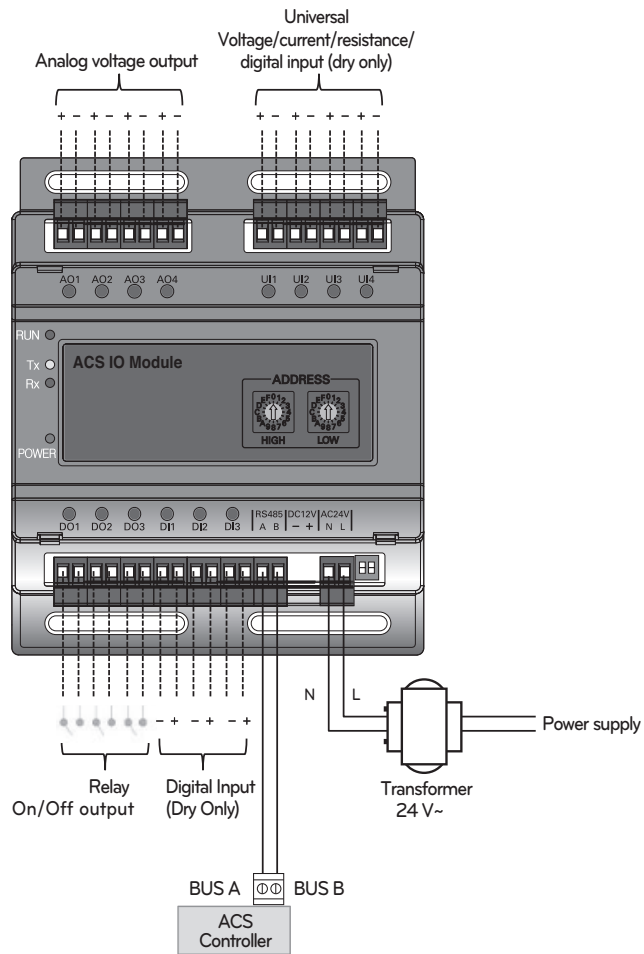
3.4.10.2 Field Wiring Diagram



3.4 Product Description

Connecting the product

The illustration below shows all the cable connections of the ACS IO.



< Illustration of ACS IO cable connections >

! CAUTION

- Be careful not to plug in the wrong cord when connecting to the various input/output sockets. The product may be damaged an improper +/- connection is made.

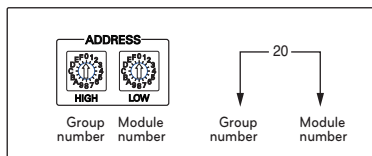
3.4 Product Description

Address creation

When one ACS Controller(AC Smart IV, AC Smart 5, ACP IV, ACP 5) is connected to multiple ACS IO, to classify each module a unique address must be used by selecting rotary switches.

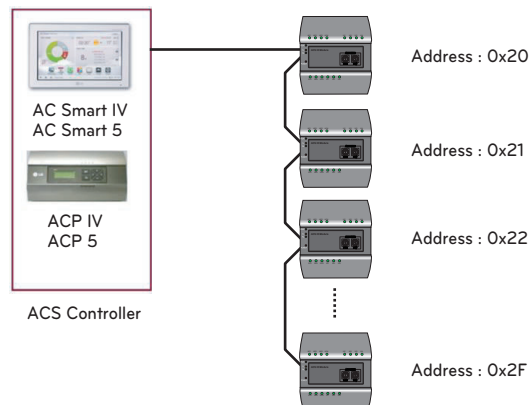


Using the ACS IO rotary switch a 16 digit between 01~F7 can be created.
(00 addresses may not be created because they are used for broadcasting at MODBUS communications.)
Numbers 20~2F are recommended for creating an ACS IO address.
A maximum of 16 ACS IO can be connected.



Recommended address

- Recommended address range : 20~2F
- Valid address range : 01~F7

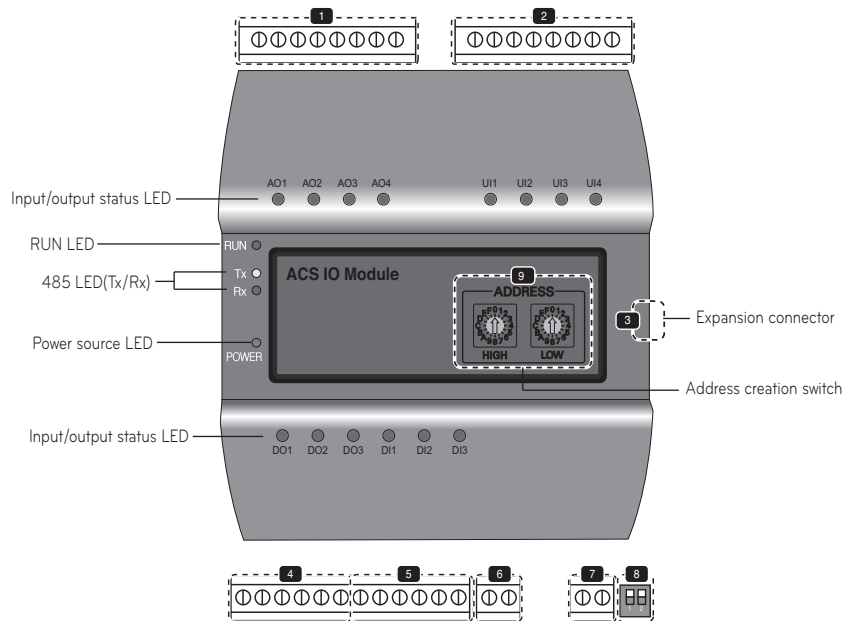


CAUTION

- Please create a unique address for each module.
- Do not create an address with 00.
(00 addresses may not be created because they are used for broadcasting MODBUS communications.)
- After changing the address be sure to cycle power.

3.4 Product Description

3.4.10.3 Name and Functions



- | | |
|--|--|
| 1 AO Port (control signal interconnect) | 4 DO Port (control signal interconnect) |
| 2 UI Port (control signal interconnect) | 5 DI Port (control signal interconnect) |
| 3 Expansion connector (Not used) | 6 RS485 Communication unit |
| | 7 24 V~ Power input port |
| | 8 Dip Switch (Not used) |
| | 9 Rotary Switch (ACS IO address creation) |

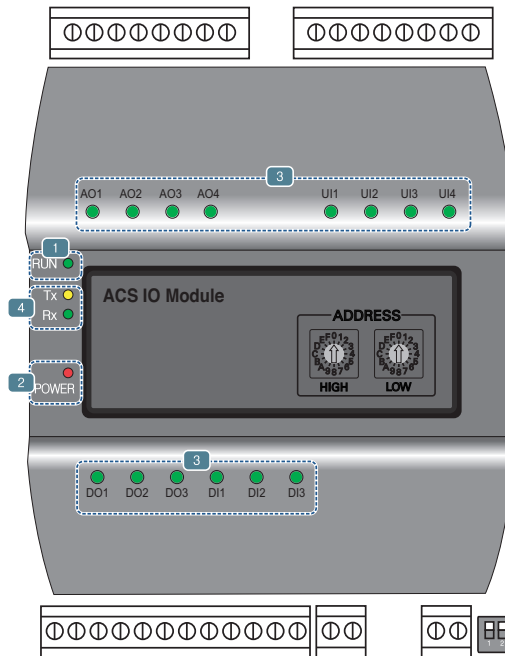


CAUTION

When expanding on the product using a connecting product, check the shape of the expansion connector head before attempting to connecting the cord.
Connecting the wrong cord can results in damage and a malfunction of the product.

3.4 Product Description

■ LED Status



- 1 RUN LED : This is used to confirm that normal operations have been established after connecting to ACS IO.
 - Under normal conditions.
Under normal conditions flashes 5 times per second when a power source is applied.
 - When an error occurs
When an error occurs between the ACS IV Controller and the ACS IO, it will be flash twice in 2 seconds.
When error occurs in ACS IOs 2 though 16, it will flash 3 times every 2 seconds.
- 2 Power source LED : This is used to confirm the condition of the power source supply.
 - LED is ON while power is applied.
 - Otherwise LED is OFF.
- 3 This is used to label the status of each port. (Refer to port descriptions for details of each of the lights.)
- 4 485 communication LED(Tx/Rx) : This is used to confirm of the operation of RS485 communication.
 - It will flash according to the communication condition of 485 Tx/Rx.

3.4 Product Description

3.4.10.4 PORT Description

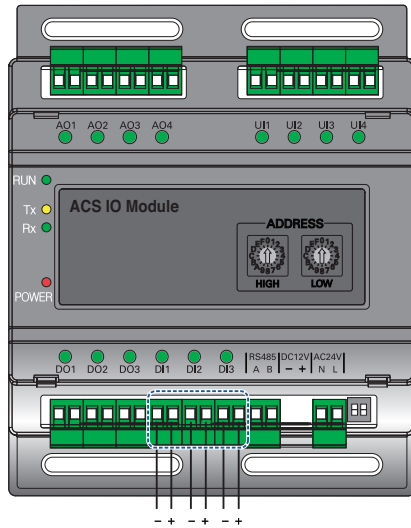
■ Connecting to an external device (DI port)

The dry contact input method is provided for DI ports.

Do not apply external power to DI ports.

Damage will occur and warranty will be voided.

There are a total of 3 DI ports.



+ : Input

- : GND

LED status (DI port)

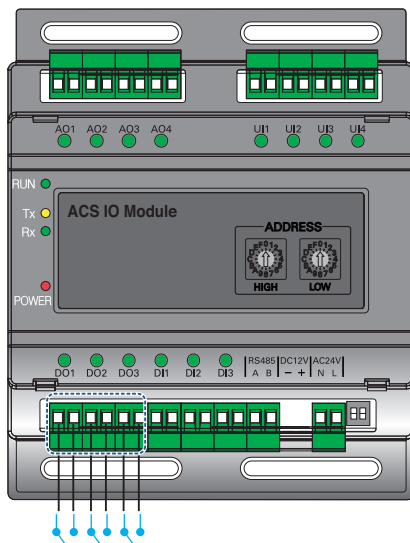
The input status LED will light up under the following circumstances.

- When there is an input value : ON
- When no input value is present : OFF

■ Connecting to an external device (DO port)

As for the DO port, this is a contact output port.

There are a total of 3 DO ports.



LED status (DO port)

The input status LED will light up under the following circumstances.

- When output shorts : ON
- When output opens : OFF

⚠ CAUTION

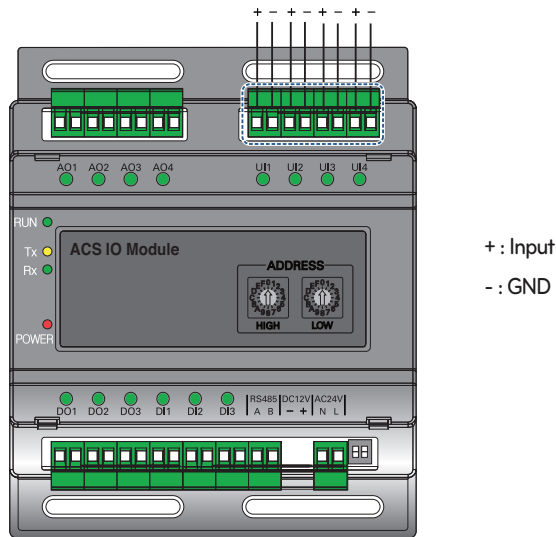
- The maximum output possible for switching through digital output is 30 V_{DC} / 30 V_{AC} and the maximum current is 2 A.
- Deviating from the intended range can cause the product to be damaged.

3.4 Product Description

■ Connecting to an external device (UI port)

Each of four UI ports can be configured for use as analog in or digital in only.

There are a total of 4 UI ports.



The table below shows the valid configuration values for each of four UI ports.

Types of input		Minimum value	Maximum value
Analog Input	NTC 10k	0.68 kΩ	177 kΩ
	PT 1000	803 Ω	1573 Ω
	Ni 1000	871.7 Ω	1675.2 Ω
	DC(Voltage)	0 V	10 V
	DC(Current)	0 mA	20 mA
Digital Input	Binary(Dry contact)	-	-

⚠ CAUTION

- Using input other than the conditions of use list above can cause product damage and malfunction.
- Polarity matters in DC voltage and current configuration, you must follow external 3rd party device wiring to be sure that polarity is applied correctly.

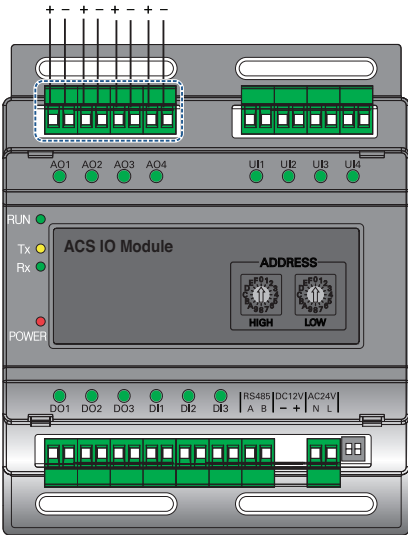
LED status (UI port)

The input status LED will light up under the following circumstances.

Types of LED input		Minimum value
Analog Input	NTC 10k	OFF
	PT 1000	OFF
	Ni 1000	OFF
	DC(Voltage)	OFF
	DC(Current)	OFF
Digital Input	Binary(Dry contact)	When there is an input value, ON

■ Connecting to an external device (AO Port)

Each of four analog output ports will provide between 0 and 10 V--- depending on central controller configuration.



+ : Output
- : GND

LED status (AO port)

The input status LED will light up under the following circumstances.

- When creating port output from the ACS IV Controller : ON
- When creating as port reserves from the ACS IV Controller : OFF

!

CAUTION

- Connecting the wrong size cable results in damage and a malfunction of the product.
- Check the size of the connector head before attempting to terminate wiring.
- The maximum output current is 20 mA.

	Minimum	Maximum
Voltage	0 V	10 V

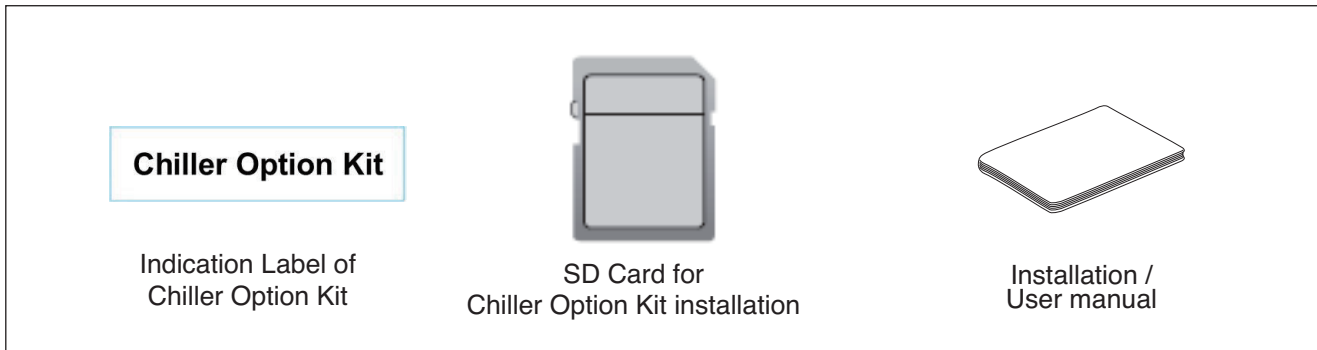
3.4 Product Description

3.4.11 Chiller Option Kit

- Model name : PCHLLN000

LG central controller series provide Chiller option kit for chiller remote control and cycle monitoring (Optional)

3.4.11.1 Specifications



CAUTION

If any product is used other than our standard product and a problem occurs, we don't take any responsibility regarding the problem. Please keep away from using other products.

3.4.11.2 INSTALLATION

- Chiller Option Kit installation of LG HVAC Solution product should be conducted by a specialized installation service engineer.
- Chiller Option Kit installation can be proceeded with a SD Card.
- The SD Card can install Chiller Option Kit in one LG HVAC Solution product.

1. Insert the SD Card in the LG HVAC Solution product. If a backup SD Card is inserted, replace it with a Chiller Option Kit SD Card.



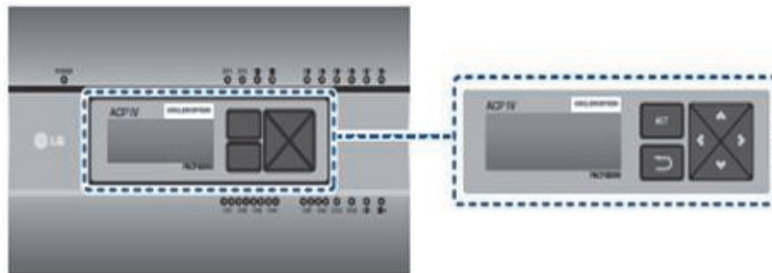
3.4 Product Description

2. Reboot the LG HVAC Solution. When LG HVAC Solution is rebooted, check the version. Installing Chiller Option Kit adds C+ to the version. If you have a back up SD Card, remove the Chiller Option Kit SD Card and insert the backup SD Card.

- Version before installation: 1.00.0
- Version after installation: 1.00.0.C+



3. After completing installation, attach the indication label of Chiller Option Kit installation to LG HVAC Solution product to which Chiller Option Kit is installed by referring to the example below.
 - Attachment example for product indication label of Chiller Option Kit product
 - Attach the product indication label at the noticeable place.



NOTE

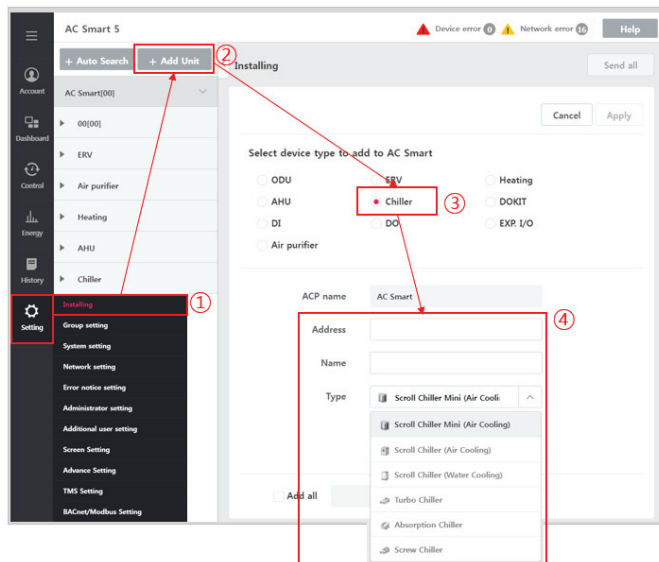
- Refer to the user manual of LG HVAC Solution product for Chiller function related contents.
- The version of LG HVAC Solution product could be checked in [Environment] → [General Setting] → [Version Information].
- Ask specialized service engineers for the verification of the LG HVAC Solution product which can install Chiller Option Kit.

3.4 Product Description

■ Compatibility with Product

	Scroll Chiller (Air, Water)	Turbo Chiller	Absorption Chiller	Screw Chiller
Chiller Option Kit	O	Only 'Standard turbo' model	O	O

■ Register Chiller



No	Category	Contents
①	Setting	Select Setting- Installing menu
②	Add Unit	Select "Add Unit" button
③	Select device type	Select Chiller device
④	Choose type	Choose Chiller type.

4. Application Controller

4.1 Dry Contact

4.2 Remote Temperature Sensor

4.3 Cool/Heat Selector

4.4 IO(Input/Output) Module

4.5 Variable Water Flow Valve Control Kit

4.6 Low Ambient Control Kit

4.7 Human detection sensor kit (for 4 way cassette)

4.8 Wi-Fi Modem

4.9 Meter Interface







4.10 Modbus Gateway

4.11 ACU IO

4.12 Water Communication module

4.1 Dry Contact

Overview

Model Code		PDRYCB000	PDRYCB400	PDRYCB300	PDRYCB500	PQDSBCDVM0	PVDSMN000
Feature							
		For IDU				For ODU Multi V III	For ODU Multi V IV Multi V 5
Case		●	●	●	●	-	-
Input port		1	2	8	-	-	-
Comm. Protocol		-	-	-	Modbus RTU	-	-
Power		220 V~	from IDU PCB			from ODU PCB	
Control	On / Off	●	●	●	●	All Off	All Off
	Mode	-	●	●	●	-	-
	Set Temp.	-	(Select & Fix)	(Select & Fix)	●	-	-
	Fan Speed	-	-	●	●	-	-
	Thermo-Off	-	(Select & Fix)	●	-	-	-
	Energy saving	-	(Select & Fix)	-	-	-	-
	Lock/Unlock	-	(Select & Fix)	-	-	-	-
	ODU low noise	-	-	-	-	●	●
	ODU Capacity	-	-	-	-	●	●
Output	Operation Status	●	●	●	●	-	●
	Error	●	●	●	●	●	●
	Room temp.	-	-	-	●	-	-
Old model name		PQDSB	PQDSBC	PQDSBNGCM1	-	-	-

4.1 Dry Contact

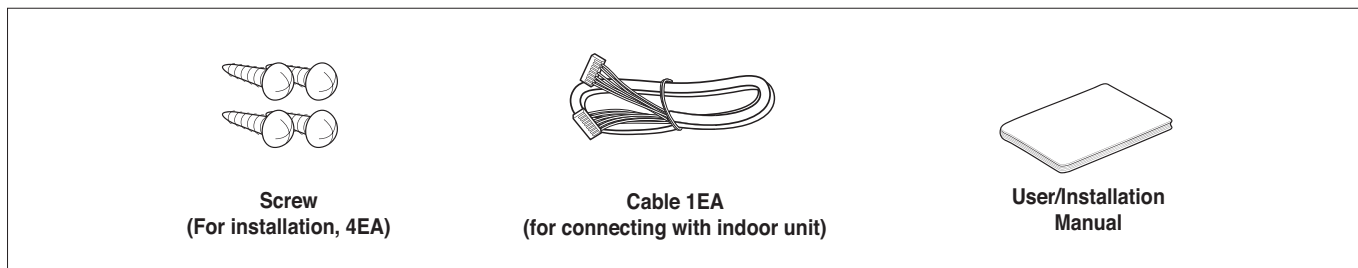
4.1.1 PDRYCB000



- Dimensions: 120 X 120 X 36.5 mm
- Unit types : For Connect indoor unit to other forced on/off controller
- Input power 220-240 V~

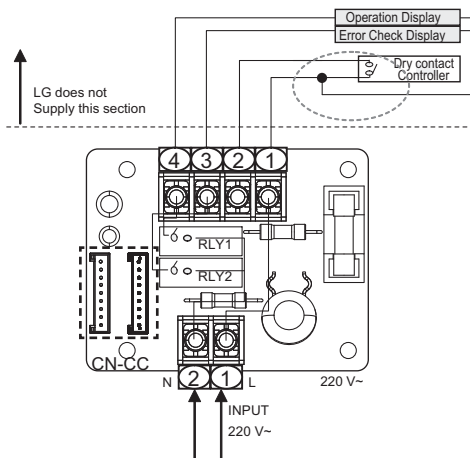
Appearance	Connect		
	No.	Name	Function
	1	CN_POWER	Power Connector
	2	CN_CC	Indoor PCB Connector
	3	CN1	Central Controller Connector
	4	CN_DRY(L)	DRY CONTROLLER Connector
	5	CN_DRY(SIG)	DRY CONTROLLER Connector
	6	CN_DRY(ERROR CHECK)	ERROR Check Display Connector
	7	CN_DRY(OPER STATE)	Operation Display Connector

■ Accessory

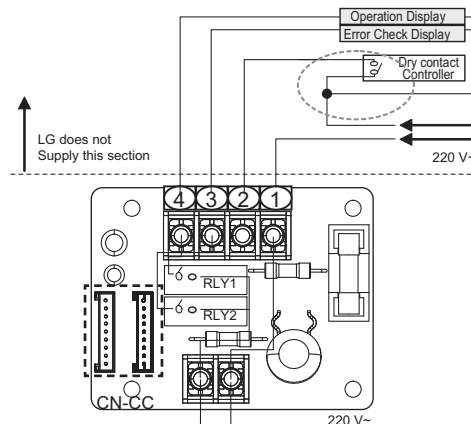


■ Installation

- To apply power source through PCB



- To apply power source directly to external source



4.1 Dry Contact

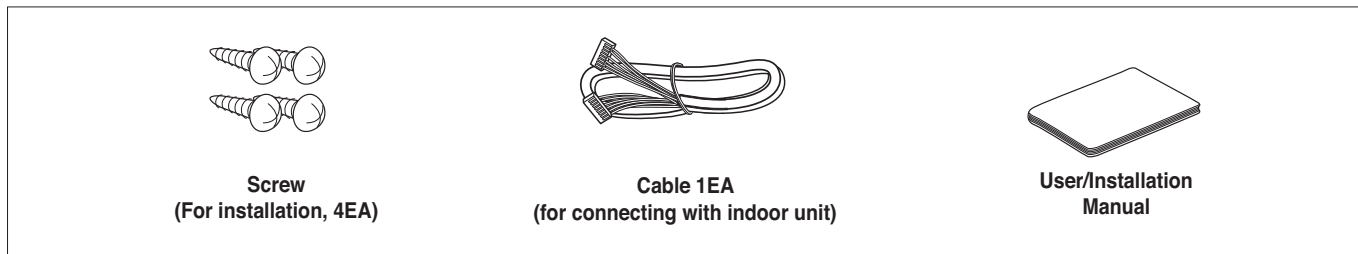
4.1.2 PDRYCB100



- Dimensions: 120 X 120 X 36.5 mm
- Unit types : For Connect indoor unit to other forced on/off controller
- Input power 24 V~

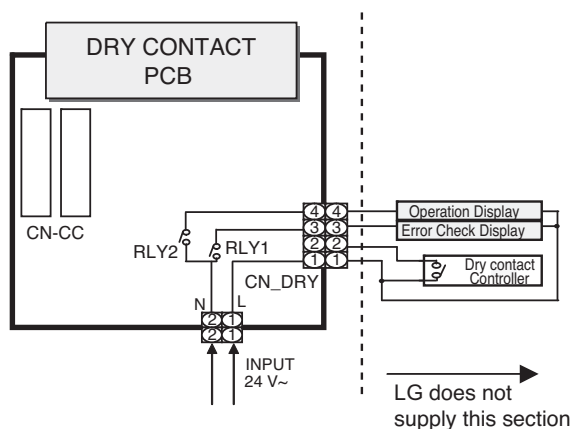
Appearance	Connect		
	No.	Name	Function
	1	CN_POWER	Power Connector
	2	CN_CC	Indoor PCB Connector
	3	CN1	Central Controller Connector
	4	CN_DRY(L)	DRY CONTROLLER Connector
	5	CN_DRY(SIG)	DRY CONTROLLER Connector
	6	CN_DRY(ERROR CHECK)	ERROR Check Display Connector
	7	CN_DRY(OPER STATE)	Operation Display Connector

■ Accessory

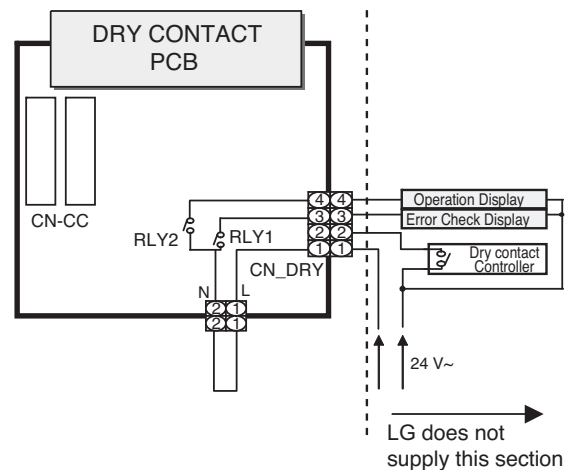


■ Installation

- To apply power source through PCB



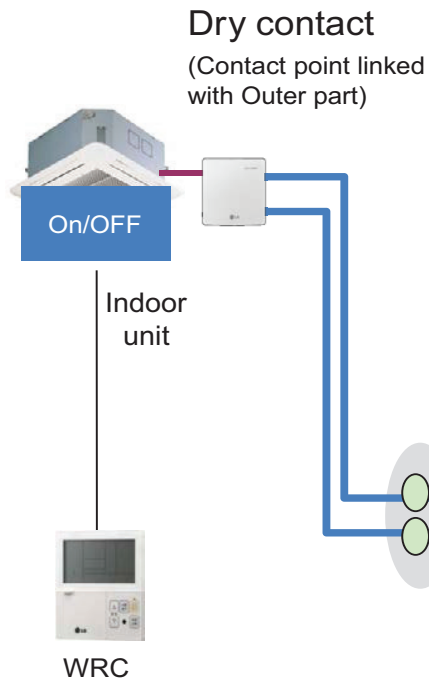
- To apply power source directly to external source



4.1 Dry Contact

■ Usage : Control indoor unit by one input signal

Various application



Key tag

- Controls the air conditioner indoor unit as a key card insertion



Door check

- Controls the air conditioner indoor unit when the door is opened and closed



Motion

- An air conditioner can be turned on/off, using the human body detection sensor



Lighting

- An air conditioner indoor unit is controlled according to the lighting on/off status



Emergency

- Controls the air conditioner indoor unit interfaced with the emergency alarm



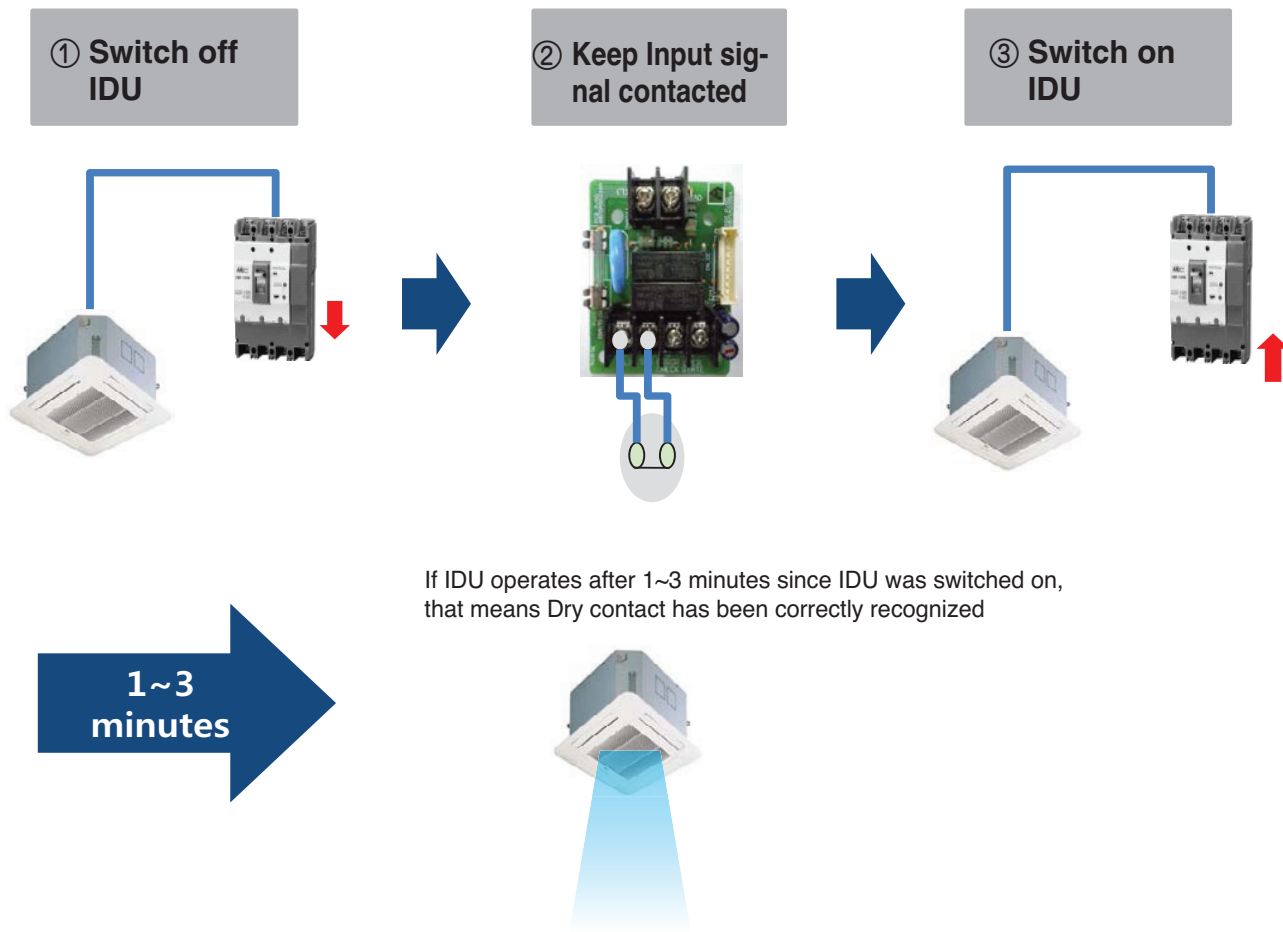
Timer

- An air conditioner indoor unit is controlled using signal of the timer device

4.1 Dry Contact

■ Dry contact recognition in Indoor unit

- Initially, switching off and on Indoor unit is required for recognizing Dry Contact.
- During this recognition time, input signal must be on



4.1 Dry Contact

■ Auto start mode / Manual mode

There are two different operation scenario depending on the mode setting

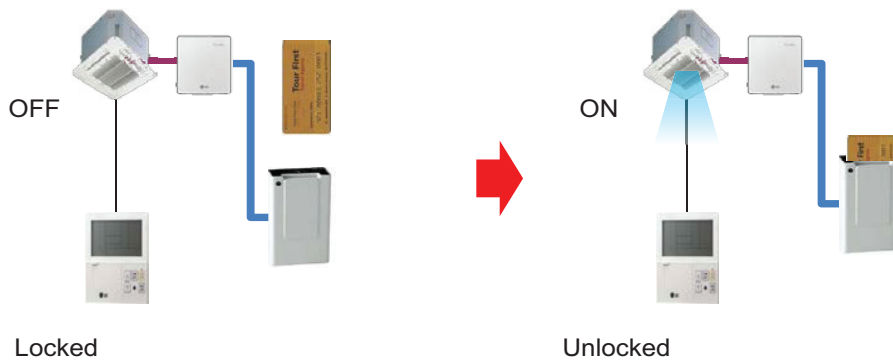
Case \ Mode	Auto start mode	Manual mode
Input On	IDU operates, Unlocked*	Unlocked
Input Off	IDU stops, Locked**	IDU stops, Locked

*Remote controller is allowed to control IDU

**Remote controller is prohibited to control IDU

Auto start mode

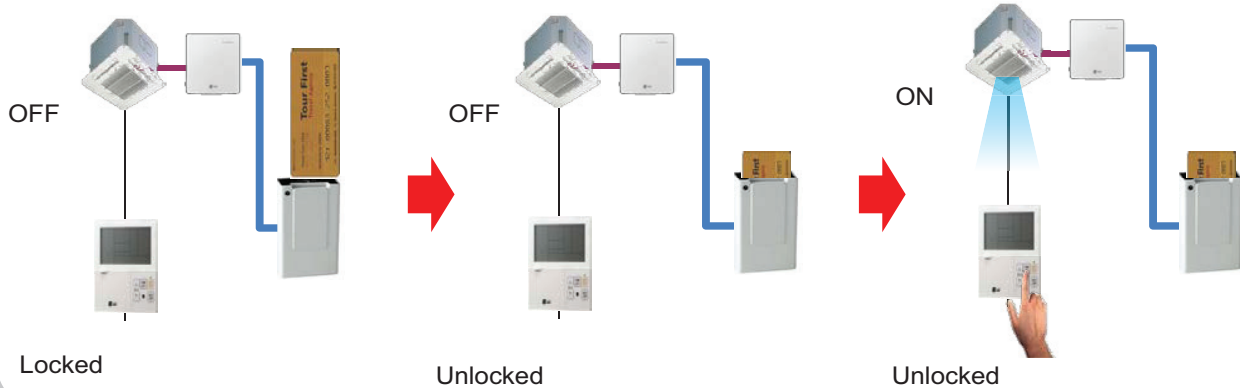
IDU operates when input signal is on



Manual mode

IDU doesn't operate automatically but remote controller is unlocked

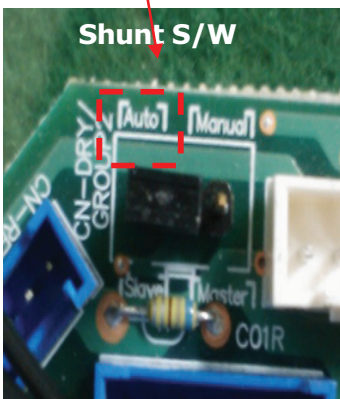
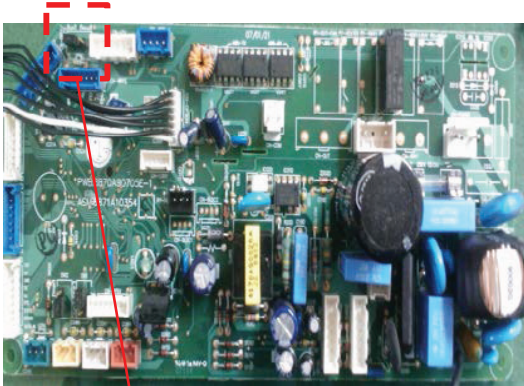
So IDU can be operated by remote controller



4.1 Dry Contact

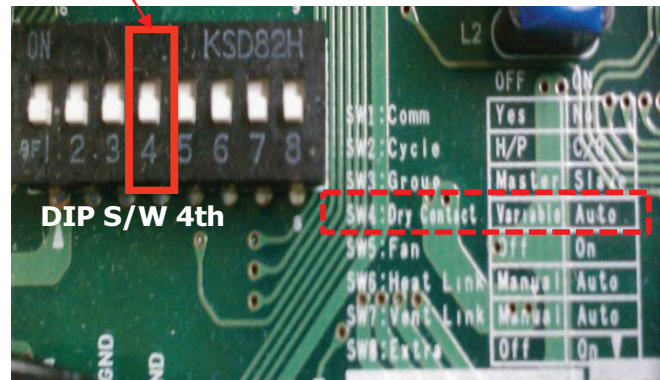
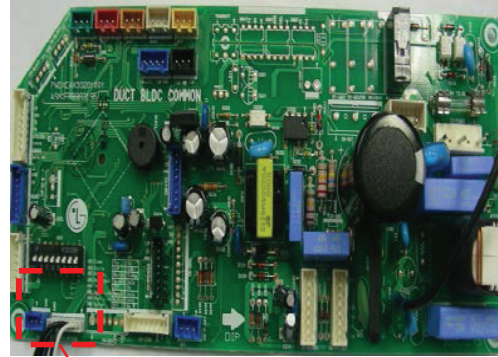
■ Auto start mode / Manual mode Setting – IDU PCB

► Case #1 : IDU PCB without Dip switch



- Auto : Auto-Start
- Manual : Depends on how it is set by Remote Controller

► Case #2 : IDU PCB with Dip switch



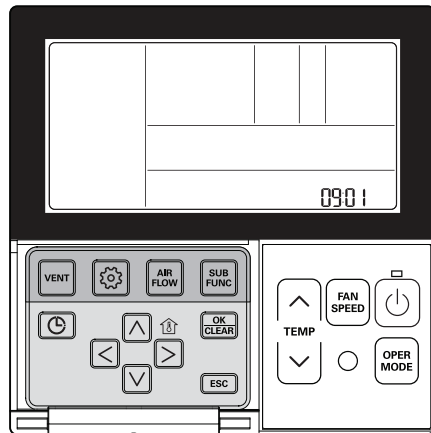
- On(Auto) : Auto-Start
- Off(Manual) : Depends on how it is set by Remote Controller

4.1 Dry Contact

■ Auto start mode / Manual mode Setting – Wired Remote Controller

• Standard Wired R/C

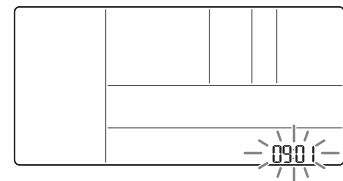
This function is available only for the products with dry contact device.



Press and hold  button for more than 3 seconds to enter the installer settings mode.

- If pressing only once briefly, it will enter the user settings mode.
Make sure to press and hold for more than 3 seconds.

Move to the Dry Contact Mode Settings in the menu using  button and then it displays as below.



Select the Dry Contact Mode using   button.


09:01
Code value for dry contact Set value

* Set value for dry contact
00 : Manual
01 : Auto



Press  button to save the setting.

Press  button to exit.

- * If no button is selected for about 25 seconds after setup, it exits the setup mode automatically.
- * If the  button is not selected before you exit, the changes will not apply.

• See the Dry Contact manual for more detailed functions about dry contact mode.

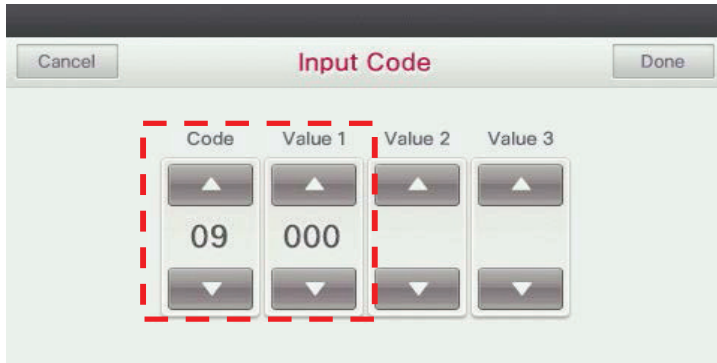
► What is Dry Contact?

It means a contact signal received when an air conditioner runs interlocking with hotel key card or sensor.

4.1 Dry Contact

• Premium Wired R/C

1. Press and hold 'wireless remote controller signal receiver part' of the remote controller for 3 seconds or longer to enter the installer function.
2. Select dry contact mode setting code value '09'.
3. At the Value 1 field, press the '▲', '▼' button to select dry contact setting value, and press 'Done' button to apply the dry contact mode setting.
- If you do not press 'Done' button, your settings will not be applied.



※ Dry contact setting value

- 00: manual
- 01: automatic

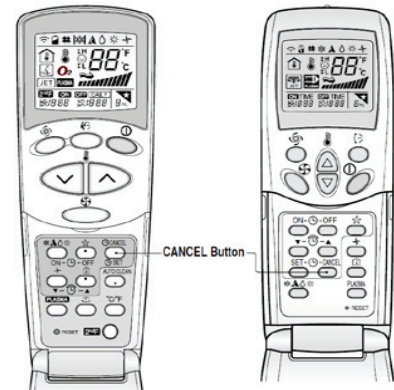
⚠ CAUTION

- When you set the Dry contact mode, you should make sure that **Dry Contact input is On**(For example, **Cardkey is injected**)

4.1 Dry Contact

■ Auto start mode / Manual mode Setting – Wireless Remote Controller

- It gives selection whether to turn ON the unit directly or not from the external source.
The selection can be made by pressing CANCEL button of the wireless remote controller 3 times within 3 minutes of resetting the unit with facing it towards the unit. (This function availability depends on indoor unit model)



- 1m 30s after supplying power to IDU, press the Clear All button on R/C three times



- 1m 30s after supplying power to IDU, press the Set/Clear button on R/C three times.



4.1 Dry Contact

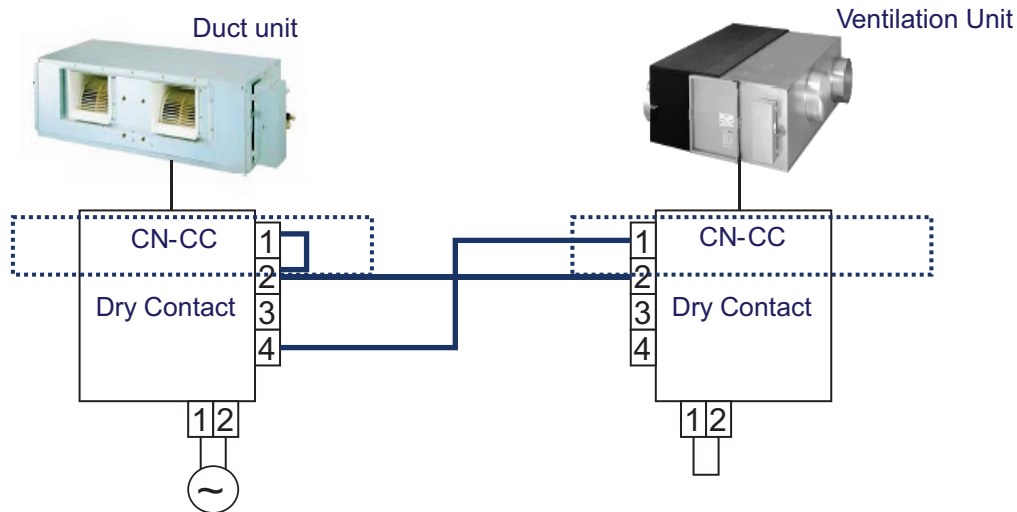


Request: In a conference room of an hotel, It is necessary to synchronize the operation of the AC with the ERV.



Solution: Indoor unit dry contact PCB is connected with ERV forced operation contact.

<Conference Room>



In this case when IDU is on, ERV starts(auto mode). And when IDU fan is Off, ERV is off

→ Check!! dip switch No.5 in ERV PCB

dip switch No.5 is ON then ERV will be auto start

dip switch No.5 is Off then ERV will be manual start(Remote controller enable)

4.1 Dry Contact

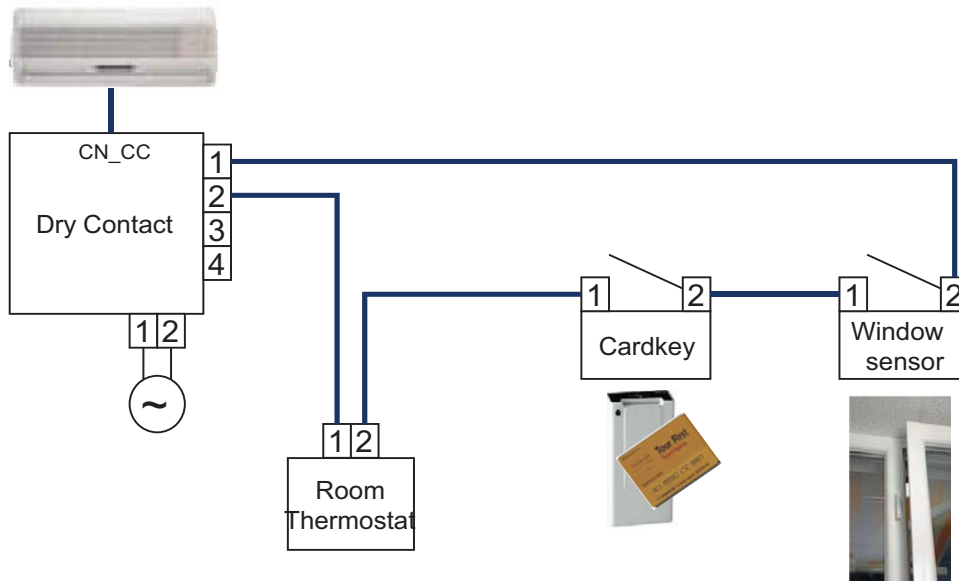


Request: The indoor unit should be controlled by external switches, and it needs to be off while window is opened.



Solution: Indoor unit is connected with a series of contacts.

<Hotel Room>

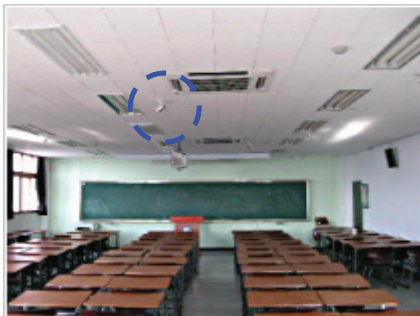


Request: The indoor unit should be on/off depending on human occupancy

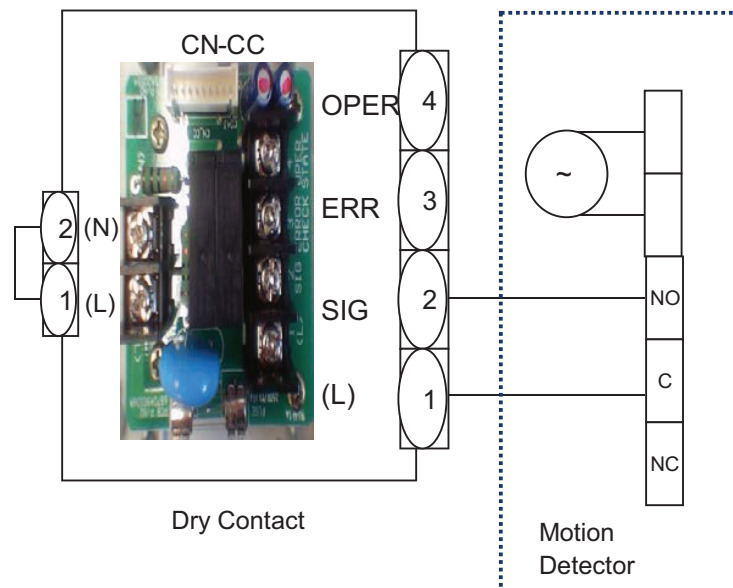


Solution: Indoor unit can start/stop automatically by motion detector

<Classroom>



Motion detector in classroom



4.1 Dry Contact

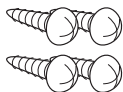
4.1.3 PDRYCB300



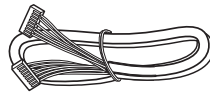
- Dimensions: 120 X 120 X 36.5 mm
- Unit types : For Connect Indoor unit to Other Thermostat Controller.
(Available from Multi V 2 series)
- No need AC input

Appearance	Connect		
	No.	Name	Function
	1	CN_INDOOR	Connect communication wire between indoor unit and Dry Contact For Setback and supply power to Dry Contact For Setback
	2	VS_SW	Switch to select voltage (5 V-12 V) of contact point
	3	CN_OPER	Contact point signal input
	4	OPER_SW	Switch to select the control mode
	5	SETTING_SW	Switch to select whether to use set function of Dry contact for setback
	6	TEMP_SW	Switch to set the desired temperature of the indoor unit
	7	CN_OUT (O1, O2)	Connector to show whether the indoor unit is operating
	8	CN_OUT (E3, E4)	Connector to show whether there is an error with the indoor unit
	9	LD01	LED to display the status of the Dry Contact For Setback
	10	RST_SW	Reset switch

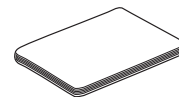
■ Accessory



Screw
(For installation, 4EA)



Cable 1EA
(for connecting with indoor unit)

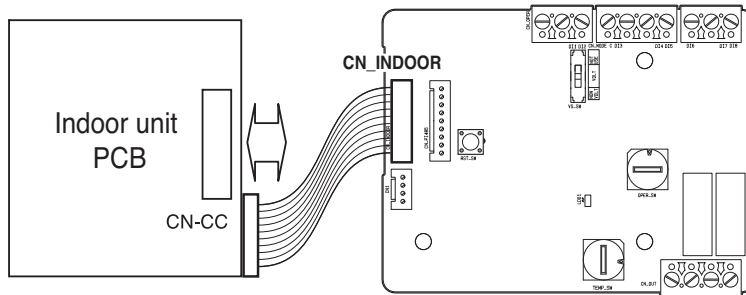


User/Installation Manual

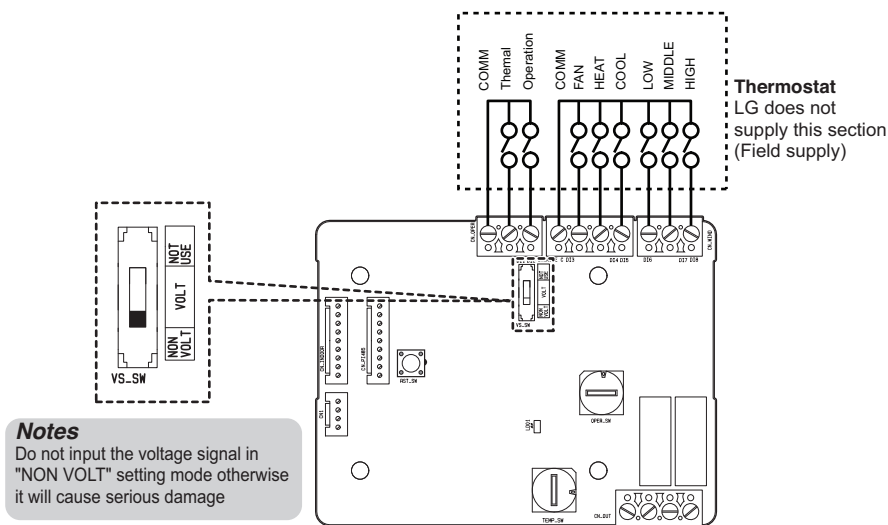
4.1 Dry Contact

■ Installation

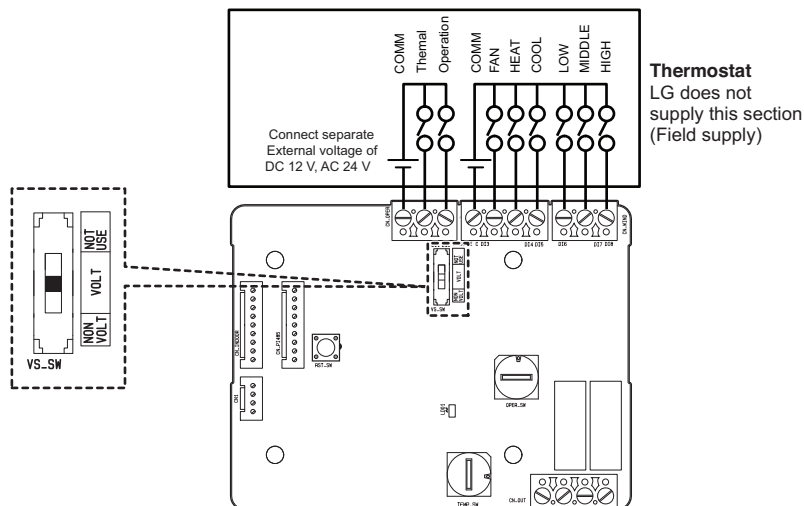
- When using the Dry contact for communication independently



- For input contact closure only (No power input)

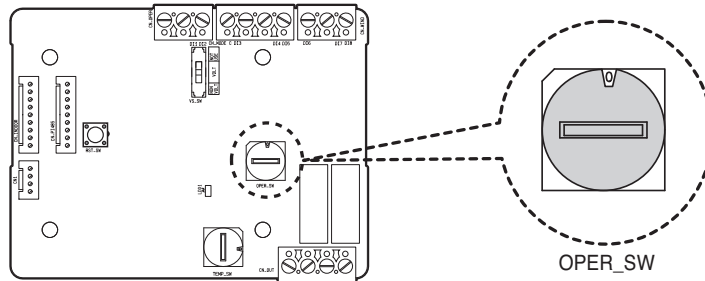


- For input contact voltage : 12 V_{DC}, 24 V_{AC}



4.1 Dry Contact

■ Using 'OPER_SW' , select the Option of control Function as described below



<OPER_SW Function>

No.	WIND Signal en/disable	Thermal en/disable	Oper Mode en/disable	Dry Contact Control Priority
0	Disable	Disable	Disable	Disable
1	Disable	Disable	Disable	Enable ⁴⁾
2	Disable	Disable	Enable ³⁾	Disable
3	Disable	Disable	Enable	Enable
4	Disable	Enable ²⁾	Disable	Disable
5	Disable	Enable	Disable	Enable
6	Disable	Enable	Enable	Disable
7	Disable	Enable	Enable	Enable
8	Enable ¹⁾	Disable	Disable	Disable
9	Enable	Disable	Disable	Enable
A	Enable	Disable	Enable	Disable
B	Enable	Disable	Enable	Enable
C	Enable	Enable	Disable	Disable
D	Enable	Enable	Disable	Enable
E	Enable	Enable	Enable	Disable
F	Enable	Enable	Enable	Enable

1) Enable CN_WIND signal – Amount of wind flow (Low, Middle, High) signal enable

2) Enable Thermo ON/OFF input signal

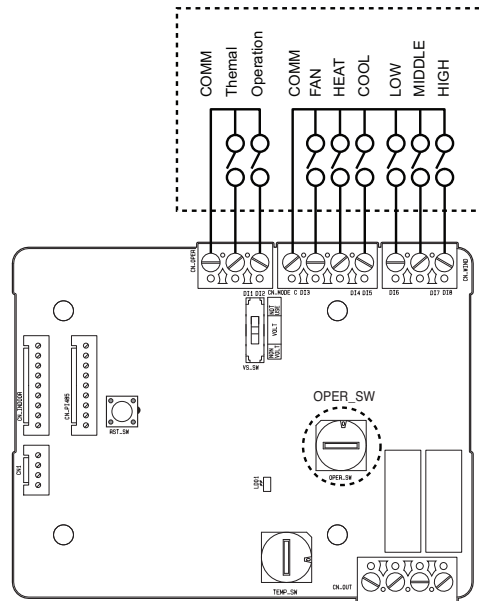
- Desired Temperature 18 °C in cooling mode
- Desired Temperature 30 °C in heating mode
- No function in FAN mode


3) Enable CN_MODE signal – Operation mode (Cool, Heat, Fan) signal enable

4) Enable Thermostat priority control mode – Indoor's remote-controller signal will be disregarded

4.1 Dry Contact

■ Function table for the selection of 'OPER_SW' and the input signal



 OPER_SW	CN_MODE input			Function
	FAN	HEAT	COOL	
2,3,6,7,A,B,E,F	0	0	0	NA
	0	0	1	COOL
	0	1	0	HEAT
	0	1	1	NA
	1	0	0	FAN
	1	0	1	NA
	1	1	0	NA
	1	1	1	NA
Others	-	-	-	NA
 OPER_SW	CN_WIND input			Function
	Low	Middle	High	
8,9,A,B,C,D,E,F	0	0	0	NA
	0	0	1	High
	0	1	0	Middle
	0	1	1	NA
	1	0	0	Low
	1	0	1	NA
	1	1	0	NA
	1	1	1	NA
Others	-	-	-	NA
 OPER_SW	CN_OPER		Function	
	Thermal	Operation		
4,5,6,7,C,D,E,F	0	0	Thermal Off + Stop	
	0	1	Thermal Off + Run	
	1	0	Thermal On + Stop	
	1	1	Thermal On + Run	
Others	-	-	NA	

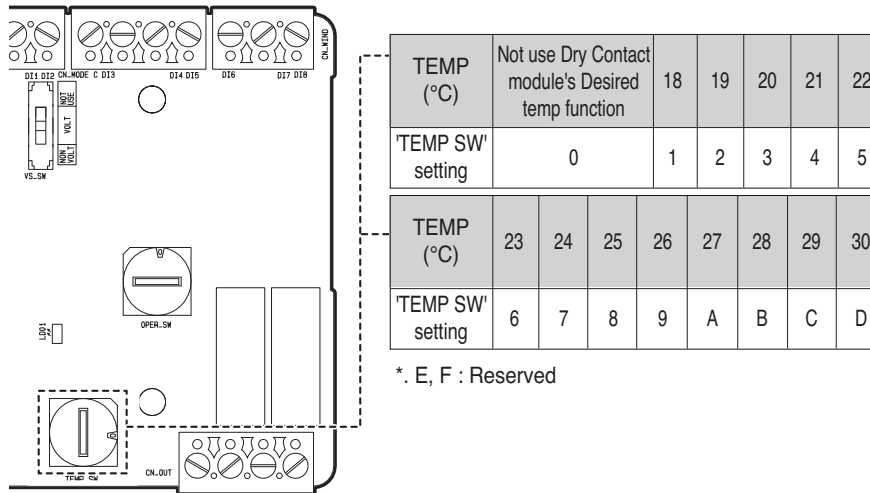
4.1 Dry Contact

■ When setting the desired temperature of the Dry contact Module

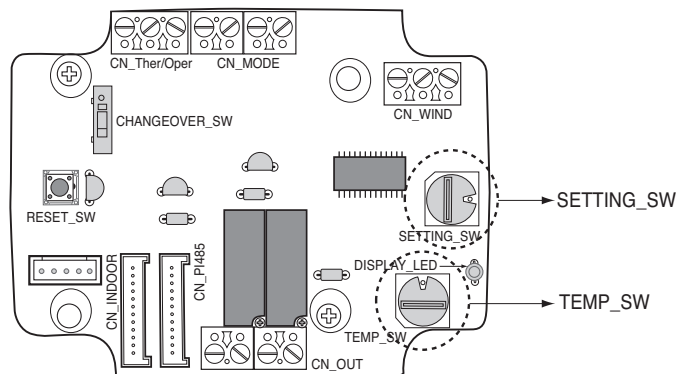
: When operating the indoor unit using Dry contact module's desired temperature, set the desired temperature according to the 'TEMP_SW' setting.

Thermostat priority control mode is disabled, the desired temperature can be reset by other controller

- Use the 'TEMP_SW' to set the temperature as shown below.



■ When interlocking with thermostat, select the option of control function as described below.



<Switch Function>

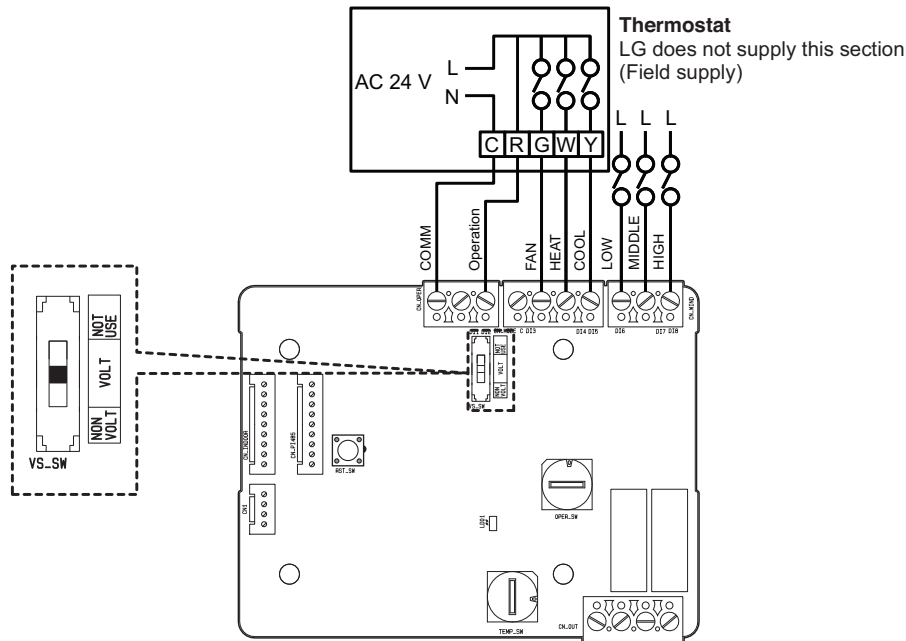
TEMP_SW	SETTING_SW	Thermostat mode	WIND Signal en/disable
F	0	Conventional AC Unit Thermostat	Disable
	1		Enable
	2	Heat Pump Thermostat_O Terminal	Disable
	3		Enable
	4	Heat Pump Thermostat_B Terminal	Disable
	5		Enable

1) When interlocking with thermostat, set TEMP_SW to F.

2) Enable CN_WIND signal – Amount of wind flow(Low, Middle, High) signal enable

4.1 Dry Contact

■ For conventional thermostat signal input



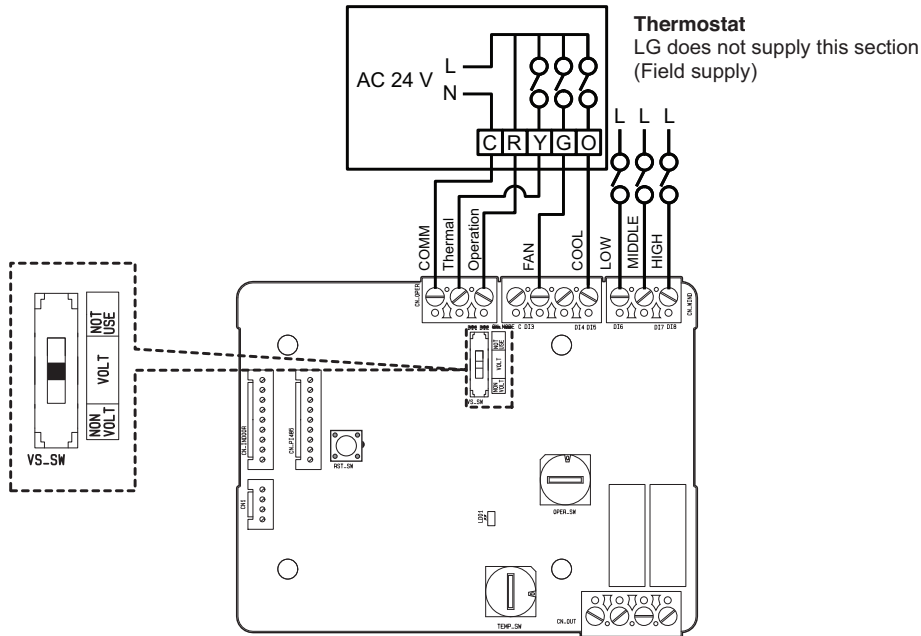
Thermostat Fan & System Switch			Input				IDU Response [Mode / Thermal / Fan]
FAN [Auto / On]	MODE [Cool / Heat / Off]		Operation	FAN [G]	HEAT [W]	COOL [Y]	
-	-	-	0	-	-	-	Disable Operation
Auto	OFF	-	1	0	0	0	Off
	Cool	RT > SP	1	1	0	1	Cool / On / On
		RT < SP	1	0	0	0	Enable
	Heat	RT < SP	1	1	1	0	Heat / On / On
		RT > SP	1	0	0	0	Off
ON	FAN	-	1	1	0	0	Fan / Off / On
	Cool	RT > SP	1	1	0	1	Cool / On / On
		RT < SP	1	1	0	0	Fan / Off / On
	Heat	RT < SP	1	1	1	0	Heat / On / On
		RT > SP	1	1	0	0	Fan / Off / On

※ RT : Room Temperature

※ SP : Set Point

4.1 Dry Contact

■ For heat pump thermostat with O terminal signal input

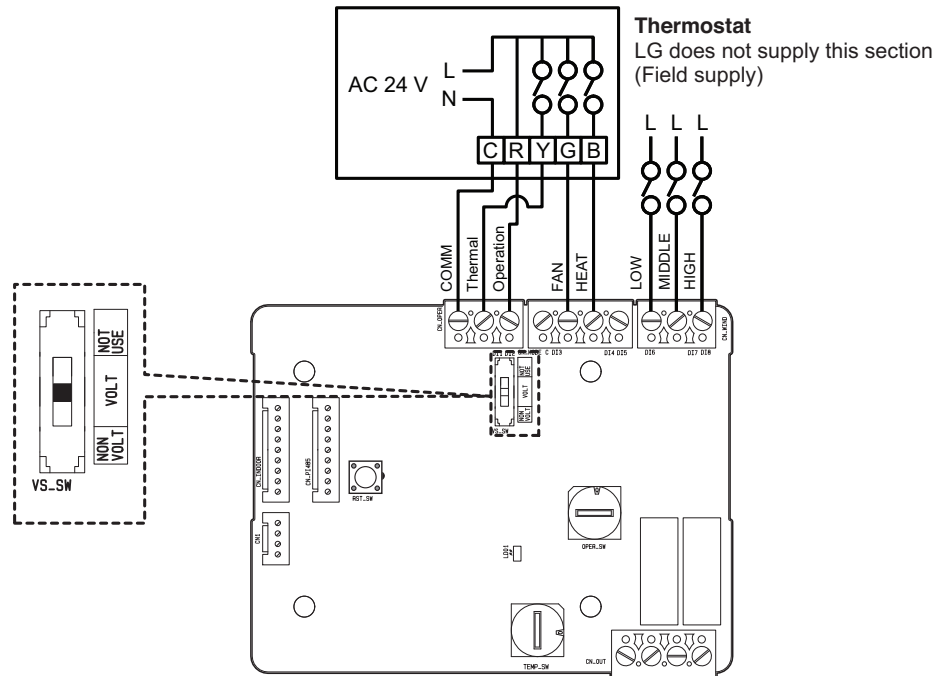


Thermostat Fan & System Switch			Input				IDU Response [Mode / Thermal / Fan]
FAN [Auto / On]	MODE [Cool / Heat / Off]		Operation	Thermal [Y]	FAN [G]	COOL [O]	
-	-	-	0	-	-	-	Disable Operation
Auto	OFF	-	1	0	0	0	Off
	Cool	RT > SP	1	1	0	1	Cool / On / On
		RT < SP	1	0	0	1	Off
	Heat	RT < SP	1	1	0	0	Heat / On / On
		RT > SP	1	0	0	0	Off
ON	FAN	-	1	0	1	0	Fan / Off / On
	Cool	RT > SP	1	1	1	1	Cool / On / On
		RT < SP	1	0	1	1	Fan / Off / On
	Heat	RT < SP	1	1	1	0	Heat / On / On
		RT > SP	1	0	1	0	Fan / Off / On

※ RT : Room Temperature
※ SP : Set Point

4.1 Dry Contact

■ For heat pump thermostat with B terminal signal input



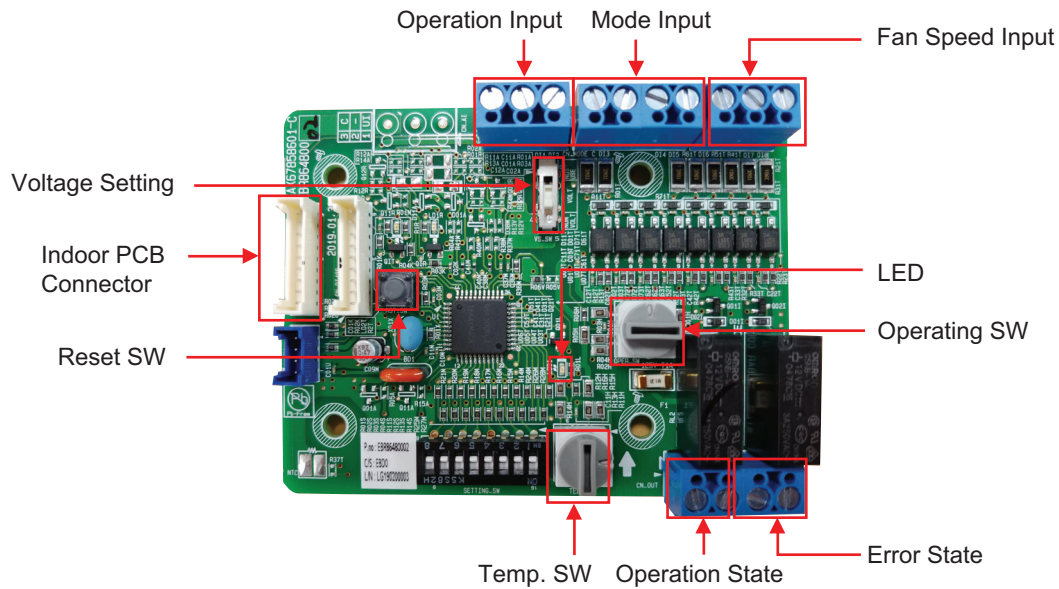
Thermostat Fan & System Switch			Input				IDU Response [Mode / Thermal / Fan]
FAN [Auto / On]	MODE [Cool / Heat / Off]		Operation	Thermal [Y]	FAN [G]	HEAT [B]	
-	-	-	0	-	-	-	Disable Operation
Auto	OFF	-	1	0	0	0	Off
	Cool	RT > SP	1	1	0	0	Cool / On / On
		RT < SP	1	0	0	0	Off
	Heat	RT < SP	1	1	0	1	Heat/ On/On
		RT > SP	1	0	0	1	Off
ON	OFF	-	1	0	1	0	Fan/ Off/ On
	Cool	RT > SP	1	1	1	0	Cool/ On/ On
		RT < SP	1	0	1	0	Fan/ Off/ On
	Heat	RT < SP	1	1	1	1	Heat/ On/ On
		RT > SP	1	0	1	1	Fan/ Off/ On

※ RT : Room Temperature
※ SP : Set Point

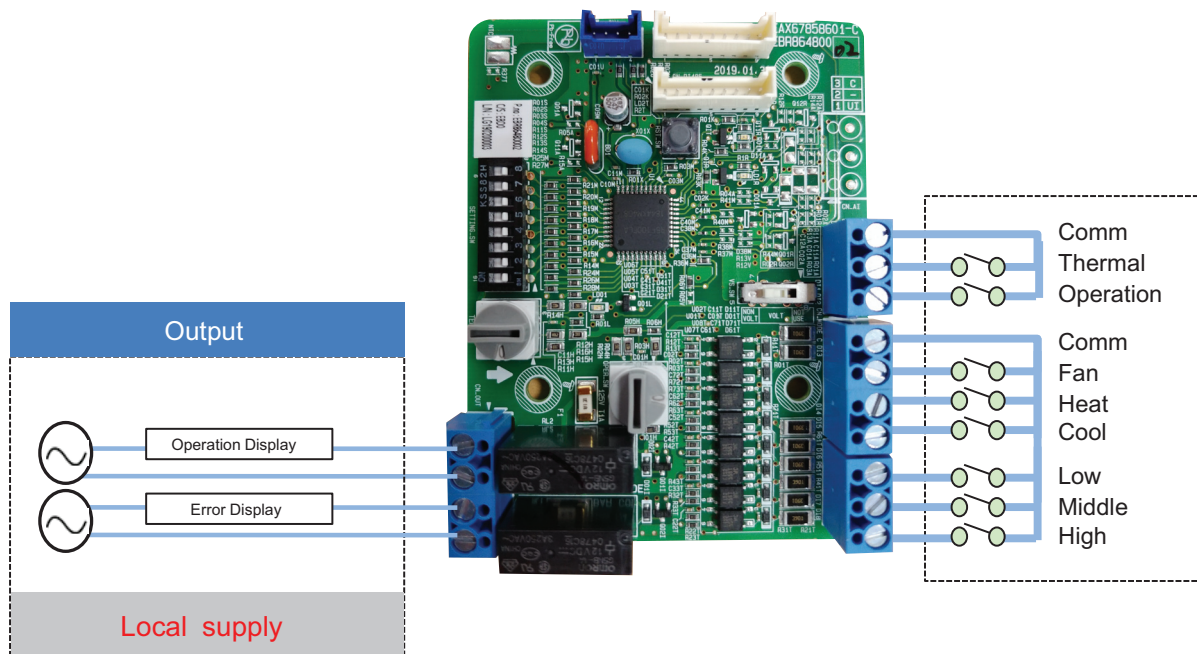
4.1 Dry Contact

4.1.4 PDRYCB300 (Dry Contact for Thermostat)

• Feature



• Wiring



* Depending on different thermostat models, wiring can be different from others

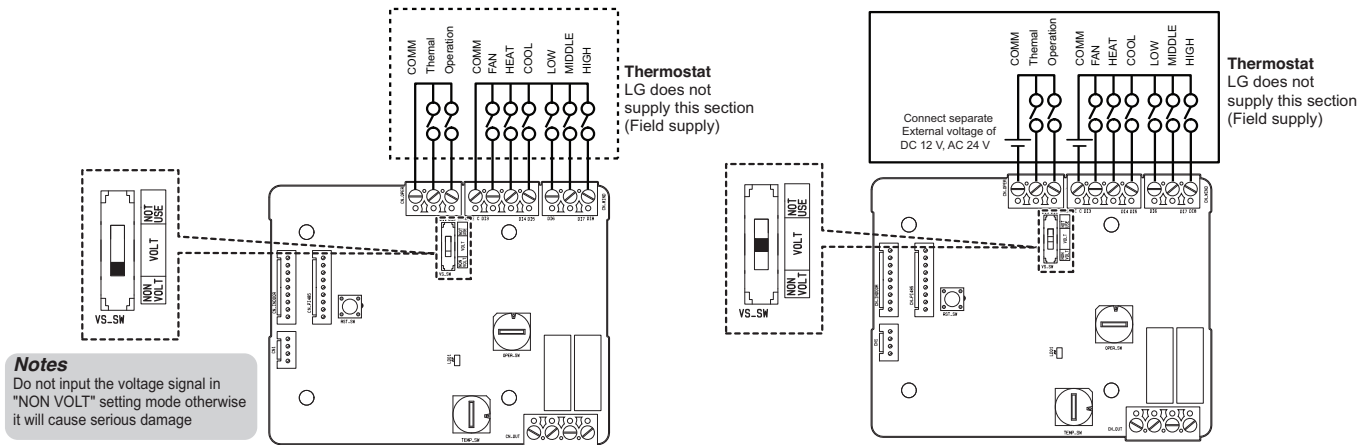


4.1 Dry Contact

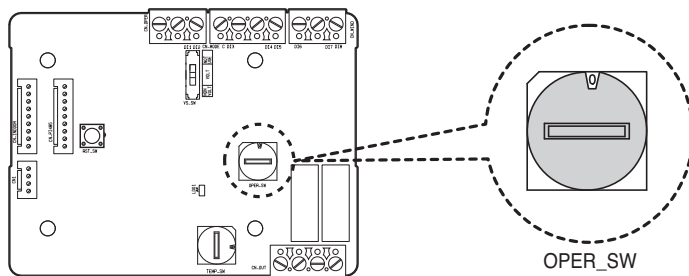
• Voltage / Non Voltage setting for Input signal

► Non Voltage setting

► Voltage setting : 12 V $\overline{\text{---}}$, 24 V \sim



• Setting SW – Enable/Disable each of input signals



* Thermal On : This input will change automatically desired temperature
Desired Temp. 18 in cooling mode
Desired Temp. 30 in heating mode
No function in FAN mode

No.	WIND Signal en/disable	Thermal en/disable	Oper Mode en/disable	Dry Contact Control Priority
0	Disable	Disable	Disable	Disable
1	Disable	Disable	Disable	Enable ⁴⁾
2	Disable	Disable	Enable ³⁾	Disable
3	Disable	Disable	Enable	Enable
4	Disable	Enable ²⁾	Disable	Disable
5	Disable	Enable	Disable	Enable
6	Disable	Enable	Enable	Disable
7	Disable	Enable	Enable	Enable
8	Enable ¹⁾	Disable	Disable	Disable
9	Enable	Disable	Disable	Enable
A	Enable	Disable	Enable	Disable
B	Enable	Disable	Enable	Enable
C	Enable	Enable	Disable	Disable
D	Enable	Enable	Disable	Enable
E	Enable	Enable	Enable	Disable
F	Enable	Enable	Enable	Enable

4.1 Dry Contact

• Setting SW – Enable/Disable each of input signals

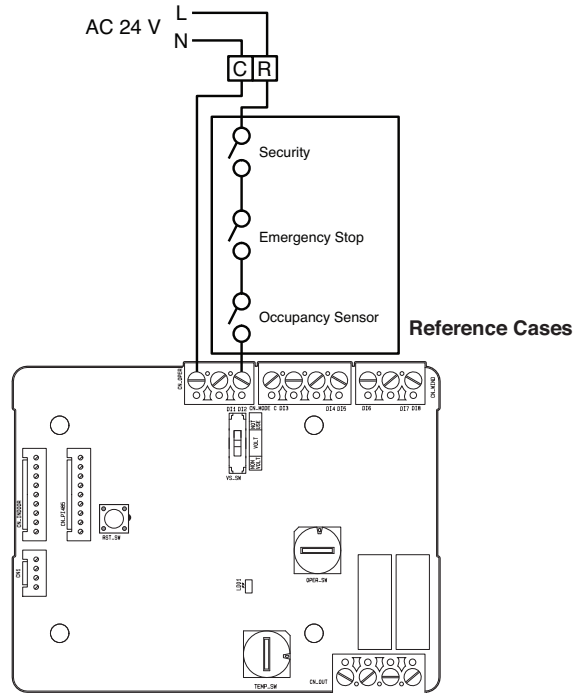
 OPER_SW	CN_MODE input			Function
	FAN	HEAT	COOL	
2,3,6,7,A,B,E,F	0	0	0	NA
	0	0	1	COOL
	0	1	0	HEAT
	0	1	1	NA
	1	0	0	FAN
	1	0	1	NA
	1	1	0	NA
	1	1	1	NA
Others	-	-	-	NA
 OPER_SW	CN_WIND input			Function
	Low	Middle	High	
8,9,A,B,C,D,E,F	0	0	0	NA
	0	0	1	High
	0	1	0	Middle
	0	1	1	NA
	1	0	0	Low
	1	0	1	NA
	1	1	0	NA
	1	1	1	NA
Others	-	-	-	NA
 OPER_SW	CN_OPER			Function
	Thermal		Operation	
4,5,6,7,C,D,E,F	0		0	Thermal Off + Stop
	0		1	Thermal Off + Run
	1		0	Thermal On + Stop
	1		1	Thermal On + Run
Others	-		-	NA

<Switch Function>

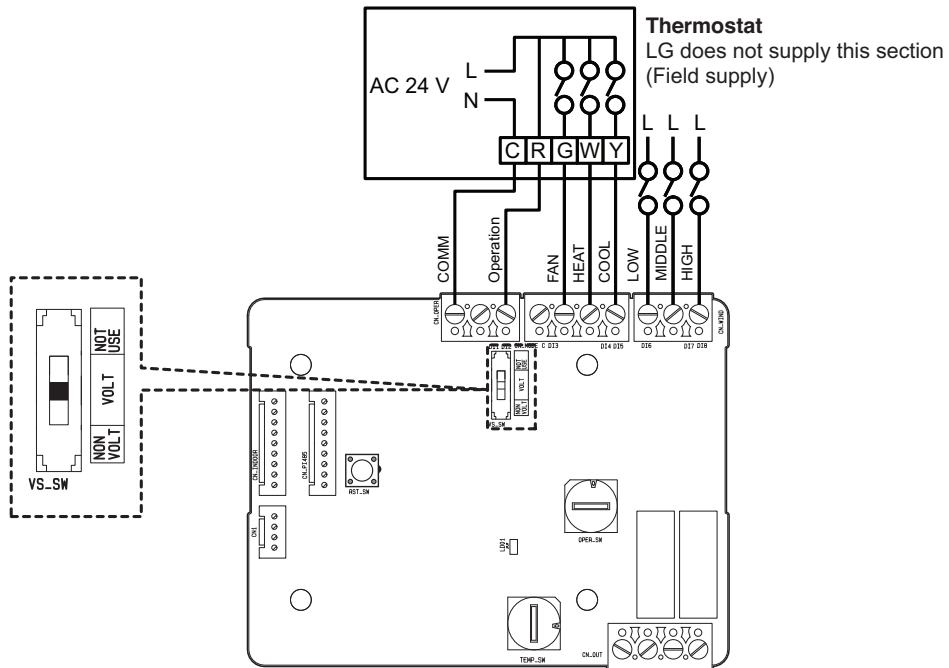
TEMP_SW	OPER_SW	Thermostat mode	WIND Signal en/disable
F	0	Conventional AC Unit Thermostat	Disable
	1		Enable
	2	Heat Pump Thermostat_O Terminal	Disable
	3		Enable
	4	Heat Pump Thermostat_B Terminal	Disable
	5		Enable

4.1 Dry Contact

- Usage Example
- In case of on/off sensor



- With Conventional thermostat



4.1 Dry Contact

4.1.5 PDRYCB400



- Dimensions: 120 X 120 X 36.5 mm
- Unit types : For Connect Indoor unit to other Forced on/off Controller.
(Available from Multi V 2 series)
- No need AC input

Appearance		Connect		
	No.	Name	Function	
	1	CN_INDOOR	Connect communication wire between indoor unit and Dry Contact For Setback and supply power to Dry Contact For Setback	
	2	VS_SW	Switch to select voltage (5 V-12 V) of contact point	
	3	CN_OPER	Contact point signal input	
	4	OPER_SW	Switch to select the control mode	
	5	SETTING_SW	Switch to select whether to use set function of Dry contact for setback	
	6	TEMP_SW	Switch to set the desired temperature of the indoor unit	
	7	CN_OUT (O1, O2)	Connector to show whether the indoor unit is operating	
	8	CN_OUT (E3, E4)	Connector to show whether there is an error with the indoor unit	
	9	LD01	LED to display the status of the Dry Contact For Setback	
	10	RST_SW	Reset switch	

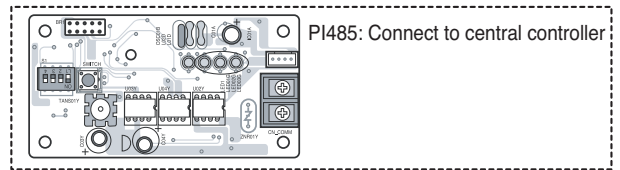
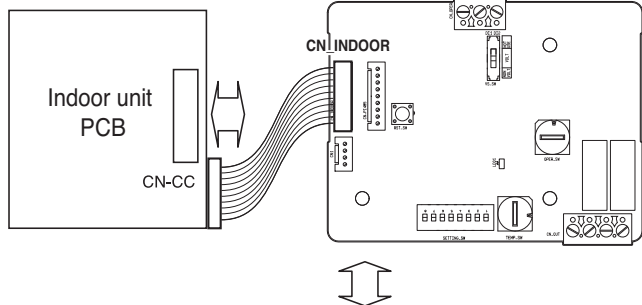
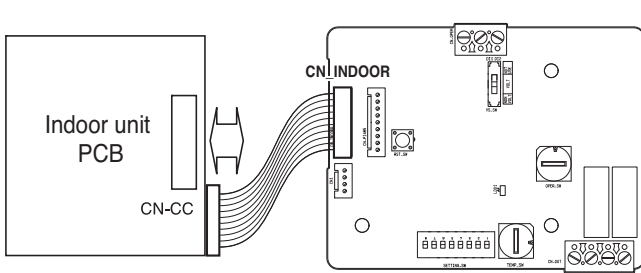
■ Accessory

Cable 1EA (for connecting with indoor unit) *Other : Screw (For installation, 4EA)	User/Installation Manual	Metal Case (Front)	Isolation Sheet	Metal Case (Rear)	Rubber

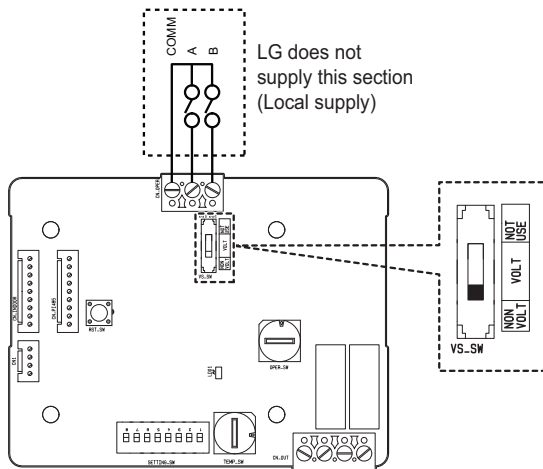
4.1 Dry Contact

■ Installation

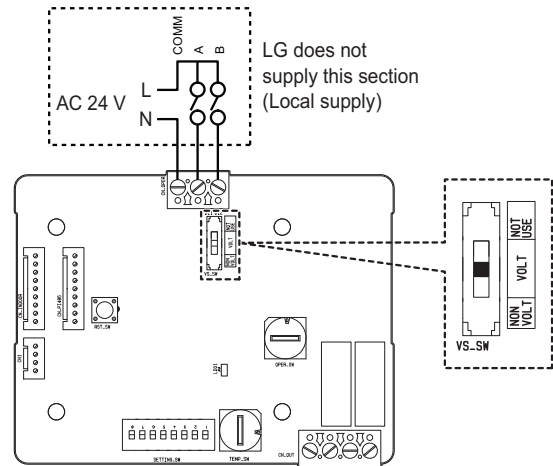
- When using the Dry Contact For Setback independently
- When using with the central controller (Only when the indoor unit PCB is a non-communication model)



- For no power contact point signal input



- For power contact point signal input



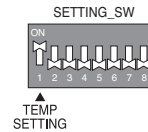
4.1 Dry Contact

■ Function List

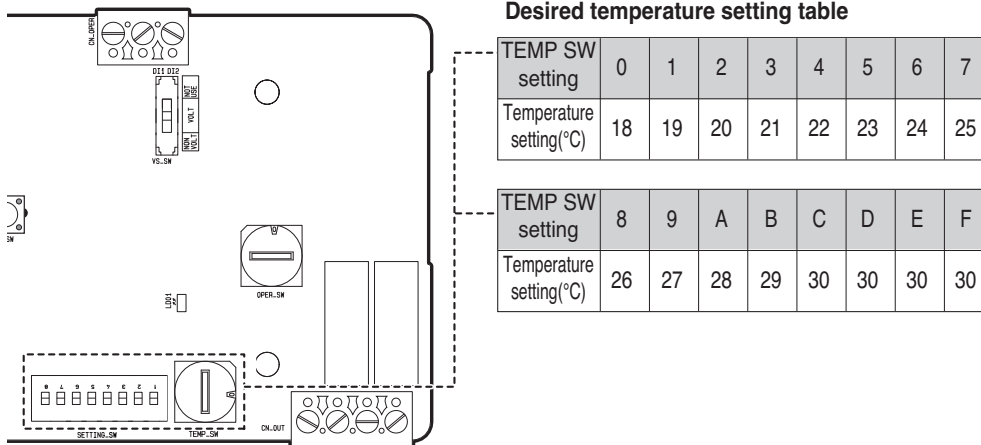
• When setting the desired temperature of the Dry contact for Setback

: When operating the indoor unit, set the desired temperature according to the TEMP_SW setting.
When the indoor unit is unlocked, the desired temperature can be reset by other controller

- 1) Turn on the TEMP_SETTING switch of SETTING_SW.

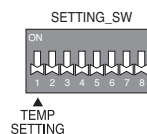


- 2) Use the TEMP_SW to set the temperature as shown below.

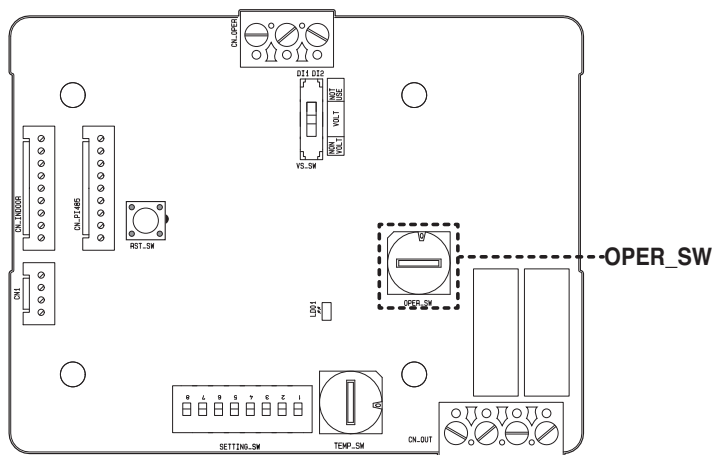


• When not using the desired temperature setting of Dry contact for Setback

- 1) Turn off the TEMP_SETTING switch of SETTING_SW.



• Use the OPER_SW to set the control mode you want from 0~E.



➤ Indoor control priority

Central control > Dry Contact For Setback > Wired/Wireless remote controller, indoor unit button

➤ Dry Contact For Setback controls the indoor unit according to the applicable mode when there is a change in input of A and B.

4.1 Dry Contact

• Description of each control mode

1) Cancel mode for use of Dry contact for setback

OPER_SW	Input A	Input B	Operating mode
0	OFF	OFF	The indoor unit cannot be controlled through the Dry contact for setback No change in indoor unit condition
	ON	OFF	
	OFF	ON	
	ON	ON	

☞ Set this when the Dry Contact For Setback is connected but not used.

2) General mode

OPER_SW	Input A	Input B	Operating mode
1	OFF	OFF	Indoor unit stopped, locked
	ON	OFF	Indoor unit prior operating condition maintained, unlocked
	OFF	ON	Indoor unit stopped, locked
	ON	ON	Indoor unit stopped, locked
2	OFF	OFF	Indoor unit stopped, locked
	ON	OFF	Indoor unit operating, unlocked
	OFF	ON	Indoor unit stopped, locked
	ON	ON	Indoor unit stopped, locked
3	OFF	OFF	Indoor unit stopped, locked
	ON	OFF	Indoor unit stopped, locked
	OFF	ON	Indoor unit prior operating condition maintained, unlocked
	ON	ON	Indoor unit operating, unlocked
4	OFF	OFF	Indoor unit stopped, locked
	ON	OFF	Indoor unit stopped, locked
	OFF	ON	Indoor unit prior operating condition maintained, unlocked
	ON	ON	Indoor unit prior operating condition maintained, unlocked
5	OFF	OFF	Indoor unit prior operating condition maintained, locked
	ON	OFF	Indoor unit prior operating condition maintained, locked
	OFF	ON	Indoor unit prior operating condition maintained, locked
	ON	ON	Indoor unit prior operating condition maintained, unlocked
6	OFF	OFF	Indoor unit prior operating condition maintained, locked
	ON	OFF	Indoor unit prior operating condition maintained, locked
	OFF	ON	Indoor unit prior operating condition maintained, locked
	ON	ON	Indoor unit operating, unlocked

4.1 Dry Contact

3) Fan level setting mode

OPER_SW	Input A	Input B	Operating mode
7	OFF	OFF	Indoor unit operating at low level, locked
	ON	OFF	Indoor unit operating at low level, unlocked
	OFF	ON	Indoor unit stopped, locked
	ON	ON	Indoor unit stopped, locked
8	OFF	OFF	Indoor unit operating at low level, locked
	ON	OFF	Indoor unit operating at low level, unlocked
	OFF	ON	Indoor unit stopped, locked
	ON	ON	Indoor unit prior operating condition maintained, unlocked

⤵ When the indoor unit is operating with a Dry Contact For Setback, the fan level can be changed by other controller when the fan level is set to low level and the indoor is in unlocked condition.

4) Power save mode

OPER_SW	Input A	Input B	.Operating mode
9	OFF	OFF	Indoor unit operating in power save mode, locked
	ON	OFF	Indoor unit operating in power save mode, unlocked
	OFF	ON	Indoor unit stopped, locked
	ON	ON	Indoor unit operating, unlocked
A	OFF	OFF	Indoor unit operating in power save mode, locked
	ON	OFF	Indoor unit operating in power save mode, unlocked
	OFF	ON	Indoor unit stopped, locked
	ON	ON	Indoor unit stopped, locked

⤵ When setting 9, A mode, the TEMP_SETTING must always be set to ON.
 ⤵ Power save mode: Adjust the set temperature to +3°C for cooling and -3°C for heating.

4.1 Dry Contact

5) Compressor stop mode

OPER_SW	Input A	Input B	Operating mode
B	OFF	OFF	Indoor unit operating (Compressor in stop mode), locked
	ON	OFF	Indoor unit prior operating condition maintained (Compressor not in stop mode), unlocked
	OFF	ON	Indoor unit stopped, locked
	ON	ON	Indoor unit stopped, locked

↪ Compressor stop mode: The compressor is stopped during cool/heat operation.

6) Operating mode selection mode

OPER_SW	Input A	Input B	Operating mode
C	OFF	OFF	Indoor unit stopped
	ON	OFF	Indoor unit in cool/high operation
	OFF	ON	Indoor unit in heat/high operation
	ON	ON	Indoor unit in fan/high operation
D	OFF	OFF	Indoor unit stopped, locked
	ON	OFF	Indoor unit in cool/high operation, locked
	OFF	ON	Indoor unit in heat/high operation, locked
	ON	ON	Indoor unit in fan/high operation, locked

↪ Power save mode: Adjust the set temperature to +3°C for cooling and -3°C for heating.

7) Compressor stop mode when interlocking with Economizer

OPER_SW	Input A	Input B	Operating mode
E	OFF	OFF	Indoor unit prior operating condition maintained (Compressor not in stop mode), unlocked
	ON	OFF	Indoor unit operating (Compressor in stop mode), unlocked
	OFF	ON	Indoor unit stopped, unlocked
	ON	ON	Indoor unit stopped, unlocked

↪ When interlocking with Economizer, turn On 2nd switch of SETTING.

4.1 Dry Contact

8) Occupancy Sensor

OPER_SW	Input A	Input B	Operating mode
F	OFF	OFF	Occupied, unlocked
	ON	OFF	Unoccupied, unlocked
	OFF	ON	Occupied, locked
	ON	ON	Unoccupied, locked

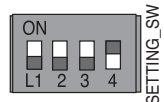
⇒ When using the Occupancy sensor interlock mode, the switch must be set as shown on the right.



9) Extended mode

OPER_SW	Input A	Input B	Operating mode
0	OFF	OFF	Indoor unit stopped, locked
	ON	OFF	Indoor unit stopped, locked
	OFF	ON	Indoor unit stopped, locked
	ON	ON	Indoor unit prior operating condition maintained, unlocked
1	OFF	OFF	Indoor unit stopped, unlocked
	ON	OFF	Indoor unit stopped, unlocked
	OFF	ON	Indoor unit stopped, unlocked
	ON	ON	Indoor unit prior operating condition maintained, unlocked

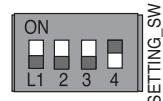
⇒ When using the expand mode, the switch must be set as shown on the right.
When SETTING_SW is set as shown on the right, other modes except Extended 0 ~ 2 mode can not be used.



10) Refrigerant leakage solution for Hotel

OPER_SW	Input A	Input B	Operating mode
2	OFF	OFF	Indoor unit stopped, locked
	ON	OFF	Indoor unit prior operating condition maintained, unlocked
	OFF	ON	Indoor unit operating, unlocked
	ON	ON	Indoor unit prior operating condition maintained, unlocked

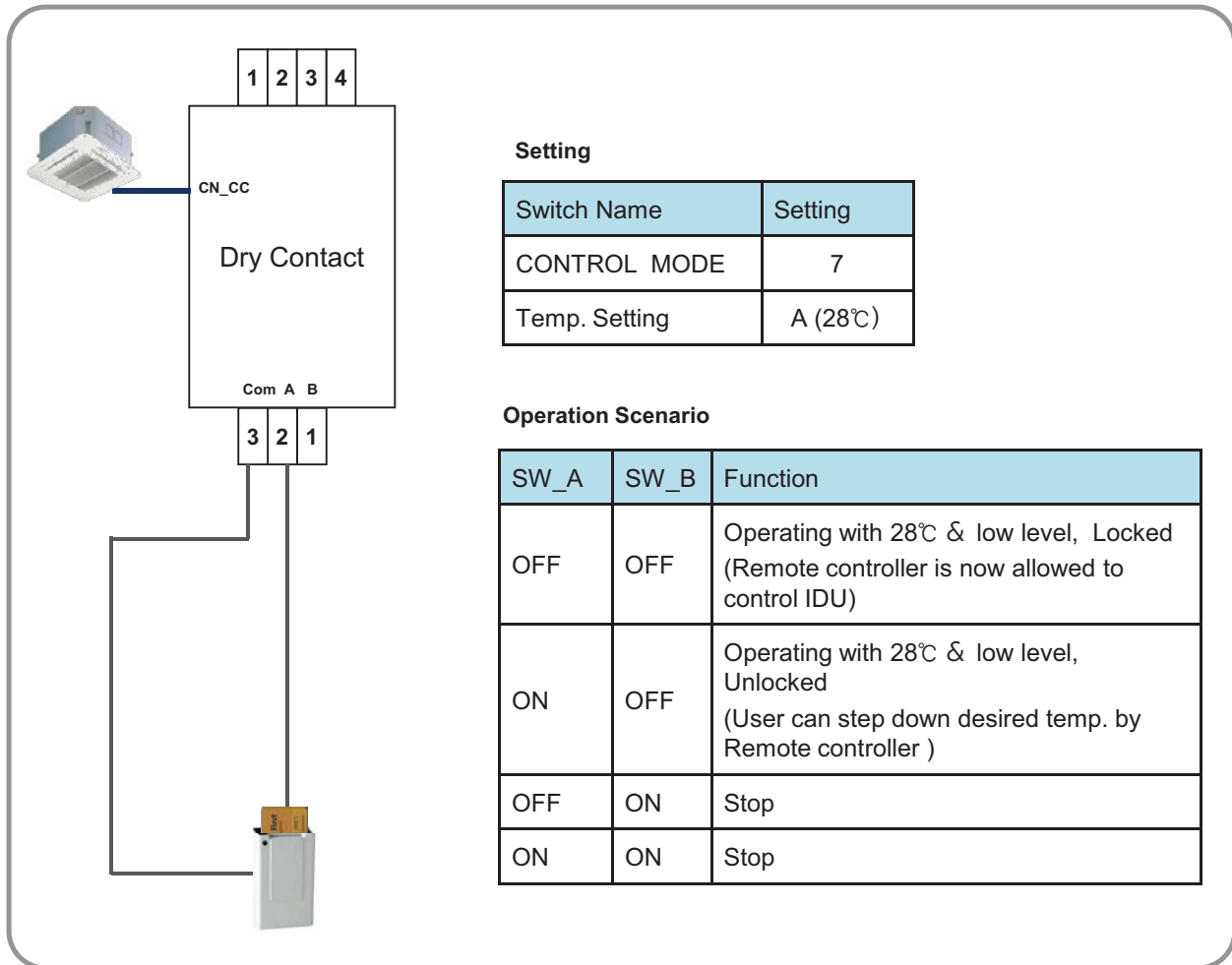
⇒ When using the expand mode, the switch must be set as shown on the right.
When SETTING_SW is set as shown on the right, other modes except Extended 0 ~ 2 mode can not be used.



4.1 Dry Contact

■ Usage example

• Pre-Cooling



4.1 Dry Contact

• Emergency stop

Setting

Switch Name	Setting
CONTROL MODE	2

Operation Scenario

SW_A	SW_B	Function
OFF	OFF	Stop
ON	OFF	Operating
OFF	ON	Stop
ON	ON	Stop

• Mode Selector

Setting

Switch Name	Setting
CONTROL MODE	C or D

Operation Scenario

SW_A	SW_B	Function
OFF	OFF	Stop
ON	OFF	Cool Mode
OFF	ON	Heat Mode
ON	ON	FAN Mode

Only a manager can control this switch

4.1 Dry Contact

4.1.6 PDRYCB500



- Dimensions: 120 X 120 X 36.5 mm
- Unit types : For Connect Indoor unit to external controller.
(Available from Multi V 2 series)
- No need AC input

Appearance	Connect		
	No.	Name	Function
	1	CN-OUT	Indoor Unit Connector
	2	BUS-A	RS485(+) Terminal
	3	BUS-B	RS485(-) Terminal
	4	SW1	Reset Switch
	5	SWDIP	Setting Address Switch
	6	LED1	RS485 Status LED
	7	LED(01~03)G	Communication Status LED
	8	CN-JIG	Connector for expanding the raddress range

■ Accessory

<p>Screw (For installation, 4EA)</p>	<p>Cable(1 EA) (For Connecting with indoor unit)</p>	<p>User/Installation Manual</p>	<p>Connector (1 EA) (For expanding address range)</p>
---	---	--	--

4.1 Dry Contact

■ Specification

- 1) Modbus configuration
- Network : 2 wire RS485
 - Mode : Modbus RTU slave
 - Baud : 9600
 - Parity : None
 - Stop bits : 1
 - Register Base : 0

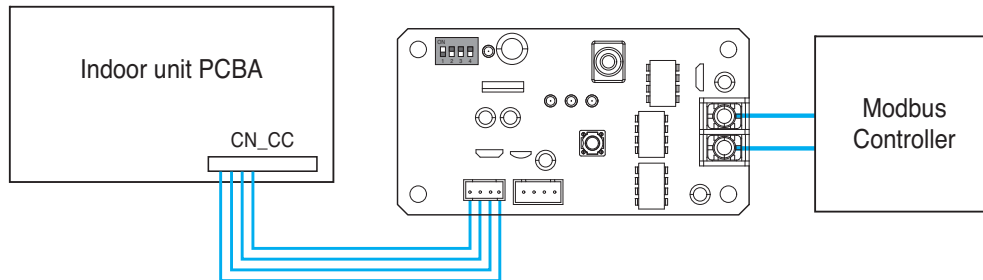
2) Data registers

Function code	Register	Address	Name	Range	Notes
01(read)/05(write)	00001	0x0000	Operation	0~1	0: Stop 1: Run
04(read)	30001	0x0000	Pipe in temprature	-300~1120	Degrees (°C) × 10
04(read)	30002	0x0001	Pipe out temperature	-300~1120	Degrees (°C) × 10
04(read)	30003	0x0002	Indoor temperature	100~400	Degrees (°C) × 10
04(read)	30100	0x0063	Error code	0~999	0: No error 1~999: Error code
03(read)/06(write)	40001	0x0000	Set run mode (aircon)	0~4	0: Cool 2: Fan 3: Auto 4: Heat
03(read)/06(write)	40002	0x0001	Set temperature	180~300	Degrees (°C) × 10
03(read)/06(write)	40003	0x0002	Set run mode (ventilation)	0~2	0: Heat exchange 1: Auto 2: Bypass
03(read)/06(write)	40004	0x0003	Set sub operation (ventilation)	0~2	0: Off 1: Fast 2: Energy saving
03(read)/06(write)	40015	0x000E	Set fan speed	1~3	1: Low 2: Middle 3: High 4: Auto 7: Super High

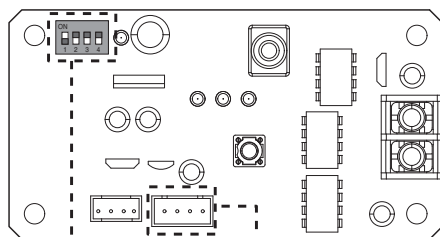
* Above function may not work in some products.

4.1 Dry Contact

■ Installation



■ Address Setting



*Status of switch



- Not attached(default): 1~8
- Attached(expanding address range): 9~16 (After 2018)

Address 1/9



Address 2/10



Address 3/11



Address 4/12



Address 5/13



Address 6/14



Address 7/15



Address 8/16



* /Number: Address when connector is attached

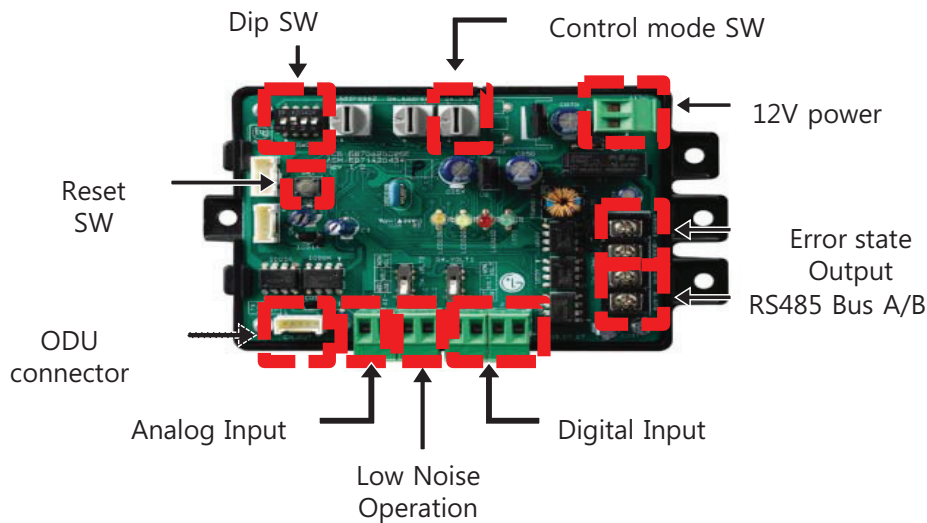
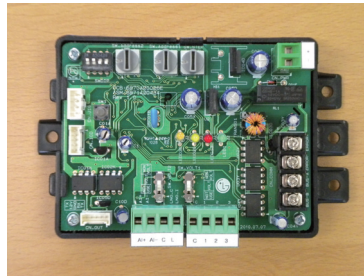
- ※ In case, connect a Modbus controller with several product, Address have to be set different from others.
- ※ If the connector is attached to 'CN-JIG', the address range is expanded. (Please attach the connector before turning on the product.)

4.1 Dry Contact

4.1.7 PQDSBCDVM0 (Dry contact for Outdoor Demand control)

* Note : This dry contact Module is available for MultiV III series.

1) Model name : PQDSBCDVM0

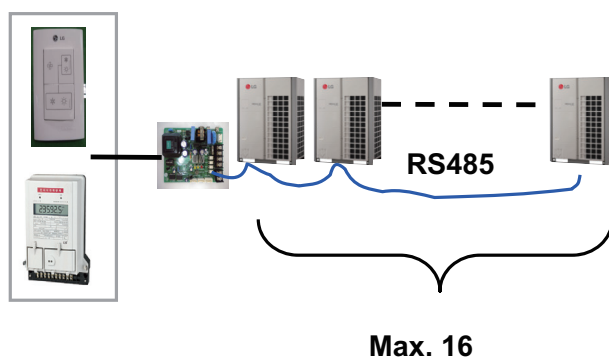


2) Specification

Applied Model : Over Multi V 3 Series

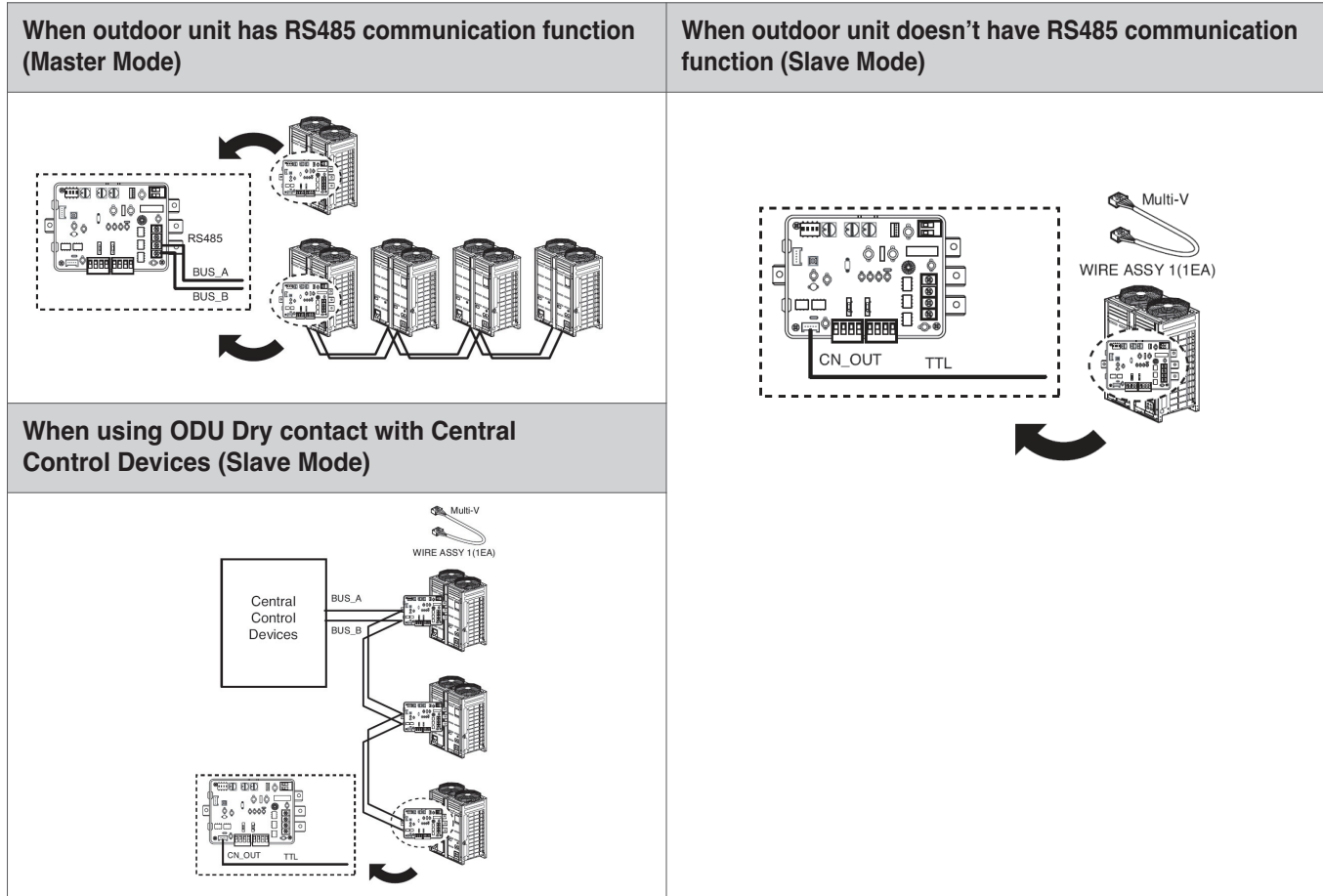
- Function : - Demand control (3 contact signal)
- Demand control (Co-work with DDC)
 - ODU fan low speed control (Night low noise operation)
 - All Off
 - Error Output (Display)

• Overview

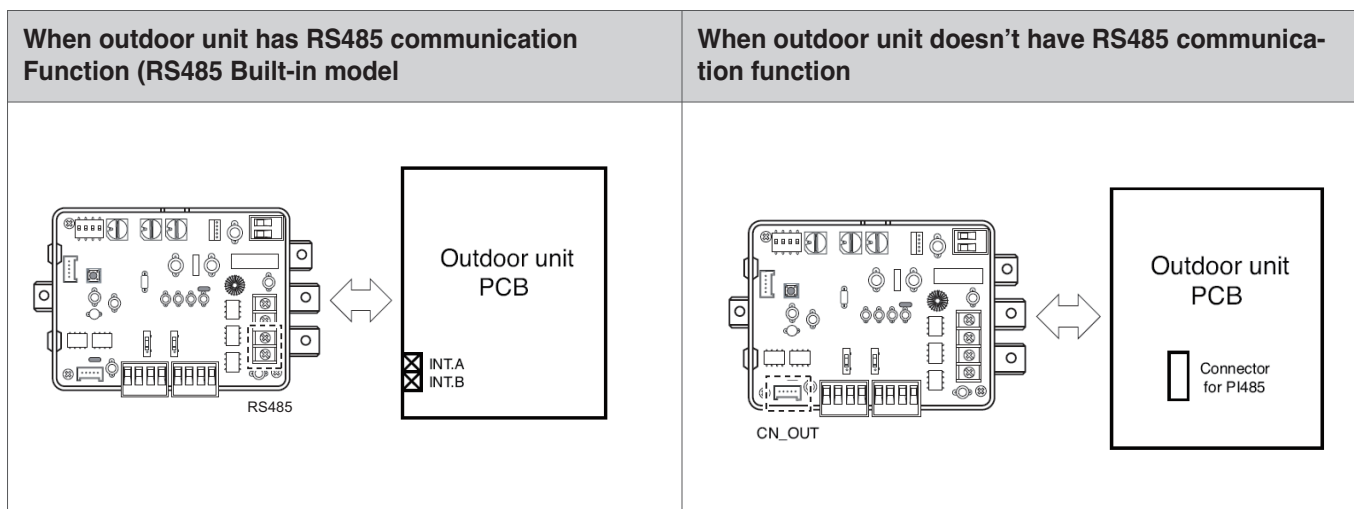


4.1 Dry Contact

• System structure

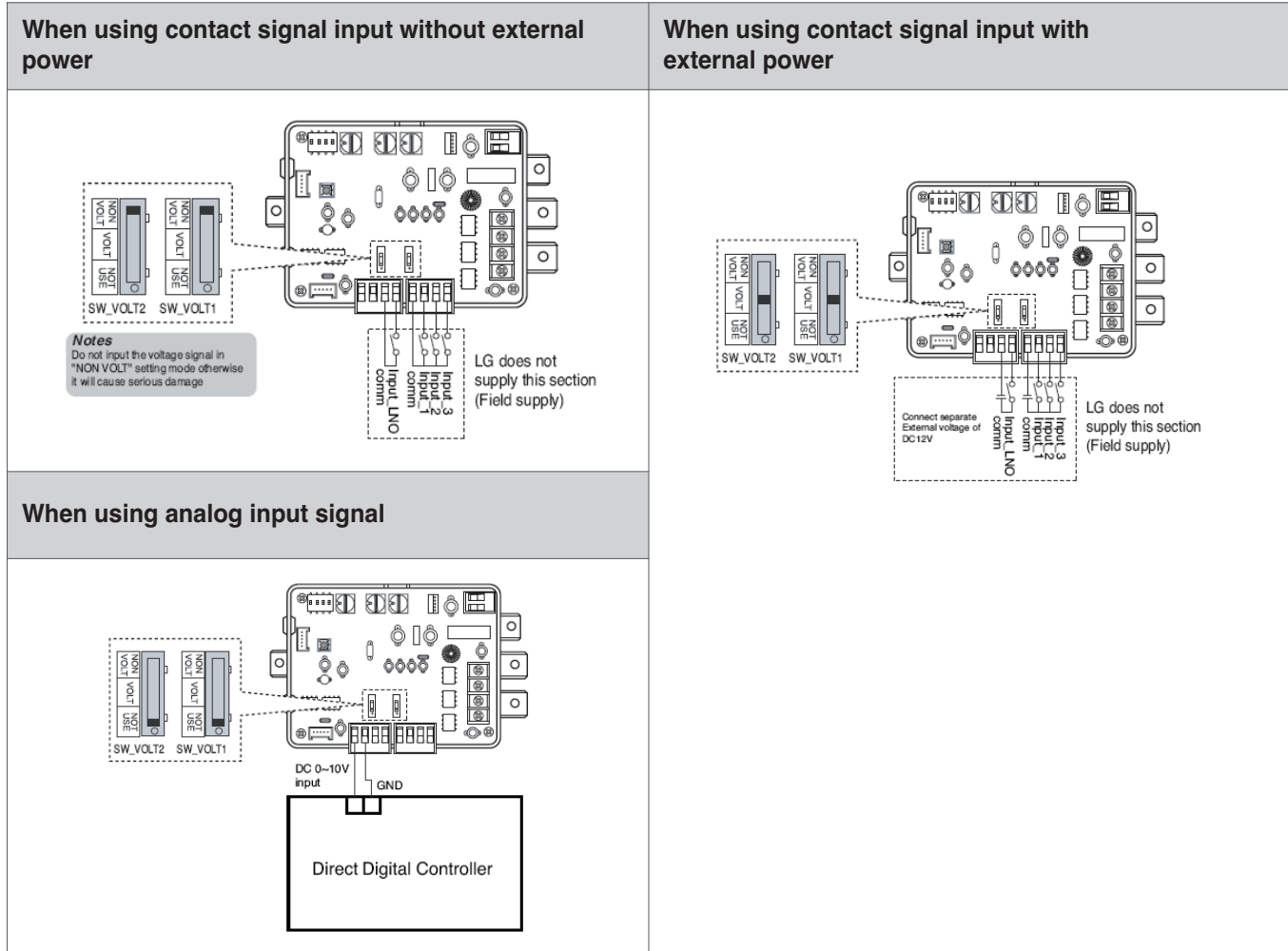


• System structure



4.1 Dry Contact

• Setting of input signal



• Setting of 'SWDIP'

* Using 'SWDIP', select the option of control function as described below

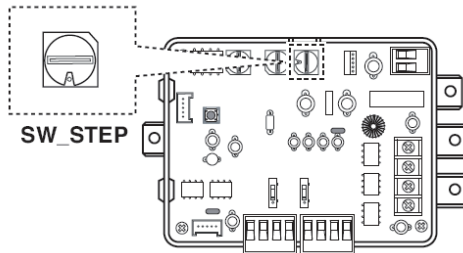
SWDIP	Function										
<p>Notes Default State is L1: ON, L2: ON</p>	<table border="1"> <thead> <tr> <th>Position</th><th>Function</th></tr> </thead> <tbody> <tr> <td> </td><td>ON : Master Mode OFF : Slave Mode</td></tr> <tr> <td> </td><td>ON : Enable Low Noise Operation OFF : Disable Low Noise Operation</td></tr> <tr> <td> </td><td>No Function</td></tr> <tr> <td> </td><td>ON : On Boarding Mode OFF : No Function</td></tr> </tbody> </table>	Position	Function		ON : Master Mode OFF : Slave Mode		ON : Enable Low Noise Operation OFF : Disable Low Noise Operation		No Function		ON : On Boarding Mode OFF : No Function
Position	Function										
	ON : Master Mode OFF : Slave Mode										
	ON : Enable Low Noise Operation OFF : Disable Low Noise Operation										
	No Function										
	ON : On Boarding Mode OFF : No Function										

4.1 Dry Contact

• Setting of 'SW_STEP'

* Use the 'SW_SETUP' to set a control step for contact signal input.

SW_STEP



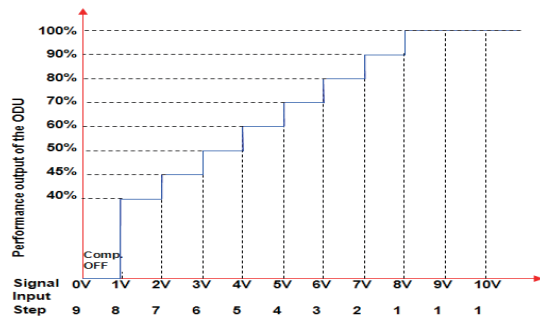
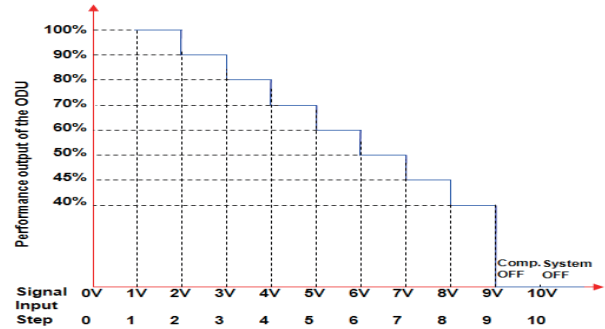
Contact signal input (Mode 0~6)

SW_STEP	Input_1	Input_2	Input_3	Comp capacity Of outdoor unit(%)
0	0	0	0	No control
	1	0	0	70
	0	1	0	40
	0	0	1	COMP OFF
1	0	0	0	No control
	1	0	0	70
	0	1	0	50
	0	0	1	COMP OFF
2	0	0	0	No control
	1	0	0	80
	0	1	0	50
	0	0	1	COMP OFF
3	0	0	0	No control
	1	0	0	70
	0	1	0	40
	0	0	1	ALL OFF
4	0	0	0	No control
	1	0	0	70
	0	1	0	50
	0	0	1	ALL OFF
5	0	0	0	No control
	1	0	0	80
	0	1	0	50
	0	0	1	ALL OFF
6	0	0	0	No control
	1	0	0	50
	0	1	0	COMP OFF
	0	0	1	ALL OFF

4.1 Dry Contact

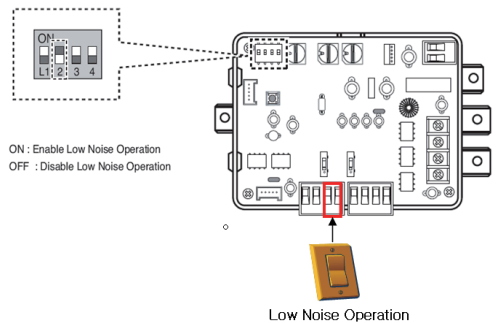
Analog signal input (Mode 0~6)

SW_STEP	Input Voltage	Comp capacity Of outdoor unit(%)	Type of input
D	0	No control	Analog input
	1	100	
	2	90	
	3	80	
	4	70	
	5	60	
	6	50	
	7	45	
	8	40	
	9	COMP OFF	
	10	ALL OFF	
E	0	COMP OFF	
	1	40	
	2	45	
	3	50	
	4	60	
	5	70	
	6	80	
	7	90	
	8	100	
	9	100	
	10	100	



• Low Noise Operation

Night low noise operation



4.2 Remote Temperature Sensor

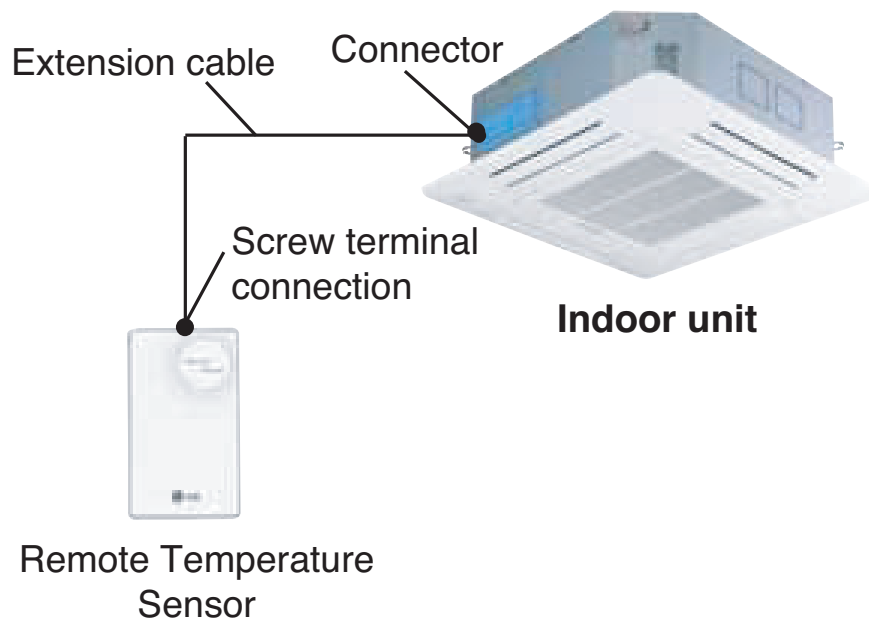
4.2.1 PQRSTA0

■ Overview

Sensor for detecting the room temperature.



- It can help to detect the exact room temperature at the optimal position.
- Model applied to Cassette,Duct type, Single package ¹⁾
- Parts
 - Remote temperature sensor assembly
 - Cable 15m



1) It need additional settings for Single package.

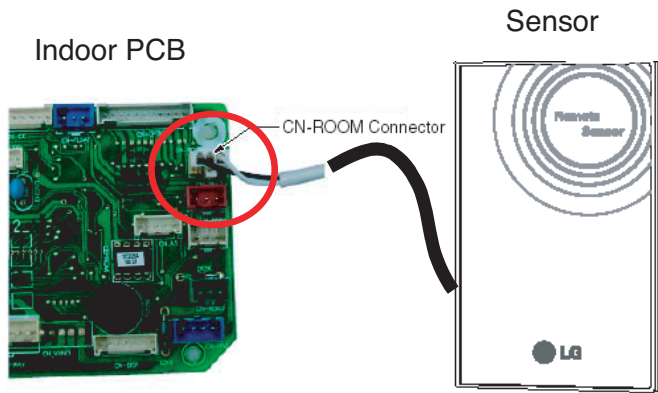
Please refer installation manuals of Single package model and set the dip S/W to use temperature sensor.

4.2 Remote Temperature Sensor

■ Installation

Step 1

Insert the connector of the connection wire into the space for the connector in place of the room temperature sensor.



Wiring diagram of back side of Remote sensor



The Connection wire does not matter if you change the color of the wire because of non-polar.

Step 2

In the case of wired remote controller installed, set the Temperature sensing mode at MAIN mode.

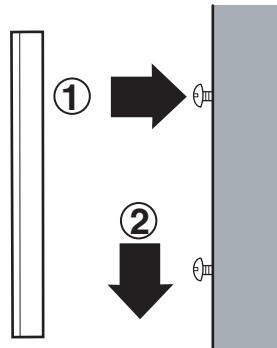
(* Note : Refer each wired remote controller's installation manual
How to change and set room temperature sensing mode)

4.2 Remote Temperature Sensor

Step 3

Integrate the remote temperature sensor with the screws as the order of arrows.

Fixing the remote controller



! CAUTION

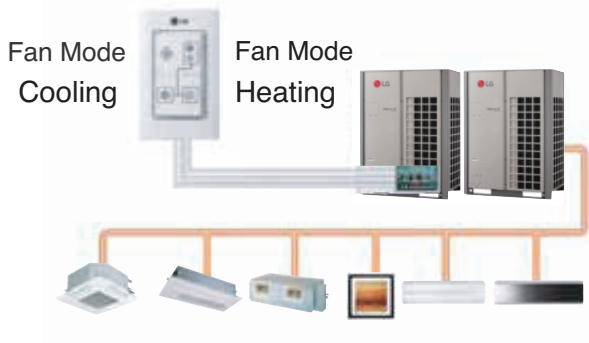
1. Choose the place where the average temperature can be measured for the place the indoor unit operates.
2. Avoid direct sunlight
3. Choose the place where the cooling/heating devices do not affect the remote sensor.
4. Choose the place where the outlet of the cooling fan do not affect the remote sensor.
5. Choose the place where the remote sensor isn't affected when door is open.

4.3 Cool/Heat Selector

4.3.1 PRDSBM

■ Overview

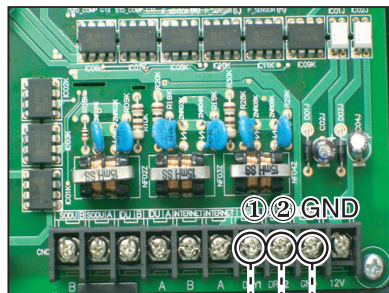
- This switch enables selection of heating, cooling or fan mode.
So it can prevent that cooling & heating mixing error occurs during the change of season.
- To use the cool/heat selector function you should set dip switch of outdoor main PCB.



- Indoor unit control without central controller
- Select operation mode : Cooling, Heating, Fan mode
- Mode lock for cooling & heating mixing error-proof during the change of season.

■ Installation

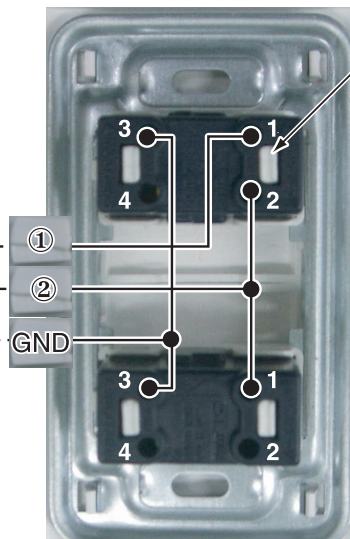
- Connect terminals (①, ②, GND) on the back side of Cool/Heat Selector to terminals (①, ②, GND) of Outdoor Main PCB.



< Outdoor Main PCB >

..... shows field wiring

—— connected wiring



<Outdoor Dry Contact Back Side >

Push Button

- Insert wire method -



Push arrow direction.



Insert wire to connector.

※ Communication line length can be maximum 300m, use communication line as thick as 1.25mm².

- In case of Multi V III series , You can use all off function instead of Fan mode more details are refer each Multi V III product's installation Manual

4.4 IO(Input/Output) Module

4.4.1 PVDSMN000

IO module is communication interface device for connection between Multi V outdoor unit and external devices.

*** Note : This Module is available after Multi V 4 series. For detail information, refer to the PDB of outdoor unit.**

- Functions

• INPUT

Enable / Disable Low Noise Operation (Only for MULTI V)

- This function enable or disable low noise operation according to contact input signal to the IO Module. When it's enabled, outdoor unit reduces fan speed depends on outdoor unit setting. For more information for setting outdoor unit, please refer to installation manual of outdoor unit.

Demand Control

- This function is to reduce outdoor unit power consumption by using input signal. This manual provides variable setting for demand control according to input method. This function supports 2 types of input signal : AI(0~10V) and contact signal(3 Step).

• OUTPUT

Output Outdoor or Indoor Unit Status Signal

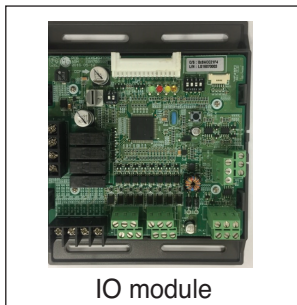
- This function displays outdoor or indoor unit's operation status. Depends on dip switch setting, either outdoor or indoor unit operation status is reflected through output signal.

Output Error Status

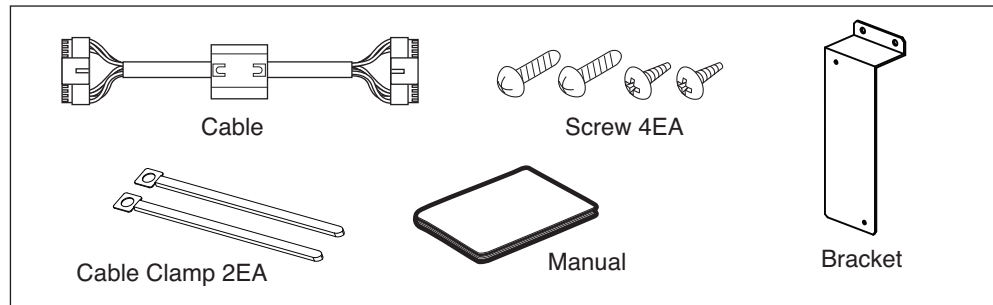
- This function displays error signal by digital output when either outside or indoor unit has an error.

■ Specifications

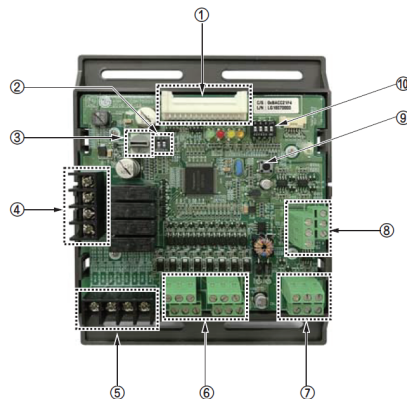
• Features



• Accessory



• Name of each part



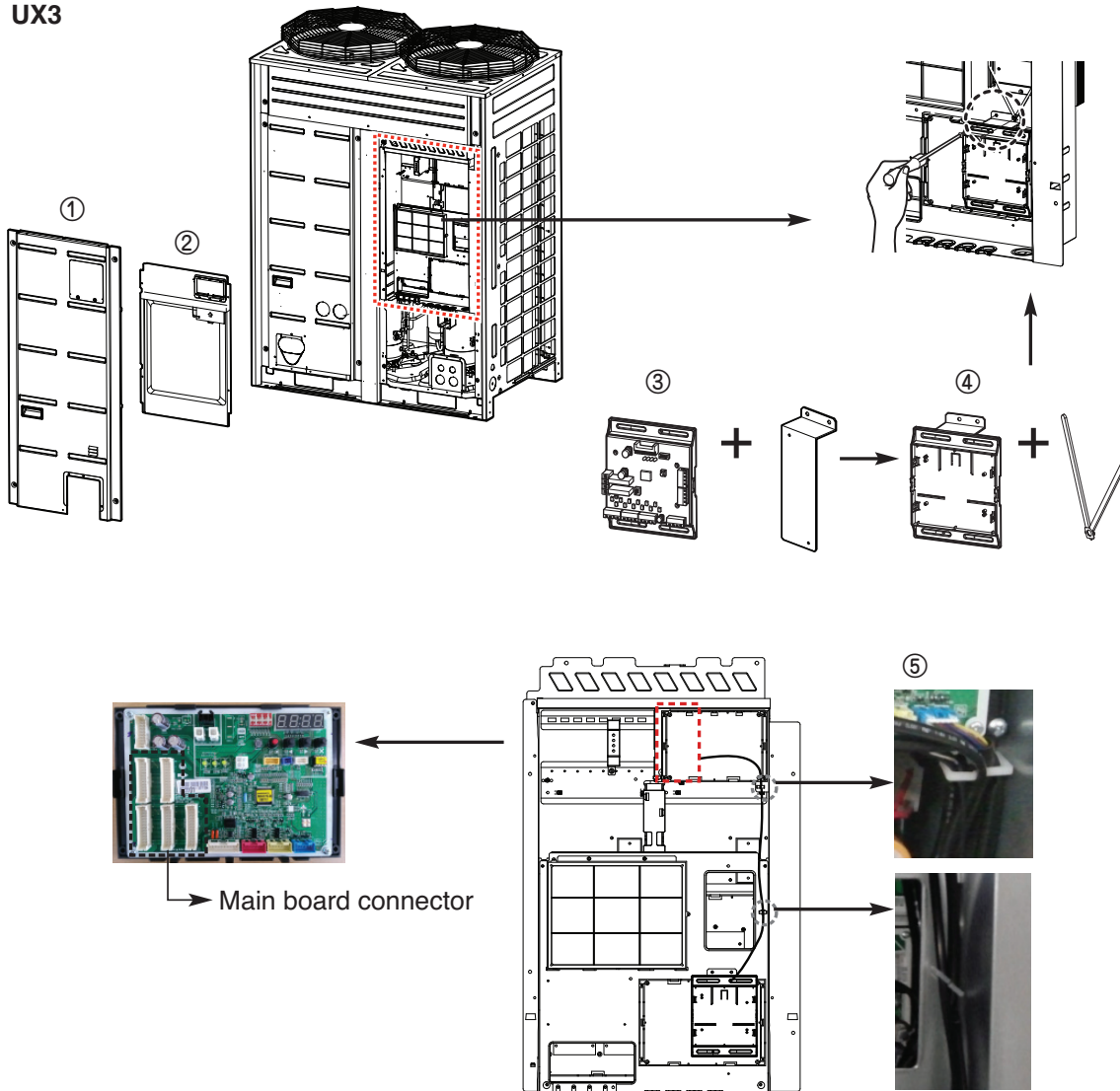
- ① **Main connector** : Power input and communication connector with Outdoor unit
- ② **SW102** : Switch for setting internal function
- ③ **SW104** : Rotary Switch for setting Demand control step
- ④ **Digital Output** : Operating & Error status Relay output (250V, 1A)
- ⑤ **Digital Output** : Automatic ball valve(Shut off Refrigerant leakage) Relay output (250V, 1A)
- ⑥ **Digital Input** : Dry contact input
- ⑦ **Analog Input** : 0 - 10 V--- Analog signal input
- ⑧ **Analog Output** : 0 - 10 V--- Analog signal output
- ⑨ **SW103** : Reset Switch
- ⑩ **SW101** : Dip Switch for setting operating function

4.4 IO(Input/Output) Module

■ Installation

- ① Separate front panel from outdoor unit.
- ② Separate front cover of control box.
- ③ Assemble IO Module and bracket.
- ④ Fix the bracket on designated location with two clamp cords(105mm).
- ⑤ Connect the connection wires according to the instructions. (Please refer to Setting and Using Method)

UX3



! NOTE

IO Module is installed only master outdoor unit.

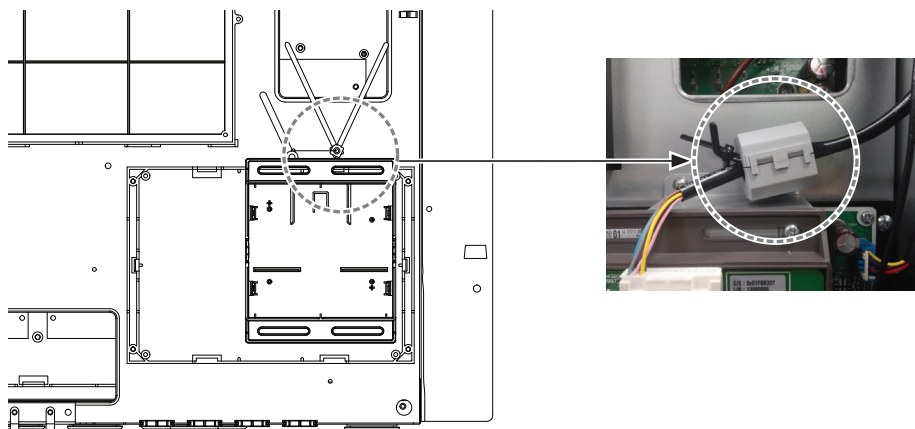
! CAUTION

Be sure to turn off outdoor unit power before installation.

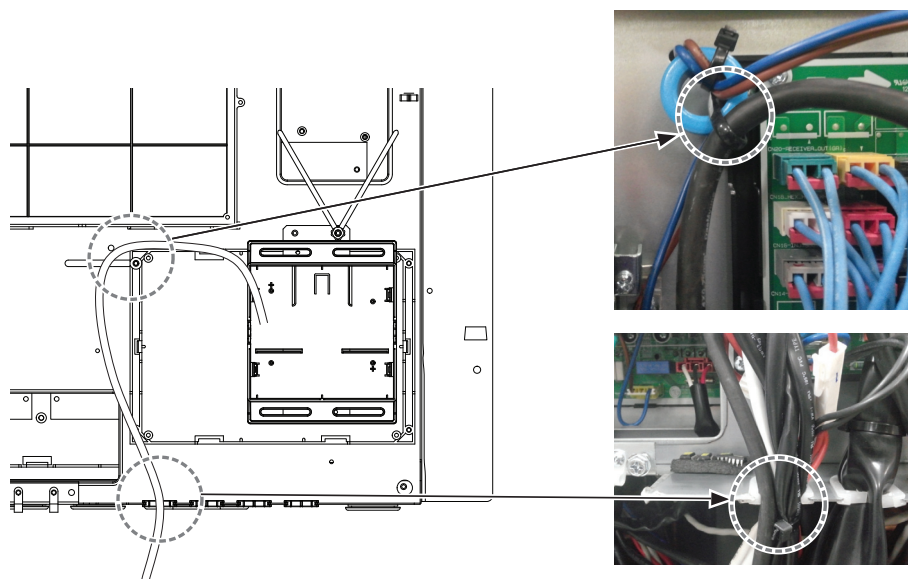
4.4 IO(Input/Output) Module

- ⑥ Fix and fasten components and cables.
- ⑦ Perform the switch setting according to the instructions.

Using 105mm clamp cords, fasten the core as below.

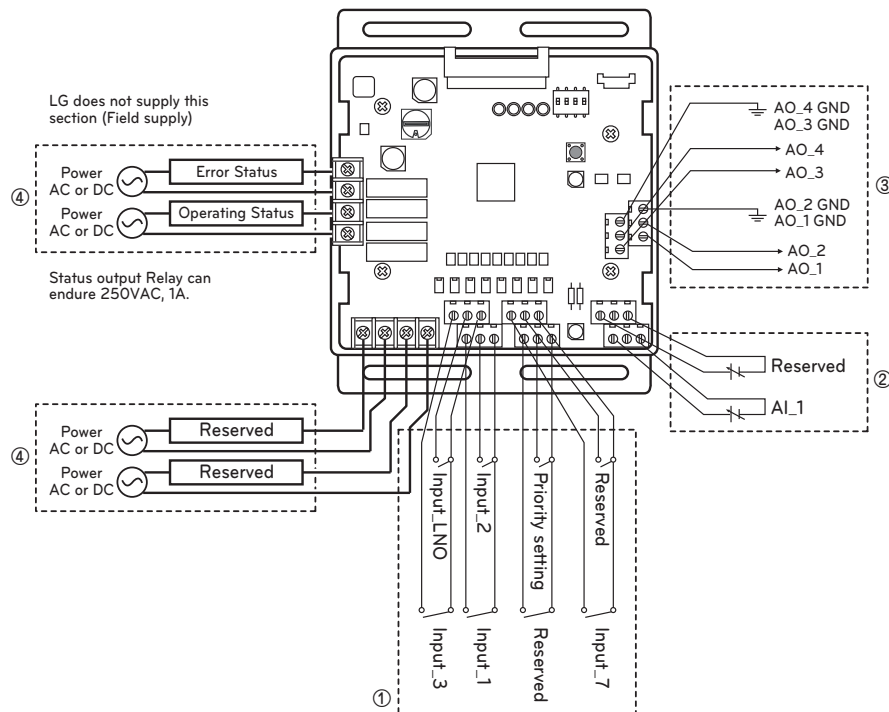


Using 65mm clamp cords, fasten the relay output cable as below.



4.4 IO(Input/Output) Module

■ Power source input



AI : Analog Input (0 - 10 V_{rms})

AO : Analog Output (0 - 10 V_{rms}, Max 20 mA)

Input_LNO : Low Noise Operation

- ① Dry contact input part
Connect Non Voltage contact signal for demand control (3 step)
* Priority setting
Using 'Priority setting' contact signal, set the priority of command.
(External command from DDC Vs Command from LG central controller.)
- Close : Central controller has priority to external signal.
- Open : External signal has priority to central controller.
- ② Analog input part
Connect Analog input signal for demand control (10 step)
- ③ Analog output part
Connect Analog output signal for controlling third party devices.
Ex) Valve actuator for variable water flow. Damper actuator for Low Ambient Kit
- ④ Digital output part
Connect status display devices.

⚠ CAUTION

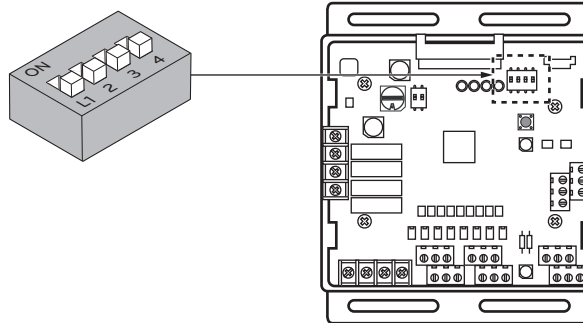
Power must be turned on after the product is wired completely.

4.4 IO(Input/Output) Module

■ Set Up

• Select the option of control functions(1)

Using 'SW101', select the option of control function as described below.



! NOTE

Default status is all off

► L3 : Set Low Noise Operation

This is a function driving outdoor unit fan RPM to operate low speed for reducing fan noise according to the input signal. To use this function, you should set Outdoor unit mode, Please refer to PDB more detail.

Position	Function
	ON : Enable Low Noise Operation OFF : Disable Low Noise Operation

! CAUTION

If the Dip SW is set , IO module System is operating preferentially than outdoor unit setting.

► L4 : Set Operating status output

Position	Function
	ON : Activate Digital Output according to Indoor Unit status OFF : Activate Digital Output according to Outdoor Unit status

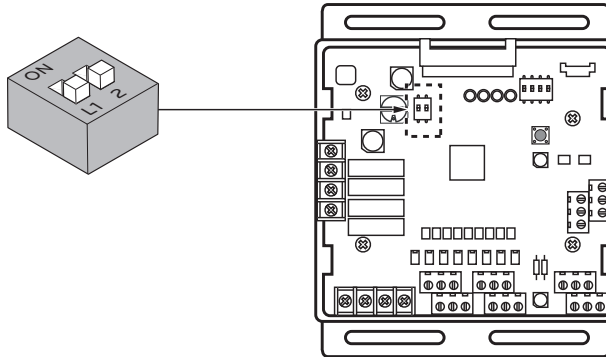
! CAUTION

After change Dip SW setting, press reset switch to reflect the setting.

4.4 IO(Input/Output) Module

• **Select the option of control functions(2)**

Using 'SW102', set the internal function as described below.



! NOTE


Default status is all off

► **L1 : Set Analog output default value when Communication Error will be occur (Module – ODU)**

Position	Function
	ON : Analog output 0V OFF : Analog output 10V

► **L2 : Set Analog output Range**

Basically this module keeps a minimum Analog output voltage refer to L1,L2 setting of SW101 to prevent unexpected accident. When you need to use 0~10V full range, L2 should be set as ON.

Position	Function
	ON : Ignore minimum Analog output value setting (L1,L2 setting value of 4pin Dip SW) OFF : Follow minimum Analog output value setting (L1,L2 setting value of 4pin Dip SW)

! CAUTION

After change Dip SW setting, press reset switch to reflect the setting.

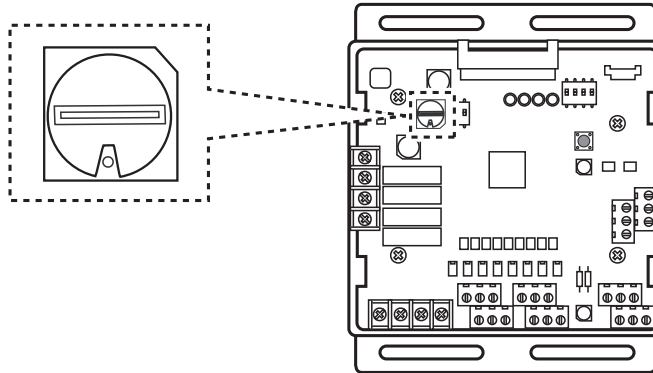
4.4 IO(Input/Output) Module

• Set the control step for demand control

Use the Rotary Switch to set a control step for contact signal input : The type of input signal and control step can be set using 'SW104'

This function is for demand control to reduce power consumption.

Set the control mode what you want according to the table as below.



- Type of input signal

SW_STEP	Input signal
0, 1, 2, 3, 4, 5, 6, 7	Contact signal input
C, D, E	Analog input signal

⚠ CAUTION

Do not change a command too quickly.

Keep the command 30 seconds at least, otherwise it will cause a damage to outdoor unit.

- Operation rate condition :
 - Cooling : Outdoor 35 °C, Indoor 27 °C
 - Heating : Outdoor 7 °C, Indoor 20 °C
- The tolerance of the operation rate can be cause by combination of outdoor unit, operating condition, installation circumstance.
- When operation rate is 100%, Target Evaporating Temp. and Target Condensing Temp. can be changed by installation option. (Refer to product data book)
- Input_1 : 0 'E OFF, Input_1 : 1 'E ON

4.4 IO(Input/Output) Module

- Detail of the control step for digital input signal

SW_STEP	Input_1	Input_2	Input_3	Cooling		Heating		Type of input
				Evaporating Temp. [°C]	Operation rate	Condensing Temp. [°C]	Operation rate	
0	0	0	0	No control	-	No control	-	Contact signal
	1	0	0	5.9	70%	40.4	70%	
	0	1	0	11.0	40%	31.3	40%	
	0	0	1	Comp off	0%	Comp off	0%	
1	0	0	0	No control	-	No control	-	
	1	0	0	5.9	70%	40.4	70%	
	0	1	0	9.0	50%	34.5	50%	
	0	0	1	Comp off	0%	Comp off	0%	
2	0	0	0	No control	-	No control	-	
	1	0	0	5.0	80%	43.1	80%	
	0	1	0	9.0	50%	34.5	50%	
	0	0	1	Comp off	0%	Comp off	0%	
3	0	0	0	No control	-	No control	-	Contact signal
	1	0	0	5.9	70%	40.4	70%	
	0	1	0	11.0	40%	31.3	40%	
	0	0	1	All off	0%	All off	0%	
4	0	0	0	No control	-	No control	-	
	1	0	0	5.9	70%	40.4	70%	
	0	1	0	9.0	50%	34.5	50%	
	0	0	1	All off	0%	All off	0%	
5	0	0	0	No control	-	No control	-	
	1	0	0	5.0	80%	43.1	80%	
	0	1	0	9.0	50%	34.5	50%	
	0	0	1	All off	0%	All off	0%	
6	0	0	0	No control	-	No control	-	
	1	0	0	9.0	50%	34.5	50%	
	0	1	0	Comp off	0%	Comp off	0%	
	0	0	1	All off	0%	All off	0%	
7	0	0	0	No control	-	No control	-	
	1	0	0	Comp off	0%	Comp off	0%	
	0	1	0	9.0	50%	34.5	50%	
	0	0	1	5.5	75%	41.8	75%	

4.4 IO(Input/Output) Module

- Demand control by analog input control (10 Step)

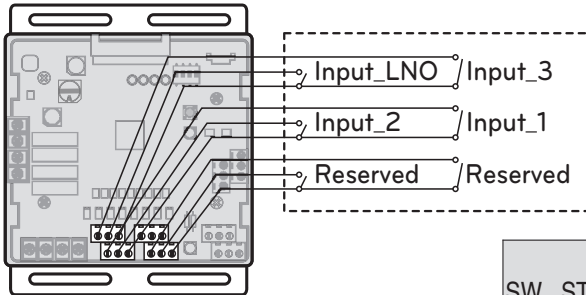
SW_STEP	Input Voltage	Cooling		Heating		Type of input	
		Evaporating Temp. [°C]	Operation rate	Condensing Temp. [°C]	Operation rate		
C	0	Comp off	0%	Comp off	0%	Analog input	
	1	Comp off		Comp off			
	2	Comp off		Comp off			
	3	11.0	40%	31.3	40%		
	4	9.8	45%	33.3	45%		
	5	9.0	50%	34.5	50%		
	6	7.2	60%	37.5	60%		
	7	5.9	70%	40.4	70%		
	8	5.0	80%	43.1	80%		
	9	4.1	90%	45.6	90%		
	10	3.1	100%	48.1	100%		
D	0	No control	-	No control	-	Analog input	
	1	3.1	100%	48.1	100%		
	2	4.1	90%	45.6	90%		
	3	5.0	80%	43.1	80%		
	4	5.9	70%	40.4	70%		
	5	7.2	60%	37.5	60%		
	6	9.0	50%	34.5	50%		
	7	9.8	45%	33.3	45%		
	8	11.0	40%	31.3	40%		
	9	Comp off	0%	Comp off	0%		
	10	All off	0%	All off	0%		
E	0	Comp off	0%	Comp off	0%	Analog input	
	1	11.0	40%	31.3	40%		
	2	9.8	45%	33.3	45%		
	3	9.0	50%	34.5	50%		
	4	7.2	60%	37.5	60%		
	5	5.9	70%	40.4	70%		
	6	5.0	80%	43.1	80%		
	7	4.1	90%	45.6	90%		
	8	3.1	100%	48.1	100%		
	9	3.1		48.1			
	10	3.1		48.1			

4.4 IO(Input/Output) Module

■ Using functions

• Demand control

Using Demand control function with 3-Non Voltage contact.



With this function comp capacity of outdoor unit can be controlled.

Ex) Demand control by 3-contact signal

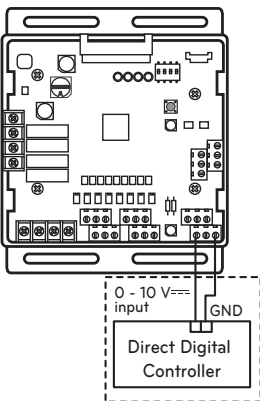
LG does not supply this section (Field supply)

SW_STEP	Input_1	Input_2	Input_3	Comp capacity Of outdoor unit(%)	Type of input
0	0	0	0	No control	Contact signal
	1	0	0	70	
	0	1	0	40	
	0	0	1	Comp off	

! CAUTION

- This input can accept only non voltage contact.
Do not input external power source. Otherwise it will cause a serious damage.
- If the contact point is attached, capacity control is applied preferentially by TMS system.
- If the NLO contact point is attached, System is operated preferentially than outdoor unit setting.

Using Demand control function with 0 - 10 V_{DC}



With this function comp capacity of outdoor unit can be controlled by BMS.

Ex) Demand control by Analog input signal

Refer to Detail of the control step for analog input signal.

LG does not supply this section (Field supply)

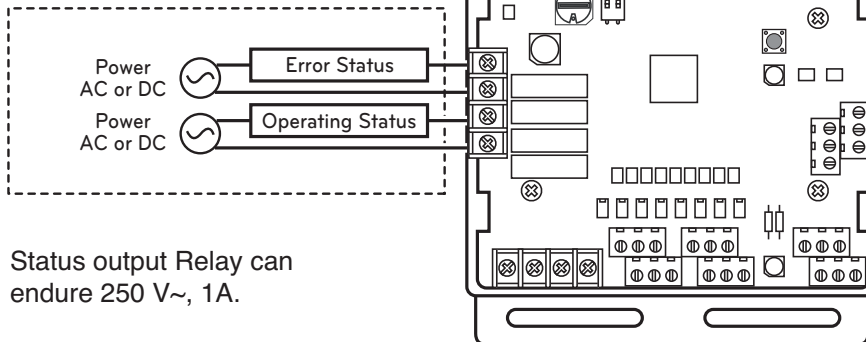
! CAUTION

- This function is very sensitive to voltage level.
So when using analog input, make a signal cable as short as possible.
- Do not change a command too quickly.
Keep the command 30 seconds at least, otherwise it will cause a damage to outdoor unit.

4.4 IO(Input/Output) Module

• Operation status

LG does not supply this section (Field supply)



CAUTION

When using high voltage over than 24 V~, make sure to use H07RNF wire.

- ① Error Display : This Module display error signal as below
 - Level 1,2 error of Outdoor Unit
 - Indoor Unit error _ All IDU Error.
- ② Operating Display : This function is depend on 4th Dip SW setting of 'SW101'.
 - L4 is ON : Display Indoor Unit operating status (Include FAN mode only)
 - L4 is OFF : Display Outdoor Unit operating status (Compressor operating condition)

• L4 : Set Operating status output

Position	Function
<p>The diagram shows a row of four dip switches labeled L1, 2, 3, and 4. Above them is the label 'ON'. Switch L4 is shown in the 'ON' position (up), while L1, 2, and 3 are in the 'OFF' position (down).</p>	<p>ON : Activate Digital Output according to Indoor Unit status</p> <p>OFF : Activate Digital Output according to Outdoor Unit status</p>

4.5 Variable Water Flow Valve Control Kit

4.5.1 PWFCKN000

This can be applied to save pump operation power by optimizing water flow rate by interlocking between electric valve and MULTI V WATER IV operation. Depends on MULTI V WATER IV operation cycle, IO module outputs analog signal (0~10V) to electric valve. Please keep water flow rate more than 40% of the rated water flow.

- Applied model : **MULTI V™ WATER IV**

- Functions

• Demand control

- This function is to reduce Outside Unit power consumption by using input signal. This manual provides variable setting to control outside unit capacity according to input method. This function supports 2 types of input signal : AI(0~10V) and contact signal(3 Step).

• Output Outside or Indoor Unit Operation status

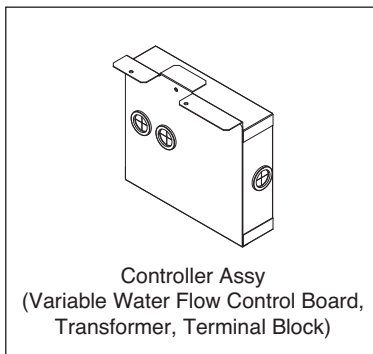
- This function displays outside or indoor unit's operation status. Depends on DIP switch setting, either outside or indoor unit operation status is reflected through output signal.

• Output Outside or Indoor Unit Error Status Signal

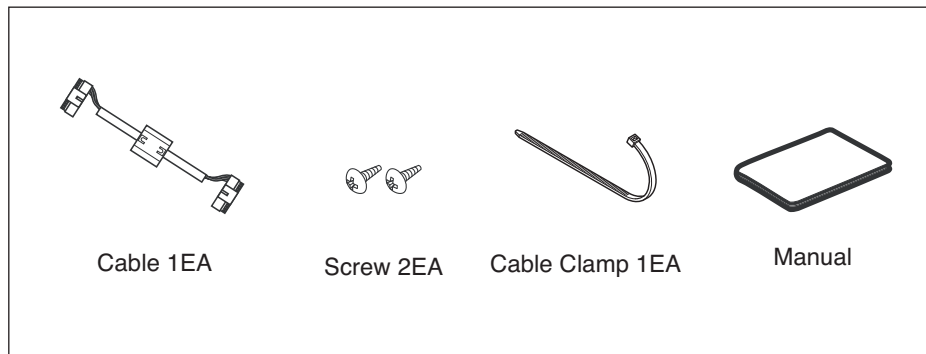
- This function displays error signal by digital output when either outside or indoor unit has an error.

■ Specifications

• Features



• Accessory



✳ Variable Water Flow Control board is same with IO module board.

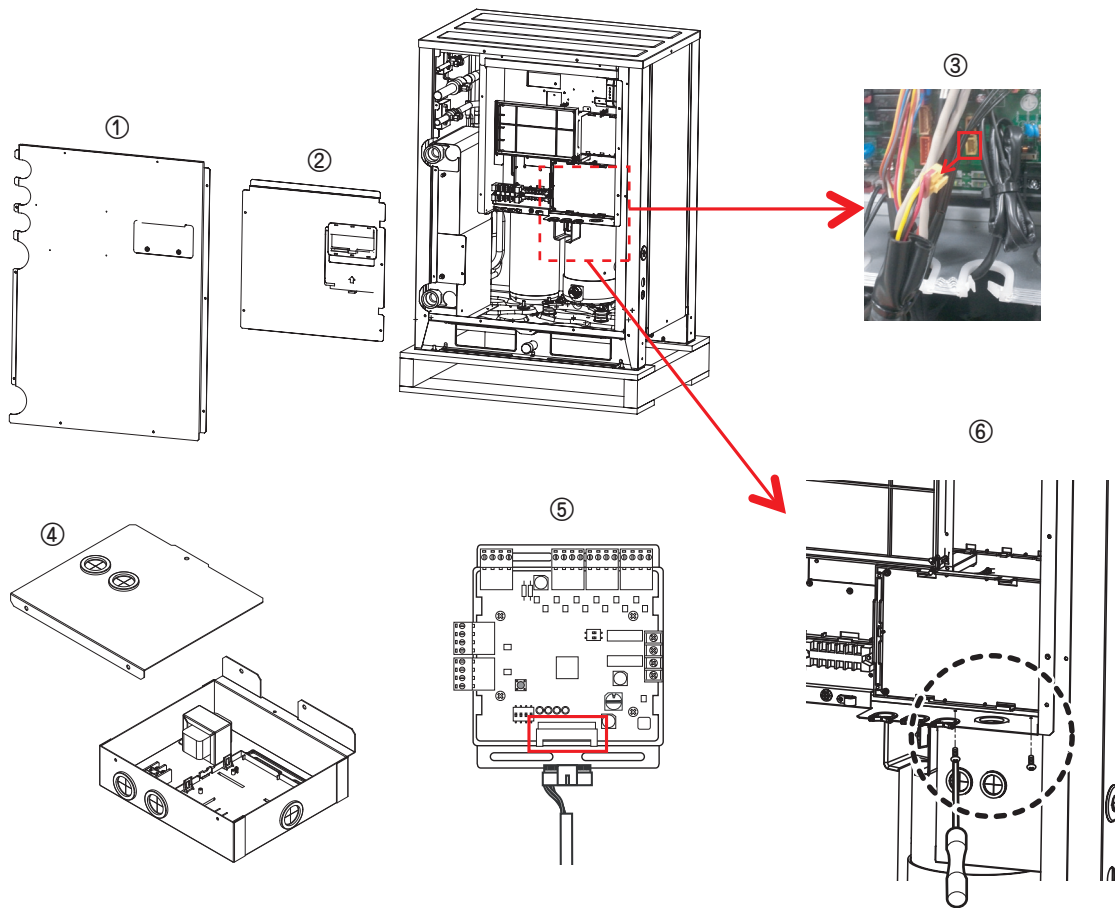
For basic control functions which are operated by IO module, refer to “2.7 IO(Input/Output) module”.

4.5 Variable Water Flow Valve Control Kit

■ Installation

- ① Separate front panel from Outside Unit
- ② Separate front cover of control box.
- ③ Separate Oil_Level Harness(3Pin Yellow) in External PCB(CN28).
- ④ Sepatate VWFC* Cover in VWFC* Assy.
- ⑤ Connect the black cable to the VWFC* PCB(CN101).
- ⑥ Install the VWFC* Assy to the C/Box by using screws.

* VWFC : Variable Water Flow Control kit

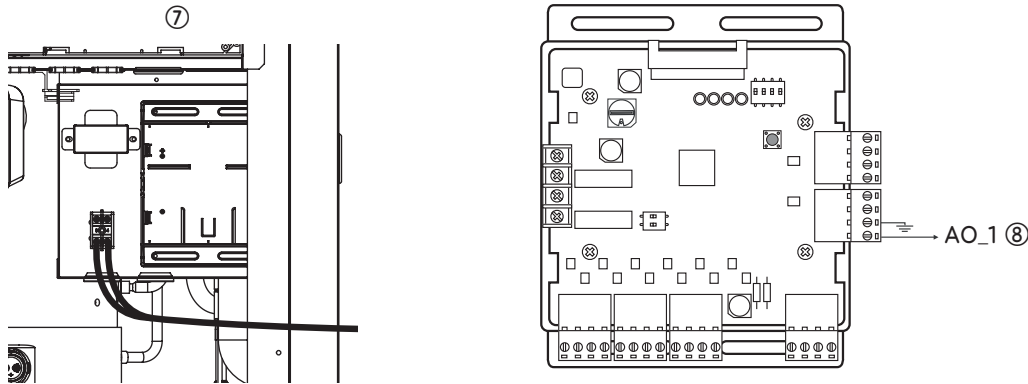


CAUTION

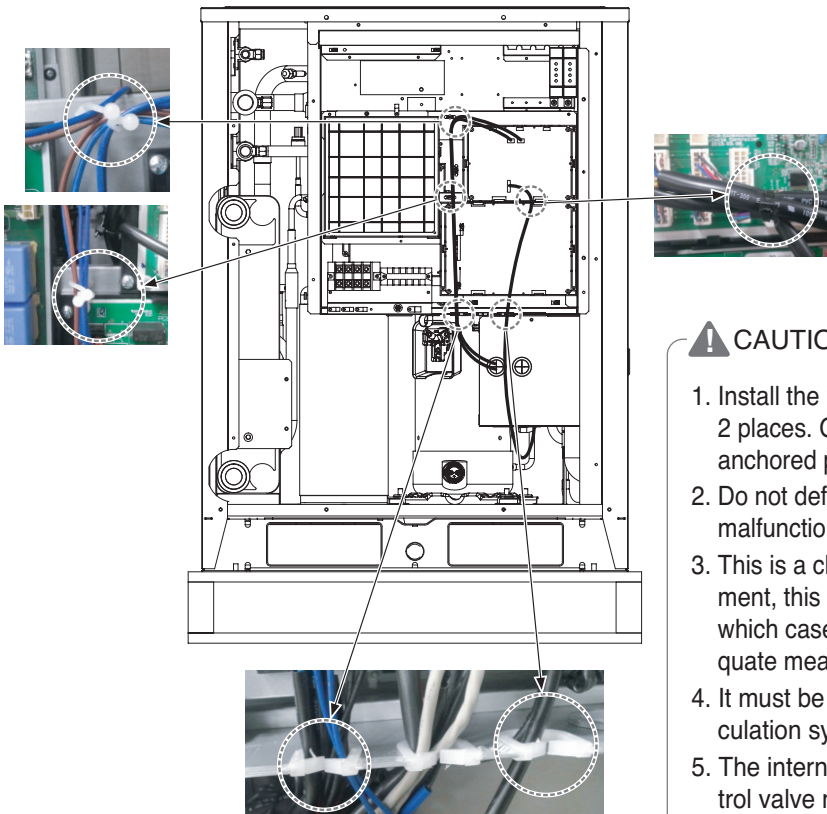
Be sure to turn off Outside Unit power before installation.

4.5 Variable Water Flow Valve Control Kit

- ⑦ Connect a power cable (24 V~) of water flow control valve to the terminal block (2Pin Terminal block, Max current 0.42A).
- ⑧ Connect a signal cable (0 - 10 V=) of water flow control valve to CN1_A0(A0_1(A+), GND(A-)) of VWFC.
- ⑨ Set up the main function DIP Switch of VWFC PCB.
- ⑩ Pull out put cable on Cover Bush.
- ⑪ Install the VWFC Cover by using screws.



- ⑫ Connect the blue cable of transformer to the Main PCB(CN_JIG_N,CN_JIG_L).
- ⑬ Connect the black cable of VWFC PCB to the Main PCB(CN10).
- ⑭ Connect the Oil_Level harness(3Pin Yellow) to the External PCB(CN28).
- ⑮ Fix and fasten components and cables.
- ⑯ Turn on the main power line of Outside unit.
- ⑰ Check the signal of water flow control valve to CN1_A0(A0_1, GND) of VWFC and the water flow rate.



! CAUTION

1. Install the product on flat surface and screw at least 2 places. Otherwise the VWFC PCB may not be anchored properly.
2. Do not deform the case at random. It may cause malfunction of the Variable Water Flow Control PCB
3. This is a class A product. In a non-industrial environment, this product may cause radio interference, in which case the user may be required to take adequate measures.
4. It must be installed variable flow valve on water circulation system in advance.
5. The internal resistance of variable water flow control valve must be above 100kΩ. The resistance of signal cable(CN1_A0) must be below 10Ω.

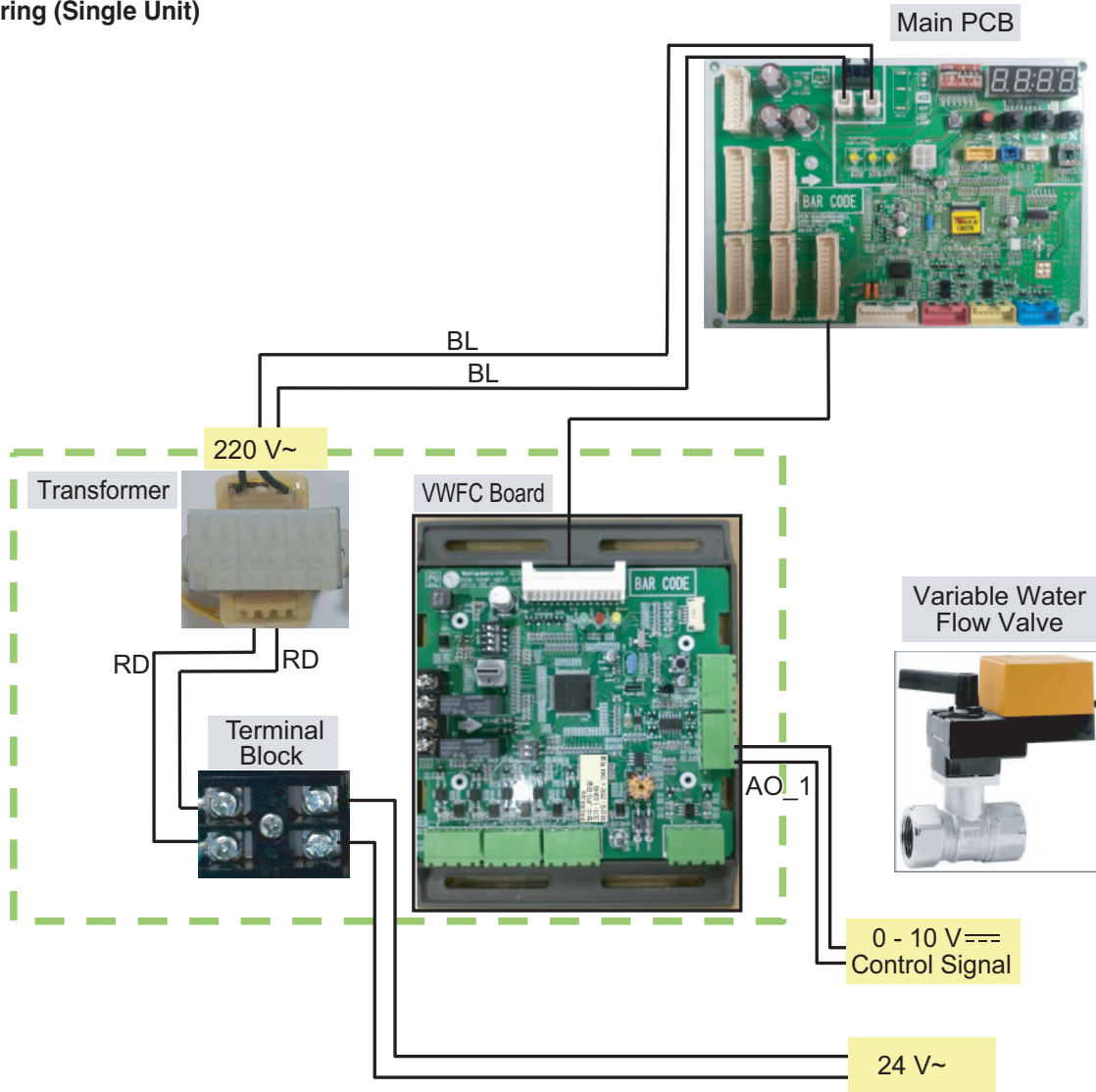
4.5 Variable Water Flow Valve Control Kit

■ Wiring

• Power source input

For connecting of power source input, refer to “2.7 I/O(Input/Output) module” part.

• Wiring (Single Unit)



※ BL : Blue, BR : Brown, RD : Red, BK : Black, WH : White, GR : Green

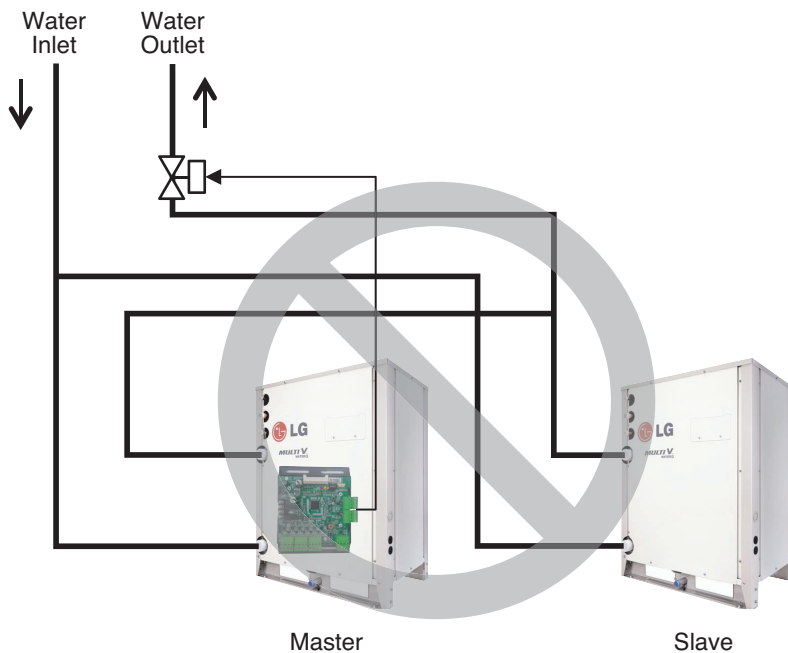
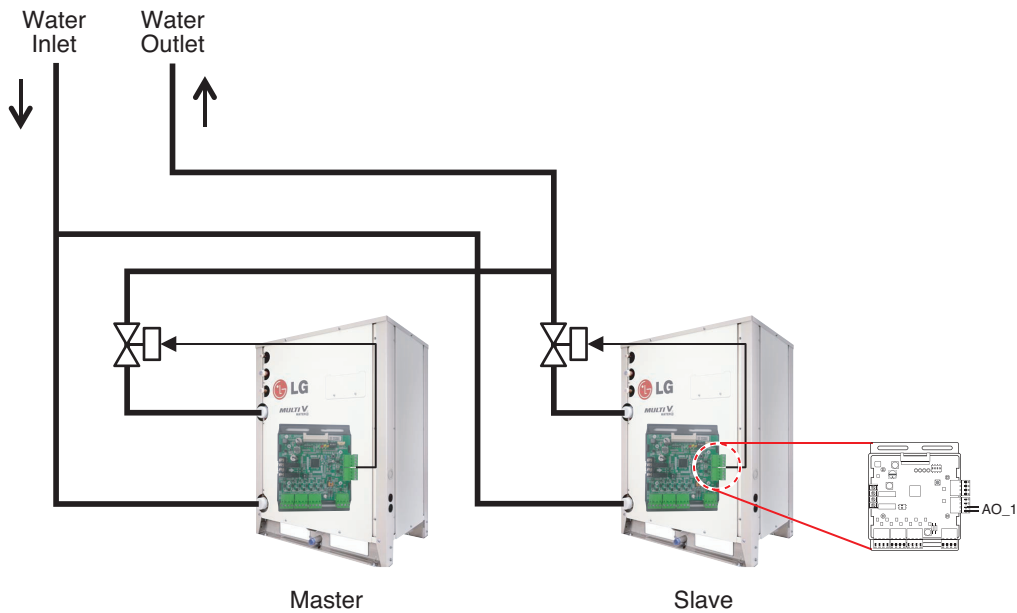
! NOTE

Transformer can supply only 24 V~ to the terminal block
 Do not input external power into Main PCB. Otherwise it will cause a serious damage.
 The Variable Water Control Kit controls only 1 valve actuator.
 The power (24 V~) and signal(0 - 10 V===) line is recommended by AWG22(1/32 in, (0.644 mm), 0.016 Ω/ft (0.053 Ω/m)).

4.5 Variable Water Flow Valve Control Kit

• Wiring (Series Unit)

Please apply an individual PWFCKN000 model for each MULTI V WATER IV unit.



! CAUTION

Variable Water Control Kit only can control 1 unit of MULTI V WATER IV and electric valve.

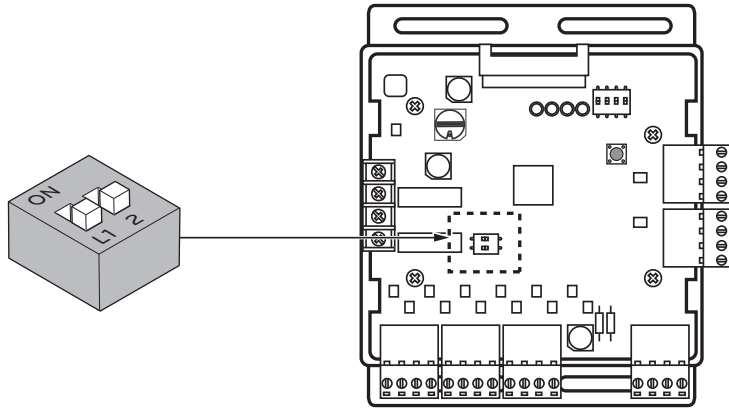
4.5 Variable Water Flow Valve Control Kit

■ Set Up

• Select the option of control functions(1)

Using 'SW102', Select the option of control function as described below.


- Set analog output for communication error.



! NOTE


Default status is all off

► L1 : Set Analog output default value when Communication Error will be occur (Module – ODU)

Position	Function	Wiring
	ON : Analog output 0V OFF : Analog output 10V	AO_1 ~ 4

► L2 : Set Analog output Range

Basically this module keeps a minimum Analog output voltage refer to L1,L2 setting of SW101 to prevent unexpected accident. When you need to use 0~10V full range, L2 should be set as ON.

Position	Function
	ON : Ignore minimum Analog output value setting (L1,L2 setting value of 4pin DIP SW) OFF : Follow minimum Analog output value setting (L1,L2 setting value of 4pin DIP SW)

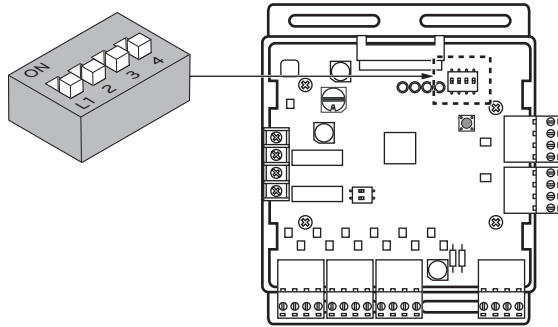
! CAUTION

After change Dip SW setting, press reset switch to reflect the setting.

4.5 Variable Water Flow Valve Control Kit

• Select the option of control functions(2)

Using 'SW101', select the option of control function as described below.



► Output signal setting

Position	Function	Position	Function
	Control signal : 0 V ₋₋₋ (OFF), 8 - 10 V ₋₋₋ (ON)		Control signal : 0 V ₋₋₋ (OFF), 4 - 10 V ₋₋₋ (ON) Default status
	Control signal : 0 V ₋₋₋ (OFF), 6 - 10 V ₋₋₋ (ON)		Control signal : 0 V ₋₋₋ (OFF), 2 - 10 V ₋₋₋ (ON)

! CAUTION

If the DIP SW is set , VWCK(Board) has a higher Priority than outside unit setting.

► Operation status output : SW101 L4

Position	Function	Wiring
	ON : Activate Digital Output according to Indoor Unit status OFF : Activate Digital Output according to Outside Unit status	Operation status

Depends on SW101 L4 position(ON/OFF), VWCK(Board) is operated as below

Dip Switch	Operation
SW101 L4 ON	One of indoor is turned on(include fan mode) → Relay on All Indoor are turned off → Relay off
SW101 L4 OFF	One of the compressor is turned on → Relay on All compressor are turned off → Relay off

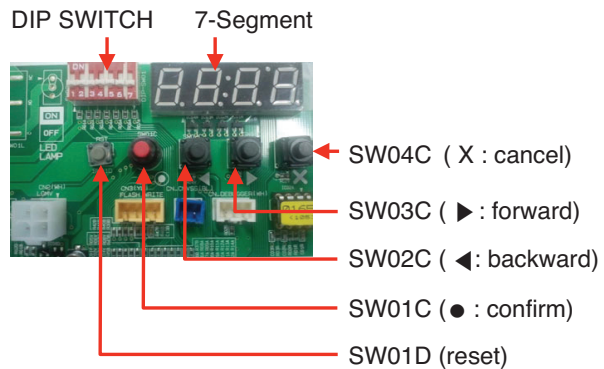
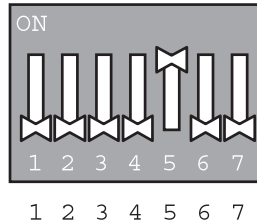
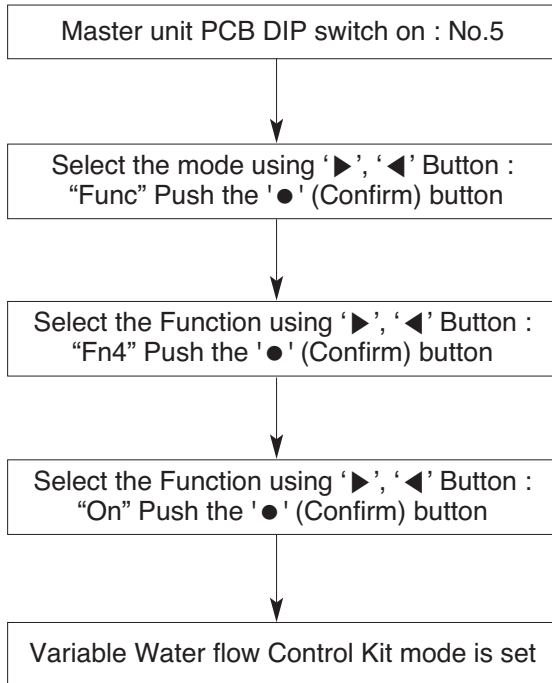
! CAUTION

After change 'DIP Switch' setting, then you must press reset switch to reflect the setting.
Before operating the Outside unit, check the flow rate of water and voltage signal of PCB.
Minimum flow rate of water is recommended 40% of rated flow rate. Otherwise, the Outside unit get damage.

4.5 Variable Water Flow Valve Control Kit

• Setting the Variable Water Flow control function of Outside Unit

Variable Water Flow Control kit mode Setting method



※ If you want to stop the Variable Water flow Control Kit Mode, refer to the following.
 ▷ DIP Switch No.5 On -> "Func" -> "Fn4" -> "Off"

⚠ CAUTION

After change 'DIP Switch' setting, then you must press reset switch to reflect the setting.
 Before operating the Outside unit, check the flow rate of water and voltage signal of PCB.
 Minimum flow rate of water is recommended 40% of rated flow rate. Otherwise, the Outside unit get damage.

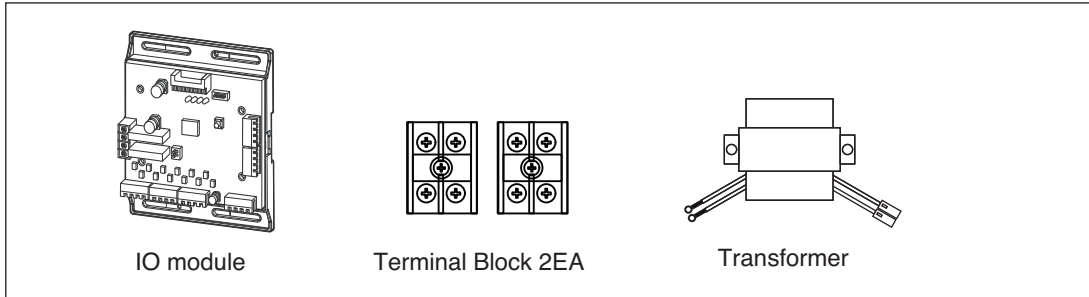
4.6 Low Ambient Control Kit

4.6.1 PRVC2

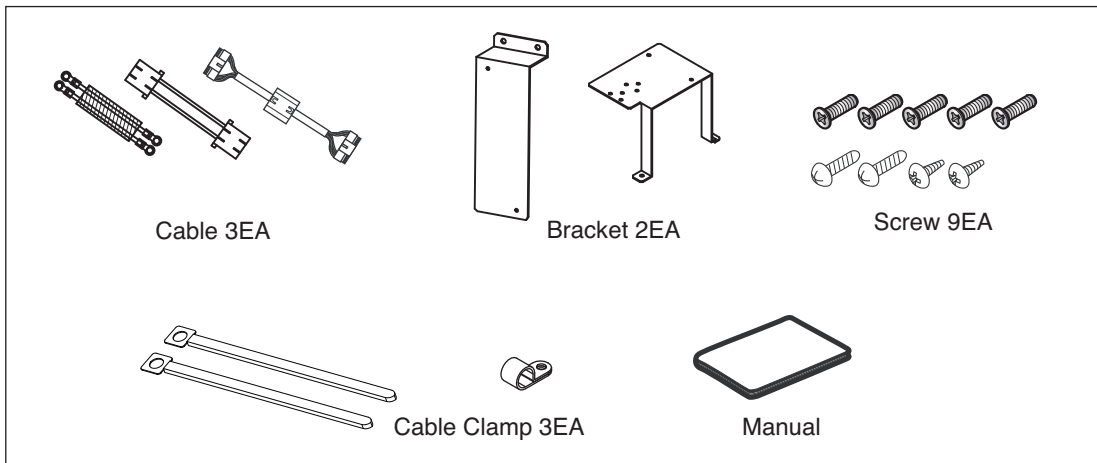
This Kit expands the operation range of Multi V product to the lower ambient condition at cooling mode. For Low Ambient operation, Snow Hood and Air Damper also should be installed. Refer to the installation manual of Kit.

■ Specifications

• Features



• Accessory



4.6 Low Ambient Control Kit

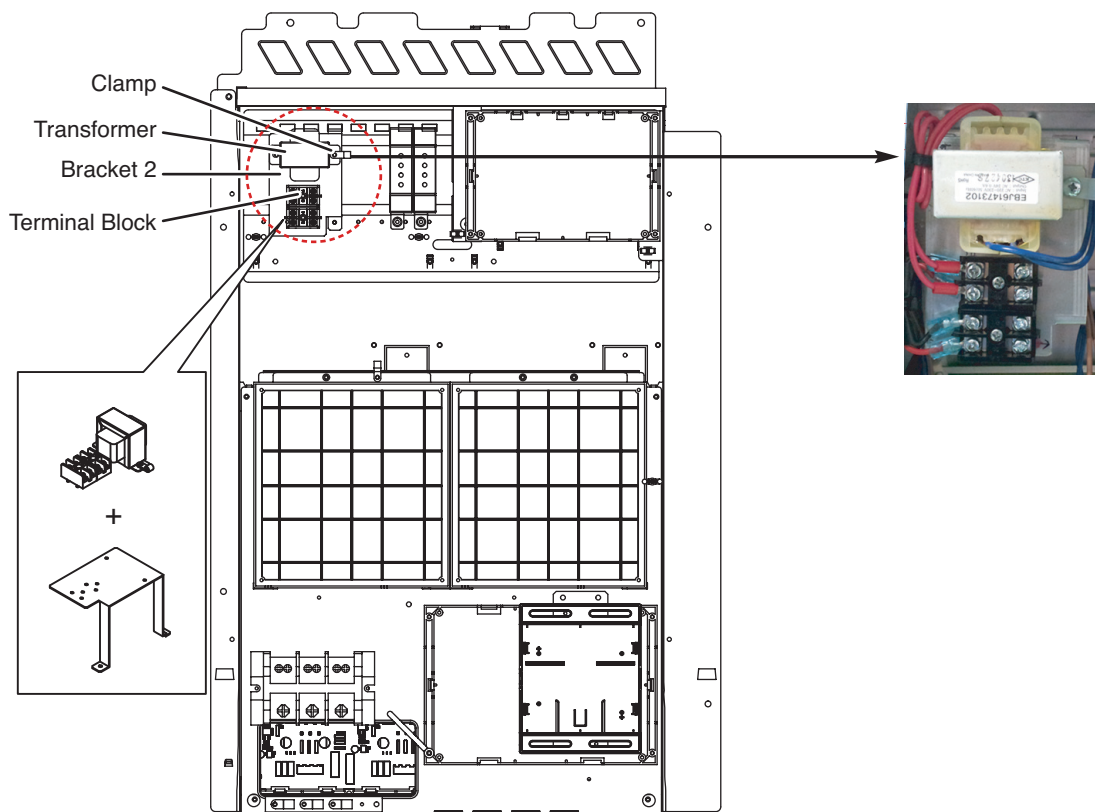
■ Installation

• Installation of IO module

For installation method of IO module, refer to the IO module part.

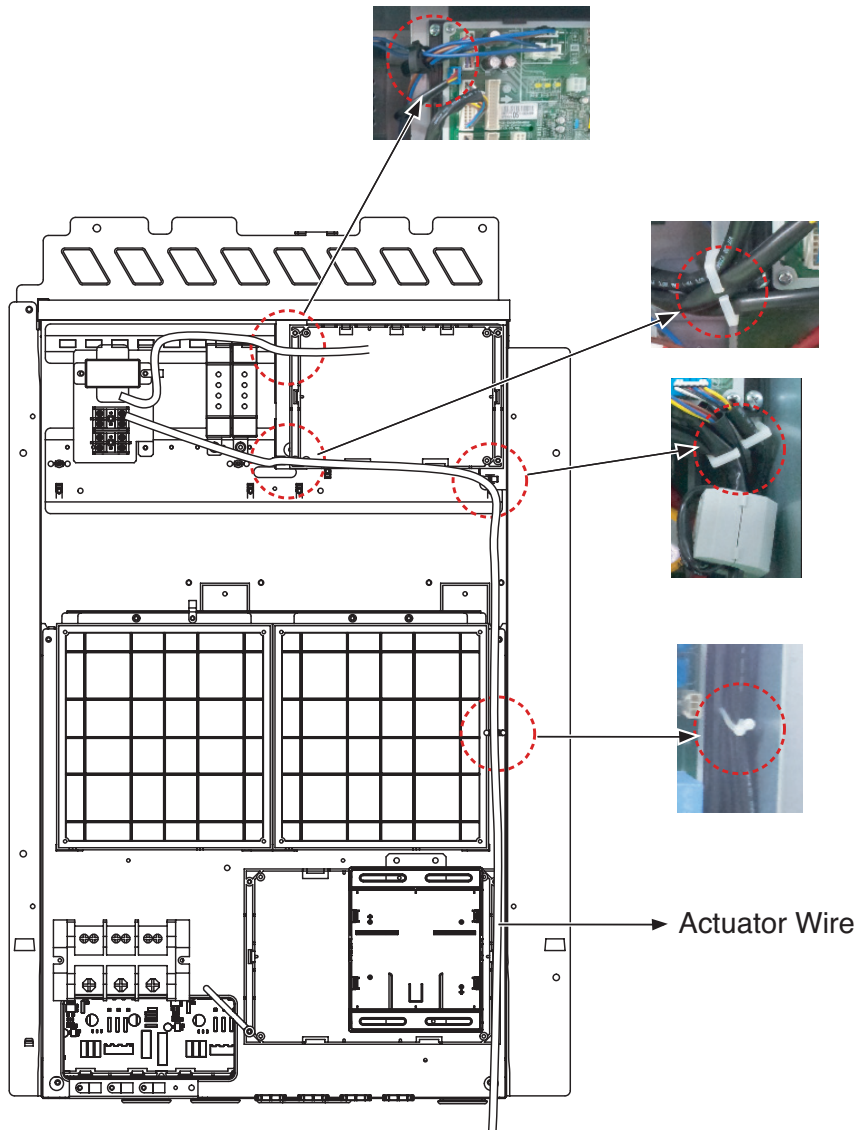
• Installation of Transformer, Terminal Block

- ① Shut off the main power of outdoor unit.
- ② Install the IO Module in the C/Box by using screws.
- ③ Install the Bracket2 in the C/Box by using screws.
- ④ Install the transformer on the Bracket2 by using screws.
- ⑤ Install the terminal block on the Bracket2 by using screws.
- ⑥ Connect the Main PCB(CN10) to IO Module(CN101) by using the cable assembly.
- ⑦ Connect the blue cable of transformer to the Main PCB(JIG_N), brown cable of transformer to the Main PCB(JIG_L).
- ⑧ Connect the red cable of transformer to the terminal block (2Pin Yellow terminal block).
- ⑨ Connect a power cable(12 V---) to CN101(12V,GND) of IO Module.
- ⑩ Connect the black cable of Damper Actuator to the terminal block and connect the cable of IO Module(CN1_A0(GND(A-))) to the black cable of Damper Actuator.
- ⑪ Connect the red cable of Damper Actuator to CN1_A0(A0_1(A+)) of IO Module.
- ⑫ Set up the main function Dip S/W of IO Module.
(SW101 : L1,L2=On and L3,L4=Off / SW102 : L1,L2=Off)
- ⑬ Set up the Dip S/W of Main Outdoor unit PCB. (Refer to page 21 for details)
- ⑭ Turn on the main power of outdoor unit.
- ⑮ Check the signal to CN1_A0(AO_01,GND) of IO Module and Air Damper.



4.6 Low Ambient Control Kit

Using the Clamp and Tie, fasten the Damper Actuator output cable and Trans output cable as below.



4.6 Low Ambient Control Kit

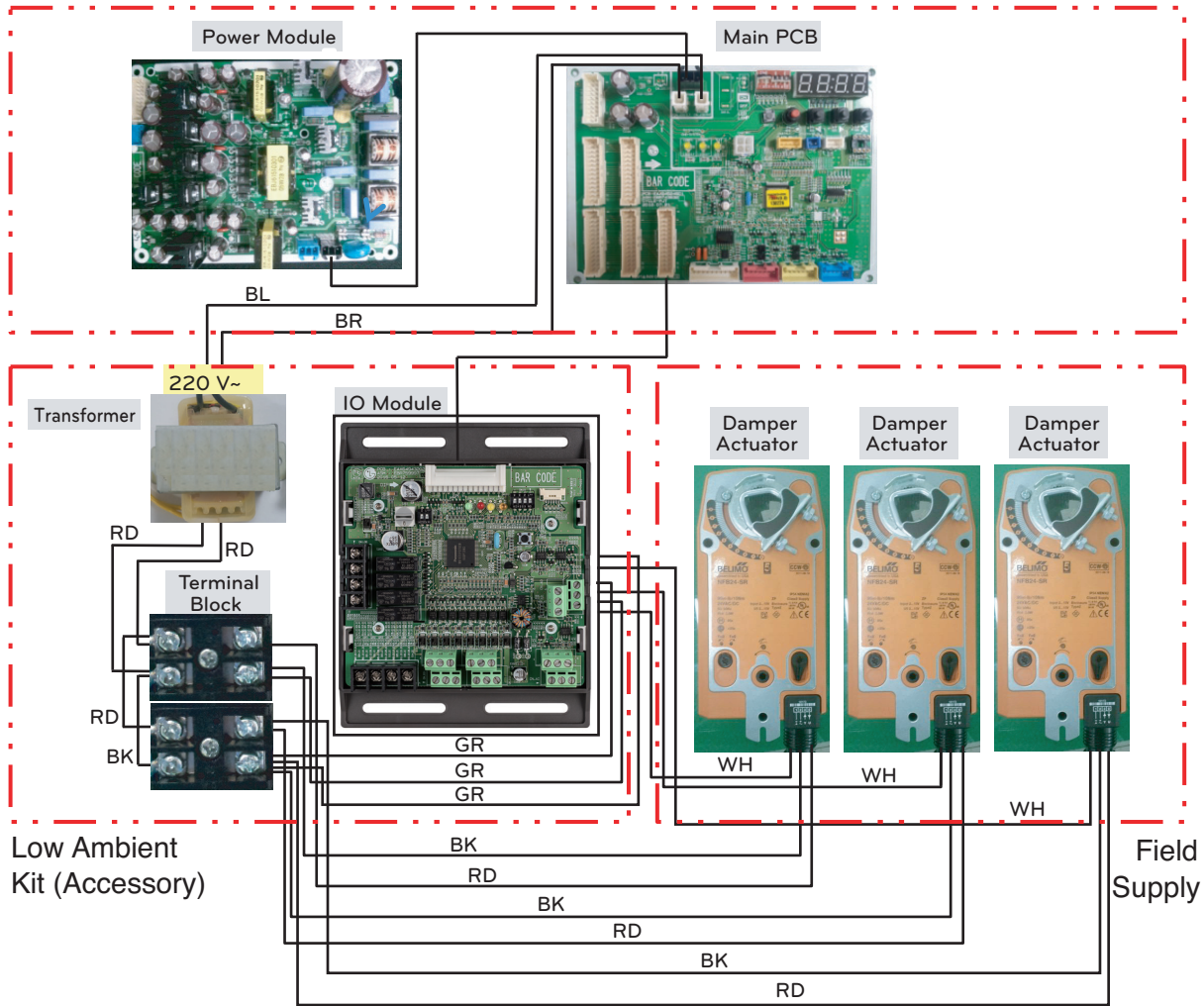
■ Wiring

• Power source input

For connecting of power source input, refer to the IO module part.

• Wiring for Damper Actuator (In case of 3 Unit)

Outdoor Unit C/Box



※ BL : Blue, BR : Brown _ 220 V~
 RD : Red, BK : Black, GR : Green _ AC/DC 24V
 WH : White _ 0 - 10 V--- Control Signal

! NOTE

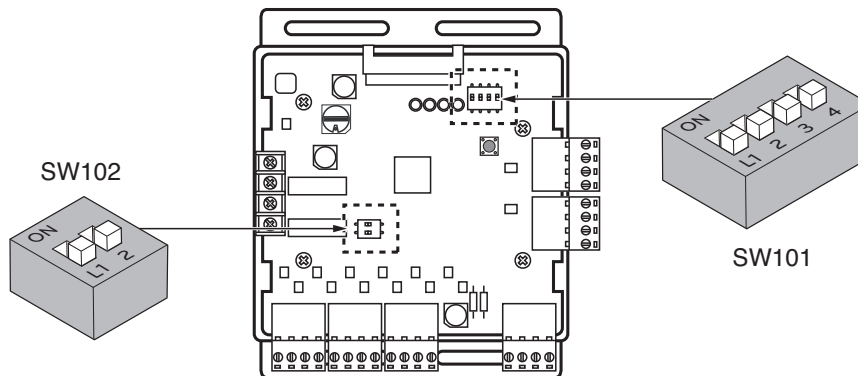
Damper Actuator can accept only 24 V--- power input. Do not input AC power. Otherwise it will cause a serious damage.
The IO Module can control maximum three actuators.
Case of one valve, the slave signal connector must not use.
The power (AC/DC 24V) and signal(0 - 10 V---) line is recommended by AWG22(1/32 in, (0.644 mm), 0.016 Ω/ft (0.053 Ω/m)).

4.6 Low Ambient Control Kit

■ Set Up

• Setting the Low Ambient Function of IO module

Using 'SW101', 'SW102', You can use Low Ambient Kit Mode



! NOTE

Default status is all off.

Set Low Ambient Kit Operation

Position	Setting of Dip Switch
	SW101 - L1=ON L2=ON L3=OFF L4=OFF
	SW102 - L1=OFF L2=OFF

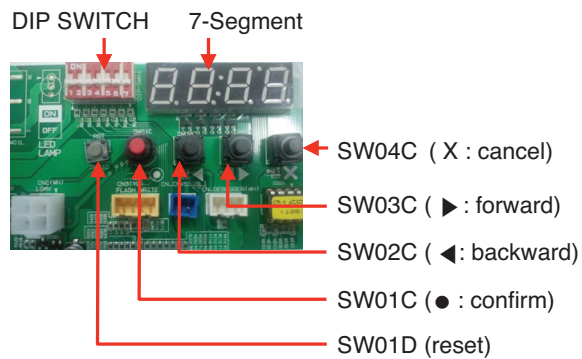
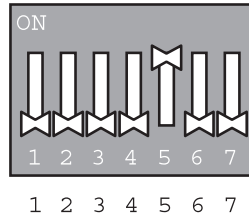
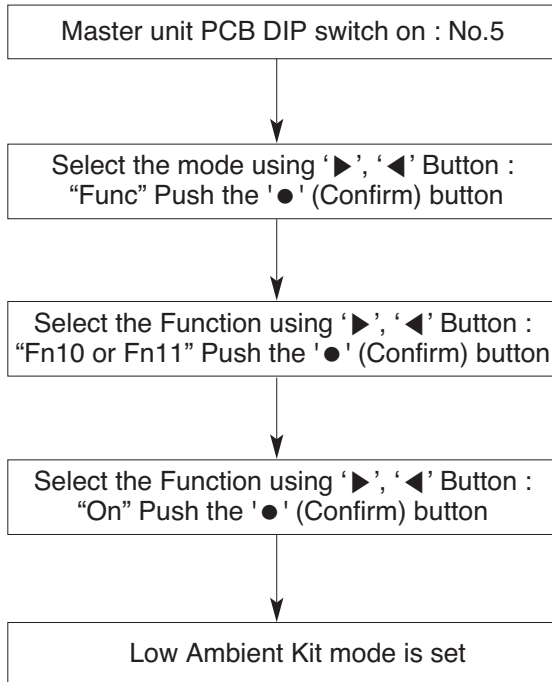
! CAUTION

- If the Dip SW is set, IO module System is operating preferentially than outdoor unit setting.
- After change Dip SW setting, press reset switch to reflect the setting.

4.6 Low Ambient Control Kit

• Setting the Low Ambient Function of Outdoor Unit

Low Ambient Kit mode Setting method



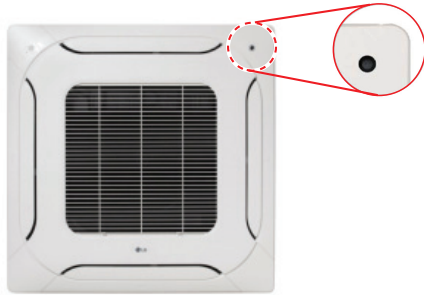
※ If you want to stop the Low Ambient Kit mode, refer to the following.
 ▷ Dip Switch No.5 On -> "Func" -> "Fn10" -> "Off"

※ Fn10 Model : Heat Recovery Model
 Fn11 Model : Heat Pump Model

4.7 Human detection sensor kit (for 4 way cassette)

It is the sensor kit to use a function that automatically controls room temperature and wind direction by detecting the number of people through human body detection sensor

■ Model name : PTVSMA0



Human detection kit

The Human Detection Sensor detects movement within the detection range.

- Detection Range : ~ height 3.2
1) Installation Height 2.7 m → Detection area 12 m x 6 m
2) Installation Height 3.2 m → Detection area 15 m x 8 m
- Lumens : 200 Lux ~

■ Accessory (Necessities, sold separately)



■ Description of Functions

Human Detection Control provides two function. 'Saving Operation' for energy savings and 'Wind Direction Operation' for comfort

1) Power Saving Operation

- On/Off Power Saving: If no one is detected for the 'judgement time(default 30min)', IDU is turned off. If anyone is detected, IDU is turned on.
- Temperature Power Saving: When no movement is detected, the power saving operation is performed to reach the desired temperature. The time for detecting the absence of a person can be set to 5, 10, 15, 30, 60 or 90 minuts.

2) Human Detection Wind Direction

- Direct Wind: When a movement is detected, the wind is automatically controlled to reach the location of the movement.
- Indirect Wind: When a movement is detected, the wind is automatically controlled not to reach the location of the movement.

4.7 Human detection sensor kit (for 4 way cassette)

■ Installation

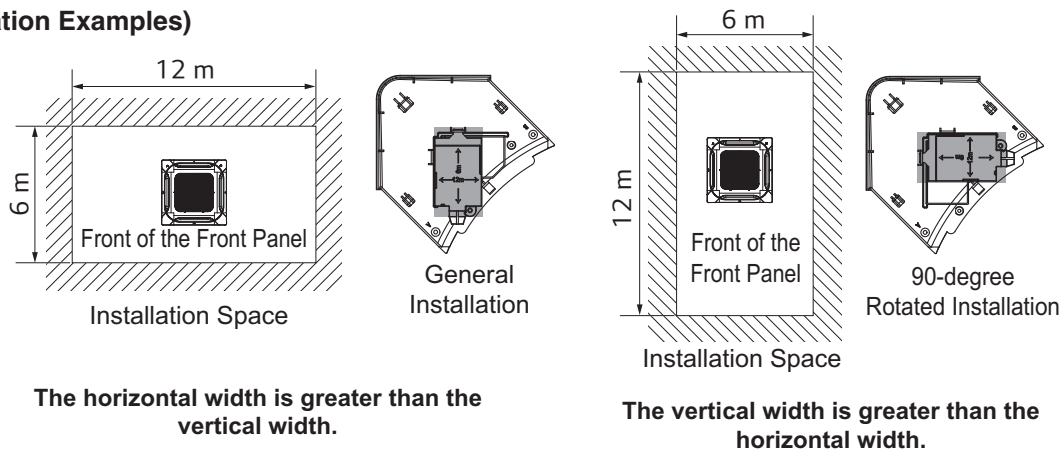
Make sure that you install the Human Detection Sensor kit before installing the front panel.

- If the front panel has already been installed, you cannot install the Human Detection Sensor kit. In such a case, separate the front panel, install the kit, and re-install the front panel.
- You can operate the kit using remote controls described in the Components of Human Detection Sensor Kit section (page 3).
- A protective film is attached on the exterior of the Human Detection Sensor kit. Make sure that you remove the protective film after installation is completed

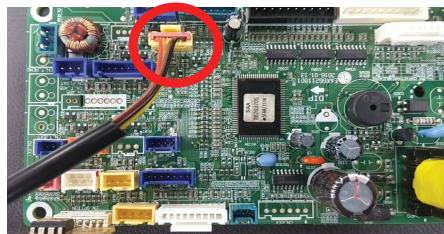
1. Check the mounting direction of the Human Detection Sensor kit.

- Determine the installation direction of the sensor kit based on the conditions of the site where the air conditioner is to be installed.
 - When the horizontal width is greater: General installation
 - When the vertical width is greater: 90-degree rotated installation

(Installation Examples)



2. Attach the kit to the product.
3. Use the front panel fixing bolts to fasten the panel and the main body together
4. Open the control box cover of the main body.
5. Refer to the wiring diagram attached to the control box to connect all the connecting wires on the panel to the connector inside PCB.
 - Connect the connecting wires of the kit to the yellow connector (CN_BLDC2) on the PCB as shown in the figure.



6. Fasten the control box cover and attach the air intake grille.
7. After completing the installation, check for normal operation by performing the following steps:
 - Set the installation direction of the sensor kit in the Installer Settings of the remote control.
 - After starting the operation, select 'Body Sensing Operation' in the 'Function Settings'.
 - Set 'Body Sensing Wind Direction' to 'Indirect Wind'.
 - Check if the vane in the direction of the movement operates properly.

! NOTE

Refer to the manual of Human detection kit for how to install in detail.

4.8 Wi-Fi Modem

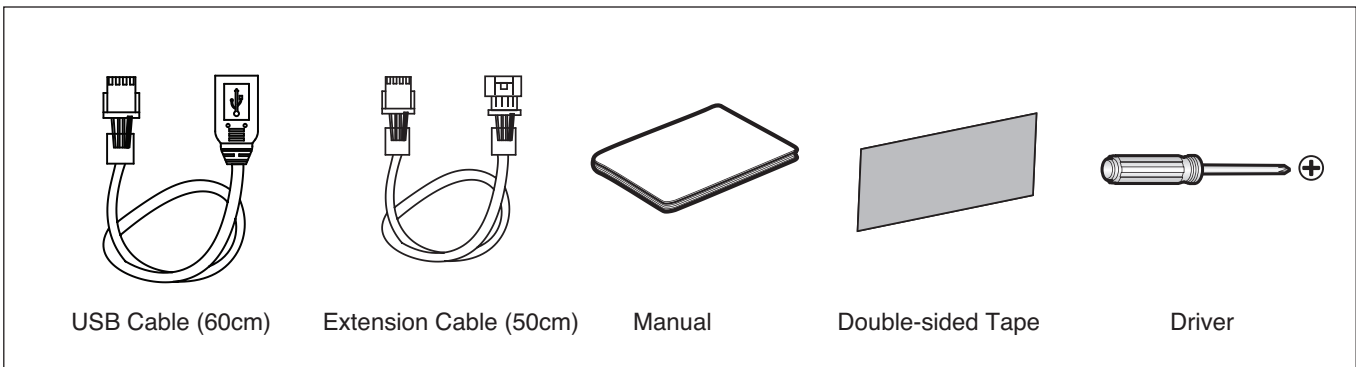
You can use LG smart ThinQ application through this Wi-Fi modem.

■ Model name : PWFMD200



- Frequency Range 2412~2462 MHz
- Input power :DC 12 V
- Output Power (Max)
 - IEEE 802.11b : 19.29 dBm
 - IEEE 802.11g : 25.43 dBm
 - IEEE 802.11n : 25.30 dBm

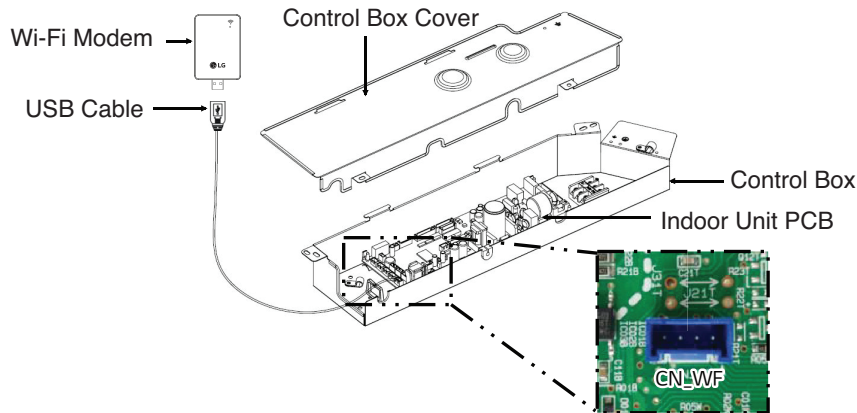
■ Components



4.8 Wi-Fi Modem

■ Wi-Fi Model Installation

1. Check if the indoor unit is turned off and the power of the outdoor unit is turned off.
2. Open the control box of the indoor unit.
3. Connect the USB cable to the indoor unit PCB (CN_WF).
4. Connect the Wi-Fi modem to the USB cable.
5. Refer to the image below to install the Wi-Fi modem in the marked position. (Use the included doublesided tape to fix it in place.)



Installation example for 1way, 2way CST

! NOTE

Please refer the manual of Wi-Fi modem for more product's installation guide.

■ LG SmartThinQ Application Installation

1. Search and install "LG SmartThinQ" from the Google Play Store or iOS App Store on your smartphone.
2. Refer to the help in the application for how to use "LG Smart-ThinQ" in detail.

4.8 Wi-Fi Modem

■ Smartphone Wi-Fi settings

! NOTE

To register the product, set the following items to off in Wi-Fi general settings and advanced settings. Please be aware that the expressions in the settings may differ depending on the manufacturer of your smartphone.

Automatically Switch to Mobile Data

If you cannot use the internet with Wi-Fi, use the Internet with your mobile data plan.



Cancel Connection to Wi-Fi with Weak Signal

If the currently-connected Wi-Fi signal is weak, the device cancels the connection and tries to connect to another Wi-Fi or mobile network.



Pass Point

Connect automatically to the Wi-Fi that supports Pass Point.



Disconnect Wi-Fi with Weak Signal

When the signal is weak, it tries to connect to another Wi-Fi or data network.



Smart Network Switching

While using this feature, it will automatically connect to your mobile network when your Wi-Fi connection is not good. Additional charges may apply, depending on the data plan.

- ☐ On
- ☒ Off

Cancel

Connection Failure Prevention

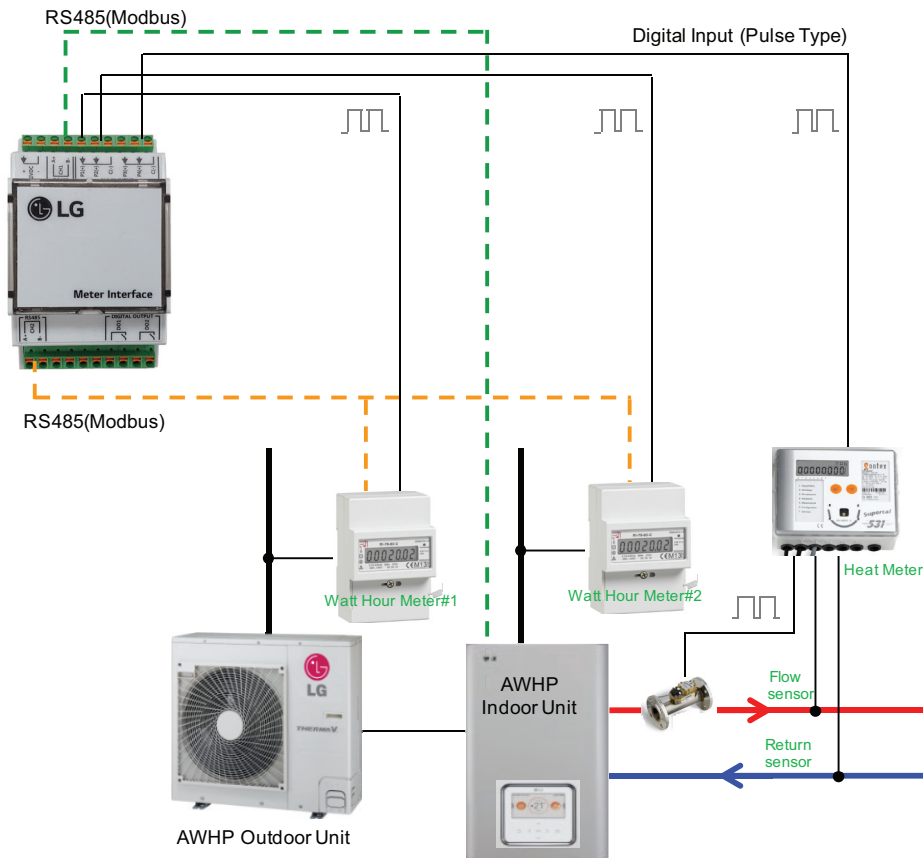
Do not use Wi-Fi networks that are not properly-connected to the Internet.



4.9 Meter Interface

4.9.1 PENKTH000

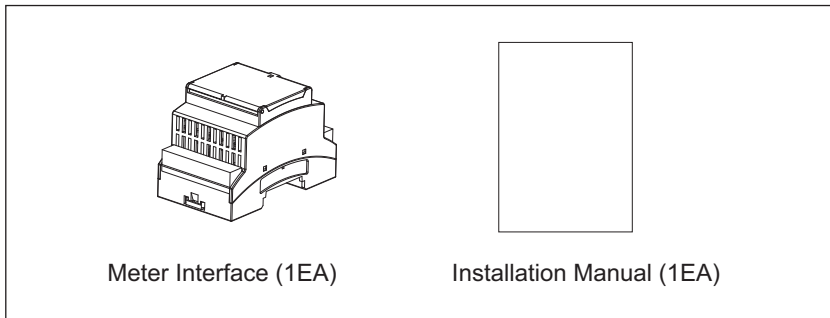
This module Interfaces between watt hour meter or heat meter and AWHP indoor unit.



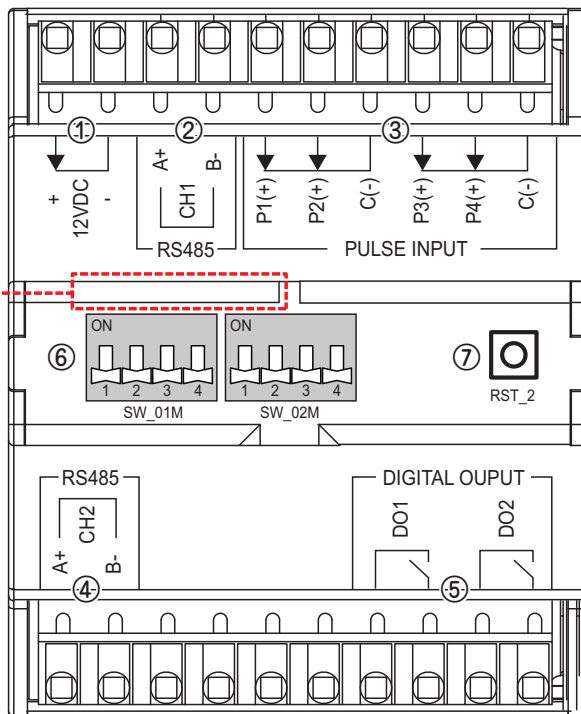
1. With AWHP Indoor Unit (Communication)
 - Network : 2 wire RS485
 - Mode : Modbus RTU slave
 - Baud : 9600
 - Parity : None
2. With Watt Hour Meter (Communication & Pulse Input)
 - 1) Communication
 - Network : 2 wire RS485
 - Mode : Modbus RTU Master
 - Baud : 9600
 - Parity : None
 - 2) Pulse Input
 - Type : 5 VDC Pulse detection
 - Duration : Minimum On time : 40 ms
Minimum OFF time : 100 ms
3. With Heat Meter (Pulse Input)
 - Type : 5 VDC Pulse detection
 - Duration : Minimum On time : 40 ms
Minimum OFF time : 100 ms

4.9 Meter Interface

■ Components



■ Part Description



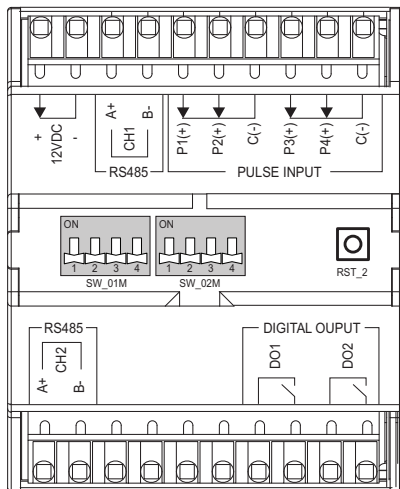
Display(LED)



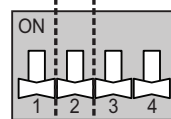
- ① Power : DC 12 V
- ② RS485 (CH1)
: Between Indoor Unit and Meter Interface
- ③ Pulse Input : Meter Pulse Input
 - P1(+), P2(+), P3(+): Meter Pulse Input
 - P4(+): Heat Meter
 - C(-): Common
- ④ RS485(CH2) : Between Meter Interface and Meter
- ⑤ Digital Output
 - DO1 : Operate Status
 - DO2 : Error status
- ⑥ DIP Switch
- ⑦ RST_2 : Reset
- ⑧ Display (LED)
 - LD01M / LD02M : With Indoor Unit Communication(CH1) Tx / Rx
 - LD03M / LD04M : With Meter Communication(CH2) Tx / Rx
 - LD05M : Not Used
 - LD06M : Error display

4.9 Meter Interface

■ DIP Switch Setting



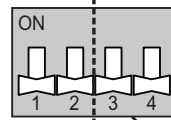
SW_01M



Watt Hour Meter Interlock Type Setting

MODBUS Address Setting

SW_02M



Watt Hour Meter Unit Setting

(When setting up interworking by communication)

SW_01M	Function	DIP Switch Setting	
1	Address Setting	Off	Address value: 1
		On	Address value: 2
2	Watt Hour Meter Interlock Type Setting	Off	Comm. (Modbus RTU)
		On	Pulse Input
3	Not Used	-	-
4	Not Used	-	-

SW_02M				Function
1	2	3	4	Watt Hour Meter Unit Setting (When setting up interworking by communication)
Not Used		Off	Off	1 Wh
Not Used		Off	On	10 Wh
Not Used		On	Off	100 Wh
Not Used		On	On	1 000 Wh

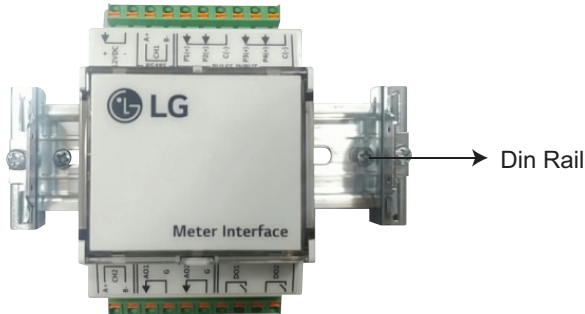
※ When setting up interlocking by pulse input, it have to set from wired remote control.
Refer to the wired remote control manual about watt hour meter setting

4.9 Meter Interface

■ Installation Method

1. When installing the meter interface, please fix and install using Din Rail.

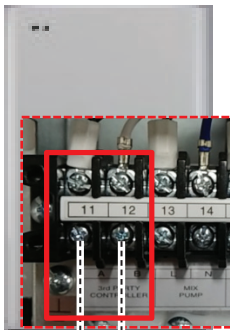
(Example of Installation)



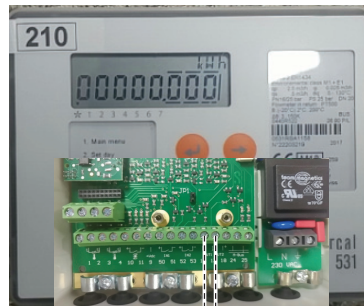
2. Connect the '3rd PARTY CONTROLLER' of IDU and CH1 of Meter Interface
3. When connecting heat, connect 'P4 (+)' and 'C (-)' to +, - terminal of meter. Refer to the installation manual of each meter for detailed wiring of the meter

----- Field Wiring

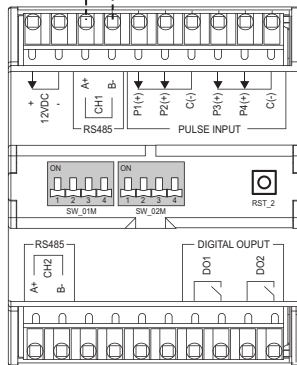
(IDU)



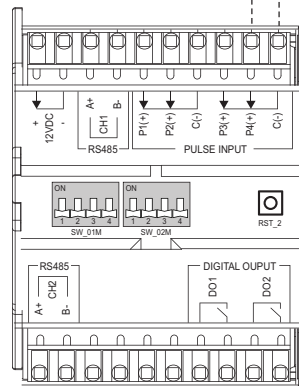
(Sontex Supercal 531)



Bus_A Bus_B



(Meter Interface)



(Meter Interface)

4.9 Meter Interface

4. Interlocking method of watt hour meter has 2 types (communication & Pulse Input)
Please select one and use it.

• When interlocking by communication

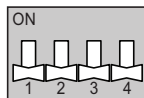
When connected by watt hour meter communication method, After Setting DIP S/W (SW_01M) No. 2 to 'OFF' and connect it to the RS485 terminal of 'CH2' and Meter.

Refer to the installation manual of each meter for detailed wiring of the meter.

! CAUTION

Please match A and B polarity and install it. It does not work when wrong wiring.

1) DIP Switch Setting



SW_01M

2) Wiring Method

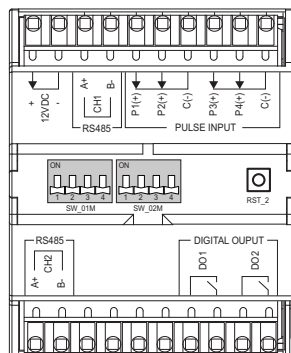
----- Field Wiring

(Rayleight RI-78-80-C)



Bus_A

Bus_B



4.9 Meter Interface

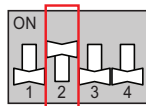
• When interlocking by Pulse Input

When connecting the watt hour meter pulse input, After setting No. 2 of DIP S/W (SW_01M) to 'ON', connect one of 'P1 (+)', 'P2 (+)', 'P3 (+)' and 'C (-)' to the +, - terminals of the meter. Refer to the installation manual of each meter for detailed wiring of the meter.

! CAUTION

Please match +, - polarity and install it. It does not work when wrong wiring.

1) DIP Switch Setting

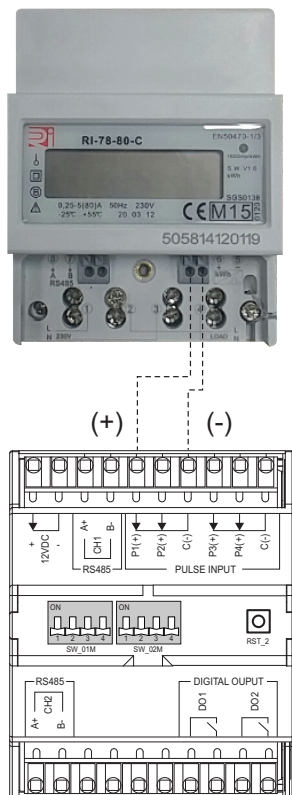


SW_01M

2) Wiring Method

----- Field Wiring

(Rayleight RI-78-80-C)

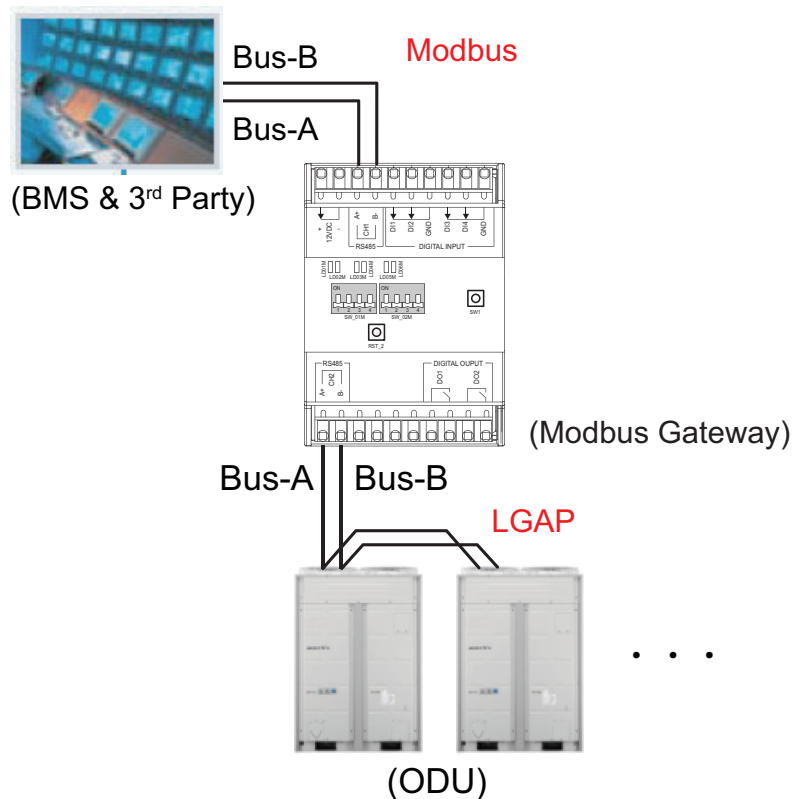


4.10 Modbus Gateway

4.10.1 PMBUSB00A

The Modbus gateway uses Open Protocol(Modbus).
It is gateway for interworking with Multi-V products, 3rd Party BMS and Controller.

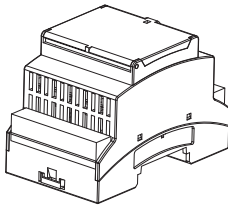
(Installation Example)



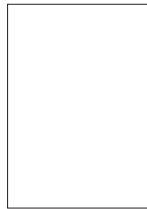
Model no.	PMBUSB00A
Dimension (WxHxD)	53.6 mm x 89.7 mm x 60.7 mm
Weight (kg)	104 g
Max. number of unit	16 (64 IDUs when combining multiple modules)
Power	12 VDC (250 mA) (IEC61558-2-6 and NEC Class 2.)
Surrounding Conditions	Ambient temperature : -20 ~ 65 °C Humidity : 0 ~ 98 % (non-condensing)
Comm. type	2 Channel RS485 *Channel 1 : To 3rd party controller *Channel 2 : To Outdoor unit / Other module comm.

4.10 Modbus Gateway

■ Components

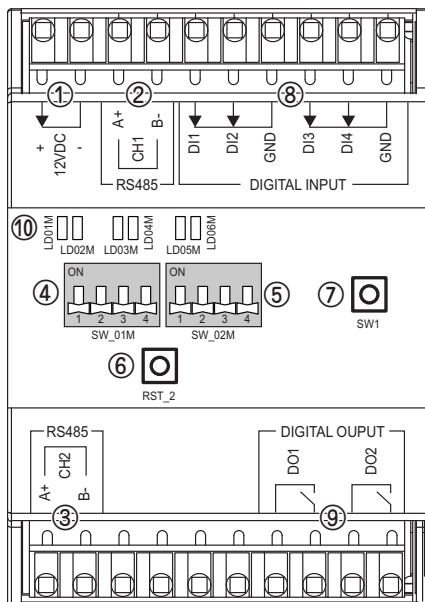


Modbus Gateway (1 EA)



Installation Manual (1 EA)

■ Part Description

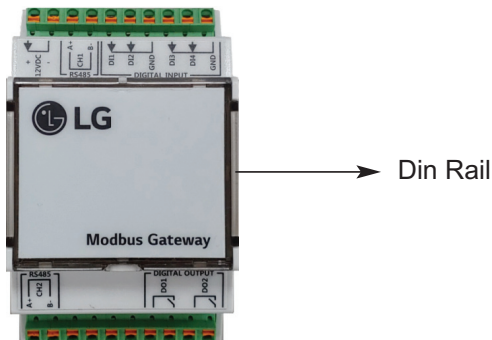


- ① Power : DC 12 V
- ② RS485 (CH1) : To 3rd Party Controller
- ③ RS485(CH2) : To Outdoor Unit
- ④ DIP Switch(SW_01M) : Not Used
- ⑤ DIP Switch(SW_02M) : Modbus Address Setting
- ⑥ RST_2 : Reset
- ⑦ SW1 : Not Used
- ⑧ DIGITAL INPUT(DI1~DI4) : Not Used
- ⑨ DIGITAL OUTPUT (DO1~DO2) : Not Used
- ⑩ Display (LED)
 - LD01M / LD02M : BMS & 3rd party / Tx / Rx
 - LD03M / LD04M : Outdoor Unit / Tx / Rx
 - LD05M : Indoor Unit Searching
 - LD06M : Error

4.10 Modbus Gateway

■ Installation Method

When installing the Modbus Gateway, please fix and install using Din Rail
And then it should be setting modbus address. (Modbus Address Setting : SW_02M)
Refer to 'Installation Scene' about modbus address and wiring.



Modbus Address Table (SW_02M)

※ When factory shipped, Modbus address default is "1".

Modbus Address	SW_02M	DIP S/W No.			
		1	2	3	4
1		OFF	OFF	OFF	OFF
2		OFF	OFF	OFF	ON
3		OFF	OFF	ON	OFF
4		OFF	OFF	ON	ON
5		OFF	ON	OFF	OFF
6		OFF	ON	OFF	ON
7		OFF	ON	ON	OFF
8		OFF	ON	ON	ON
9		ON	OFF	OFF	OFF
10		ON	OFF	OFF	ON
11		ON	OFF	ON	OFF
12		ON	OFF	ON	ON
13		ON	ON	OFF	OFF
14		ON	ON	OFF	ON
15		ON	ON	ON	OFF
16		ON	ON	ON	ON

4.10 Modbus Gateway

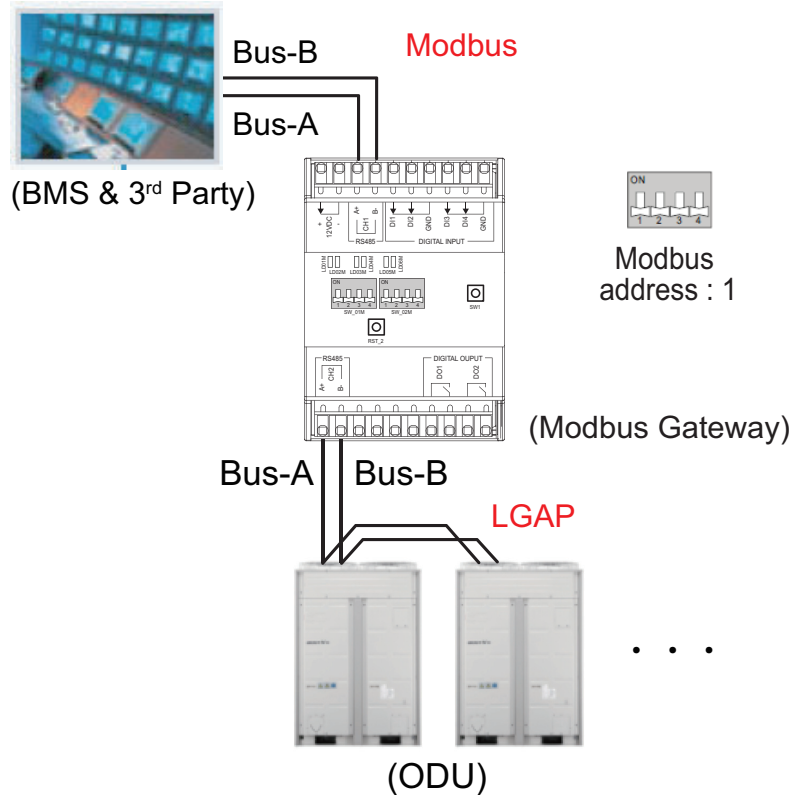
■ Installation Scene

Case 1. Single Module Installation Scene

Indoor Unit : Max. 16 EA

Outdoor Unit : Max. 16 EA

(Installation Example)



⚠ CAUTION

- Modbus Gateway can be connected with only the outdoor unit of the Multi-V 5.
- When connecting to an outdoor unit, it must be connected to the master unit of each outdoor unit.
- The communication line needs to match the A and B polarities. If it is incorrect, it will not work.
- First power on the indoor unit and the outdoor unit and then power on the Modbus Gateway after 3 minutes. Otherwise, it will not work properly.

4.10 Modbus Gateway

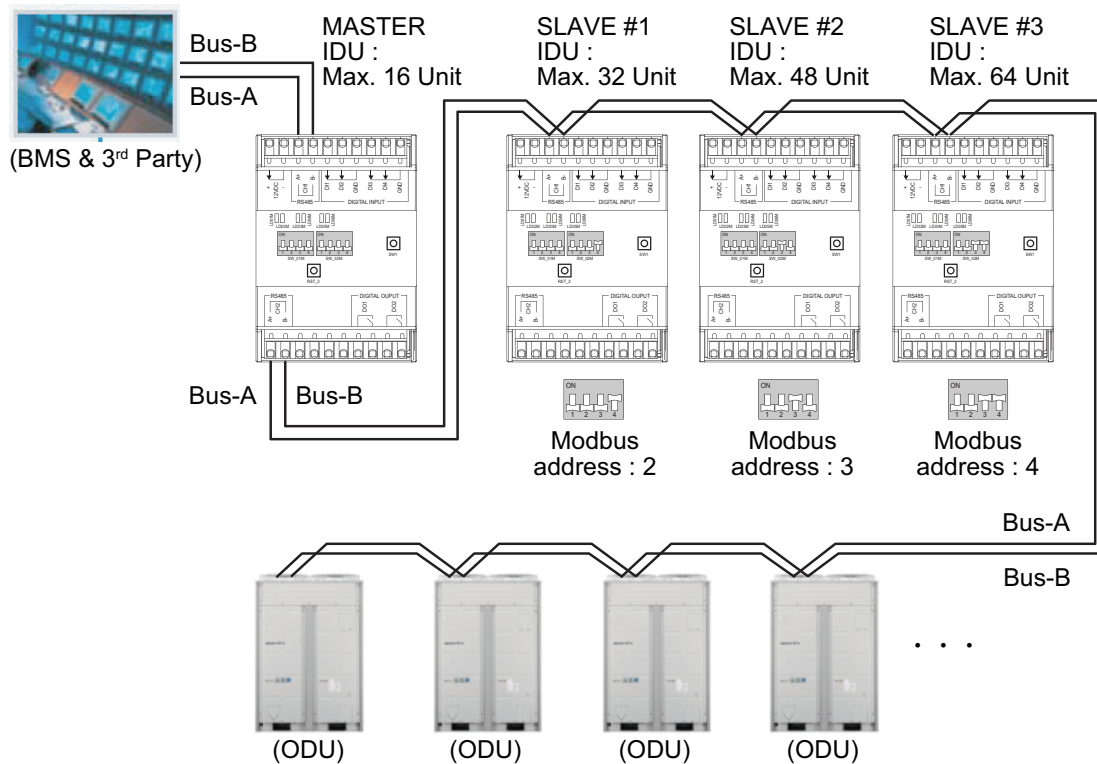
Case 2. Series Module Installation Scene

The master module can connect up to three slave modules.

- The number of indoor units that can be connected depends on the number of modules.
- The Modbus address of each slave modules are fixed. (Reference in Fig 2. / Modbus Address Setting : SW_02M)

The number of Modbus Gateway6	Indoor Unit
Master	Max. 16 Unit
Master + Slave(1 Module)	Max. 32 Unit
Master + Slave(2 Module)	Max. 48 Unit
Master + Slave(3 Module)	Max. 64 Unit

(Installation Example)



! CAUTION

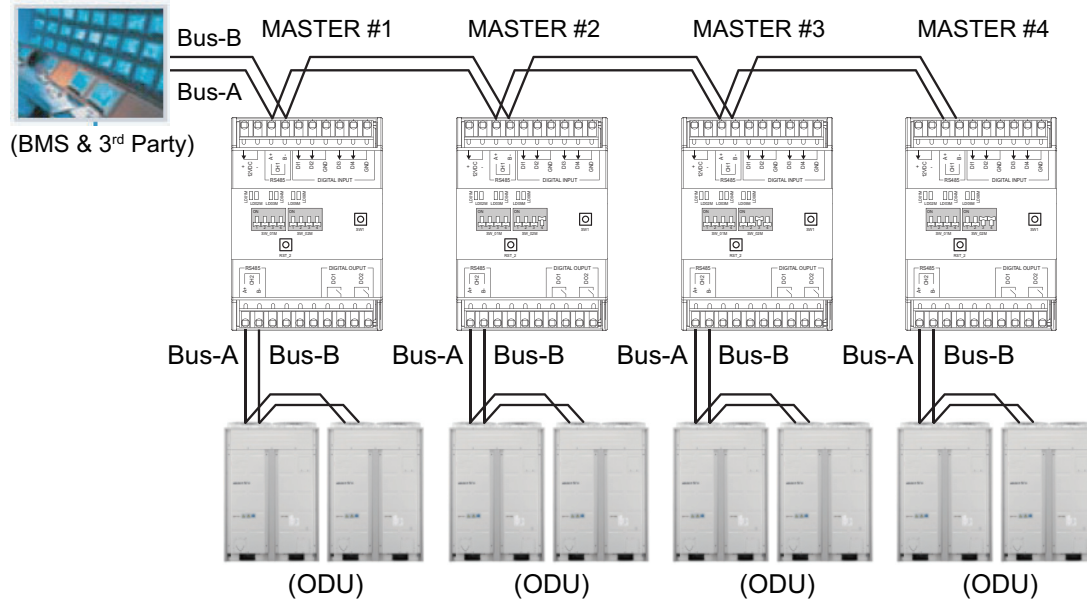
- The number of connectable indoor units must be matched as shown in Table 1. Otherwise it will not work.
- If one or more modules of the Modbus Gateway connected in the Series broken, the indoor unit is not controlled normally.
- Master module address setting and Slave module address setting do not affect each other.

4.10 Modbus Gateway

Case3. Single module combination Installation Scene

1. The number of indoor units that can be connected to the system increases depending on the number of Master modules.
2. It can be connected up to 16 indoor unit per master module.
 - It can be connected up to 64 indoor unit through combination Installation
3. It should be set different address each master unit. (Modbus Address Setting : SW_02M)

(Installation Example)



! CAUTION

- If the address of each master module is the same, it will not work.
- If more than 16 indoor units are connected to each Master module, it will not operate normally.

4.10 Modbus Gateway

■ MEMORY MAP

Baud Rate : 9 600 bps

Stop Bit : 1 stop bit

Parity : None Parity

Coil Register (0x01)

① No.	Data Bit		Function	Register
	Air Conditioner	Ventilator		
1	Operate (On/Off)	Operate (On/Off)	0: Stop / 1: Run	Register = (N-1) X 16 + ① (N = Indoor unit Number)
2	Auto Swing	Aircon Operate (On/Off)	0: Disable / 1: Enable	
3	Filter Alarm Reset	Filter Alarm Reset	0: Normal / 1: Reset	
4	Lock Remote Controller	Lock Remote Controller	0: Unlock / 1: Lock	
5	Lock Operate Mode	Lock Operate Mode	0: Unlock / 1: Lock	
6	Lock Fan Speed	Lock Fan Speed	0: Unlock / 1: Lock	
7	Lock Target Temp.	Lock Target Temp.	0: Unlock / 1: Lock	
8	Lock IDU Address	Lock IDU Address	0: Unlock / 1: Lock	
9	Reserved	Quick Ventilate	(0: Disable / 1: Enable)	
10	Reserved	EnergySave	(0: Disable / 1: Enable)	

Discrete Register (0x02)

① No.	Data Bit		Function	Register
	Air Conditioner	Ventilator		
10001	Connected IDU	Connected IDU	0: Disconnected / 1: Connected	Register = (N-1) X 16 + ① (N = Indoor unit Number)
10002	Alarm	Alarm	0: Normal / 1: Alarm	
10003	Filter Alarm	Filter Alarm	0: Normal / 1: Alarm	

Holding Register (0x03)

① No.	Data Bit		Function	Register
	Air Conditioner	Ventilator		
40001	Operate Mode	Operate Mode	0 : Cooling, 1 : Dehumidifying, 2 : Fan, 3 : Auto, 4 : Heating	Register = (N-1) X 20 + ① (N = Indoor unit Number)
40002	Fan Speed	Fan Speed	1 : Low, 2 : Mid, 3 : High, 4 : Auto	
40003	Target Temp.	Target Temp.	16.0 ~ 30.0 [°C] X 10	
40004	Target Temp. Limit (Upper)	Target Temp. Limit (Upper)	16.0 ~ 30.0 [°C] X 10	
40005	Target Temp. Limit (Lower)	Target Temp. Limit (Lower)	16.0 ~ 30.0 [°C] X 10	
40006	Reserved	Vent. Operate Mode	(0 : HEX, 1 : Auto, 2 : Normal)	

Input Register (0x04)

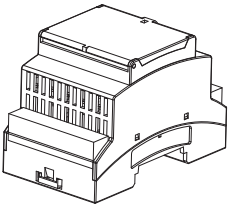
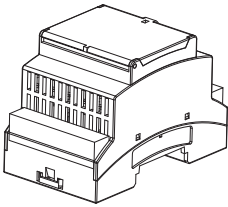
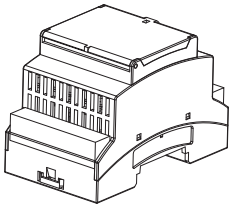
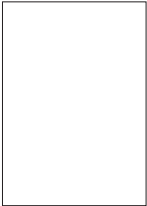
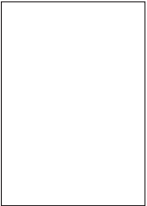
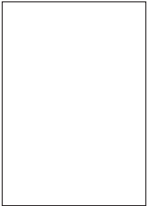
① No.	Data Bit		Function	Register
	Air Conditioner	Ventilator		
30001	Error Code	Error Code	0 ~ 255 ※ Please refer to the product error table.	Register = (N-1) X 20 + ① (N = Indoor unit Number)
30002	Room Temp.	RA Temp.	-99.0 ~ 99.0 [°C] X 10	
30003	Pipe In Temp.	OA Temp.	-99.0 ~ 99.0 [°C] X 10	
30004	Pipe Out Temp.	SA Temp.	-99.0 ~ 99.0 [°C] X 10	
30005	Reserved	Pipe In Temp.	(-99.0 ~ 99.0 [°C] X 10)	
30006	Reserved	Pipe Out Temp.	(-99.0 ~ 99.0 [°C] X 10)	

4.11 ACU IO

4.11.1 PEXPMB100, PEXPMB200, PEXPMB300

It is a product for interlocking external contact-module or sensors by using 485 communicable 3rd party controller in addition to central controller provided by LG.

■ Components

PEXPMB300 (ACU.UIO)	PEXPMB200 (ACU.UO)	PEXPMB100 (ACU.UI)
		
ACU.UIO (1 EA)	ACU.UO (1 EA)	ACU.UI (1 EA)
		
Installation Manual (1 EA)	Installation Manual (1 EA)	Installation Manual (1 EA)

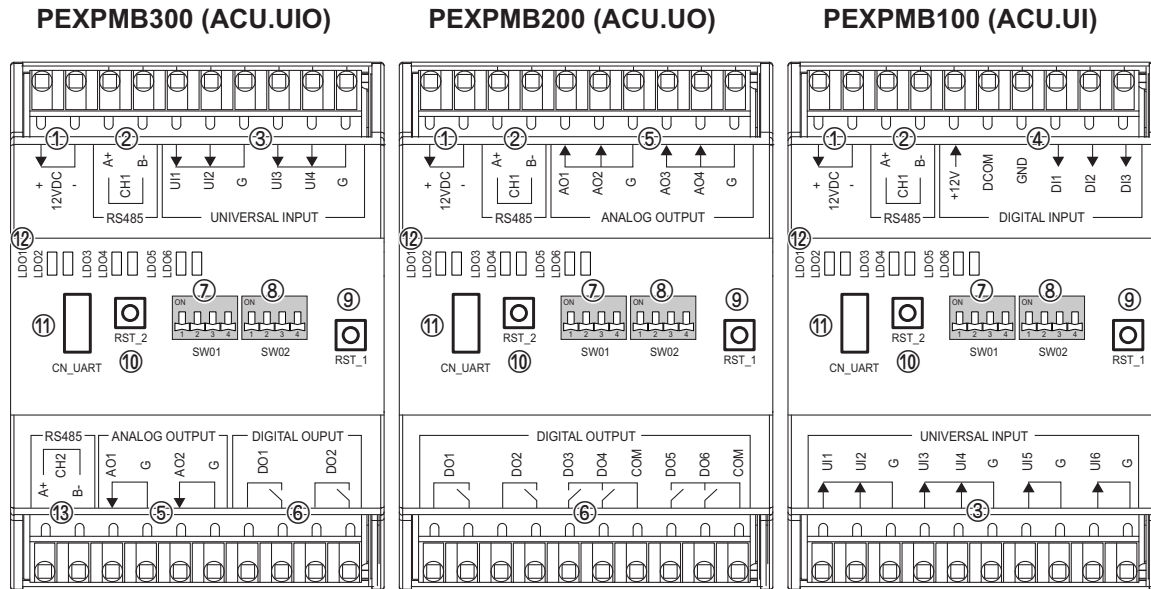
! NOTE

- This model requires external power supply (DC 12 V)
(Select an insulating transformer that complies with IEC61558-2-6 and NEC Class 2.)
- Please check the product operation range below.

Power supply		DC 12 V
Product operation range	Ambient temperature	-20 ~ 65 °C
	Humidity	0 ~ 98 % (Non-condensing)

4.11 ACU IO

■ Part Description



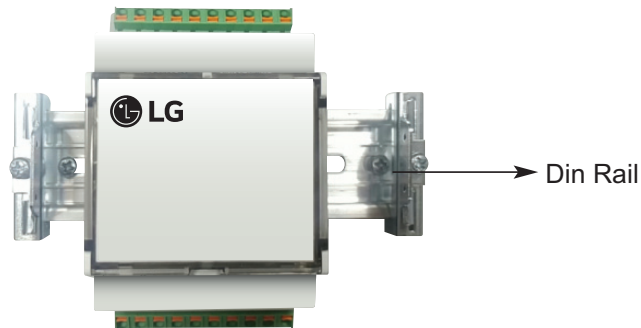
- ① Power : DC 12 V
- ② RS485 (CH1) : From Master Unit Communication
- ③ Universal Input : Digital & Analog Signal Input
- ④ DIGITAL Input : Digital Signal Input
- ⑤ Analog Output : Analog Signal Output
- ⑥ Digital Output : Digital Signal Output
- ⑦ DIP Switch (SW01) : Not Used
- ⑧ DIP Switch (SW02) : Address Setting
- ⑨ RST_1 : Not Used
- ⑩ RST_2 : Reset
- ⑪ CN_UART : Not Used
- ⑫ Display (LED)
 - LD01 / LD02 : Master Unit Communication Tx / Rx
 - LD03 / LD04 : Not Used
 - LD05 : Not Used
 - LD06 : Error
- ⑬ RS485 (CH2) : Not Used

4.11 ACU IO

■ Installation Method

1. When installing the ACU IO, please fix and install using Din Rail

(Example of Installation)



2. It should be setting address. (Address Setting : SW02)

Model	PEXPMB300 (ACU.UIO)				
	SW02	DIP S/W No.			
		1	2	3	4
60		OFF	OFF	OFF	OFF
61		OFF	OFF	ON	OFF
62		OFF	ON	OFF	OFF
63		OFF	ON	ON	OFF
64		ON	OFF	OFF	OFF
65		ON	OFF	ON	OFF
66		ON	ON	OFF	OFF
67		ON	ON	ON	OFF

Model	PEXPMB200 (ACU.UO)				
	SW02	DIP S/W No.			
		1	2	3	4
80		OFF	OFF	OFF	OFF
81		OFF	OFF	ON	OFF
82		OFF	ON	OFF	OFF
83		OFF	ON	ON	OFF
84		ON	OFF	OFF	OFF
85		ON	OFF	ON	OFF
86		ON	ON	OFF	OFF
87		ON	ON	ON	OFF

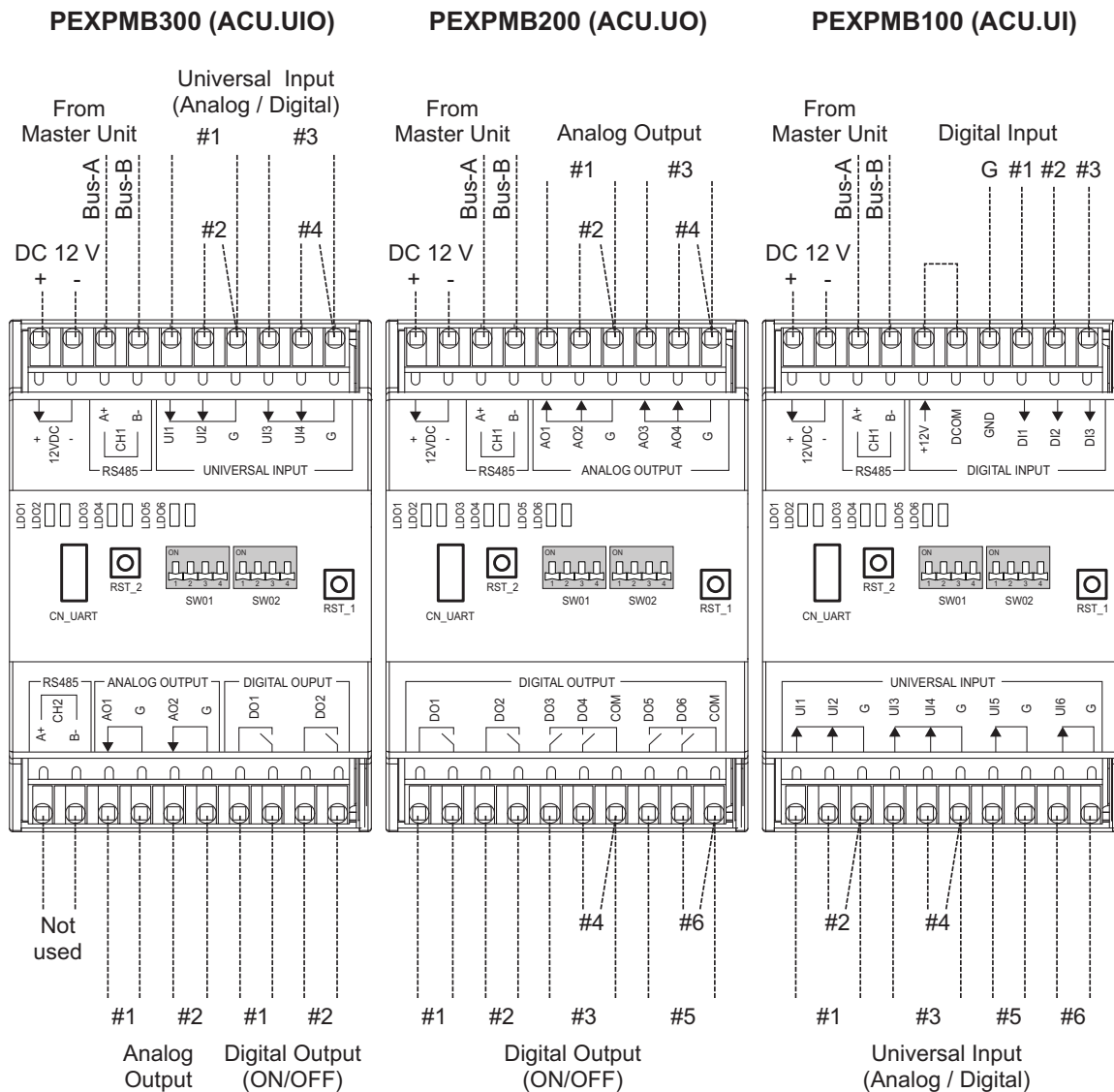
Model	PEXPMB100 (ACU.UI)				
	SW02	DIP S/W No.			
		1	2	3	4
70		OFF	OFF	OFF	OFF
71		OFF	OFF	ON	OFF
72		OFF	ON	OFF	OFF
73		OFF	ON	ON	OFF
74		ON	OFF	OFF	OFF
75		ON	OFF	ON	OFF
76		ON	ON	OFF	OFF
77		ON	ON	ON	OFF

! NOTE

- This product should be installed in an enclosure. The enclosure must grounding.
- When factory shipped, DIP Switch is all OFF state.
- Address of same model should be different otherwise it is not work.
- It should be fixed 'OFF' about DIP S/W No.4 otherwise it is not work.

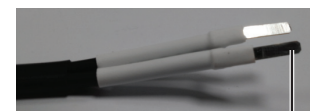
4.11 ACU IO

■ Wiring



! NOTE

- The Power and communication line needs to match the polarities. If it is incorrect, it will not work.
- Turn power off before wiring. and then power it on after wiring.
- Be careful because static electricity can cause product damage during installation.
- For the wired Power wire, Communication wire and Signal wire, remove the coating at the end of the wire to connect and then use the pin type (JOBN153) to connect to the terminal block
- All field supplied parts and materials and electric works must be conform to local codes.
- Use copper wire only.
- All wiring must be performed by an authorized electrician.



Pin type (JOBN153)

4.11 ACU IO

■ Memory map

Baud Rate : 9 600 bps

Stop Bit : 1 stop bit

Parity : None Parity

1. ACU.UIO

Coil Register (0x01)

No	Register	Data Bit	Funtion
1	1	DO #1	0: Open / 1: Short
2	2	DO #2	0: Open / 1: Short
3	9	SEL #1	0: Open / 1: Short
4	10	SEL #2	0: Open / 1: Short
5	11	SEL #3	0: Open / 1: Short
6	12	SEL #4	0: Open / 1: Short

Discrete Register (0x02)

No	Register	Data Bit	Funtion
1	10001	DI #1	0: Open / 1: Short
2	10002	DI #2	0: Open / 1: Short
3	10003	DI #3	0: Open / 1: Short
4	10004	DI #4	0: Open / 1: Short

Holding Register (0x03)

No	Register	Data Bit	Funtion
1	40001	AO #1	0~1000 (0.0~10.0 V)
2	40002	AO #2	0~1000 (0.0~10.0 V)

Input Register (0x04)

No	Register	Data Bit	Funtion
1	30001	AI #1	0~1000 (0.0~10.0 V)
2	30002	AI #2	0~1000 (0.0~10.0 V)
3	30003	AI #3	0~1000 (0.0~10.0 V)
4	30004	AI #4	0~1000 (0.0~10.0 V)

2. ACU.UO

Coil Register (0x01)

No	Register	Data Bit	Funtion
1	1	DO #1	0: Open / 1: Short
2	2	DO #2	0: Open / 1: Short
3	9	DO #3	0: Open / 1: Short
4	10	DO #4	0: Open / 1: Short
5	11	DO #5	0: Open / 1: Short
6	12	DO #6	0: Open / 1: Short

4.11 ACU IO

Holding Register (0x03)

No	Register	Data Bit	Funtion
1	40001	AO #1	0~1000 (0.0~10.0 V)
2	40002	AO #2	0~1000 (0.0~10.0 V)
3	40003	AO #3	0~1000 (0.0~10.0 V)
4	40004	AO #4	0~1000 (0.0~10.0 V)

3. ACU.UI

Coil Register (0x01)

No	Register	Data Bit	Funtion
1	9	SEL #1	0: DI / 1: AI
2	10	SEL #2	0: DI / 1: AI
3	11	SEL #3	0: DI / 1: AI
4	12	SEL #4	0: DI / 1: AI
5	13	SEL #5	0: DI / 1: AI
6	14	SEL #6	0: DI / 1: AI

Discrete Register (0x02)

No	Register	Data Bit	Funtion
1	10001	DI #1 (Dry Contact)	0: Open / 1: Short
2	10002	DI #2 (Dry Contact)	0: Open / 1: Short
3	10003	DI #3 (Dry Contact)	0: Open / 1: Short
4	10004	DI #4 (Dry Contact)	0: Open / 1: Short
5	10005	DI #5 (Dry Contact)	0: Open / 1: Short
6	10006	DI #6 (Dry Contact)	0: Open / 1: Short
7	10009	DI #1 (Wet Contact)	0: Open / 1: Short
8	10010	DI #2 (Wet Contact)	0: Open / 1: Short
9	10011	DI #3 (Wet Contact)	0: Open / 1: Short

Input Register (0x04)

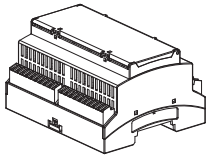


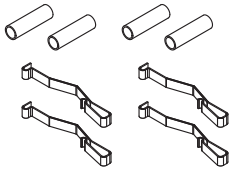
No	Register	Data Bit	Funtion
1	30001	AI #1	0~1000 (0.0~10.0 V)
2	30002	AI #2	0~1000 (0.0~10.0 V)
3	30003	AI #3	0~1000 (0.0~10.0 V)
4	30004	AI #4	0~1000 (0.0~10.0 V)
5	30005	AI #5	0~1000 (0.0~10.0 V)
6	30006	AI #6	0~1000 (0.0~10.0 V)

4.12 Water Communication module

4.12.1 PAHCMW000

This module is intended to connect 3rd party plate heat exchanger to LG outdoor unit with the ability to control water temperature from 3rd party DDC or LG remote controller.

■ Supplies

PAHCMW000				
Components	Water Communication Module	Thermistor (Water In / Water Out / Pipe In / Pipe Out)	OWNER'S & INSTALLATION MANUAL	Sensor Holder & Clip
Shape				
Quantity	1	4 (each 5m)	1	4



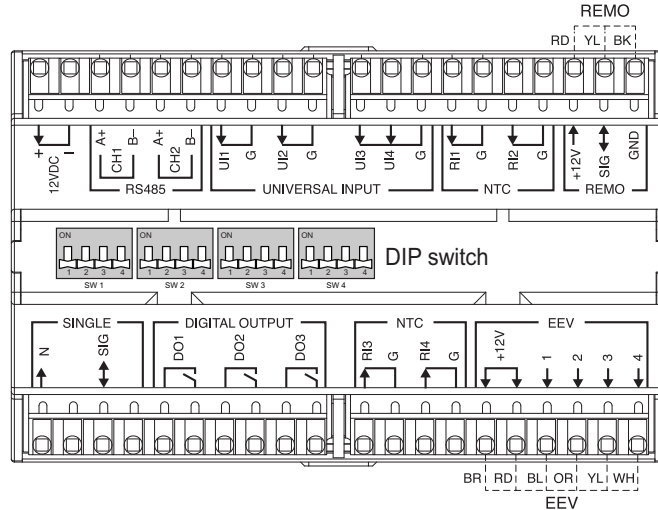
CAUTION

- This model requires DC12 V external power supply. (Select an insulating transformer that complies with IEC61558-2-6 and NEC Class 2.)
- Please check the Product operation range below.
- The Ingress Protection marking for this product restricts installation location.
LG Electronics is not responsible for installation at locations non-compliant to the IP rating.

Power Supply		12 V DC
Product Operation Range	Ambient Temperature	-20 ~ 65 °C DB
	Humidity	0~98 % (Non Condensing)
Product Protection Class	IP Rating	IP20

4.12 Water Communication module

■ Part Description



Contents	Connection Port		Function
RS485	CH1 (A+ / B-)	Module Comm. Port	Communication Port Modbus
	CH2 (A+ / B-)	IDU Comm. Port	Communication with Multi V Outdoor
UNIVERSAL INPUT (Cooling/Heating Setting)	UI1	Flow Switch	Flow Switch Input by 3 rd party
	UI2	0-10V Set Temp	Target Temp. Setting
	UI3	Cooling Thermostat Signal	Thermostat Cooling Signal
	UI4	Heating Thermostat Signal	Thermostat Heating Signal
UNIVERSAL INPUT (DHW Only)	UI1	Flow Switch	Flow Switch Input by 3 rd party
	UI2	0-10V Set Temp	Target Temp. Setting
	UI3	DHW Temperature Transmitter 0-10V	Measured Water Temp Input by 3 rd party 0 ~10 V sensor
	UI4	DHW Thermostat Signal	DHW Heating Signal
NTC	RI1	Water Inlet Sensor	PHEX Water Inlet Sensor
	RI2	Water Outlet Sensor	PHEX Water Outlet Sensor
REMO	+12V / SIG / GND	LG Remote Controller	-
SINGLE	Reserved	-	-
DIGITAL OUTPUT	DO1	Defrost/Mode	Output for defrost signal and/or cool mode
	DO2	Pump	Output signal for pump on/off
	DO3	Bypass	Output signal for PHEX Bypass Valve
NTC	RI3	Thermistor Pipe In	PHEX Ref. Inlet Pipe Sensor
	RI4	Thermistor Pipe Out	PHEX Ref. Outlet Pipe Sensor
EEV	+12V / 1 / 2 / 3 / 4	Expansion Valve	EEV Control

4.12 Water Communication module

■ Compatibility & Accessory

EEV (LG MODEL)

Model	Capacity (kW)		PAHCMW000
	Min	Max	
PAEEVC000	3.6	28	HP/HR
PRLK048A0	3.6	28	HP/HR
PRLK096A0	28.1	56	HP
PRLK396A0	56.1	112	* HP
PRLK594A0	112.1	198	X

*PRLK396A0 is on the field test, will be compatible.

Accessory

Controller	Individual Controller	Centralized Controller		Dry Contact
	Standard III	AC EZ touch	AC smart 5	
	PREMTW101	PACEZA000	PACS5A000	PDRYCB000

■ Specification for Field supply item

The 3rd party can select the for best usable version

Solenoid valve for Bypass

Capacity (kW)		EEV Type	System Compatibility	Kv Value of Solenoid and Non-Return Valve	Pipe size for bypass
Min	Max				
3.6	28	PAEEVC000	HP/HR	0.95	3/8" / 9.52mm
		PRLK048A0			
> 28	56	PRLK096A0	HP	1.90	1/2" / 12.7mm
> 56	84	PRLK396A0	HP	2.85	5/8" / 15.88mm
> 84	112	PRLK396A0	HP	3.81	5/8" / 15.88mm

Flow switch

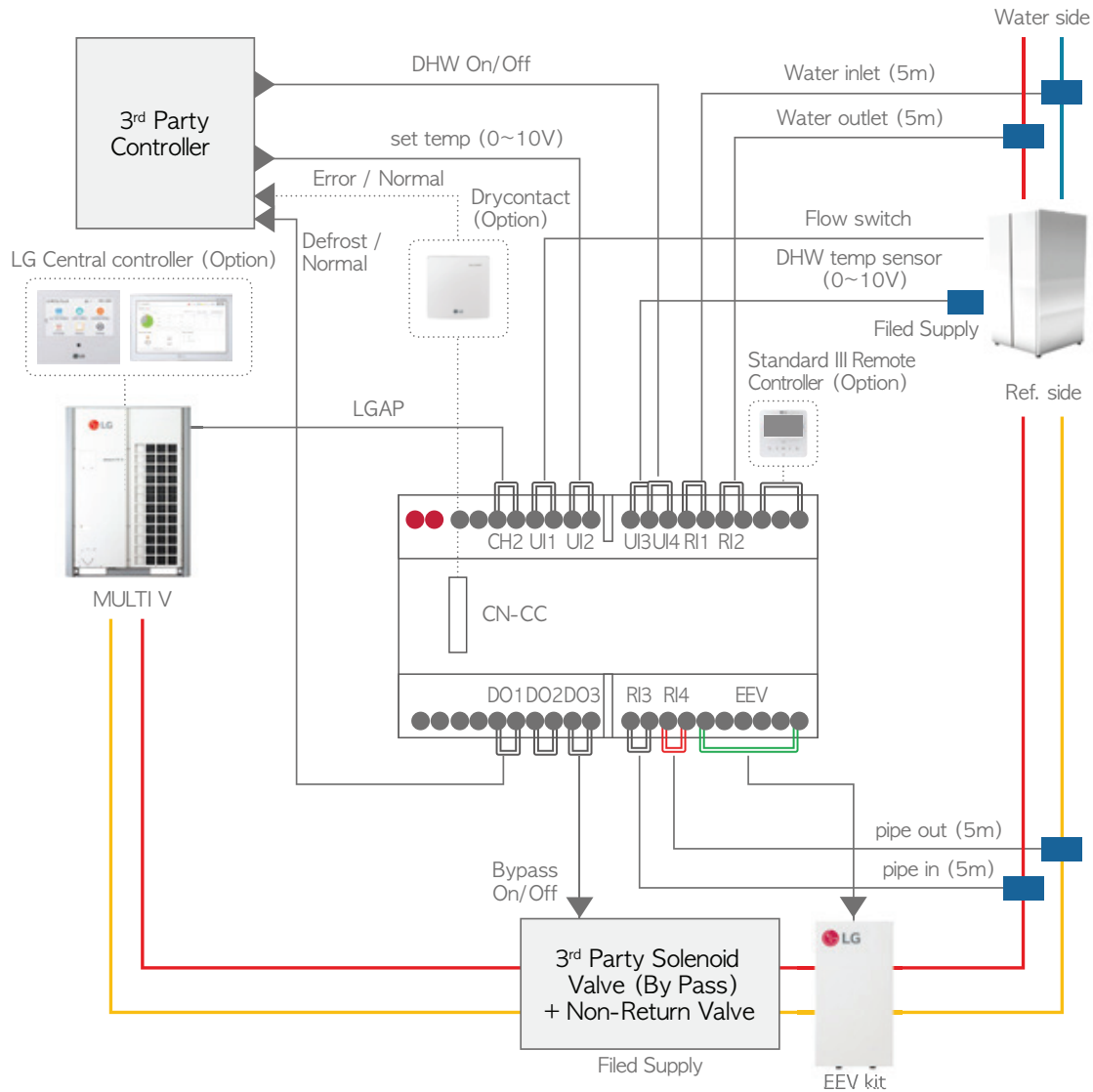
The nominal flow and cut of flow can be calculated using the values below.

	Nominal Flow	Flow switch Cut Off
L/min*kW	3.29	1.23

Example : ODU nominal Cooling Capacity 28 kW
 $28 * 3.29 = 92.12$ L/min nominal flow
 $28 * 1.23 = 34.44$ L/min flow switch cut off

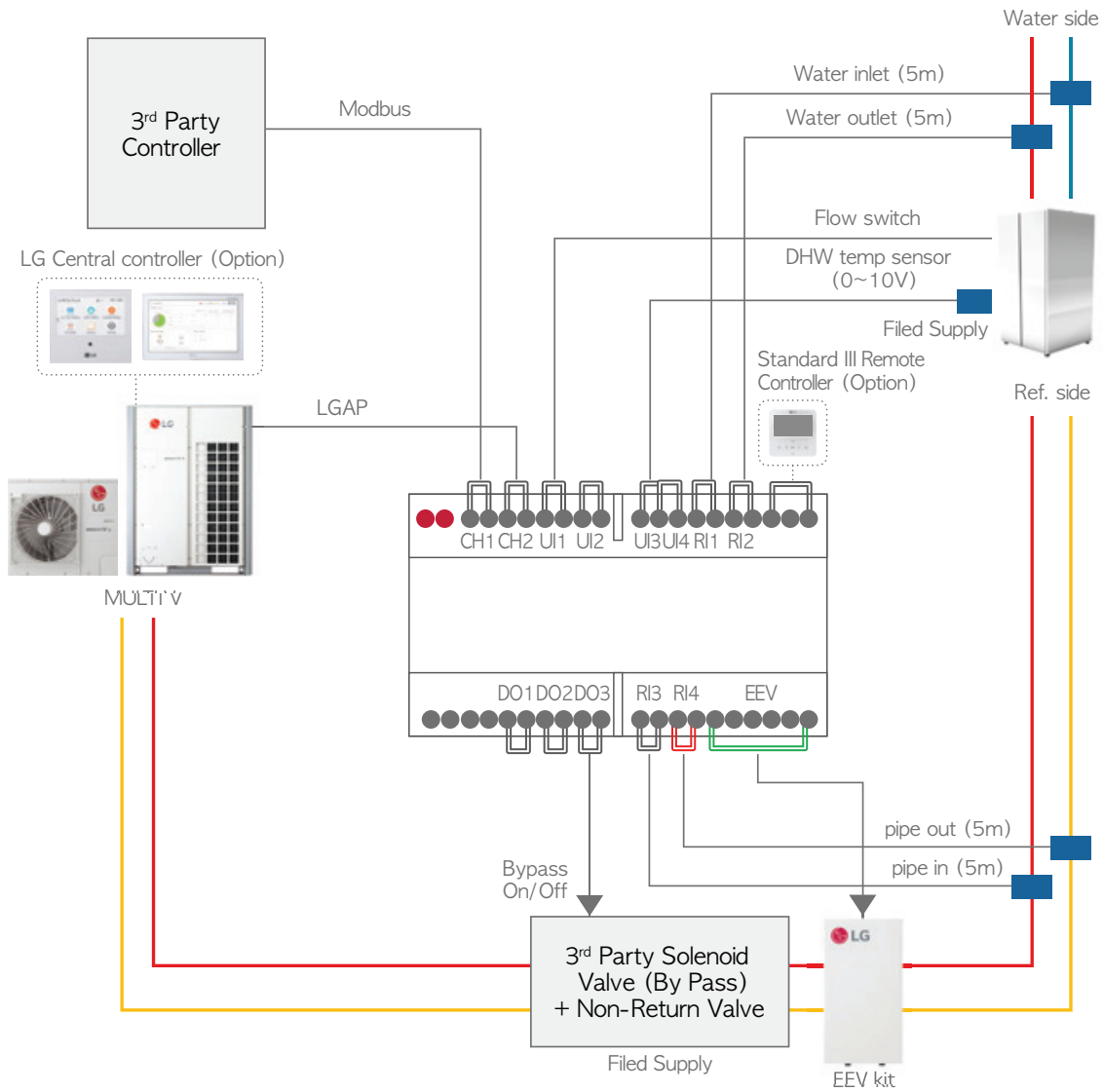
4.12 Water Communication module

■ [Contact signal + DHW Only Setting]



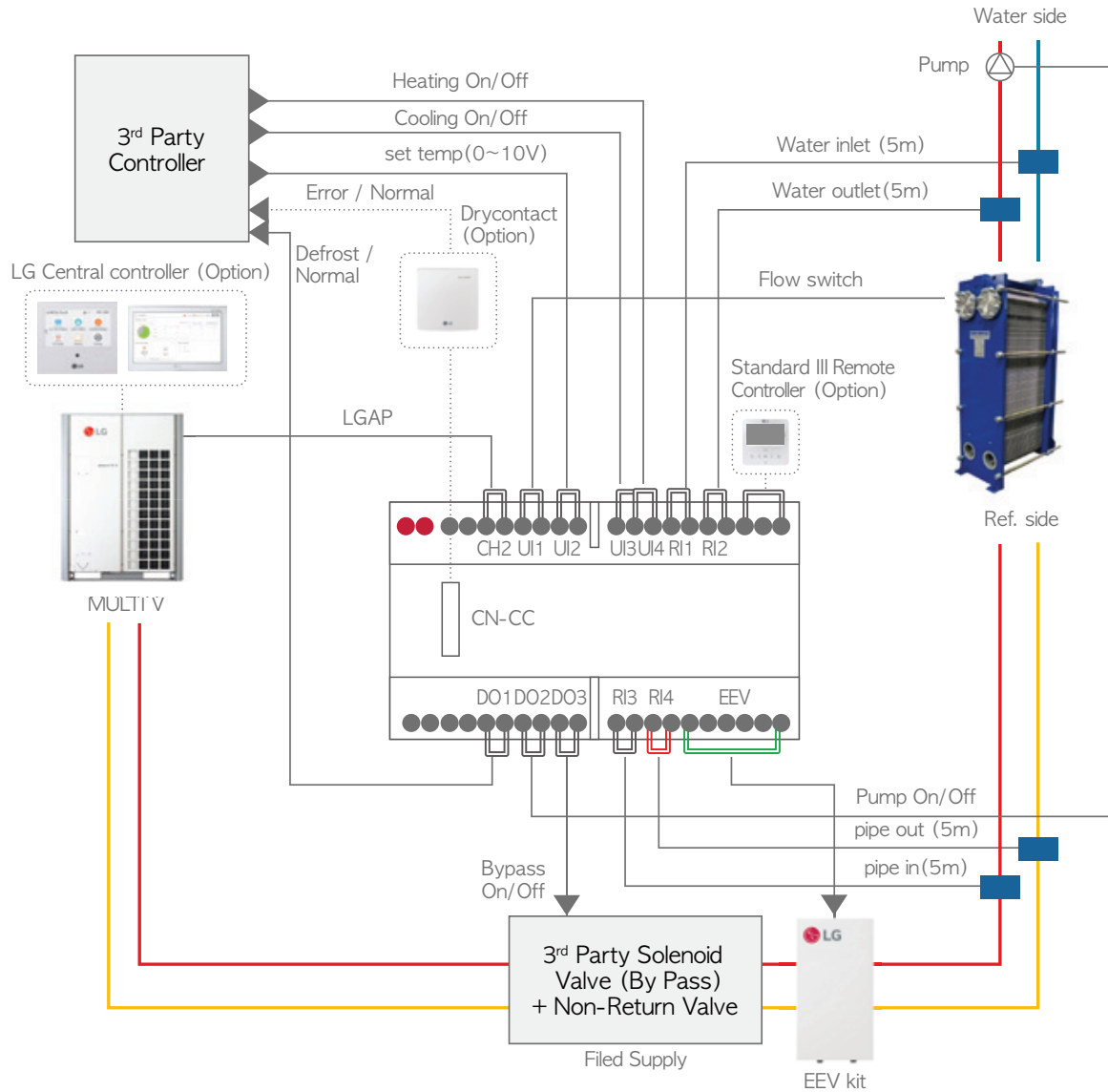
4.12 Water Communication module

■ [Modbus+ DHW Only Setting]



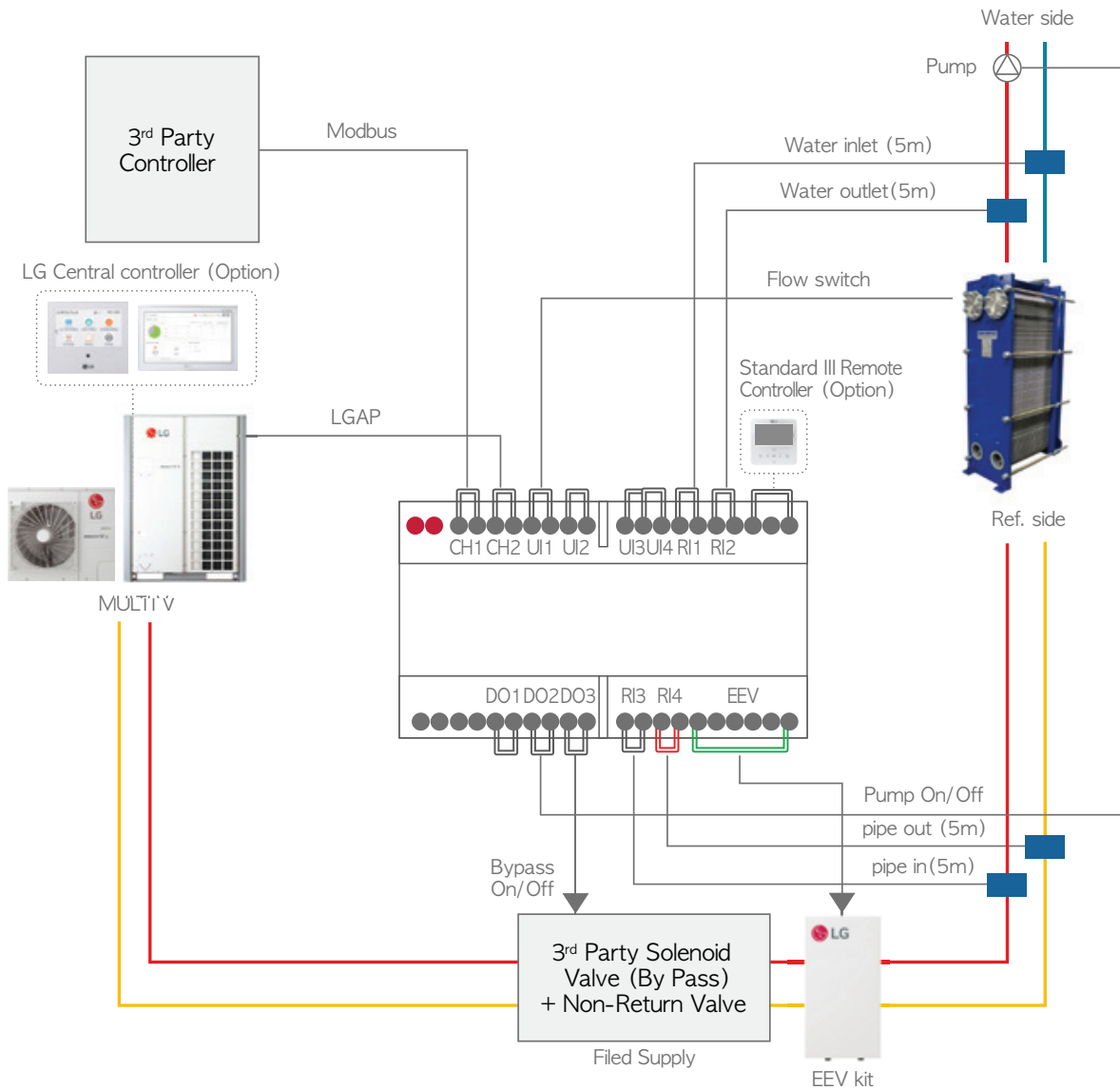
4.12 Water Communication module

■ [Contact signal + Heating/Cooling Setting]



4.12 Water Communication module

■ [Modbus+ Heating/Cooling Setting]





P/No.: MFL61741641



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Printed in Korea December / 2019

The air conditioners manufactured by LG have received ISO9001 certificate for quality assurance and ISO14001 certificate for environmental management system.
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