DVM S
DIGITAL VARIABLE MULTI

DVM Technical Data Book

Control Systems

SAMSUNG

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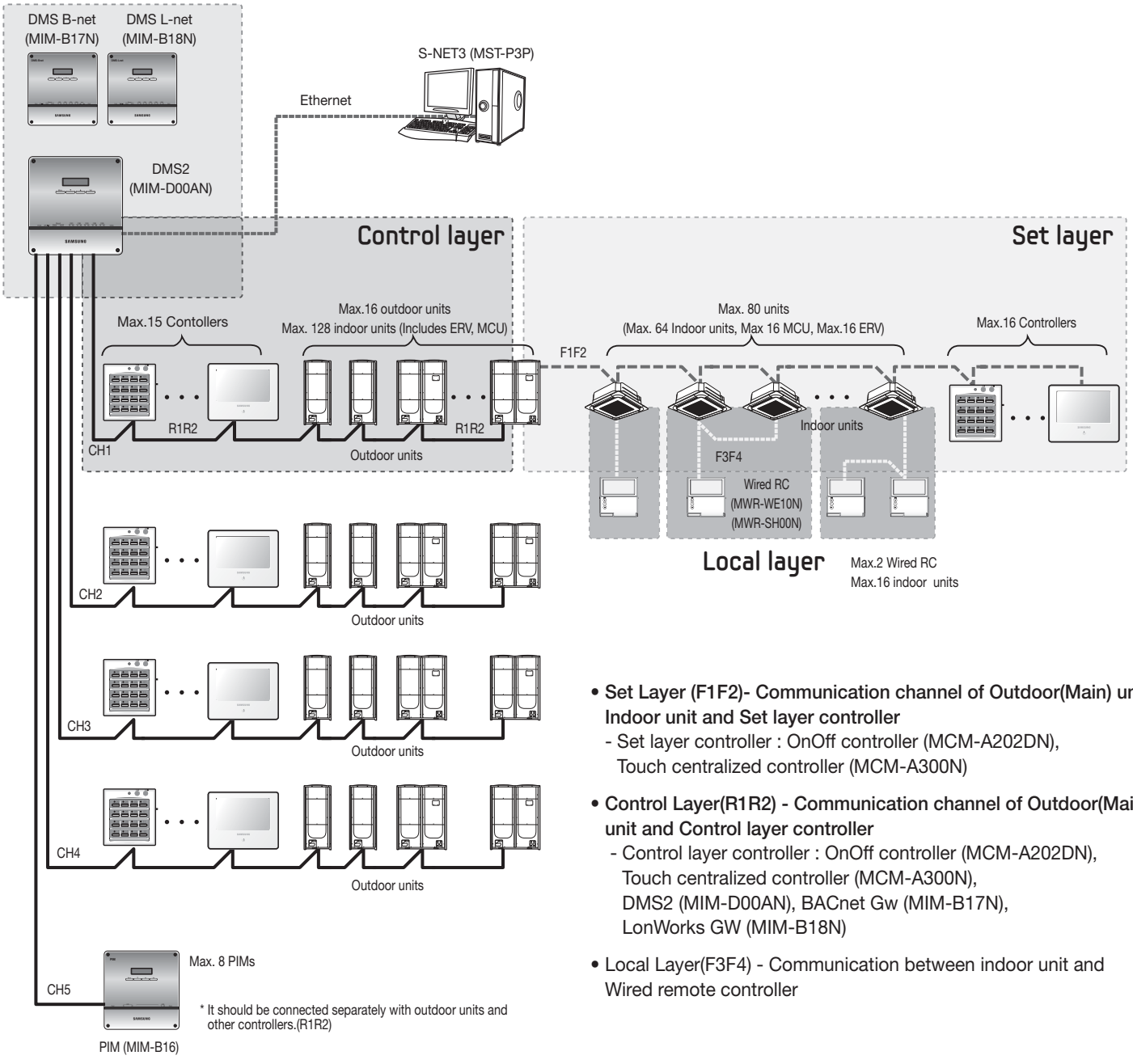
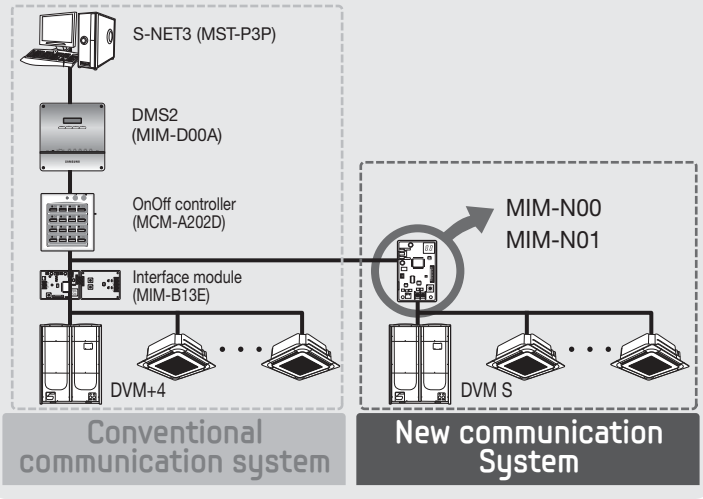
Overview of DVM S
New communication system diagram

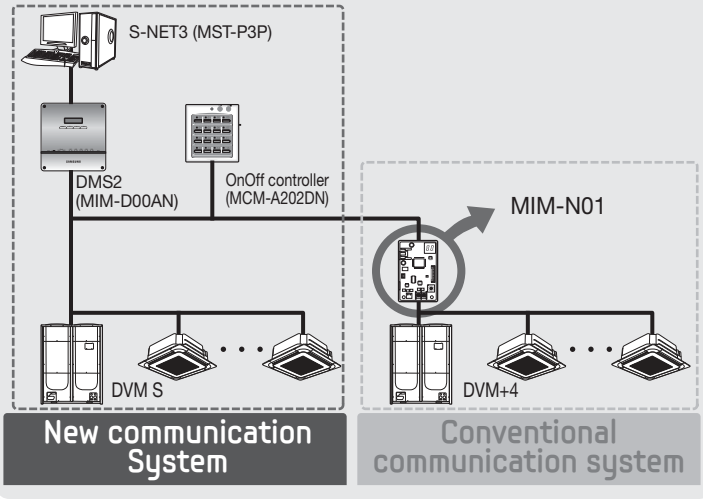


- **Set Layer (F1F2)- Communication channel of Outdoor(Main) unit, Indoor unit and Set layer controller**
  - Set layer controller : OnOff controller (MCM-A202DN), Touch centralized controller (MCM-A300N)
- **Control Layer(R1R2) - Communication channel of Outdoor(Main) unit and Control layer controller**
  - Control layer controller : OnOff controller (MCM-A202DN), Touch centralized controller (MCM-A300N), DMS2 (MIM-D00AN), BACnet Gw (MIM-B17N), LonWorks GW (MIM-B18N)
- Local Layer(F3F4) - Communication between indoor unit and Wired remote controller

• Case 1 > When DVM S is connected to conventional system



• Case 2 > When DVM+4 is connected to new system



Compatibility table (New ↔ Conventional)

	Product	Conventional communication SAC		Conventional communication Controller			
		Outdoor unit	Indoor unit	Interface module	OnOff Controller	DMS2 (BACnet GW/ LonWorks GW)	S-NET mini
New communication controller	Wired remote controller (MWR-WE10N)						
	Interface module I (MIM-N00) ✳				●	●	●
	Interface module II (MIM-N01)	●			●	●	●
	Interface module III (MIM-N10) ✳				●	●	●
	OnOff Controller (MCM-A202DN)						
	DMS2 (MIM-D00AN)						
	BACnet GW (MIM-B17N)						
	LonWorks GW (MIM-B18N)						
	PIM (MIM-B16N) ✳						
	S-NET 3 (MST-S3P,D3P,P3P)					●	
	Touch centralized controller (MCM-A300N)						
	External contact interface module (MIM-B14)		●				
	Receiver & display unit (MRK-A10N)						
	Wireless remote controller (MR-DH(C)00)		●				
	MTFC (MCM-C210N)						
	S-Converter (MIM-C02N)	●					
	Operation mode selection switch (MCM-C200)	●					

	Product	New communication SAC		New communication Controller			
		Outdoor unit	Indoor unit	MIM-N00	MIM-N01	OnOff Controller	DMS2 (BACnet GW/ LonWorks GW)
New communication controller	Wired remote controller (MWR-WE10N)		●				
	Interface module I (MIM-N00) ✳	●					
	Interface module II (MIM-N01)	●				●	●
	Interface module III (MIM-N10) ✳					●	●
	OnOff Controller (MCM-A202DN)	●	●		●	●	●
	DMS2 (MIM-D00AN)	●			●	●	
	BACnet GW (MIM-B17N)	●			●	●	
	LonWorks GW (MIM-B18N)	●			●	●	
	PIM (MIM-B16N) ✳						●
	S-NET 3 (MST-S3P,D3P,P3P)						●
	Touch centralized controller (MCM-A300N)	●	●		●	●	●
	External contact interface module (MIM-B14)		●				
	Receiver & display unit (MRK-A10N)		●				
	Wireless remote controller (MR-DH(C)00)		●				
	MTFC (MCM-C210N)		●				
	S-Converter (MIM-C02N)	●					
	Operation mode selection switch (MCM-C200)	●					

✳ MIM-N00 will be integrated to MIM-N01 at the end of 2013.

✳ MIM-N10 is only for ERV, it will be launched with new communication ERV.

✳ PIM(MIM-B16N) will be launched at the end of 2013

	Product	Conventional communication SAC		Conventional communication Controller			
		Outdoor unit	Indoor unit	Interface module	OnOff Controller	DMS2 (BACnet GW/ LonWorks GW)	S-NET mini
Conventional communication controller	Wired remote controller (MWR-WE10)		●				
	Interface module (MIM-B13D,E)	●			●	●	●
	OnOff controller (MCM-A202D)			●		●	●
	Function controller (MCM-A100)				●		
	DMS2 (MIM-D00A)			●	●		●
	BACnet GW (MIM-B17)			●	●		
	LonWorks GW (MIM-B18)			●	●		
	PIM (MIM-B16)					●	
	S-NET 3 (MST-S3P,D3P,P3P)					●	
	S-NET mini (MST-S3W)			●	●	●	
	External contact interface module (MIM-B14)		●				
	Receiver & display unit (MRK-A01)		●				
	Wireless remote controller (MR-DH(C)00)		●				
	Converter (MIM-C02)	●					
	Operation mode selection switch (MCM-C200)	●					

	Product	New communication SAC		New communication Controller			
		Outdoor unit	Indoor unit	MIM-N00	MIM-N01	OnOff Controller	DMS2 (BACnet GW/ LonWorks GW)
Conventional communication controller	Wired remote controller (MWR-WE10)						
	Interface module (MIM-B13D,E)						
	OnOff controller (MCM-A202D)			●	●		
	Function controller (MCM-A100)						
	DMS2 (MIM-D00A)			●	●		
	BACnet GW (MIM-B17)			●	●		
	LonWorks GW (MIM-B18)			●	●		
	PIM (MIM-B16)						▲
	S-NET 3 (MST-S3P,D3P,P3P)						●
	S-NET mini (MST-S3W)			●	●		
	External contact interface module (MIM-B14)		●				
	Receiver & display unit (MRK-A01)						
	Wireless remote controller (MR-DH(C)00)		●				
	Converter (MIM-C02)						
	Operation mode selection switch (MCM-C200)	●					

▲ MIM-B16 can be connected to DMS2(MIM-D00AN) temporary until release of MIM-B16N at the end of 2013.

DVM CONTROL SYSTEMS

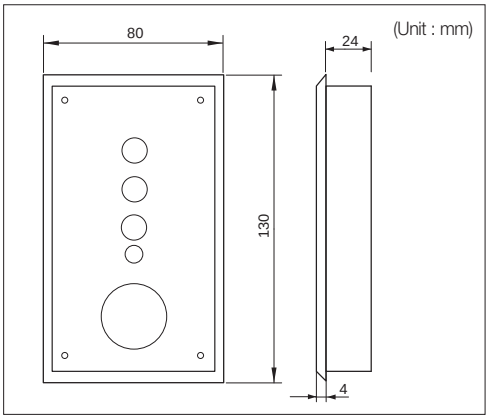
I. Individual Control Systems

I Individual control systems

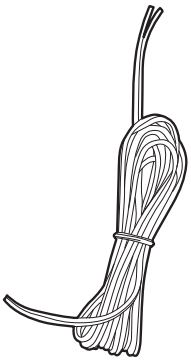
1. Receiver & Display unit

❑ *MRK-A10N*

1) Features



Receiver wire

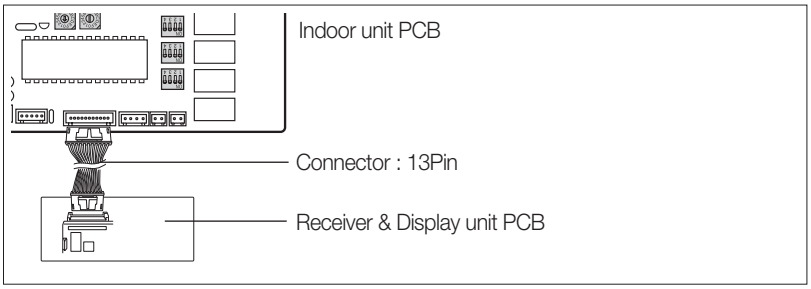


Receiver & Display Unit

- Concealed wireless signal receiver
- Filter replacement sign
- Fan operation display
- Operation Timer setting display
- Operation On/Off button
- Operation On display LED (blue)
- Defrost operation display LED (red)

2) Wiring

- Connect one end of the receiver wire with the Receiver & Display unit PCB.
- Connect the other end of the receiver wire with the duct type indoor unit PCB.



☑ ***Note***

- Wire length: 10m
- Receiver & Display unit is only available for a duct type indoor unit.

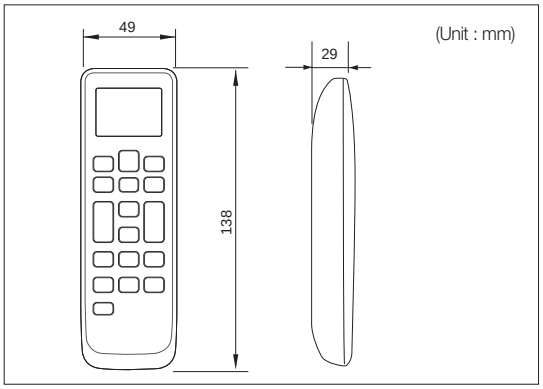
2. Wireless remote controller

❑ *MR-DH00*

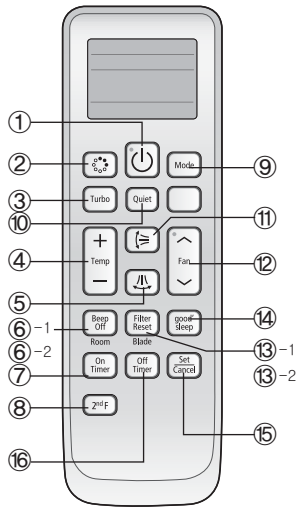
1) Features

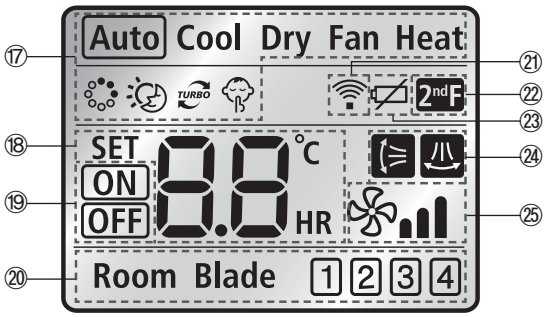
Easy and convenient operation control

- Operation ON/OFF control
- Fan speed control
- Operation temperature setting
- Filter replacement alarm reset
- Air swing control
- Simple On/Off timer
- Indoor unit option code setting



2) Description of parts





✷ ②, ⑥-1, ⑥-2, ⑧, ⑬-2, ⑳, ㉒ is only supported and available in certain indoor units.

No	Name	Description
①	On/Off button	Press this button to turn on/off the indoor unit.
②	S-Plasma ion button	Press this button to turn on/off the S-Plasma ion.
③	Turbo button	Press this button to cool your room quickly and powerfully.
④	Temp + - button	Press this button to increase/decrease the set temperature by 1°C.
⑤	Horizontal air swing button	Press this button to activate/deactivate horizontal air flow movement.
⑥-1	Beep Off button	Press this button to mute the beep sounds that occurs when pressing the button.
⑥-2	Room button	Press the 2nF function button and press this button to control individual indoor unit or all indoor units at once.
⑦	On timer button	Press the button to set the On Timer on.
⑧	2ndF button	Press this button to select the function printed under the button. (Room, Blade function)
⑨	Mode button	Press this button to select one of the 5 operation modes. (Auto, Cool, Dry, Fan, Heat)
⑩	Quiet button	Press this button to select quiet mode.
⑪	Vertical air swing button	Press this button to activate/deactivate vertical air flow movement. (Not applicable to Duct type model)
⑫	Fan ∧ ∨ button	Press this button to select one of the fan speeds. (Auto, Low, Medium and High.)
⑬-1	Filter Reset button	Press this button to turn off the filter indicator light.
⑬-2	Blade button	Press the 2nF function button and press this button to control individual blade unit or all blades at once.
⑭	good'sleep button	Press this button to set the good'sleep mode on.
⑮	Set/Cancel button	Press this button to set or cancel the On/Off Timer and good'sleep mode.
⑯	Off Timer button	Press this button to set the Off Timer on.
⑰	Operation mode indicator	Indicates the operation mode.
⑱	Set temperature & On/Off set time indicator	Basic – Indicates the set temperature. Timer setting – Indicates the On/Off set time.
⑲	On/Off timer indicator	Indicates the On/Off timer setting.
⑳	Room & Blade selection indicator	1) When [Beep off/Room] button is pressed after pressing the 2nF button, "Room" indicator will be displayed with the selected indoor unit number. 2) When [Filter Reset/Blade] button is pressed after pressing the 2nF button, "Blade" indicator will be displayed with the selected blade number.
㉑	Transmission indicator	Indicates when wireless signal is received (by pressing any buttons).
㉒	2ndF indicator	Indicates when 2nF button is pressed. You can select the second function (Selecting Room/ Blade)
㉓	Low battery indicator	Indicates the battery life.
㉔	Air swing indicator	Indicates when vertical or horizontal air flow movement.
㉕	Fan speed indicator	Indicates the fan speed settings.

I Individual control systems

2. Wireless remote controller

❑ *MR-DH00*

3) Additional function

(1) Option code setting

❶ Remove the batteries from the remote controller.

❷ Press the Temp [+] and [-] button at the same time and insert the batteries.

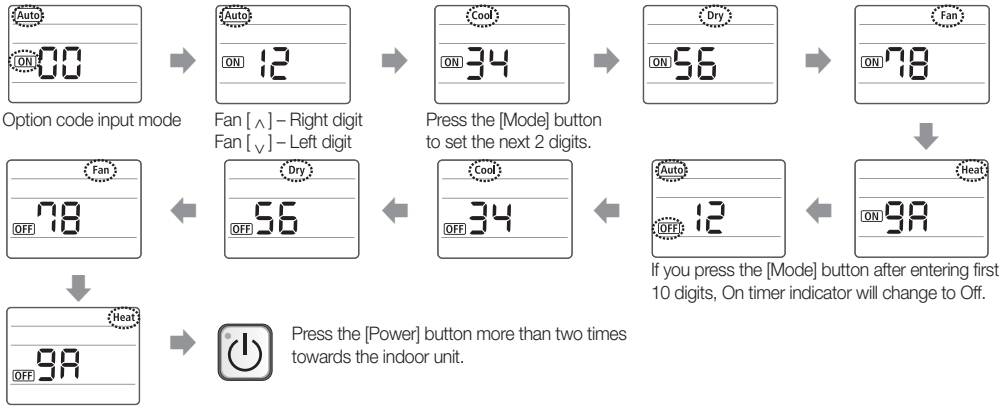
❸ Set the 2 digits of option code.
If you press the Fan [∧] button, you can change the right digit.
If you press the Fan [∨] button, you can change the left digit.

❹ Press the [Mode] button to set the next 2 digits of option code.
Input 20 digits in total.

❺ Press the ⏻ button more than twice to set the indoor unit option code.
(When indoor unit option code is set, a beep will sound. When the setting is incorrect, all the LED on the indoor unit panel will flicker.)

※ Option code is composed with total of 24 digits including page number.
From the wireless remote controller, enter the option code without page number.

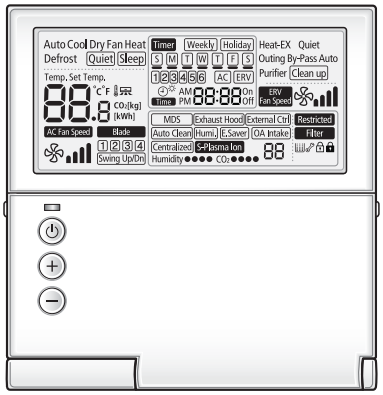
Setting Ex.) Option code: 012345 – 16789A – 212345 – 36789A
↑ Page 0 ↑ Page 1 ↑ Page 2 ↑ Page 3

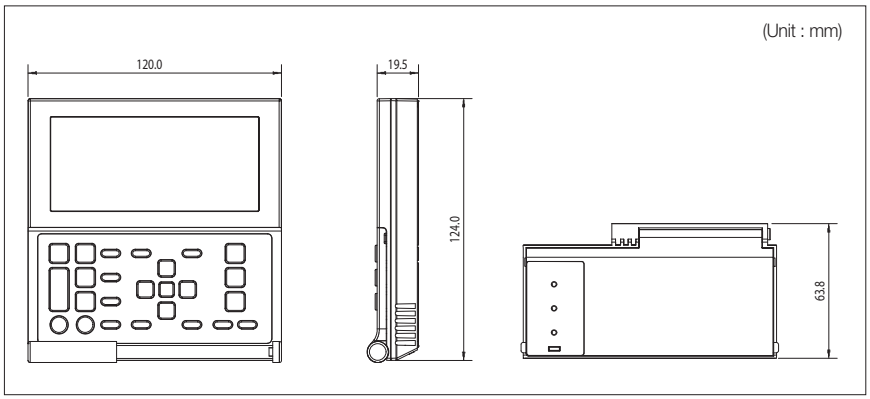


3. Wired remote controller

1 *MWR-WE10N*

1) Features





(1) Air conditioner / ERV control (ERV cannot be connected to MWR-WE10N until end of 2013)

- AC operation ON/OFF control
- AC operation mode, setting temperature, fan speed, air flow direction setting
- AC individual blade control and occupancy detection
  (Function is available when indoor units support any of above functions)
- ERV operation ON/OFF control
- ERV operation mode, fan speed setting
- AC/ERV error monitoring
- Filter cleaning alert and reset alert time
- Individual/group control, indoor unit/ERV interlocking control
- Energy saving control
- Control maximum 16 "Indoor unit + ERV" in group with single wired remote controller

(2) Energy saving operation

- Upper/Lower temperature limit setting
- Automatic operation stop: Automatically stops the operation, when it is not used for certain period of time set by user

(3) Weekly operation schedule setting

- Weekly operating schedule (A/C only, ERV only, A/C+ERV)
- Able to set desired AC operation mode, setting temperature and fan speed to operate based on weekly reservation
- Able to apply schedule exception day for fluid management

(4) User convenience function

- Child lock
- Different button permission levels
  (Opertion mode, temperature setting, ON/OFF, fan speed)
- Real-time clock: Displays current time, day (Summer time support)
- Built-in room temperature sensor
- Service mode support
  - Indoor unit cycle data monitoring
  - Indoor unit option code setting and monitoring
  - Indoor unit address and option setting and monitoring

2) Product specification

Power Supply	DC12V
Power Consumption	2W
Operating Temperature range	0°C~40°C
Operating Humidity range	30%RH~90%RH
Communication	2-wire PLC

Compatible product

Indoor unit	AM✶✶✶✶N✶✶✶✶✶✶Model

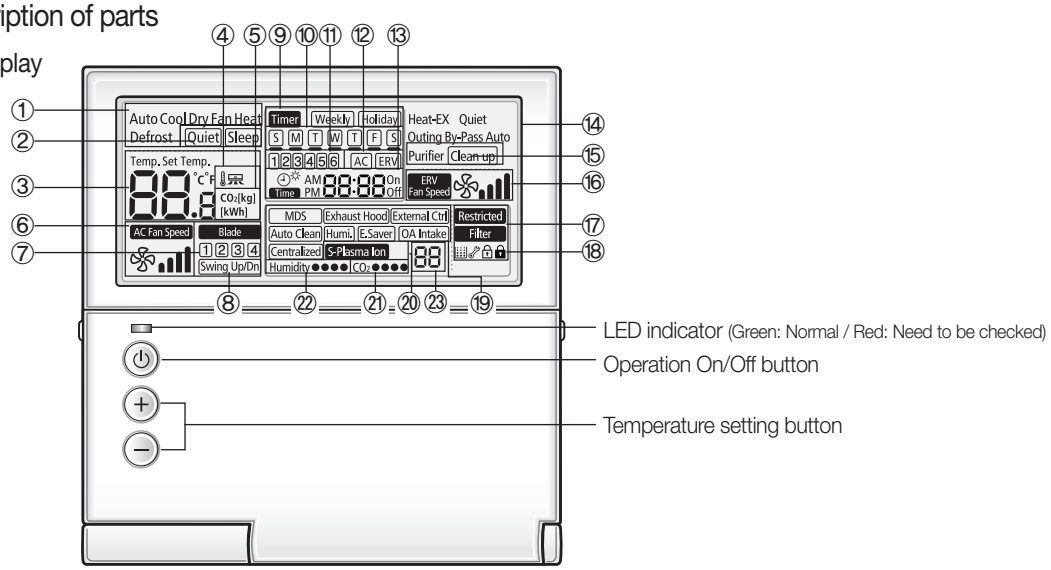
I Individual control systems

3. Wired remote controller

1 *MWR-WE10N*

3) Description of parts

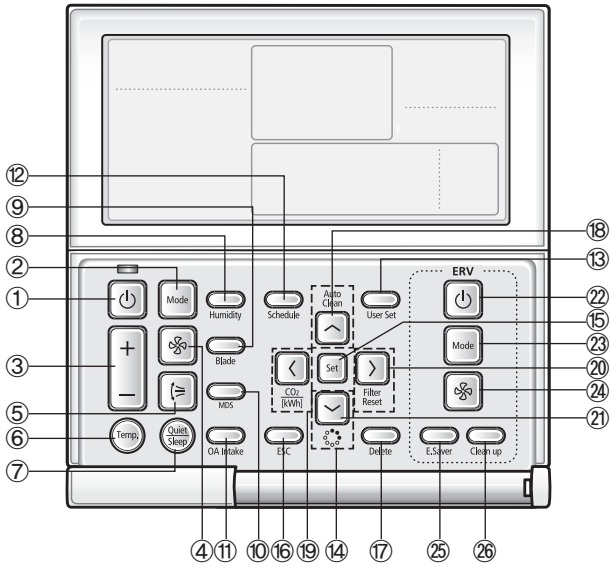
(1) Display



Classification		Indication	Function
Air conditioner related information	①	Auto Cool Dry Fan Heat Defrost	Displays air conditioner operation
	②	Quiet Sleep	Displays Quiet/Sleep operation
	③	Temp. Set Temp. 88.8 °C °F	Displays Indoor temperature/Set temperature
	④		Displays discharge temperature control
	⑤	88.8 °C CO2[kg] [kWh]	Displays CO_2 /power consumption
	⑥	AC Fan Speed	Displays AC fan speed
	⑦	Blade 1 2 3 4	Displays Blade selection
	⑧	Swing Up/Dn	Displays Air swing(Up/Dn)
Schedule related information	⑨	Timer Weekly Holiday	Weekly schedule/Holiday setting displays
	⑩	S M T W T F S	Displays Current day(□) or scheduled day(_)
	⑪	1 2 3 4 5 6	Displays Schedule number
	⑫	AC ERV	Displays Scheduled device selection
	⑬	Time AM PM 88:88 On Off	Displays Current time/daylight saving time/scheduled time
Ventilator (ERV) related information	⑭	Heat-EX Quiet Outing By-Pass Auto Purifier	Displays Ventilator(ERV) operation
	⑮	Clean up	Displays Clean up
	⑯	ERV Fan Speed	Displays Ventilator(ERV) fan speed
Common function related information	⑰	Restricted Filter	Displays Invalid operation /Filter cleaning (filter cleaning period)
	⑱		Displays Dust box cleaning alert/check/part lock / All lock
	⑲	MDS Exhaust Hood External Ctrl Auto Clean Humi. E.Saver OA Intake Centralized	Displays Motion detect sensor/Exhaust hood/External interconnection control/Auto clean/ Humidifying/Energy saving/Outdoor air supply intake/Centralized control
	⑳	S-Plasma Ion	Displays S-Plasma Ion
	㉑	CO_2 ●●●●	Displays Indoor CO_2 density
	㉒	Humidity ●●●●	Displays Indoor humidity
	㉓	88	Displays remaining time of the auto stop time / ERV delay time - Solid : Hour unit, Blinking : Minute unit

✳ ERV cannot be connected to MWR-WE10N until end of 2013

(2) Buttons



Classification		Button	Function	
Air conditioner related button	①		Operation On/Off button	Turn the air conditioner power On/Off
	②	Mode	Mode button	Selects the desired air conditioner operation
	③	+ −	Temperature setting button	Sets the desired temperature
	④		Fan speed button	Changes the air conditioner's fan speed
	⑤		Air swing button	Changes the air flow direction to move upward or downward
	⑥	Temp.	Temp. button	Checks the indoor temperature
	⑦	Quiet Sleep	Quiet/Sleep button	Selects quiet or sleep operation for the air conditioner
	⑧	Humidity	Humidity button	Turns the AHU humidifying function On/Off
	⑨	Blade	Blade button	Selects a blade for individual control
	⑩	MDS	MDS button	Set the power to automatically turn off if there is nobody in the room
	⑪	OA Intake	Outdoor air intake	Select the AHU Outdoor intake function
Common function related button	⑫	Schedule	Schedule Button	Select the schedule setting function
	⑬	User Set	User Set Button	Select the detailed setting function
	⑭		Navigational buttons	Move between items or change the item value
	⑮	Set	Set button	Save new setting
	⑯	ESC	ESC button	Return to general mode from schedule and detailed setting screens
	⑰	Delete	Delete button	Cancel the schedule setting
	⑱	Auto Clean	Auto Clean button	Use the auto cleaning function for your air conditioner
	⑲	CO2 [kWh]	CO_2/[kWh] button	Display the amount of CO_2 and the power consumption
	⑳	Filter Reset	Filter Reset button	Turn off the filter cleaning displays (filter using time reset)
	㉑		S-Plasma Ion button	Choose the S-Plasma ion function
Ventilator (ERV) related buttons	㉒		Operation On/Off button	Turn the Ventilator(ERV) On/Off
	㉓	Mode	Mode button	Select the desired operation for the Ventilator(ERV)
	㉔		Fan speed button	Change the fan speed for your Ventilator(ERV)
	㉕	E.Saver	E. Saver button	Begin Energy Saving Operation
	㉖	Clean up	Clean up button	Select air purification through the in/out load controls

✳ ERV cannot be connected to MWR-WE10N until end of 2013

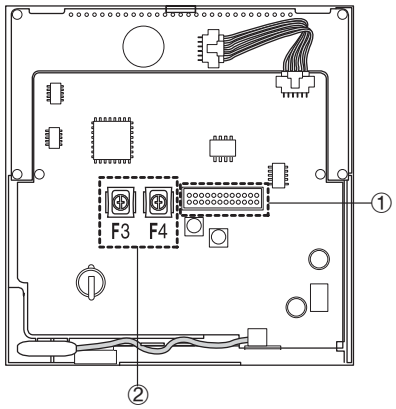
I Individual control systems

3. Wired remote controller

1 *MWR-WE10N*

3) Description of parts

(3) PCB



No.	Name	Description
①	Software upgrade connector	It is used to upgrade the software
②	Communication and power wiring terminal	Connection with indoor unit (F3/F4)

✳ MWR-WE10N uses 2-wire power line communication.

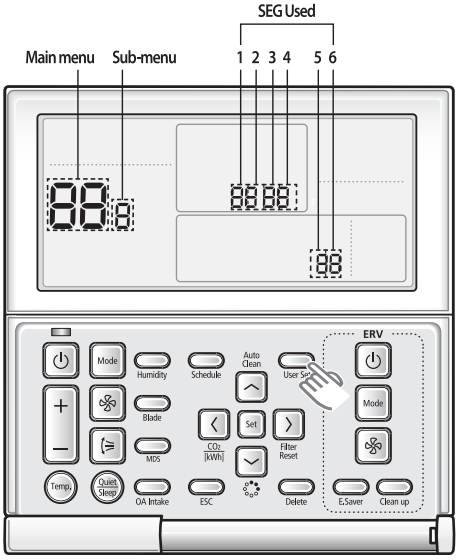
4) Option function

User setting mode

Main menu	Sub menu	Function		SEG Used	Default	Range	Unit
1		Auto stop time setting/checking		1,2	0	0~12 hours	1 hour
2		Temp limits [°C(°F)]	Lowest temperature	1,2	16 (61)	16~30°C (61~86°F)	1°C(1°F)
			Highest temperature	3,4	30 (86)	18~30°C (65~86°F)	1°C(1°F)
3		All lock		1	0	0 – Unlock, 1 - Lock	-
		Lock of partial button	On/Off button	2	0	0 – Unlock, 1 – Lock	-
			Mode button	3	0	0 – Unlock, 1 – Lock	-
			Temperature button	4	0	0 – Unlock, 1 – Lock	-
			Fan speed button	5	0	0 – Unlock, 1 – Lock	-
			Schedule button	6	0	0 – Unlock, 1 – Lock	-
4	1	Current date Setting (Year, Month, Date)		1,2/3,4 /5,6	10/01/01	00~99/1~12/1~31	YY/MM/ DD
	2	Current Time Setting (Day, Hour, Minute)		Day/ Am,Pm /1,2/3,4	Friday/ PM /12/00	Sun~Sat/AM~PM/0~12/0~59	Day/ Hour/ Minute
5	1	Summer Time Use and Setting Methods	Use of summer time (Y/N)	1	0	0 – No use, 1 – Use	-
			Summer Time Application Method	2	0	0 – Weekly, 1 – Daily	-
	2	Summer time use (Weekly) Start (? Month, ? th Sunday)		1,2/4	03/F	1~12th month / 1~4,F (last week)th week	-
	3	Summer time use (Weekly) End (? Month, ? th Sunday)		1,2/4	10/F	1~12th month / 1~4,F (last week)th week	-
	4	Summer time use (Daily) Start (? Month, ? th Sunday)		1,2/3,4	03/22	Jan~Dec /1~31th day	Month, date
	5	Summer time use (Daily) End (? Month, ? th Sunday)		1,2/3,4	09/22	Jan~Dec / 1~31th day	Month, date
6		Backlight Time Setting/Checking		1,2	5	0~30 sec	1sec
		Use of LED(Green) (Y/N)		3	1	0 – No use, 1 – use	-
		Use of LED (Red) (Y/N)		4	1	0 – No use, 1 – use	-
7		Ventilator (ERV) delay time setting/checking [When using Ventilator (ERV) interlocking control]	Ventilator(ERV) Delay Application (Y/N)	1	0	0 – No use, 1 – use	-
			Delay Time	3,4	30	30~60 minutes	1 minute
0		Reset to user mode defaults (except the current time)		1	0	0 – No use, 1 – Reset	-

✳ ERV cannot be connected to MWR-WE10N until end of 2013

▶ How to set the user mode

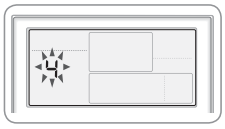


(1) If you want to set the detailed settings, press the [User Set] button.
- You will enter the User Set mode, and the [Main Menu] will be displayed.

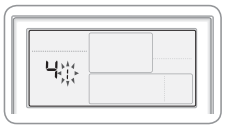
(2) Refer to the Wired Remote Controller's User Set list on the next page to select the desired menu.
- Using the [∧]/[∨] buttons, select a main menu number and press the [>] button to enter the sub-menu setting screen.
- Using the [∧]/[∨] buttons, select a sub-menu number and press the [>] button to enter the data setting screen.
- Once you have entered the setting screen, the current setting will be displayed.
- Refer to the chart for data setting.
- Using the [∧]/[∨] buttons, change the settings and press the [>] button to move to the next setting.
- Press the Set button to save the setting and exit to the sub-menu setting screen.
- Press the Esc button to exit to general mode.

☑ *Note*
- While setting the data, you can use the [∧]/[∨] buttons to set the range of SEG used.
- While configuring the setting, press the [Esc] button to exit to the sub-menu setting screen without saving the setting.

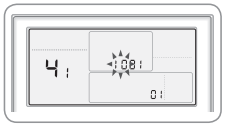
▶ Current time setting (Example)



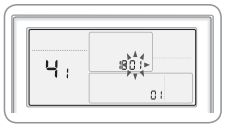
(1) Press the [User Set] button.
- (Main Menu) will be displayed, and you can press the [∧]/[∨] buttons to select No.4, which will set the current time.



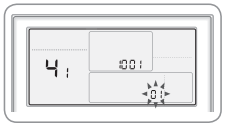
(2) Press the [>] button to select 'Year, Month, Date' in the [Sub-menu].
- Press the [∧]/[∨] buttons to select No. 1. You can modify the year/month/date setting.



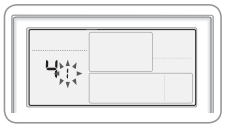
(3) Press the [>] button to select the 'Year'.
- Press the [∧]/[∨] buttons to select the year ('00~'99).



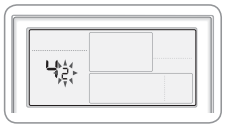
(4) Press the [>] button to select the 'Month'.
- Press the [∧]/[∨] buttons to select month(01~12).



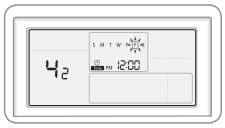
(5) Press the [>] button to select the 'Day'.
- Press the [∧]/[∨] buttons to select day(01~31).



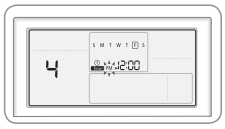
(6) Press the [Set] button to complete your setting of 'Year, Month, Day'.
- The setting changes will be applied and you can exit to the sub-menu.



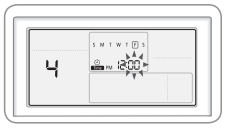
(7) In the sub-menu, select 'day, AM/PM, hour, minute'.
- Press the [∧]/[∨] buttons to select no. 2. You can set the 'day, AM/PM, hour, minute'.



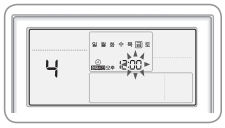
(8) Press the [>] button to select the 'Day'.
- Press the [∧]/[∨] buttons to select day (Sun~Sat).



(9) Press the [>] button to select 'AM or PM'.
- Press the [∧]/[∨] buttons to toggle between AM and PM.



(10) Press the [>] button to select the 'Hour'.
- Press the [∧]/[∨] buttons to select the hour (01~12).



(11) Press the [>] button to select the 'Minute'.
- Press the [∧]/[∨] buttons to select minute (00~59).

(12) Press the [Set] button to complete the current time setting.
- The setting changes are applied and you can exit to general mode.

(13) Press the [Esc] button to exit to general mode.

I Individual control systems

3. Wired remote controller

1 *MWR-WE10N*

4) Option function

Service mode

Main menu	Sub menu	Function		SEG Used	Default	Range	Unit
1	1	Wired remote controller Option setting / checking (1)	Cooling / Heating selection	1	0	0-Cooling/Heating, 1-Cooling only	-
			Use of wireless remote controller	2	1	0-No use, 1-Use	-
			MAIN / SUB wired remote controller	3	0	0-MAIN, 1-SUB	-
			Temperature unit	4	0	0 – Celsius(°C), 1 – Fahrenheit(°F)	
	2	Wired remote controller Option setting / checking (2)	Temperature sensor selection	1	0	0–Indoor unit, 1–Wired remote controller	-
			Use of average temperature	2	0	0-No use, 1-Use	-
			Use of Auto mode	3	1	0-No use, 1-Use	-
			Temperature display	4	0	0–Set temperature,1-Room temperature	-
			AC On/Off button function	5	0	0–Indoor unit+ERV, 1–Indoor unit only, 2–ERV only	-
	3	Blade setting / checking	Lock blade 1	1	0	0- Unlock, 1- Lock	-
			Lock blade 2	2	0	0- Unlock, 1- Lock	-
			Lock blade 3	3	0	0- Unlock, 1- Lock	-
			Lock blade 4	4	0	0- Unlock, 1- Lock	-
	4	ERV option Setting / checking	Use of By-pass mode	1	0	0-No use, 1-Use	
			Use of Auto mode	2	0	0-No use, 1-Use	
			Use of air purification mode	3	0	0-No use, 1-Use	
			Use of external control	4	0	0-No use, 1-Use	
	5	Room temperature compensation	Current room temperature	1, 2, 3	-	-9 ~ 40(°C)	0.1(°C)
			Temperature compensation value	4,5,6	-	-9.9 ~ 9.9(°C)	0.1(°C)
	6	number of connected indoor units	Number of indoor units	1,2	0	0~16	-
			Number of ERVs	3,4	0	0~16	-
	7	Temperature increment/decrement unit (°C only)		1	-	0-1°C, 1-0.5°C, 2-0.1°C	-
	0	Factory option setting		1	-	0-Unchanged, 1-Factory setting	-
2	1	Software code		1~6	-	Software code	-
	2	Software version		1~6	-	Software version	-
3	1	Indoor unit room temperature		1,2,3	-	Room temperature	°C
	2	Indoor unit EVA IN temperature		1,2,3	-	EVA IN temperature	°C
	3	Indoor unit EVA OUT temperature		1,2,3	-	EVA OUT temperature	°C
	4	Indoor unit EEV step		1,2,3	-	EEV step	-
	5	Indoor unit option checking(1)	Use of central control	1	-	0-No use, 1-Use	-
			Use of drain pump	2	-	0-No use, 1-Use	-
			Use of electric heater	3	-	0-No use, 1-Use	-
			Use of hot water coil	4	-	0-No use, 1-Use	-
	6	Indoor unit option checking(2)	Use of external control	1	-	0-No use, 1-Use	-
			Use RPM compensation	2	-	0-No use, 1-Use	-
			Filter time	3	-	0-2000 hours, 1-1000 hours	-
			Heating temperature compensation	4	-	0-2°C, 1-5°C	-
			EEV stop step in heating	5	-	0-0/80 step, 1- 80 step	-
4	1	Indoor unit option setting 2)*	Indoor unit main address	1, 2	-	Main address(00H~4FH, Hexadecimal digits)	-
			Indoor unit setup address (Manual setting main address)	3, 4	-	Main address (00H~4FH, Hexadecimal digits)	-
			Indoor unit RMC address	5, 6	-	RMC address (00H~FEH, Hexadecimal digits)	-
	2		Indoor unit Product option code	1)*	-	Indoor unit option code	-
	3		Indoor unit INSTALL option	1)*	-	Refer to the indoor unit installation manual for details	-
	4		Indoor unit INSTALL option(2)	1)*	-		-

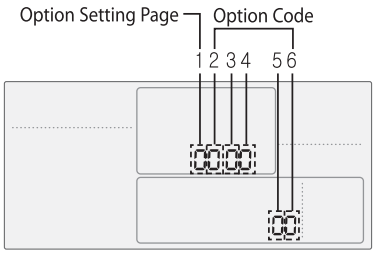
Main menu	Sub menu	Function		SEG Used	Default	Range	Unit
5	1	AHU setting/ checking	Setting/checking the different value	1, 2	-	0~30	1
			RPM setting /checking	3, 4	-	0~25	1RPM
			Filter performance	5	-	0- Pre, 1-Medium performance, 2-High performance	-
			Humidity setting / checking	6	-	0-30, 1-40, 2-50	-
	2	Indoor unit, AHU discharge temperature setting /checking	Use of discharge temperature control	1	-	0-No use, 1-Use	-
			Cooling discharge temperature	3, 4	-	8~18°C	1°C
			Heating discharge temperature	5, 6	-	30~43°C	1°C
	3	Fresh Duct discharge temperature checking	Cooling discharge temperature	1, 2	-	13~25°C	1°C
			Heating discharge temperature	3, 4	-	18~30°C	1°C
6	1	ERV Plus setting / checking	Use of cold air prevention	1	-	0-No use, 1-Use	-
			Use of humidification	2	-	0-No use, 1-Use	-
			Use of fan operation in defrost	3	-	0-No use, 1-Use	-
			Use of humidification	4	-	0-No use, 1-Use	-
	2	ERV Plus temperature setting /checking	Cooling	1, 2	-	15~30°C	1°C
			Heating	3, 4	-	15~30°C	1°C
	3	ERV Plus Auto mode temperature setting /checking	Set temperature	1, 2	-	15~30°C	1°C
			Set temperature difference	3, 4	-	5~15°C	1°C
	4	Setting/checking the compensation temperature A under the Heating EEV control for ERV Plus		1, 2	-	0~10°C	1°C
		Checking the compensation temperature B under the Heating EEV control for ERV Plus		3, 4	-	0-Non use humidifier(0°C) 1-Use humidifier(10°C)	-
	5	ERV	Air supply RPM	1, 2	-	10~27RPM	1 RPM
7	1	Master / checking (F3F4 line Indoor unit master)	Indoor unit master setting/ checking	1, 2,3, 4,5,6	-	Address	-
	2		ERV unit master setting/ checking	1, 2,3, 4,5,6	-	Address	-
	3	Mode master indoor unit setting/ checking (F1F2 line Indoor unit master) 3)*	Mode master indoor unit checking	1, 2,3, 4,5,6	-	Address	-
	4		Mode master indoor unit setting	1	-	0-No use, 1-Use, 2-Release	-
0	1	Reset	Factory setting	1	0	0-No use, 1-Reset	-
	2		Power master reset 4)*	1	0	0-No use, 1-Reset	-
	3		Addressing reset	1	0	0-No use, 1-Reset	-

1)* SEG1 means option setting page/ SEG2~6 means option code.

2)* If you enter Main menu #4, you must select the targeted indoor unit address and then select the sub menu.

3)* Mode master indoor unit : The indoor unit which can decide the operation mode. Other indoor unit follows Mode master indoor unit's operation mode.

4)* Power master reset : Setting for finding the most stable power supply indoor unit.



▶ To set 24 digit option

Page	Option Setting	How to move between pages
Page1	1~5th digit option	Press the [>] button to go to Page2.
Page2	6~10th digit option	Press the [>] button to go to Page3.
Page3	11~15th digit option	Press the [>] button to go to Page4.
Page4	16~20th digit option	Press the [>] button to go to Page5.
Page5	21~24th digit option	-

I Individual control systems

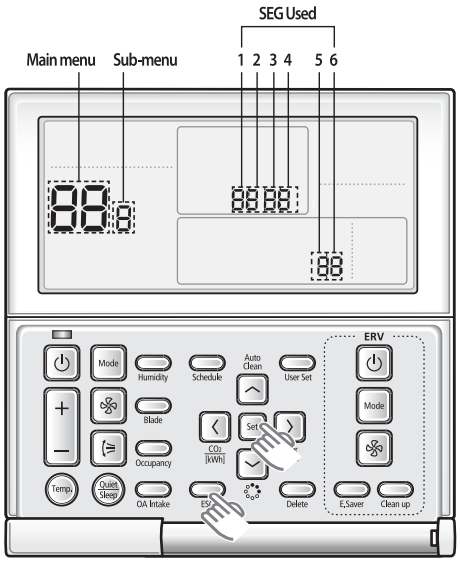
3. Wired remote controller

1 *MWR-WE10N*

4) Option function

Service mode

▶ How to set the service mode



(1) If you want to use the various additional functions for your Wired Remote Controller, press the [Set] and [Esc] buttons at the same time for more than three seconds.

- You will enter the additional function settings, and the [main menu] will be displayed.

(2) Refer to the list of additional functions for your Wired Remote Controller on the next page, and select the desired menu.

- Using the [∧]/[∨] buttons, select a main menu number and press the [>] button to enter the sub-menu setting screen.
- Using the [∧]/[∨] buttons, select a sub-menu number and press the [>] button to enter data setting screen.
- When you enter the setting stage, the current setting will be displayed.
- Refer to the chart for data settings.
- Using the [∧]/[∨] buttons, select the settings. Press the [>] button to move to the next setting.
- Press the [Set] button to save the settings and exit to the sub-menu setting screen.
- Press the [Esc] button to exit to normal mode.

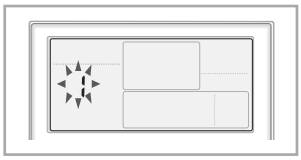
☑ ***Note***

- While setting the data, you can use the [∧]/[∨] buttons to set the range of SEG
- While configuring the setting, press the [Esc] button to exit to the setting sub-menu without saving your changes.

▶ Example method of setting wired remote controller option

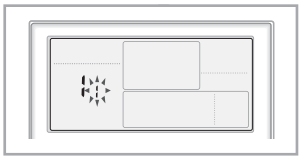
(1) Press the [Set] and [ESC] buttons at the same time for more than 3 seconds.

- When(Main menu) is displayed press the [∧]/[∨] button to select no.1.



(2) Press the [>] button to select the number you will set.

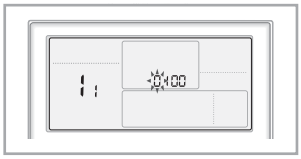
- Press the [∧]/[∨] button and select no.1

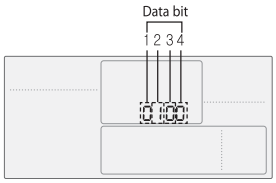


(3) Press the [>] button to enter the data setting stage.

- When you enter the setting stage, the current setting value will be displayed.

▶ Example of data setting stage display

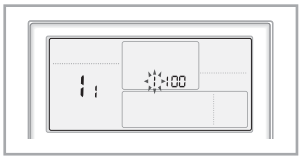




SEG1: Heat pump indoor unit
SEG2: Use wireless remote controller
SEG3: Master wired remote controller
SEG4: Temperature display – Celsius (°C)

(4) Press the [<]/[>] button to select the desired Data1.

- Press the [∧]/[∨] button to select no.1.
- The wired remote controller option is set from both cooling and heating to cooling only.



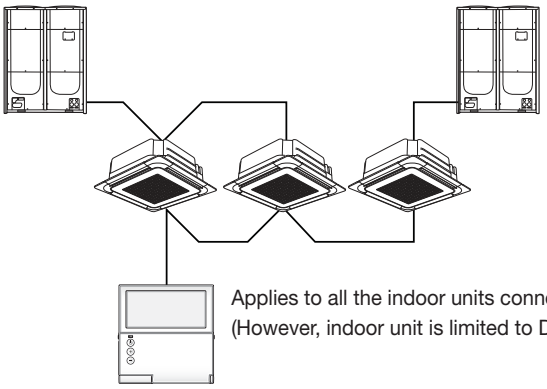
(5) Press [Set] button to complete the option setting.

- Save the setting value and exit to sub menu.

(6) Press [Esc] button to exit to normal mode.

Built-in temperature sensor of wired remote controller

▶ Temperature control with built-in temperature sensor

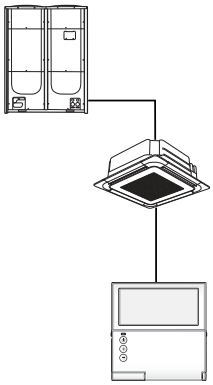


Applies to all the indoor units connected within a group.
(However, indoor unit is limited to DVM S series)

✳ Check the setting of the wired remote controller built-in sensor from the service menu.

Main menu	Sub menu	Function		Used SEG	Factory setting	Description	Unit
1	1	Wireless remote controller Option setting / checking (1)	Cooling / Heating selection	1	0	0-Cooling/Heating, 1-Cooling only	-
			Use of wireless remote controller	2	1	0-No use, 1-Use	-
			MAIN / SUB wired remote controller	3	0	0-MAIN, 1-SUB	-
			Temperature unit	4	0	0 – Celsius(°C), 1 – Fahrenheit(°F)	
	2	Wireless remote controller Option setting / checking (2)	Temperature sensor selection	1	0	0–Indoor unit, 1–Wired remote controller	-
			Use of average temperature	2	0	0-No use, 1-Use	-
			Use of Auto mode	3	1	0-No use, 1-Use	-
			Temperature display	4	0	0–Set temperature,1-Room temperature	-
			AC On/Off button function	5	0	0–Indoor unit+ERV, 1–Indoor unit only, 2–ERV only	-

▶ Heating mode temperature compensation



Indoor unit INSTALL option setting (Refer to indoor unit intallation manual)

SEG	Function	Value
21	Heating setting temperature compensation	1 – 2°C 2 - 5°C

☑ *Note*

- When built-in sensor of the wired remote controller is used, heating mode temperature compensation (+2°C or +5°C) will be reset to 0°C.

✳ If there is no option switch on the indoor unit PCB, check the setting of the heating temperature compensation from the service menu.

Main menu	Sub menu	Function		Used SEG	Factory setting	Description	Unit
3	6	Indoor unit option checking(2)	Use of external control	1	-	0-No use, 1-Use	-
			Use RPM compensation	2	-	0-No use, 1-Use	-
			Filter time	3	-	0-2000 hours, 1-1000 hours	-
			Heating temperature compensation	4	-	0-2°C, 1-5°C	-
			EEV stop step in heating	5	-	0-0/80 step,1-80 step	-

I Individual control systems

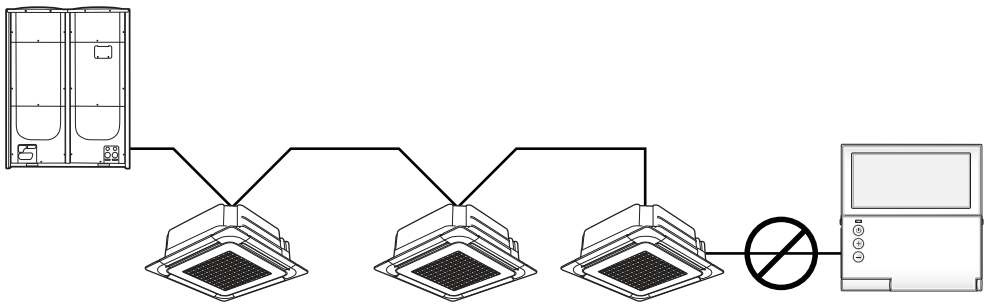
3. Wired remote controller

1 *MWR-WE10N*

4) Option function

Built-in temperature sensor of wired remote controller

▶ When communication error or power failure occurs while using built-in temperature sensor



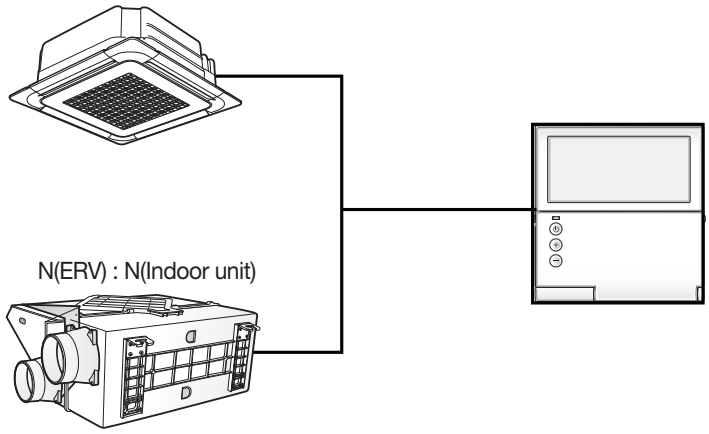
(1) When communication error occurs over 3 minutes,

- Indoor unit ignores the built-in temperature sensor and use indoor unit temperature sensor.
- Ignores the temperature compensation setting on the wired remote controller and use the compensation value set on indoor unit instead.

(2) When communication resumes,

- Built-in temperature use is recovered.
- Setting must be done again to use the temperature compensation.

Energy saving operation mode



✳ Energy saving operation mode is available only when there is at least one indoor unit and ERV is connected.

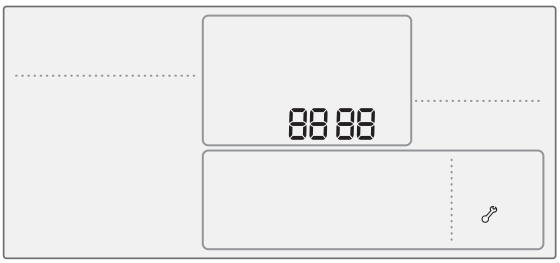
- By comparing indoor room temperature, setting temperature and outdoor temperature, wired remote controller changes ERV operation mode and fan speed to minimize unnecessary outdoor unit operation.
- Energy saving operation is not available when ERV is not connected.
- Energy saving operation is not available when 'Centralized control' is set.
- Energy saving operation will not be executed when ERV is set to Outing mode or set in external interlocking mode.
- Temperature measurement is set as indoor unit temperature sensor as default, and it can be changed depending on the wired remote controller option setting.

✳ ERV cannot be connected to MWR-WE10N until end of 2013

5) Display

Error display

Error codes for the Wired Remote Controller and the product connected to the Wired Remote Controller will be displayed in the LCD display.

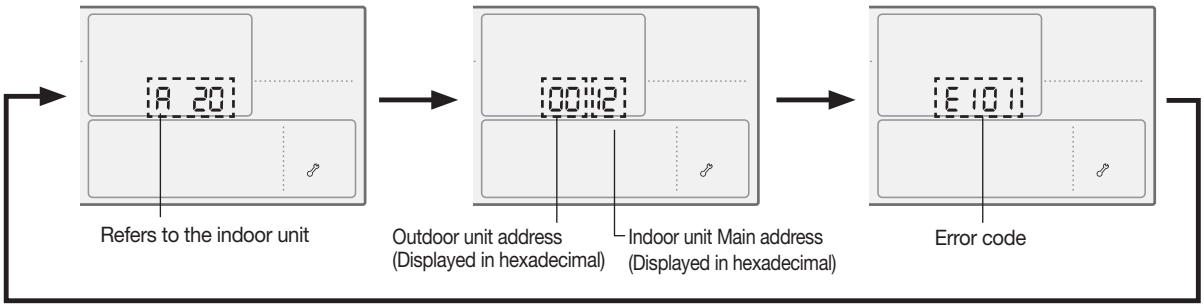


LCD Display

▶ When an Error Occurs in Your Indoor/Outdoor Units (Product Group Display : A20)

- The product address for the error will be displayed, followed by the error code.

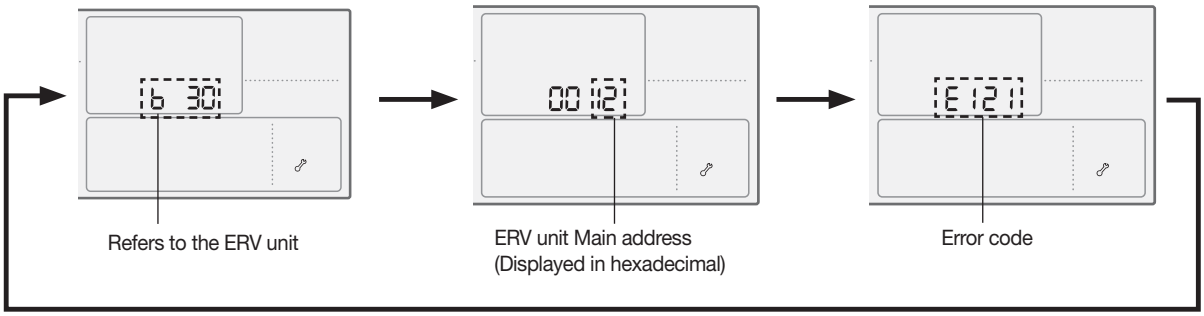
Example : Error 121 occurred in indoor unit with main address no. 18 (decimal numbers).



▶ When an Error Occurs in Your Ventilator(ERV) (Product Group Display : B30)

- The product address for the error will be displayed, followed by the error code.

Example : Error 121 occurred in indoor unit with main address no. 18 (decimal numbers).



▶ When an Error Occurs in Your Wired Remote Controller

- Only an error code will be displayed. (No address will be displayed.)

Example : Error 601 has occurred at your Wired Remote Controller.

I Individual control systems

3. Wired remote controller

1 *MWR-WE10N*

5) Display

Wired remote controller error codes

Display	Description	Remarks
601	Communication error between wired remote controller and indoor/ERV units after successful communication	
602	No communication between Master (Main) and Slave(Sub) wired remote controllers	
604	No communication between wired remote controller and indoor/ERV units	
606	Wired remote controller is connected on F1/F2 channel	
607	Two or more wired remote controllers are set as Master (Main)	When using Master remote controller
608	No ERV unit installed for interlocking function	Detection available from both Master/Slave wired remote controller
609	No indoor unit installed for interlocking function	When external interlocking control is in use
618	Over 16 indoor/ERV indoor units installed	
619	Indoor units of different temperature setting (°C/°F) connected to same wired remote controller	Detection available in Master wired remote controller
620	Wired remote controller(s) has different temperature unit setting with indoor unit(s)	
653	Temperature sensor Open/Short error	Detection available in models with temperature sensor
654	• Memory error • No damper feedback	

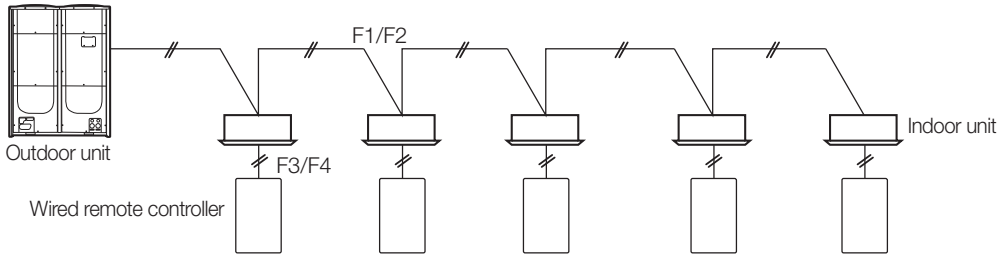
✳ ERV cannot be connected to MWR-WE10N until end of 2013

☑ *Note*

◆ For the error codes for your indoor/outdoor units and ventilator (ERV), refer to the installation manual of each device.

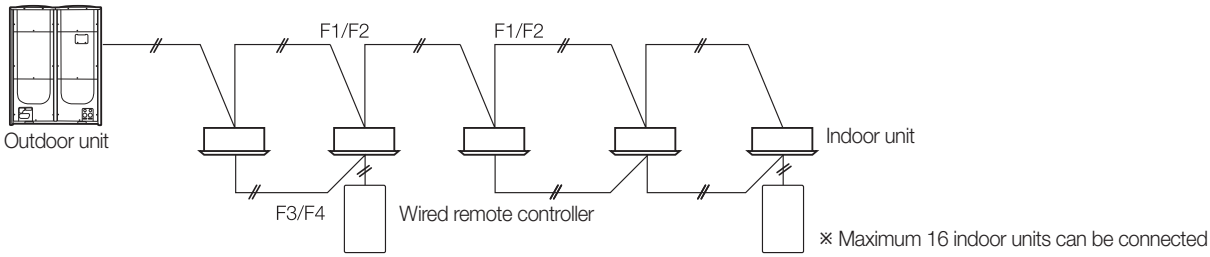
6) Communication diagram

Individual control (1) Control 1 indoor unit with 1 wired remote controller



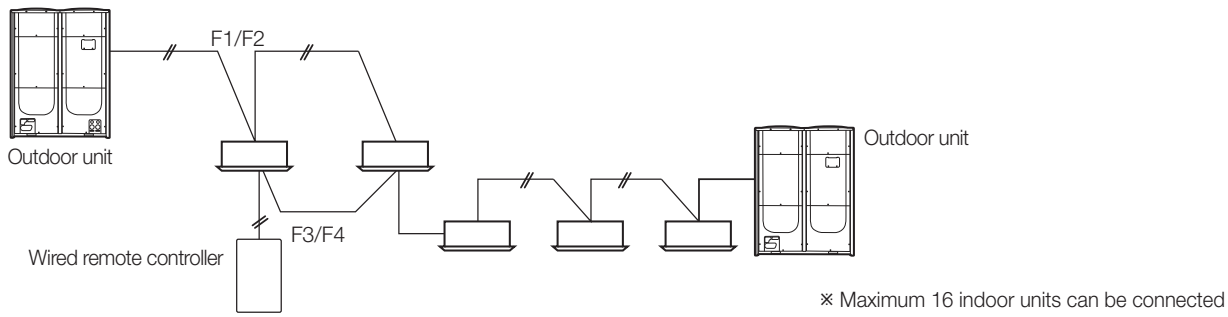
Control	All connected indoor units
Display	Operation status of the connected indoor unit

Group control (1) Control multiple indoor units with 1 wired remote controller



Control	All connected indoor units
Display	Priority 1. Display the status of View Master indoor unit Priority 2. Display the status of indoor unit which has the earliest Main address

Group control (2) Control multiple indoor units connected to different outdoor units with 1 wired remote controller



Control	All connected indoor units
Display	Priority 1. Display the status of View Master indoor unit Priority 2. Display the status of indoor unit which has the earliest Main address

▶ Caution

When controlling group of indoor units connected to different outdoor unit, address of the each outdoor unit must be set differently.

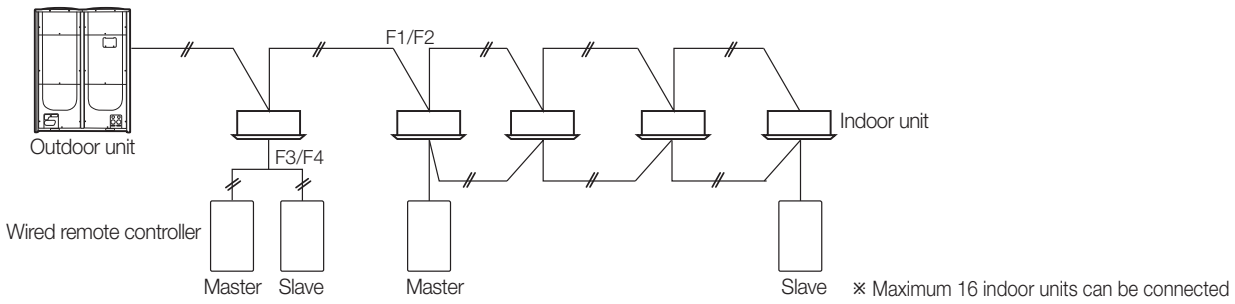
I Individual control systems

3. Wired remote controller

1 *MWR-WE10N*

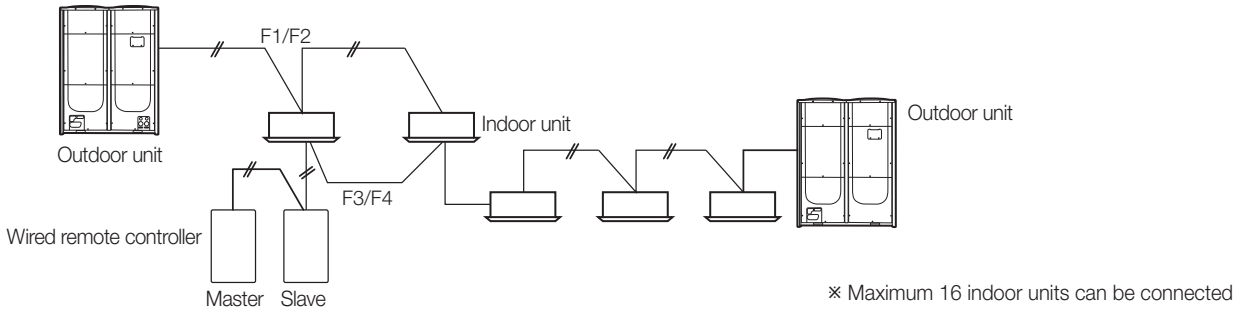
6) Communication diagram

Group control (3)	Control 1 or multiple indoor units with 2 wired remote controllers



Control	All connected indoor units
Display	Priority 1. Display the status of View Master indoor unit Priority 2. Display the status of indoor unit which has the earliest Main address ✳ Two wired remote controllers identically display the operation status of the indoor unit according to above priority.

Group control (4)	Control multiple indoor units connected to different outdoor units with 2 wired remote controller

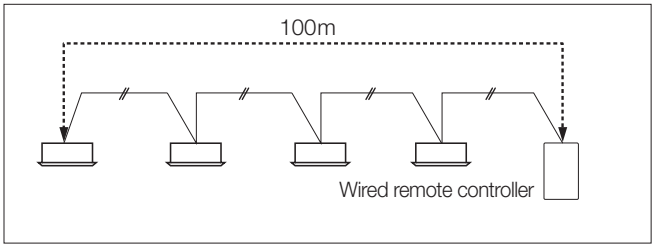


Control	All connected indoor units
Display	Priority 1. Display the status of View Master indoor unit Priority 2. Display the status of indoor unit which has the earliest Main address ✳ Two wired remote controllers identically display the operation status of the indoor unit according to above priority.

▶ Caution

When controlling group of indoor units connected to different outdoor unit, address of the each outdoor unit must be set differently.

Max. distance between the farthest indoor unit and wired remote controller : 100m

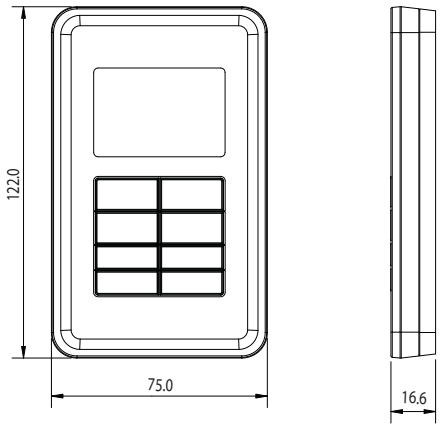


② *MWR-SH00N*

1) Features

- Simplified wired remote controller
- AC operation ON/OFF control
- Fan speed control
- Setting operation temperature
- Reset filter cleaning alert indicator
- Adjust air flow direction
- Operation on/off timer function

(Unit : mm)



2) Product specification

Power supply	DC 12 V
Power consumption	1.5 W
Operating temperature range	0°C~40°C
Operating humidity range	30 % RH~90 % RH
Communication	2-wire PLC
Maximum length of connection	100 m
Maximum number of controllable devices	16 indoor units

Compatible product

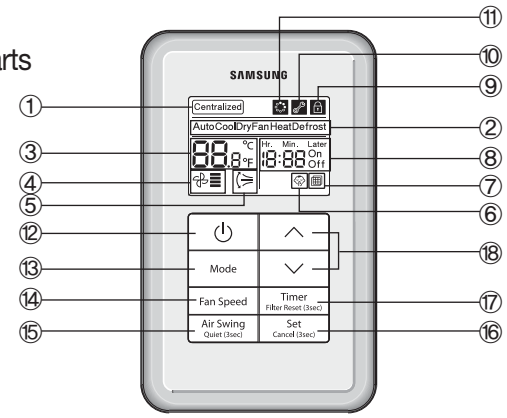
Indoor unit	AM✶✶✶✶N✶✶✶✶✶✶Model

I Individual control systems

3. Wired remote controller

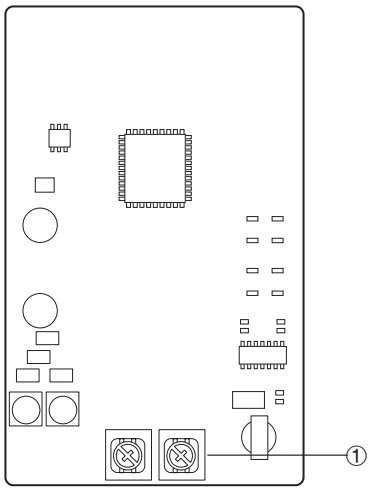
② *MWR-SH00N*

3) Description of parts



No.	Name	Description
①	Centralized control indicator	Indicator will be on when remote controller usage restriction is set. (Devices that support centralized control: OnOff controller, DMS2, Touch centralized controller etc.)
②	Operation mode indicator	Indicates current operation mode when the indoor unit is operating (Cool/Auto/Dry/Fan/Heat)
③	Set temperature indicator	Indicates the set temperature when the indoor unit turns on.
④	Fan speed indicator	Indicates the fan speed settings.
⑤	Air swing indicator	Indicates when vertical air swing is on.
⑥	Quiet mode indicator	Indicates when quiet mode is on.
⑦	Filter cleaning indicator	Indicates when preset filter cleaning period is passed.
⑧	Timer indicator	On : Indicates when On timer is set Off : Indicates when Off timer is set Hr. Min. Later : ① Timer mode – Displays the set time for On/Off timer (Min. 30 minutes ~ Max. 18 hours) ② General mode - Displays remaining time before Timer function will execute
⑨	Lock / Restricted indicator	This icon will be displayed when button is locked or when unavailable function (function which indoor unit does not support) is selected ① Icon On: All buttons are locked ② Icon blinks for 3 seconds: When partially locked button is pressed or unavailable function (function which indoor unit does not support) is selected
⑩	SPi indicator	Indicates that SPi or other cleaning function of the indoor unit is on.
⑪	Inspection indicator	Indicates that inspection is required.
⑫	On/Off button	Press this button to turn on/off the indoor unit.
⑬	Mode button	Press this button to select the desired operation mode. (Auto → Cool → Dry → Fan → Heat)
⑭	Fan speed button	Press this button to select one of the fan speeds from Auto, Low, Medium, High, Turbo. Available Fan Speed may differ depending on the operation mode of the indoor unit. Low → Medium → High → Turbo → Auto
⑮	Air swing button	Press this button to turn on/off the vertical air swing when the indoor unit supports vertical air swing movement.
⑯	Set/ Cancel button	This button can be used only for Timer, User mode, Service mode. *Short press: Set (Save) * Press and hold for 3 seconds: Cancel
⑰	Timer button / Filter reset button	*Short press: You can set the On/Off timer. * Press and hold for 3 seconds: Resets the filter cleaning alert indicator.
⑱	Temperature adjustment / Time adjustment button	① General mode Press this button to increase/decrease the set temperature by preset unit. * Short press - adjust the temperature by 1℃ or 0.5℃ or 0.1℃ depending on the setting. * Press and hold – adjust the temperature by 1℃ every 0.5 second ② Timer mode Press this button to increase/decrease the set time. * Up to 3 hours: Increase/decrease by 30 minute unit * Over 3 hours: Increase/decrease by 1 hour unit

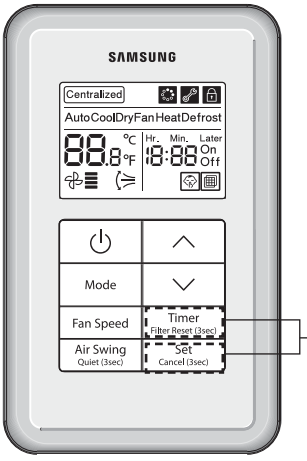
PCB



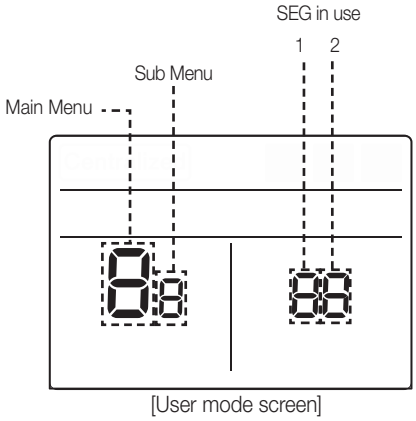
No.	Name	Description
①	Power/communication connection terminal	Connect to indoor unit (F3/F4)

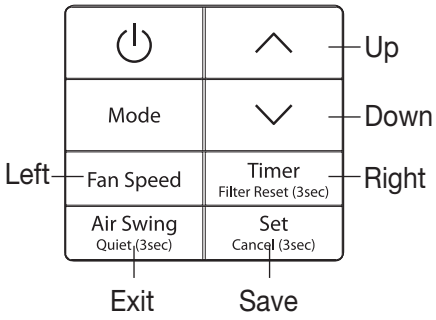
User setting mode

▶ How to set



Press for more than 3 seconds simultaneously





Main menu	Sub menu	Function		Default	Page in use	Range	Save
0	1	Reset User mode to default value		0	1	0 - Disabled, 1 - Reset	none
1	1	Lock all		0	1	0 - Unlock, 1 - Lock	o
	2	Partially lock buttons	Lock On/Off button	0	1	0 - Unlock, 1 - Lock	o
	3		Lock Mode button	0	1	0 - Unlock, 1 - Lock	o
	4		Lock Temperature adjustment button	0	1	0 - Unlock, 1 - Lock	o
	5		Lock Fan speed button	0	1	0 - Unlock, 1 - Lock	o
	6		Lock Timer button	0	1	0 - Unlock, 1 - Lock	o
2	1	Temperature restriction	Lower temperature	16	1	16~30	o
	2		Upper temperature	30	1	16~30	o

I Individual control systems

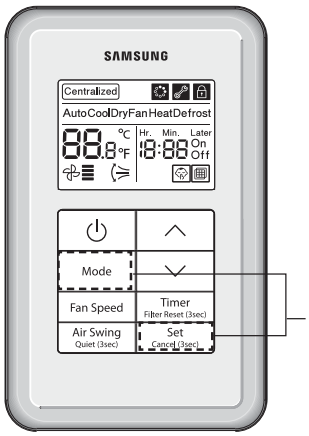
3. Wired remote controller

② *MWR-SH00N*

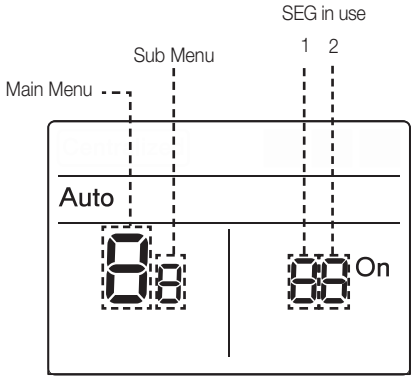
4) Option function

Service mode

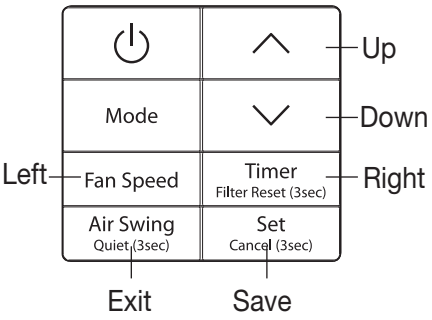
▶ How to set



Press for more than 3 seconds simultaneously



[Service mode screen]



Page display

On	Page1	Page2	Page3	Page4	Page5
	Auto	Cool	Dry	Fan	Heat

Off	Page6	Page7	Page8	Page9	Page10
	Auto	Cool	Dry	Fan	Heat

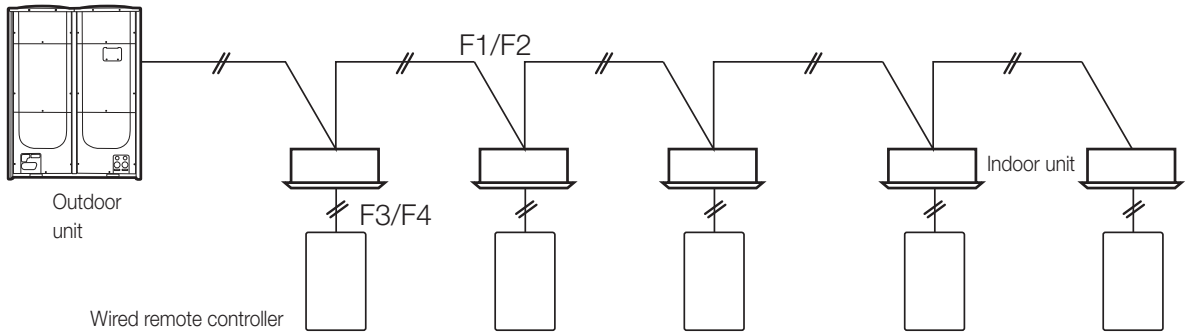
Main menu	Sub menu	Function		Default value	Page in use	Range
0	1	Reset	Reset the option setting of the wired remote controller to dafault value	0	1	0 - Disable, 1 - Reset
	2		Reset wired remote controller to factory default	0	1	0 - Disable, 1 - Reset
	3		Power Master Reset	0	1	0 - Disable, 1 - Reset
	4		Addressing Reset	0	1	0 - Disable, 1 - Reset
1	1	Wired remote controller information	Check the number of connected indoor units	0	1	0~16
	2		Check the number of connected ERV	0	1	0~16
	3		Check the MICOM code of wired remote controller	none	1~3	MICOM code
	4		Check the software version of the wired remote controller	none	1~3	Updated date
2	1	Address/ option setting	Target indoor unit address setting setting	View Master indoor unit	1~3	Select address from one of the connected indoor unit Display example) Page 1: 20 (Refers to indoor unit) Page 2: 00 (Outdoor unit addres) Page 3: 04 (Main address)
	2		Check/Set main address	Main address of Target indoor unit	1	Main address (00H~4FH, Hexadecimal digits)
	3		Check/Set RMC address	Main address of Target indoor unit	1	RMC(1): 0~F / RMC(2): 0~F (Hexadecimal number) 1)✳
	4		Check/set the product option	Product option of target indoor unit	1~10	Option code
	5		Check/Set installation option (1)	Installation option of target indoor unit	1~10	Option code
	6		Check/Set installation option (2)	Installation option of target indoor unit (2)	1~10	Option code
3	1	Check/Set view master	Check/Set indoor unit view master	View Master indoor unit	1~3	Select address from one of the connected indoor unit (hexadecimal number)
	2		No function	-	1~3	-
4	1	Check/Set Mode master indoor unit	Check the address of the mode Master indoor unit	none	1~3	Address of the mode Master indoor units
	2		Setting the mode Master indoor unit 2)✳	none	1	0- Not set, 1-Set, 2-Cancel

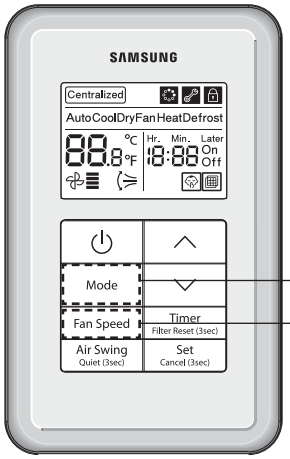
1)✳ When RMC(1) is set as F, RCM(2) can be set up to E only.

2)✳ Mode master indoor unit : The indoor unit which can decide the operation mode. Other indoor unit will follow mode master indoor unit's operation mode.

Main menu	Sub menu	Function		Default value	Page in use	Range
5	1	Check/Set option function of the wired remote controller	Set indoor unit for 'coolilng and heating' / 'cooling only'	0	1	0- Cooling and heating, 1-Cooling only
	2		Setting wireless remote controller usage restriction	1	1	0 - Disable, 1 - Enable
	3		Setting Master/Slave wired remote controller	0	1	0-Master, 1-Slave
	4		Setting auto operation usage	1	1	0 - Disable, 1 - Enable
	5		Temperature display Celsius(°C)/ Fahrenheit(°F)	0	1	0- Celsius (°C), 1-Fahrenheit (°F)
	6		Set unit for desired temperature (0,1,2) (Only available when temperature is displayed in Celsius (°C)	0	1	0- 1°C, 1-0.5°C, 2-0.1°C

Setting mode master indoor unit





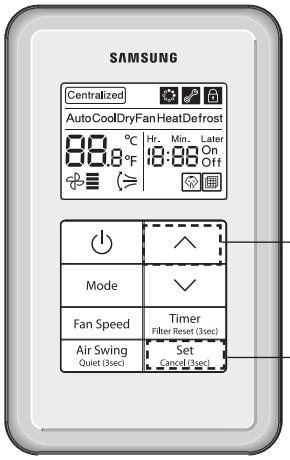
- Only when the wired remote controller is connected to an indoor unit directly (1:1 connection), you can set the mode master indoor unit that sets the operation mode of the outdoor unit.

Press and hold for over 5 seconds
All connected indoor units will be set as Master indoor unit

Press and hold for over 5 seconds
All Master indoor unit setting will be canceled

System reset

- Reset the power of the simplified wired remote controller



Press and hold for over 5 seconds Power reset

I Individual control systems

3. Wired remote controller

② *MWR-SH00N*

5) Display

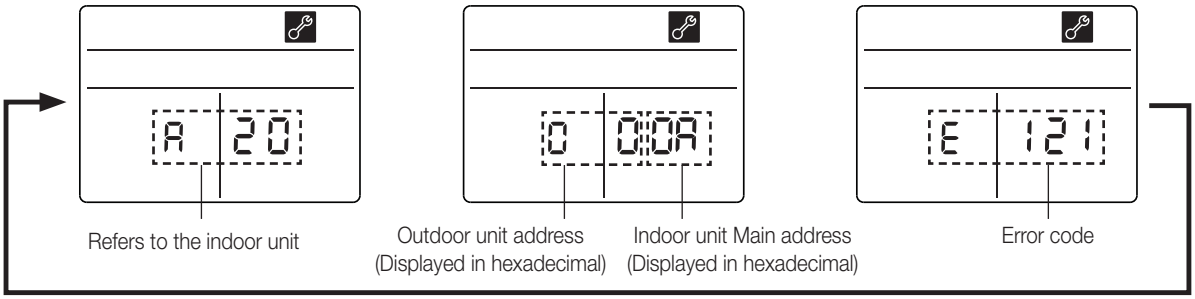
Error display

• Error codes of for the simplified wired remote controller and the product connected to it will be displayed on the LCD display.

▶ When an error occurs in your indoor/outdoor units (Product group display: A20)

• Address of the product with error and the error code will be displayed alternately.

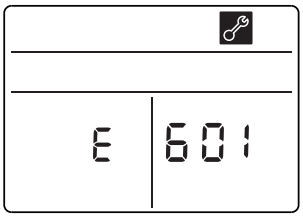
Example : Error 121 occurs for indoor unit No. 10 (Decimal digits)



▶ When an error occurs in your simplified wired remote controller

• Only an error code will be displayed. (No address will be displayed)

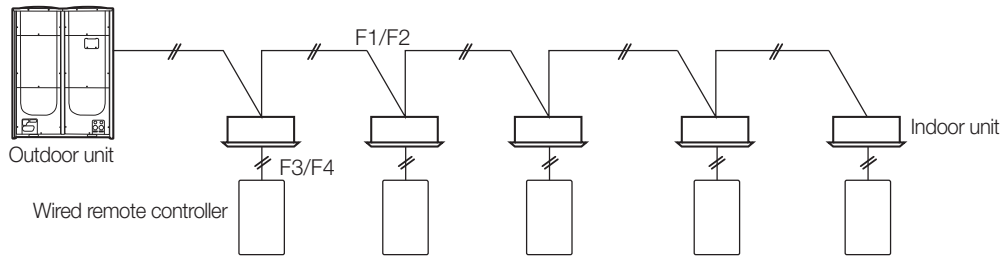
Example : Error 601 has occurred on simplified remote controller



No.	Error code	Description of the error	Remarks
1	601	• Communication error between wired remote controller ↔ Indoor unit	-
2	602	• Communication error between Master ↔ Slave wired remote controller - Error is only detected on slave wired remote controller	-
3	604	• Communication tracking error between wired remote controller ↔ Indoor unit	-
4	618	• Exceeded maximum number of units (16 units)	-
5	627	• Two or more wired remote controllers are set as Slave	-
6	654	• Memory (external ROM) read/write error - This error is detected only during power reset. If error occurs on memory after power has turned on, it will not effect on operation of the wire remote controller display and therefore error code will not be displayed.	-

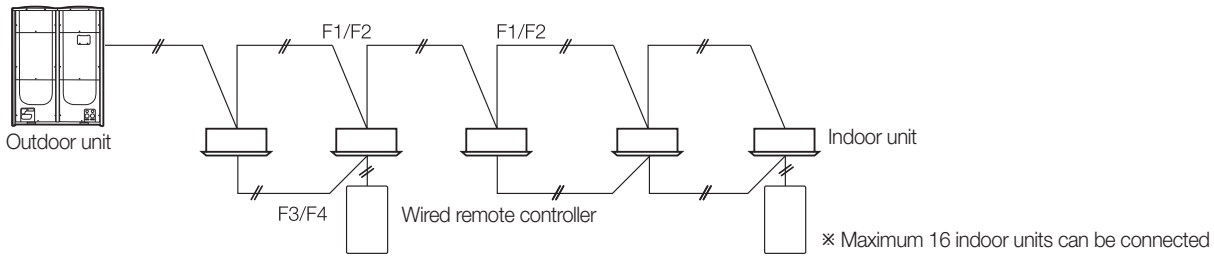
6) Communication diagram

Individual control (1) Control 1 indoor unit with 1 wired remote controller



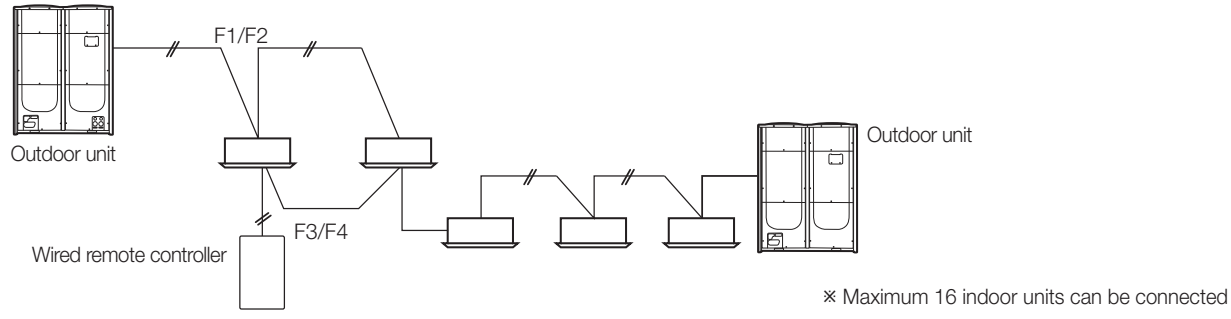
Control	All connected indoor units
Display	Operation status of the connected indoor unit

Group control (1) Control multiple indoor units with 1 wired remote controller



Control	All connected indoor units
Display	Priority 1. Display the status of view master indoor unit Priority 2. Display the status of indoor unit which has the earliest Main address

Group control (2) Control multiple indoor units connected to different outdoor units with 1 wired remote controller



Control	All connected indoor units
Display	Priority 1. Display the status of view master indoor unit Priority 2. Display the status of indoor unit which has the earliest Main address

▶ Caution

When controlling group of indoor units connected to different outdoor unit, address of the each outdoor unit must be set differently.

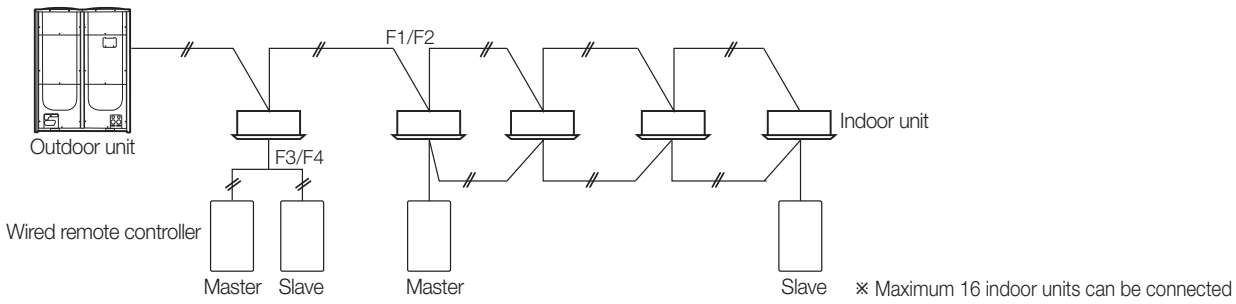
I Individual control systems

3. Wired remote controller

② *MWR-SH00N*

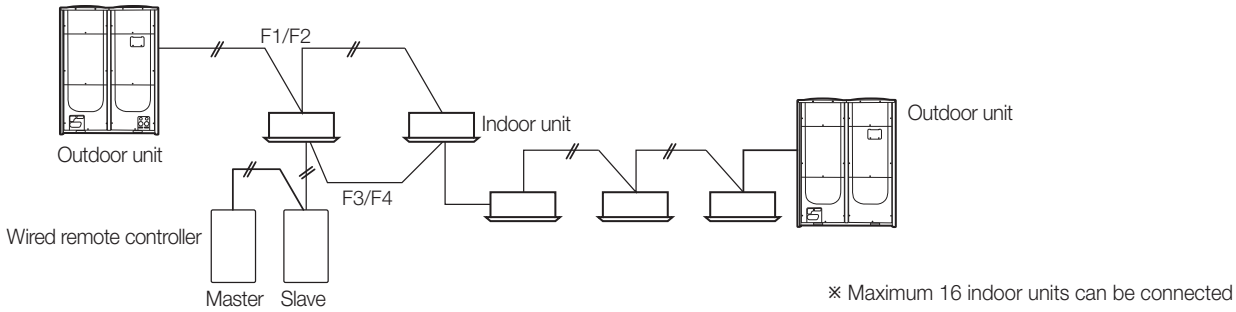
6) Communication diagram

Group control (3)	Control 1 or multiple indoor units with 2 wired remote controllers



Control	All connected indoor units
Display	Priority 1. Display the status of view master indoor unit Priority 2. Display the status of indoor unit which has the earliest Main address ✳ Two wired remote controllers identically display the operation status of the indoor unit according to above priority.

Group control (4)	Control multiple indoor units connected to different outdoor units with 2 wired remote controller

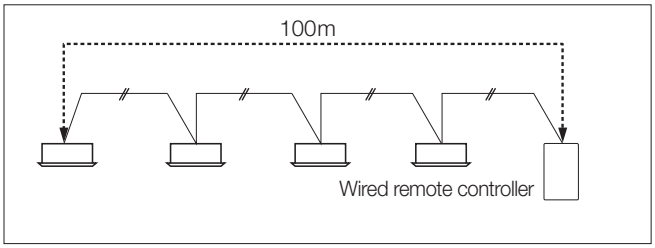


Control	All connected indoor units
Display	Priority 1. Display the status of view master indoor unit Priority 2. Display the status of indoor unit which has the earliest Main address ✳ Two wired remote controllers identically display the operation status of the indoor unit according to above priority.

▶ Caution

When controlling group of indoor units connected to different outdoor unit, address of the each outdoor unit must be set differently.

Max. distance between the farthest indoor unit and wired remote controller : 100m



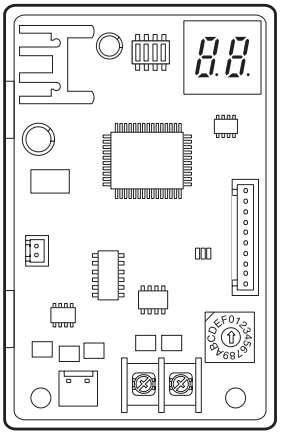
II. Centralized control systems

II Centralized control systems

1. interface module

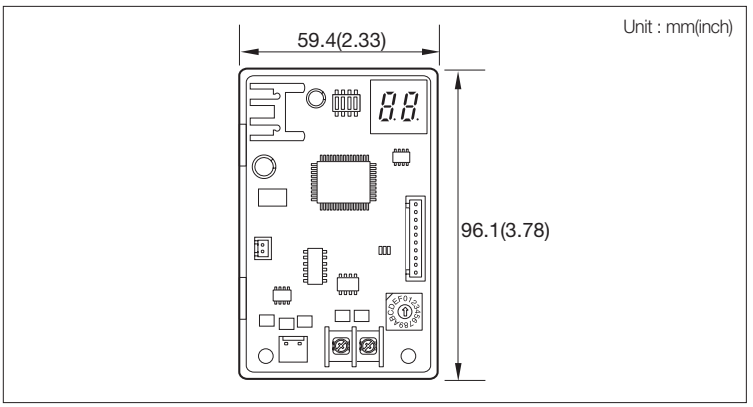
❑ *MIM-N01*

1) Features



- Communication interface module between outdoor units and the upper level controller which has different communication type
- Connect 1 interface module to 1 outdoor unit
- Individual control - Maximum 48 indoor units
- Group control - Maximum 16 groups
- Detecting communication type automatically: Judge the communication type of upper level controller according to communication type of the outdoor unit
- Supported communication type
  1) Conventional communication outdoor unit ↔ New communication upper level controller
  2) New communication outdoor unit ↔ Conventional communication upper level controller

  ✻ This interface module does not support conenction between Conventional communication outdoor unit ↔ Conventional communication upper level controller / New communication outdoor unit ↔ New communication upper level controller



2) Product specification

Power Supply	DC12V
Power Consumption	2.4 W
Operating Temperature range	-10°C~50°C (14°F~122°F)
Operating Humidity range	10%RH~90%RH
Communication	RS485 x 2
Max.Communication Length	1000M (3280ft)
Maximum number of connection	1) New communication outdoor unit ↔ Conventional communication upper level controller • F1/F2 : 1 outdoor unit • R1/R2 : 1 upper level controller 2) Conventional communication outdoor unit ↔ New communication upper level controller • F1/F2 : 1 outdoor unit • R1/R2 : Total up to 16 upper level controllers (Only 1 DMS 2, BACnet/Lonworks Gateway connection is allowed)

Compatible Models

(1) New communication outdoor unit ↔ Conventional communication upper level controller

Outdoor unit	AM✳✳✳✳X✳✳✳✳✳✳
Upper level controller	① OnOff controller : MCM-A202D ② DMS2 : MIM-D00A ③ BACnet Gateway : MIM-B17 ④ Lonworks Gateway : MM-B18 ⑤ S-NET mini : MST-S3W

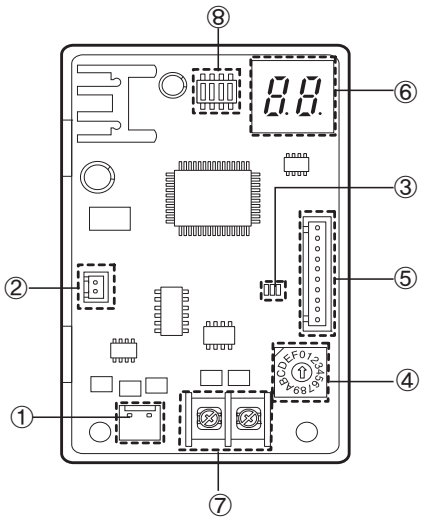
✳ Function controlelr and S-NET 2 Plus are not supported.

- New communication Outdoor unit + MIM-N01 + MCM-A202D + Function controller (X)
- New communication Outdoor unit+ MIM-N01 + MCM-A202D + S-NET 2 Plus (X)

(2) Conventional communication outdoor unit ↔ New communication upper level controller

Outdoor unit	DVM Plus 4, 3, 2, CAC
Upper level controller	① OnOff Controller: MCM-A202DN ② DMS2 : MIM-D00AN ③ BACnet gateway : MIM-B17N ④ Lonworks gateway : MIM-B18N ⑤ Touch centralized controller : MCM-A300N

3) Description of parts



No.	Name	Description
①	F1/F2 communication connector	Communication connector that connects to outdoor unit / F1/F2
②	Power connector	DC 12V
③	Communication LED	Communication indicator LED (Left LED 3 : No function Middle LED 1 : Blinks during it communicates with upper level controller Right LED 2 : Blinks during it communicates with outdoor unit and indoor unit)
④	Address setting switch	Sets the address of interface module
⑤	Software update connector	Using this connector, Interface module software can be updated
⑥	7-segment	Displays the communication status between interface module and outdoor unit/ERV
⑦	Upper level controller communication channel	Communication connection channel to upper level controller R1/R2
⑧	DIP switch	SW1 / Description 1 : On : Manual address setting / Off : Auto address setting 2 : No function 3 : No function 4 : No function

☑ Note

◆ When connecting to the conventional communication outdoor unit, address must be set manually regardless to the SW1 setting. When setting the address manually, make sure to set the address that is not assigned to other deivce already.

◆ When connecting to the new communication outdoor unit, SW1 must be ON to set the address manually, and make sure to set the address that is not assigned to other compatible interface moduleor outdoor units.

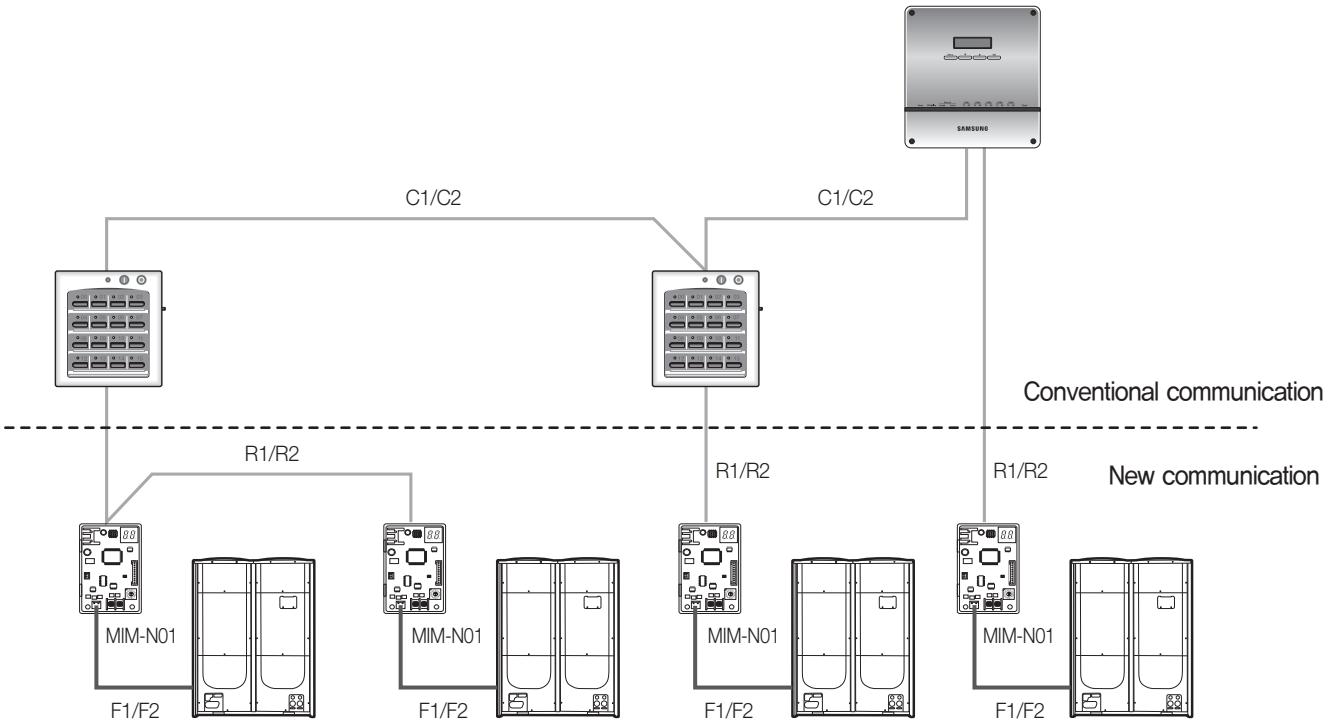
II Centralized control systems

1. interface module

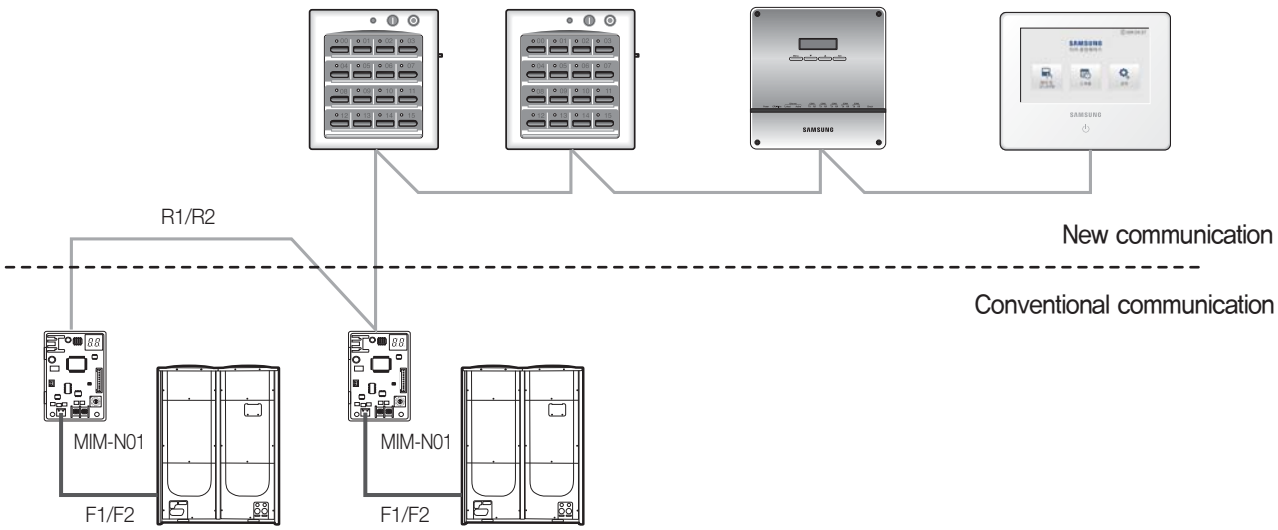
❑ *MIM-N01*

4) Connection diagram

New communication outdoor unit ↔ Conventional communication upper level controller



Conventional communication outdoor unit ↔ New communication upper level controller

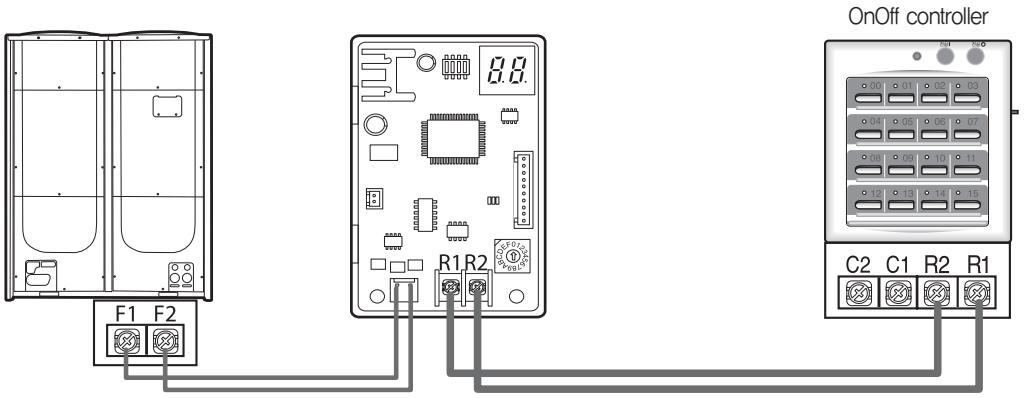


5) Connection

Connecting with OnOff controller

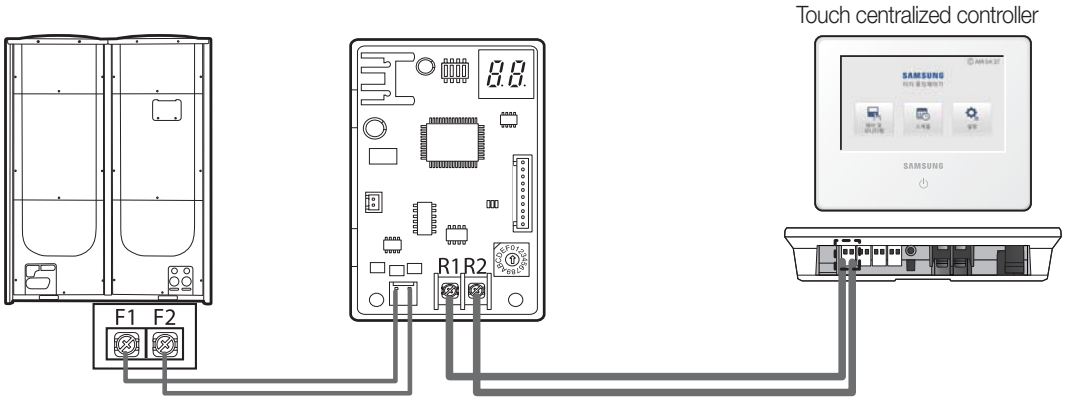
▶ Conventional communication outdoor unit ↔ New communication OnOff controller (MCM-A202DN)

▶ New communication outdoor unit ↔ Conventional communication OnOff controller (MCM-A202D)



Connecting to Touch centralized controller

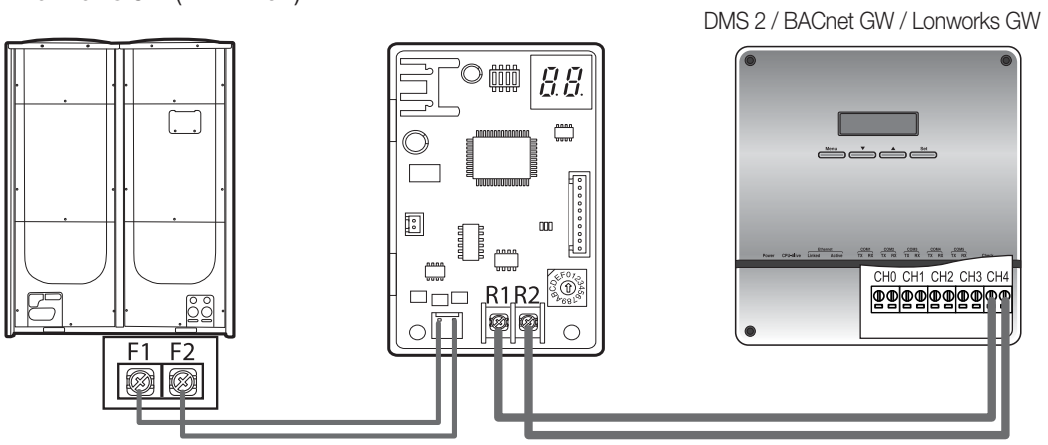
▶ Conventional communication outdoor unit ↔ New communication Touch centralized controller (ACM-A300N)



Connecting to DMS 2 / BACnet GW / Lonwoks GW

▶ Conventional communication outdoor unit ↔ New communication DMS2 (MIM-D00AN) / BACnet GW (MIM-B17N) / Lonworks GW (MIM-B18N)

▶ New communication outdoor unit ↔ Conventional communication DMS2 (MIM-D00AN) / BACnet GW (MIM-B17N) / Lonworks GW (MIM-B18N)



☑ Note

◆ When connecting AM✶✶✶✶X✶✶✶✶✶✶ outdoor unit and new communication controller, you don't have to connect them with MIM-N01.

◆ When connecting Conventional communication outdoor unit and controller (ex. MCM-A202D), MIM-B13D or MIM-B13E must be used.

II Centralized control systems

1. interface module

❑ *MIM-N01*

6) Display

Checking the operation

Software version is displayed after power is supplied

Display the set value of the rotary switch

Display the address of the interface module

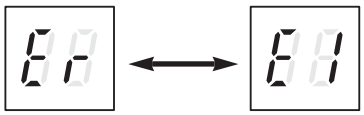
Outdoor unit detected during tracking

Tracking completed

✳ Displays the Main address of the communicating indoor units alternately [Displays the indoor unit that is set as (centralized control)]

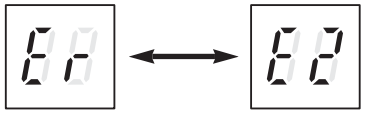
Error display

▶ Communication error between outdoor unit and the interface module



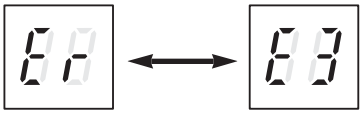
✳ FF will be displayed to the indoor unit that has lost communication during normal communication.

▶ Communication error between upper level controller and the interface module after tracking has been completed



✳ When E1, E2 occurs at the same time, only E1 will be displayed.

▶ Interface module tracking failure



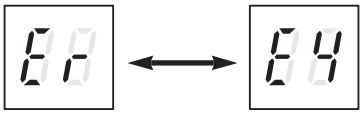
(1) Communication error between conventional communication outdoor unit ↔ New communication upper level controller after tracking has been completed

• It will be displayed after failing 80 times of communication trial after interface module has started tracking (approximately 3 minutes)

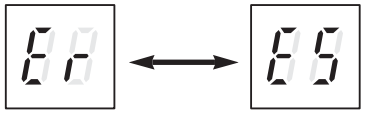
(2) Communication error between New communication outdoor unit ↔ Conventional communication upper level controller after tracking has been completed

• It will be displayed after failing the tracking process over 10 minutes from the interface module has started tracking.

▶ When problem occurs on EEPROM



▶ When same address was assigned to more than one interface module (Only detected when new communication upper level controller is connected to conventional communication outdoor unit)



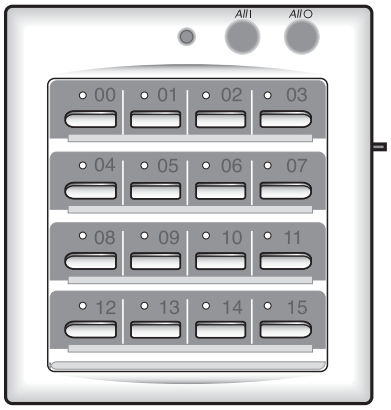
Error display table

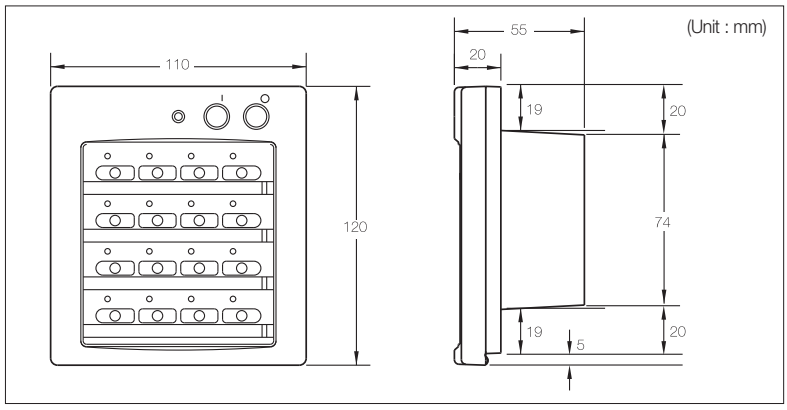
Error	Display	Error Code	Display on new communication upper level controller	Display on Conventional communication upper level controller
EEPROM	Er-E4	E654	E654	-
Overlapped address	Er-E5	E108	E108	-
Tracking failure	Er-E3	E604	E201	-
Indoor unit communication error	Er-E1	E615	E201 or E101	E615
Outdoor unit communication error	Er-E1	E616	E202	E616
Upper level controller communication error (Conventional type)	Er-E2	-	-	-

2. OnOff controller

❑ *MCM-A202DN*

1) Features





- Maximum 16-group controller (Max. 128 units)
- Whole/Group/Individual indoor unit control (On/Off)
- Restriction on the use of wireless/wired remote controllers and external contact control
- Cooling and heating mode control
- Indoor unit error display

2) Product specification

Power supply		AC200V~240V, 50/60Hz
Power consumption		66W
Operating Temperature range		0°C~40°C
Operating Humidity range		30%RH~90%RH
Communication		RS485 x 1 (R1/R2)
Max. Communication length		1000m
Max. connectable number of device	Set layer	Device: Indoor units (including ERV, MCU) — Number: 80 (Maximum 64 indoor units, 16 ERVs and 16 MCUs) Device: Outdoor unit — Number: 1 Device: OnOff controller, Touch centralized controller — Number: Total 16
	Control layer	Device: Indoor units (including ERV, MCU) — Number: 128 Device: Outdoor unit (including compatible interface module MIM-N01) — Number: 16 Device: OnOff controller, Touch centralized controller — Number: 16 (15 when DMS2, BACnet gateway, LonWorks gateway is connected) Device: DMS2, BACnet GW, LonWorks GW — Number: Total 1

Compatible product

Outdoor unit	AM✳✳✳✳X✳✳✳✳✳✳
Controller	OnOff controller (MCM-A202DN)
	Touch centralized controller (MCM-A300N)
	DMS2 (MIM-D00AN)
	BACnet GW (MIM-B17N)
	Lonworks GW (MIM-B18N)

✳ Conventional communication outdoor unit requires interface module (MIM-N01) to establish connection

✳ MIM-B13D, MIM-B13E, MIM-B04A Interface modules cannot be connected.

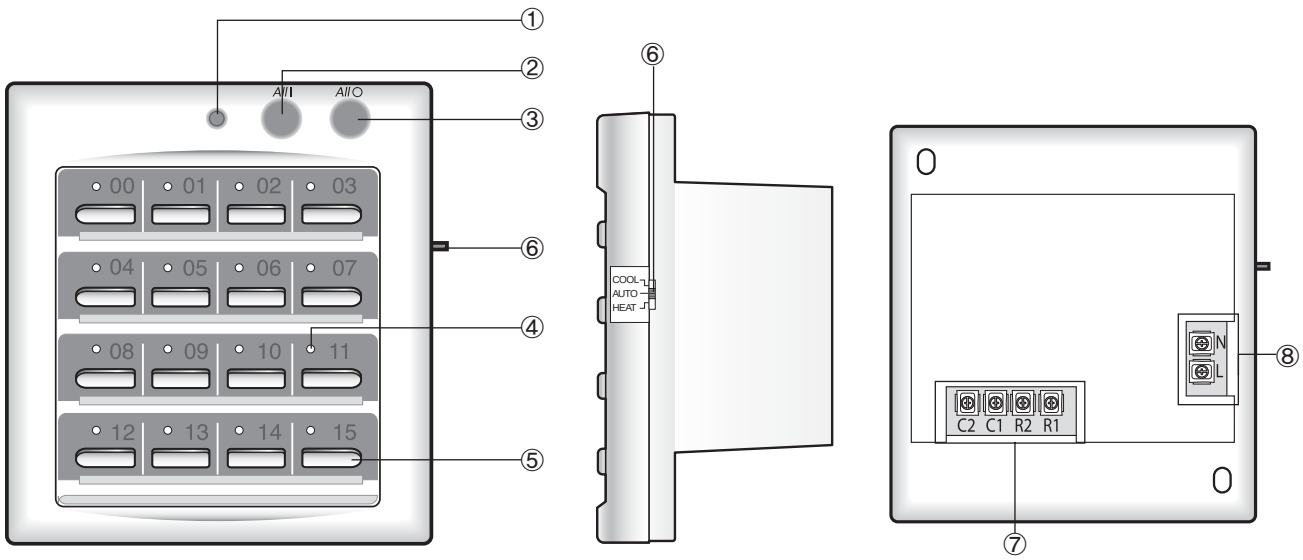
✳ ERV connection is not supported until end of 2013.

II Centralized control systems

2. OnOff controller

❑ *MCM-A202DN*

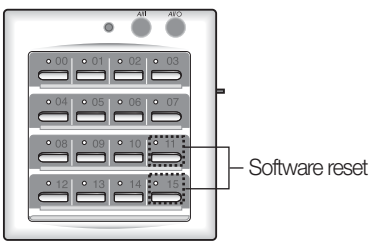
3) Description of parts



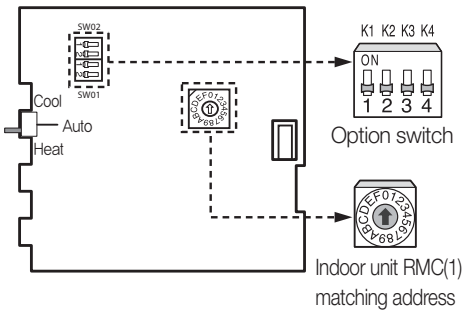
No.	Name	Description
①	Indoor unit operation LED	▪ It lights on when more than one indoor unit operates. ▪ It flickers during indoor unit tracking process after power reset.
②	All ON button	Press All ON button to turn on all the indoor units.
③	All OFF button	Press All OFF button to turn off all the indoor units.
④	Group indoor unit operation LED	▪ It lights on when one indoor unit of the group is operating. ▪ It also flickers when indoor unit has an error. ▪ During tracking indoor units, LED whose number is equivalent to indoor unit RMC(2) address flickers.
⑤	Indoor unit control button	Press each indoor unit button to control the equivalent unit operation.
⑥	Operation mode selection switch	Set operation mode selection switch to a certain mode and press indoor unit control button to control operation mode. Whenever pressing any button on the controller, set operation mode is delivered to the indoor unit.
⑦	Communication terminal	▪ C1 C2 : No function ▪ R1 R2 : Connect to Outdoor unit, DMS2, OnOff controller
⑧	Power terminal	AC200V~240V connection

☑ *Note*

◆ Press button 11 and button 15 together for 5 seconds to reset the OnOff controller.



Address & option switch



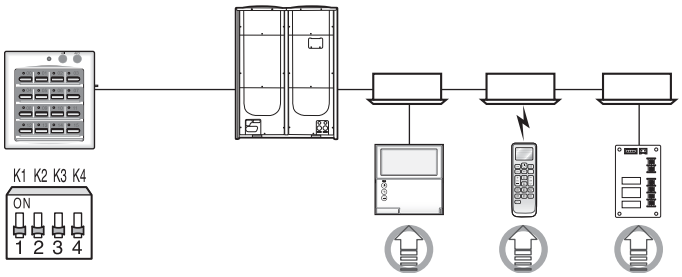
DIP SW		Description
K1	K2	Restriction setting on wired/wireless remote control use
OFF	OFF	Wired/Wireless remote control use is allowed all the time. Level 0
ON	OFF	Wired/Wireless remote control use is allowed only if indoor unit is ON by the OnOff controller. When indoor units are OFF by the OnOff controller, remote control use is prohibited. Level 1
OFF	ON	The use of wireless/wired remote controllers and external contact control is prohibited. Level 2
ON	ON	No function
K3		▪ OFF : OnOff controller use ▪ ON : Not use Onoff controller (All buttons don't work)
K4		No function

4) Optional function

Remote control restriction

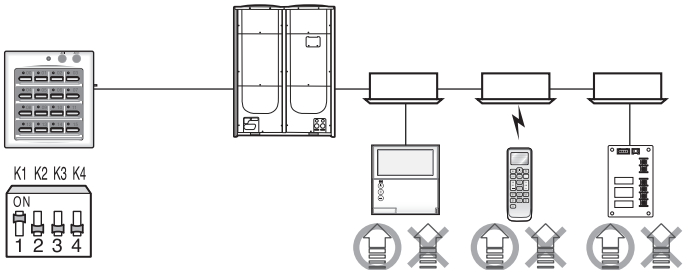
▶ LEVEL 0

- 'Allowed' remote controller



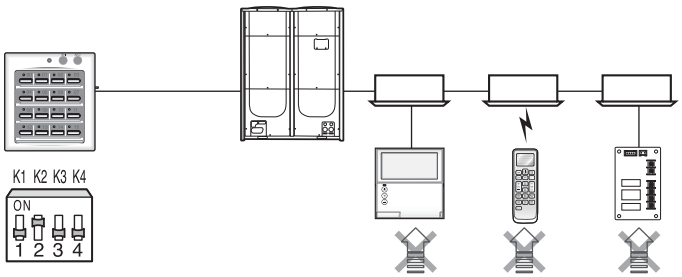
▶ LEVEL 1

- Turned on by OnOff controller
  – 'Allowed'
- Turned off by OnOff controller
  – 'Prohibited'



▶ LEVEL 2

- 'Prohibited' remote controller



II Centralized control systems

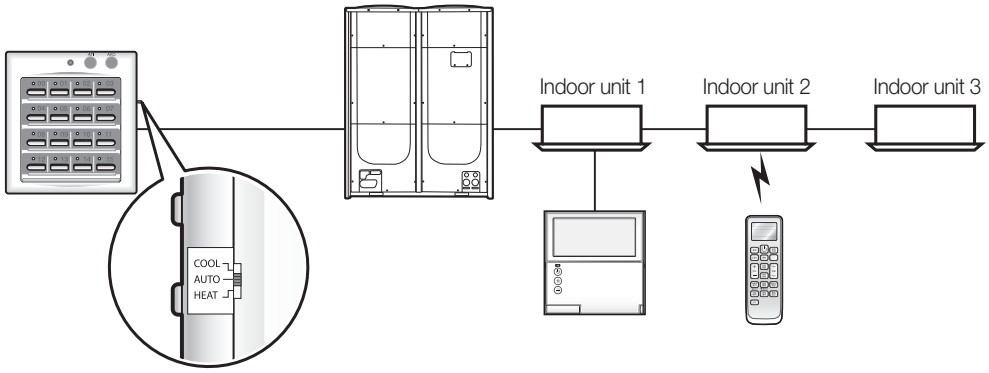
2. OnOff controller

❑ *MCM-A202DN*

4) Optional function

Operation mode selection switch

It is mainly used to set indoor unit operation mode to Cooling, Heating or Auto.



Indoor unit operation

- Cooling mode set → Cooling operation in last cooling set temperature, fan speed and fan direction
- Heating mode set → Heating operation in last heating set temperature, fan speed and fan direction
- Auto mode set → Indoor units keep their current operation mode, set temperature, fan speed and fan direction.

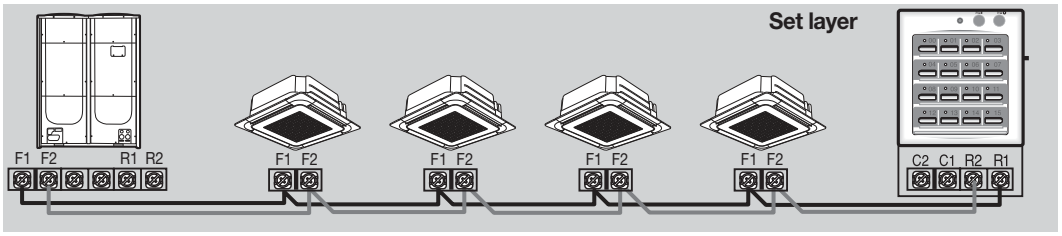
※ Operation mode selection switch doesn't lock the indoor unit operation mode.

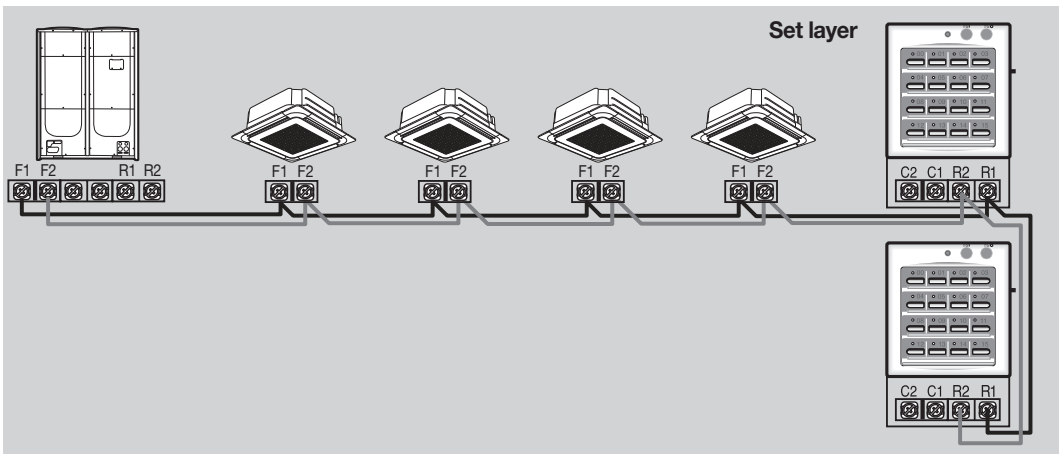
5) Connection diagram

Set layer connection (F1/F2)

- When OnOff controller only controls indoor units of 1 outdoor unit, then it can be connected to F1/F2 line of outdoor unit or indoor unit.
- Max. 16 Controllers can be connected to same communication line.

✳ Connectable controller: - OnOff controller (MCM-A202DN)
- Touch centralized controller (MCM-A300N)





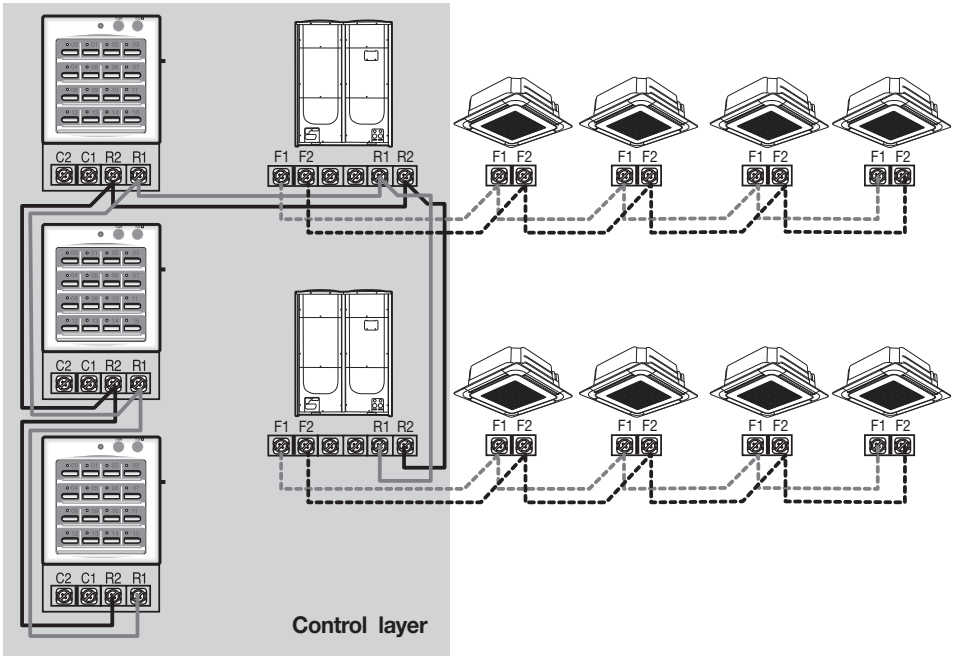
Control layer connection (R1/R2)

- Max. 16 Controllers can be connected to same communication line (In case of DMS2/BACnet gateway/LonWorks gateway connection, Max.15)
- Max. 16 outdoor units can be connected to same communication line (Includes interface module MIM-N01).

✳ Connectable controller : - Touch centralized controller (MCM-A300N).
- OnOff controller (MCM-A202DN).
- DMS2(MIM-D00AN), BACnet gateway (MIM-B17N), LonWoks gateway (MIM-B18N) : Only one of the three models.

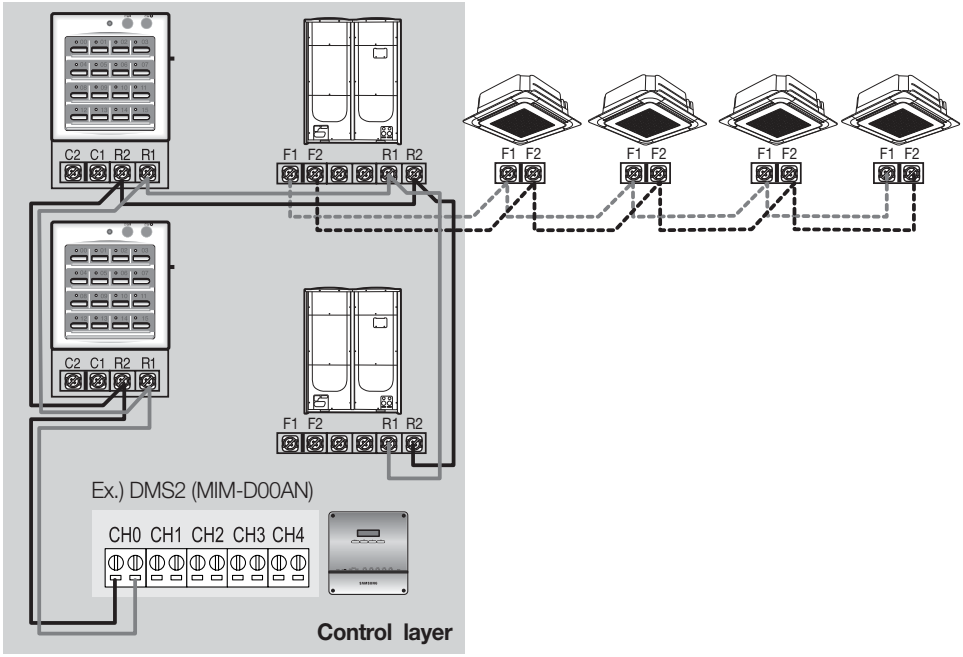
(1) Connection with outdoor unit

- When OnOff controller controls indoor units of multiple outdoor units, then it should be connected to R1/R2 line of outdoor units.



(2) Connection with DMS2/BACnet GW/Lonworks GW

▶ Case1



II Centralized control systems

2. OnOff controller

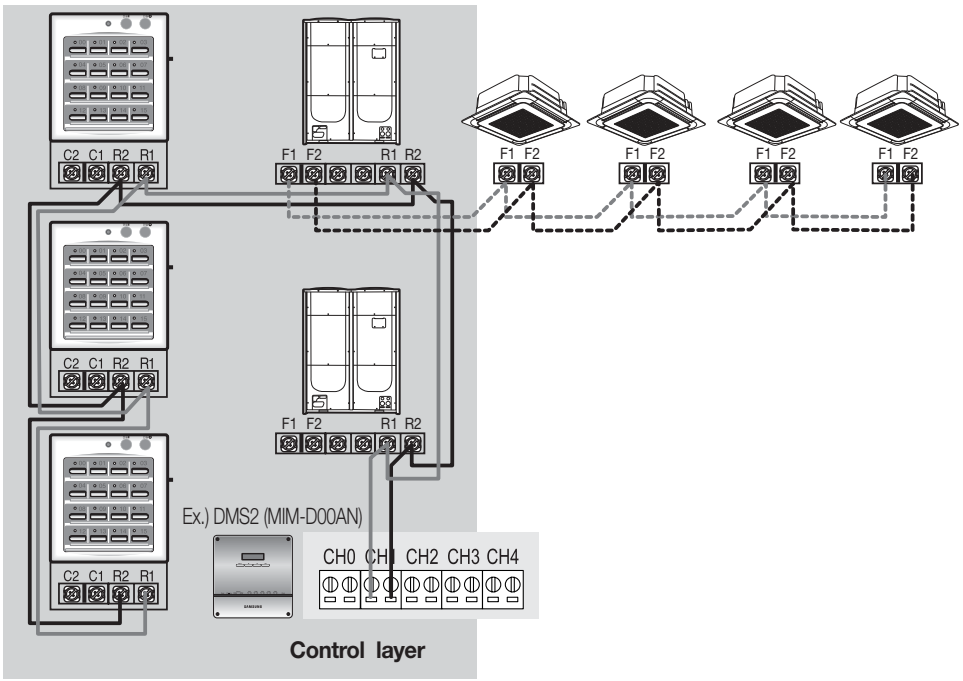
❑ *MCM-A202DN*

5) Connection diagram

Control layer connection (R1/R2)

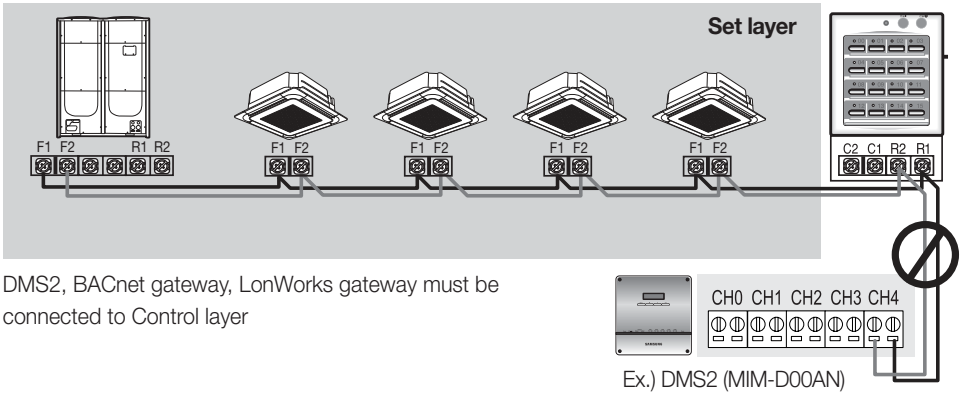
(2) Connection with DMS2/BACnet GW/Lonworks GW

▶ Case2



▶ Caution

• When OnOff controller is connected to Outdoor unit's F1/F2 line, you cannot connect DMS2 to OnOff controller's R1/R2 line.

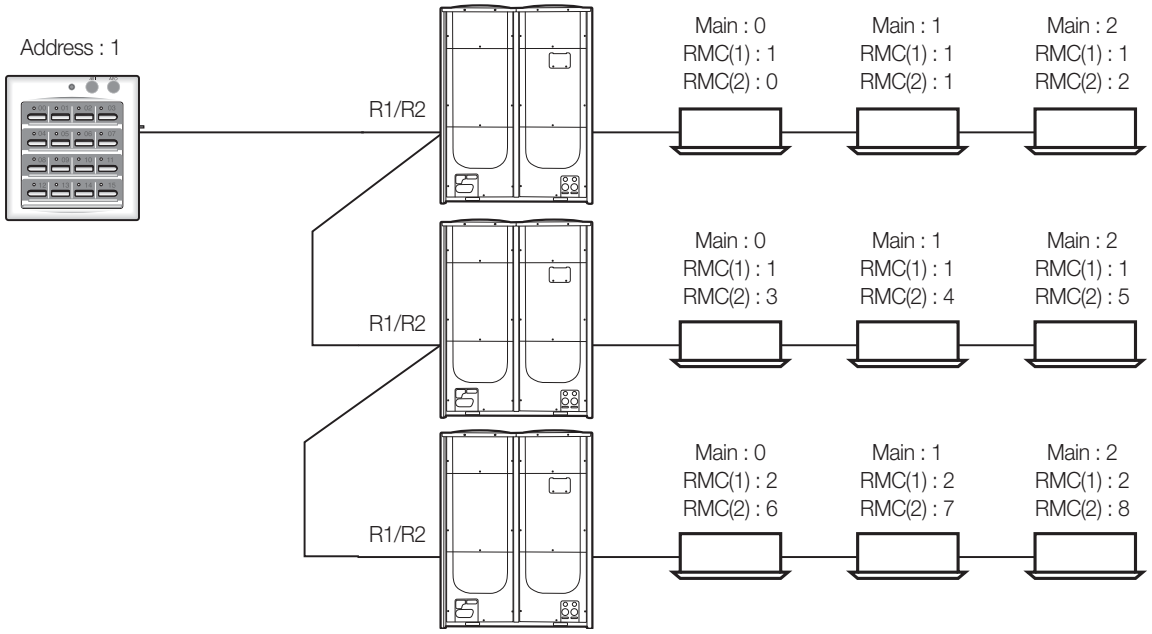


DMS2, BACnet gateway, LonWorks gateway must be connected to Control layer

6) Display

Various LED display

After power reset to the OnOff controller, it carries out indoor unit tracking process.



(1) OnOff controller only communicate with indoor units which has same RMC(1) address with OnOff controller's address.

(2) During tracking indoor units, LED whose number is equivalent to indoor unit RMC(2) address flickers.

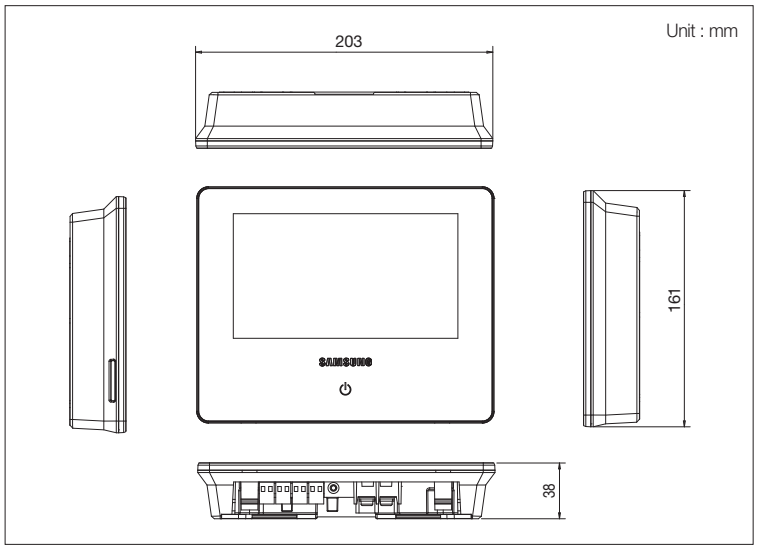
- In LED 00 → LED 01 → LED 02 → LED 03 → LED 04 → LED 05 order

II Centralized control systems

3. Touch centralized controller

❑ *MCM-A300N*

1) Features



- 7 inch touch LCD controller
- Controls maximum 128 indoor units
- Controls maximum 12 zones
- Schedule control, Indoor unit usage restriction, View indoor unit error history

2) Product specification

<table>
<tr><td colspan="2">Power supply</td><td>AC200V~240V, 50/60Hz</td></tr>
<tr><td colspan="2">Power consumption</td><td>110W</td></tr>
<tr><td colspan="2">Operating temperature range</td><td>0°C~40°C</td></tr>
<tr><td colspan="2">Operating humidity range</td><td>30%RH~90%RH</td></tr>
<tr><td colspan="2">Communication</td><td>RS485 x 1 (F1/F2 or R1/R2)</td></tr>
<tr><td rowspan="2">External communication port</td><td>Digital Output</td><td>1</td></tr>
<tr><td>Digital Input</td><td>2</td></tr>
<tr><td rowspan="3">Maximum connection length</td><td>RS485</td><td>1000m</td></tr>
<tr><td>Digital Output</td><td>100m</td></tr>
<tr><td>Digital Input</td><td>100m</td></tr>
<tr><td rowspan="2">Max. connectable number of device</td><td>Set layer</td><td>
<table>
<tr><td>Device</td><td>Number</td></tr>
<tr><td>Indoor units (including ERV, MCU)</td><td>80 (Maximum 64 indoor units, 16 ERVs and 16 MCUs)</td></tr>
<tr><td>Outdoor unit</td><td>1</td></tr>
<tr><td>OnOff controller</td><td rowspan="2">Total 16</td></tr>
<tr><td>Touch centralized controller</td></tr>
</table>
</td></tr>
<tr><td>Control layer</td><td>
<table>
<tr><td>Device</td><td>Number</td></tr>
<tr><td>Indoor units (including ERV, MCU)</td><td>128</td></tr>
<tr><td>Outdoor unit (including interface module MIM-N01)</td><td>16</td></tr>
<tr><td>OnOff controller</td><td rowspan="2">16 (15 when DMS2, BACnet gateway, LonWorks gateway is connected)</td></tr>
<tr><td>Touch centralized controller</td></tr>
<tr><td>DMS2</td><td rowspan="3">Total 1</td></tr>
<tr><td>BACnet GW</td></tr>
<tr><td>LonWorks GW</td></tr>
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</table>

Compatible product

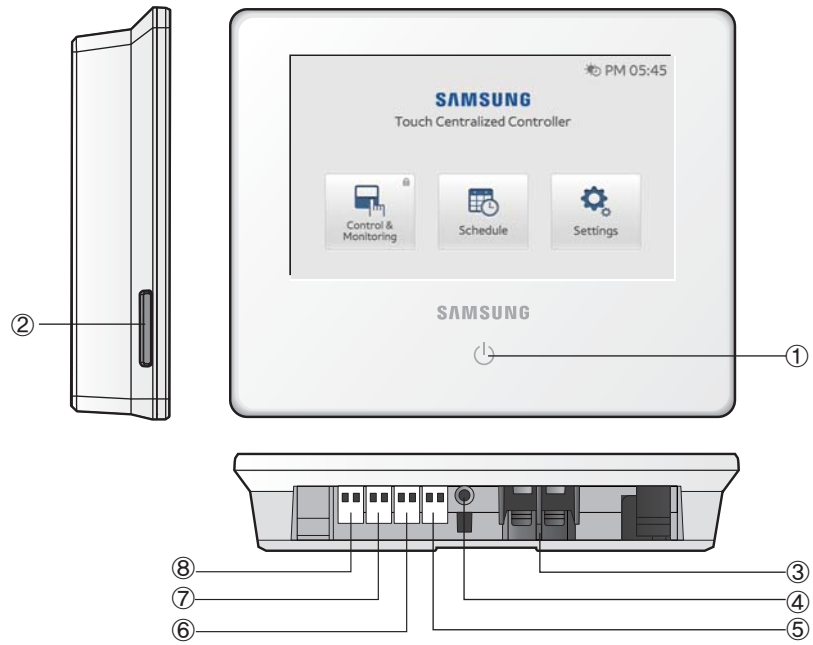
Outdoor unit	AM✶✶✶✶X✶✶✶✶✶✶
Controller	OnOff controller (MCM-A202DN)
	Touch centralized controller (MCM-A300N)
	DMS2 (MIM-D00AN)
	BACnet gateway (MIM-B17N)
	Lonworks gateway (MIM-B18N)

✶ Conventional communication outdoor unit requires interface module (MIM-N01) to establish connection

✶ MIM-B13D, MIM-B13E, MIM-B04A Interface modules cannot be connected.

✶ ERV connection is not supported until end of 2013.

3) Description of parts



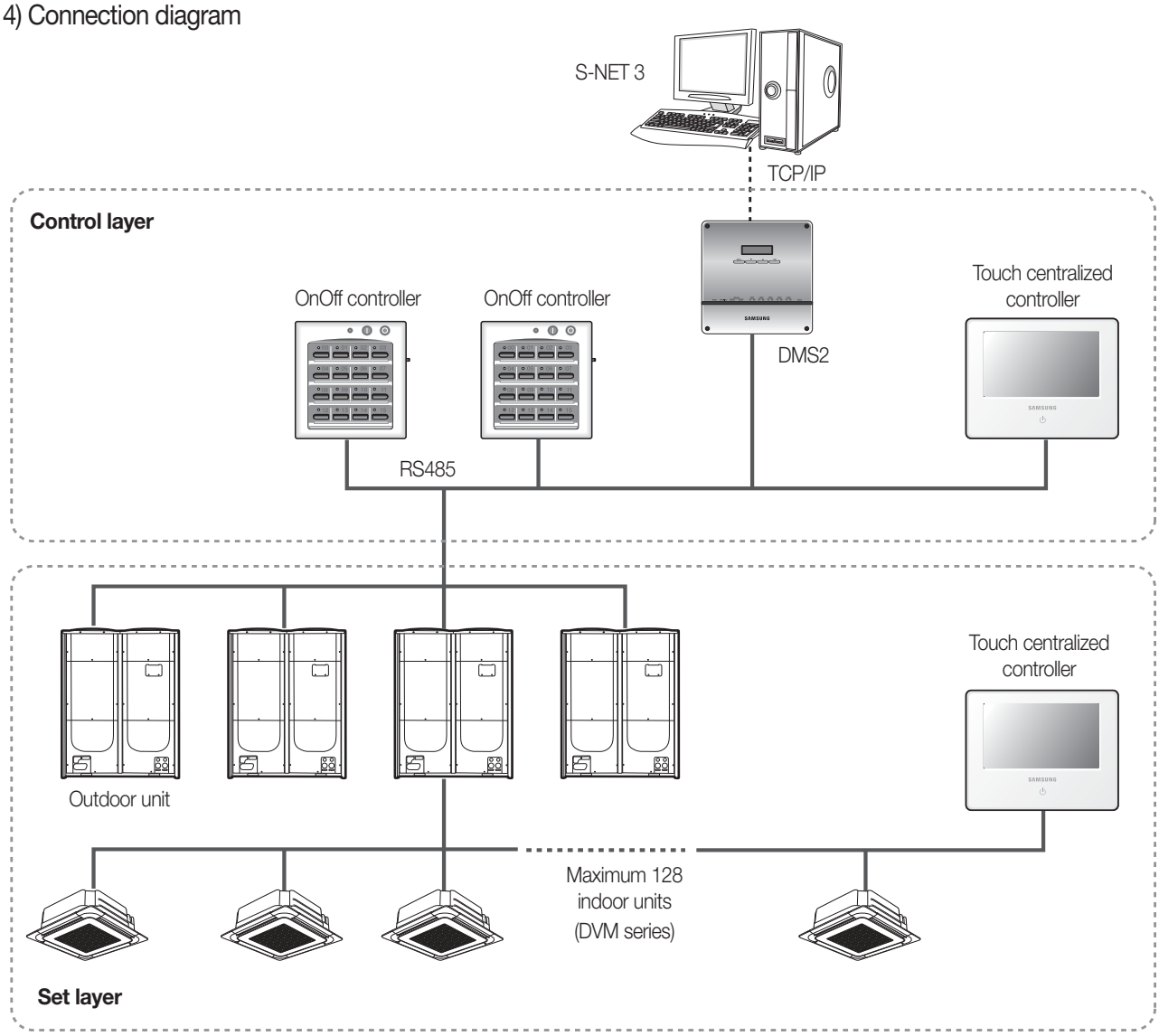
No.	Name	Description
①	LCD On/Off button and Indoor unit operation indicator	▪ Button : Turn on/off the LCD screen ▪ Indicator - Blue : Turns on if any one of the indoor unit is in operation. - Red : Turns on if nay one of the indoor unit has an error
②	SD card slot	Use to back-up data on SD card or updating S/W
③	Power terminal	Connect AC 100~240 V, 50/60 Hz power
④	Reset button	Use to reset Touch centralized controller
⑤	DI-1 terminal	Terminal block for connecting digital input signal from 3rd party device.
⑥	DI-2 terminal	Terminal block for connecting digital input signal from 3rd party device.
⑦	DO Terminal	▪ Terminal block for digital output signal. - Short : When any one of indoor units turns On - Open :When all indoor units are off
⑧	485 communication terminal	▪ When connecting to set layer: Connect to outdoor unit or indoor unit (F1/F2) ▪ When connecting to control layer: Connect to outdoor unit, OnOff controller, Touch centralized controller or DMS2 (R1/R2)

II Centralized control systems

3. Touch centralized controller

❑ *MCM-A300N*

4) Connection diagram

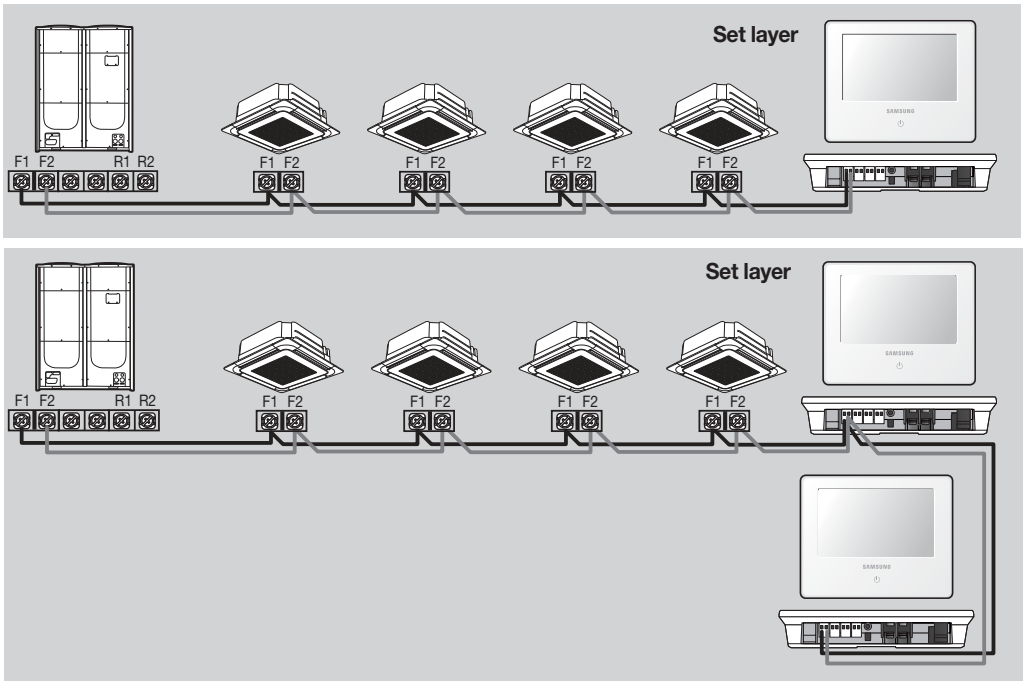


5) Connection

Set layer connection (F1/F2)

- When Touch centralized controller only controls indoor units of 1 outdoor unit, then it can be connected to F1/F2 line of outdoor unit or indoor unit.
- Max. 16 Controllers can be connected to same communication line.

✳ Connectable controller: - OnOff controller (MCM-A202DN)
- Touch centralized controller (MCM-A300N)



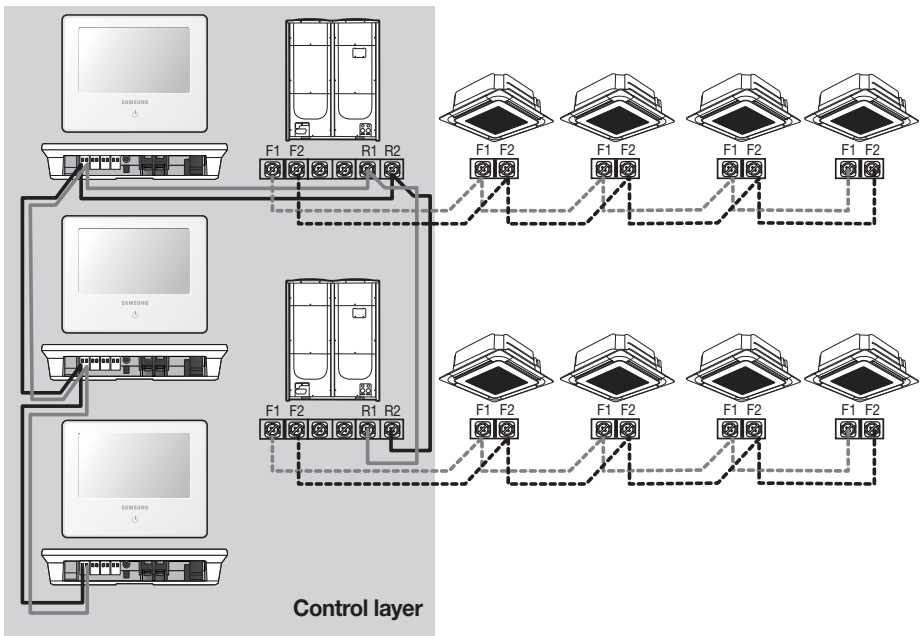
Control layer connection (R1/R2)

- Max. 16 Controllers can be connected to same communication line (In case of DMS2/BACnet gateway/LonWorks gateway connection, Max.15)
- Max. 16 outdoor units can be connected to same communication line (Includes interface module MIM-N01).

✳ Connectable controller : - Touch centralized controller (MCM-A300N).
- OnOff controller (MCM-A202DN).
- DMS2(MIM-D00AN), BACnet gateway (MIM-B17N), LonWoks gateway (MIM-B18N) : Only one of the three models.

(1) Connection with outdoor unit

- When Touch centralized controller controls indoor units of multiple outdoor units, then it should be connected to R1/R2 line of outdoor units.



II Centralized control systems

3. Touch centralized controller

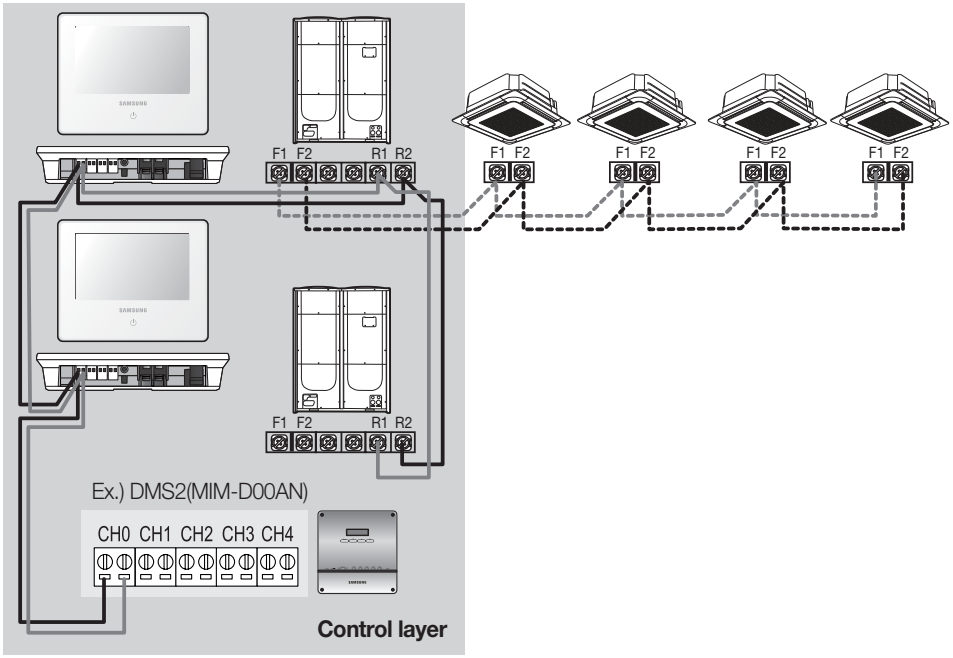
❑ *MCM-A300N*

5) Connection

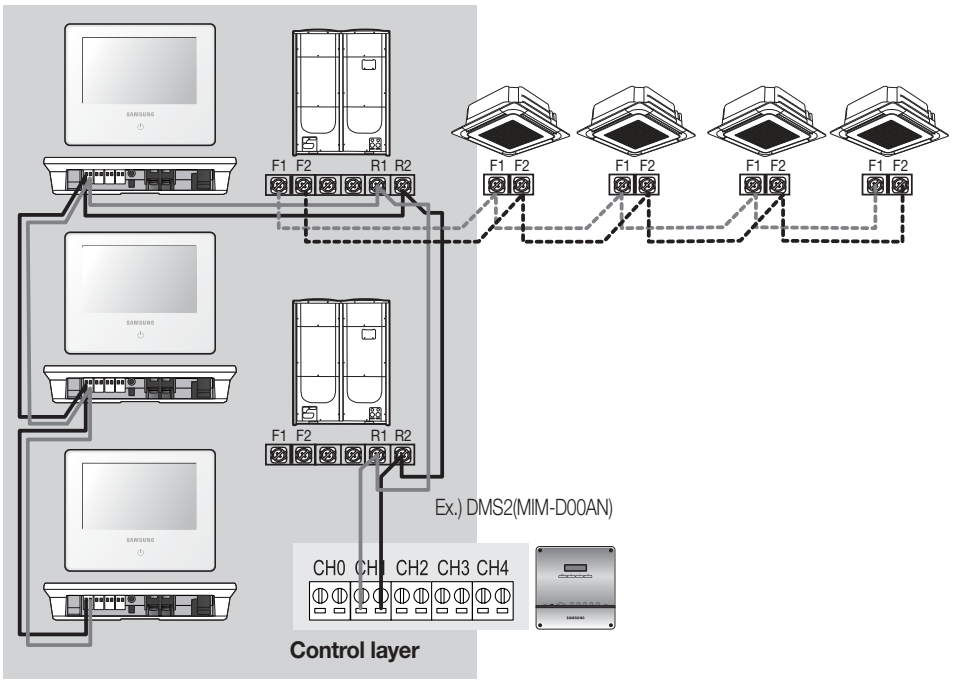
Control layer connection (R1/R2)

(2) Connection with DMS2 / BACnet GW / Lonworks GW

▶ Case1

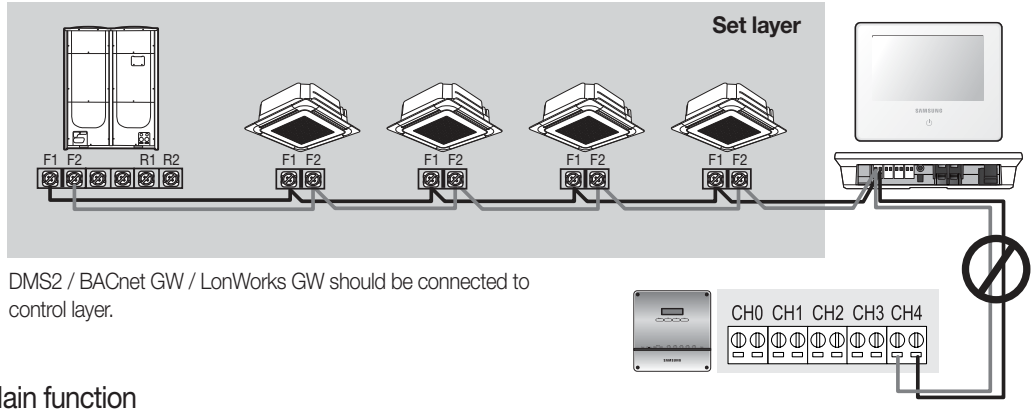


▶ Case2



▶ Caution

- When Touch centralized controller is connected to Outdoor unit's F1/F2 line, DMS2, BACnet GW, LonWorks GW cannot be connected to same communication line.



DMS2 / BACnet GW / LonWorks GW should be connected to control layer.

6) Main function

Zone control

- You can create a zone by grouping multiple indoor units
- Maximum 12 zones can be created (Total up to 128 indoor units)

- You can set the name of Zone/indoor unit
- You can set the zone icon for purpose of each zone.

II Centralized control systems

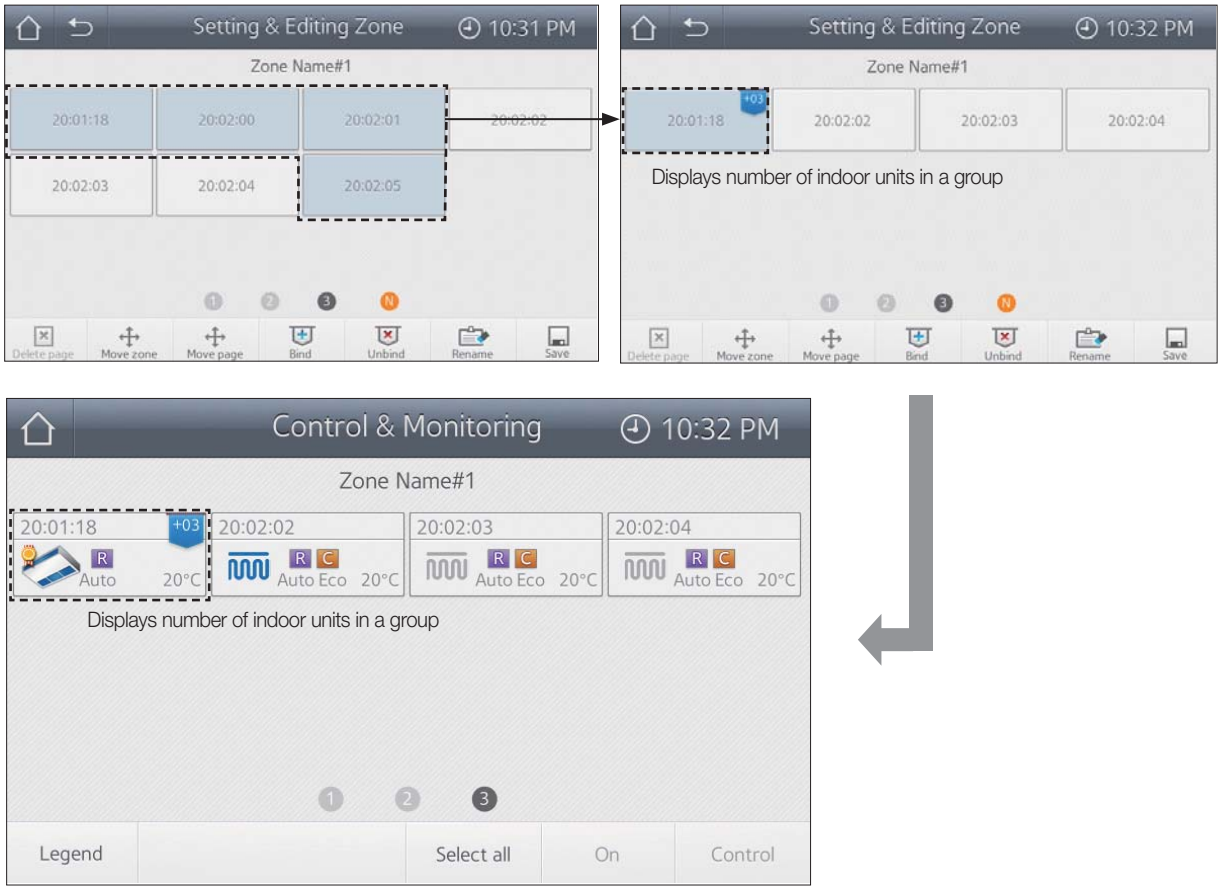
3. Touch centralized controller

❑ *MCM-A300N*

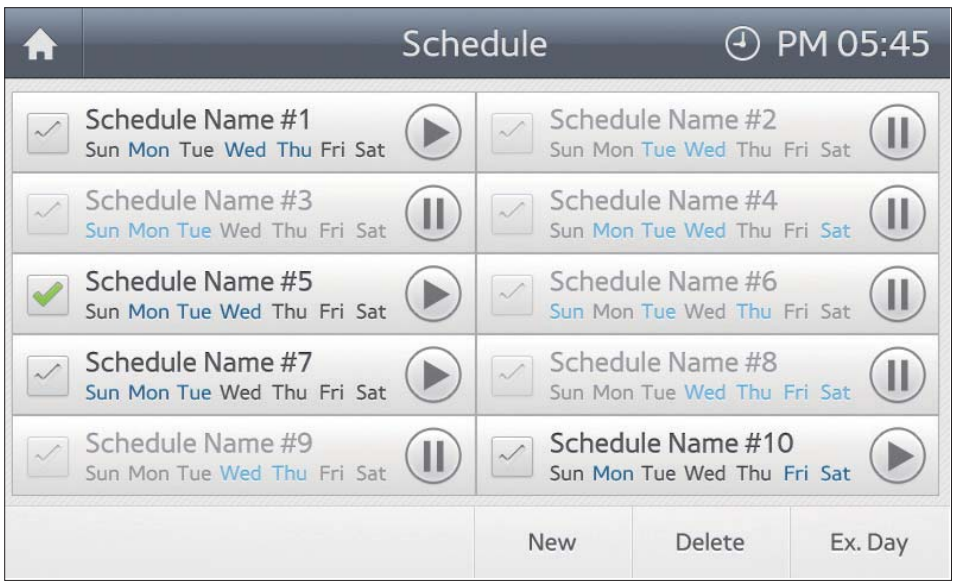
6) Main function

Grouping indoor units

- Function to control and monitor multiple indoor units that are grouped and expressed as single indoor unit



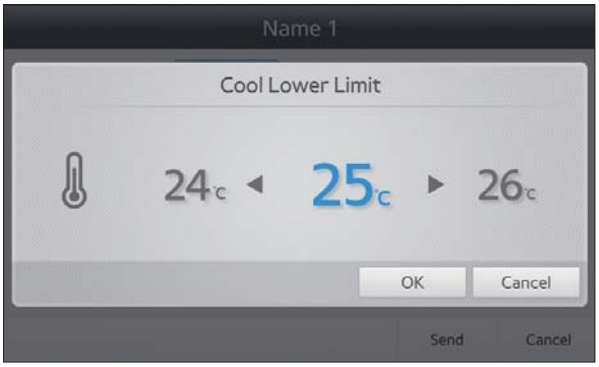
Schedule control



- Maximum 10 schedules can be created
- Excluded day setting is possible

Setting indoor unit usage restriction

(1) Cool lower limit/ Heat upper limit



- It can set the lower temperature limit in Cool mode and the upper temperature limit in Heat mode.
- This setting can be changed by other touch centralized controller and DMS2.

(2) Operation mode limit

- To prevent the wrong operation mode setting, it can limit the operation mode of indoor unit.
  - Cool only : Heat, Auto (Heat) operation mode is restricted
  - Heat only : Cool, Dry, Auto (Cool) operation mode is restricted
- This setting can be changed by other touch centralized controller and DMS2.

II Centralized control systems

3. Touch centralized controller

❑ *MCM-A300N*

6) Main function

Lock function

- You can lock the functions of Touch centralized controller.

(1) Screen lock

- You can lock the screen.
  Password is required when you try to use it.

(2) Operating panel lock

- You can set the access lock of each item of operating panel.
  The locked item will be deactivated.

(3) Menu lock

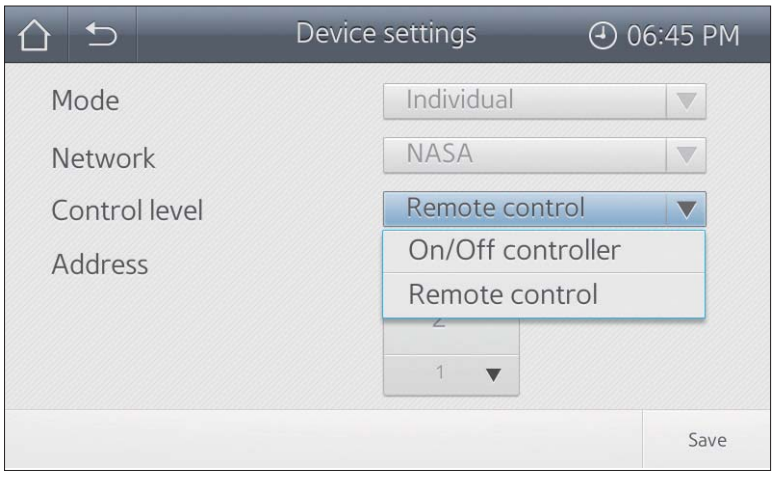
- You can set the access lock of each menu.
  Password is required when you try to use it.

Remote controller usage restriction

(1) Indoor unit operating panel

- You can set the controller restriction.
- You can set the type of controller which will be restricted when "Disable RC" is applied from operating panel.
  [Settings] → [Device settings] → [Control level]

(2) Device settings



- You can set the type of controller which will be restricted when "Disable RC" is applied from operating panel.
  - Remote controller : Restrict wired/wireless remote controller usage, OnOff controller usage is possible
  - OnOff controller : Restricts wired/wireless remote controller and OnOff controller usage

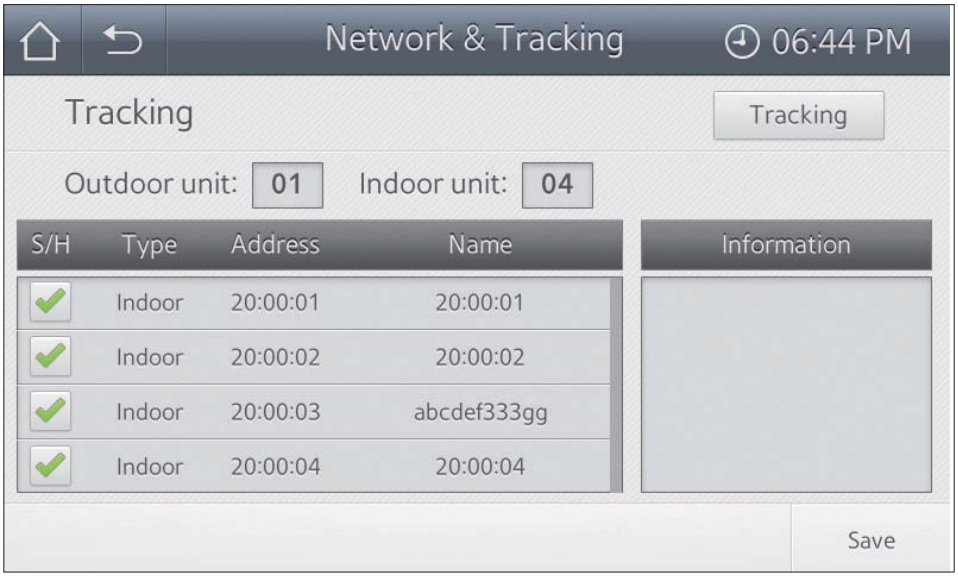
II Centralized control systems

3. Touch centralized controller

❑ *MCM-A300N*

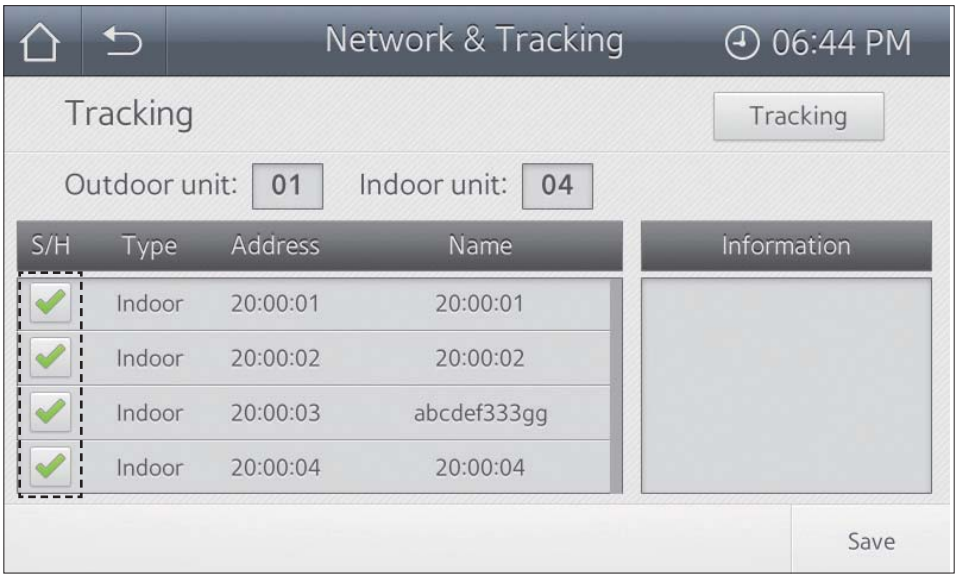
6) Main function

Tracking



- Detects all the indoor and outdoor units that are connected to communication line of Touch centralized controller
- When multiple number of Touch centralized controller is connected together, you can use check box of S/H (Show/Hide) to select indoor units that will be controlled from each Touch centralized controller.

Hiding indoor unit

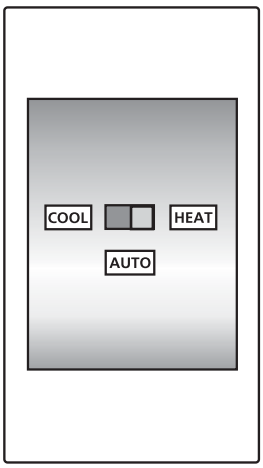


- Indoor unit with no check mark on S/H (Show/Hide) check box, will not be controlled and monitored from the Touch centralized controller.

4. Operation mode selection switch

❑ *MCM-C200*

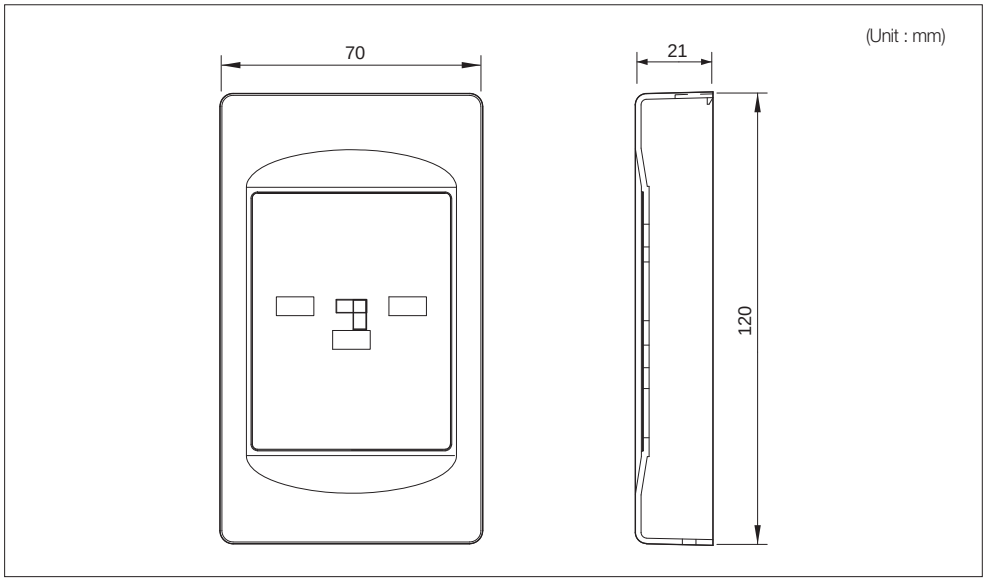
1) Features



Operation mode selection switch

- Outdoor unit operation mode selection (Cooling, Heating or Auto)

※ Mixed operation mode protection



2) Installation

- 1 operation mode selection switch must be connected to 1 outdoor unit.

※ Max. distance between the outdoor unit PCB and the MCM-200: 100m

II Centralized control systems

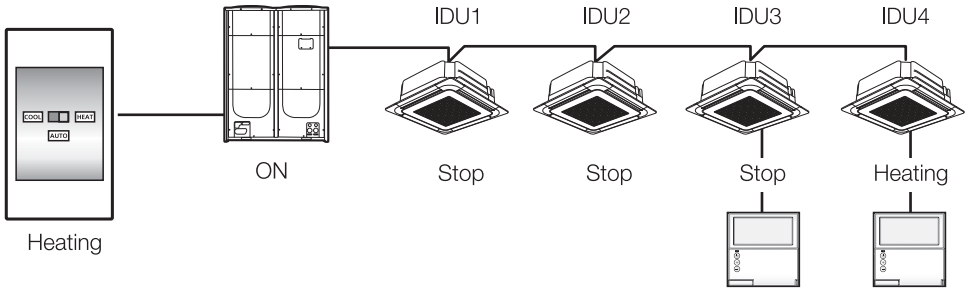
4. Operation mode selection switch

❑ *MCM-C200*

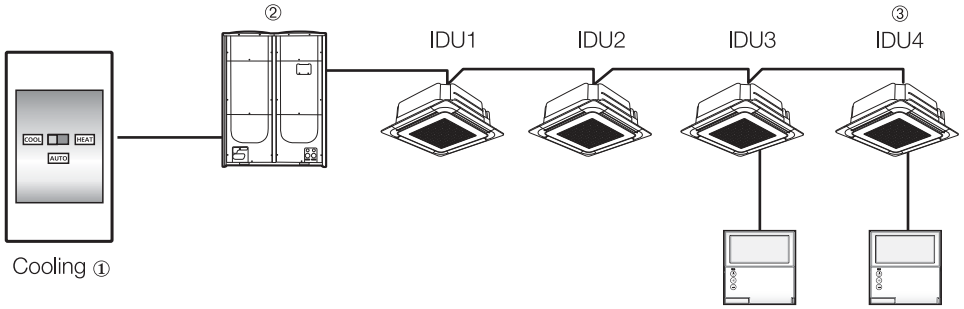
3) Control example

Initial condition

- Cool/Heat Selector : Heating position
- IDU1, 2, 3 : Stop mode, IDU4 : Heating mode
- Compressor ON

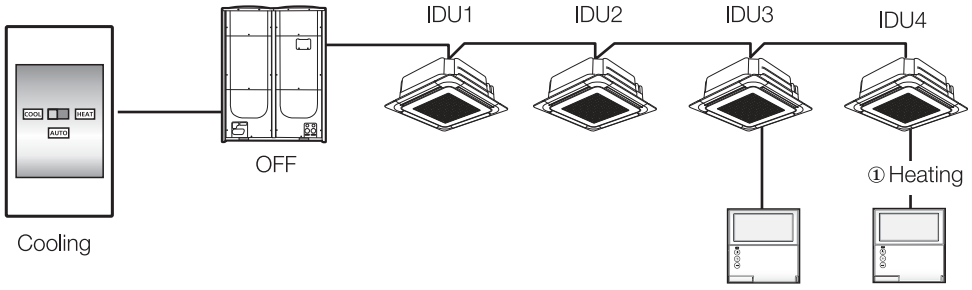


Sequence 1 Set the Cool/Heat selector to the Cooling position



Result	① Change Cool/Heat Selector to Cooling
	② Automatically compressor OFF
	③ Running IDU4 stops

Sequence 2 Set IDU4 to Heating with Remote controller



Result	① • IDU4 ignores Heating command • IDU4 keeps OFF status.

☑ *Note*

◆ Operation mode selection switch fixed indoor unit operation mode.
→ Indoor unit ignores opposite operation mode. (It will not accept the command and it will just beep shortly)

Ⅲ. Integrated management systems

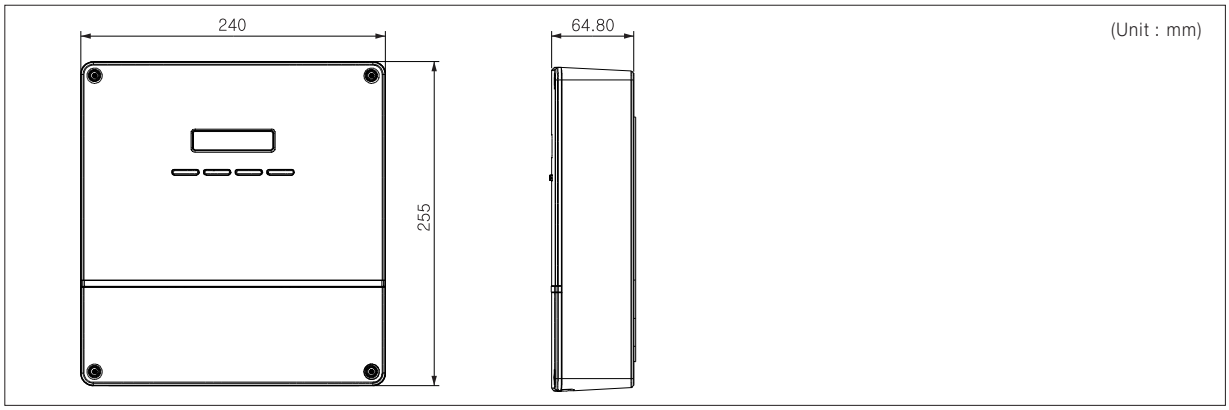
III Integrated management systems

1. DMS2

❑ *MIM-D00AN*

1) Features

- Built-in web server for PC-independent management and remote access control
- Multiple upper-layer control access (S-NET 3, Web-client)
- Weekly/Daily schedule control
- Power distribution function
- Current time management even during power failure (for 24 hours)
- Emergency stop function with simple contact interface
- Individual/Group control of up to 256 indoor units and ERV, AHU
- User editable control logic
- Accessible level management
- Dynamic security management
- Operation & error history management
- Data storage in non-volatile memory & SD memory



2) Product specification

Power	Source	DC Adaptor
	Input	100~240V AC (+-10%), 50/60Hz
	Output	12V 3A
Operating temperature range		-10℃ ~ 50℃
Operating humidity range		10%RH ~ 90%RH
Communication method		• Lower level : RS485 x 5 • Upper level : Ethernet 100 Base-T x 1
External connection port	Digital Output	10
	Digital Input	10
Maximum length of connection	RS485	1000 m
	Digital Output	100 m
	Digital Input	100 m
	Ethernet	100 m (When there is no repeater)
Max. connectable number of device	Control layer	See nested table below

Device	Numbers per each channel	Total number for 5 channels
Indoor units (including ERV, MCU)	128	256
Outdoor unit (including interface module MIM-N01)	16	80
OnOff controller	Total 15	Total 75
Touch centralized controller		
PIM interface module (MIM-B16)	8	8

Compatible product

Outdoor unit	AM✳✳✳✳X✳✳✳✳✳✳
Controller	OnOff controller (MCM-A202DN)
	Touch centralized controller (MCM-A300N)
	PIM interface module (MIM-B16)

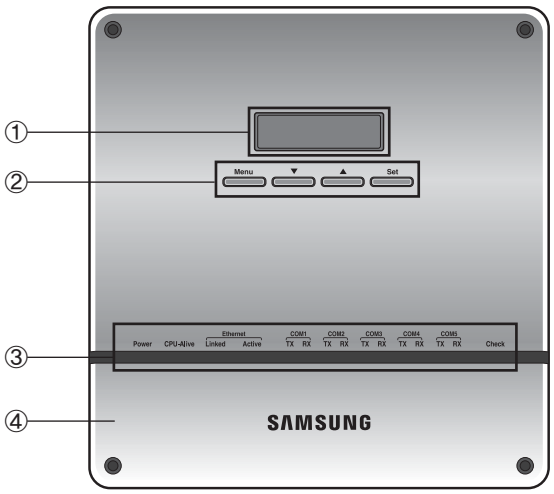
✳ Conventional communication outdoor unit requires interface module (MIM-N01) to establish connection

✳ MIM-B13D, MIM-B13E, MIM-B04A Interface modules cannot be connected.

✳ ERV connection is not supported until end of 2013.

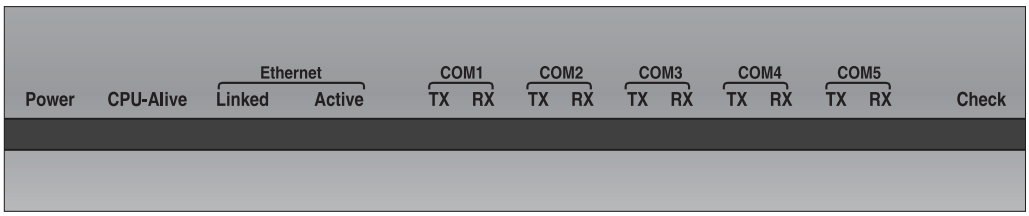
3) Description of parts

Front



No	Name	Function
①	LCD display	Shows current time and IP address. Various messages will be displayed depending on button input.
②	LCD operation button	There are 4 buttons (Menu, ▼(Down), ▲(Up), Set) and you can access to menu and move, check the menu.
③	LED Indicator	Check 15 LED status such as Power, CPU-Alive, Ethernet-Linked/Active, COM1~5-TX/RX and Check
④	DMS2 Bottom cover	Unfasten 2 screws on the bottom and separate the bottom cover from DMS2. Then check cable connection part.

LED indicator



Item	Name	Status
Power	Power indicator	Turns blue when the power is supplied
CPU Alive	CPU operation indicator	Blinks in orange with 1 second intervals during normal operation
Ethernet - Linked	Internet connection indicator	Turns green during normal connection
Ethernet - Active	Internet data transmission/ reception indicator	Blinks in orange during normal transmission/ reception
COM1~5 - TX	OnOff controller/Outdoor unit data transmission indicator	Blinks in green during normal transmission
COM1~5 - RX	OnOff controller/Outdoor unit data reception indicator	Blinks in green during normal reception
Check	Indoor/outdoor unit/ error check indicator	Turns green when there is an error on more than one indoor/outdoor unit or in communication

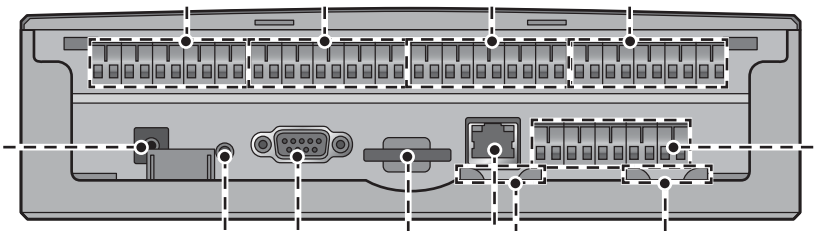
III Integrated management systems

1. DMS2

❑ *MIM-D00AN*

3) Description of parts

Bottom



DI Terminal2
Connect Digital Input
: Channel 6~Channel10

DI Terminal1
Connect Digital Input
: Channel 1~Channel 5

Power Terminal
Connect DMS2 adapter

Reset Button
Reset DMS2

Serial Terminal
Service agent checks error status

DO Terminal1
Connect Digital Output
: Channel 1~Channel 5

DO Terminal 2
Connect Digital Output
: Channel 6~Channel 10

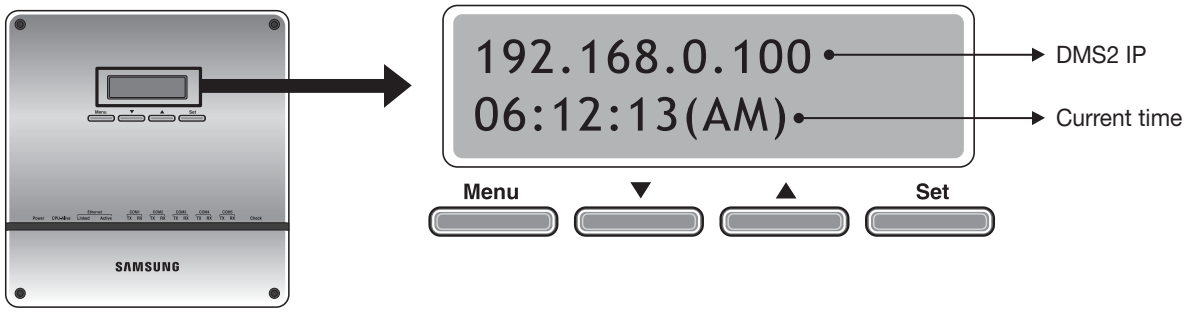
RS485 Communication terminal
Connect for RS485 communication with devices such as OnOff controller/ Outdoor units/PIM
Channel 0 ~ Channel 4

Cable tie groove
Arrange cables connected to DMS2

LAN Terminal
Connect LAN cable

SD Card Socket
Socket for sub memory (SD or MMC)
(Sub memory is for DMS2 program update and set information saving)
※ Purchase SD card separately.

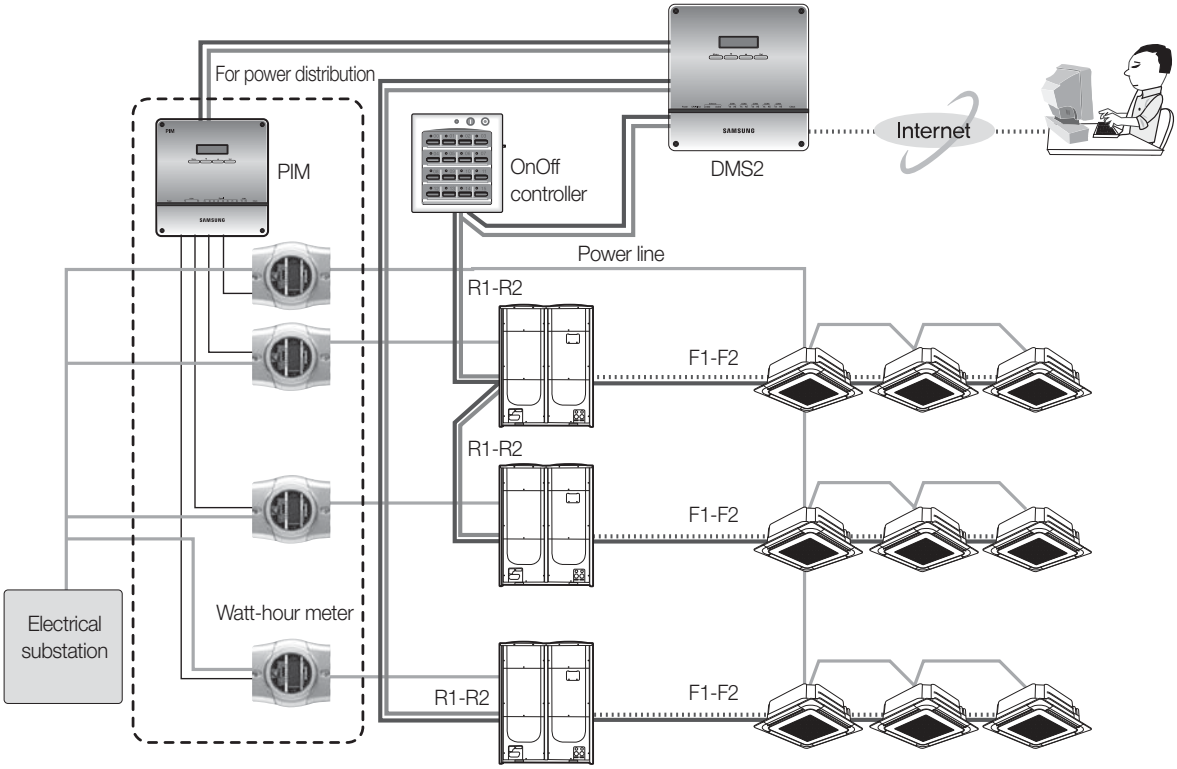
Menu and display



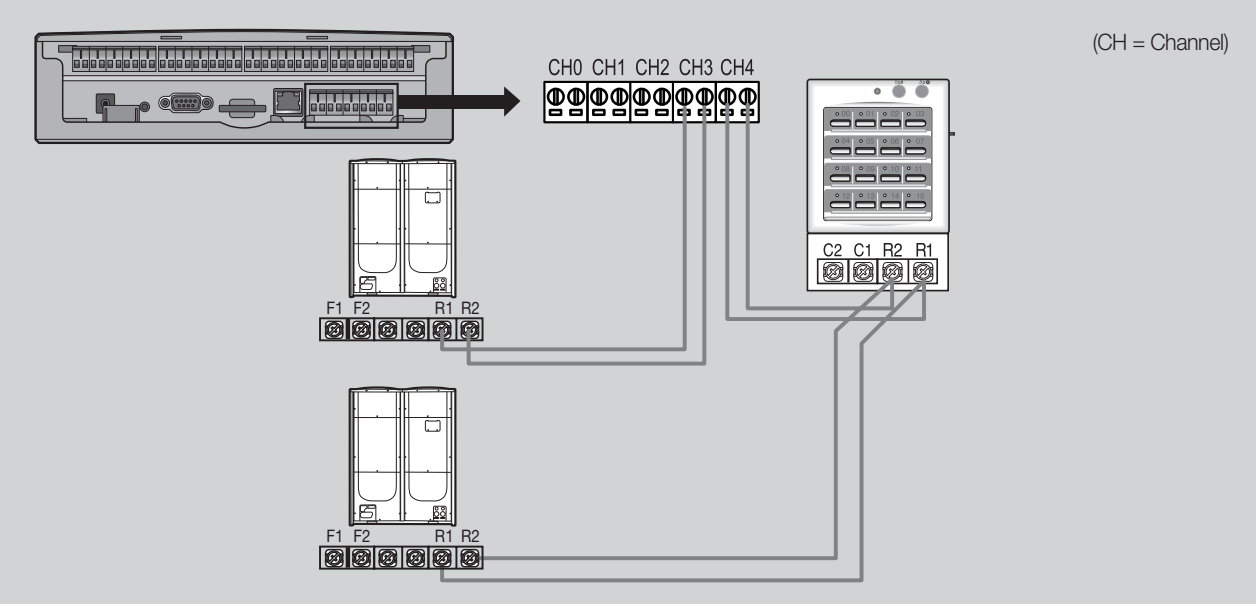
Button	Detail description
LCD display	▪ General display : Displays IP address of the DMS2 and current time ▪ In Menu : Displays menu information and set value
Menu	▪ Access menu and select main menu ▪ Cancel menu setting
▼	▪ Move between menu ▪ Change the menu settings
▲	▪ Move between menu ▪ Change the menu settings
Set	▪ Access sub menu ▪ Save the change of menu settings

4) Connection diagram

▶ MIM-B16(PIM) should be connected separately with outdoor unit or controllers.



5) Wiring



(1) Connecting outdoor unit directly

- Maximum 16 outdoor units can be connected to each channel
- Total 80 outdoor units can be connected

(2) Connecting OnOff controller / Touch centralized controller

- Maximum 15 OnOff controller / Touch centralized controller can be connected to each channel

☑ *Note*

- DMS2 can connect outdoor unit and OnOff controller / Touch centralized controller at the same time.
- Outdoor unit and OnOff controller / Touch centralized controller can be connected to 1 communication channel at the same time.

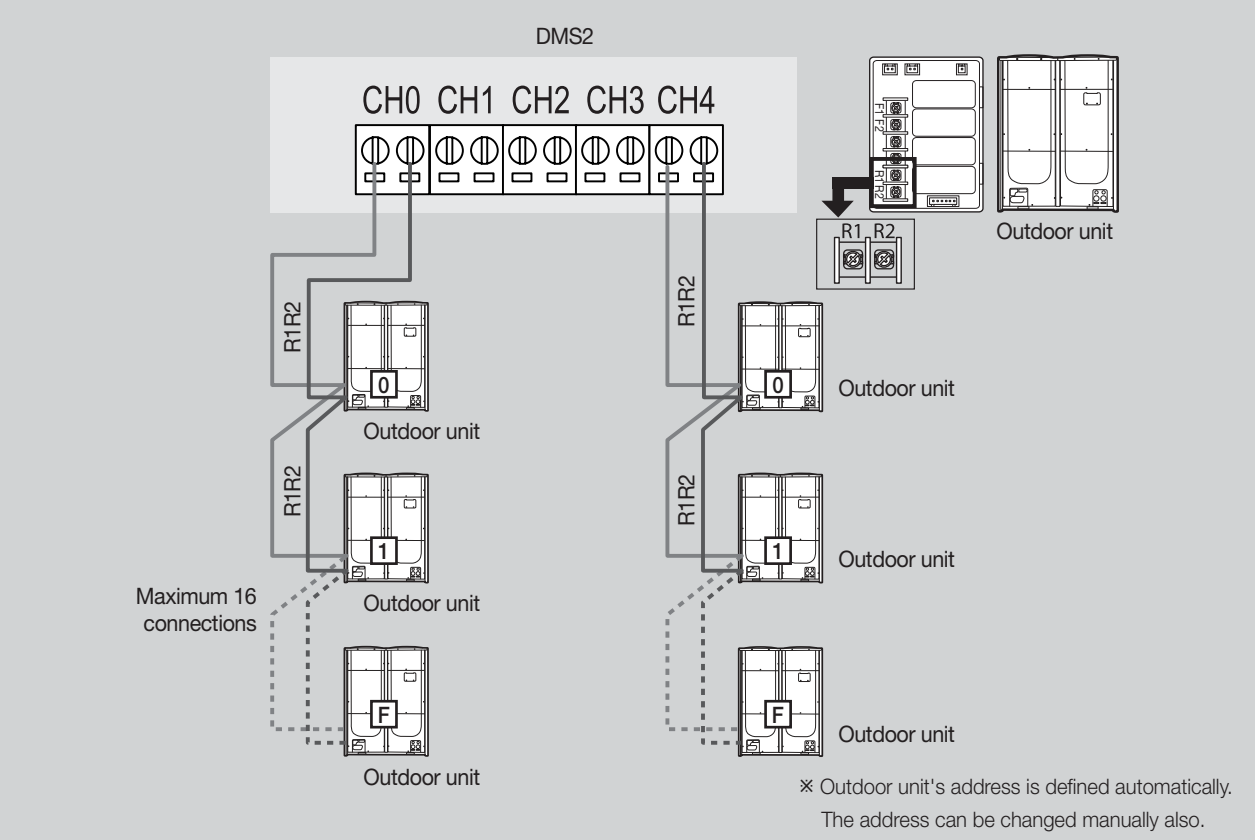
III Integrated management systems

1. DMS2

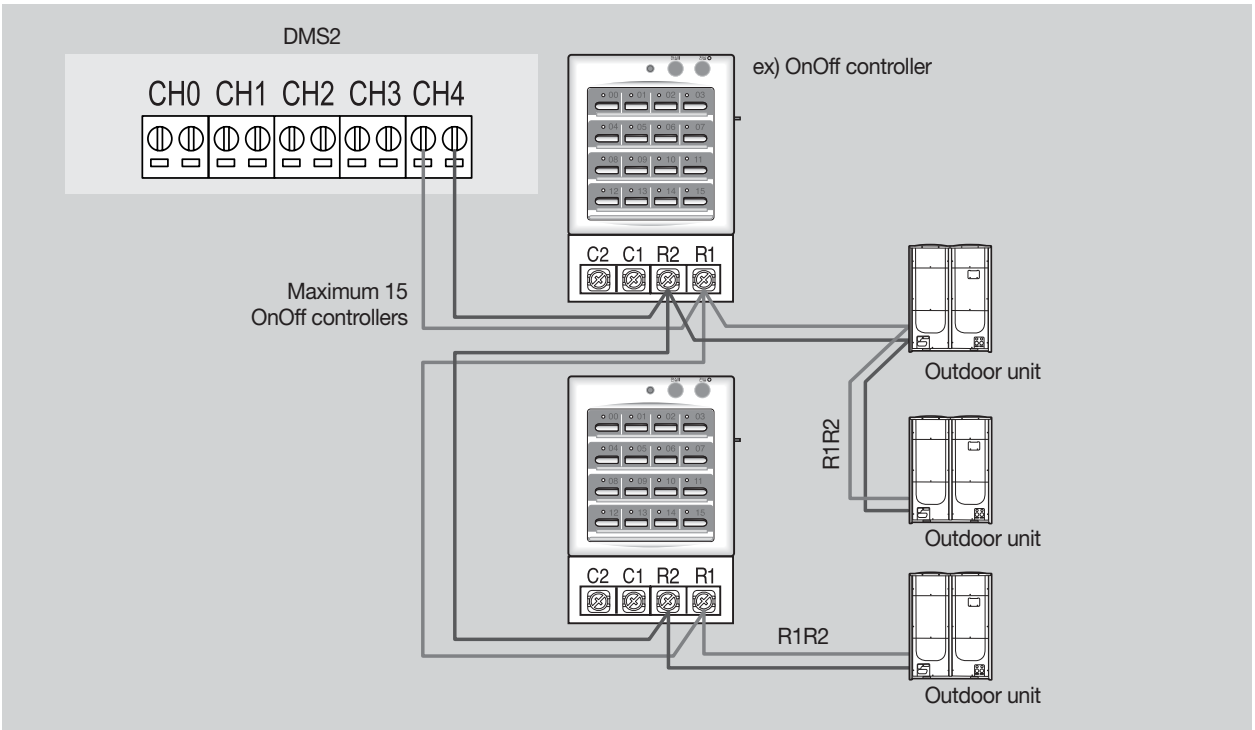
❑ *MIM-D00AN*

5) Wiring

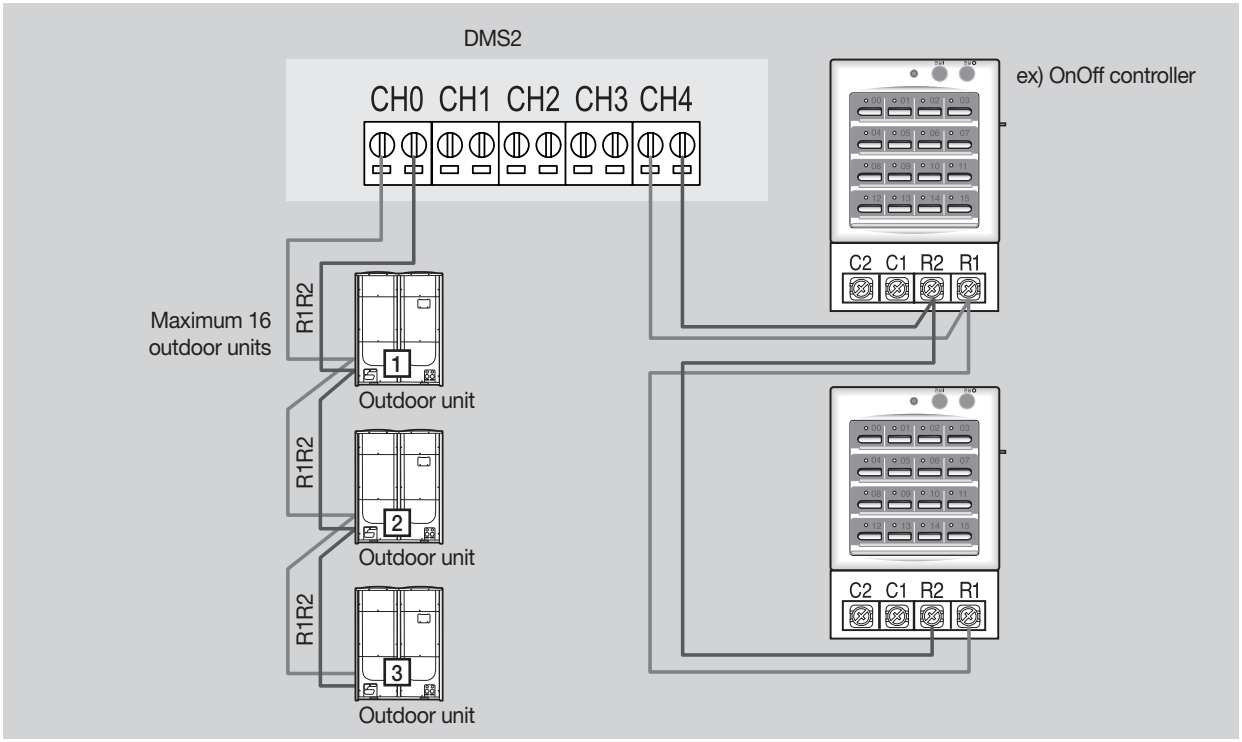
Connecting with outdoor unit



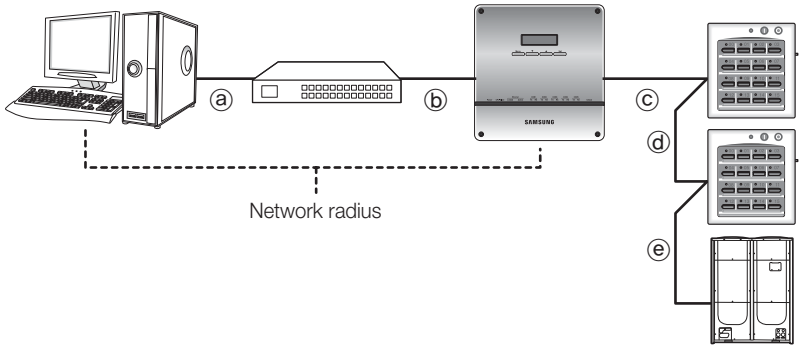
Connecting with OnOff controller / Touch centralized controller



Connecting with outdoor unit and OnOff controller / Touch centralized controller



Wiring distance

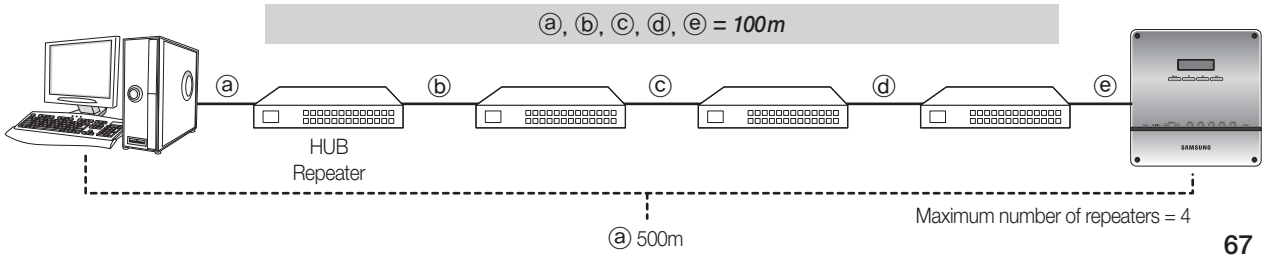


▶ Distance between DMS2 and OnOff controller / Touch centralized controller /outdoor unit

- Distance from the DMS2 to the furthest device cannot exceed 1000m.
- ⓒ + ⓓ + ⓔ ≤ ***1000m***

▶ Distance between DMS2 and upper level controller

- Since DMS2 supports 100 Base-T Ethernet, first repeater or upper level controller from the DMS2 cannot be further than 100m (IEEE 802.3). Therefore, maximum network radius is restricted to 500m.



III Integrated management systems

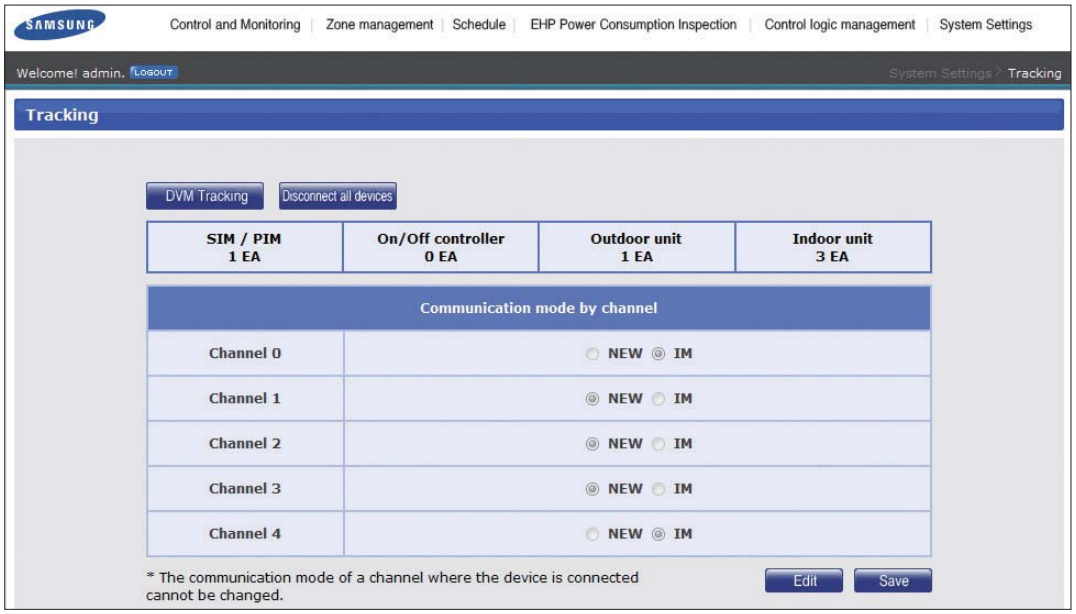
1. DMS2

❑ *MIM-D00AN*

6) Function

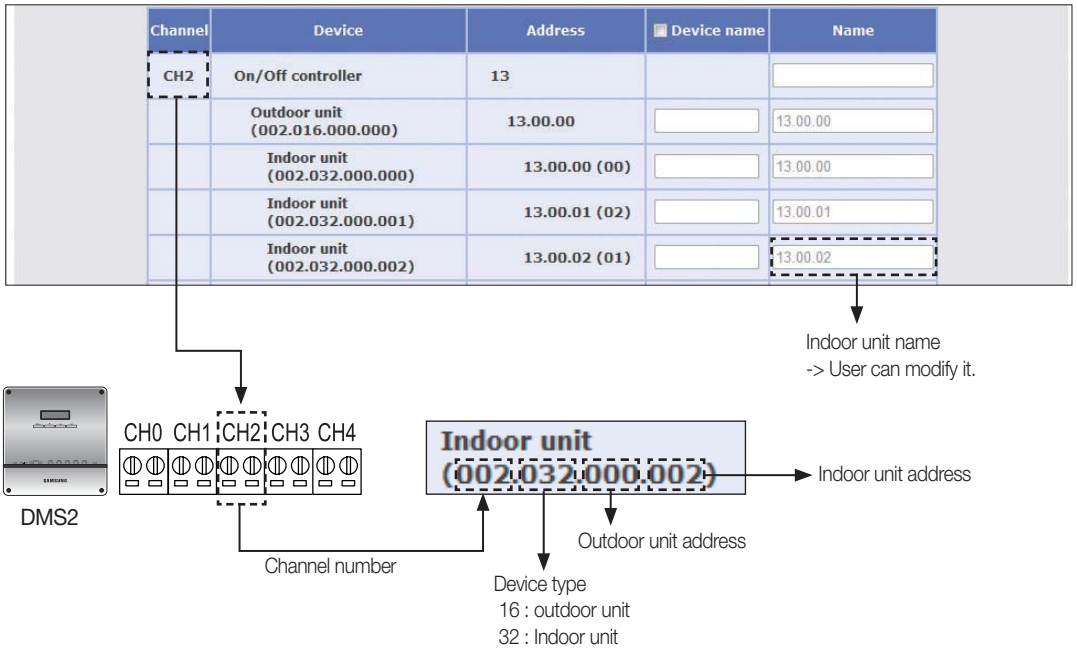
Tracking

▶ Tracking is an operation that finds devices which are connected to DMS2.
Through tracking operation, devices which are connected to DMS2 can recognize if they are connecting to DMS2.
To supervise and control system air conditioner using DMS2, tracking should be done first.



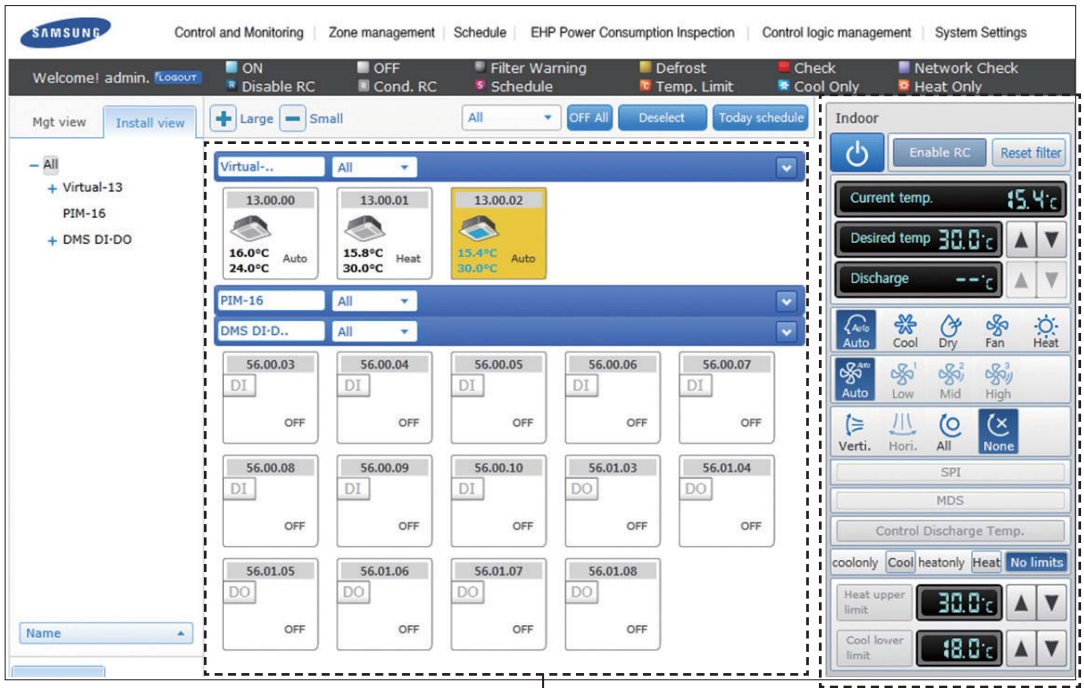
- When outdoor unit or controller is connected to channel, set as “NEW”
- When PIM(MIM-B16) is connected to channel, set as “IM”
- PIM should be connected separately with outdoor unit or controllers.

▶ You can check the number of installed devices, address of the devices or rename the indoor unit after tracking is completed.



Control & monitoring

▶ DMS2 can control and monitor Max 256 devices. (Indoor unit, ERV, AHU)
And it also controls and monitors external contact point (8 Digital input, 6 Digital output.)

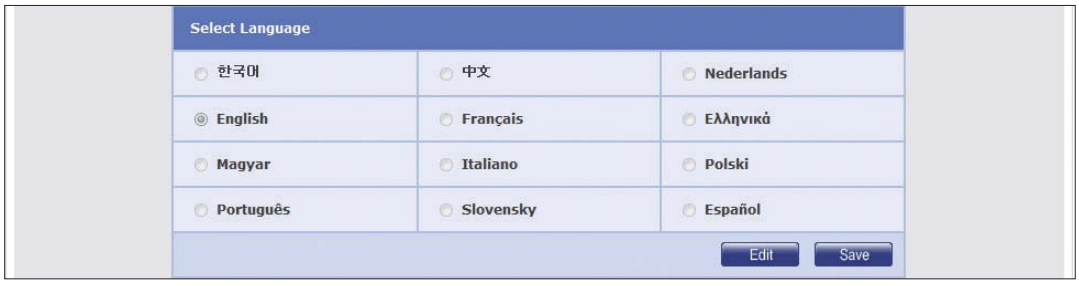


Monitoring
Indoor unit, ERV, AHU
External contact point

Control
Variable web remote controllers
depends on device type.

Multiple language support

▶ DMS2 (MIM-D00AN) supports 12 languages



Set silent contol

▶ DMS2(MIM-D00AN) can contol indoor unit without operation beeping sound using below setting option.

- Control and Monitoring: Select this if you want to control silently in 'Control and Monitoring' screen of DMS2.
- Schedule : Select this if you want to perform 'Schedule' silently.
- Control logic : Select this if you want to perform 'Control logic' silently.

III Integrated management systems

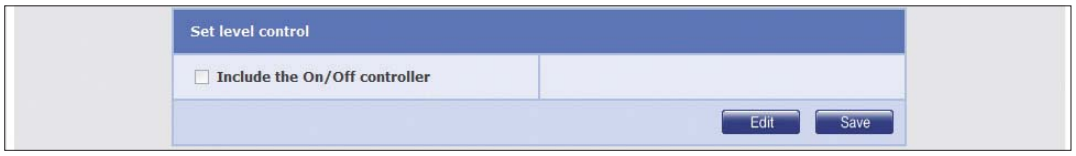
1. DMS2

❑ *MIM-D00AN*

6) Function

OnOff controller restriction

▶ DMS2 (MIM-D00AN) can restrict OnOff controller, Touch centralized controller usage.

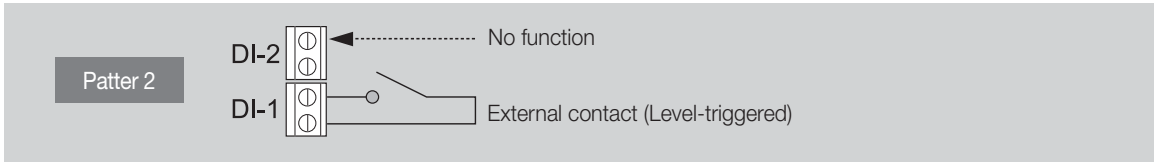


• Select this if you want to restrict controlling from OnOff controller and Touch centralized controller when you disable RC from the DMS2.

Contact point control

▶ You can select emergency operation pattern

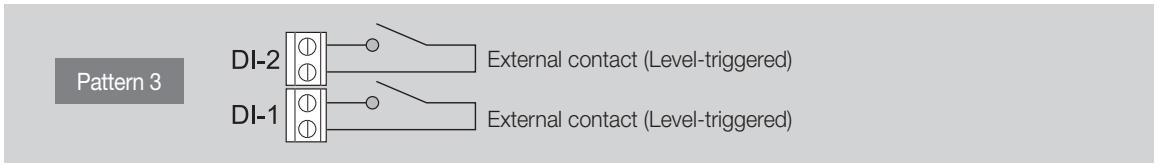
(1) Pattern 2



▶ Short external contact : Emergency stop
- Turns off all the indoor units when there is an ON signal input
- All the remote control use is disabled
- Control from S-NET3 is unavailable
- Disable schedule control

▶ Open external contact : Resume operation
- After Emergency stop, the indoor units stay in the current OFF states.
- All the remote control use is restored to the previous state.
- Schedule control is enabled again.

(2) Pattern 3

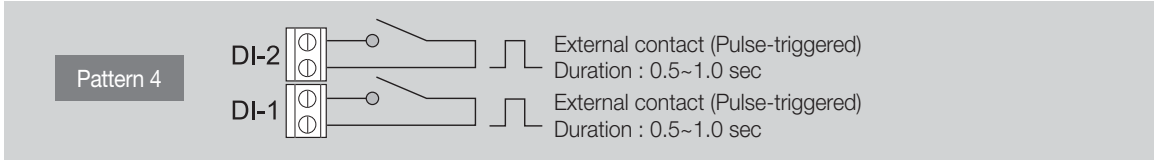


▶ External contact input to DI-1
- Short contact : Starts all indoor unit operation.
- Open contact : Stops all indoor unit operation.

※ Schedule control is not interrupted in Pattern 3.

▶ External contact input to DI-2
- Short contact : Disables the use of all wired/ wireless remote controllers.
- Open contact : Enables the use of all wired/ wireless remote controllers.

(3) Pattern 4



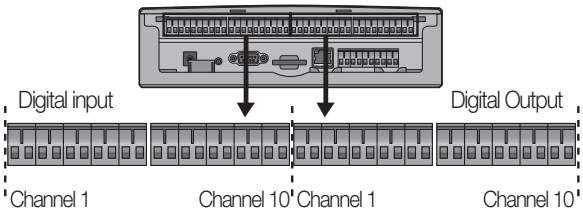
▶ External contact pulse input to DI-1
- Short pulse-triggered : Starts all indoor unit operation.

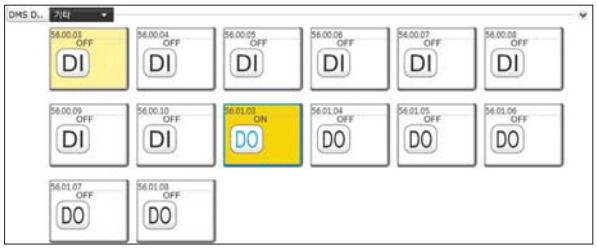
※ Schedule control is not interrupted in Pattern 4.

▶ External contact pulse input to DI-2
- Short pulse-triggered : Stops all indoor unit operation.

General external contact point control

DMS2 has Digital input/output ports to check the external device status or turn them On/Off through contact point.





▶ DI : Voltage free contact signal input (Open / Short)

- Channel 1, Channel 2 is occupied with [Emergency stop] function.
- Channel 3~Channel 10 : DMS2 can monitor the contact signal input state of each channel

▶ DO : Contact signal output (DC 12V)

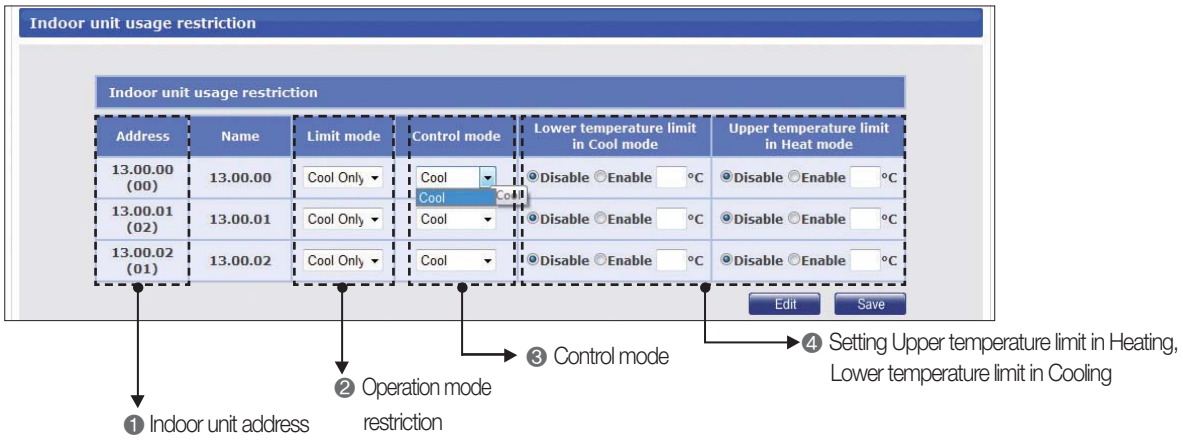
- Channel 1, Channel 2, Channel 9 and Channel 10 is occupied with other functions.
- Channel 3~Channel 8 : DMS2 can control contact signal output.

☑ *Note*

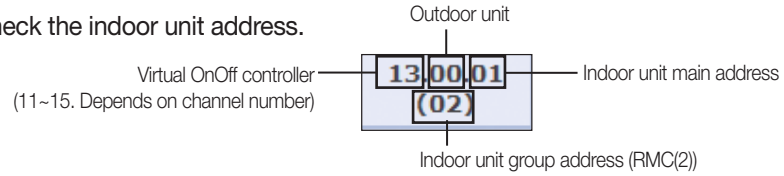
◆ DI 1, 2/ DO 1, 2, 9, 10 will be excluded from control and monitoring since it is being used by internal function of DMS2.

Indoor unit usage restriction

- Operation limit : To prevent the wrong operation mode setting, it can limit the operation mode of indoor unit.
- Temperature limit : It can set the lower temperature limit in Cool mode and the upper temperature limit in Heat mode.



❶ Check the indoor unit address.



❷ Select the Limit mode

- Indoor units within same outdoor unit must be set in same limit mode.
- All indoor units of one outdoor unit set same operation mode restriction automatically.

❸ Control mode will be set automatically depends on the seleceted restricted mode

- Ex) When the restricted mode is set to [Cool-only] and then [Control mode] is set to [Cool] automatically
  If user set [Heating mode] using remote controller → Indoor unit ignores the command.

❹ Set the Upper temperature limit in Heating and Lower temperature limit in Cooling.

- Upper temperature limit in Heating and Lower temperature limit in Cooling can be set differently for each indoor unit.
  (Cooling : 18ºC~30 ºC, Heating : 16 ºC~30 ºC)

III Integrated management systems

1. DMS2

❑ *MIM-D00AN*

6) Function

Logic control

What is logic control?

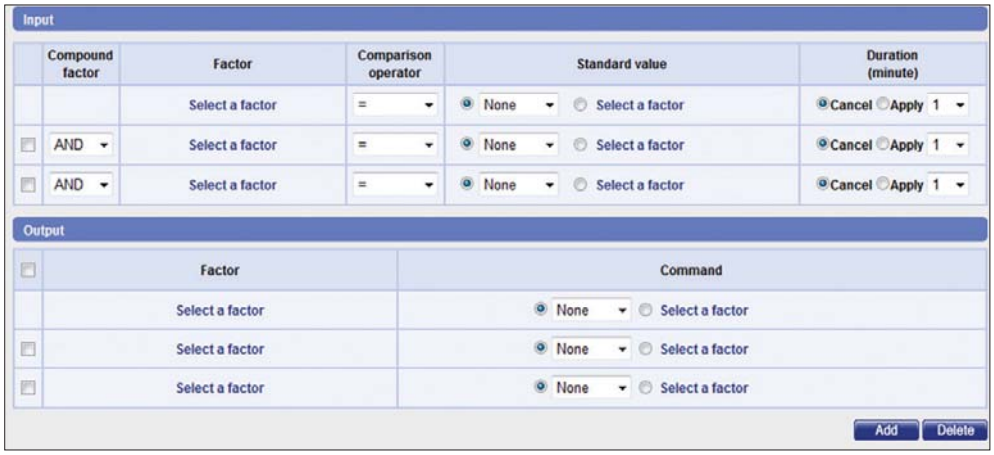
User can control the air conditioner, ERV, AHU and digital output depending on the conditions, such as room temperature and outdoor temperature, set by the user. Input condition can be used with parameter and it will be calculated with arithmetic equation. Schedule function executes operation by time but logic control executes operation according to the conditions that set by the user.

Examples of utilizing the logic control

Case 1) Government regulates the lowest room temperature to be 26ºC in public places. When the room temperature is lower than 26ºC, administrator must turn off all the air conditioners in the area. Is there any way for the air conditioner to turn off automatically depending on the certain room temperature?

Case2) During spring and fall, it is cold in the morning and warm in the afternoon. Therefore, I'm using the air conditioner in heating mode in the morning and cooling mode in the afternoon. Can I set the air conditioner to change operation mode automatically depending on the outdoor temperature?

Case 3) I'm using air conditioner with ERV. In the days with the outdoor temperature relatively lower than the indoor, I want to use ERV instead of the air conditioner to ventilate and minimize the air conditioner use. Is there any way to set the air conditioner or ERV to operate appropriately and automatically depending on the temperature?



Input

1. Select the factor to input condition
   - Device, factor
2. Edit the condition
   - Compound factor
   - Comparison operator
   - Standard value
   - Duration

Output

1. Select output factor
   - Device, factor
2. Edit output
   - Create control

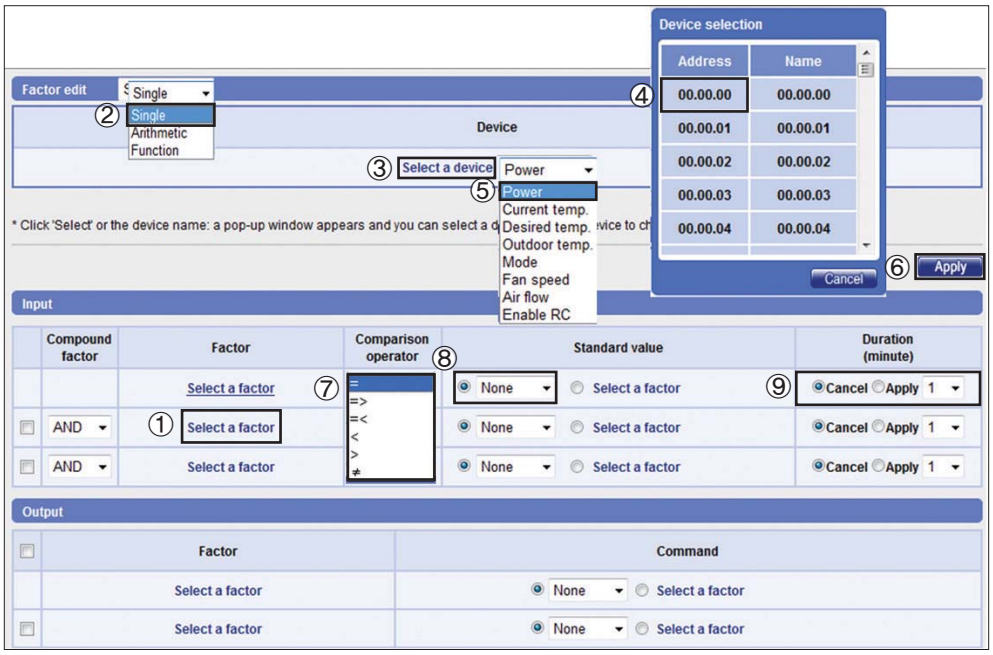
Edit factor		
Single factor	Power Current temp. Desired temp. Outdoor temp. Mode Fan speed Air flow Enable/Disable RC	
Arithmetic factor	+ -	Current temp. Desired temp. Outdoor temp.
Function factor	Average	Current temp. Desired temp. Outdoor temp.

Compound factor
AND
OR

Comparison operator
=
=>
=<
>
<
≠

Command
Power
Desired temp.
Mode
Fan speed
Air swing
Enable/ Disable RC

(1) Editing input factor

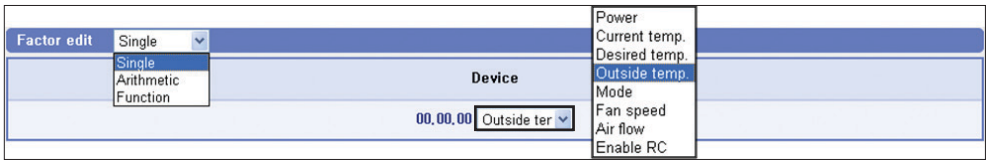


① Click “Select a factor”. ➡ ② Select type of the factor ➡ ③ Click “Select a device”

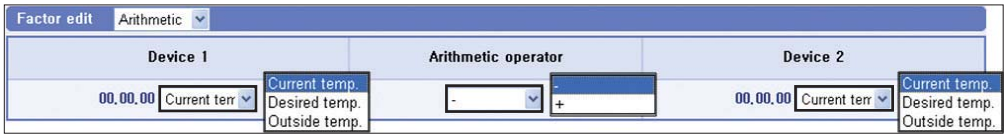
⑥ Click “Apply”. ⬅ ⑤ Select a detail item ⬅ ④ Select the device from the list.

⑦ Select the comparison operator ➡ ⑧ Select a standard value ➡ ⑨ Select the duration

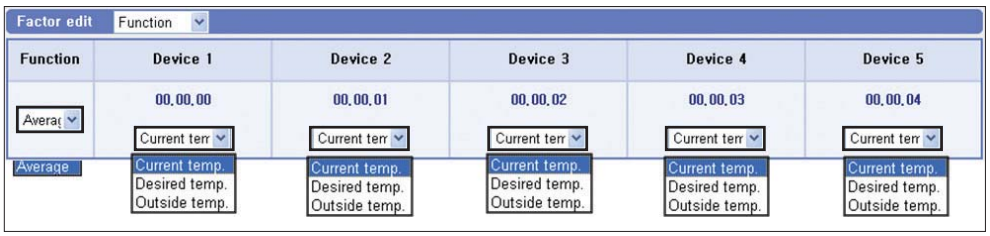
▶ Single factor : 1 device and 1 factor.



▶ Arithmetic : It means 2 devices are connected by arithmetic operator.



▶ Function : Use average value of various conditions from the device and create it as a factor.



III Integrated management systems

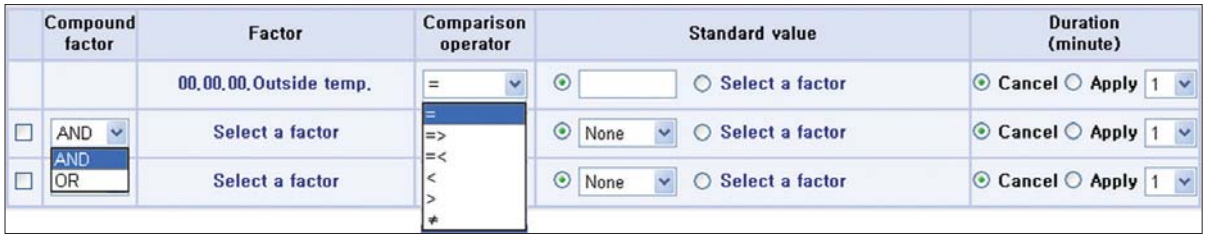
1. DMS2

❑ *MIM-D00AN*

6) Function

Logic control

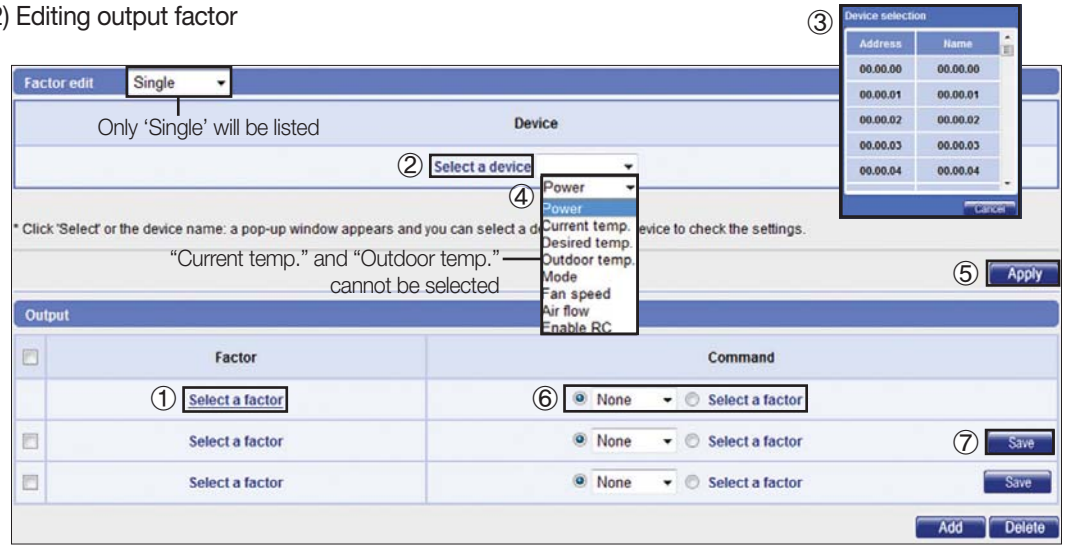
(1) Editing input factor



- Compound factor : AND, OR, No selection
  Ex) Apply 'AND' or 'OR' to 3 factors
  → (input 1) And (input 2) OR (input 3)
- Comparison operator : =, =>, =<, <, >, ≠
- Standard value : Standard value of the factor
  Ex) When the factor is “Outdoor temperature of the indoor unit number 00”, then standard value is value of the “Outdoor temperature”.
  → “Outdoor temperature of the indoor unit number 00” > 20
- Duration : Duration can be set between 1~60 min.

Item	Comparison operator	Standard value
Power	=, ≠	On, Off
Current temp	=, =>, =<, <, >, ≠	Temperature value (number)
Desired temp	=, =>, =<, <, >, ≠	Temperature value (number)
Outside temp	=, =>, =<, <, >, ≠	Temperature value (number)
Mode	=, ≠	Auto, Cool, Dry, Fan, Heat
Fan speed	=, ≠	Auto, Low, Med, High
Air flow	=, ≠	Vertical, Horizontal, All, None
Enable RC	=, ≠	ON, OFF, Level 1

(2) Editing output factor



① Click “Select a factor”. ➡ ② Click “Select a device”. ➡ ③ Select the device from the list.

⬇

⑥ Select “Command”. ⬅ ⑤ Click “Apply”. ⬅ ④ Select a detail item to control.

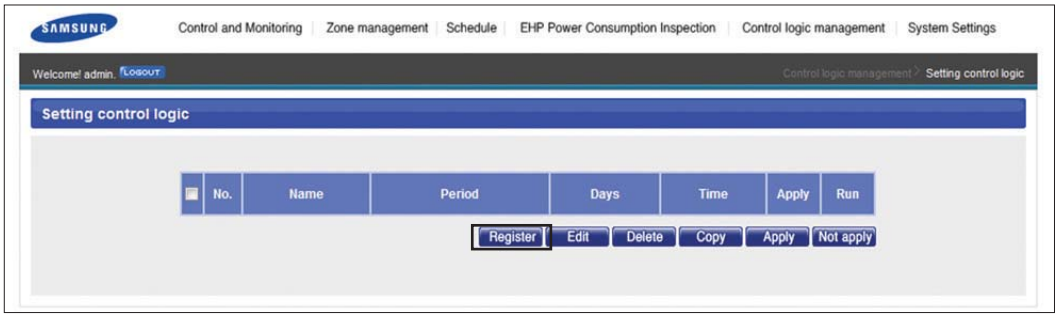
⬇

⑦ Click “Save”.

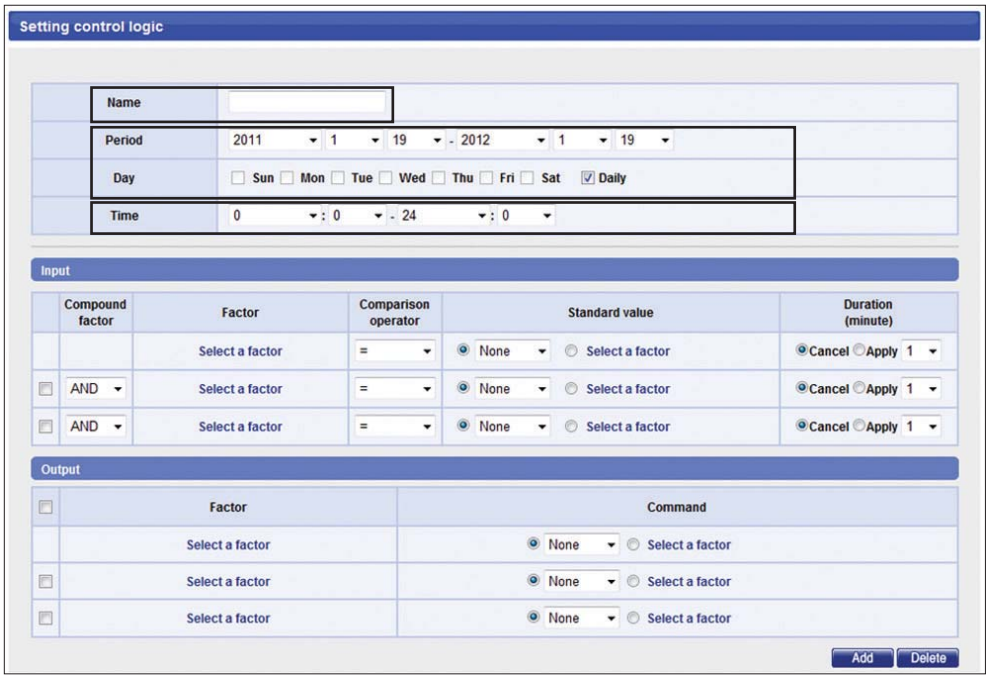
(3) Control example – Setting

Ex) Set the ERV to turn off together when the indoor unit turns off

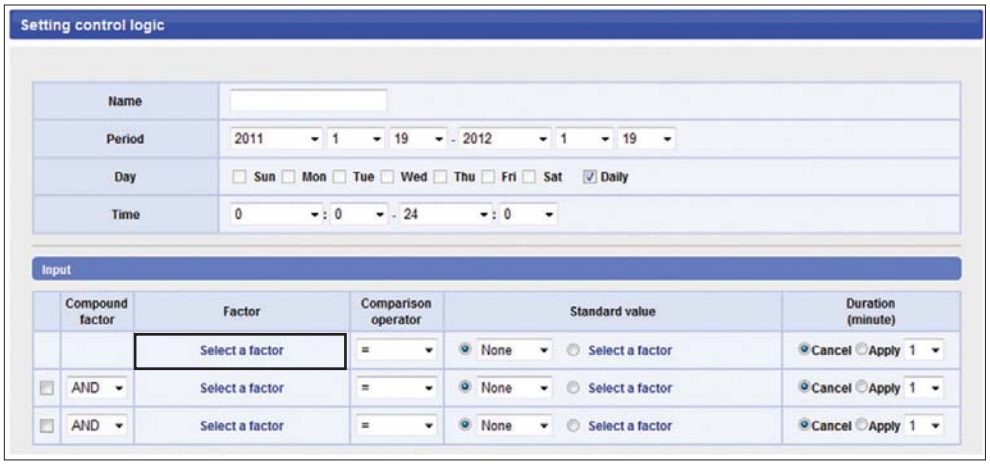
❶ Click [Control logic management] → [Setting control logic] from DMS2 menu. Click [Register] to create new control logic.



❷ Enter Name, period/day and time for new control logic.



❸ **Create input condition :** Click [Select a factor] from the 'Input' window.



III Integrated management systems

1. DMS2

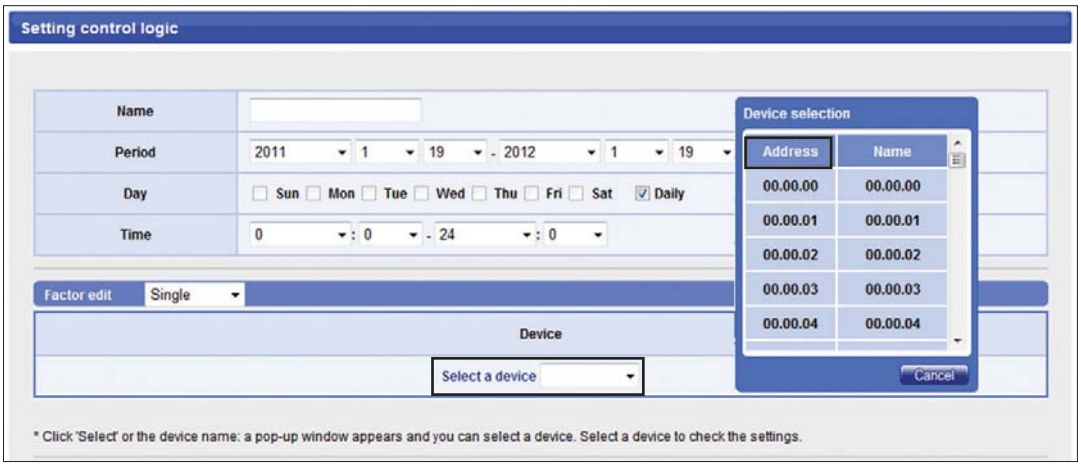
❑ *MIM-D00AN*

6) Function

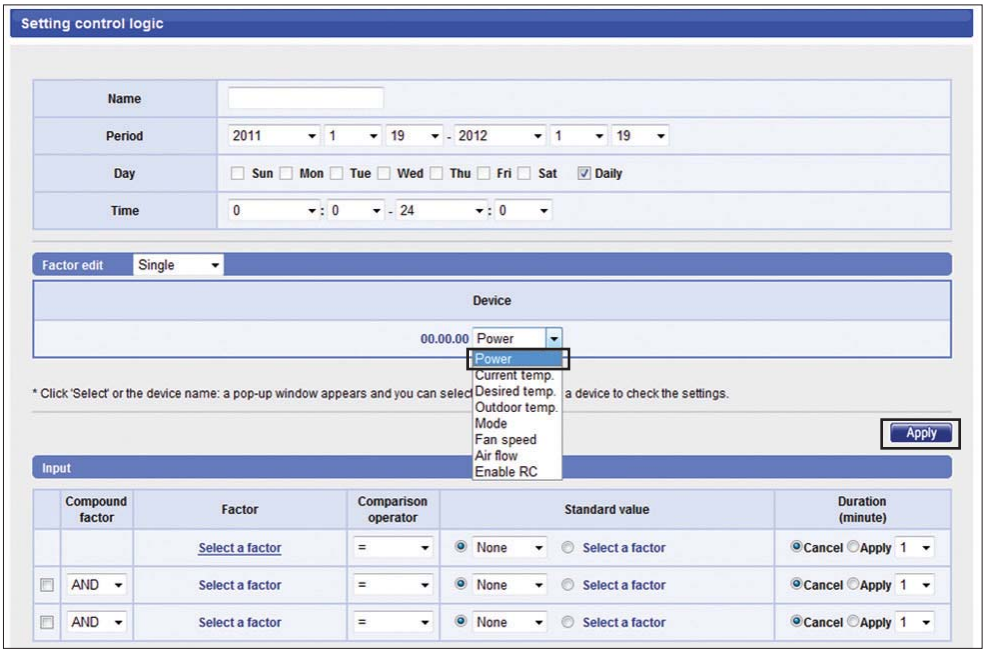
Logic control

(3) Control example – Setting

❹ Click [Select a device], then [Device selection] window will pop up.
Select a indoor unit to apply the new control logic.

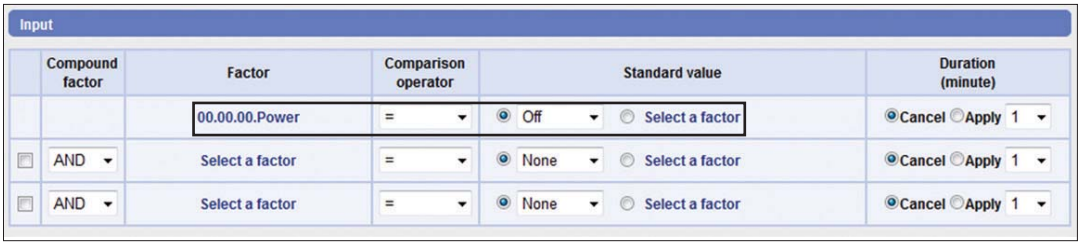


❺ **Create input condition :** When the device is selected, click [Power] and click [Apply].
※ [Power] means the operation state (On/Off).

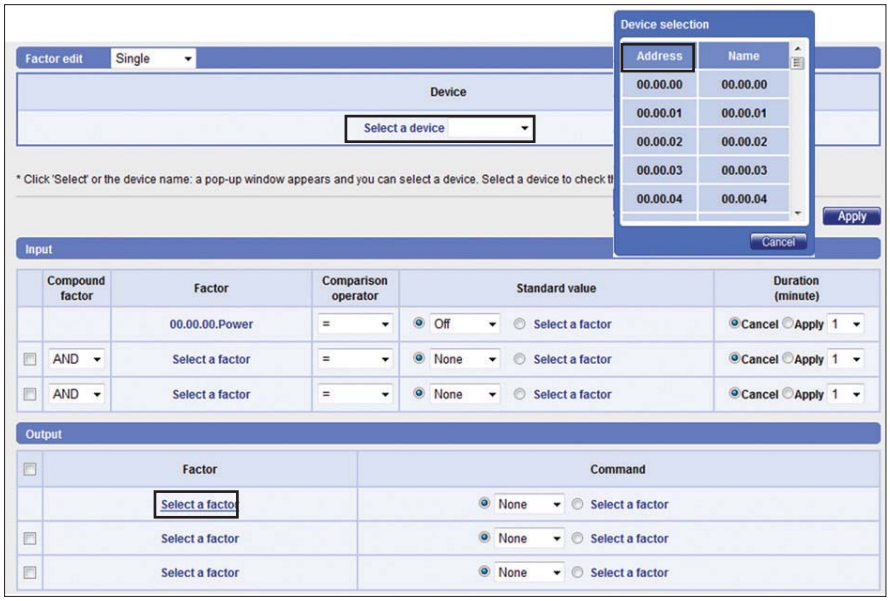


❻ **Create input condition :** Select '=' as a comparison operator and select "Off" as a standard value.

- Meaning: Execute output control when 00.00.00 device is off.



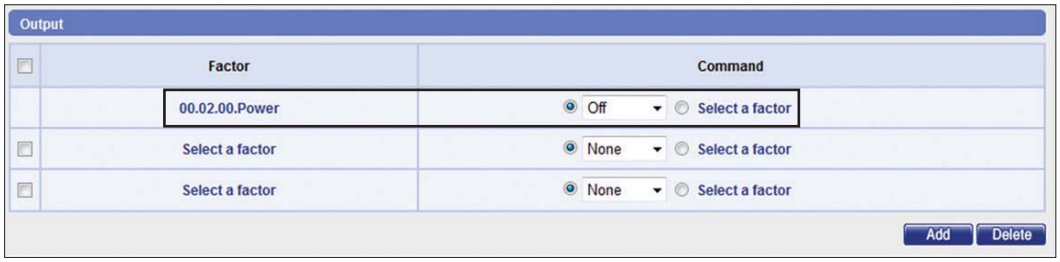
❼ **Create output :** From the output window, select the device to apply the control when input condition is satisfied. Click [Apply] when selection is completed.



❽ **Create output :** Select “Power” as a factor of the selected device and click [Apply].

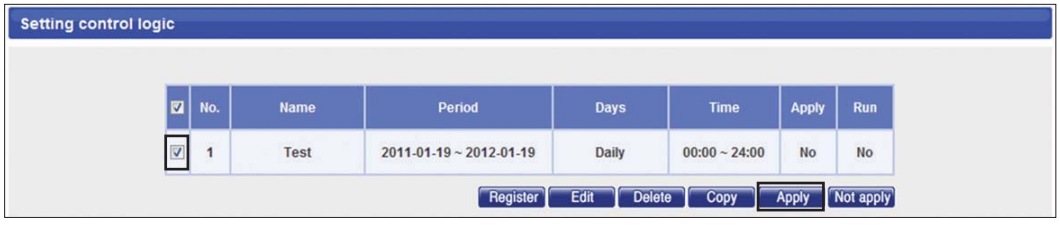
❾ **Create output :** From the output window, select the control to be executed when input condition is satisfied.

- Turn off the ERV no. 0



❿ Click [Save] when the setting is completed.

⓫ To apply the new logic control, select the created logic and click [Apply].



III Integrated management systems

1. DMS2

❑ *MIM-D00AN*

6) Function

Logic control

(4) Control example – Control logic

Ex) Control logic 1 : Turn on 4 indoor units when outdoor temperature is 30°C or higher.
Control logic 2 : Turn off 4 indoor units when outdoor temperature is 26°C.

Control logic 1

Name	PowerOn_Temp30
Period	2010 3 23 - 2011 3 23
Day	☐ Sun ☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri ☐ Sat ☐ Daily
Time	8 : 0 - 18 : 0

Input

Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
	00.00.00.Outdoor temp.	=>	◉ 30 ○ Select a factor	○ Cancel ◉ Apply 5
☐ AND	Select a factor	=	◉ None ○ Select a factor	◉ Cancel ○ Apply 1
☐ AND	Select a factor	=	◉ None ○ Select a factor	◉ Cancel ○ Apply 1

Output

☑	Factor	Command
	00.00.00.Power	◉ On ○ Select a factor
☑	00.00.01.Power	◉ On ○ Select a factor
☑	00.00.02.Power	◉ On ○ Select a factor
☑	00.00.03.Power	◉ On ○ Select a factor

❶ Input : When outdoor temperature is 30°C or higher. ❷ When condition 1 lasted for 5 miniute. ❸ Output : Turn on 4 indoor units.

Control logic 2

Name	PowerOff_Temp26
Period	2010 3 23 - 2011 3 23
Day	☐ Sun ☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri ☐ Sat ☐ Daily
Time	8 : 0 - 18 : 0

Input

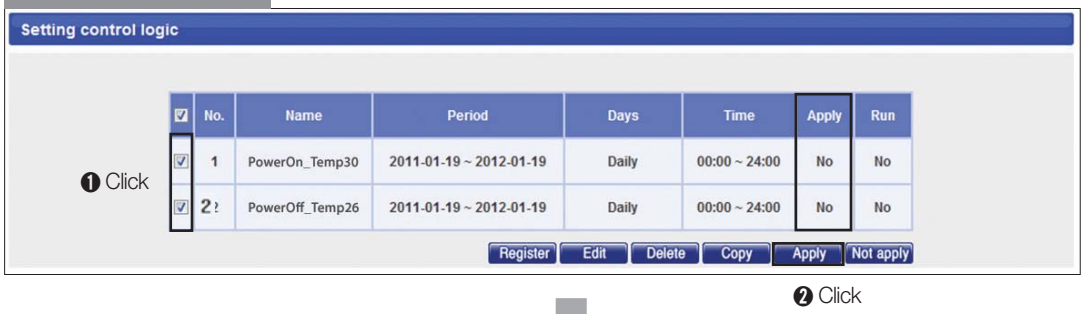
Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
	00.00.00.Outdoor temp.	=<	◉ 26 ○ Select a factor	◉ Cancel ○ Apply 1
☐ AND	Select a factor	=	◉ None ○ Select a factor	◉ Cancel ○ Apply 1
☐ AND	Select a factor	=	◉ None ○ Select a factor	◉ Cancel ○ Apply 1

Output

☑	Factor	Command
	00.00.00.Power	◉ Off ○ Select a factor
☑	00.00.01.Power	◉ Off ○ Select a factor
☑	00.00.02.Power	◉ Off ○ Select a factor
☑	00.00.03.Power	◉ Off ○ Select a factor

❶ Input : When outdoor temperature is 26°C or lower. ❷ Output : Turn off 4 indoor units.

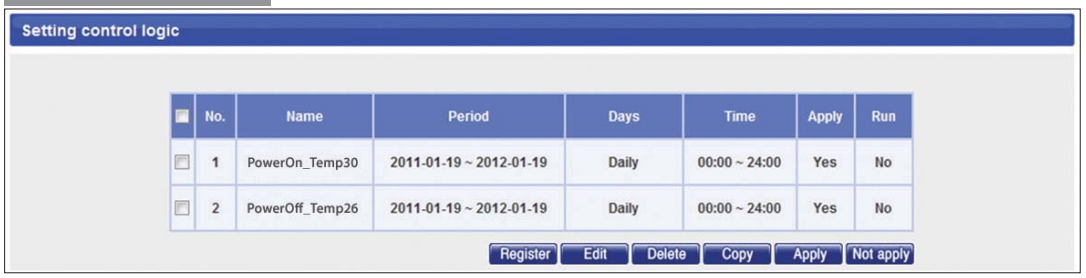
Register control logic



❶ Click

❷ Click

Control logic applied



Application completed

III Integrated management systems

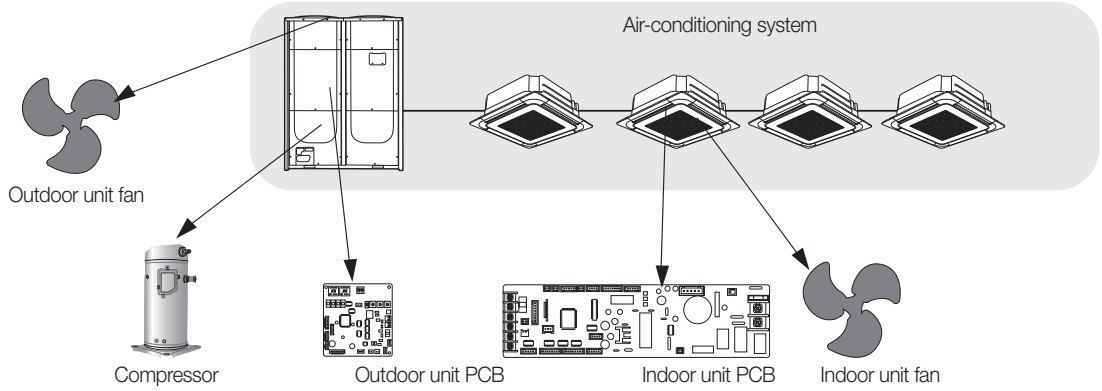
1. DMS2

❑ *MIM-D00AN*

6) Function

Power distribution

• Where does power consumption occurs?

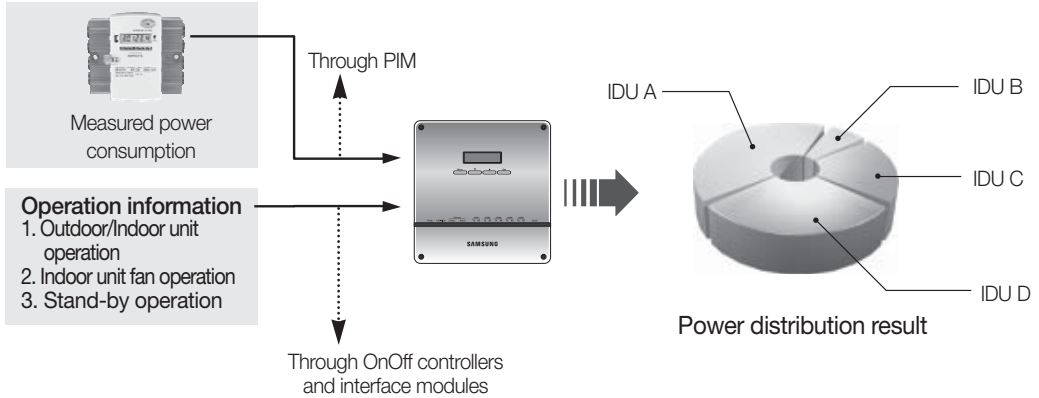


System power consumption includes:
1. Main power - Compressor operation power
2. Fan power - Indoor/Outdoor unit fan operation
3. Stand-by power - Preheating coil power, Indoor/Outdoor PCB power

(1) DMS2 power distribution theory

All the system information of power and indoor/outdoor operation is always monitored by the DMS2 for power distribution calculation.

IDU: Indoor unit



$$\text{IDU A's electric power consumption} = \text{Total power consumption} \times \frac{\text{Demand capacity of IDU A}}{\text{Total demand capacity of all IDUs}}$$

Here, Demand capacity = Main capacity + Fan capacity + Stand-by capacity

☑ *Note*

- Demand capacity means the value that parameters of different units like required power and refrigerant amount are transformed into as a common number to make easy algebraic calculation.

(2) Main capacity

This is determined dynamically with the combination of various refrigerating parameters such as difference between room and set temperature or evaporator input/output temperature.

These parameters, as a result, determine the refrigerant amount flowing into the indoor unit by controlling EEV steps.

(3) Fan capacity

This is constant value for indoor unit models. It differs depending on indoor units of different capacity.

When the indoor unit starts Cooling, Heating, Auto and Fan modes, fan capacity values of the indoor units are always monitored by the DMS2. DMS2 gathers capacity of zero value when they stop operating.

(4) Stand-by capacity

Stand-by capacity is constant for all indoor units regardless of their operations. Since stand-by power is consumed all the time by PCBs and preheating coils in the outdoor unit, whose value is monitored with the same fraction which is relatively small compared to main capacity or fan capacity.

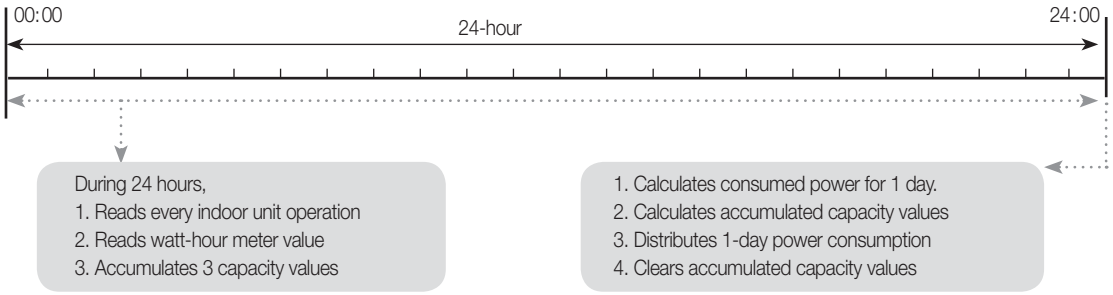
(5) What if the room temperature begins to reach the set temperature?

If the room temperature begins to reach the set temperature, the indoor unit does not have to extract the full refrigerant amount to keep the set condition. Capacity from the indoor unit goes down to indicate the outdoor unit that it does not need refrigerant at the full capacity state.

When the room temperature has reached the set temperature, there is no need to pump the refrigerant into the indoor unit. Indoor unit goes into the thermally OFF state and sends capacity of zero value to the outdoor unit and the DMS2, which results in fan or stand-by power distribution only.

(6) Capacity accumulation and power distribution

DMS2 gathers power consumption and capacity values during one-day.
At midnight, 1-day power consumption is distributed to the indoor units using the gathered information.

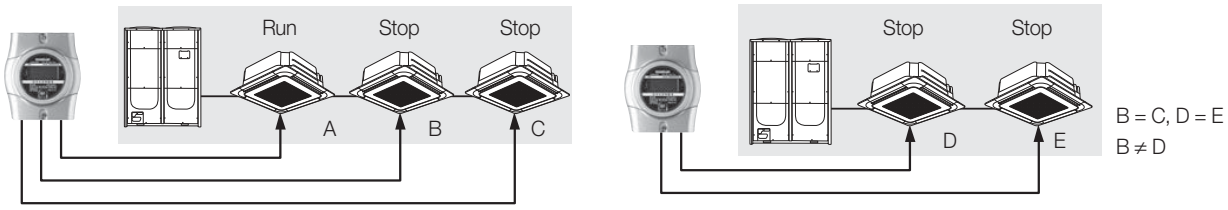


(7) Undesirable situation protection

Even when there occurred communication error between the DMS2 and PIM or DMS2 can no longer gather power consumption, DMS2 stores power distribution ratio for all indoor units. As soon as communication between them resumes and power information is transmitted to the DMS2, power distribution during the interrupted period is recovered as normal condition.

(8) Not equal stand-by power distribution (In case all the indoor units are stopped)

Since there always exists error in each power consumption amount, distributed stand-by power may not be equal for different air-conditioning system. But the difference is so small that it is negligible.



III Integrated management systems

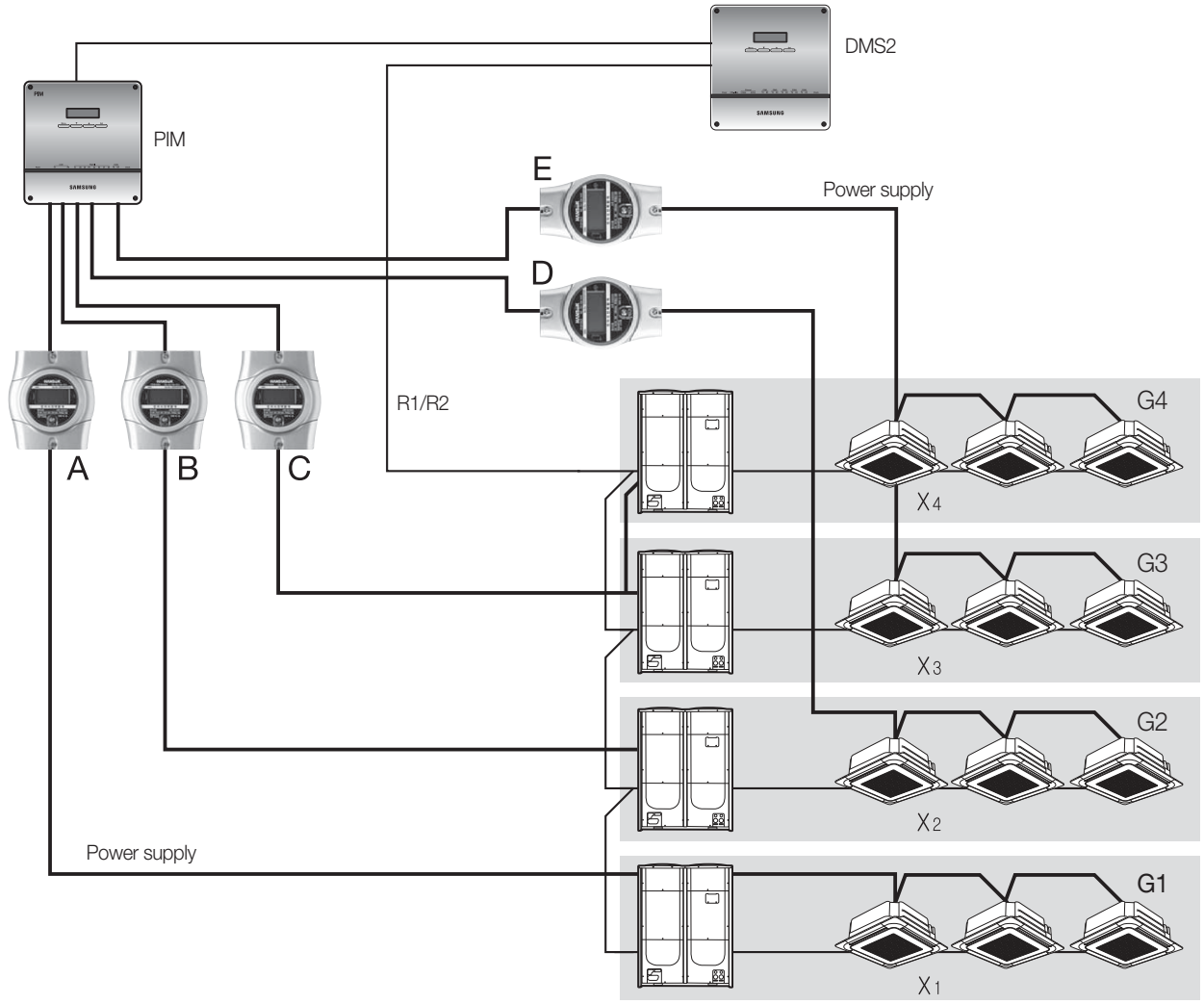
1. DMS2

❑ *MIM-D00AN*

6) Function

Power distribution

Power distribution equation



▶ When configuring the DMS2 and the whole system, mapping of watt-hour meters for indoor/outdoor units must be precisely assigned for correct power distribution.

$$\text{Indoor unit power X in G1} = \text{Watt-hour A} \times \frac{\text{Main + Fan + Stand-by capacity of indoor unit X}}{\text{Total capacity of G1}}$$

$$\text{Indoor unit power X in G2} = \text{Watt-hour B} \times \frac{\text{Main + Fan + Stand-by capacity of indoor unit X}}{\text{Total capacity of G2}}$$

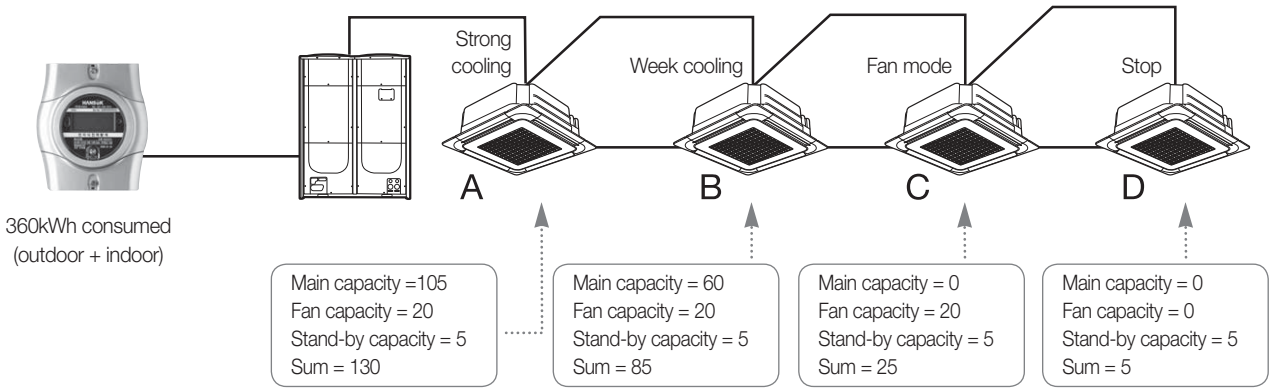
$$+ \text{Watt-hour D} \times \frac{\text{Fan + Stand-by capacity of indoor unit X}}{\text{Total Fan/Stand-by capacity of G2}}$$

$$\text{Indoor unit power X in G3+G4} = \text{Watt-hour C} \times \frac{\text{Main + Fan + Stand-by capacity of indoor unit X}}{\text{Total capacity of G3 + G4}}$$

$$+ \text{Watt-hour E} \times \frac{\text{Fan + Stand-by capacity of indoor unit X}}{\text{Total Fan/Stand-by capacity of G3 + G4}}$$

Example

Suppose capacity values accumulated at 24:00 during one whole day is as follows.



$$\text{Pd of Indoor unit A} = \frac{\text{Indoor unit capacity}}{\text{Total capacity}} \times \text{Total kWh} = \frac{130 \times 360}{130 + 85 + 25 + 5} = 192.020 \text{ kWh}$$

$$\text{Pd of Indoor unit B} = \frac{85 \times 360}{130 + 85 + 25 + 5} = 124.900 \text{ kWh}$$

$$\text{Pd of Indoor unit C} = \frac{25 \times 360}{130 + 85 + 25 + 5} = 36.735 \text{ kWh}$$

$$\text{Pd of Indoor unit D} = \frac{5 \times 360}{130 + 85 + 25 + 5} = 7.347 \text{ kWh}$$

III Integrated management systems

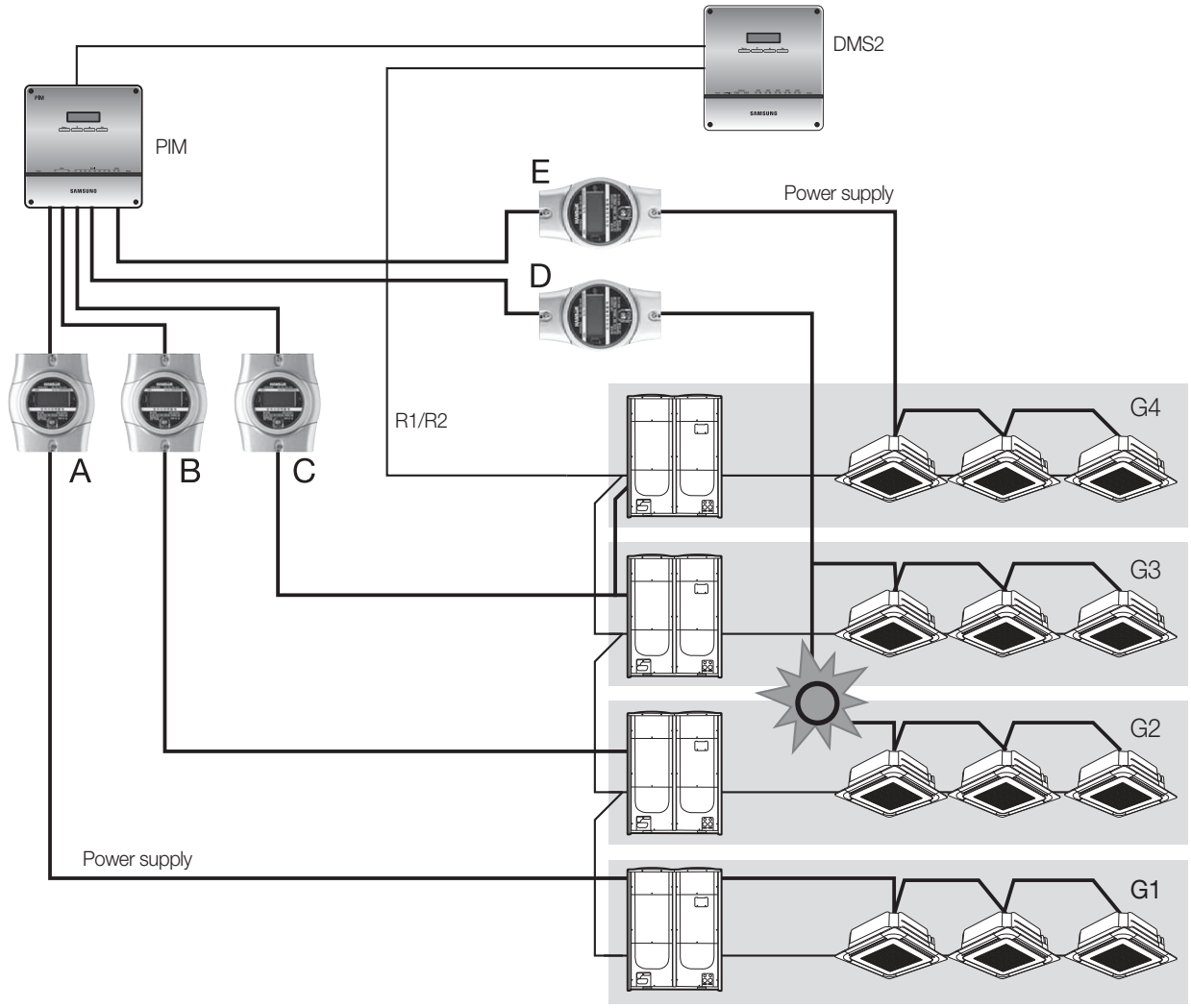
1. DMS2

❑ *MIM-D00AN*

6) Function

Power distribution

Installation example (Allowed)



Mapping watt-hour meters to indoor/outdoor units

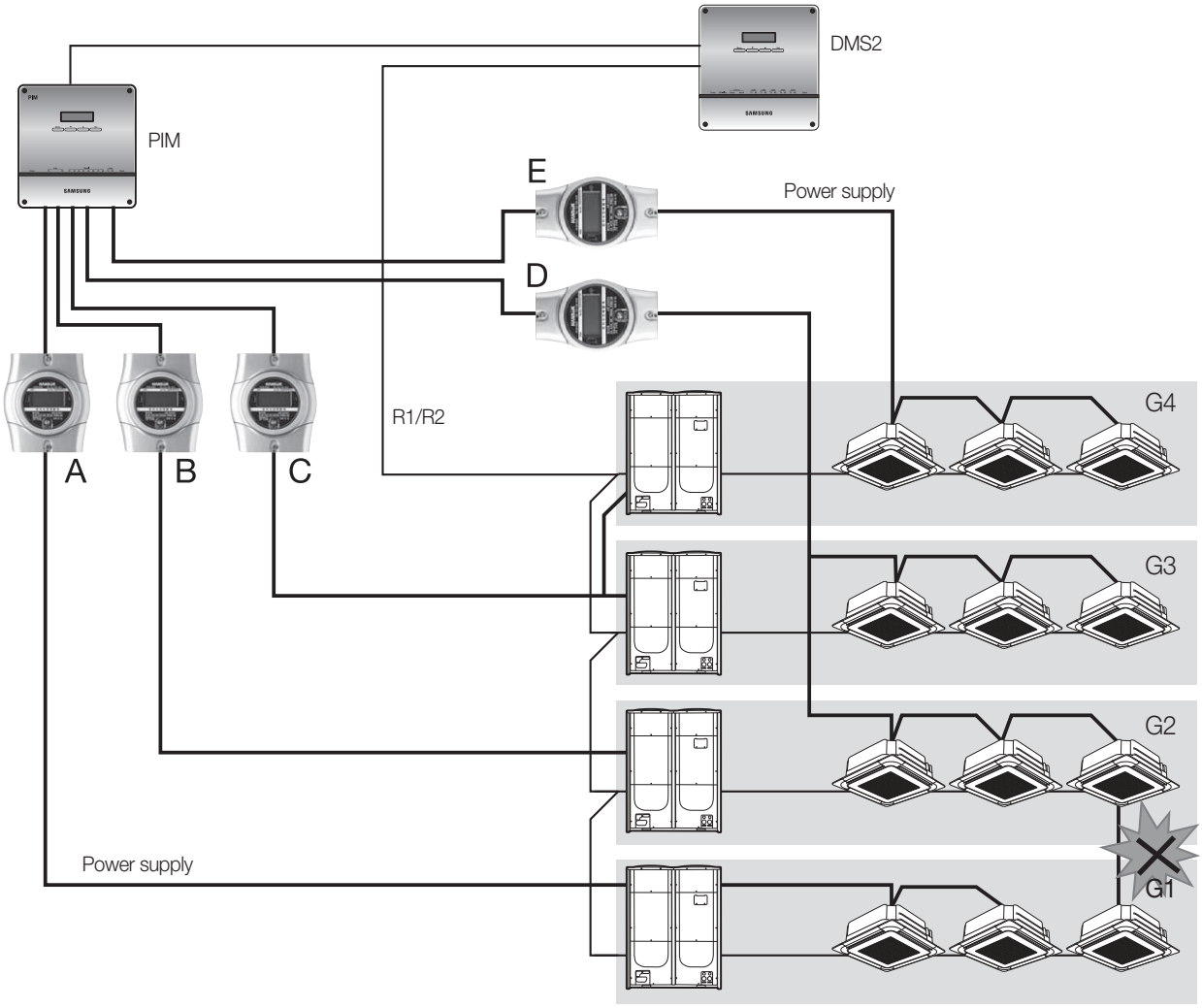
- Watt-hour meter A is mapped to all indoor/outdoor units in G1.
- Watt-hour meter B is mapped to the outdoor unit in G2.
- Watt-hour meter C is mapped to the outdoor units in G3 and G4.
- Watt-hour meter D is mapped to the indoor units in G2 + G3.
- Watt-hour meter E is mapped to the indoor units in G4.

※ Installation above is allowed with proper mapping configuration.

☑ *Note*

◆ Watt-hour meter can be shared to the multiple indoor/outdoor systems.

Installation example (Not allowed)



All indoor units in one outdoor unit must have the same power source.

- Installation above cannot be available for the reason that one indoor unit in G1 has different power source from the other indoor units. In this case, fractional power of D consumed by the separate-powered indoor unit in G1 is distributed to the indoor units in G2 and G3.

III Integrated management systems

1. DMS2

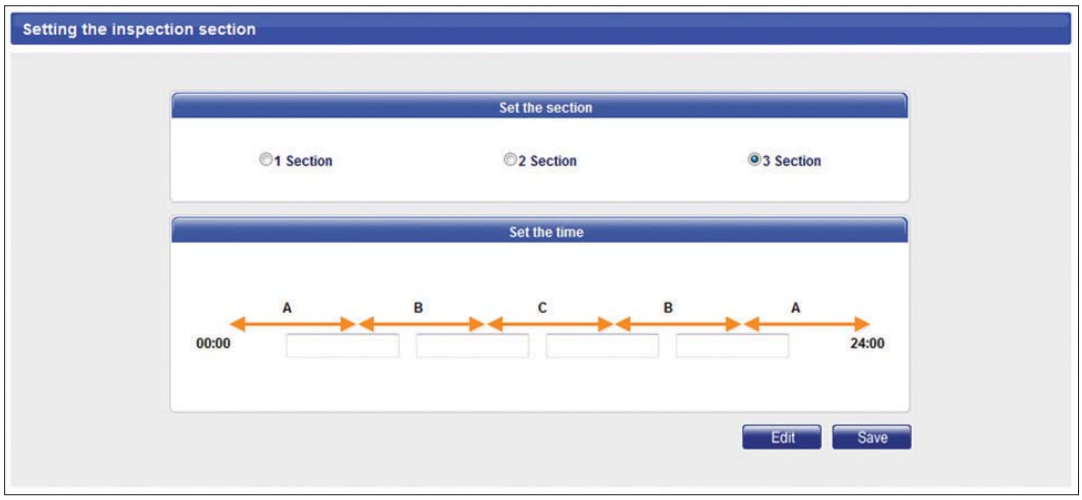
❑ *MIM-D00AN*

6) Function

Power distribution

(10) Setting the inspection section

If you want to check the distribution result by time period, set the time section.
You must use S-NET3 to check the distribution result by time period.



(11) Setting the power distribution environment

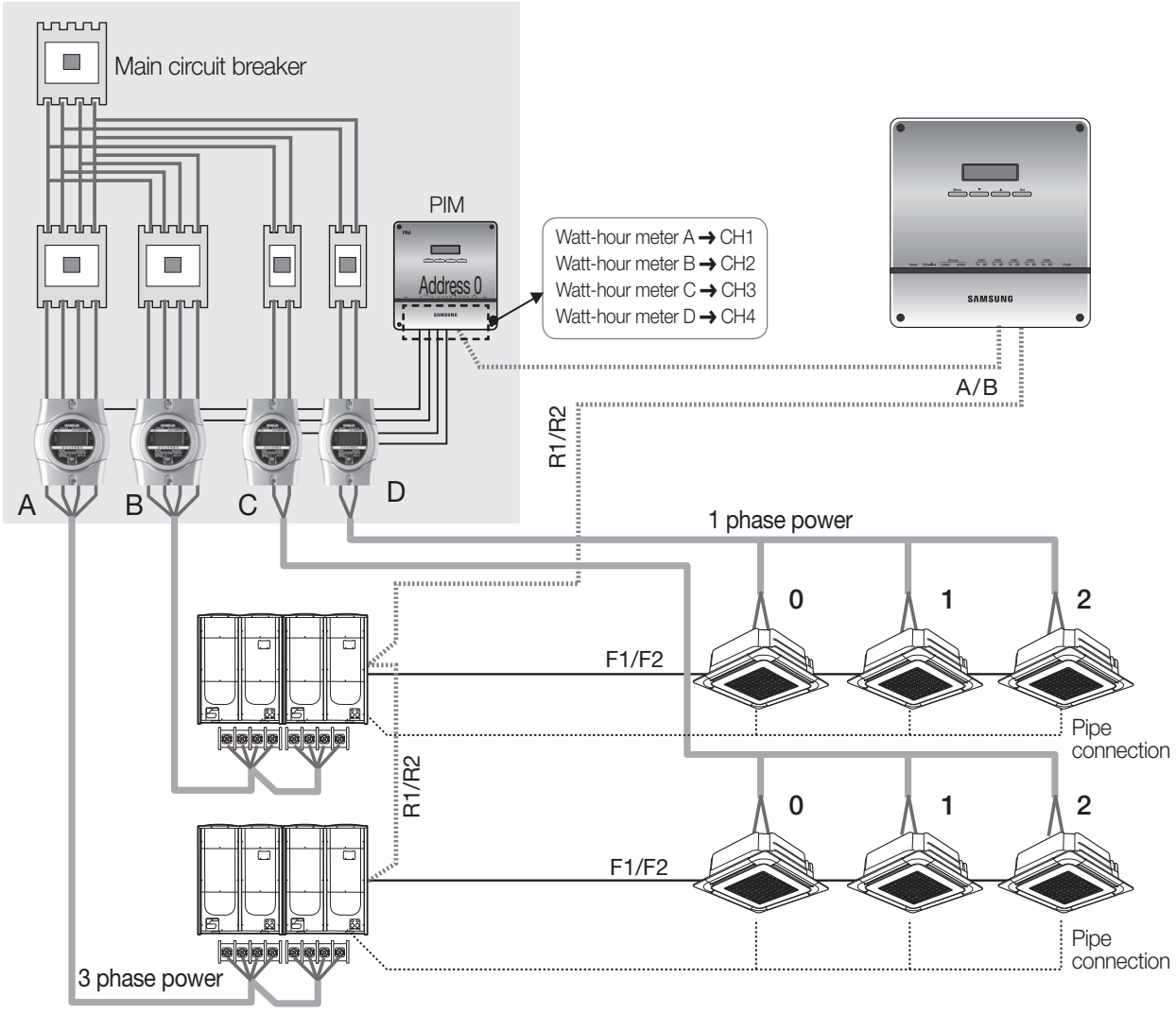
This is important task for checking precise energy consumption of the outdoor/indoor unit. Each watt-hour meter connected to outdoor unit must be checked for which channel of the PIM interface module it is connected.
Then PIM channel must be set according to the outdoor unit.

Indoor units must be checked which watt-hour meter it is connected to and then PIM channel of the corresponding watt-hour meter must be set according to indoor unit PIM channel as shown below.

Channel setting by indoor unit

Indoor unit address	Indoor unit name	Outdoor unit SIM / PIM channel				Indoor unit SIM / PIM channel	Outdoor unit virtual channel	Indoor unit virtual channel
		Channel1	Channel2	Channel3	Channel4			
13.00.00	13.00.00	16.1				16.3		
13.00.01	13.00.01	16.1				16.3		
13.00.02	13.00.02	16.1				16.3		
13.01.00	13.01.00	16.2				16.4		
13.01.01	13.01.01	16.2				16.4		
13.01.02	13.01.02	16.2				16.4		

Example of watt hour meter installation ❶ Installing watt-hour meter to outdoor/ indoor unit



Channel setting by indoor unit

Indoor unit address	Indoor unit name	Outdoor unit SIM / PIM channel				Indoor unit SIM / PIM channel	Outdoor unit virtual channel	Indoor unit virtual channel
		Channel1	Channel2	Channel3	Channel4			
13.00.00	13.00.00	16.1				16.3		
13.00.01	13.00.01	16.1				16.3		
13.00.02	13.00.02	16.1				16.3		
13.01.00	13.01.00	16.2				16.4		
13.01.01	13.01.01	16.2				16.4		
13.01.02	13.01.02	16.2				16.4		

※ Connect appropriate watt-hour meter to outdoor/ indoor unit.

III Integrated management systems

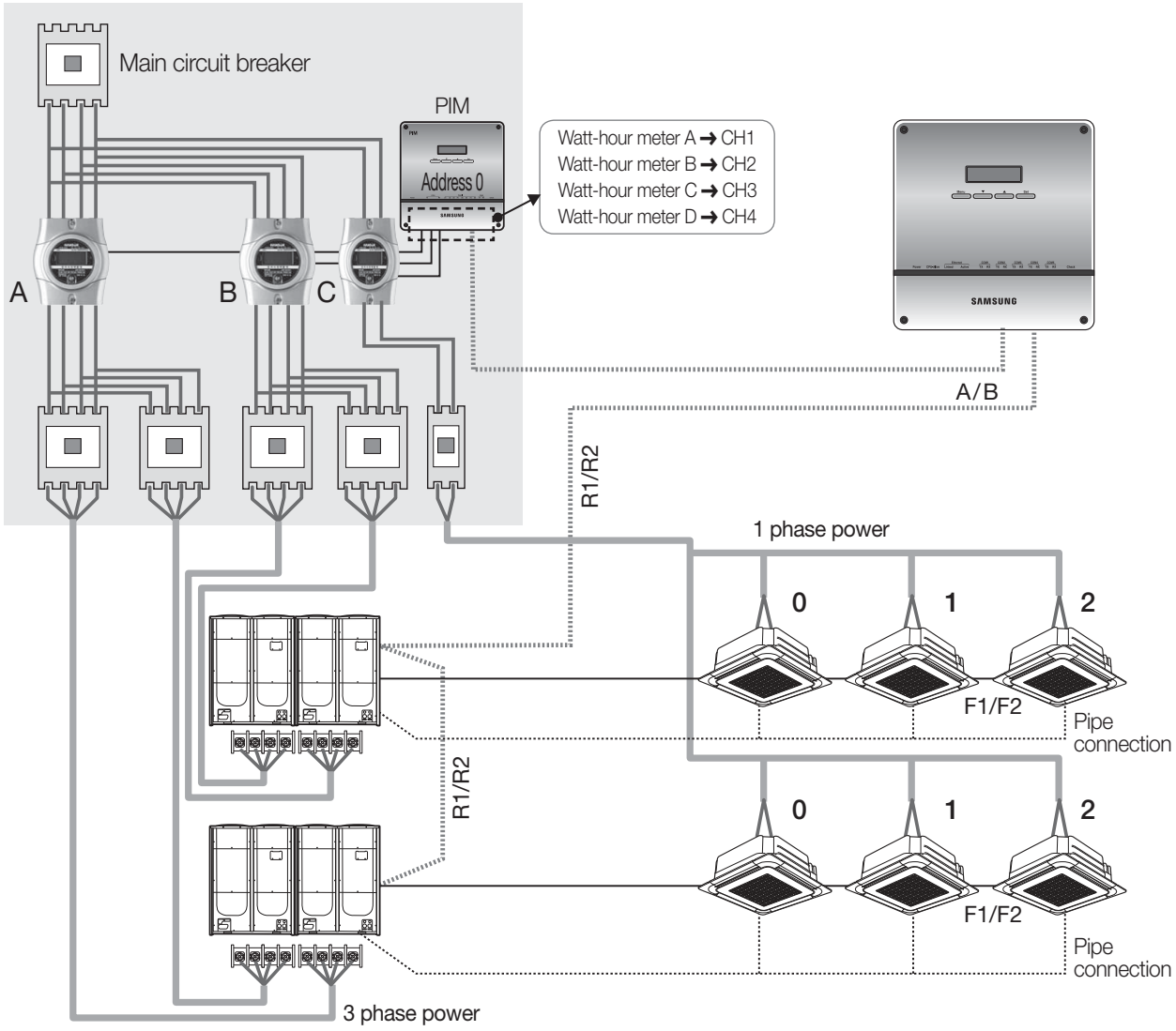
1. DMS2

❑ *MIM-D00AN*

6) Function

Power distribution

Example of watt hour meter installation ❷ Installing 1 watt-hour meter to all indoor units

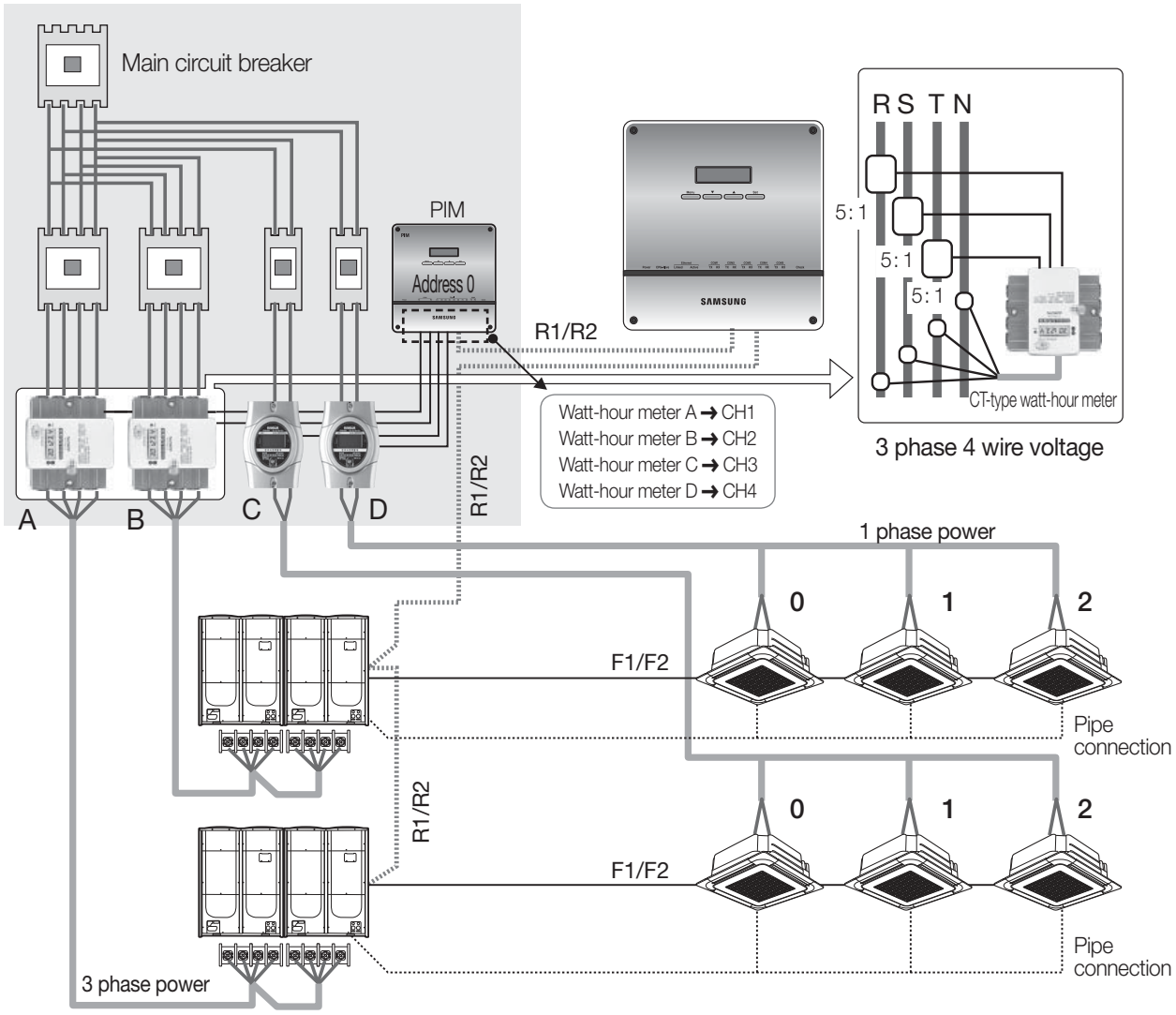


Channel setting by indoor unit

Indoor unit address	Indoor unit name	Outdoor unit SIM / PIM channel				Indoor unit SIM / PIM channel	Outdoor unit virtual channel	Indoor unit virtual channel
		Channel1	Channel2	Channel3	Channel4			
13.00.00	13.00.00	16.1				16.3		
13.00.01	13.00.01	16.1				16.3		
13.00.02	13.00.02	16.1				16.3		
13.01.00	13.01.00	16.2				16.3		
13.01.01	13.01.01	16.2				16.3		
13.01.02	13.01.02	16.2				16.3		

Since all indoor units are connected to 1 watt-hour meter, PIM channel address of all indoor units is same.

Example of watt hour meter installation ❸ Using CT watt-hour meter to and outdoor unit



Setting and checking watt-hour meter — Kilowatthour history

SIM / PIM Channel	Name	CT proportion	Watt-hour meter value (kWh)
16.1	16.1	5	100.0
16.2	16.2	5	100.0
16.3	16.3	1	100.0
16.4	16.4	1	100.0
16.5	16.5	1	100.0
16.6	16.6	1	100.0
16.7	16.7	1	100.0
16.8	16.8	1	100.0

[Setting and checking watt-hour meter] From the menu, CT proportion of the CT watt-hour meter must be entered.

☑ *Note*

- After entering CT proportion of the CT watt-hour meter, watt-hour meter must be set to correct outdoor/indoor units from the [Channel setting by indoor unit] window.

III Integrated management systems

1. DMS2

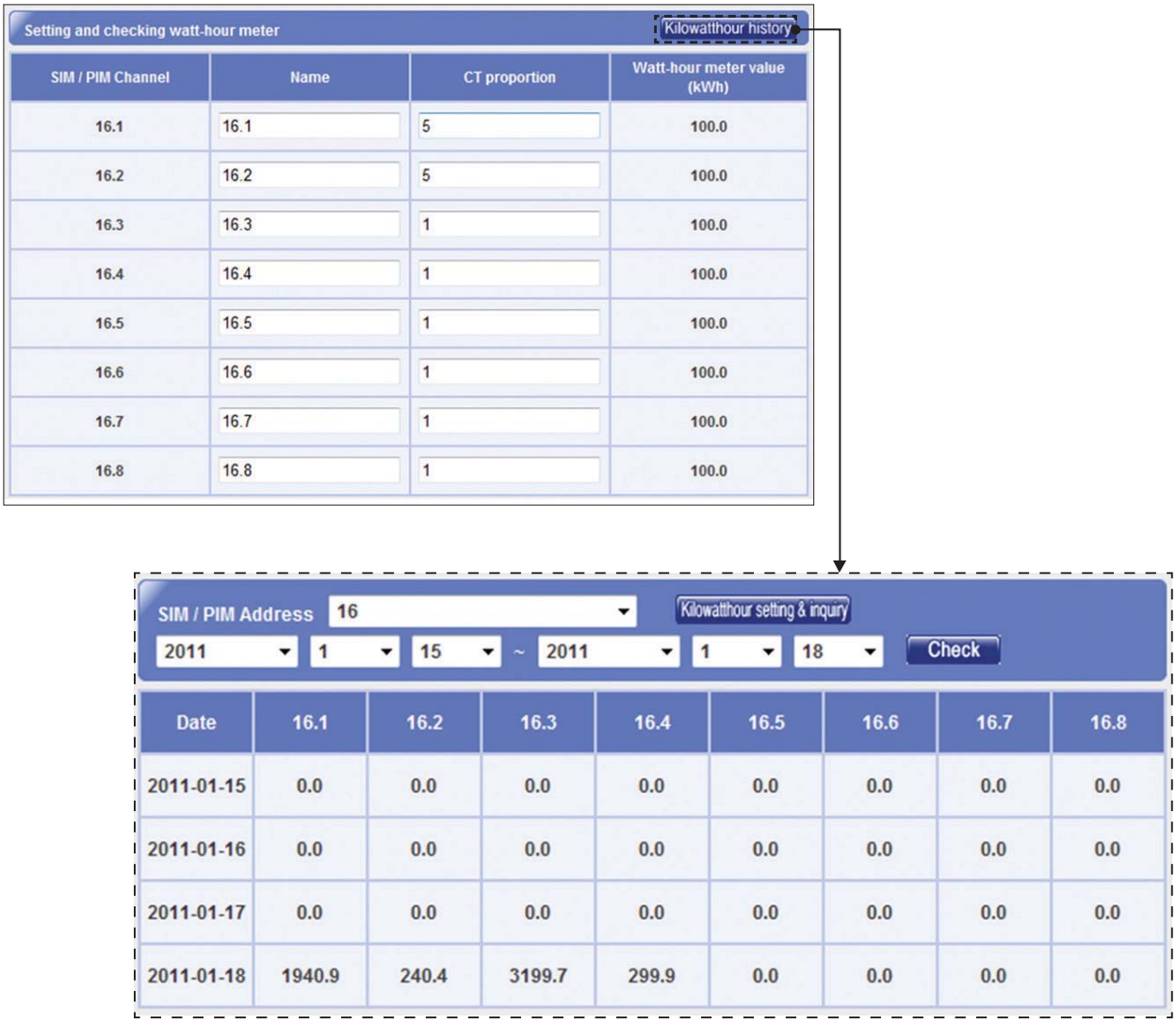
❑ *MIM-D00AN*

6) Function

Power distribution

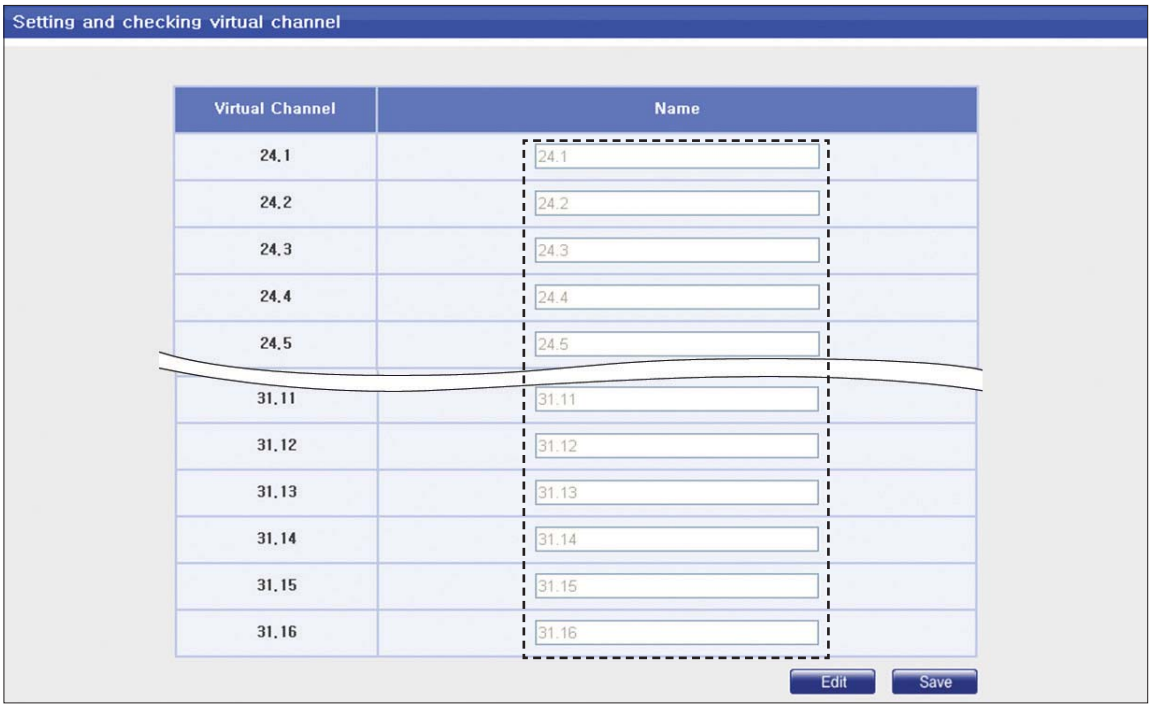
Checking the watt-hour meter connection

Kilowatthour history of the watt-hour meter, connected to each PIM interface module, can be checked.
Maximum 365 days worth of Kilowatthour history can be checked.

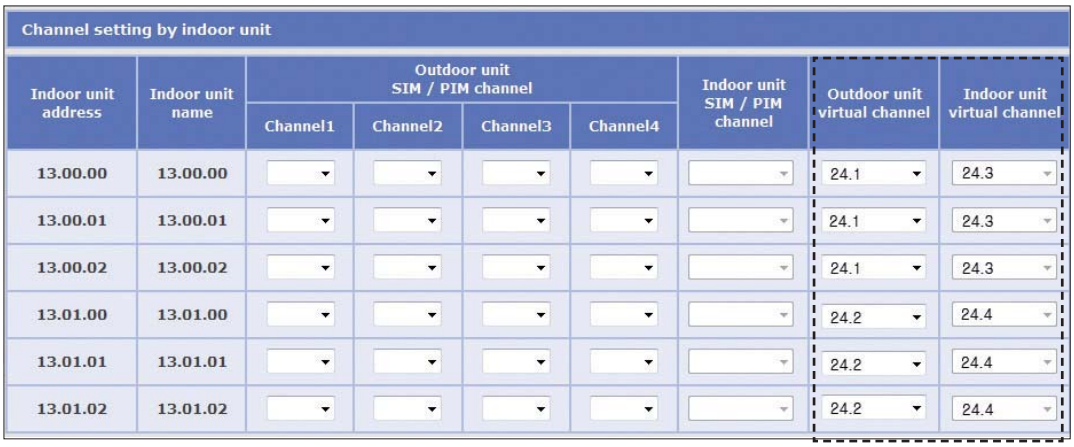


Setting virtual watt-hour meter

When watt-hour meter or PIM interface module is not installed to a watt-hour meter channel, virtual channel can be used to manually distribute the power distribution



- Maximum 128 virtual channel can be used.
- Address of the virtual channel will be displayed as following.
  (24~31).(1~16)



☑ *Note*

- When PIM interface module is not installed, PIM channel of the outdoor/indoor unit will be inactive.

III Integrated management systems

1. DMS2

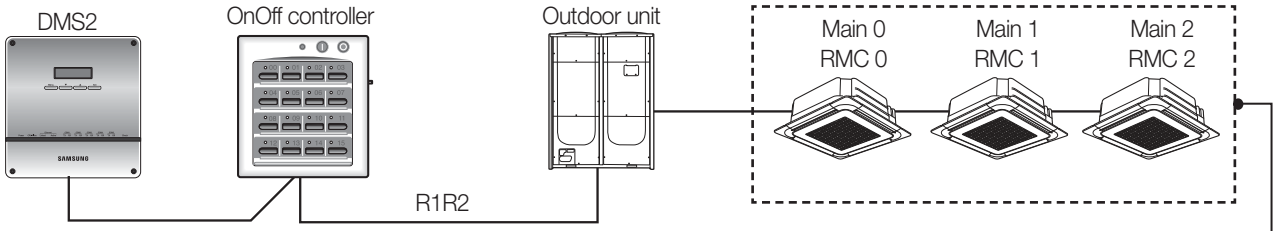
❑ *MIM-D00AN*

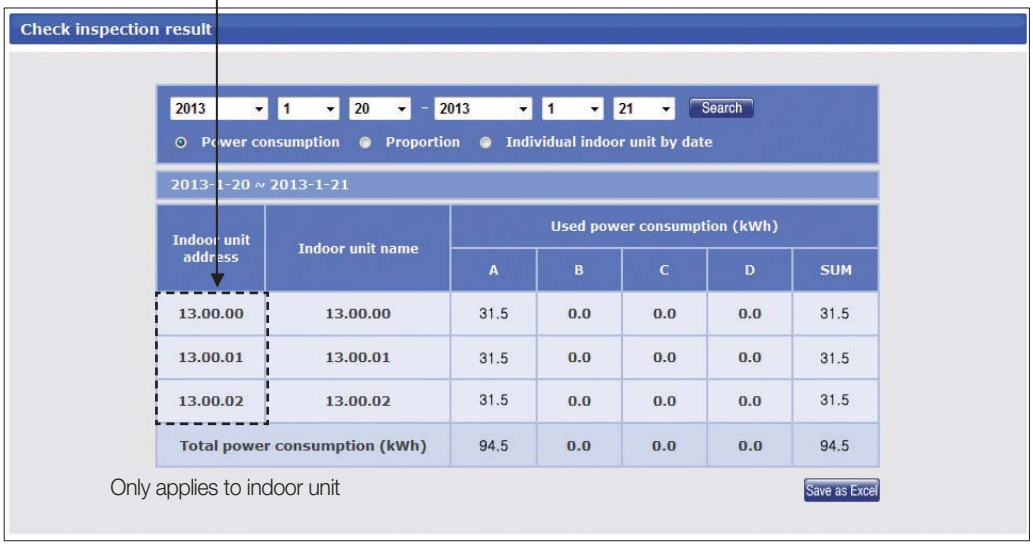
6) Function

Power distribution

Caution

Power distribution function is only supported to air conditioners and AHU. ERV is not supported.

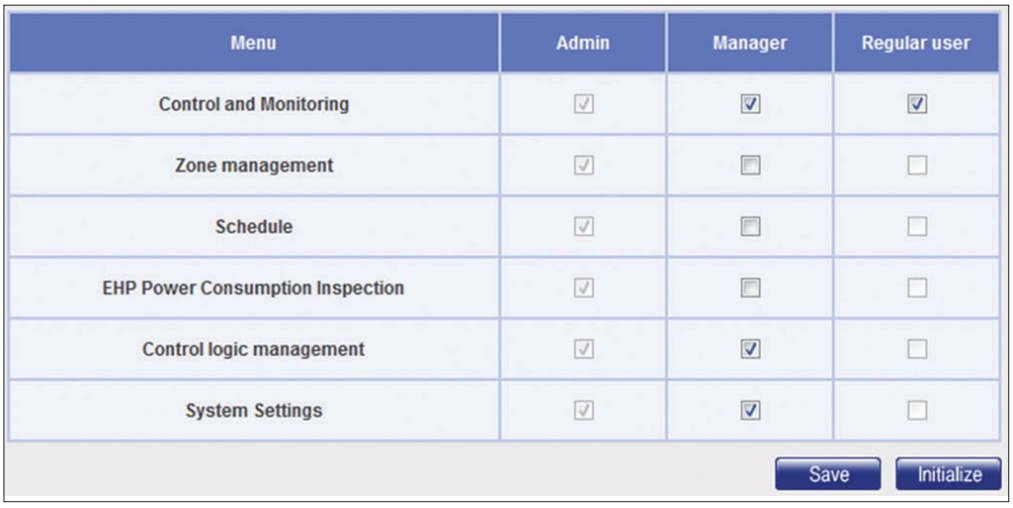




User authorization management

- Admin (Administrator) : Can access all menus, accessible menu cannot be changed
- Manager : Default setting – Can access all menus, accessible menu can be changed.
- Regular user : Default setting – Can access [Control and monitoring] menu only.

Editing user authorization



- Accessible menu authorization of manager is editable.
  Select/deselect the checkbox of the function and save the setting to change the authorization.

III Integrated management systems

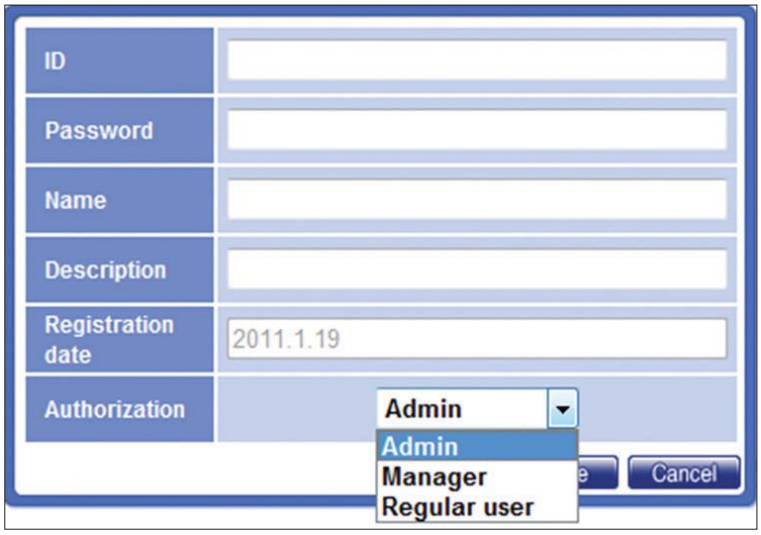
1. DMS2

❑ *MIM-D00AN*

6) Function

User management

▶ You can add or delete the user who access DMS2 through web.

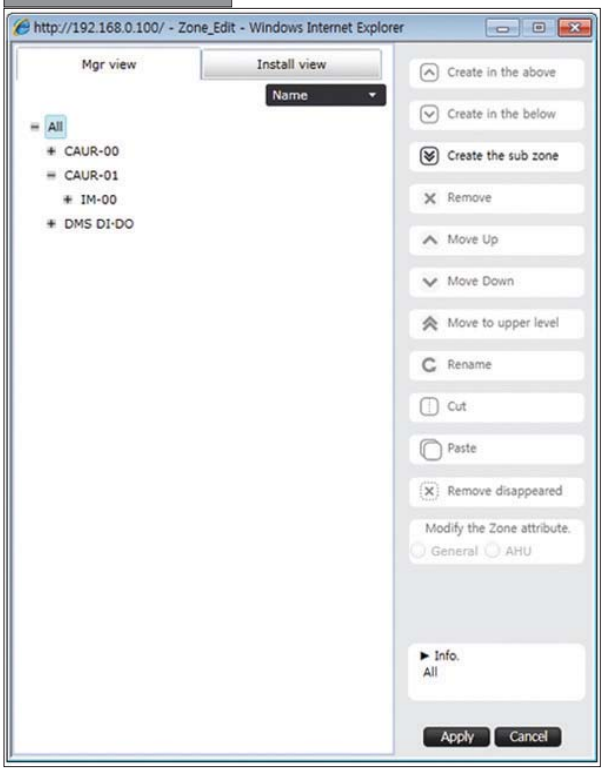


▶ Authorization of the added user can be set from [Admin], [Manager], [Regular user].

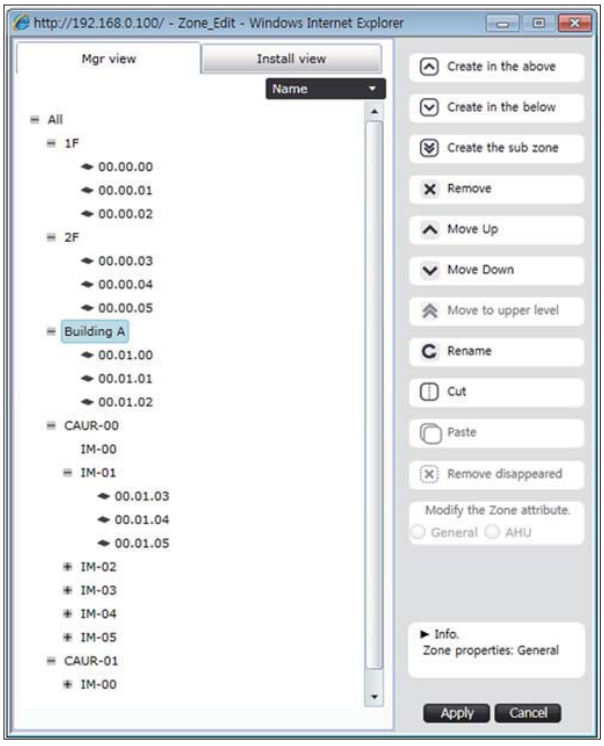
Zone management

- Zone edit: User can arrange the indoor units for convenient management.
- Setting the user authorization: Can restrict accessible indoor units depending on the user ID.

Zone edit



Initial setting



Zone edit :

- Add, delete zone
- Change name
- Move indoor unit

III Integrated management systems

1. DMS2

❑ *MIM-D00AN*

6) Function

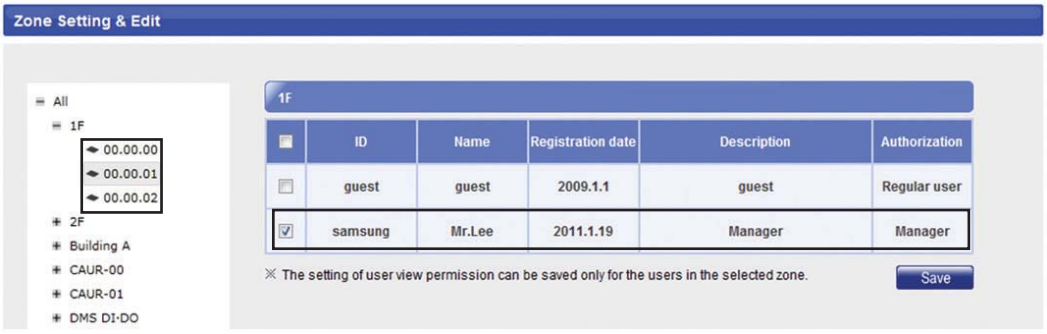
Setting the user authorization

▶ Authorization to control and monitor a zone of indoor units can be assigned according to User ID

❶ Select the zone and select a user ID who can access the zone.

- Access authorization can be set by zone.

❷ After setting, click [Save] to complete the authorization setting.

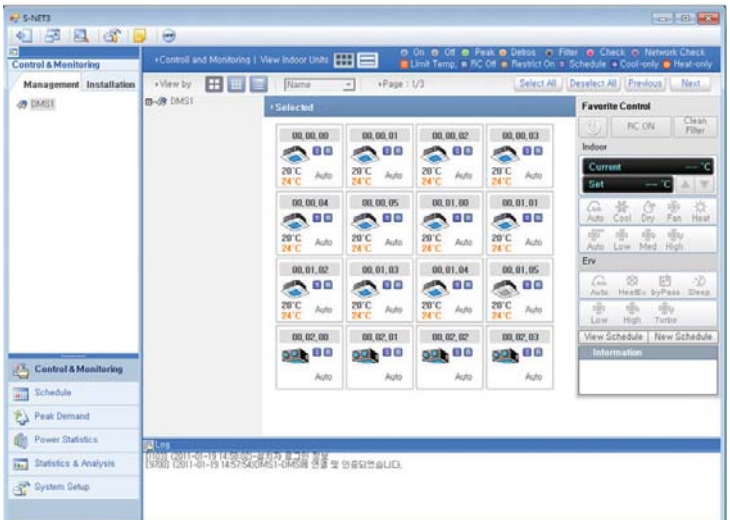


▶ User access authorization applies to all indoor units of the zone in same manager.

2. S-NET3

❑ *MST-P3P*

1) Features



PC program designed to manage system air conditioners in a large site.

- Max. 16 DMS2 connection
- Max. 4,096 indoor unit controlling and monitoring
- Integrated management of indoor units, ventilators and AHU
- Manages operation and error history
- Check indoor/outdoor unit cycle data
- Integrated management of peak control in single program

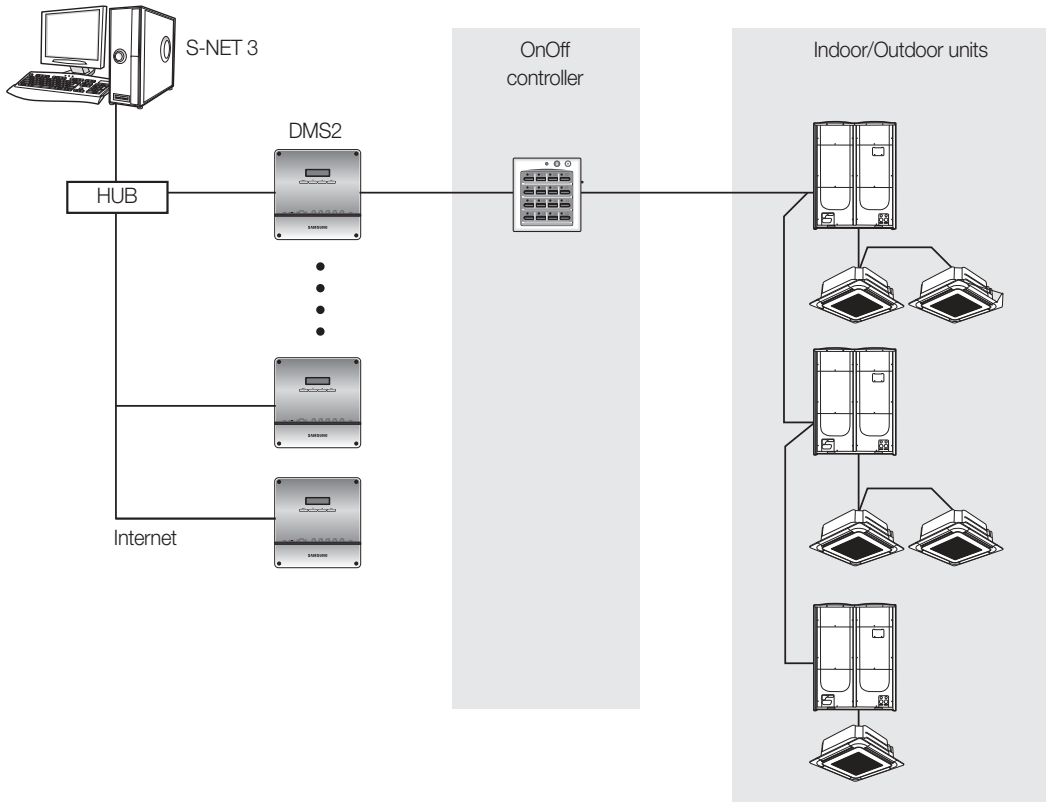
2) PC specifications

Item	Model	Details
PC	CPU	Pentium 4 or above
	Memory	More than 512MB
	HDD	More than 1Gbyte space available
	Network	10/100M
OS	-	Windows NT, Windows 2000, Windows XP, Windows VISTA, Windows 7

☑ *Note*

Model	MST-P3P
Number of connection	Max. 16 DMSs

3) System connection



III Integrated management systems

2. S-NET3

❑ *MST-P3P*

4) Function

(1) S-NET3 function description

Control & Monitoring	View the management structure	Control and monitor the indoor units (max. 4,096 units).
	View the installation structure	Check and refer the state of various devices such as indoor/outdoor units, OnOff controller, and I/M.
	Indoor unit/ERV control	Set the operation mode, temperature, fan speed, and fan Control & Monitoring direction of indoor unit/ERV.
	Indoor unit/ERV monitoring	Monitor the status of indoor unit/ERV.
	View outdoor unit	Check the outdoor unit's cycle data and the cycle data of the linked indoor units.
	View DMS2	Check the status data of the control unit linked to DMS2.
Schedule	Create new schedule	Set new schedule.
	View schedule	Check the schedule of the selected indoor unit.
	Start/Stop schedule	Start/Stop schedule application.
	Store/Call schedule	Store/Call a prepared schedule.
	View daily schedule	Confirm each schedule by date.
	Set common exception date	Set the date which schedule operation is not applied on.
Usage time and power	Usage time and power	Check the usage time and power for total, group, and individual indoor units.
	Power consumption report	For preparing the report on the power consumption by each indoor unit for the period set.
	Power distribution management group edition	Edit an indoor unit's power management structure
	Set the electricity rate section	Set up to 3 sections for electricity billing management.
Statistics and analysis	Indoor unit status	Check the status of indoor unit operation / temperature setting per period.
	Usage time and power	Check the usage time and power for total, group, and individual indoor units.
	Indoor unit usage	The usage ratio of all indoor units for a specific period.
System management	Set environment	Set the environment related to S-NET3 (password, language, temperature unit).
	Set DMS2	Set the DMS2 to connect with S-NET3.
	Refer event log	Refer the warning, error, data of indoor units.
	Renew installed device information	Modify S-NET3 data if installation data has been changed.
	DMS2 backup/restore	Backup the data of DMS2 connected to S-NET3.
	S-NET3 backup/restore	Backup the data of S-NET3.

(2) User functions

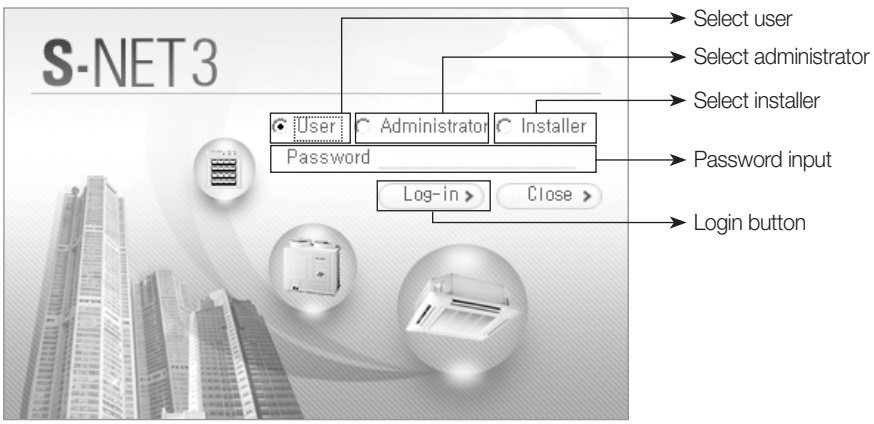
Manage a range of functions accessible to different types of users such as regular user, administrator and installer.

	User	Administrator	Installer
View the total indoor unit	O	O	O
Structure editing	X	O	O
The list of installed devices	X	O	O
Whole indoor unit stop	O	O	O
Indoor unit/ERV control/Monitoring	O	O	O
View the management structure	O	O	O
View the installation structure	X	O	O
View outdoor units, DMS2	X	O	O
Schedule	X	O	O
Indoor unit operation setting	X	X	O
Usage time and power	X	O	O
Power consumption report	X	O	O
Power distribution management group edit	X	O	O
Power distribution section setting	X	X	O
Statistics/Analysis	X	O	O
S-NET3 setting	X	O	O
DMS2 setting	X	X	O
Event log reference	X	O	O
Tracking	X	X	O
DMS2 restoration	X	X	O
DMS2 backup	X	O	O
S-NET3 restoration/backup	X	O	O

5) Detail function description

(1) S-NET3 display

Log-in



III Integrated management systems

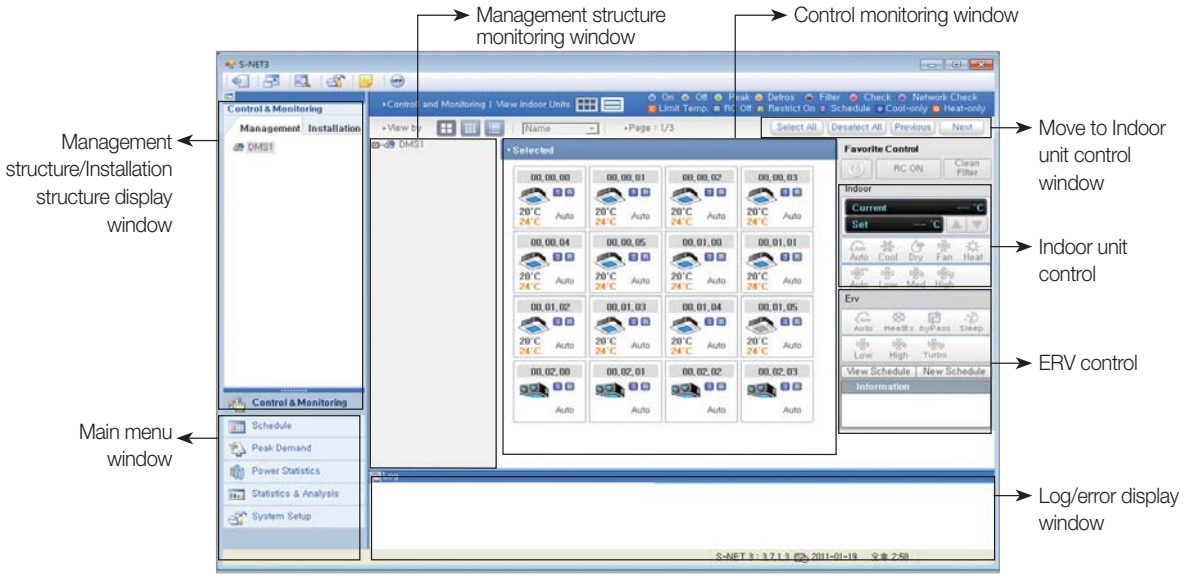
2. S-NET3

❑ *MST-P3P*

5) Detail function description

(1) S-NET3 display

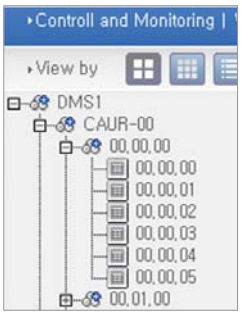
Control and monitoring



Installation structure window

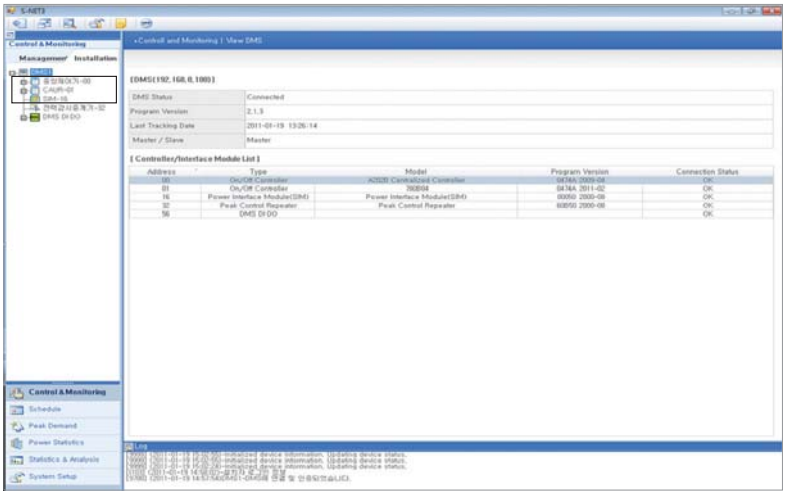
Select the installation structure tab then select DMS2 connected to S-NET3; it is possible to see the program version, status of the selected DMS2, the program version and communication status of OnOff controller.
If indoor or outdoor unit is selected at the installation structure, it is possible to check the hardware information of the selected device.

Selecting management structure



Selecting installation structure

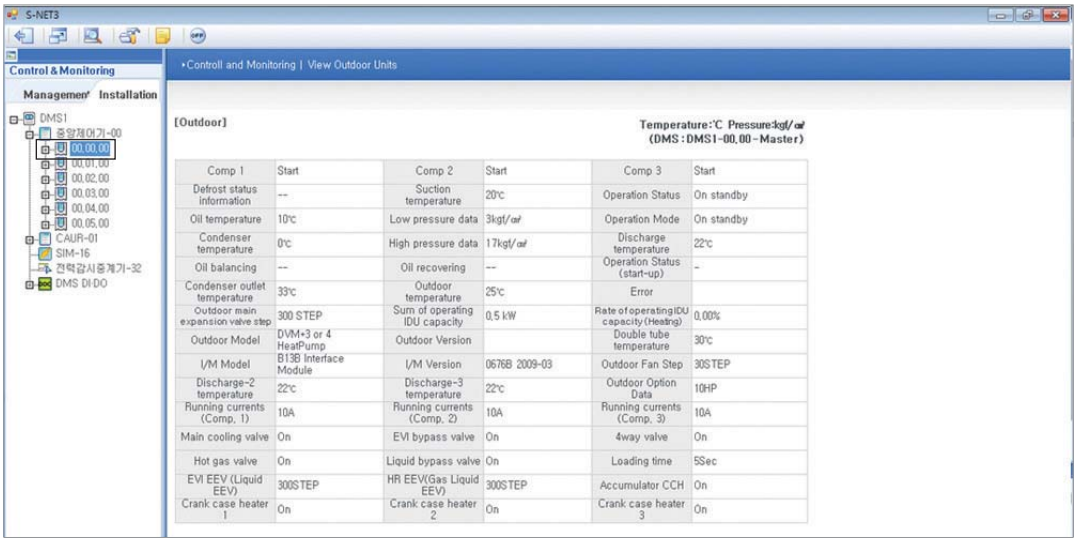
▶ When DMS2 & OnOff controller are selected.



- DMS2 status, DMS2 program version, last tracking date and Master/Slave setting state.
- Displays model name, software version, communication state of centralized controller, PIM.

Installation structure window

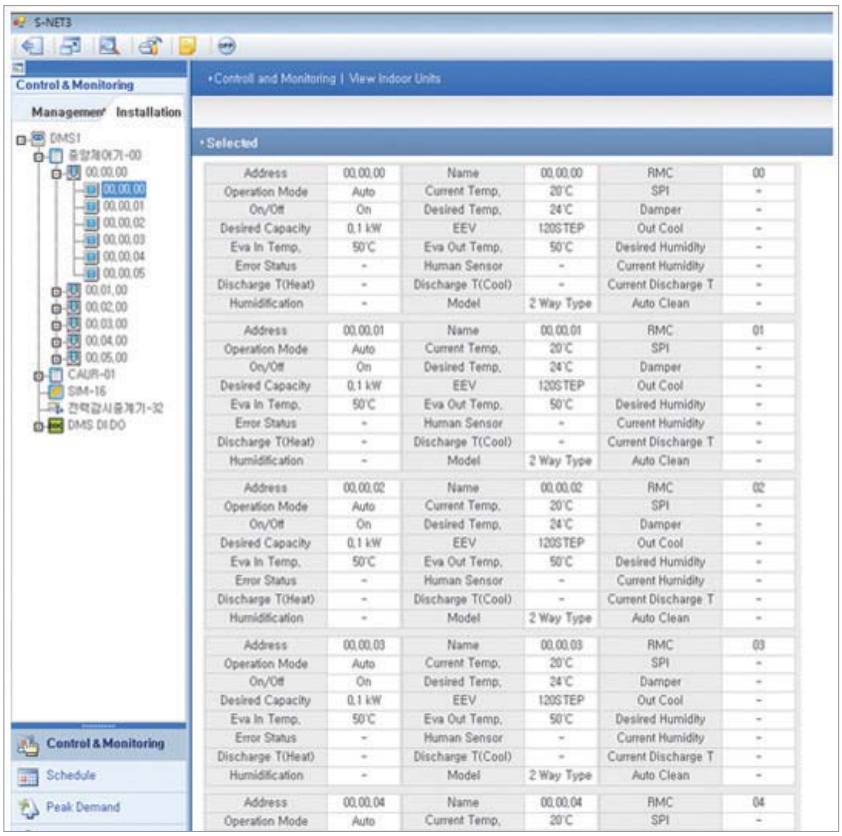
▶ When outdoor unit is selected



Comp 1	Start	Comp 2	Start	Comp 3	Start
Defrost status information	--	Suction temperature	20℃	Operation Status	On standby
Oil temperature	10℃	Low pressure data	3kgf/㎠	Operation Mode	On standby
Condenser temperature	0℃	High pressure data	17kgf/㎠	Discharge temperature	22℃
Oil balancing	--	Oil recovering	--	Operation Status (start-up)	-
Condenser outlet temperature	33℃	Outdoor temperature	25℃	Error	
Outdoor main expansion valve step	300 STEP	Sum of operating IDU capacity	0.5 kW	Rate of operating IDU capacity (Heating)	0.00%
Outdoor Model	DVM+3 or 4 HeatPump	Outdoor Version		Double tube temperature	30℃
I/M Model	B13B Interface Module	I/M Version	0676B 2009-03	Outdoor Fan Step	30STEP
Discharge-2 temperature	22℃	Discharge-3 temperature	22℃	Outdoor Option Data	10HP
Running currents (Comp. 1)	10A	Running currents (Comp. 2)	10A	Running currents (Comp. 3)	10A
Main cooling valve	On	EVI bypass valve	On	4way valve	On
Hot gas valve	On	Liquid bypass valve	On	Loading time	5Sec
EVI EEV (Liquid EEV)	300STEP	HR EEV(Gas Liquid EEV)	300STEP	Accumulator CCH	On
Crank case heater 1	On	Crank case heater 2	On	Crank case heater 3	On

• Outdoor unit cycle data, outdoor unit model, interface module model and interface module program version is displayed.

▶ When indoor unit is selected



Address	00,00,00	Name	00,00,00	RMC	00
Operation Mode	Auto	Current Temp.	20℃	SPI	-
On/Off	On	Desired Temp.	24℃	Damper	-
Desired Capacity	0.1 kW	EEV	120STEP	Out Cool	-
Eva In Temp.	50℃	Eva Out Temp.	50℃	Desired Humidity	-
Error Status	-	Human Sensor	-	Current Humidity	-
Discharge T(Heat)	-	Discharge T(Cool)	-	Current Discharge T	-
Humidification	-	Model	2 Way Type	Auto Clean	-
Address	00,00,01	Name	00,00,01	RMC	01
Operation Mode	Auto	Current Temp.	20℃	SPI	-
On/Off	On	Desired Temp.	24℃	Damper	-
Desired Capacity	0.1 kW	EEV	120STEP	Out Cool	-
Eva In Temp.	50℃	Eva Out Temp.	50℃	Desired Humidity	-
Error Status	-	Human Sensor	-	Current Humidity	-
Discharge T(Heat)	-	Discharge T(Cool)	-	Current Discharge T	-
Humidification	-	Model	2 Way Type	Auto Clean	-
Address	00,00,02	Name	00,00,02	RMC	02
Operation Mode	Auto	Current Temp.	20℃	SPI	-
On/Off	On	Desired Temp.	24℃	Damper	-
Desired Capacity	0.1 kW	EEV	120STEP	Out Cool	-
Eva In Temp.	50℃	Eva Out Temp.	50℃	Desired Humidity	-
Error Status	-	Human Sensor	-	Current Humidity	-
Discharge T(Heat)	-	Discharge T(Cool)	-	Current Discharge T	-
Humidification	-	Model	2 Way Type	Auto Clean	-
Address	00,00,03	Name	00,00,03	RMC	03
Operation Mode	Auto	Current Temp.	20℃	SPI	-
On/Off	On	Desired Temp.	24℃	Damper	-
Desired Capacity	0.1 kW	EEV	120STEP	Out Cool	-
Eva In Temp.	50℃	Eva Out Temp.	50℃	Desired Humidity	-
Error Status	-	Human Sensor	-	Current Humidity	-
Discharge T(Heat)	-	Discharge T(Cool)	-	Current Discharge T	-
Humidification	-	Model	2 Way Type	Auto Clean	-
Address	00,00,04	Name	00,00,04	RMC	04
Operation Mode	Auto	Current Temp.	20℃	SPI	-

• Indoor unit operation status, indoor unit cycle data and indoor unit model code is displayed.

III Integrated management systems

2. S-NET3

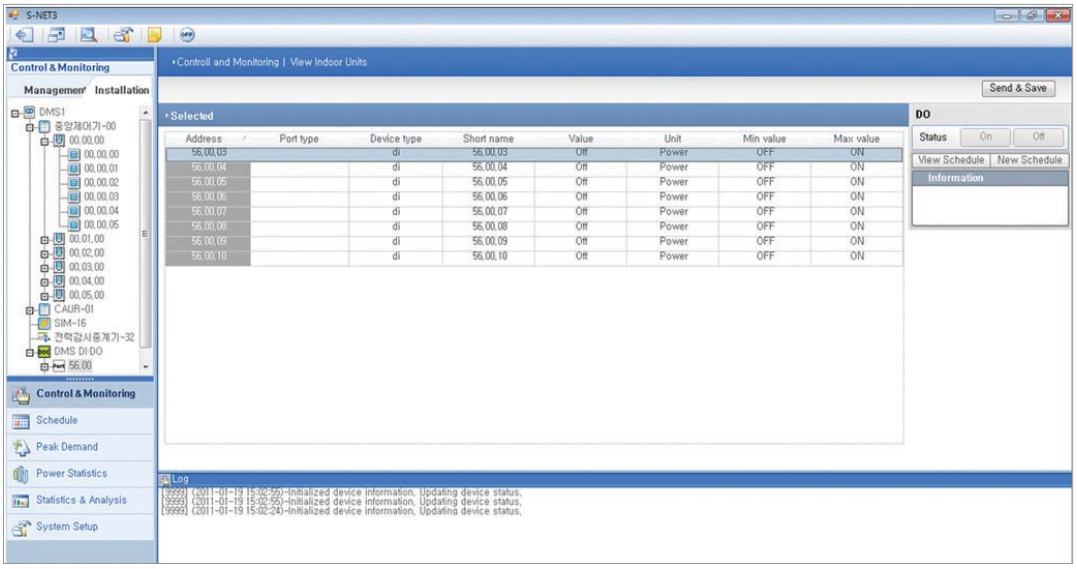
❑ *MST-P3P*

5) Detail function description

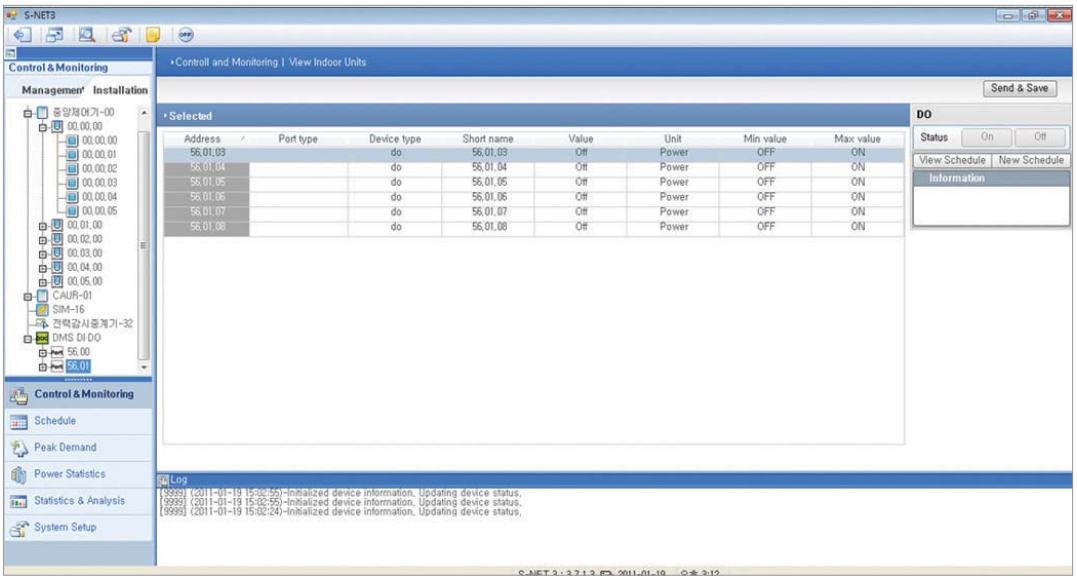
(1) S-NET3 display

Installation structure window

▶ When DI is selected



▶ When DO is selected



Control

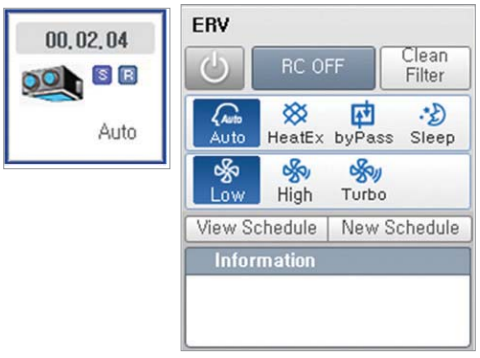
- Control indoor unit/ERV through the control window that appears on the screen.
- Control total indoor units, the operation mode of indoor units, multiple selection, temperature, fan speed, and fan direction.
- Set Upper/Lower temperature limit so that temperature cannot be set outside of the limited temperature range.
- Enable/disable remote control usage.
- Check the schedule of the selected indoor unit.

▶ Deselect device

▶ Selecting indoor unit and ERV together

▶ Selecting indoor unit

▶ Selecting ERV



III Integrated management systems

2. S-NET3

❑ *MST-P3P*

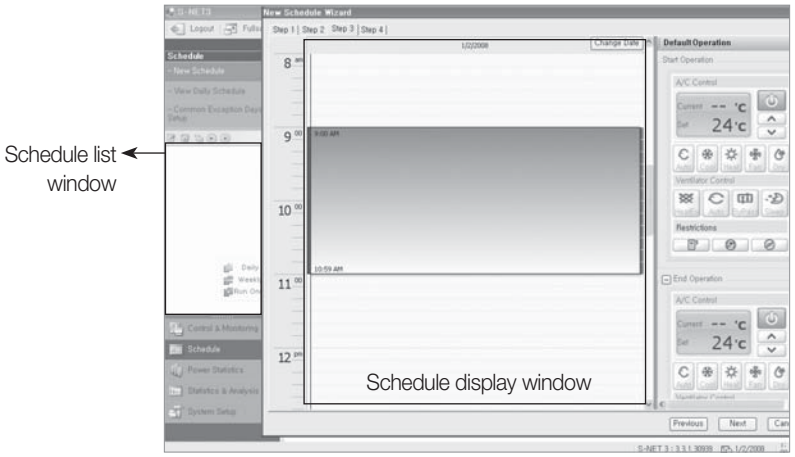
5) Detail function description

(1) S-NET3 display

Schedule control

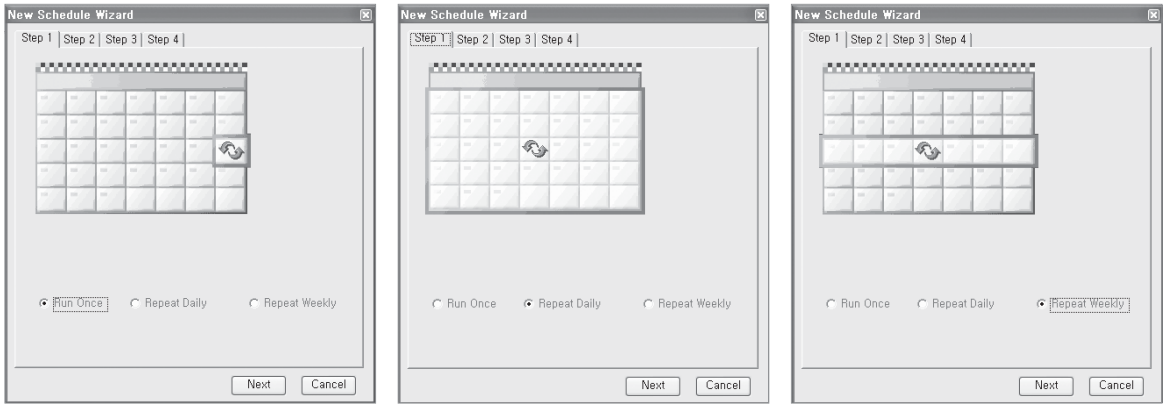
❶ Schedule setting

- Able to set a schedule to control indoor units and ERVs. (creating, modifying, deleting).
- Able to set weekly, daily, one day schedule.
- Able to control the operation mode, temperature setting, fan speed, fan direction during the schedule control.



※ Easy schedule control for user with the wizard method (step-by-step setting).

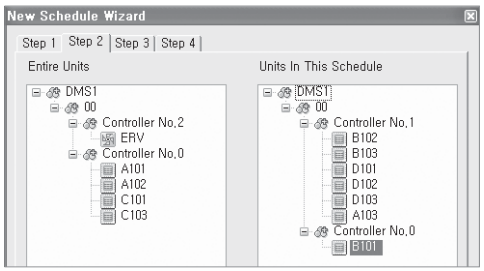
▶ The 1st step (select a schedule mode)



One day only | Repeat daily | Repeat weekly

▶ The 2nd step (select the indoor units to apply a schedule to)

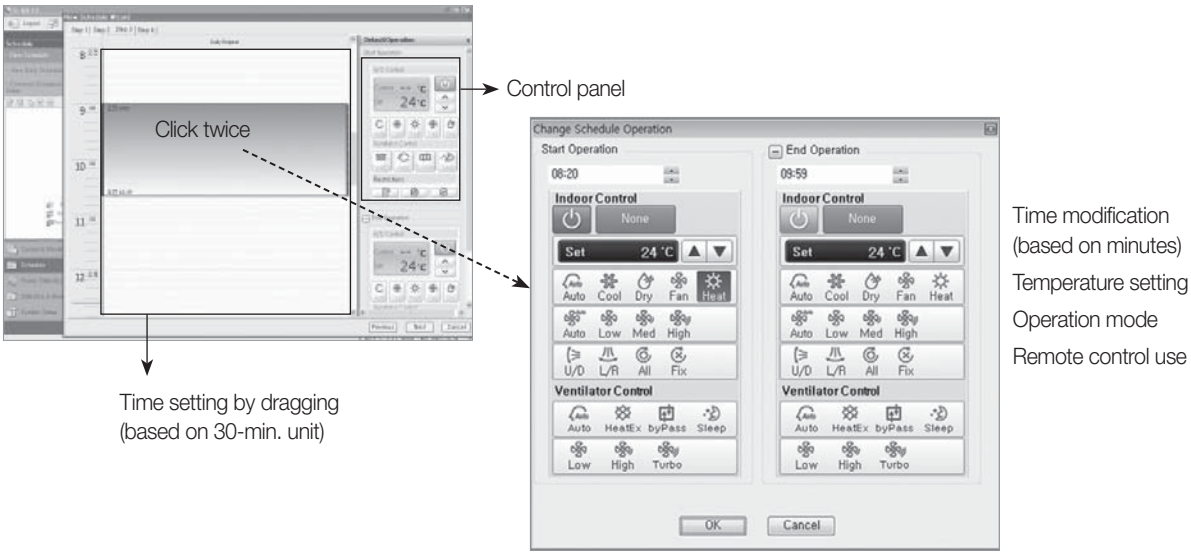
- Display the total indoor units in S-NET3.
- Able to select individual indoor units, OnOff controller, DMS2.



Schedule control

▶ The 3rd step (schedule operation setting)

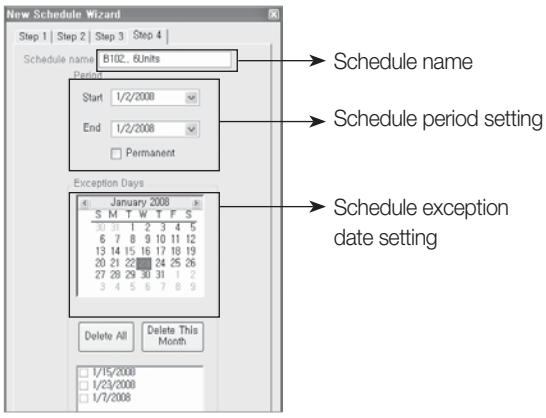
- Set up time by dragging on the time table.
- Set the schedule with the control panel on the right. (Operation mode. temperature setting, fan speed, fan direction and remote control use).
- Click the schedule time setup window to display a schedule modification window (able to modify a schedule time, operation mode and temperature setting).



Schedule modification panel

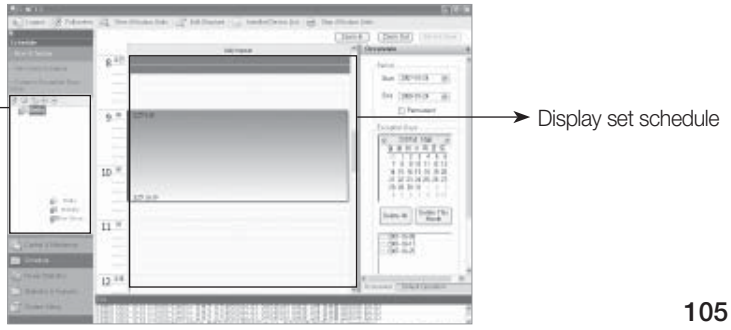
▶ The 4th step (Schedule period and exception date setting)

- Click the date on the calendar to set the date (once selected, the designated date is displayed in red).



▶ Schedule setting completion

- Displays a schedule list to be automatically applied to the schedule



III Integrated management systems

2. S-NET3

❑ *MST-P3P*

5) Detail function description

(1) S-NET3 display

Schedule control

❷ Schedule modification

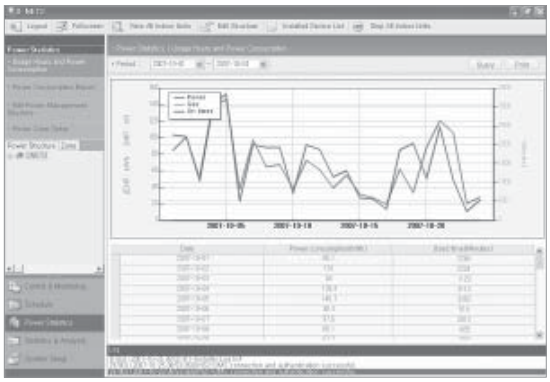
- Click the set schedule display window twice to display the modification panel.
  Then it is possible to modify various functions such as schedule time, operation mode and temperature setting.
- Able to carry out various functions such as a schedule name change, schedule delete, indoor unit addition and deletion with the icons on the left menu window.

→ Add/ Delete indoor unit for schedule control.
→ Delete a set schedule.
→ Modify a schedule name.

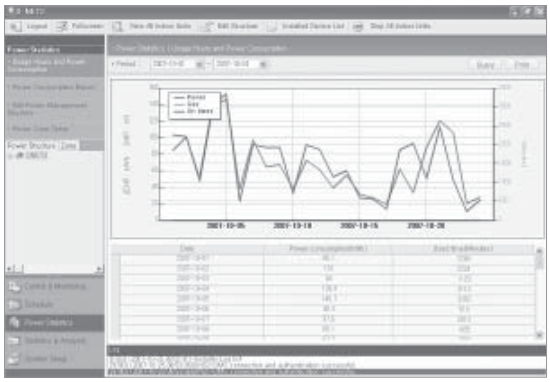
Usage time and power consumption

❶ Usage time and power

- Able to search for the power consumption and usage time by different conditions including the total indoor units applied to S-NET3, OnOff controller, individual indoor unit.OnOff controller, individual indoor unit.



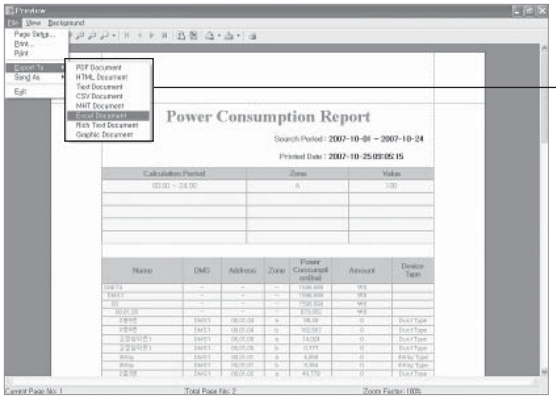
Total indoor unit usage reference



Individual indoor unit usage reference

❷ Power consumption report

- Able to print out the amount of power consumed for a specific period of time in the form of report.
- The applicable formats include PDF, TXT, HTML, CSV, MHT, EXCEL, graphic documents.

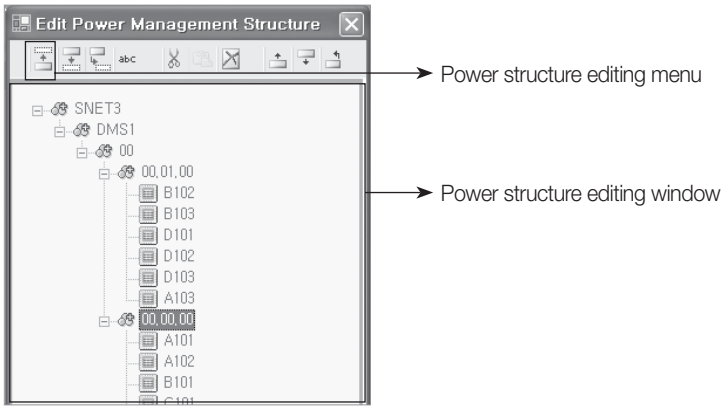


→ Types of document to be stored

Usage time and power consumption

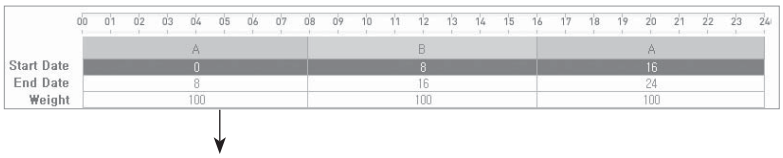
❸ Power management structure editing

- Just as the structural editing at the monitoring, power management can be restructured to ensure greater convenience for administrators.
- Once the power management structure is edited, power consumption report and usage can be referred in the edited formats.



❹ Power section setting

- It can be referred and divided into max. 3 sections for power consumption reference.
- It is possible to refer or prepare reports for usage time and power consumption by dividing section by each hour.



Able to adjust the sections by inputting relevant time.

III Integrated management systems

2. S-NET3

❑ *MST-P3P*

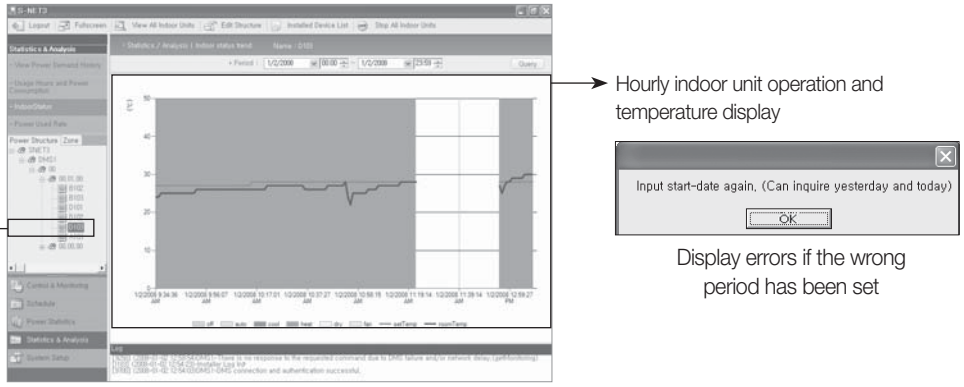
5) Detail function description

(1) S-NET3 display

Statistics and analysis

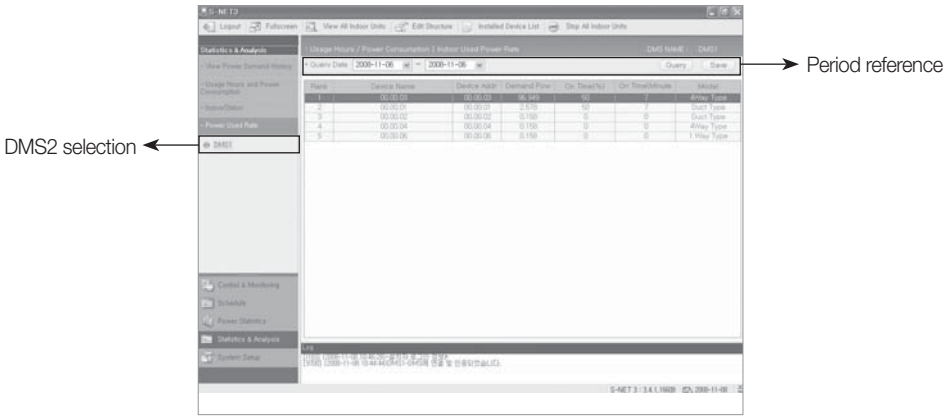
❶ Indoor unit status

- Able to see the operation status of selected indoor units and room temperature for the present and the past.
- Able to refer to the operation status for the last two days. If the reference day is out of range, an error message window will appear.



❷ Power consumption of indoor units

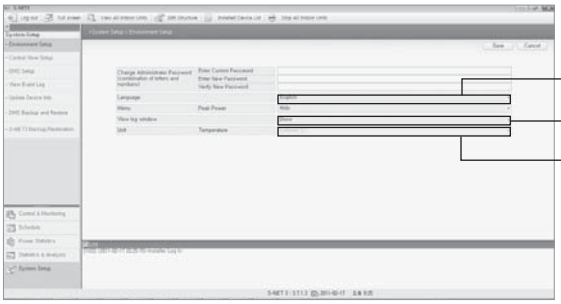
- Displays the use time and power consumption ratios for the indoor units connected to each DMS2.



System management

❶ Environment setting

- Set the environment of S-NET3.
- Set administrator password, language, temperature unit, default value for indoor unit, etc.
- Determine if peak power will be displayed or not in the menu setting (Korean market only).



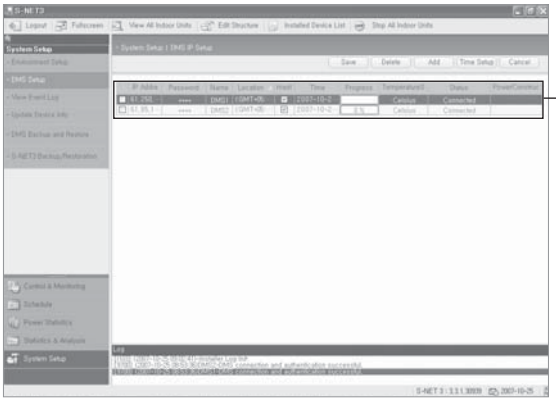
→ Language setting

→ Log date view setting

→ Temperature unit setting : It is set automatically depending on indoor unit.

❷ DMS2 setting

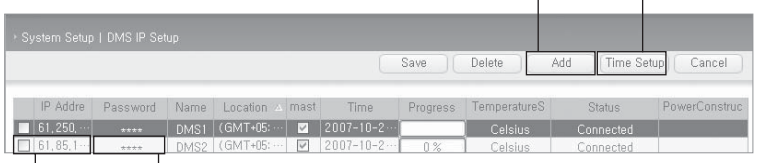
- Set the DMS2 to connect with S-NET3.
- Click 'save' after inputting IP and passwords (1) and it will attempt to make communication with S-NET3 and DMS2 then display normal when communication is made.



→ DMS2 setup window

When a DMS2 to connect with S-NET3 is added

DMS2 time setting



Password input

DMS2's access IP input

☑ *Note*

- DMS2 has two passwords. One is a password needed to connect to a DMS2 web client (set at the user management), the other is necessary to make access to S-NET3 (set at the system environment).
- When the wrong password for S-NET3 is input, a message indicating DMS2 – account recognition failure appears.

III Integrated management systems

2. S-NET3

❑ *MST-P3P*

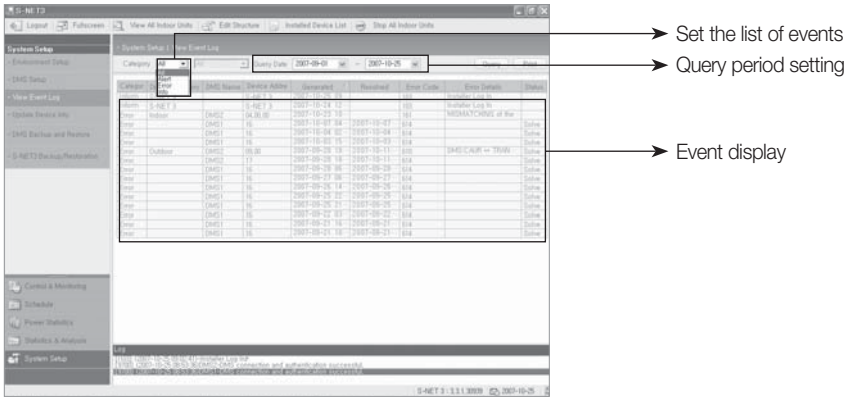
5) Detail function description

(1) S-NET3 display

System management

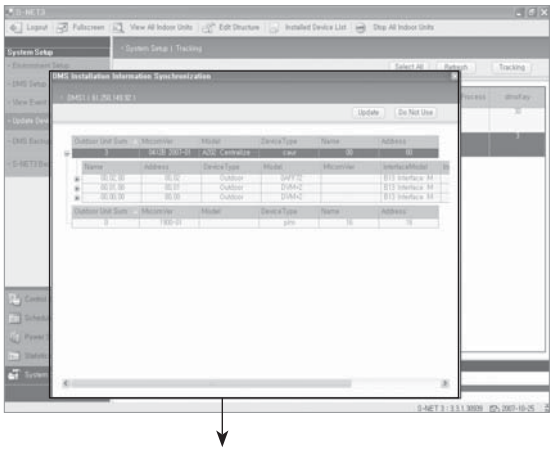
❸ View event log

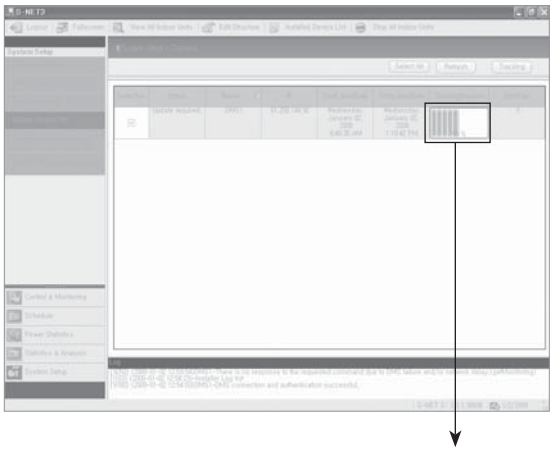
- Able to check various information such as indoor/outdoor units connected to S-NET3, control device error/warning, information details by date.



❹ Information update of the installed device

- Able to carry out information update or tracking for the installed device.
- Tracking involves receiving data from DMS2 after tracking it so as to renew data, whereas data renewal involves correcting data from DMS2 after receiving data without DMS2 tracking.

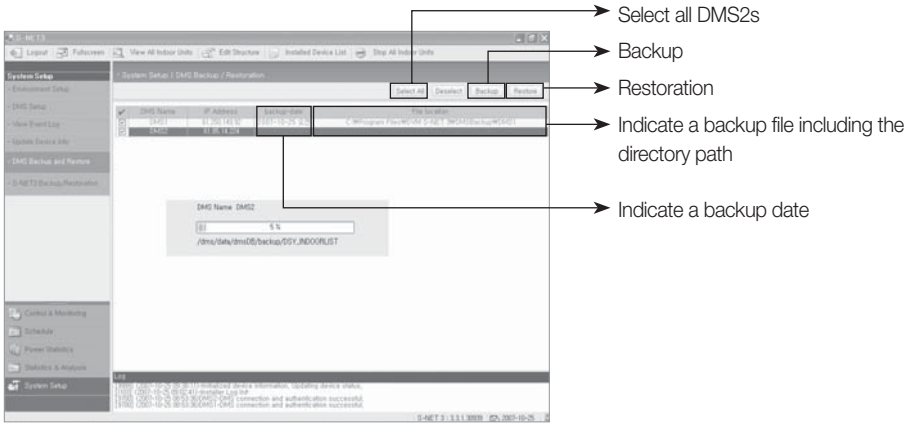




System management

❺ DMS2 backup and restoration

- Able to backup and restore the DMS2 data connected to S-NET3.
- Backup refers to activities of storing data in the data folder in PC.



❻ S-NET3 backup and restoration

- Able to backup and restore data of S-NET3.
- Backup involves in backing up all data in S-NET3. Thus, if backup data is restored in a PC where S-NET3 is installed, it will produce the same environment that is previously used.

III Integrated management systems

2. S-NET3

❑ *MST-P3P*

5) Detail function description

(2) S-NET3 log information

Log	Contents
E9000	Connection impossible
E9001	Connection denied
E9002	Connection finished
E9010	WINK denied
E9011	DMS2 password authentication failure
E9012	Serial exchange failure
E9100	General error on instruction transmission
E9150	Attempt to transmit to a DMS2 not in connection
E9151	Attempt to transmit to a DMS2 not registered
E9200	General error on response acceptance
E9250	There is no response to the requested command due to DMS2 failure and/or network delay
E9300	XML generating
E9400	XML parsing
E9401	Installation information on S-NET3 and DMS2 does not match, check tracking information
E9999	Initialized device information updating device status
I101	Common user log in
I102	Administrator user log in
I103	Installer log in
I104	Log in
I105	Log out
I201	Tracking
I202	Request to tracking
I301	Request to schedule change
I801	Insert DMS2
I802	Delete DMS2
I803	DMS2 time setting
I9700	DMS2 connection and authorization successful
I9701	Reconnection
I9801	Emergency stop

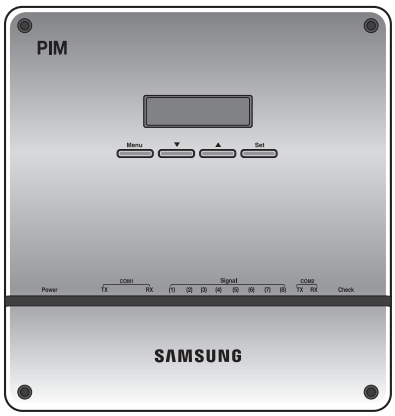
Ⅳ. Power distribution system

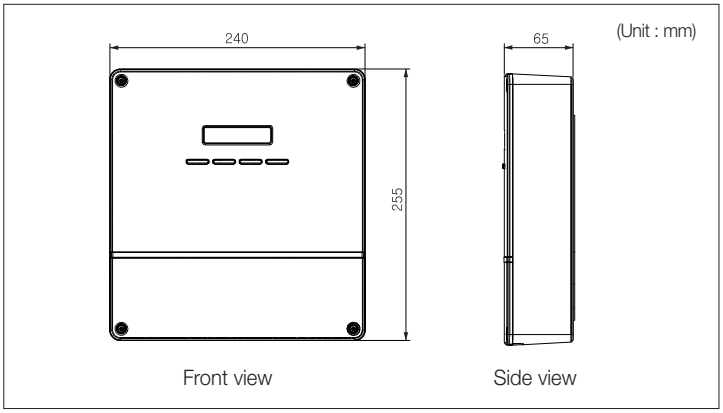
IV Power distribution system

1. Electricity meter interface module

❑ *MIM-B16*

1) Features

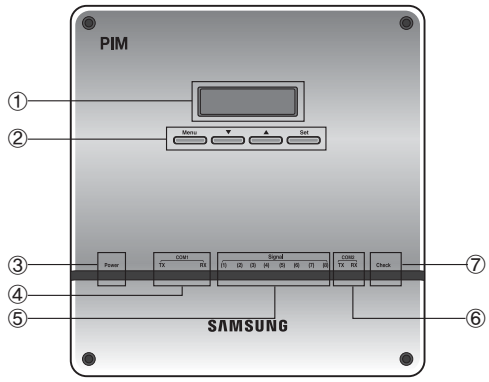




- Pulse output electricity meter interface unit (max. 8 meters)
- 8-channel energy consumption display in real time
- System configuration with button manipulation
- Various text messages in LCD
- Current communication state indication

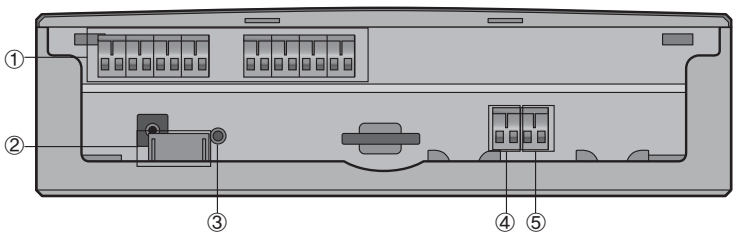
Power supply (adapter)	Input : 100~240V AC, 50/60Hz, 1.0A Output : 12V DC, 3.0A
Operating temperature range	-10℃ ~ 50℃
Operating humidity range	10%RH~90%RH
Maximum wiring length	DMS2 : 1000m Electricity meter : 200m
Number of interfaces	Electricity meter : max. 8 units DMS2 : 1 unit

2) Display and buttons



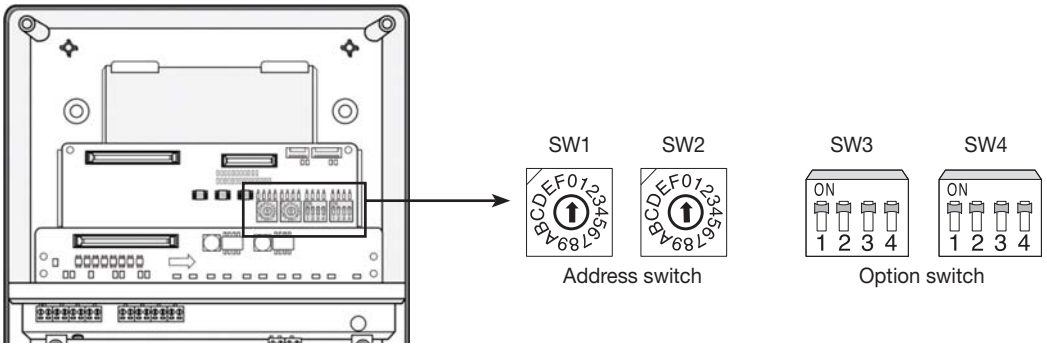
No.	Name	Description
①	LCD window	Information on current electricity readings, settings and operation state is displayed (16 character x 2 line LCD).
②	Menu button	Various menus are selected to monitor current electricity readings, to make configuration settings for electricity meters, and to check the error/settings.
③	Power (blue)	It's ON when power is supplied normally.
④	Communication (orange)	It blinks when communication between DMS2 and MIM-B16 normally works.
⑤	Pulse input (orange)	Each of the 8 LEDs blinks whenever a pulse from an electricity meter is detected.
⑥	Communication (orange)	Reserved
⑦	Check	It's ON when errors occur in communication or pulse input from electricity meters.

3) Connectors



No.	Name	Description
①	Pulse input terminals	8 terminals are allocated to interface pulse-type electricity meters. Each terminal is seen with a dedicated address on DMS2.
②	Power input	Power supply via the power adapter.
③	Reset button	Press the button to reset the MIM-B16.
④	COM1	Connection terminal for RS485 communication with DMS2.
⑤	COM2	Reserved

4) Address & option switches



No	Name	Description
1	SW1	No function
2	SW2	MIM-B16 address switch. Address greater than 7 (8~F) is not recognized.
3	SW3	No function
4	SW4	No function

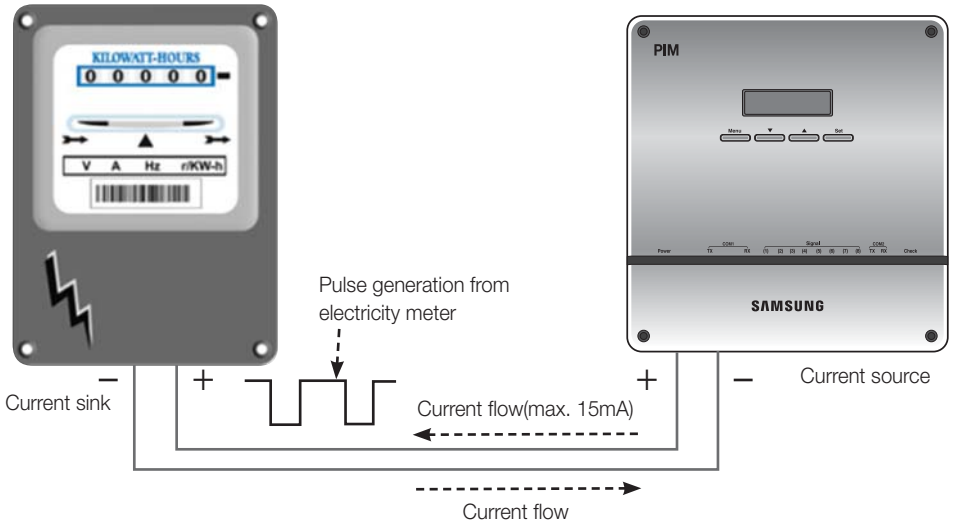
IV Power distribution system

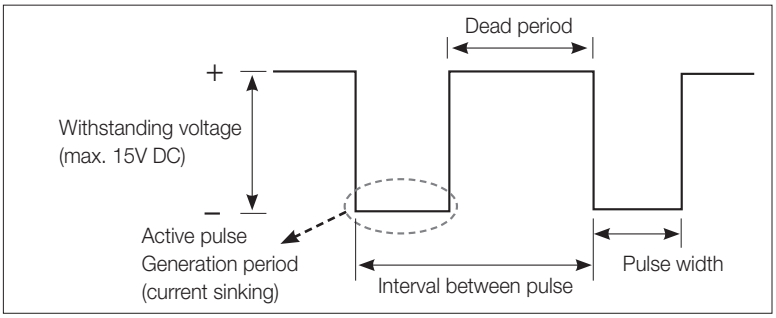
1. Electricity meter interface module

❑ *MIM-B16*

5) Specifications on electricity meter

- Current flow on output : Current-sinking
- Pulse rate : 1 ~10000 Wh/pulse (no decimal pulse rate allowed)
- Pulse width : 20 ~ 400ms with +/- 5% tolerance (no decimal pulse rate allowed)
- Time interval between pulses : min. 3ms
- Allowable current sinking : min. 15mA
- Withstanding voltage : min. 15V DC
- Interface circuitry : Electronic isolation circuitry recommended, no voltage output





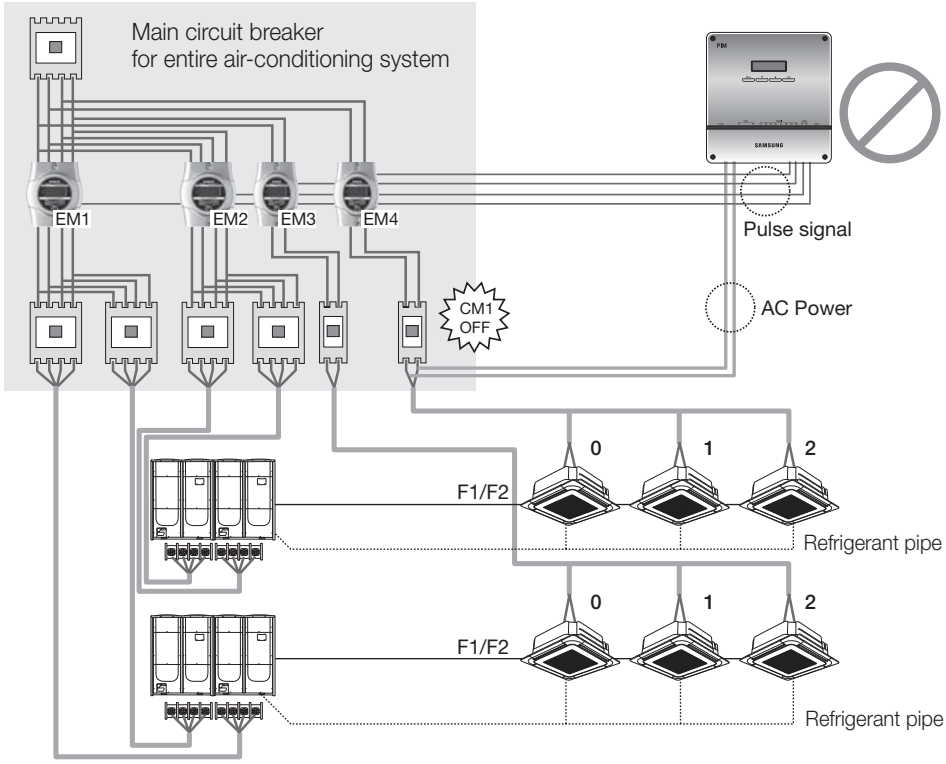
☑ *Note*

- Interface circuitry of an electricity meter has to withstand min. 15mA and min. 15V DC, both of which are applied by MIM-B16.
- Even though MIM-B16 interface circuitry is realized with electric isolation components, it's highly recommended that interface circuitry of an electricity meter be designed with isolation to ensure robustness from contact spike or electric interference during wiring.

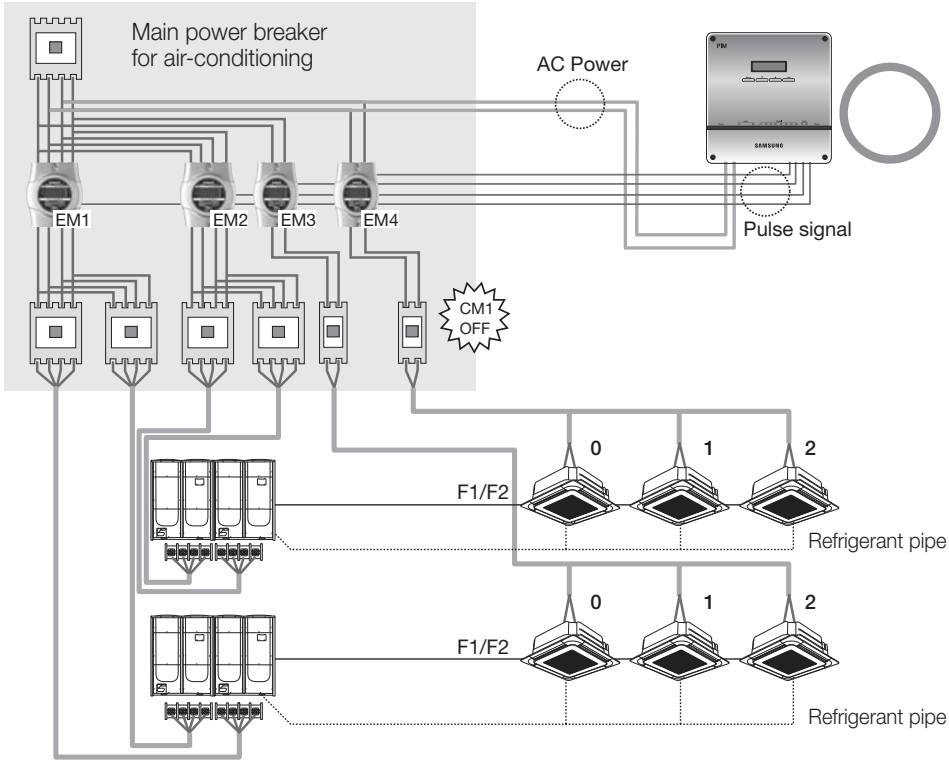
6) Installation

MIM-B16 must not be installed in a way that power to MIM-B16 is off when one of the over-current circuit breakers is switched off. Power supply to MIM-B16 must be off only when all the power supplies to refrigerant systems whose power consumptions are monitored by the MIM-B16 are cut off. This is because every pulse from electricity meters of some alive refrigerant systems must be sensed normally even if power supplies to other refrigerant systems have troubles.

• Example 1) When the circuit breaker, CM1 is switched off for some reason while the others are still on, pulses from the electricity meters, EM1, EM2 and EM3 are not calculated by MIM-B16, whose power is off by the CM1. This installation could lead to errors in electricity billing function when power interruption in local areas occurs.



• Example 2) Even when the circuit breaker, CM1 is switched off while the others are on, pulses from the electricity meters, EM1, EM2 and EM3 are still calculated by MIM-B16, whose power is not interrupted by CM1.



IV Power distribution system

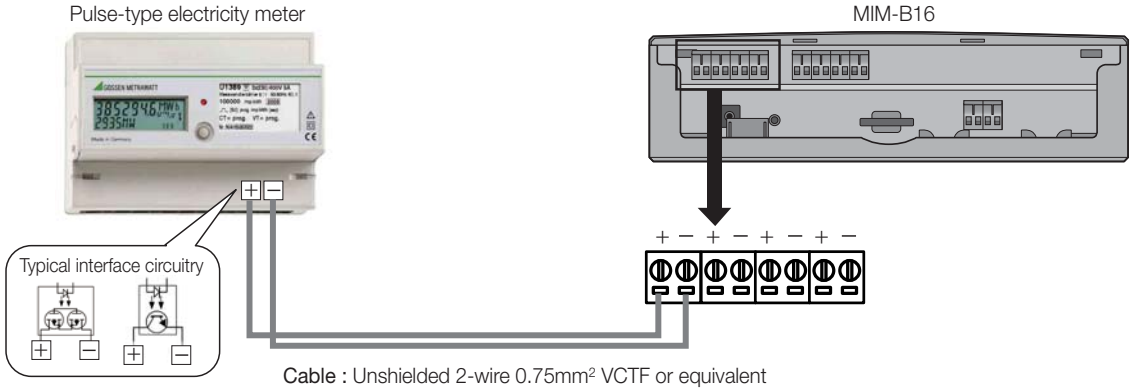
1. Electricity meter interface module

❑ *MIM-B16*

7) Wiring

▶ Wiring to electricity meter

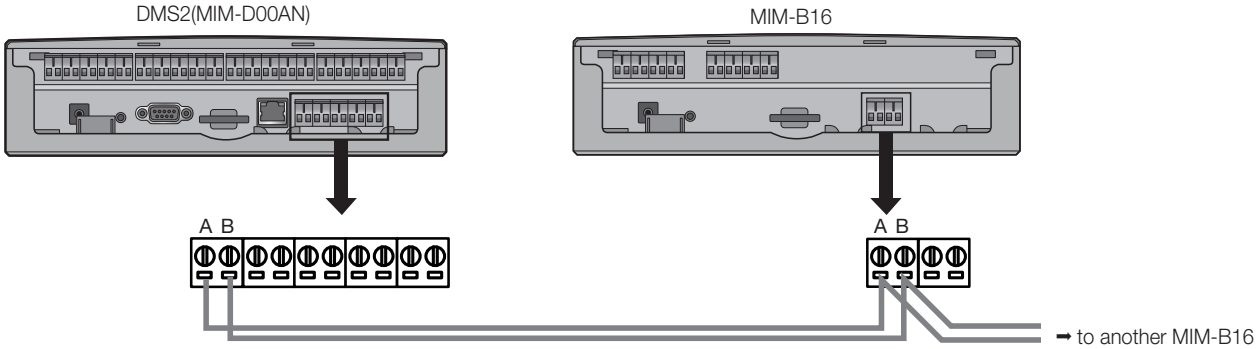
- Attention must be paid to make polarized connection between an electricity meter and MIM-B16 with correct specifications on wires.



Cable : Unshielded 2-wire 0.75mm² VCTF or equivalent
Length : Max. 200m

▶ Wiring to DMS2

- Make sure that communication cable is wired between DMS2 and MIM-B16 with the right polarity.



Cable : Unshielded 2-wire 0.75~1.5mm² VCTF or equivalent
Length : Max. 1000m

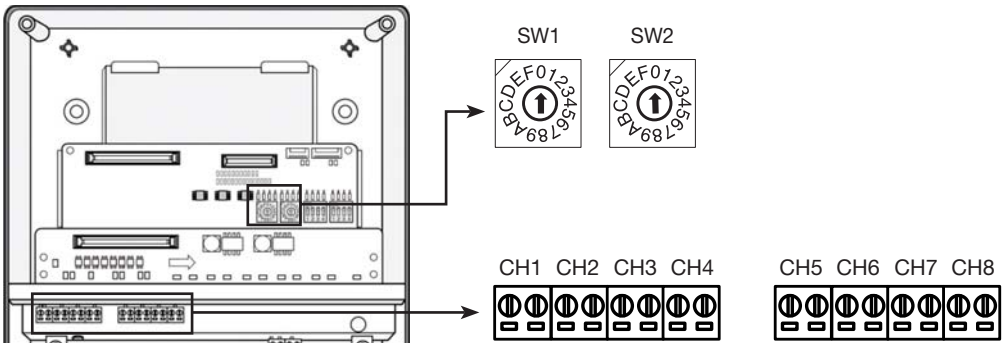
▶ Caution

- MIM-B16(PIM) should be connected to dedicated channel of DMS2 in advance

Ex) DMS2 CH1 : PIM + Outdoor unit (X)
PIM + OnOff controller (X)

8) Address assignment

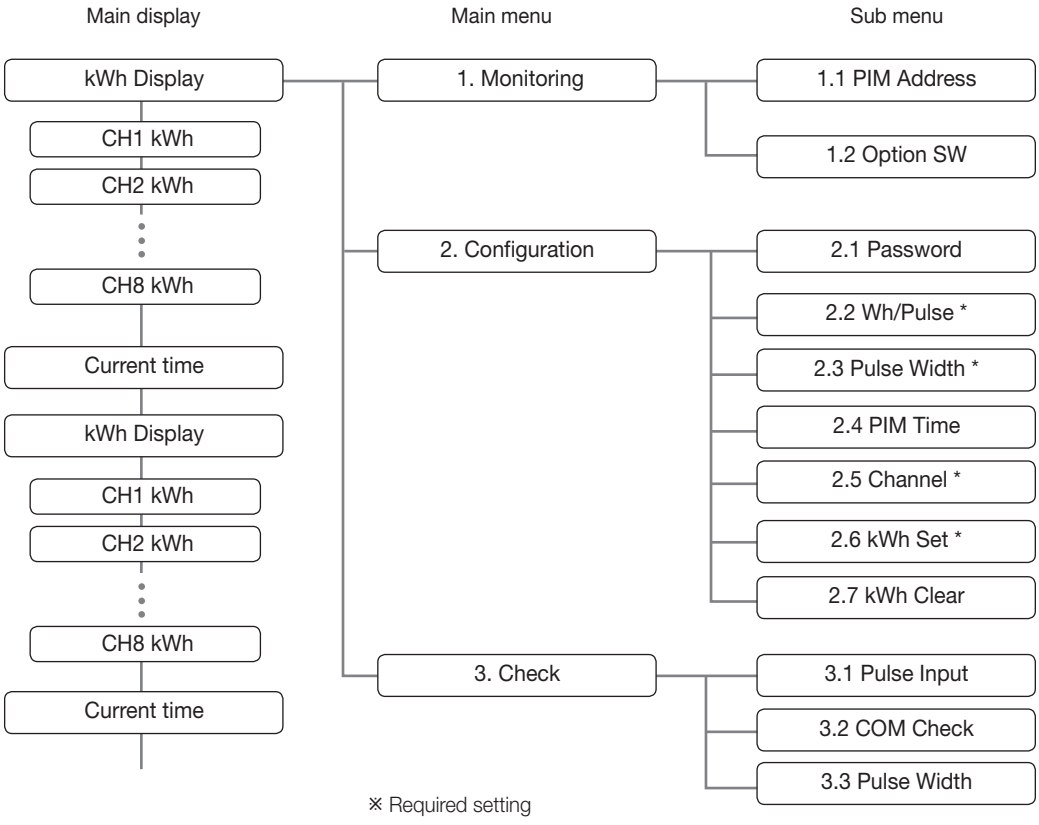
Each of the electricity meters is assigned with the dedicated address depending on MIM-B16 address setting and the position of the pulse input terminals.



▶ Electricity meter address assignment table

SW2	Pulse input terminal							
	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
0	16.01	16.02	16.03	16.04	16.05	16.06	16.07	16.08
1	17.01	17.02	17.03	17.04	17.05	17.06	17.07	17.08
2	18.01	18.02	18.03	18.04	18.05	18.06	18.07	18.08
3	19.01	19.02	19.03	19.04	19.05	19.06	19.07	19.08
4	20.01	20.02	20.03	20.04	20.05	20.06	20.07	20.08
5	21.01	21.02	21.03	21.04	21.05	21.06	21.07	21.08
6	22.01	22.02	22.03	22.04	22.05	22.06	22.07	22.08
7	23.01	23.02	23.03	23.04	23.05	23.06	23.07	23.08
8~15	Not recognized							

9) MIM-B16 menu structure

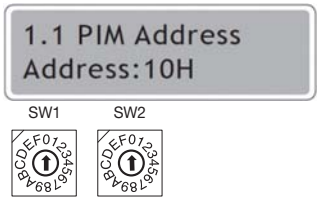
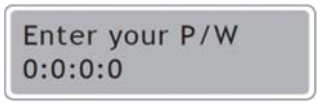
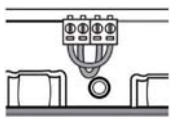


IV Power distribution system

1. Electricity meter interface module

❑ *MIM-B16*

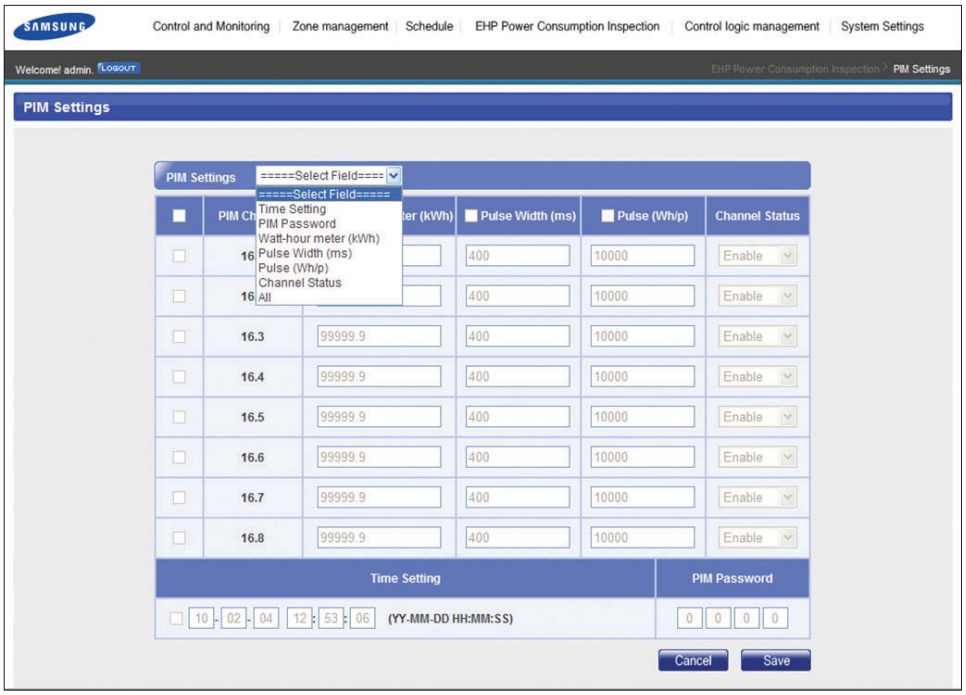
9) MIM-B16 menu structure

Main menu	Sub menu	Description
Monitoring	PIM Address	The MIM-B16 address is displayed with the physical address SW2 added by 10H on the LCD window. Ex) LCD / SW2 setting: 10H / 0; 11H / 1; … / …; 17H / 7 
	Option SW	Option switch setting to ON is displayed with the position number at the corresponding positions while setting to OFF is shown with the mark 'X'. Ex) 
Configuration	Password	The password, which is asked to enter to change the configuration setting, is used to prevent unauthorized persons from accessing MIM-B16. Factory setting is '0000'. Ex) 
	Wh/Pulse	The pulse rate of electricity meters must be set to calculate power consumption from the incoming pulse. The pulse rate in Wh/pulse must be an integer with no support of decimal numbers. The allowable range is 1~10000 Wh/pulse.
	Pulse Width	The width of the pulse from an electricity meter must be in the range between 20ms and 400ms during current sink into the meter.
	PIM Time	Current time is recommended to set for future use.
	Channel	Each of the 8 electricity meter interface channels is required to set to be enabled or disabled. Channels where electricity meters are connected must be set to be enabled.
	kWh Set	Initial electricity reader value must be set as a starting point for each of the enabled interface channels.
	kWh Clear	Each or all the initial kWh values are cleared when selected.
Check	Pulse Input	When pulse input is detected during the test period, the channel numbers are displayed. Otherwise, the character 'X' is displayed on the corresponding channel position. 
	COM Check	Make a loopback connection between COM1 and COM2 to check if the DMS2 communication channel is working or not. Care must be taken for the connection polarity.  When the COM1 communication channel is normal, the message 'OK' is displayed on the LCD window.
	Pulse Width	The pulse width test result is displayed with the messages "OK" or "NG" followed by the set and measured width values.  S : set value M : measured value

10) Setting parameters on DMS2 (MIM-D00AN)

▶ The following parameters for MIM-B16 can be also set and monitored on DMS2 (MIM-D00AN)

- Current power consumption (kWh), Pulse rate, Pulse width
- Channel Enable/Disable, Current time, Password



※ DMS2 setting for MIM-B16 parameters

11) Error

Error code	Description
E613	Communication error between DMS2 (MIM-D00AN) and MIM-B16
E614	E614 occurs when the width of the pulse from an electricity meter is out of range.
E654	Memory Read/Write error

DVM CONTROL SYSTEMS

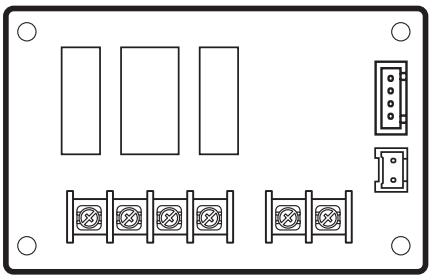
V. External control systems

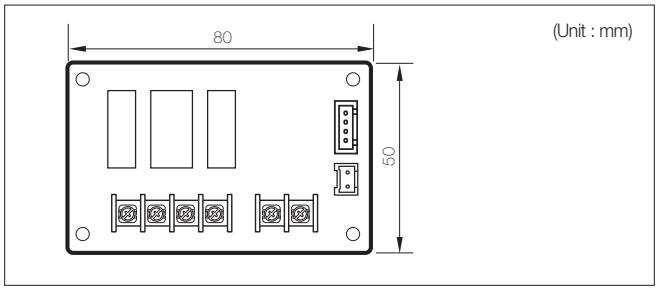
V External control systems

1. External contact interface module

❑ *MIM-B14*

1) Features

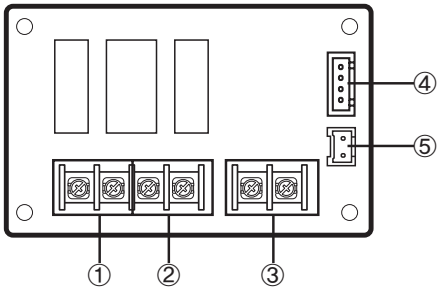




Interlock DVM air-conditioner with external controller

- Indoor unit On/Off control by the external contact (Usable equipment: Card-key, Timer, Sensor)
- Output the indoor unit thermo ON/OFF state and operation status
- Output the indoor unit error state

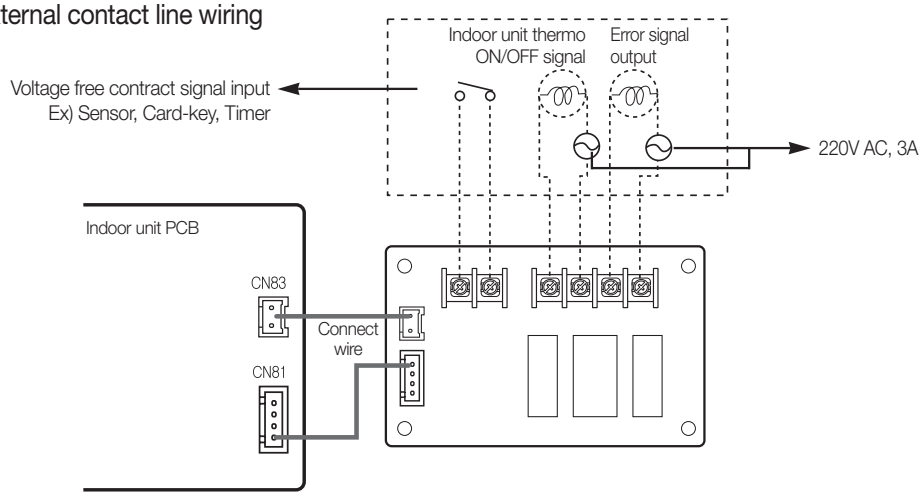
2) Description of parts



No.	Input/Output	Contact rating	Operation
①	Error state	220V AC, 3A	Normal : Close, Error : Open
②	Indoor unit Thermo On/Off or Operation State output (It depends on indoor unit's INSTALL option setting SEG 15.)	220V AC, 3A	[Output signal] SEG 15 = 0 Thermo On/Off SEG 15 =1 Operation On/Off (On : contact close, Off : contact open)
③	Operation signal input load	5V DC, 5mA	-
④	Connector for indoor unit	-	-
⑤	Connector for indoor unit	-	-

3) Installation

External contact line wiring



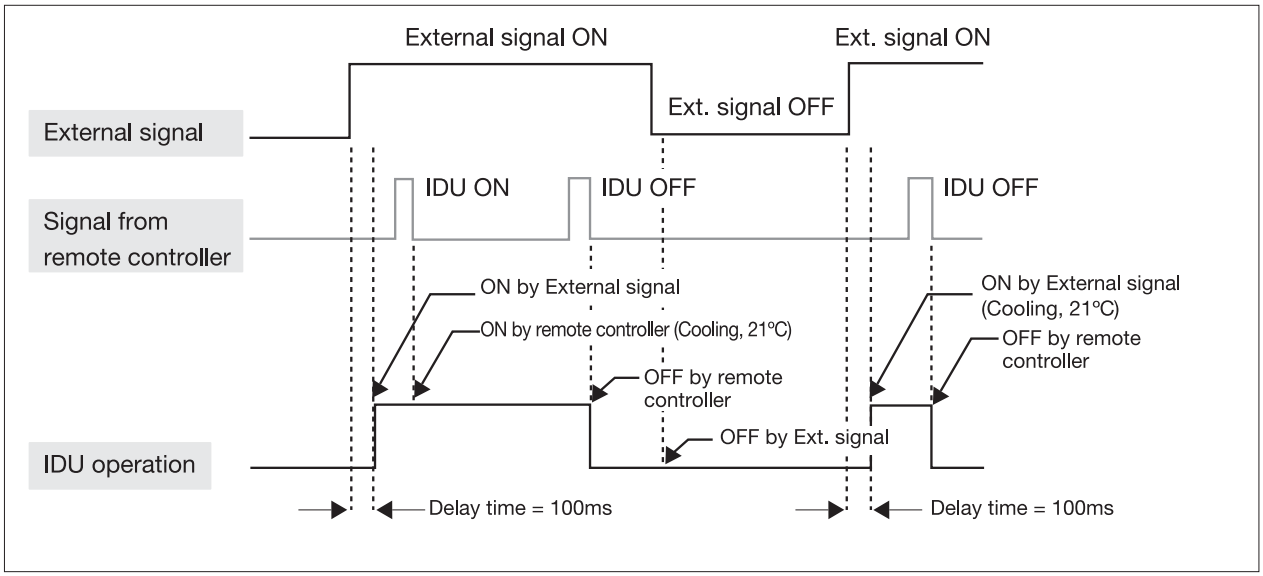
☑ *Note*

- External operation input load: 5V DC/5mA.
- The length of wiring between MIM-B14 and external control equipment is 100m max.
- To use external contact control system, indoor unit's INSTALL option setting is required.
  (Refer to indoor unit installation manual)
  ✳ SEG 14 - External control setting (Default : No use)
- After installed, the first operation will be conducted with Auto mode, Set temp. 24°C, Auto Fan speed.
- If the indoor unit in OFF status is turned ON through external contact signal; it will operate in the last operation status before it was turned off.

4) Control

Timing diagram for external contact control

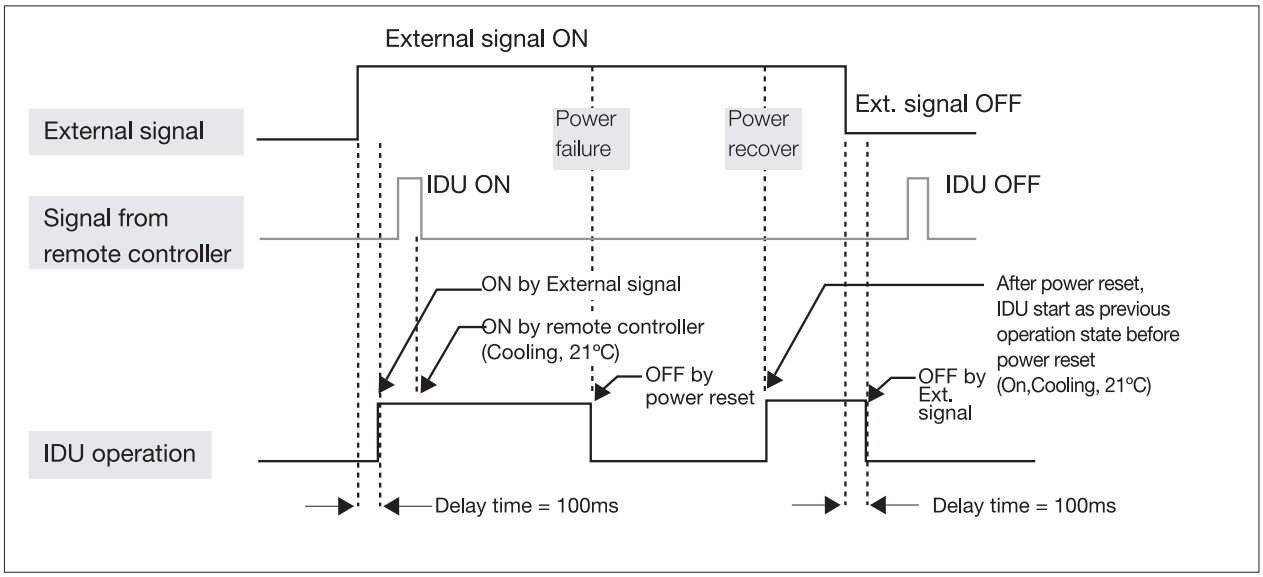
Ex1)



☑ *Note*

- IDU stands for Indoor Unit.
  No prioritized operation between the R/C and the external contact I/M.

Ex2)



☑ *Note*

- IDU stands for Indoor Unit.
  After power reset, indoor unit operates as previous state. (IDU has power recovery function)

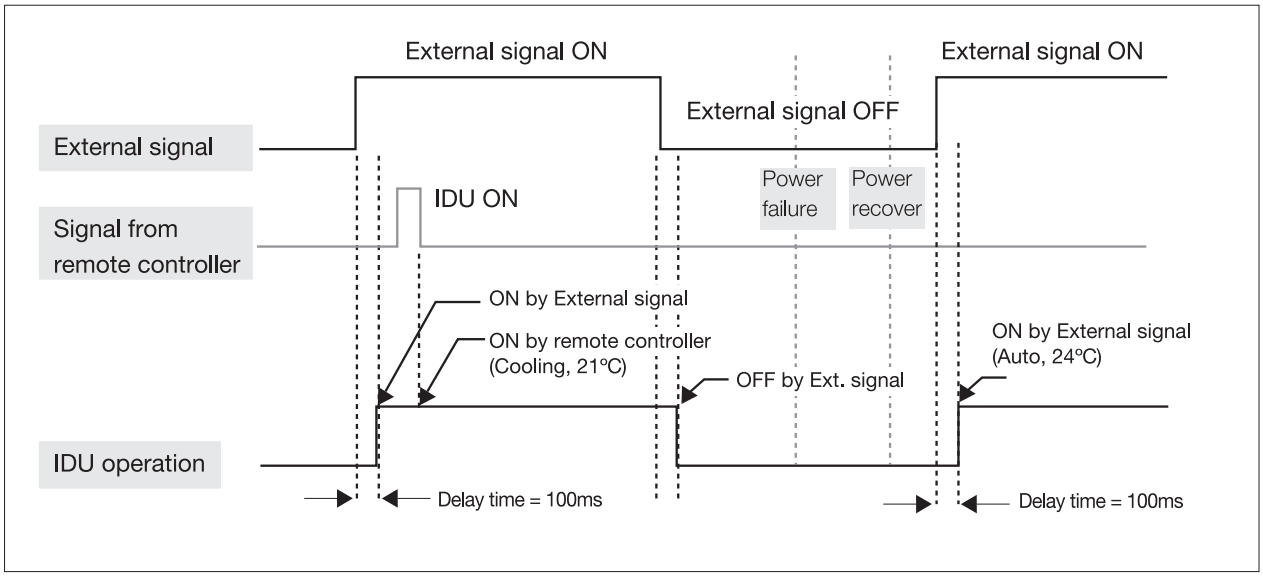
V External control systems

1. External contact interface module

❑ *MIM-B14*

4) Control

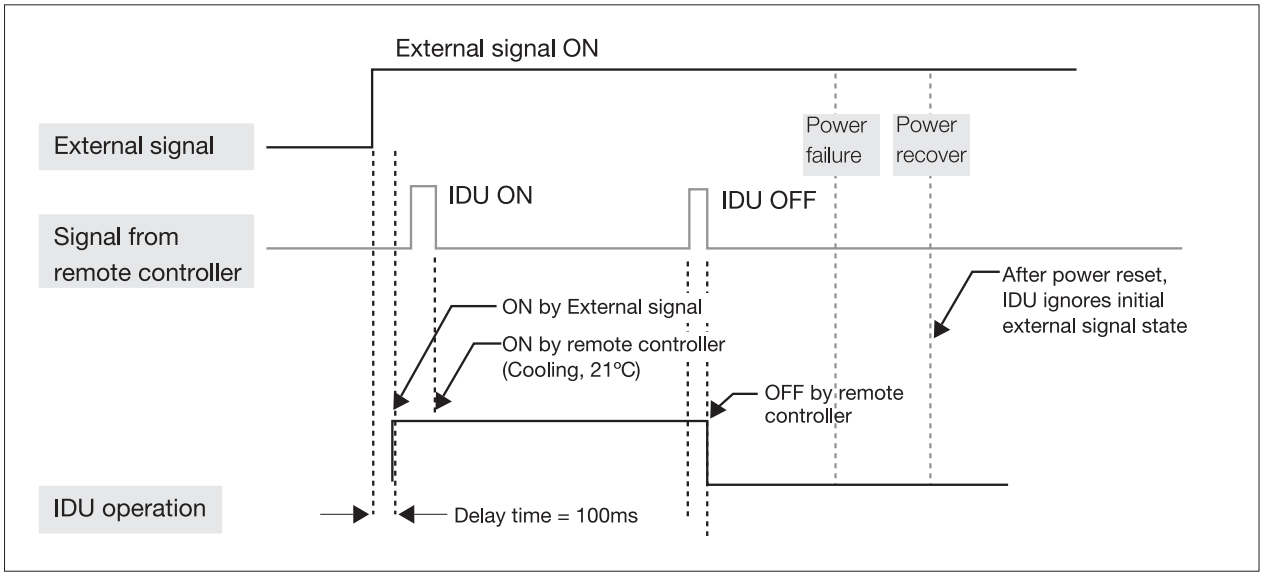
Ex3)



☑ *Note*

- IDU stands for Indoor Unit.
  After power reset, if IDU is turn ON by external contact, it starts as Auto mode, 24°C, Auto fan speed.

Ex4)



☑ *Note*

- IDU stands for Indoor Unit.
  After power reset, IDU ignores initial external signal state.

▶ Operation input

It is possible to set the method of indoor unit control by external contact signal.

- Method 1. Turn On/Off the indoor units by external contact signal
- Method 2. Set standby/Turn Off the indoor unit by external contact signal
- Method 3. Return to the last status / Turn Off the indoor unit by external contract signal

	Method 1	Method 2	Method 3
Indoor unit INSTALL option setting (Refer to inidoor unit installation manual)	SEG 14 = 1	SEG 14 = 2	SEG 14 = 3
Indoor unit operation by external contact	Short → Indoor unit On Open → Indoor unit Off	Short → Standby Open → Indoor unit Off	Short → Return to the last status of indoor unit Open → Indoor unit Off
Remote controller use	Short → Available Open → Available	Short → Available Open → Unavailable	Short → Available Open → Unavailable

▶ Operation output

	DVM S series indoor unit	
Output signal	SEG 15 = 0 SEG 15 = 1	Thermo On/Off Operation On/Off
Output signal delay time	None	
Error signal		

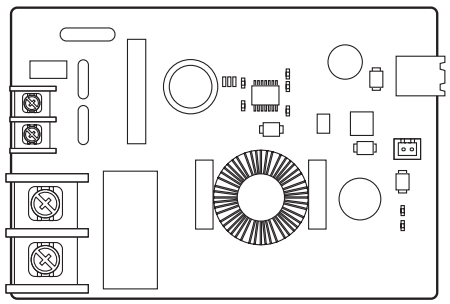
- Thermo off : Status where refrigerant is not flowing in either cooling/heating operation because desired temperature has been reached.

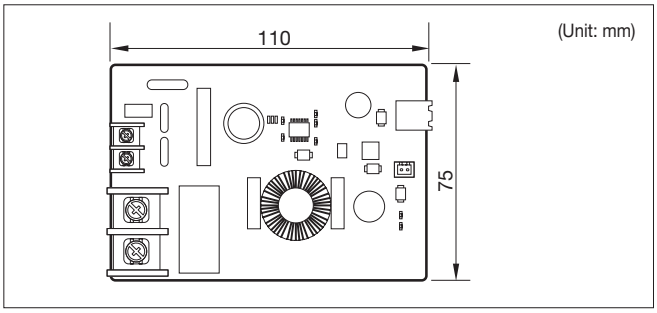
V External control systems

2. Multi tenant function controller (MTFC)

❑ *MCM-C210N*

1) Features





- Multi tenant function controller is an auxiliary power supply device which allows indoor unit to turn off (close EEV) normally and maintain communication when main power supply is cut.
- It is used in site such as hotel where individual power is supplied to the indoor unit

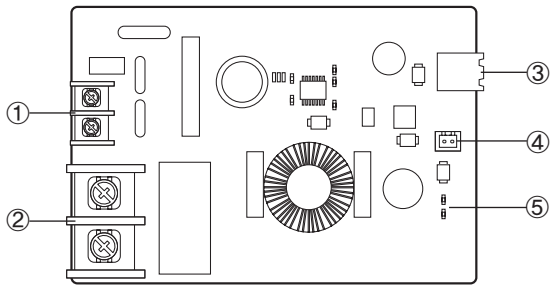
✻ To intall the MTFC, connection cable for the power, transformer and the IP (Ingress Protection) box must be purchased separately at the installation site.

✻ Specification of the transformer: UL Standard, Class2, 24Vac ±15% 50/60 Hz

2) Product specification

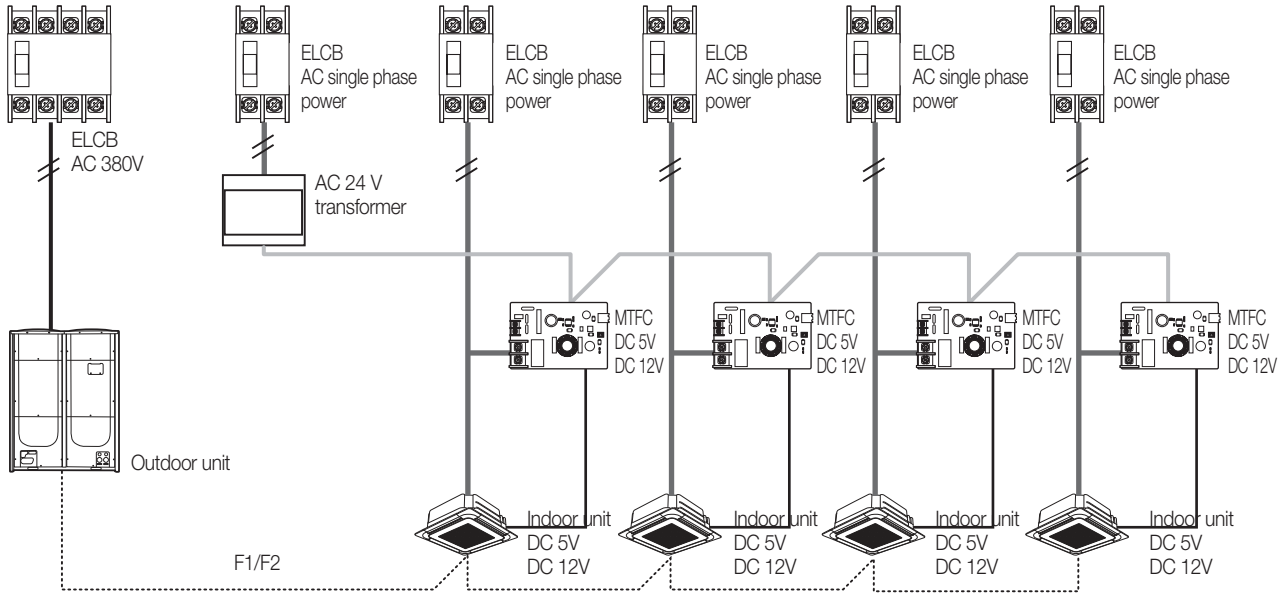
Power supply	AC 24V
	50/60 Hz
Power consumption	10W
Operating temperature range	-10°C ~ 50°C
Operating humidity range	10 % RH~90 % RH
Maximum length of connection	3 m
Number of control devices	1 indoor unit

3) Description of parts

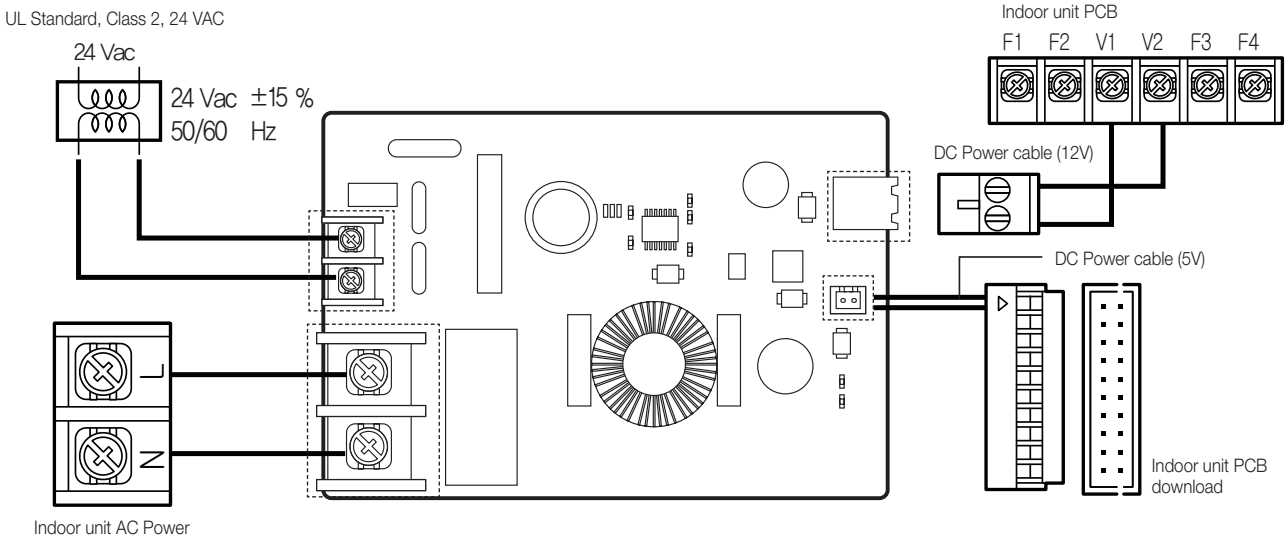


No.	Name	Description
①	Terminal for auxiliary power	Connect AC 24 V power
②	Terminal for indoor unit power connection	To check for AC single phase power cut-off of the indoor unit, connect the power cable to the multi tenant function controller.
③	DC 12 V output terminal	Terminal which supplies DC 12 V to indoor unit
④	DC 5V output terminal	Terminal which supplies DC 5V to indoor unit
⑤	Operation status indicator LED	• **LED ON :** When AC single phase power for indoor unit is cut-off and DC 12 V, DC 5 V is output normally from the multi tenant function controller • **LED OFF :** When AC single phase is supplied normally to the indoor unit

4) Connection diagram



5) Connecting



V External control system

2. Multi tenant function controller

❑ *MCM-C210N*

6) Main fucntion

▶ Multi tenant function controller operation

- When AC power (that is supplied to indoor unit) is cut-off, it supplies auxiliary power (DC 12 V, DC 5 V) to the indoor unit.
- When AC power (that is supplied to indoor unit) is supplied normally, it cuts-off the auxiliary power (DC 12 V, DC 5 V) to the indoor unit.

▶ Detail information of the indoor unit when the power is supplied by MTFC

Item	Operation	Detail information
Indoor unti operation	OFF	Remain indoor unit in off status, turning on is not possible
EEV control	Close	Operation off, follows indoor unit's EEV control
Self error diagnosis	Operating	Detects error such as EEV close/open by executing self-diagnosis
Displaying error on panel display	Display partially	Case 1) The errors of itself : it displays. Case 2) The errors of the other units : it doesn't display.
Oepration of the connected wired remote controller	OFF	Power cut (not working)
Panel display	All off	All LEDs is off
Input outdoor unit key mode (Test run)	Not operating	The others are operated except the indoor unit in MTFC mode
Controlliing from the control device	Not operating	Remain off status, turning on is not possible
Setting option code	Not operating	Option setting from wireles remote controller, wired remote controller and S-NET Pro etc is not possible
Recognition of MTFC status	Possible only through S-NET Pro 2	Using S-NET Pro2, user can check MTFC working status
Beep	Not operating	-

▶ When AC single phase power is normally supplied to indoor unit

- Indoor unit operates normally.

▶ Caution

- Wired remote controller for group control cannot be installed to an indoor unit which Multi Tenant Function controller was installed.
- EEV operation of the stopped Heat mode will be controlled in same condition as noise reduction control option when Multi Tenant Function Controller operates.
- If the Multi Tenant Function Controller operates while multiple indoor units are working in mixed operation mode (cooling and heating at the same time), dew may form on the indoor unit fan.

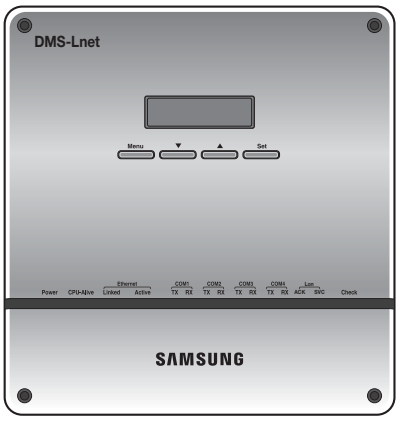
VI. Building management systems

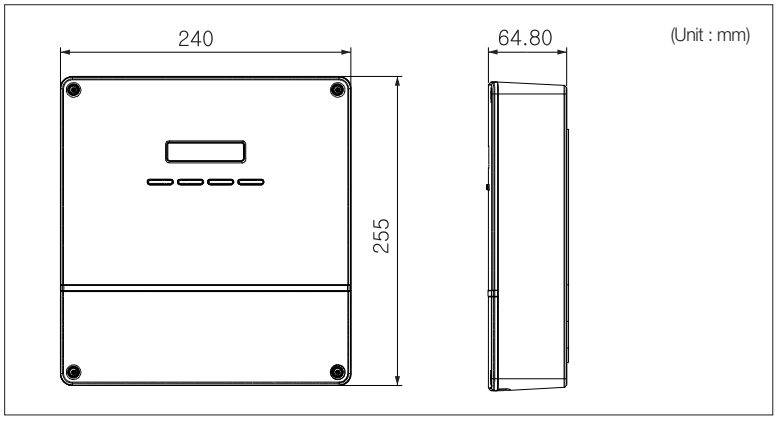
VI Building management system

1. DMS L-net (Lonworks GW)

❑ *MIM-B18N*

1) Features





- For LonWork protocol system.
- Support DMS2 control function at the same time.

2) Product specification

Power supply	Source	DC Adaptor
	Input	100~240VAC (±10%), 50/60Hz
	Output	12V 3A
Operating temperature range		-10ºC ~ 50°C
Operating humidity range		10%RH ~ 90%RH
Communication connection		Lower layer : RS485 x 5 Upper layer : Ethernet 100Base-T x 1 LonWorks layer : TP/FT-10A(Free topology 78kbps)
External connection port	Digital Output	8
	Digital Input	10
Maximum length of connection	RS485	1000 m
	Digital Output	100 m
	Digital Input	100 m
	Ethernet	100 m (When there is no repeater)
	LonWorks	500 m (When connecting with Bus type : 2700 m)
Max. connectable number of device	Control layer	(see nested table)

Device	Numbers per each channel	Total number for 5 channels
Indoor units (including ERV, MCU)	128	128
Outdoor unit (including compatible interface module MIM-N01)	16	80
OnOff controller	Total 15	Total 75
Touch centralized controller		
PIM interface module (MIM-B16)	8	8

Compatible product

Outdoor unit	AM✶✶✶✶X✶✶✶✶✶✶
Controller	OnOff controller (MCM-A202DN)
	Touch centralized controller (MCM-A300N)
	PIM interface module (MIM-B16)

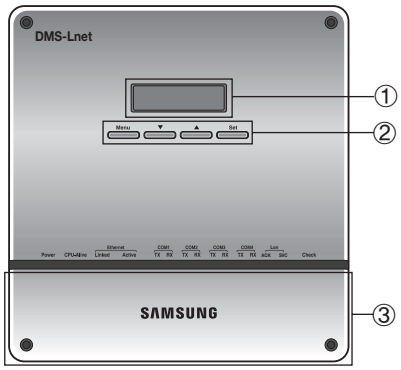
✶ Conventional communication outdoor unit requires compatible interface module (MIM-N01) to establish connection

✶ MIM-B13D, MIM-B13E, MIM-B04A Interface modules cannot be connected.

✶ ERV connection is not supported until end of 2013.

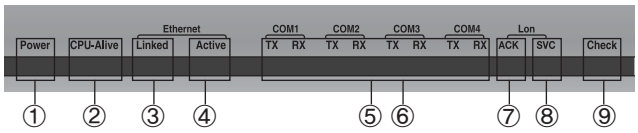
3) Description of parts

Front



No	Name	Function
①	LCD display	Displays current time or menu.
②	Menu button	Access the setting menu.
	▲/▼ button	Select function or setting item in the setting menu.
	Set button	Enter or check setting item in the setting menu.
③	Bottom cover	Unscrew 2 screws on the bottom to remove the cover and check the cable connections.

LED indicator



No.	Item	Name	Status
①	Power	Power indicator	Turns blue when the power is supplied.
②	CPU Alive	CPU operation indicator	Blinks in orange with 1 second intervals during normal operation.
③	Ethernet-Linked	Internet connection indicator	Turns green during normal connection.
④	Ethernet-Active	Internet data transmission/reception indicator	Blinks in orange during normal transmission/reception.
⑤	COM1~4-TX	Channel 1~4 OnOff controller/Interface module Data transmission indicator	Blinks in green during normal transmission.
⑥	COM1~4-RX	Channel 1~4 OnOff controller/interface module Data reception indicator	Blinks in green during normal reception.
⑦	Lon ACK	LonWorks data reception indicator	Blinks in green during normal reception.
⑧	Lon SVC	LonWorks device status indicator	Blinks in green during un-configured.
⑨	Check	Indoor/Outdoor unit communication status indicator	Turns green when there is an error on more than one indoor/outdoor unit or in communication.

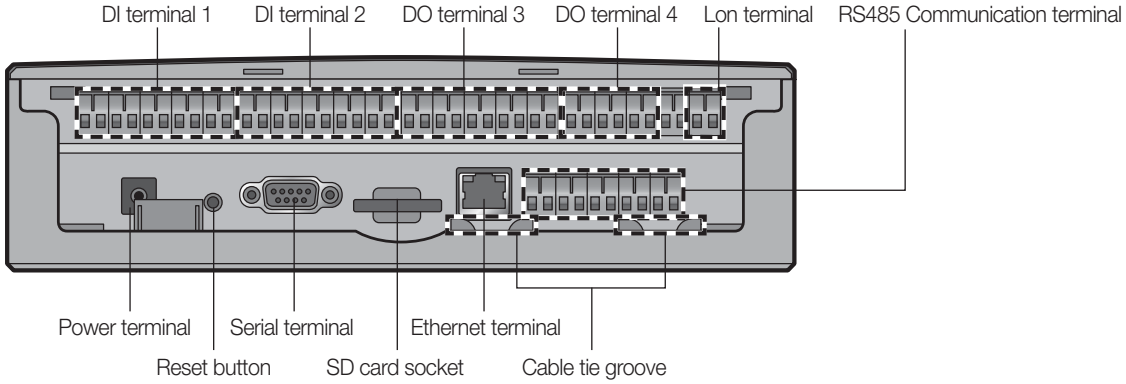
VI Building management system

1. DMS L-net (Lonworks GW)

❑ *MIM-B18N*

3) Description of parts

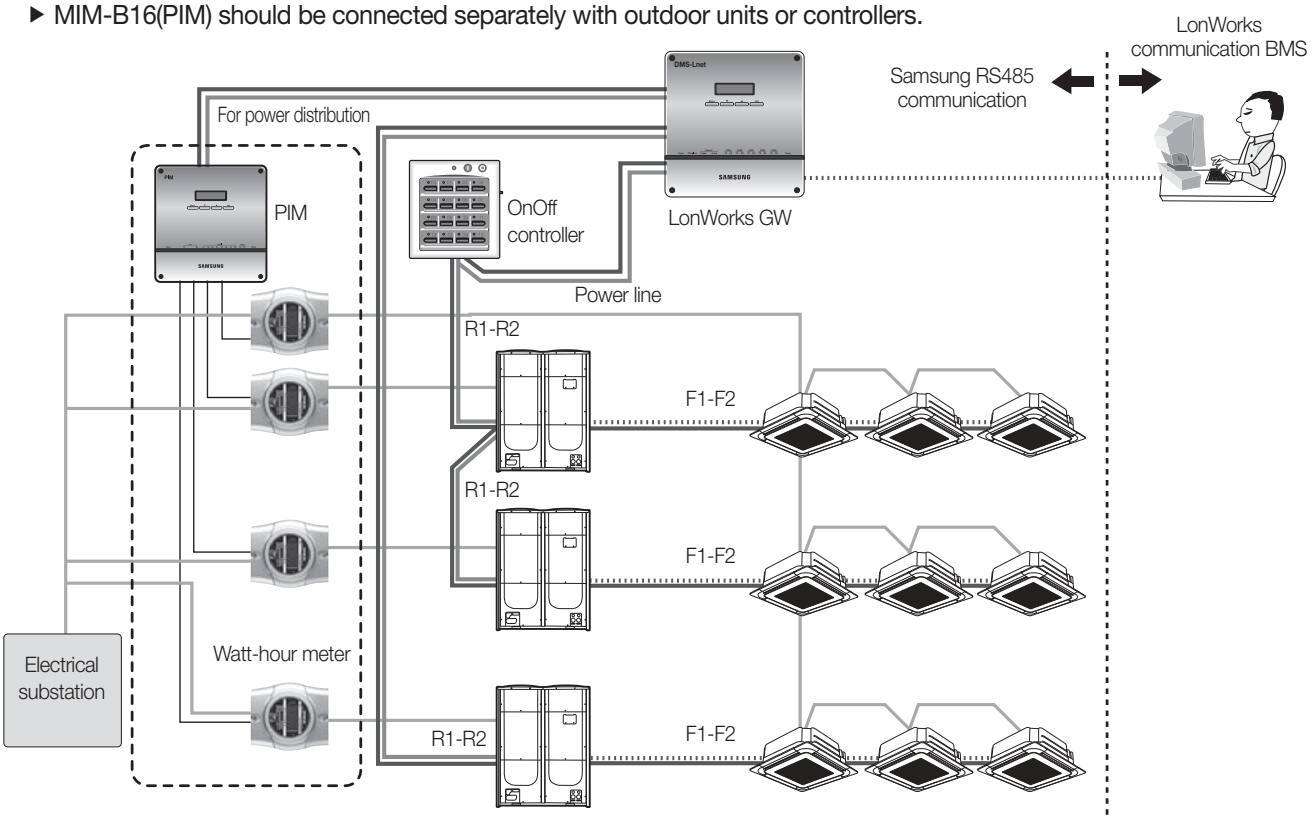
Bottom



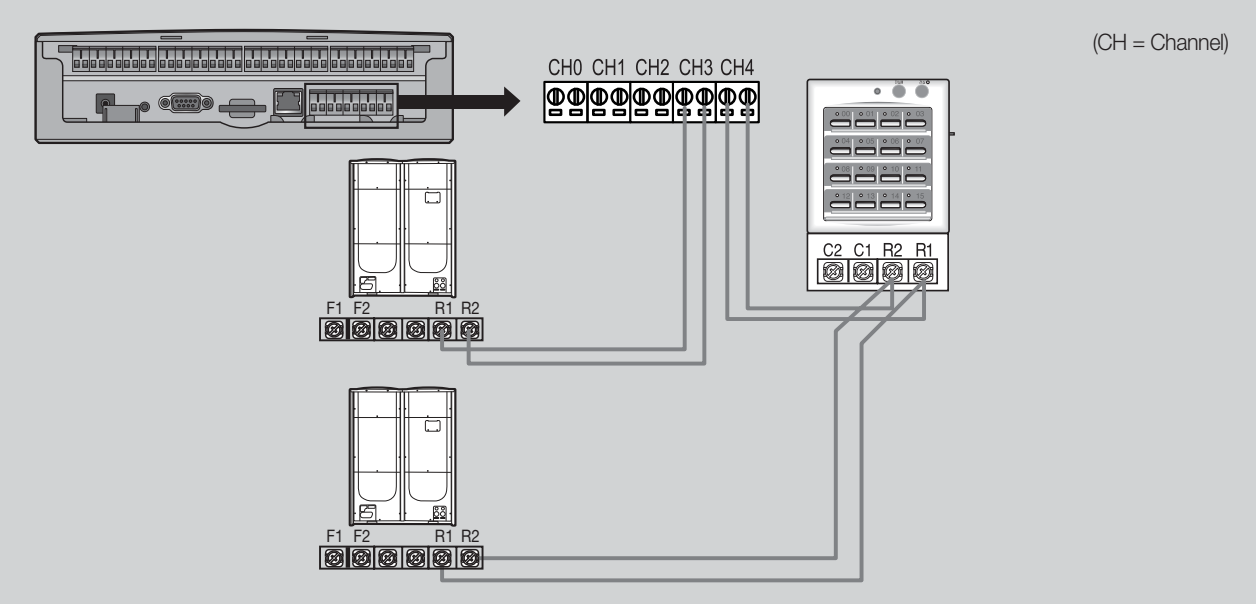
Name	Description
DI terminal 1	Digital Input connection terminal, Channel1~Channel5
DI terminal 2	Digital Input connection terminal, Channel6~Channel10
DO terminal 3	Digital Output connection terminal, Channel1~Channel5
DO terminal 4	Digital Output connection terminal, Channel6~Channel8
Lon terminal	Terminal Block for LonWorks communication (TP/FT-10)
Reset button	Reset LonWorks Gateway
Serial terminal	Service check port
SD card socket	Sub memory (for program update and set information saving) socket
RS485 communication terminal	RS485 port for communication with OnOff controller / interface module
Ethernet Terminal	Connect LAN cable
Cable tie groove	Groove for arranging cables

4) Connection diagram

▶ MIM-B16(PIM) should be connected separately with outdoor units or controllers.



5) Wiring



(1) Connecting outdoor unit directly

- Maximum 16 outdoor units can be connected to each channel
- Total 80 outdoor units can be connected

(2) Connecting OnOff controller/Touch centralized controller

- Maximum 15 OnOff controller/Touch centralized controller can be connected to each channel

☑ *Note*

- LonWorks GW can connect outdoor unit and OnOff controller/Touch centralized controller at the same time.
- Outdoor unit and OnOff controller/Touch centralized controller can be connected to 1 communication channel at the same time.

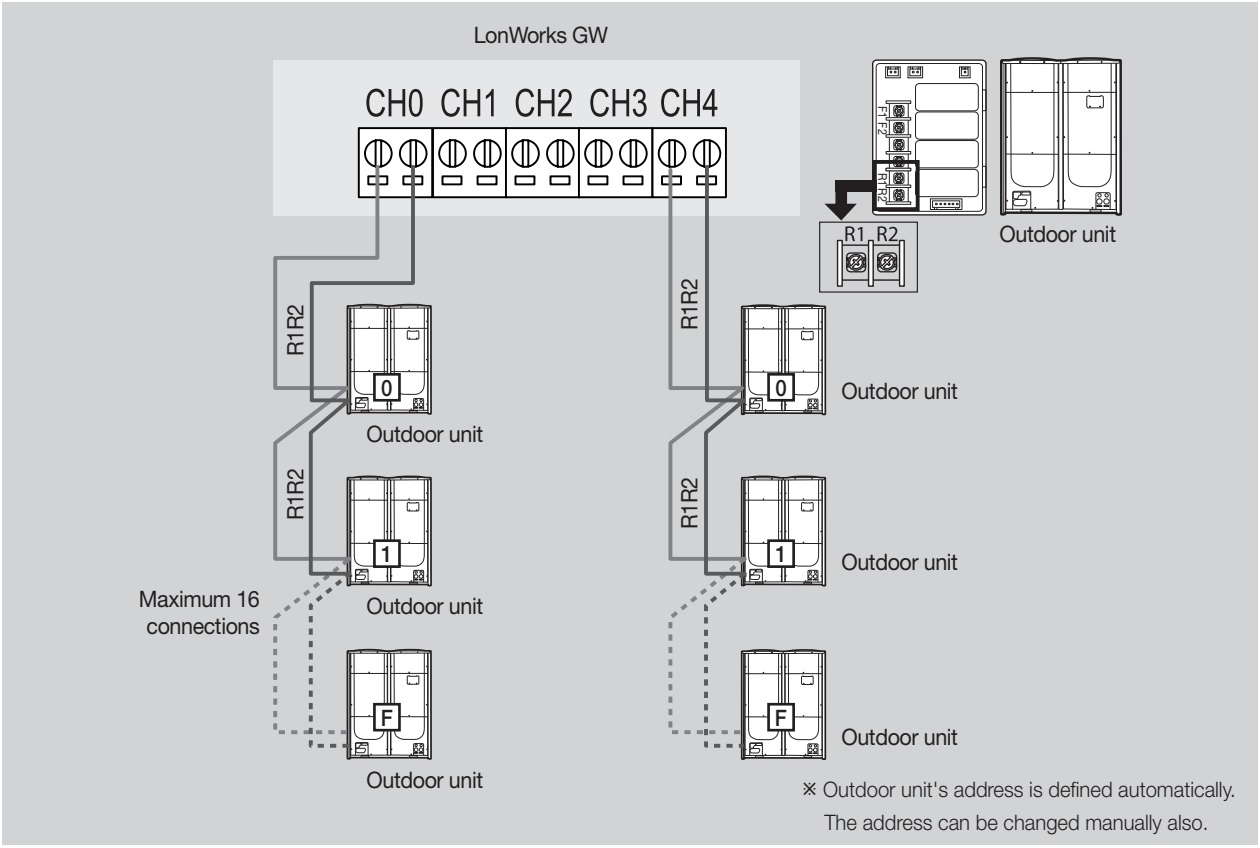
VI Building management system

1. DMS L-net (Lonworks GW)

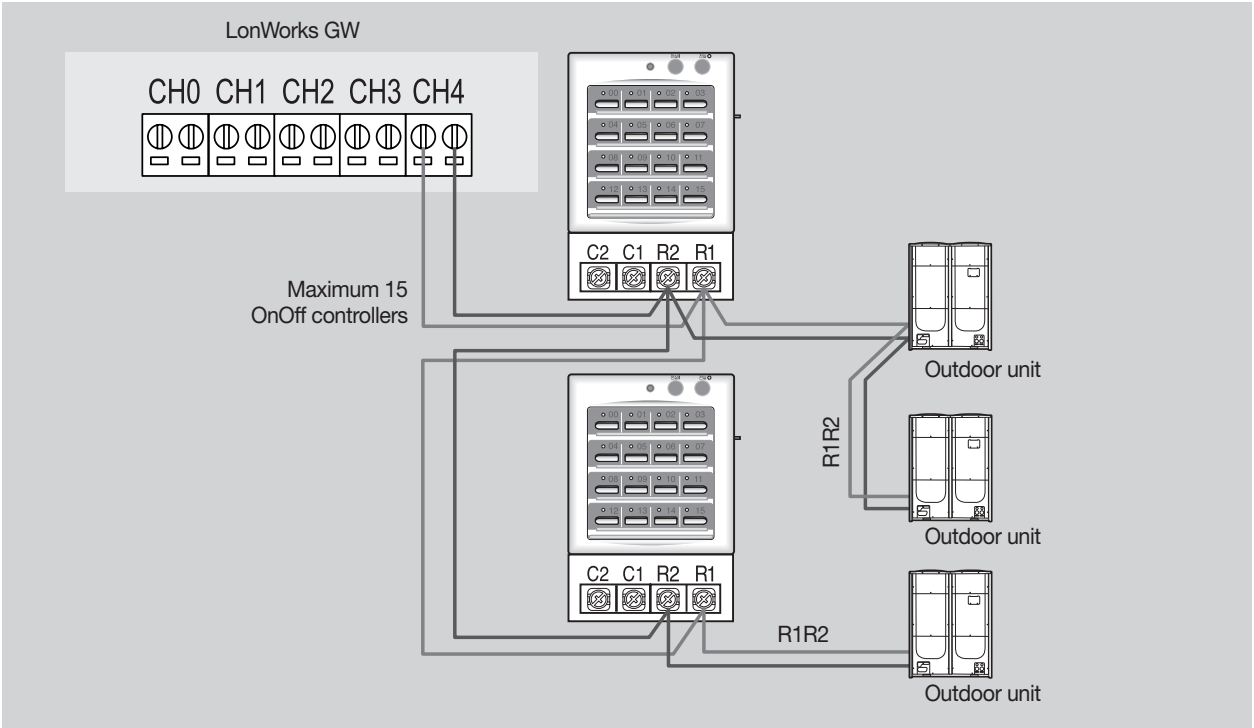
❑ *MIM-B18N*

5) Wiring

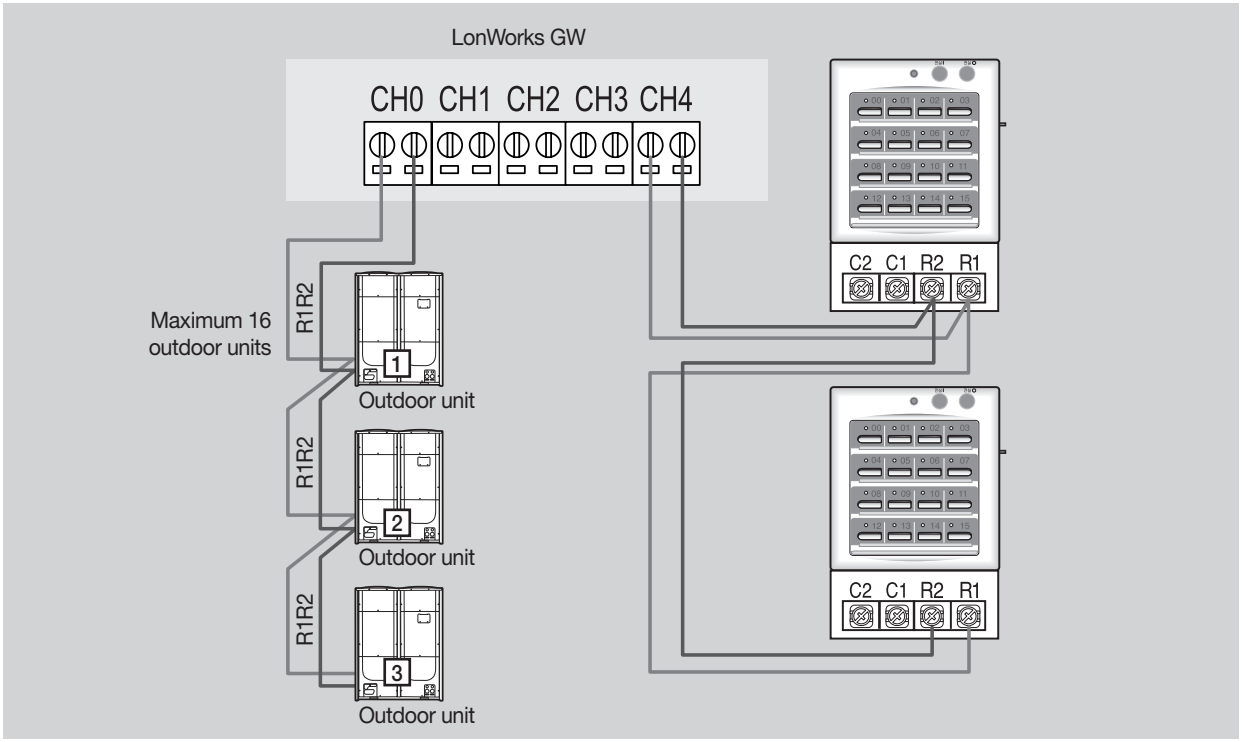
Connecting with outdoor unit



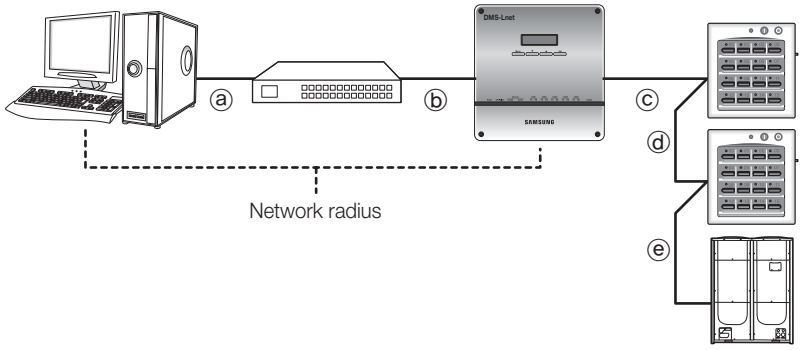
Connecting with OnOff controller



Connecting with outdoor unit and OnOff controller



Wiring distance

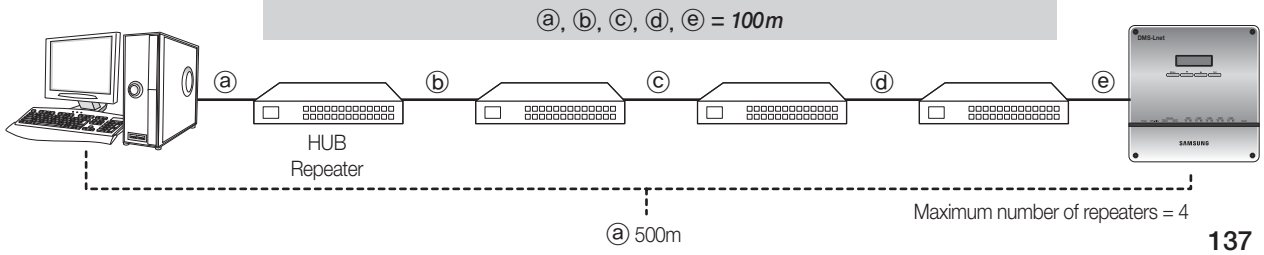


▶ Distance between LonWorks GW and OnOff controller/outdoor unit

- Distance from the LonWorks GW to the furthest device cannot exceed 1000m.
- ⓒ + ⓓ + ⓔ ≤ ***1000m***

▶ Distance between LonWorks GW and upper level controller

- Since LonWorks GW supports 100 Base-T Ethernet, first repeater or upper level controller from the LonWorks GW cannot be further than 100m (IEEE 802.3). Therefore, maximum network radius is restricted to 500m.



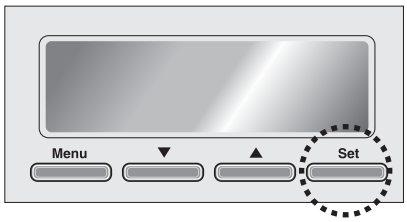
VI Building management system

1. DMS L-net (Lonworks GW)

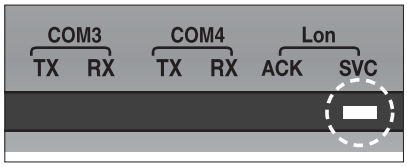
❑ *MIM-B18N*

6) Commission

- For Commission operation with BMS, press the [Set] button for more than 3 seconds.



- When you press Service Pin, Neuron ID will be sent and [SVC] LED of the front panel will be lit up for a second.



7) Standard program identifier (SPID)

- Manufacturers : Samsung Electronics Co., Ltd. MID: 191
- Device Classes : 70.00 - Gateways 72.80 --- HVAC Gateways
- Usage (Device Subclass) : Utility {11}
- Channel Types : TP/FT-10 {ID : 4}

Object Types	Description	SFPT Name
8500	SCC – Generic	SFPTspaceComfortController

※ Program ID : 90:00:BF:48:50:0B:04:00

8) Item summary

Item		Function
Control & Monitoring	Common	Operation On/Off
		Operation mode
		Air flow direction
		Fan speed
		Device error information
		Model, address, type information
	Indoor unit AHU	Set temperature
		Indoor temperature
		Filter replacement alert/ reset
		Remote controller level
		Thermostat information
		Operation restriction setting (Cooling/Heating)
		Setting lowest temperature/ restriction
		Setting highest temperature/ restriction
		Power consumption
	Additional functions	Operation time
		Emergency stop
		DMS2 DI/DO
		DMS2 lock
		DMS2 error information
		System error information

9) Network variable

(1) Indoor unit/ ERV/ AHU kit object

No.	Name	Type	M/O	Description
1	nviONOff	SNVT_switch	O	ON/OFF command
2	NviApplicMode	SNVT_hvac_mode	O	Setting operating mode
3	nviSetpoint	SNVT_temp_p	O	Setting desire temperature
4	nviFanStatus	SNVT_switch	O	Setting fan speed
5	nviERVMode	SNVT_count	O	Setting ERV operation mode
6	nviFilterReset	SNVT_switch	O	Filter reset command
7	nviUserLockout	SNVT_switch	O	Setting the restriction of remote control use
8	nviOccOpMode	SNVT_switch	O	Setting cooling only mode / heating only mode
9	nviCoolTempLock	SNVT_switch	O	Setting the low temperature limit
10	nviHeatTempLock	SNVT_switch	O	Setting the high temperature limit
11	nvoSpaceTemp	SNVT_temp_p	M	Display indoor temperature
12	nvoApplicMode	SNVT_hvac_mode	O	Display operating mode
13	nvoSetpoint	SNVT_temp_p	O	Display desire temperature
14	nvoOnOff	SNVT_switch	O	Display ON/OFF status
15	nvoFanStatus	SNVT_switch	O	Display fan speed
16	nvoERVMode	SNVT_count	O	Display ERV operating mode
17	nvoErrorCode	SNVT_count	O	Display Error code
18	nvoDeviceAlarm	SNVT_state	O	Remote control lock, Filter sign, Thermo ON/OFF, Error occurrence status display
19	nvoOccOpMode	SNVT_switch	O	Cooling only/Heating only setup status display
20	nvoCoolTempLock	SNVT_switch	O	Display low temperature limit setting status
21	nvoHeatTempLock	SNVT_switch	O	Display high temperature limit setting status
22	nvoUserLockout	SNVT_switch	O	Display the restriction of remote control use
23	nvoEnergyConp	SNVT_elec_kwh_l	O	Display electricity usage (Time Period)
24	nvoEnergyCon	SNVT_elec_kwh_l	O	Display electricity usage (Basic date)
25	nvoRuntimep	SNVT_time_hour	O	Display used hours (Period)
26	nvoRuntime	SNVT_time_hour	O	Display used hours (Basic date)
27	nvoDevListDesc	SNVT_str_asc	O	Indoor unit HW information

(2) DVM system object

No.	Name	Type	M/O	Description
1	nviDigitalOut[6]	SNVT_ switch	O	Control Digital output of DMS
2	nviAllOff	SNVT_hvac_emerg	O	Control all indoor unit / ERV OFF
3	nvoDigitalOut[6]	SNVT_ switch	O	Display Digital output status of DMS
4	nvoDigitalIn[8]	SNVT_ switch	O	Display Digital input status of DMS
5	nvoSystemLock	SNVT_ switch	O	Display System Lock status of DMS
6	nvoDMS2Alarm	SNVT_ count	O	Display communication error of the sub device connected to DMS
7	nvoSystemAlarm	SNVT_ count	O	

(3) Configuration properties

No.	Name	Type	M/O	Description
1	nciSndHrtBt	SNVT_time_sec SCPTmaxSendTime	O	Send Heartbeat
2	nciMinOutTm	SNVT_time_sec SCPTminSendTime	O	Minimum Send Time
3	nciMinDeltaTemp	SNVT_temp_p SCPTminDeltaTemp	O	Min. difference before update
4	nciDelayStatrup	SNVT_time_sec SCPTpwrupDelay	O	Delay time after a power-up

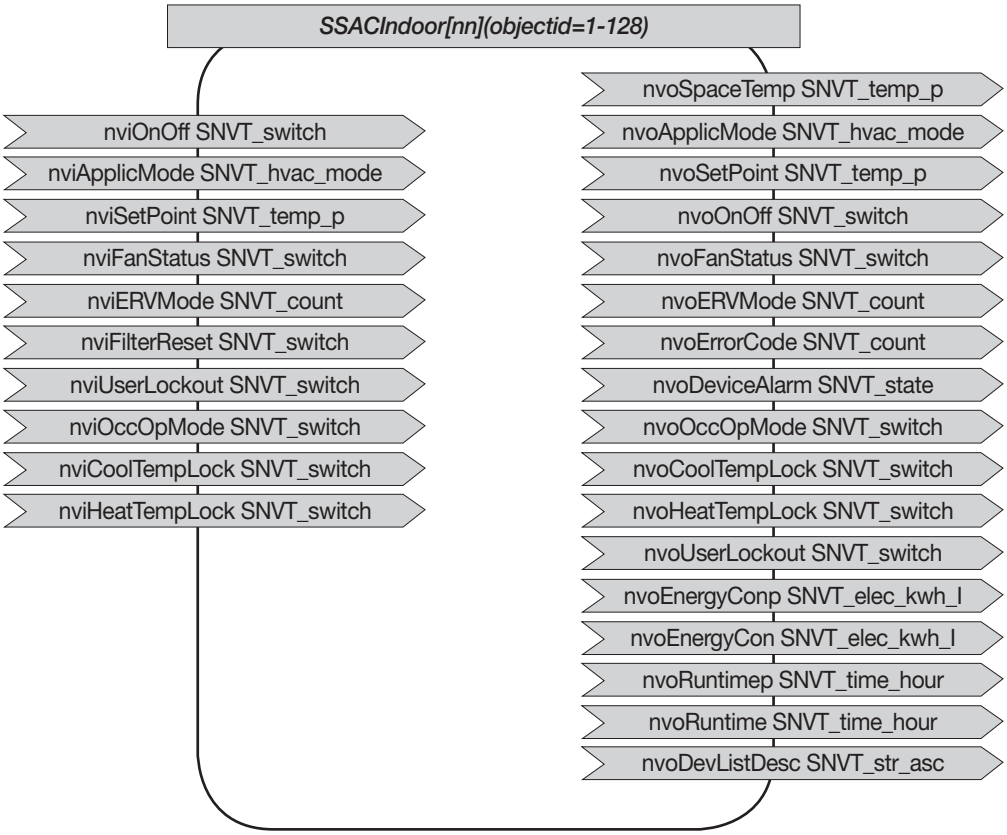
VI Building management system

1. DMS L-net (Lonworks GW)

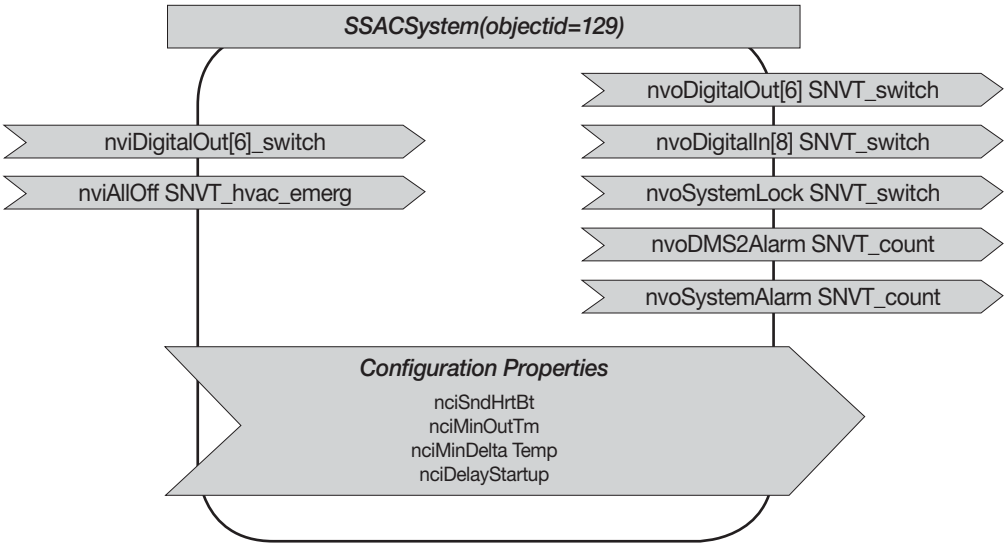
❑ *MIM-B18N*

10) Network parameter chart

(1) Indoor unit/ ERV/ AHU kit object



(2) DMS system object



11) Network variable list

• Supported NV (Network Variable) is different depending on the connected devices.

No.	NV Name	Description	Indoor	ERV	AHU Kit
1	nviOnOff	ON/OFF command	O	O	O
2	nviApplicMode	Setting operating mode	O	X	O
3	nviSetpoint	Setting desirable temperature	O	X	O
4	nviFanStatus	Setting fan swing and speed	O	O	X
5	nviERVMode	Setting ERV operation mode	X	O	X
6	nviFilterReset	Filter reset command	O	O	O
7	nviUserLockout	Setting the restriction of remote control use	O	O	O
8	nviOccOpMode	Setting cooling only mode / Setting heating only mode	O	X	O
9	nviCoolTempLock	Setting the low temperature limit	O	X	O
10	nviHeatTempLock	Setting the high temperature limit	O	X	O
11	nvoSpaceTemp	Display indoor temperature	O	X	O
12	nvoApplicMode	Display operating mode	O	X	O
13	nvoSetpoint	Display desire temperature	O	X	O
14	nvoOnOff	Display ON/OFF status	O	O	O
15	nvoFanStatus	Display wind speed and direction	O	O	X
16	nvoERVMode	Display ERV operating mode	X	O	X
17	nvoErrorCode	Display Error code	O	O	O
18	nvoDeviceAlarm	Remote control Lock, Filter Sign, Thermo ON/OFF, Error occurrence status display	O	O	O
19	nvoOccOpMode	Cooling only/Heating only setup status display	O	X	O
20	nvoCoolTempLock	Low temperature limit setting status display	O	X	O
21	nvoHeatTempLock	High temperature limit setting status display	O	X	O
22	nvoUserLockout	Display the restriction of remote control use	O	O	O
23	nvoEnergyConp	Display electricity usage	O	X	X
24	nvoEnergyCon	Monitor total electricity usage	O	X	X
25	nvoRuntimep	Display used hours (Period)	O	X	O
26	nvoRuntime	Monitor total operation hours	O	X	O
27	nvoDevListDesc	The summary of device information (Model, Address, Operation Status)	O	O	O

VI Building management system

1. DMS L-net (Lonworks GW)

❑ *MIM-B18N*

12) Detail description of network variable

(1) Indoor unit/ ERV/ AHU kit object

1-1. nvoSpaceTemp(11)

Description	Indoor temperature
SNVT Type	SNVT_temp_p: Signed Long, 2 bytes
Value and operation	Range: -10.00°C ~ 50.00°C

1-2. nvoApplicMode(12), nviApplicMode(2)

Description	Operation Mode status
SNVT Type	SNVT_hvac_mode: Enumeration(hvac_t)
Value and operation	0: HVAC_AUTO 1: HVAC_HEAT 3: HVAC_COOL 6: HVAC_OFF 9: HVAC_FAN_ONLY 14: HVAC_DEHUMID

✶ Invalid Value: Automatically set as HVAC_AUTO

1-3. nvoSetpoint(13), nviSetpoint(3)

Description	Set Temperature
SNVT Type	SNVT_temp_p: Signed Long, 2 bytes
Value and operation	Cool : 18.0°C ~ 30.0°C, Heat : 16.0°C ~ 30.0°C

✶ Invalid Value: Automatically set up as minimum or maximum value.

✶ When setting temperature, only an integer value is applied. A decimal point is ignored.

1-4. nvoOnOff(14), nviOnOff(1)

Description	Power ON/OFF status		
SNVT Type	SNVT_switch: Unsigned/signed Short		
Value and operation		Value	State
	OFF	0.0	0
	ON	100.0	1

1-5. nvoFanStatus(15), nviFanStatus(4)

Description	Fan Speed and direction		
SNVT Type	SNVT_switch: Unsigned/signed Short		
Value and operation		Value	State
	Auto	0.0	-
	Low	1.0	-
	Mid	2.0	-
	High	3.0	-
	Eco	4.0	-
	Turbo	5.0	-
	Auto	Any>5.0	
	Stop	-	0
	Up-Down	-	1

✶ Supporting modes are different according to indoor units.
- Indoor unit: Auto, Low, Mid, High
- ERV : Mid, High, Turbo
- AHU Kit: High

✶ When an indoor unit operation mode is Auto or Dehumid, Fan speed is controlled as 'Auto'.

✶ When an indoor unit operation mode is FAN ONLY, 'Auto'cannot be controlled by Fan speed.

1-6. nvoERVMode(16), nviERVMode(5)

Description	ERV Operation Mode
SNVT Type	SNVT_count: Unsigned Long, 2 bytes
Value and operation	(0: Auto) 1: H/R (2: Air purification) 3: Sleep 4: Normal

✶ ( ) : Function that is not supported now.

1-7. nvoErrorCode(17)

Description	Error Code
SNVT Type	SNVT_count: Unsigned Long, 2 bytes
Value and operation	Valid Range: 0 ~ 999 00 00 → No Error Refer to list of Error code

1-8. nvoDeviceAlarm(18)

Description	1. Remote control restriction status 2. Filter alert status 3. Thermo On/Off status 4. Error alert Status
SNVT Type	SNVT_state: 16 Unsigned Bitfields
Value and operation	

Byte	Bit9	Bit8	Operation	Remark
Flags _1	0	0	Unlock	nvo User Lockout
	0	1	Level1	
	1	0	Lock	

Byte	Bit	value	Operation	Remark
Flags _2	2	0	No alarm	nvo Filter Alarm
		1	Alarm	
	1	0	Thermo Off	Thermo On/Off
		1	Thermo On	
	0	0	No Error	nvo Error Code
		1	Error	

1-9. nvoOccOpMode(19), nviOccOpModeCmd(8)

Description	Operation Mode restriction
SNVT Type	SNVT_switch: Unsigned/singed Short
Value and operation	

	Value	State
Unlock	0.0	0
Cool only	1.0	1
Heat only	2.0	1

1-10. nvoCoolTempLock(20), nviCoolTempLock(9)

Description	Setting/monitoring Lower limit temperature and function toggle
SNVT Type	SNVT_switch: Unsigned/singed Short
Value and operation	

Operation	Value	State
Unlock	18.0 ~ 30.0	0
Lock	18.0 ~ 30.0	1

Cool: 18.0°C ~ 30.0°C

1-11. nvoHeatTempLock(21), nviHeatTempLock(10)

Description	Setting/monitoring upper limit temperature and function toggle
SNVT Type	SNVT_switch: Unsigned/signed Short
Value and operation	

Operation	Value	State
Unlock	16.0 ~ 30.0	0
Lock	16.0 ~ 30.0	1

Heat: 16.0°C ~ 30.0°C

1-12. nvoEnergyConp(23)

Description	Electric consumption value within the period
SNVT Type	SNVT_elec_kwh_l: Signed Quad, 4bytes
Value and operation	Raw range: 0 ~ 999999 Resolution: 0.1

1-13. nvoEnergyCon(24)

Description	Electric consumption value after baselin
SNVT Type	SNVT_elec_kwh_l: Signed Quad, 4bytes
Value and operation	Raw range: 0 ~ 999999 Resolution: 0.1

1-14. nvoRunTimep(25)

Description	Indoor unit usage within the period
SNVT Type	SNVT_time_hour: Signed Long, 2bytes
Value and operation	Raw range: 0 ~ 65535

1-15. nvoRunTime(26)

Description	Indoor unit usage after baseline
SNVT Type	SNVT_time_hour: Signed Long, 2bytes
Value and operation	Raw range: 0 ~ 65535

✶ Energy consumption and Runtime are the accumulated value during the user setting period.

✶ The data above is for reference so you can not use them for official billing.

1-15. nviFilterReset(6)

Description	Filter alert reset
SNVT Type	SNVT_switch: Unsigned/singed Short
Value and operation	

Value	State	Operation	remark
0.0	0	No Action	
100.0	1	Filter Reset	

1-15. nviUserLockout(7), nvoUserLockout(22)

Description	Remote control restriction
SNVT Type	SNVT_switch: Unsigned/singed Short
Value and operation	

Value	State	Operation	remark
0.0	0	Unlock	
100.0	1	Level 1	
100.0	2	Lock	

1-15. nvoDevListDesc(27)

Description	Device Information
SNVT Type	SNVT_str_asc: Unsigned Character Array, 31bytes
Value and operation	Refer to Expansion of nvoDevListDesc

VI Building management system

1. DMS L-net (Lonworks GW)

❑ *MIM-B18N*

12) Detail description of network variable

(1) Indoor unit/ ERV/ AHU kit object

2-17. Expansion of nvoDevListDesc

		desription	character	value
ascii.	[0]	Model information	Alphabet or digit	
	[1]		Alphabet or digit	
	[2]		Alphabet or digit	
	[3]		Alphabet or digit	
	[4]		Alphabet or digit	
	[5]		Alphabet or digit	
	[6]	Separator	Underbar(_)	095
	[7]	Centralized controller address	Alphabet or digit	
	[8]		Alphabet or digit	
	[9]	Separator	Period(.)	046
	[10]	Interface Module address	Alphabet or digit	
	[11]		Alphabet or digit	
	[12]	Separator	Period(.)	046
	[13]	Indoor Unit Address	Alphabet or digit	
	[14]		Alphabet or digit	
	[15]	Separator	Underbar(_)	095
	[16]	Unit type	0: indoor unit, 1: AHU, 2: ERV	
	[17]	Separator	Underbar(_)	095
	[18]	Operation mode	DMS Format 0: Auto, 1: Cool, 2: Dehumid, 3: Fan, 4: Heat	
	[19]	ON/OFF	0, 1	
	[20]	Fan speed	0, 1, 2, 3, 4, 5	
	[21]	Fan Swing	0, 1	
	[22]	Error	0, 1	
	[23]	Separator	Underbar(_)	095
	[24]	setPoint temperate	Second significant digit	
	[25]		First significant digit	
	[26]		First decimal place	
	[27]	Space temperate(*)	Second significant digit	
	[28]		First significant digit	
	[29]		First decimal place	
	[30]	Null padding	0	048

(✳) If the value is a negative number, it is displayed as sign, 10-digit, single-digit.

(2) DMS System object

2-1. nvoDigitalOut(3), nviDigitalOut(1)

Description	Digital output status on DMS		
SNVT Type	SNVT_switch: Unsigned/singed Short		
Value and operation		Value	State
	OFF	0.0	0
	ON	100.0	1

2-2. nvoDigitalIn(4)

Description	Digital Input status on DMS		
SNVT Type	SNVT_switch: Unsigned/singed Short		
Value and operation		Value	State
	OFF	0.0	0
	ON	100.0	1

2-3. nvoSystemLock(5)

Description	System lock status of DMS(only monitoring available)		
SNVT Type	SNVT_switch: Unsigned/singed Short		
Value and operation		Value	State
	Unlock	0.0	0
	Lock	100.0	1

2-4. nvoDMSAlarm(6)

Description	DMS Alarm
SNVT Type	SNVT_count : Unsigned Long, 2 bytes
Value and operation	0 : Normal 8 : Emergency stop 105 : Tracing in progress 108 : Tracking failed 109 : Lon Module ↔ DMS2 communication Error 110 : Object ID Update

2-5. nvoSystemAlarm(7)

Description	SIM/PIM Communication Error Code
SNVT Type	SNVT_count: Unsigned Long, 2 bytes
Value and operation	SIM/PIM Communication Error Refer to list of Error code

2-6. nviAllOff(2)

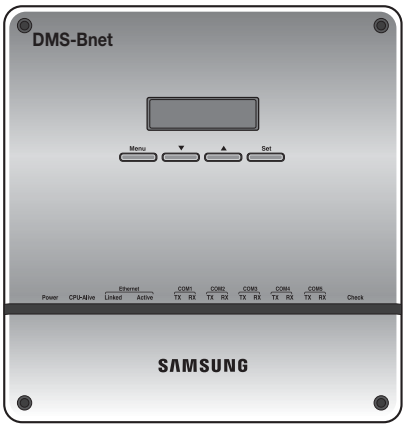
Description	All indoor units turn off
SNVT Type	Enumeration, emerg_t
Value and operation	0 : EMERG_NORMAL 4 : EMERG_SHUTDOWN

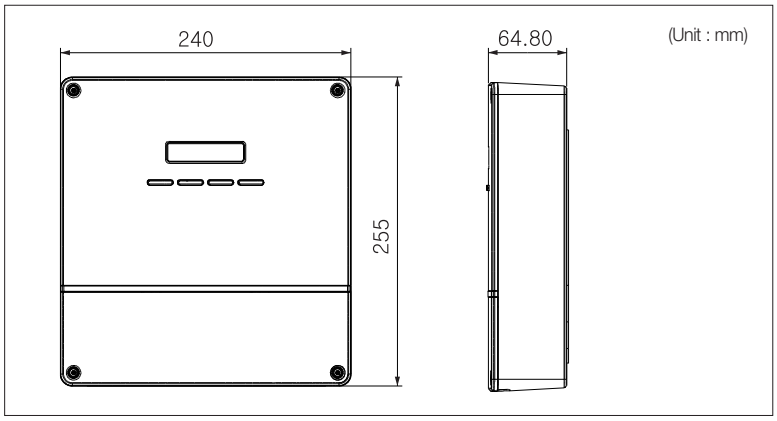
VI Building management system

2. DMS B-net (BACnet GW)

❑ *MIM-B17N*

1) Features





• For BACnet protocol system Support DMS2 control function at the same time.

2) Product specification

Power supply	Source	DC Adaptor
	Input	100~240VAC (±10%), 50/60Hz
	Output	12V 3A
Operating temperature range		-10℃ ~ 50°C
Operating humidity range		10%RH ~ 90%RH
Communication connection		Lower layer : RS485 x 5 Upper layer : Ethernet 100Base-T x 1(BACnet IP)
External connection port	Digital Output	10
	Digital Input	10
Maximum length of connection	RS485	1000 m
	Digital Output	100 m
	Digital Input	100 m
	Ethernet	100 m (When there is no repeater)
Max. connectable number of device	Control layer	(see nested table)

Device	Numbers per each channel	Total number for 5 channels
Indoor units (including ERV, MCU)	128	256
Outdoor unit (including compatible interface module MIM-N01)	16	80
OnOff controller	Total 15	Total 75
Touch centralized controller		
PIM interface module (MIM-B16)	8	8

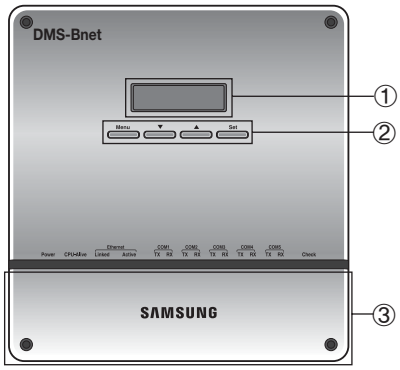
Compatible product

Outdoor unit	AM✳✳✳✳X✳✳✳✳✳✳
Controller	OnOff controller (MCM-A202DN)
	Touch centralized controller (MCM-A300N)
	PIM interface module (MIM-B16)

✳ Conventional communication outdoor unit requires compatible interface module (MIM-N01) to establish connection
✳ MIM-B13D, MIM-B13E, MIM-B04A Interface modules cannot be connected.
✳ ERV connection is not supported until end of 2013.

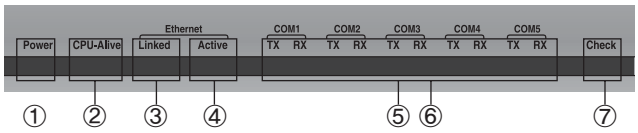
3) Description of parts

(1) Front



No	Name	Function
①	LCD display	Displays current time or menu
②	Menu button	Access the setting menu
	▲/▼ button	Select function or setting item in the setting menu
	Set button	Enter or check setting item in the setting menu
③	Bottom cover	Unscrew 2 screws on the bottom to remove the cover and check the cable connections

(2) LED indicator



No.	Item	Name	Status
①	Power	Power indicator	Turns blue when the power is supplied
②	CPU Alive	CPU operation indicator	Blinks in orange with 1 second intervals during normal operation
③	Ethernet–Linked	Internet connection indicator	Turns green during normal connection
④	Ethernet–Active	Internet data transmission/reception indicator	Blinks in orange during normal transmission/ reception
⑤	COM1~5 – TX	Channel 1~5 OnOff controller/Interface module Data transmission indicator	Blinks in green during normal transmission
⑥	COM1~5 – RX	Channel 1~5 OnOff controller/interface module Data reception indicator	Blinks in green during normal reception
⑦	Check	Indoor/Outdoor unit Communication status indicator	Turns green when communication error occurs

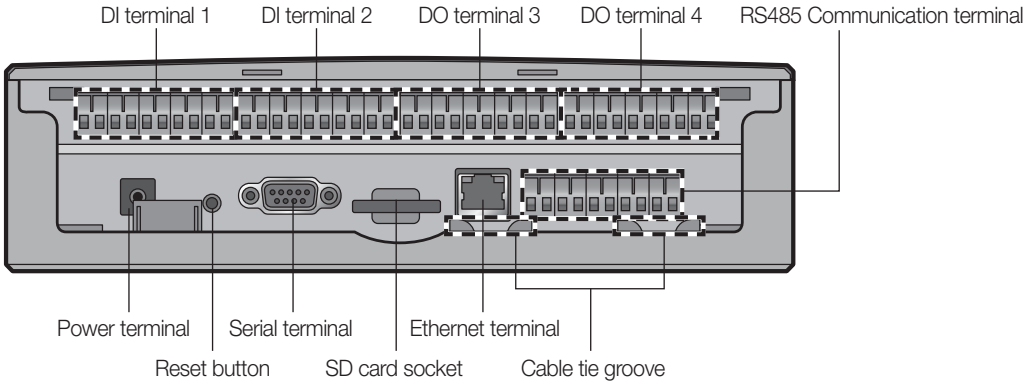
VI Building management system

2. DMS B-net (BACnet GW)

❑ *MIM-B17N*

3) Description of parts

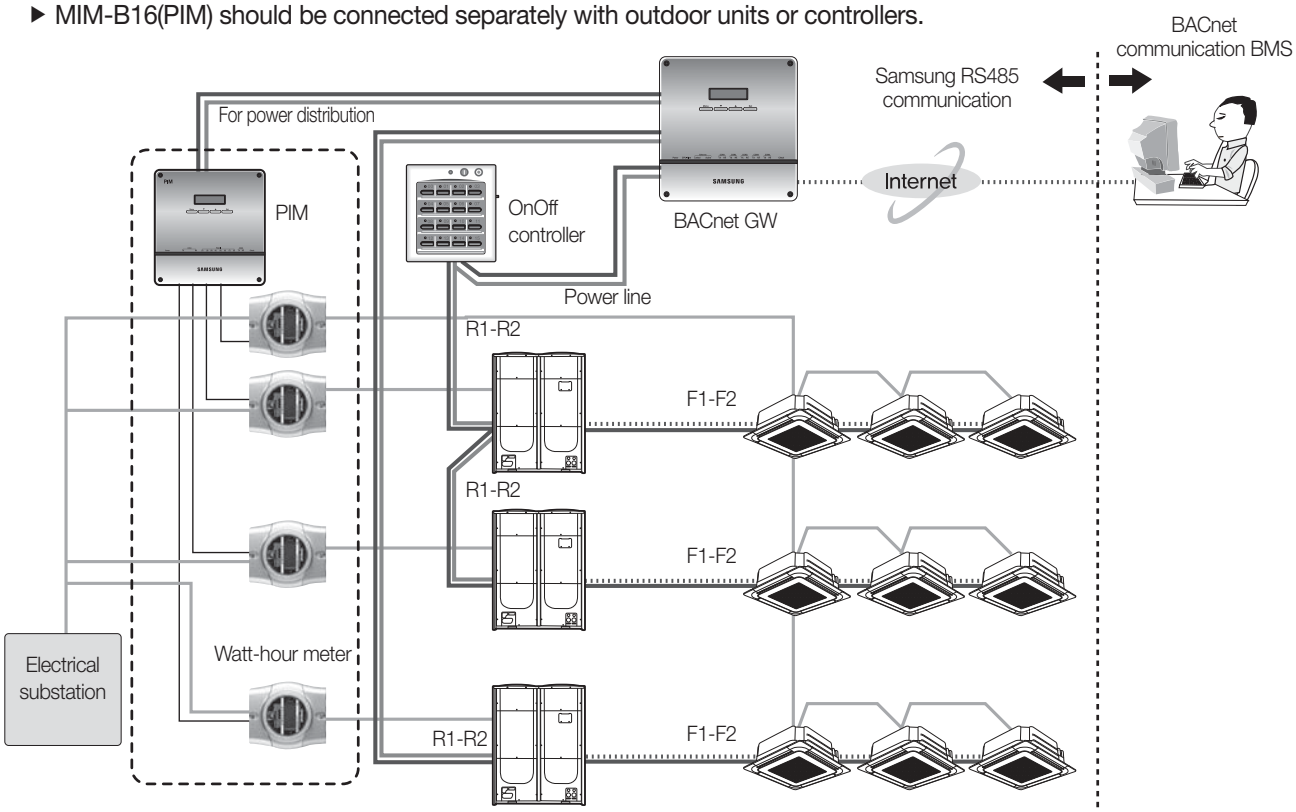
(3) Bottom



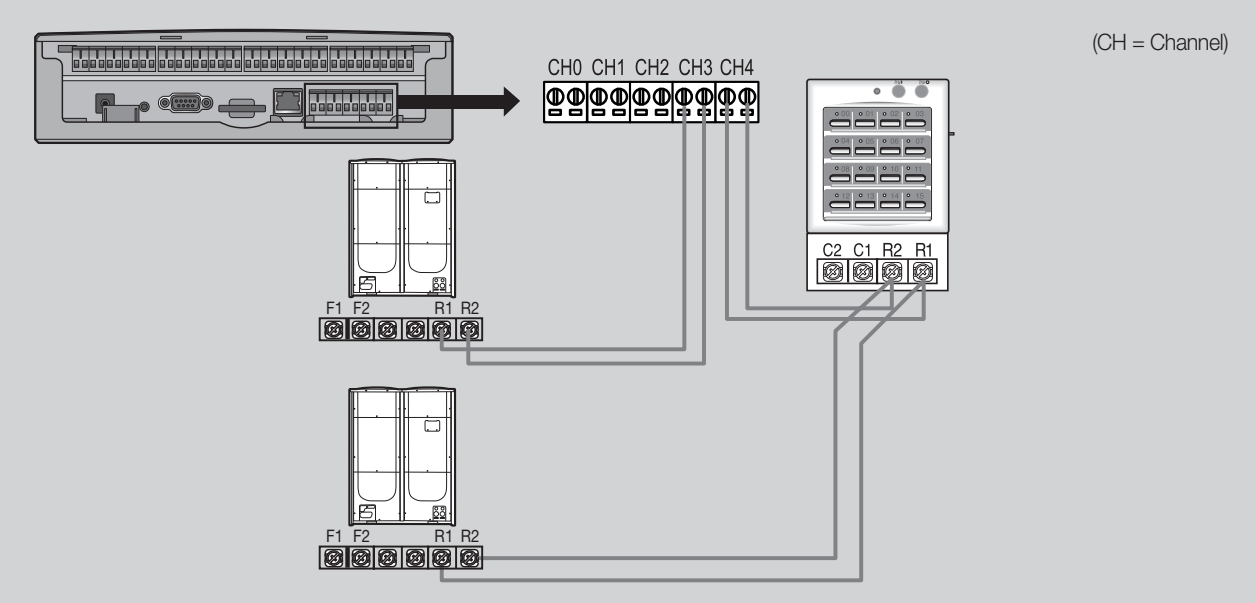
Name	Description
DI terminal 1	Digital Input connection terminal, Channel 1~Channel 5
DI terminal 2	Digital Input connection terminal, Channel 6~Channel 10
DO terminal 3	Digital Output connection terminal, Channel 1~Channel 5
DO terminal 4	Digital Output connection terminal, Channel 6~Channel 8
Reset button	Reset BACnet Gateway
Serial terminal	Sevice check port
SD card socket	Sub memory (for program update and set information saving) socket
RS485 communication terminal	RS485 port for communication with OnOff controller / interface module
Ethernet Terminal	Connect LAN cable
Cable tie groove	Groove for arranging cables

4) Connection diagram

▶ MIM-B16(PIM) should be connected separately with outdoor units or controllers.



5) Wiring



(1) Connecting outdoor unit directly

- Maximum 16 outdoor units can be connected to each channel
- Total 80 outdoor units can be connected

(2) Connecting OnOff controller/Touch centralized controller

- Maximum 15 OnOff controller/Touch centralized controller can be connected to each channel

☑ ***Note***

- BACnet GW can connect outdoor unit and OnOff controller/Touch centralized controller at the same time.
- Outdoor unit and OnOff controller/Touch centralized controller can be connected to 1 communication channel at the same time.

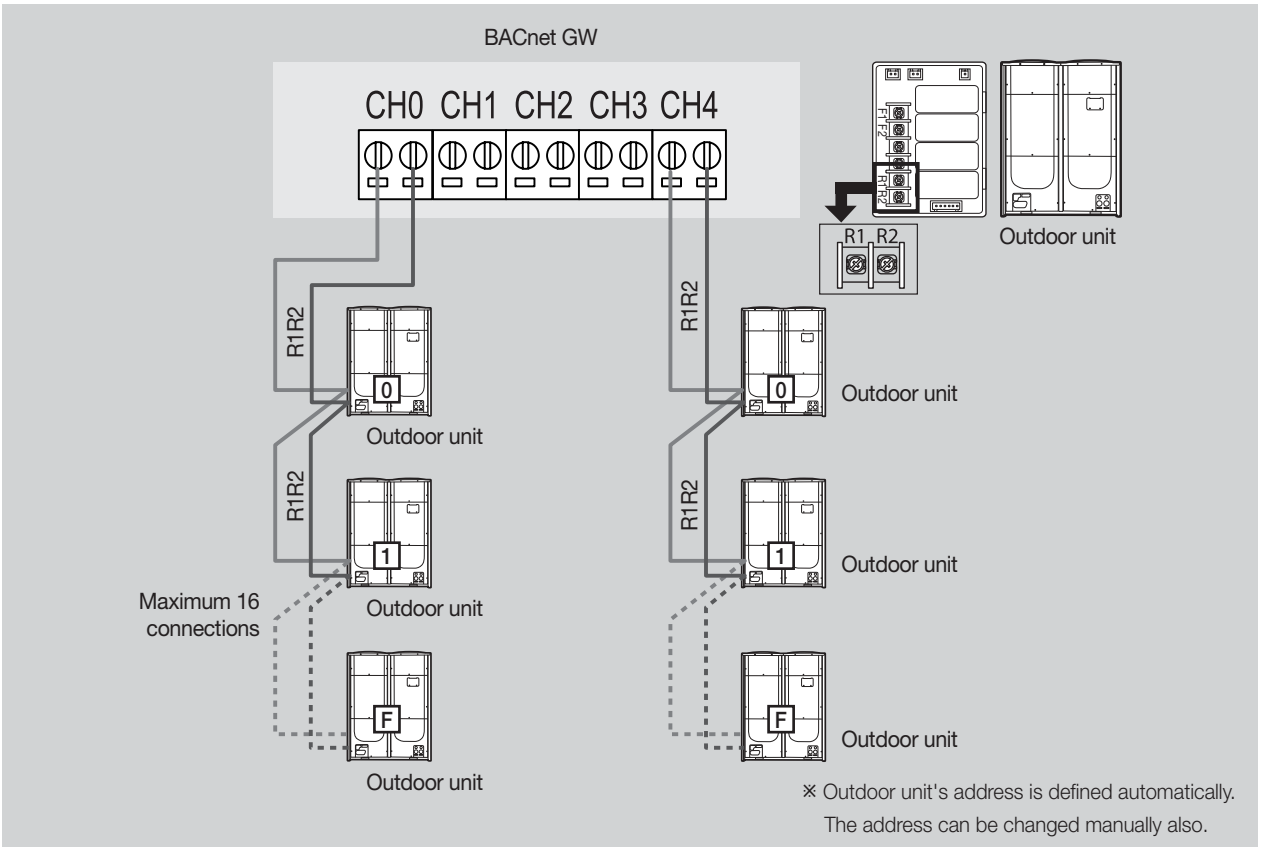
VI Building management system

2. DMS B-net (BACnet GW)

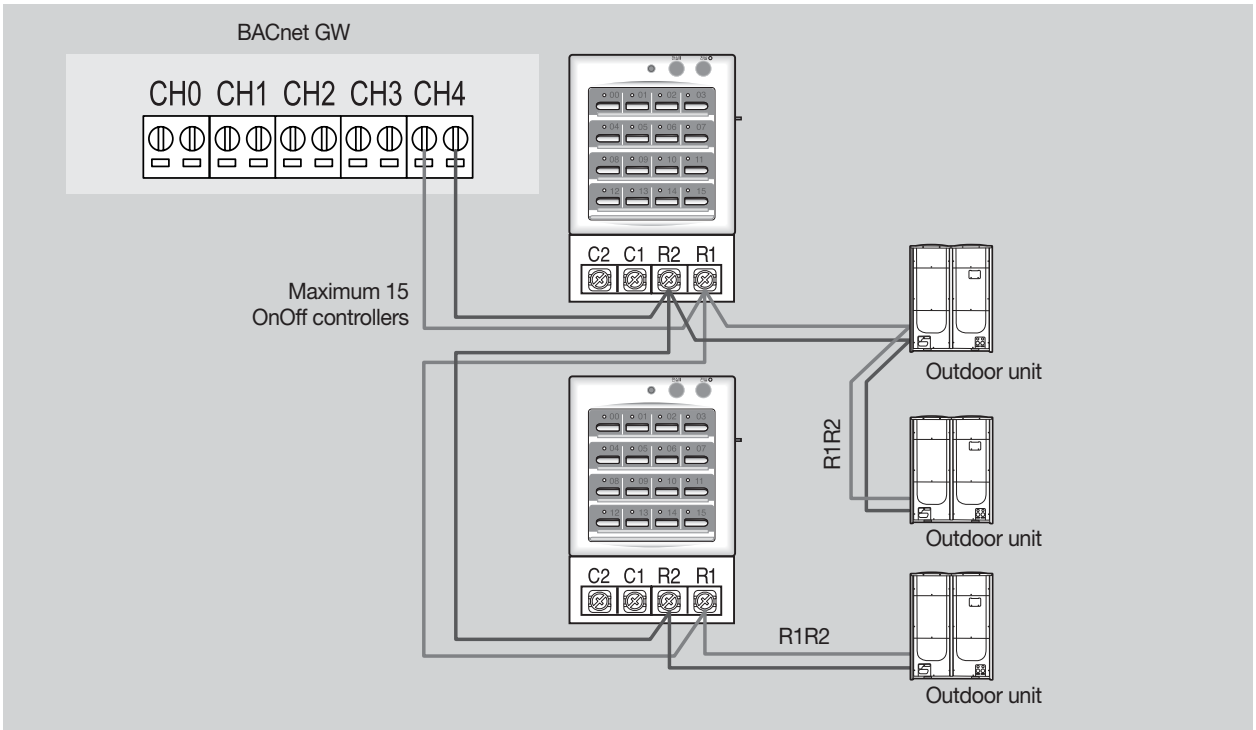
❑ *MIM-B17N*

5) Wiring

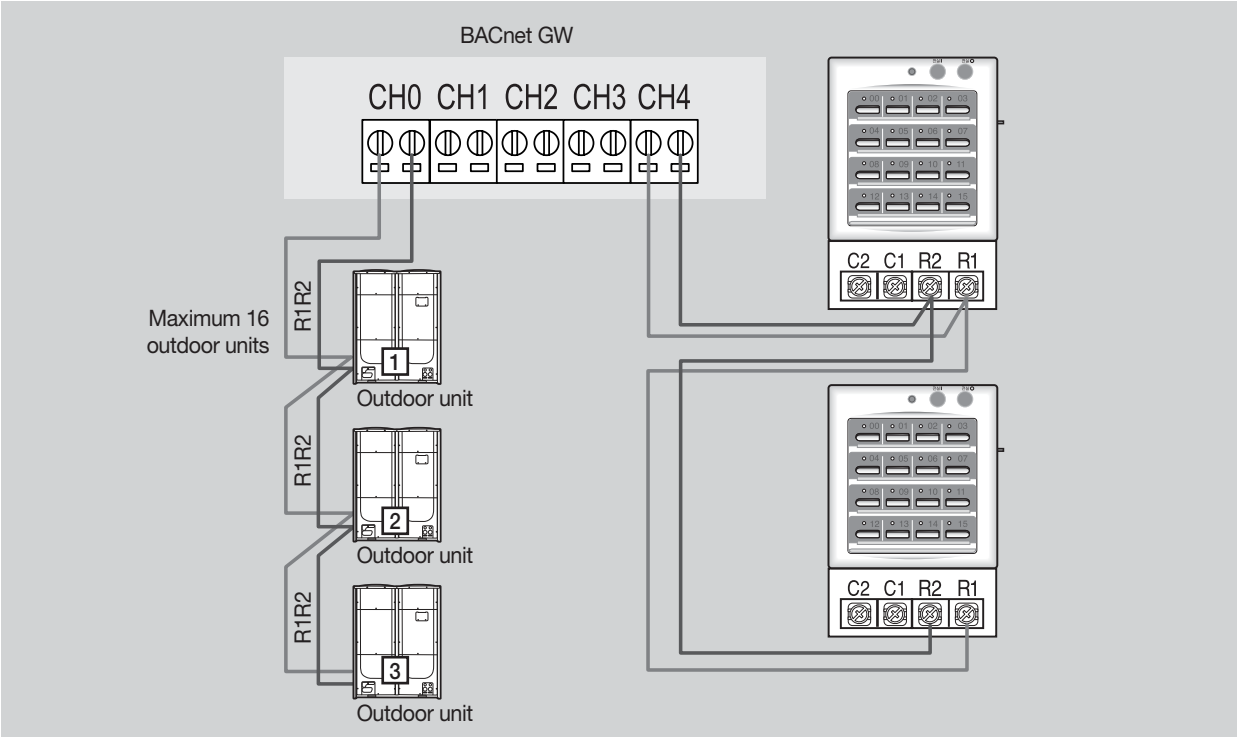
Connecting with outdoor unit



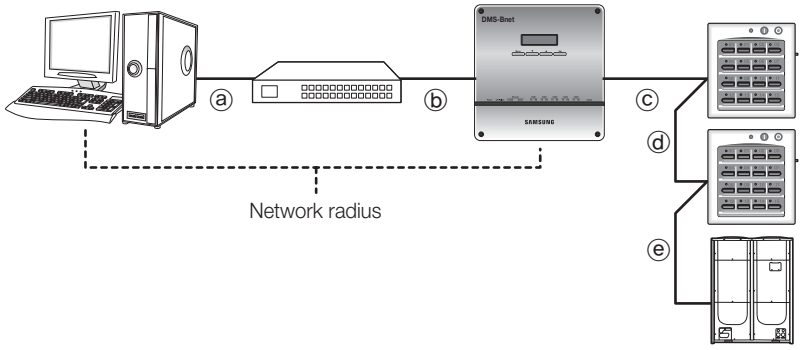
Connecting with OnOff controller



Connecting with outdoor unit and OnOff controller



Wiring distance

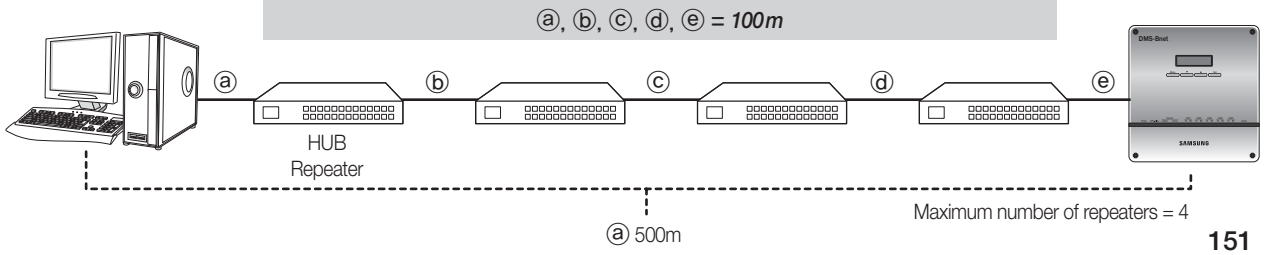


▶ Distance between BACnet GW and OnOff controller/outdoor unit

- Distance from the BACnet GW to the furthest device cannot exceed 1000m.
- ⓒ + ⓓ + ⓔ ≤ ***1000m***

▶ Distance between BACnet GW and upper level controller

- Since BACnet GW supports 100 Base-T Ethernet, first repeater or upper level controller from the BACnet GW cannot be further than 100m (IEEE 802.3). Therefore, maximum network radius is restricted to 500m.



VI Building management system

2. DMS B-net (BACnet GW)

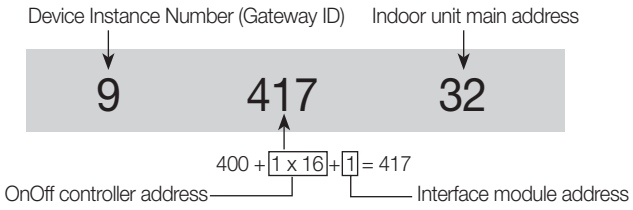
❑ *MIM-B17N*

6) Description of device ID

Item	DNET – Range [Digit 2]	CPP – Range [Digit 3]	INDOOR – Range [Digit 2]
OnOff Controller	1~40	000~015	64
PIM	1~40	100~115	64
DMS DI/DO	1~40	300~315	64
Interface Module	1~40	400~655 (16 x 16)	64
Indoor Unit, ERV AHU kit, EHS	1~40	400~655	0~63
Gateway	1~40	900	64

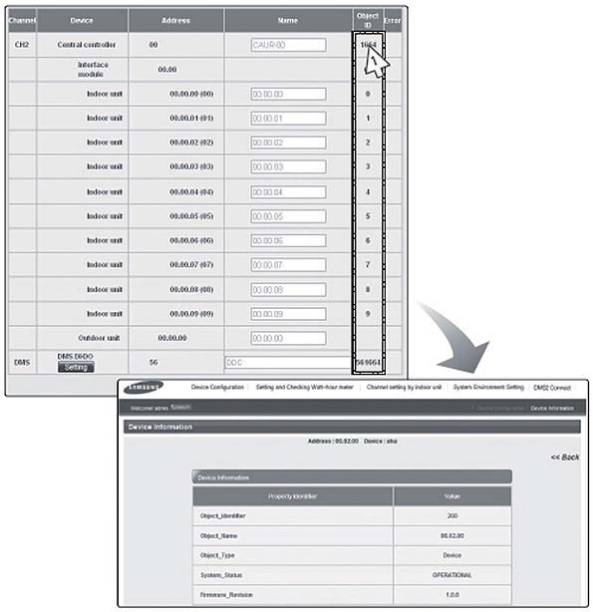
Ex)

- Indoor Unit
- DNET (Gateway number) : 9
- Indoor Unit Address: 01.01.32
- Device ID: 941732



Checking device ID from BACnet Gateway

- Click 'Object ID' from the 'Object ID' column.
  Detail information window will appear and detail information will be displayed.



7) Object list

(1) Indoor unit

Single indoor unit has following point list.

Instance Number	Object	Object Type	Object Name	Unit	Status value			
				Inactive	Active			
				Text-1	Text-2	Text-3	Text-4	Text-5
1	Indoor temperature	AI	AC_RoomTemp_xx_xxxxxx	℃				
2	Set temperature	AV	AC_Temp_Set_xx_xxxxxx	℃				
3	Setting lower temperature limit	AV	AC_Cool_LimitTemp_xx_xxxxxx	℃				
4	Setting upper temperature limit	AV	AC_Heat_LimitTemp_xx_xxxxxx	℃				
5	The power value of an indoor unit after the basic date	AI	AC_Baseline_kWh_xx_xxxxxx	kWh				
6	The number of hours usage of an indoor unit after the basic date	AI	AC_Baseline_Minute_xx_xxxxxx	Minute				
7	Power value within period	AI	AC_Period_kWh_xx_xxxxxx	kWh				
8	The number of hours usage of an indoor unit within period	AI	AC_Period_Minute_xx_xxxxxx	Minute				
9	Power On/Off	BV	AC_Power_xx_xxxxxx	Off	On			
10	Applying lower temperature limit setting	BV	AC_Cool_Limit_set_xx_xxxxxx	False	True			
11	Applying upper temperature limit setting	BV	AC_Heat_Limit_set_xx_xxxxxx	False	True			
12	Filter sign status	BI	AC_FilterSign_xx_xxxxxx	False	True			
13	Filter sign reset	BO	AC_FilterSign_Reset_xx_xxxxxx	False	True			
14	Operation mode status	MV	AC_Operation_Mode_xx_xxxxxx	Auto	Cool	Heat	Fan	Dry
15	Fan speed status	MV	AC_FanSpeed_xx_xxxxxx	Auto	Low	Mid	High	
16	Air flow direction status	MV	AC_FanFlow_xx_xxxxxx	None	Vertical	Horizon	All	
17	Operation mode limit status	MV	AC_Mode_Limit_xx_xxxxxx	No Limit	Cool Only	Heat Only		
18	Remote controller limit status	MV	AC_Remocon_Limit_xx_xxxxxx	Enable RC	Disable RC	Conditional RC		
19	Integrated error code of both indoor unit and outdoor unit	AI	AC_Error_Code_xx_xxxxxx	Refer to Samsung integrated error code list				
20(*)	SPI setting	BV	AC_SPI_xx_xxxxxx	False	True			
21(*)	HumanSensor setting	BV	AC_MDS_xx_xxxxxx	False	True			
22(*)	AC Indoor Notify	NC	AC_Notify_xx_xxxxxx	When the error occurred, send event to list of destination in the recipient_list. (Max : 8)				

※ Temperature setting range can be different depending on the model and the common range is as follows :

Auto : 18℃~30℃

Cool : 18℃~30℃

Heat : 16℃~30℃

Fan : Temperature cannot be adjusted

Dry : 18℃~30℃

(*) Mark is optionally supported.

VI Building management system

2. DMS B-net (BACnet GW)

❑ *MIM-B17N*

7) Object list

(2) AHU kit

Single AHU unit has following point list.

Instance Number	Object	Object Type	Object Name	Unit	Status value			
				Inactive	Active			
				Text-1	Text-2	Text-3	Text-4	Text-5
1	Indoor Temperature	AI	AHU_RoomTemp_xx_xxxxxx	℃				
2	Set temperature	AV	AHU_Temp_Set_xx_xxxxxx	℃				
3	Setting lower temperature limit	AV	AHU_Cool_LimitTemp_xx_xxxxxx	℃				
4	Setting upper temperature limit	AV	AHU_Heat_LimitTemp_xx_xxxxxx	℃				
5	The power value of an indoor unit after the basic date	AI	AHU_Baseline_kWh_xx_xxxxxx	kWh				
6	The number of hours usage of an indoor unit after the basic date	AI	AHU_Baseline_Minute_xx_xxxxxx	Minute				
7	Power value within period	AI	AHU_Period_kWh_xx_xxxxxx	kWh				
8	The number of hours usage of an indoor unit within period	AI	AHU_Period_Minute_xx_xxxxxx	Minute				
9	Power On/Off	BV	AHU_Power_xx_xxxxxx	Off	On			
10	Applying lower temperature limit setting	BV	AHU_Cool_Limit_set_xx_xxxxxx	False	True			
11	Applying upper temperature limit setting	BV	AHU_Heat_Limit_set_xx_xxxxxx	False	True			
12	Filter sign status	BI	AHU_FilterSign_xx_xxxxxx	False	True			
13	Filter sign reset	BO	AHU_FilterSign_Reset_xx_xxxxxx	False	True			
14	Operation mode status	MV	AHU_Operation_Mode_xx_xxxxxx	Auto	Cool	Heat	Fan	Dry
15	Operation mode limit status	MV	AHU_Mode_Limit_xx_xxxxxx	No Limit	Cool Only	Heat Only		
16	Remote controller limit status	MV	AHU_Remocon_Limit_xx_xxxxxx	Enable RC	Disable RC	Conditional RC		
17	Integrated error code of both indoor unit and outdoor unit	AI	AHU_Error_Code_xx_xxxxxx	Refer to Samsung integrated error code list				
18(*)	Discharge cooling set temperature	AV	AHU_DisCoolSetTemp_xx_xxxxxx	°C				
19(*)	Discharge heating set temperature	AV	AHU_DisHeatSetTemp_xx_xxxxxx	°C				
20(*)	Discharge current temperature	AI	AHU_Dis_CurrentTemp_xx_xxxxxx	°C				
21(*)	Humidification setting	BV	AHU_Humidification_xx_xxxxxx	Off	On			
22(*)	Outdoor air intake setting	BV	AHU_OAIntake_xx_xxxxxx	Off	On			
23(*)	Outdoor cooling setting	BV	AHU_OutdoorCool_xx_xxxxxx	Off	On			
24(*)	Fan speed status	MV	AHU_FanSpeed_xx_xxxxxx	Low	Mid	High		
25(*)	Set humidity status	MV	AHU_SetHumidity_xx_xxxxxx	Low	Mid	High		
26(*)	Current humidity status	MI	AHU_CurrentHumidity_xx_xxxxxx	Low	Mid	High		
27	AHU Notify	NC	AHU_Notify_xx_xxxxxx	When the error occurred, send event to list of destination in the recipient_list. (Max : 8)				

(*) Mark is optionally supported.

(3) ERV

Single ERV unit has following point list.

Instance Number	Object	Object Type	Object Name	Unit	Status value			
				Inactive	Active			
				Text-1	Text-2	Text-3	Text-4	Text-5
1	Power On/Off operation	BV	ERV_Power_xx_xxxxxx	Off	On			
2	Filter sign status	BI	ERV_FilterSign_xx_xxxxxx	False	True			
3	Filter sign reset	BO	ERV_FilterSign_Reset_xx_xxxxxx	False	True			
4	Operation mode status	MV	ERV_Operation_Mode_xx_xxxxxx	Auto	HeatEx	Bypass	Sleep	
5	Fan speed status	MV	ERV_FanSpeed_xx_xxxxxx	Low	High	Turbo		
6	Remote controller limit status	MV	ERV_Remocon_Limit_xx_xxxxxx	Enable RC	Disable RC	Conditional RC		
7	Integrated error code of ERV unit	AI	ERV_Error_Code_xx_xxxxxx	Refer to list of error code				
8	ERV Notify	NC	ERV_Notify_xx_xxxxxx	When the error occurred, send event to list of destination in the recipient_list. (Max : 8)				

VI Building management system

2. DMS B-net (BACnet GW)

❑ *MIM-B17N*

7) Object list

(4) EHS

Instance Number	Object	Object Type	Object Name	Unit	Status value		
				Inactive	Active		
				Text-1	Text-2	Text-3	Text-4
1	Room temperature	AI	EHS_RoomTemp_xx_xxxxxx	℃			
2	Set temperature	AV	EHS_Temp_Set_xx_xxxxxx	℃	Use when displayed temperature type is set to 'Room'.		
3	Set temperature of water out	AV	EHS_WaterOutTemp_Set_xx_xxxxxx	℃	Use when displayed temperature type is set to 'WaterOut'.		
4	Set temperature of hot water	AV	EHS_HotWaterTemp_Set_xx_xxxxxx	℃			
5	Setting lower temperature limit	AV	EHS_Cool_LimitTemp_xx_xxxxxx	℃	Use when displayed temperature type is set to 'Room'.		
6	Setting upper temperature limit	AV	EHS_Heat_LimitTemp_xx_xxxxxx	℃	Use when displayed temperature type is set to 'Room'.		
7	Lower temperature limit for water out	AV	EHS_WOCoolLimitTemp_xx_xxxxxx	℃			
8	Upper temperature limit for water out	AV	EHS_WOHeatLimitTemp_xx_xxxxxx	℃			
9	Upper temperature limit for hot water	AV	EHS_WTHeatlLimitTemp_xx_xxxxxx	℃			
10	The power value after the basic date	AI	EHS_Baseline_kWh_xx_xxxxxx	kWh			
11	The number of hours usage of an indoor unit after the basic date	AI	EHS_Baseline_Minute_xx_xxxxxx	Minute			
12	Power value within period	AI	EHS_Period_kWh_xx_xxxxxx	kWh			
13	The number of hours usage of an indoor unit within period	AI	EHS_Period_Minute_xx_xxxxxx	Minute			
14	Current temperature of water out	AI	EHS_WOCurrentTemp_xx_xxxxxx	℃			
15	Current temperature of hot water	AI	EHS_HotWaterTemp_xx_xxxxxx	℃			
16	Displayed temperature type	BI	EHS_ControlTempType_xx_xxxxxx	Room	WaterOut		
17	Thermostat usage	BI	EHS_Thermostat_xx_xxxxxx	False	True		
18	Outing	BI	EHS_GoOut_xx_xxxxxx	Off	On		
19	Power On/Off	BV	EHS_Power_xx_xxxxxx	Off	On		
20	Setting lower temperature limit	BV	EHS_Cool_LimitTemp_Set_xx_xxxxxx	False	True	Use when displayed temperature type is set to 'Room'.	
21	Setting upper temperature limit	BV	EHS_Heat_LimitTemp_Set_xx_xxxxxx	False	True	Use when displayed temperature type is set to 'Room'.	
22	Apply lower temperature limit for water out	BV	EHS_WOCoolLimitFlag_xx_xxxxxx	False	True	Use when displayed temperature type is set to 'WaterOut'.	
23	Apply upper temperature limit for water out	BV	EHS_WOHeatLimitFlag_xx_xxxxxx	False	True	Use when displayed temperature type is set to 'WaterOut'.	
24	Apply upper temperature limit for hot water	BV	EHS_WTHeatLimitFlag_xx_xxxxxx	False	True		
25	On/Off status of hot water mode	BV	EHS_HotWater_Power_xx_xxxxxx	Off	On		
26	Status of quiet operation	BV	EHS_Sleep_xx_xxxxxx	Off	On		
27	Operation mode status	MV	EHS_Operation_Mode_xx_xxxxxx	Auto	Cool	Heat	
28	Operation mode limit status	MV	EHS_Mode_Limit_xx_xxxxxx	No Limit	Cool Only	Heat Only	
29	Remote controller limit status	MV	EHS_Remocon_Limit_xx_xxxxxx	Enable RC	Disable RC	Conditional RC	
30	Status of hot water operation mode	MV	EHS_HotWater_Mode_xx_xxxxxx	* Force	Eco	Standard	Power
31	Integrated error code of both indoor unit and outdoor unit	AI	EHS_Error_Code_xx_xxxxxx				
32	EHS notifiy	NC	EHS_Notify_xx_xxxxxx	When the error occurred, send event to list of destination in the recipient_list. (Max : 8)			

Force hot water mode (* marked) will be supported later. It is the point list of Hydro Unit and Hydro Unit HT.

(5) SIM (PIM)

Single SIM (PIM) has following point list.

Instance Number	Object	Object Type	Object Name	Status value
1	SIM (PIM) error code	AI	SIM_Error_Code_xx_xx	Refer to list of error code
2	SIM (PIM) Notify	NC	SIM_Notify_xx_xx	When the error occurred, send event to list of destination in the recipient_list. (Max : 8)

(6) OnOff Controller

Single OnOff Controller has following point list.

Instance Number	Object	Object Type	Object Name	Status value
1	OnOff Controller error code	AI	Central_Error_Code_xx_xx	Refer to the list of the integrated error code
2	OnOff Controller notify	NC	Central_Notify_xx_xx	When the error occurred, send event to list of destination in the recipient_list. (Max : 8)

(7) Interface module (Outdoor unit)

Single Interface(Outdoor unit) module has following point list.

Instance Number	Object	Object Type	Object Name	Unit	Status value			
				Inactive	Active			
				Text-1	Text-2	Text-3	Text-4	Text-5
1	Outside temperature	AI	ODU_Outside_Temp_xx_xxxx	℃				
2(*)	Cool capacity compensation	AV	ODU_Cool_Compensation_xx_xxxx	0 : 5~7°C / 1 : 7~9°C / 2 : 9~11°C / 3 : 10~12°C / 4 : 11~13°C / 5 : 12~14°C / 6 : 13~15°C / 14 : Auto control (from ODU)				
3(*)	Heat capacity compensation	AV	ODU_Heat_Compensation_xx_xxxx	0 : 25kg/cm² / 1 : 26kg/cm² / 2 : 27kg/cm² / 3 : 28kg/cm² / 4 : 29kg/cm² / 5 : 30kg/cm² / 6 : 31kg/cm² / 7 : 32kg/cm² / 8 : 33kg/cm² / 14 : Auto control (from ODU)				
4	Compressor status	BI	ODU_Comp_Status_xx_xxxx	False	True			
5	Interface module error code	AI	Repeater_Error_Code_xx_xxxx	Refer to the list of the integrated error code				
6	Interface module notify	NC	IM_Notify_xx_xxxx	When the error occurred, send event to list of destination in the recipient_list. (Max : 8)				

(*) Mark is optionally supported.

VI Building management system

2. DMS B-net (BACnet GW)

❑ *MIM-B17N*

7) Object list

(8) BACnet Gateway

BACnet Gateway has following point list.

Instance Number	Control and Monitoring	Object Type	Object Name	Status value
1	All device OFF	BO	ALL_OFF_xx	Inactive : All devices Off
1	DMS2 Status	AI	DMS2_Status_xx	0: Normal, 8: Emergency stop, 105 : Tracking in progress, 108 : Tracking failed 109 : DMS2 ↔ BACnet Communication failed
1	BACnet error code	AI	BACnetApp_Error_ Code_xx	BACnet error code
2	Gateway Notify	NC	GW_Notify_xx	When the error occurred, send event to list of destination in the recipient_list. (Max : 8)

(9) Digital input / output

Digital input / output Gateway has following point list.

Instance Number	Object	Object Type	Object Name	Unit	Status value			
				Inactive	Active			
				Text-1	Text-2	Text-3	Text-4	Text-5
1	Digital Input 1	BI	DI_01_xx_xx (BACnet Gateway Reserved)	Off	On			
2	Digital Input 2	BI	DI_02_xx_xx (BACnet Gateway Reserved)	Off	On			
3	Digital Input 3	BI	DI_03_xx_xx	Off	On			
4	Digital Input 4	BI	DI_04_xx_xx	Off	On			
5	Digital Input 5	BI	DI_05_xx_xx	Off	On			
6	Digital Input 6	BI	DI_06_xx_xx	Off	On			
7	Digital Input 7	BI	DI_07_xx_xx	Off	On			
8	Digital Input 8	BI	DI_08_xx_xx	Off	On			
9	Digital Input 9	BI	DI_09_xx_xx	Off	On			
10	Digital Input 10	BI	DI_10_xx_xx	Off	On			
11	Digital Output 1	BO	DO_01_xx_xx (BACnet Gateway Reserved)	Off	On			
12	Digital Output 2	BO	DO_02_xx_xx (BACnet Gateway Reserved)	Off	On			
13	Digital Output 3	BO	DO_03_xx_xx	Off	On			
14	Digital Output 4	BO	DO_04_xx_xx	Off	On			
15	Digital Output 5	BO	DO_05_xx_xx	Off	On			
16	Digital Output 6	BO	DO_06_xx_xx	Off	On			
17	Digital Output 7	BO	DO_07_xx_xx	Off	On			
18	Digital Output 8	BO	DO_08_xx_xx	Off	On			

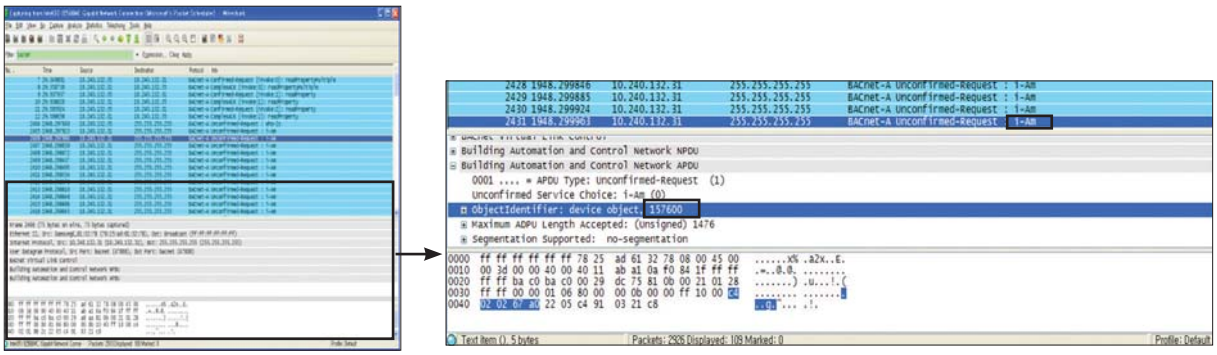
▶ Caution

- You may use ALL_OFF command to turn on all the indoor units but it is not recommended.
- If communication error occurs on devices such as SIM/OnOff Controller/Interface Module etc, other functions such as power distribution may also create a problem. You must have BMS system to check the errors and you must take action immediately.

8) Checking BACnet communication through Wireshark

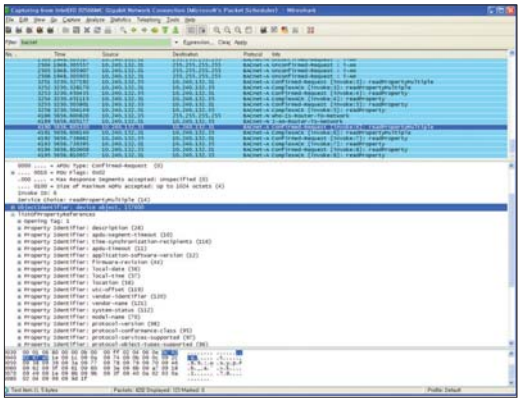
(1) Who-is (I-Am)

- After device instance numbers have been automatically assigned, Who-is command which is requested in the Wireshark will be replied by i-am from the devices.

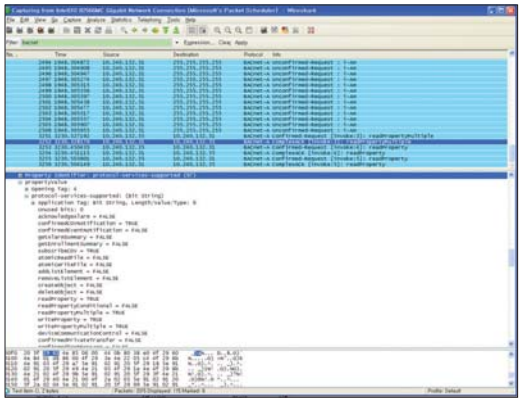


(2) ReadPropertyMultiple

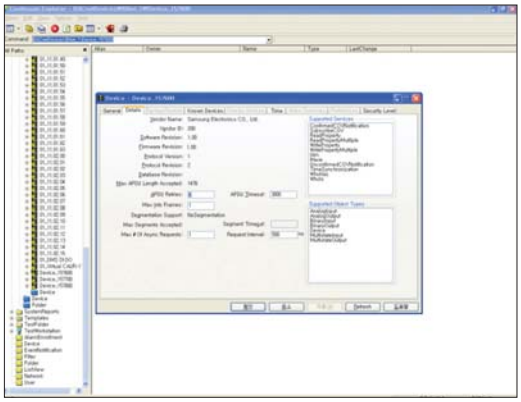
- Request all status datas.
- Device description, BACnet network number device node ID, status, BACnet MAC address version, Max APDU length accepted, APDU retries, timeout, supported services, supported object types and so on.



ReadPropertyMultiple Request



ReadPropertyMultiple Response



Continuum CyberStation

VI Building management system

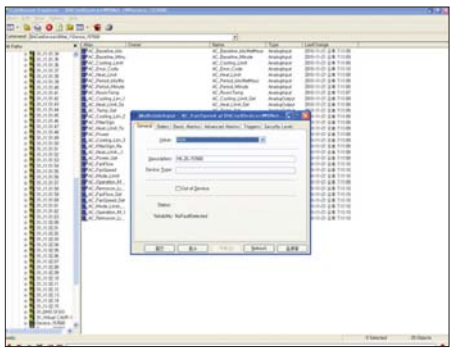
2. DMS B-net (BACnet GW)

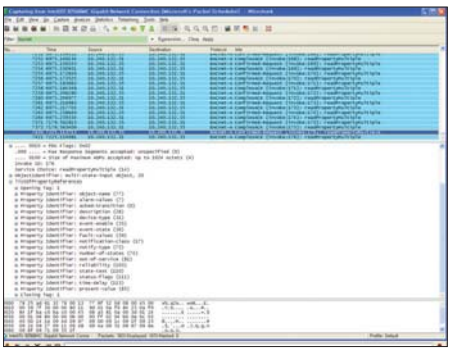
❑ *MIM-B17N*

8) Checking BACnet communication through Wireshark

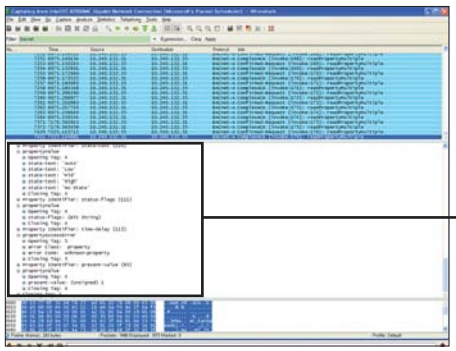
(3) ReadPropertyMultiple

• Object_MultiStateInput





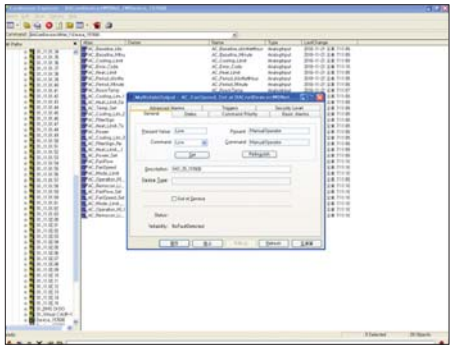
Request



Response

```
Property Identifier: state-text (110)
propertyValue
  Opening Tag: 4
  state-text: 'Auto'
  state-text: 'Low'
  state-text: 'Mid'
  state-text: 'High'
  state-text: 'No State'
  Closing Tag: 4
Property Identifier: status-flags (111)
propertyValue
  Opening Tag: 4
  status-flags: (Bit String)
  Closing Tag: 4
Property Identifier: time-delay (113)
propertyAccessError
  Opening Tag: 5
  error Class:  property
  error Code:  unknown-property
  Closing Tag: 5
Property Identifier: present-value (85)
propertyValue
  Opening Tag: 4
  present-value: (Unsigned) 1
  Closing Tag: 4
Closing Tag: 1
```

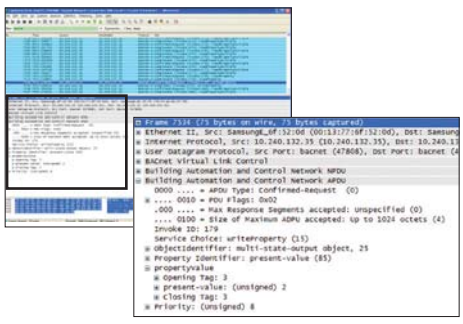
(4) WriteProperty



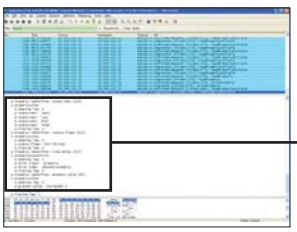
• Change the FanSpeed from Auto to Low

```
BACnet-A Confirmed-Request [invoke:179]: writeProperty
BACnet-A SimpleACK [invoke:179]: writeProperty
BACnet-A Confirmed-Request [invoke:180]: readPropertyMultiple
BACnet-A ComplexACK [invoke:180]: readPropertyMultiple
```

1. Request - WriteProperty (FanSpeed ‘Auto’ → ‘Low’)
2. Response - SimpleACK
3. Request - ReadPropertyMultiple (FanSpeed)
4. Response – ReadPropertyMultiple (FanSpeed ‘Low’)



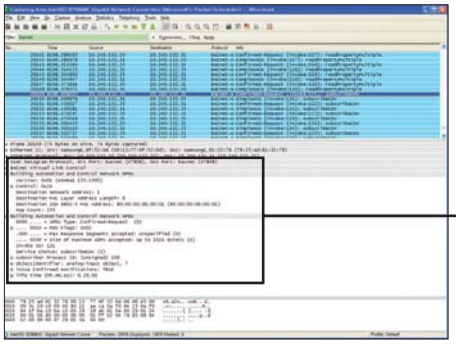
WriteProperty



```
Property Identifier: state-text (110)
propertyValue
  Opening Tag: 4
  state-text: 'Auto'
  state-text: 'Low'
  state-text: 'Mid'
  state-text: 'High'
  Closing Tag: 4
Property Identifier: status-flags (111)
propertyValue
  Opening Tag: 4
  status-flags: (Bit String)
  Closing Tag: 4
Property Identifier: time-delay (113)
propertyAccessError
  Opening Tag: 5
  error Class:  property
  error Code:  unknown-property
  Closing Tag: 5
Property Identifier: present-value (85)
propertyValue
  Opening Tag: 4
  present-value: (Unsigned) 2
  Closing Tag: 4
Closing Tag: 1
```

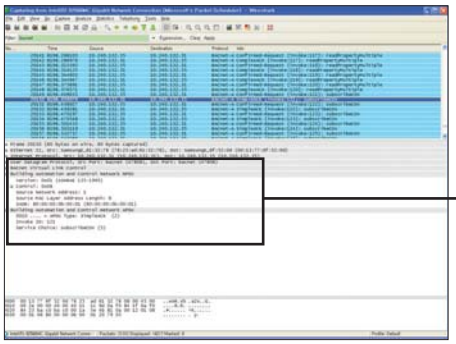
ReadPropertyMultiple

(5) Subscribe COV



```
User Datagram Protocol, Src Port: bacnet (47808), Dst Port: bacnet (47808)
BACnet Virtual Link Control
Building Automation and Control Network NPDU
  Version: 0x01 (ASHRAE 135-1995)
+ Control: 0x24
  Destination Network Address: 1
  Destination MAC Layer Address Length: 6
  Destination ISO 8802-3 MAC Address: 80:00:00:0b:00:01 (80:00:00:0b:00:01)
  Hop Count: 255
Building Automation and Control Network APDU
  0000 .... = APDU Type: Confirmed-Request  (0)
+ .... 0010 = PDU Flags: 0x02
  .000 .... = Max Response Segments accepted: Unspecified (0)
  .... 0100 = Size of Maximum ADPU accepted: Up to 1024 octets (4)
  Invoke ID: 121
  Service Choice: subscribeCOV (5)
+ subscriber Process Id: (Unsigned) 100
+ objectIdentifier: analog-input object, 7
+ issue Confirmed Notifications: TRUE
+ life time (hh.mm.ss): 0.20.00
```

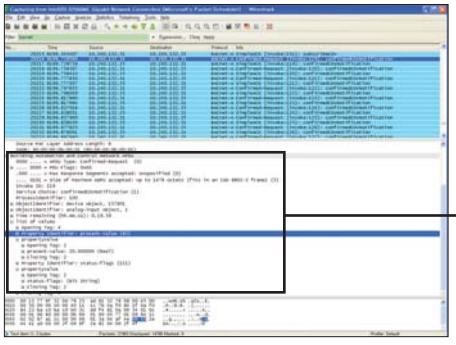
Request



```
+ User Datagram Protocol, Src Port: bacnet (47808),
+ BACnet Virtual Link Control
- Building Automation and Control Network NPDU
    Version: 0x01 (ASHRAE 135-1995)
  + Control: 0x08
    Source Network Address: 1
    Source MAC Layer Address Length: 6
    SADR: 80:00:00:0b:00:01 (80:00:00:0b:00:01)
- Building Automation and Control Network APDU
    0010 .... = APDU Type: SimpleACK  (2)
    Invoke ID: 121
    Service Choice: subscribeCOV (5)
```

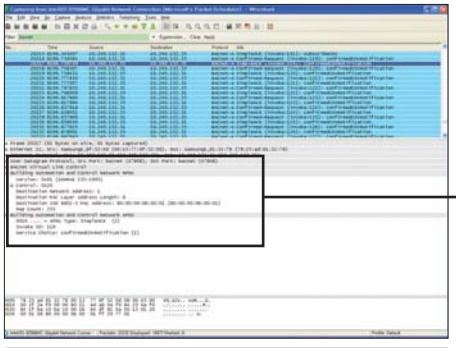
Response

(6) COV Notification



```
Building Automation and Control Network APDU
  0000 .... = APDU Type: Confirmed-Request  (0)
+ .... 0000 = PDU Flags: 0x00
  .000 .... = Max Response Segments accepted: Unspecified (0)
  .... 0101 = Size of Maximum ADPU accepted: Up to 1476 octets (fits in an ISO 8802-3 frame) (5)
  Invoke ID: 119
  Service Choice: confirmedCOVNotification (1)
  ProcessIdentifier: 100
+ objectIdentifier: device object, 157601
+ objectIdentifier: analog-input object, 1
+ Time remaining (hh.mm.ss): 0.19.59
- list of values
  + Opening Tag: 4
  + Property Identifier: present-value (85)
  - propertyvalue
    + Opening Tag: 2
    + present-value: 20.000000 (Real)
    + Closing Tag: 2
  + Property Identifier: status-flags (111)
  - propertyvalue
    + Opening Tag: 2
    + status-flags: (Bit String)
    + Closing Tag: 2
  + Closing Tag: 4
```

Notification



```
BACnet Virtual Link Control
Building Automation and Control Network NPDU
  Version: 0x01 (ASHRAE 135-1995)
+ Control: 0x20
  Destination Network Address: 1
  Destination MAC Layer Address Length: 6
  Destination ISO 8802-3 MAC Address: 80:00:00:0b:00:01 (80:00:00:0b:00:01)
  Hop Count: 255
Building Automation and Control Network APDU
  0010 .... = APDU Type: SimpleACK  (2)
  Invoke ID: 119
  Service Choice: confirmedCOVNotification (1)
```

Response

VI Building management system

2. DMS B-net (BACnet GW)

❑ *MIM-B17N*

9) Standard object type

Object Type	Support	Description
Analog Input	■	[Indoor temperature], [The power value after the basic date], [The number of hours usage of an indoor unit after the basic date], [Power value within period], [The number of hours usage of an indoor unit within period], [Indoor unit error code], [AHU error code], [ERV error code], [AHU error code], [ERV error code], [Centralized controller error code], [Interface module error code], [SIM interface module error code], [DMS status], [DMS error], [Discharge current temperature], [Outside temperature]
Analog Output	□	
Analog Value	■	[Set temperature], [Setting lower temperature limit], [Setting upper temperature limit], [Discharge cooling set temperature], [Discharge heating set temperature], [Cool capacity compensation], [Heat capacity compensation]
Averaging	□	
Binary Input	■	[DI], [Filter sign status], [Compressor status]
Binary Output	■	[DO], [Filter sign reset], [All Device off]
Binary Value	■	[Power Onoff control], [Setting the fucntion of limiting lower temperature] [Setting the function of limiting upper temperatue], [SPI setting], [HumanSensor setting], [Humidification setting], [Outdoor air intake setting], [Ourdoor cooling setting]
Calendar	□	
Command	□	
Device	■	[DMS], [A/C Indoor Unit], [ERV], [AHU], [SIM], [Centralized controller], [Interface module], [DDC]
Event Enrollment	□	
File	□	
Group	□	
Life Safety Point	□	
Life Safety Zone	□	
Loop	□	
Multi-state Input	■	[Current humidity status]
Multi-state Output	□	
Multi-state Value	■	[Operation mode control], [Fan speed control], [Air flow direction control], [Setting Cool only/ Heat only/ No Limit], [Control Enable RC/ Disable RC /Level1], [Set humidity status]
Notification Class	■	[AC Indoor Notify], [ERV Notify], [AHU Notify], [Centralized Controller Notify], [Interface Module Notify], [SIM Notify], [Gateway Notify]
Program	□	
Pulse Converter	□	
Schedule	□	
Trend Log	□	
Access Door	□	
Event Log	□	
Load Control	□	
Structured View	□	
Trend Log Multiple	□	

10) Property support specification

(1) Device property

	Property identifier	Property data	Check code	Support	DMS2
1	Object identifier	BACnetObjectIdentifier	R	V	Individual identifier
2	Object name	CharaterString	R	V	SAMSUNG DVM Gateway
3	Object type	BACnetObjectType	R	V	DEVICE
4	System status	BACnetDeviceStatus	R	V	During communication: “OPERATIONAL” Error with DMS2: “NON_OPERATIONAL”
5	Vendor name	CharacterString	R	V	Samsung Electronics CO., Ltd.
6	Vendor identifier	Unsigned16	R	V	200
7	Model name	CharterString	R	V	MIM-B17N
8	Firmware revision	CharterString	R	V	1.20
9	Application software version	CharterString	R	V	1.20
10	Location	CharterString	O		X
11	Description	CharterString	O	V	DMS2_BACnetIP [ver 1.00]
12	Protocol version	Unsigned	R	V	2.00
13	Protocol conformance class	Unsigned(1..6)	R		X
14	Protocol services supported	BACnetServicesSupported	R	V	For each device
15	Protocol object types supported	BACnetObjectTypesSupported	R	V	For each device
16	Object list	BACnetidentifier BACnet sequence [N]	R	V	For each device
17	Max APDU length accepted	Unsigned	R	V	1476
18	Segmentation supported	BACnetSegmentation	R	V	NO-SEGMENTATION
19	VT classes supported	BACnetVTClass	O(1)		X
20	Active VT sessions	BACnetVTSessions	O(1)		X
21	Local time	Time	O	V	Supported
22	Local date	Date	O	V	Supported
23	UTC offset	INTEGER	O		X
24	Daylight savings timeout	BOOLEAN	O		X
25	APDU segment timeout	Unsigned	O(2)		X
26	APDU timeout	Unsigned	R	V	3000
27	Number of APDU retries	Unsigned	R	V	3
28	List of session keys	BACnetSessionKey	O		X
29	Time synchronization recipients	BACnetRecipient	O(3)		X
30	Max master	Unsigned(1..127)	O(4)	V	X
31	Max info frames	Unsigned	O(4)	V	X
32	Device address binding	BACnetAddressBinding	R	V	X
33	Protocol revision	Unsigned	R	V	2

VI Building management system

2. DMS B-net (BACnet GW)

❑ *MIM-B17N*

10) Property support specification

(2) Analog Input Property

	Property identifier	Property data	Check code	Support	DMS2
1	Object identifier	BACnetObjectIdentifier	R	V	
2	Object name	CharaterString	R	V	
3	Object type	BACnetObjectType	R	V	
4	Present value	REAL	R(1)	V	
5	Description	CharacterString	O	V	AI_Instance_device address
6	Device type	CharacterString	O		
7	Status Flags	BACnetStatusFlags	R	V	Communication Status_Flags FAULT flag → True OUT_OF_SERVICE → TRUE
8	Event state	BACnetEventState	R	V	General Error
9	Reliability	BACnetReliability	O	V	Status_Flags FAULT flag → TRUE FAULT if Reliability is not NO_FALUT_DETECTED Communication error → COMMUNICATION_ FAILURE General error → Unreliable_other
10	Out of service	BOOLEAN	R	V	Communication error → TRUE
11	Update interval	Unsigned	O		
12	Units	BACnetEngineeringUnits	R	V	
13	Min pres value	REAL	O	V	
14	Max Pres Value	REAL	O	V	
15	Resolution	REAL	O		
16	COV increment	REAL	O(2)	V	
17	Time delay	Unsigned	O(3)		
18	Notification class	Unsigned	O(3)		
19	High limit	REAL	O(3)		
20	Low limit	REAL	O(3)		
21	Deadband	REAL	O(3)		
22	Limit Enable	BACnetLimitEnable	O(3)		
23	Event enable	BACnetEventTransitionBits	O(3)		
24	Acked transition	BACnetEventTransitionBits	O(3)		
25	Notify type	BACnetNotifyType	O(3)		

(3) Analog output property

	Property identifier	Property data	Check code	Support	DMS2
1	Object identifier	BACnetObjectIdentifier	R	V	
2	Object name	CharaterString	R	V	
3	Object type	BACnetObjectType	R	V	
4	Present value	REAL	W	V	
5	Description	CharacterString	O	V	AI_Instance_device address
6	Device type	CharacterString	O		
7	Status Flags	BACnetStatusFlags	R	V	Communication Status_Flags FAULT flag → True OUT_OF_SERVICE → TRUE
8	Event state	BACnetEventState	R	V	General Error
9	Reliability	BACnetReliability	O	V	Status_Flags FAULT flag → TRUE FAULT if Reliability is not NO_FALUT_DETECTED Communication error → COMMUNICATION_ FAILURE General error → Unreliable_other
10	Out of service	BOOLEAN	R	V	Communication error → TRUE
11	Units	BACnetEngineeringUnits	R	V	
12	Min pres value	REAL	O	V	
13	Max Pres Value	REAL	O	V	
14	Resolution	REAL	O		
15	Priority array	BACnetPriorityArray	R	V	
16	Relinquish default	REAL	R	V	
17	COV increment	REAL	O(1)		
18	Time Delay	Unsigned	O(2)		
19	Notification class	Unsigned	O(2)		
20	High limit	REAL	O(2)		
21	Low limit	REAL	O(2)		
22	Deadband	REAL	O(2)		
23	Limit enable	BACnetLimitEnable	O(2)		
24	Event Enable	BACnetEventTransitionBits	O(2)		
25	Acked transition	BACnetEventTransitionBits	O(2)		
25	Notify type	BACnetNotifyType	O(2)		

VI Building management system

2. DMS B-net (BACnet GW)

❑ *MIM-B17N*

10) Property support specification

(4) Binary input property

	Property identifier	Property data	Check code	Support	DMS2
1	Object identifier	BACnetObjectIdentifier	R	V	
2	Object name	CharaterString	R	V	
3	Object type	BACnetObjectType	R	V	
4	Present value	BACnetBinaryPV	W	V	
5	Description	CharacterString	O	V	AI_Instance_device address
6	Device type	CharacterString	O		
7	Status Flags	BACnetStatusFlags	R	V	Communication Status_Flags FAULT flag → True OUT_OF_SERVICE → TRUE
8	Event state	BACnetEventState	R	V	General Error
9	Reliability	BACnetReliability	O	V	Status_Flags FAULT flag → TRUE FAULT if Reliability is not NO_FALUT_DETECTED Communication error → COMMUNICATION_ FAILURE General error → Unreliable_other
10	Out of service	BOOLEAN	R	V	Communication error → TRUE
11	Polarity	BACnetPolarity	R	V	
12	Inactive text	CharacterString	O(1)	V	New
13	Active text	CharacterString	O(1)	V	New
14	Change of state time	BACnetDateTime	O(2)		
15	Change of state count	Unsigned	O(2)		
16	Time of state count reset	BACnetDateTime	O(2) O(3)		
17	Elapsed active time	Unsigned32	O(3)		
18	Time of active time reset	BACnetDate Time	O		
19	Time delay	Unsigned	O(4)		
20	Notification class	Unsigned	O(4)		
21	Alarm value	BACnetBinaryPV	O(4)		
22	Event enable	BACnetEventTransitionBits	O(4)		
23	Acked transition	BACnetEventTransitionBits	O(4)		
24	Notify type	BACnetNotifyType	O(4)		

(5) Binary output property

	Property identifier	Property data	Check code	Support	DMS2
1	Object identifier	BACnetObjectIdentifier	R	V	
2	Object name	CharaterString	R	V	
3	Object type	BACnetObjectType	R	V	
4	Present value	BACnetBinaryPV	W	V	
5	Description	CharacterString	O	V	AI_Instance_device address
6	Device type	CharacterString	O		
7	Status Flags	BACnetStatusFlags	R	V	Communication Status_Flags FAULT flag → True OUT_OF_SERVICE → TRUE
8	Event state	BACnetEventState	R	V	General Error
9	Reliability	BACnetReliability	O	V	Status_Flags FAULT flag → TRUE FAULT if Reliability is not NO_FALUT_DETECTED Communication error → COMMUNICATION_ FAILURE General error → Unreliable_other
10	Out of service	BOOLEAN	R	V	Communication error → TRUE
11	Polarity	BACnetPolarity	R	V	
12	Inactive text	CharacterString	O(1)	V	
13	Active text	CharacterString	O(1)	V	
14	Change of state time	BACnetDateTime	O(2)		
15	Change of state count	Unsigned	O(2)	V	
16	Time of State count reset	BACnetDateTime	O(2) O(3)	V	
17	Elapsed active time	Unsigned32	O(3)		
18	Time of active time reset	BACnetDate Time	O		
19	Minimum off time	Unsigned32	O		
20	Minimum on time	Unsigned32	O		
21	Priority array	BACnetPriorityArray	R		
22	Relinquish default	BACnetBinaryPV	R		
23	Time delay	Unsigned	O(4)		
24	Notification class	Unsigned	O(4)		
25	Alarm value	BACnetBinaryPV	O(4)		
26	Event enable	BACnetEventTransitionBits	O(4)		
27	Acked transition	BACnetEventTransitionBits	O(4)		
28	Notify type	BACnetNotifyType	O(4)		

VI Building management system

2. DMS B-net (BACnet GW)

❑ *MIM-B17N*

10) Property support specification

(6) Multi-state input property

	Property identifier	Property data	Check code	Support	DMS2
1	Object identifier	BACnetObjectIdentifier	R	V	
2	Object name	CharaterString	R	V	
3	Object type	BACnetObjectType	R	V	
4	Present value	Unsigned	R(1)	V	
5	Description	CharacterString	O	V	M_Instance_device address
6	Device type	CharacterString	O		
7	Status Flags	BACnetStatusFlags	R	V	Communication Status_Flags FAULT flag → True OUT_OF_SERVICE → TRUE
8	Event state	BACnetEventState	R	V	General Error
9	Reliability	BACnetReliability	O	V	Status_Flags FAULT flag → TRUE FAULT if Reliability is not NO_FALUT_DETECTED Communication error → COMMUNICATION_ FAILURE General error → Unreliable_other
10	Out of service	BOOLEAN	R	V	Communication error → TRUE
11	Number of states	Unsigned	R	V	
12	State text	BACnet sequence of characterString	O	V	
13	Time delay	Unsigned	O(2)		
14	Notification class	Unsigned	O(2)		
15	Alarm values	Unsigned list	O(2)		
16	Fault values	Unsigned list	O(2)		
17	Event enable	BACnetEventTransitionBits	O(2)		
18	Acked transition	BACnetEventTransitionBits	O(2)		
19	Notify type	BACnetNotifyType	O(2)		

(7) Multi-state output property

	Property identifier	Property data	Check code	Support	DMS2
1	Object identifier	BACnetObjectIdentifier	R	V	
2	Object name	CharaterString	R	V	
3	Object type	BACnetObjectType	R	V	
4	Present value	Unsigned	R(1)	V	
5	Description	CharacterString	O	V	M_Instance_device address
6	Device type	CharacterString	O		
7	Status Flags	BACnetStatusFlags	R	V	Communication Status_Flags FAULT flag → True OUT_OF_SERVICE → TRUE
8	Event state	BACnetEventState	R	V	General Error
9	Reliability	BACnetReliability	O	V	Status_Flags FAULT flag → TRUE FAULT if Reliability is not NO_FALUT_DETECTED Communication error → COMMUNICATION_ FAILURE General error → Unreliable_other
10	Out of service	BOOLEAN	R	V	Communication error → TRUE
11	Number of states	Unsigned	R	V	
12	State text	BACnet arrangement of CharacterString	O	V	
13	Time delay	Unsigned	O(2)		
14	Notification class	Unsigned	O(2)		
15	Alarm values	Unsigned list	O(2)		
16	Fault values	Unsigned list	O(2)		
17	Event enable	BACnetEventTransitionBits	O(2)		
18	Acked transition	BACnetEventTransitionBits	O(2)		
19	Notify type	BACnetNotifyType	O(2)		

DVM CONTROL SYSTEMS

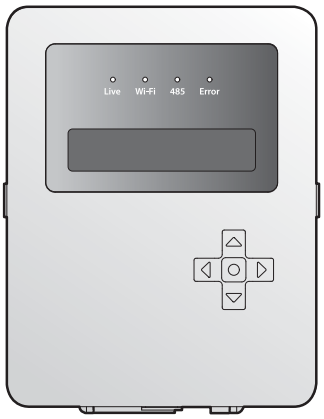
Ⅶ. Test run tool for system air contioner installation

VII Test run tool for system air conditioner installation

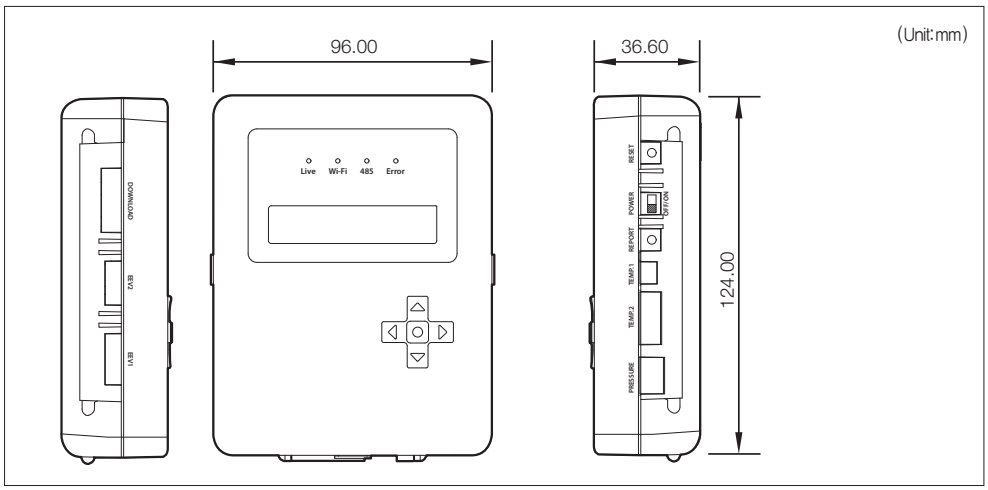
1. S-Checker

❑ *MIM-C10N*

1) Features



- Execute test run for Samsung system air conditioner and inspects the parts (EEV, Sensor).
- It can be linked with mobile application to allow saving and monitoring data of the test run.



2) Product specification

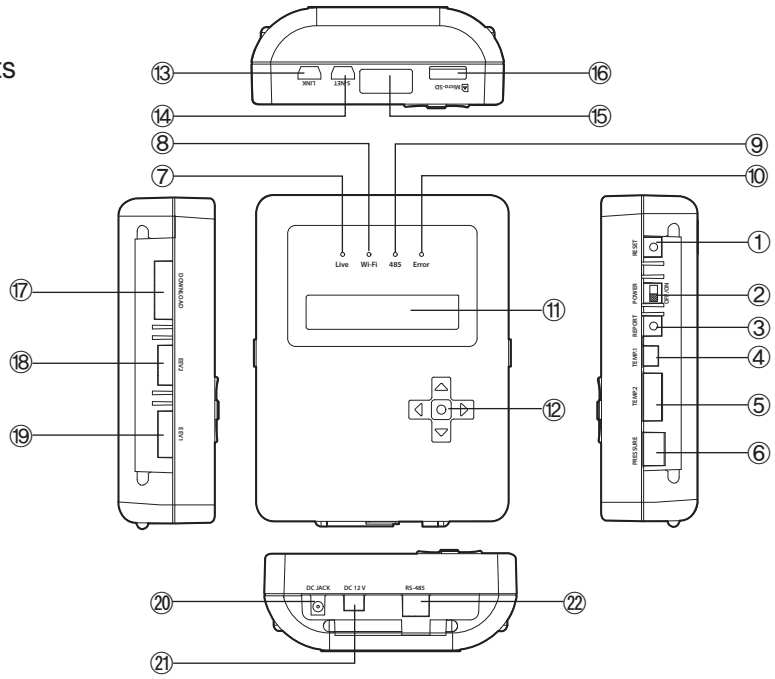
Power supply			10 0V~240 V AC, 50/60Hz
Power consumption			Below 30W
Operating temperature range			0°C~40°C
Operating humidity range			0%RH~90%RH
Communication	RS485	Port Q'ty	1
	Wi-Fi	Supportablity	Supported
Maximum number of controllable devices	RS485	m	1,000 m
	Indoor unit	EA	64
	Outdoor unit	EA	1

✻ Supported specification of the mobile application : - Resolution over 800 X 480, optimized at 1280 X 720
- OS : Android 2.3~4.12

Compatible product

Outdoor unit	AM✻✻✻✻X✻✻✻✻✻✻Model
Indoor unit	AM✻✻✻✻N✻✻✻✻✻✻Model

3) Description of parts



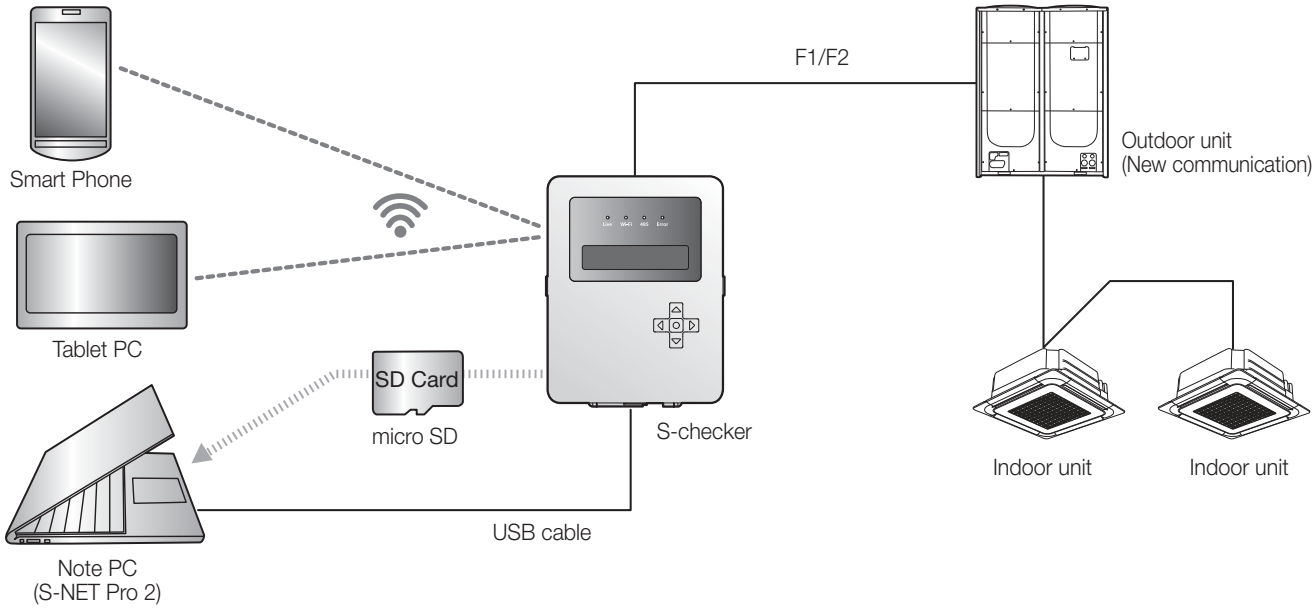
No.	Name	Description
①	Reset button	Use to reset S-checker
②	Power button	Use to turn on/off the power for S-checker.
③	Report button	Use to create report for test run.
④	Temperature sensor inpsection connector 1	Connector for temperature sensor that is connected to pitch 250 pin connector. Temperature value can be checked from the S-checker by connecting the temperature sensor directly.
⑤	Temperature sensor inpsection connector 2	Connector for temperature sensor that is connected to pitch 200 pin connector Temperature value can be checked from the S-checker by connecting the temperature sensor directly
⑥	Pressure sensor inspection connector (4 pin)	Connector for connecting high/low pressure sensor of the outdoor unit. Pressure value can be checked from the S-checker by connecting the temperature sensor directly.
⑦	System operation status LED	Turns on when the S-Checker is operating normally.
⑧	Wi-Fi connection LED	Turns on when the data is being tranmitted to mobile through Wi-Fi
⑨	RS-485 operation status LED	Turns on when data is transmitted and received through RS-485 communication
⑩	System Error LED	Turns on when error occurs on S-checker.
⑪	LCD display	Check the current information and the items in menu that can be selected by menu buttons.
⑫	Menu buttons	Use to move and select from menu.
⑬	USB for S-Net Pro 2	Mini USB for connecting with S-NET Pro 2.
⑭	USB for system	Use to download program etc.
⑮	IR tranceiver	Use to transmit IR.
⑯	Micro SD slot	Slot to insert Micro SD card.
⑰	PBA download connector	Use to download S-checker through PC.
⑱	EEV inspection connector 1 (5 Pin)	Check for error on EEV sensor 1, CAM Type (5 Pin)
⑲	EEV inspection connector 2 (6 Pin)	Check for error on EEV sensor 2, EDM Type (6 Pin)
⑳	DC 12 V adapter	Use to connect independent 12 V power.
㉑	DC 12 V connector	Connector to use 12V power from air-conditioner
㉒	RS-485 connector	Connector for RS-485 communication.

VII Test run tool for system air conditioner installation

1. S-Checker

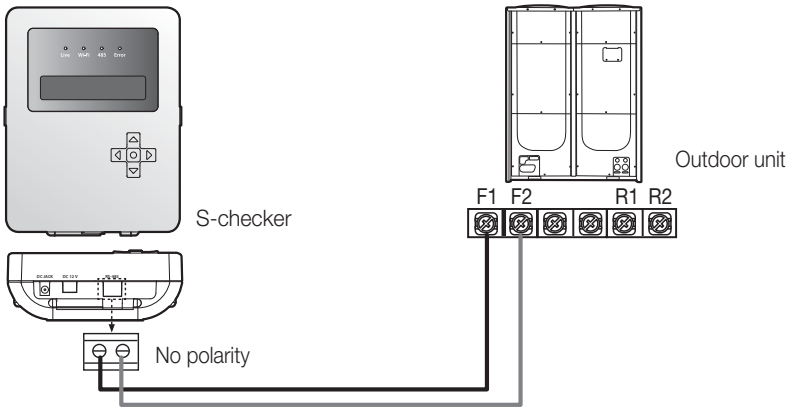
❑ *MIM-C10N*

4) Connection diagram

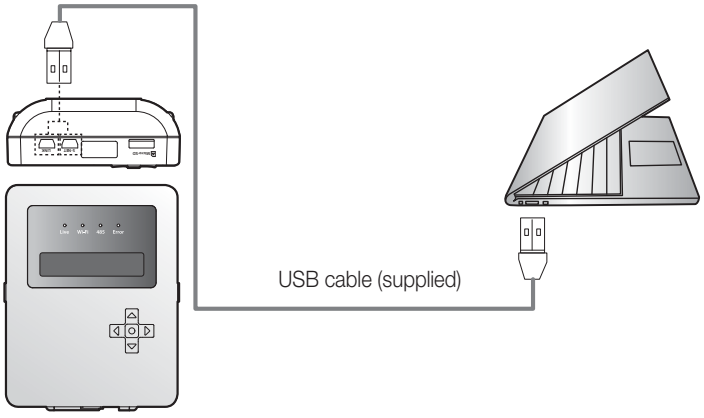


5) Connecting

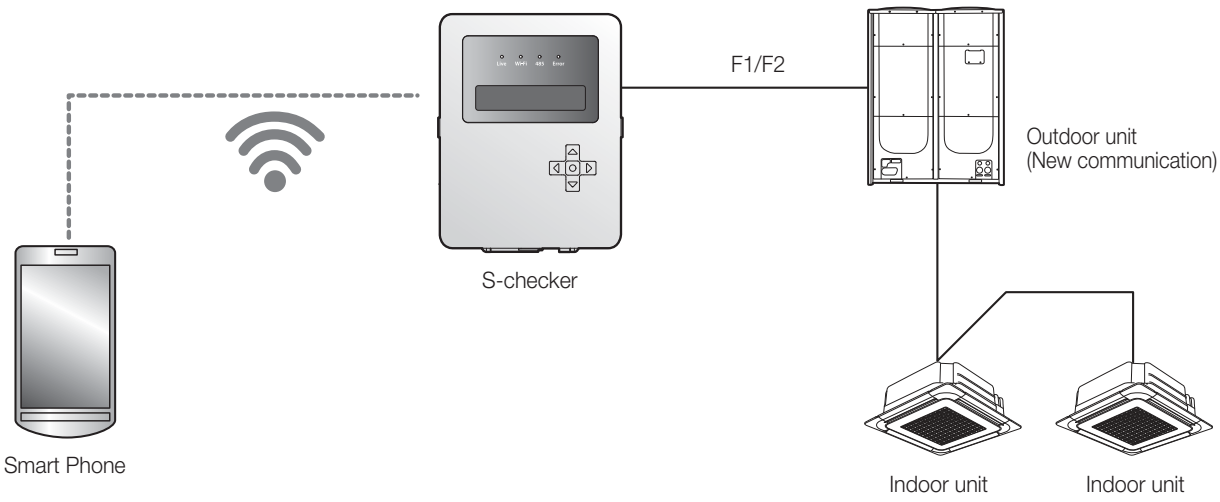
Connecting with outdoor unit



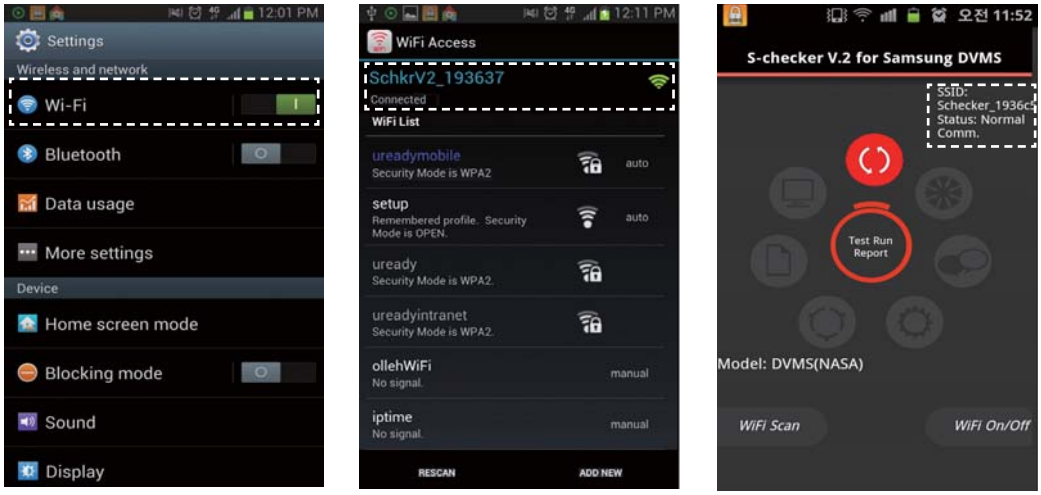
Connecting with S-NET Pro 2



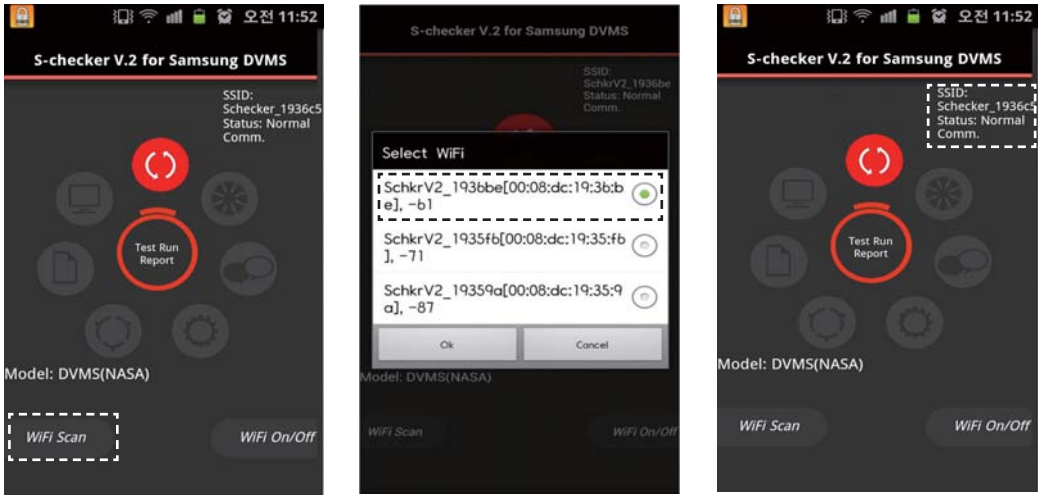
Connecting with mobile device



▶ Method 1- Search for S-Checker



▶ Method 2- Scan from mobile application



VII Test run tool for system air conditioner installation

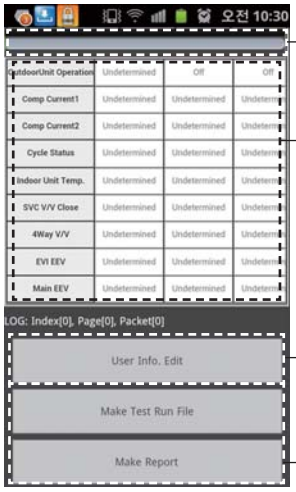
1. S-Checker

❑ *MIM-C10N*

6) Main function

Test run report

• Test run report menu will inspect the system in real time and notify the result.



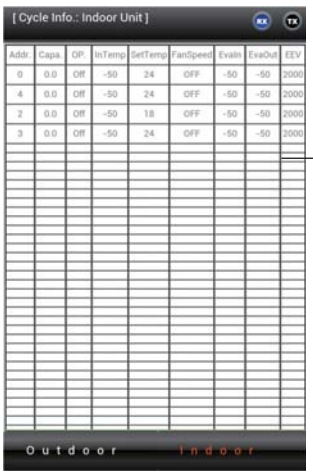
• After completing the test run report, data will be saved on the folder (name : mBiss) of mobile device as csv and pdf file.

Section	Function
Inspection step for test run	During outdoor unit test run, test run prgress will be displayed in the progress bar on top part.
Items for test run	Status for items of test run will be displayed and 'NG' will be displayed for undetermined items.
Input site information	Install engineer can input the site information
Create test run report	Make Test Run File : Saves EEPROM data on S-Checker. When saving is completed "LOG: Ready to make Report" message will appear. Make Report : Creates Test Run Report. Progress can be checked from "LOG: Making Test Run Report. Progress is X.X%" message.

Display of the cycle information

• Cycle Info : it displays cycle data of the indoor and outdoor unit.
(Displayed item is same as S-NET Pro 2)

[Cycle info : Outdoor unit]
Displays the cycle information of the connected outdoor unit.

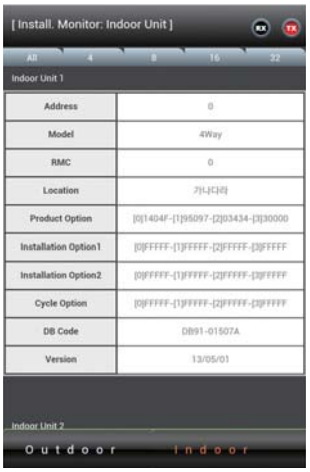


[Cycle info : Indoor unit]
Displays the cycle information of the connected indoor unit. Maximum of 64 indoor units' data can be displayed.

Install monitoring

• It displays the installation information of the outdoor unit and indoor unit.

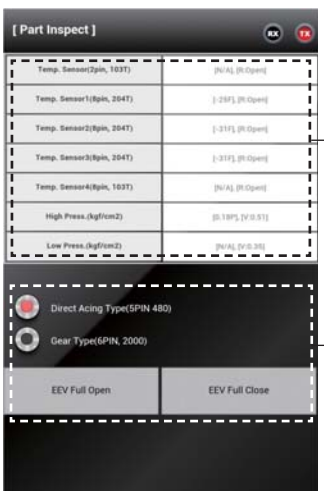
Install monitor: Outdoor unit



Install monitor: Indoor unit

Checking the status of device

• You can connect pressure sensor, temperature sensor, EEV connector (that is connected to the PBA of indoor and outdoor unit) to the terminal on the S-checker and check the status of the device.



Type of sensor	Displayed contents
Temperature sensor	Resistence value, displays temperature
Pressure sensor	Voltage value, displays pressure

EEV drive information	Related information during driving
Full Open	Control + 15 more than real maximum value
Full Close	Control the opening of EEV as 0

※ When control EEV, you can connect only Direct Acting Type or Gear Type

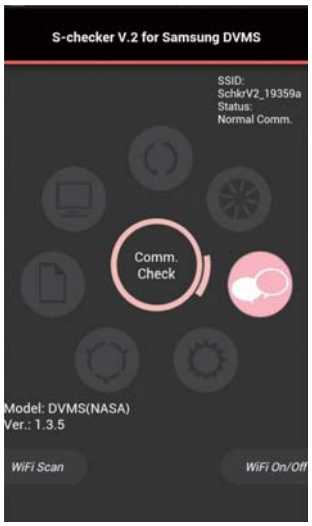
VII Test run tool for system air conditioner installation

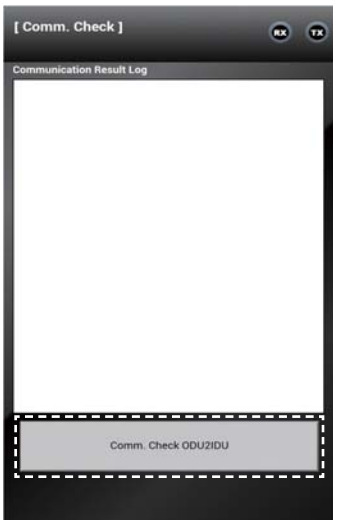
1. S-Checker

❑ *MIM-C10N*

6) Main function

Checking the communication



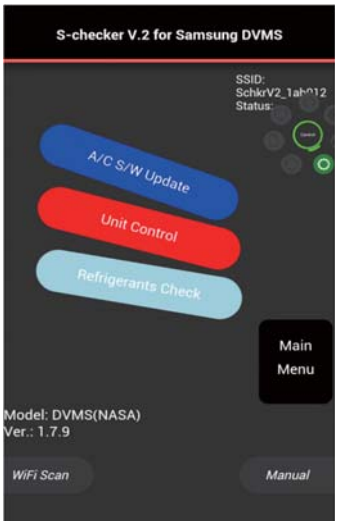


- Through Comm. Check menu, communication status between indoor/outdoor unit can be checked.
- Indoor unit can be connected to S-checker alone without outdoor unit, to check the communication status of indoor unit.

Setting the indoor unit option

- You can check the option code of indoor unit from the S-checker.
- Option code setting can be applied to multiple numbers of indoor unit at once.

Other functions



- A/C S/W Upgrade: Firmware for indoor and outdoor unit of system air conditioner can be upgraded.
- Unit control: This function restricts general operation if auto trial operation is incompleted.
- Refrigerant check: This is a detect function according to piping option which calculates the amount of refrigerant to see if it's adequate.

VII Test run tool for system air conditioner installation

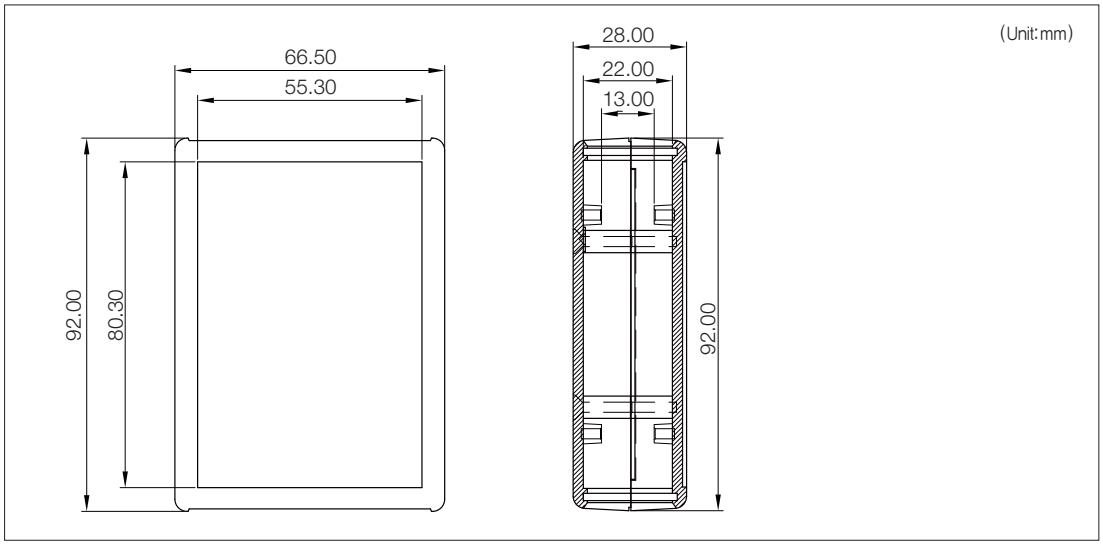
2. S-Converter

❑ *MIM-C02N*

1) Features

- Communication converting module to connect Samsung system air conditioner to a PC.
- Main purpose for use
  - To coonect with test run program

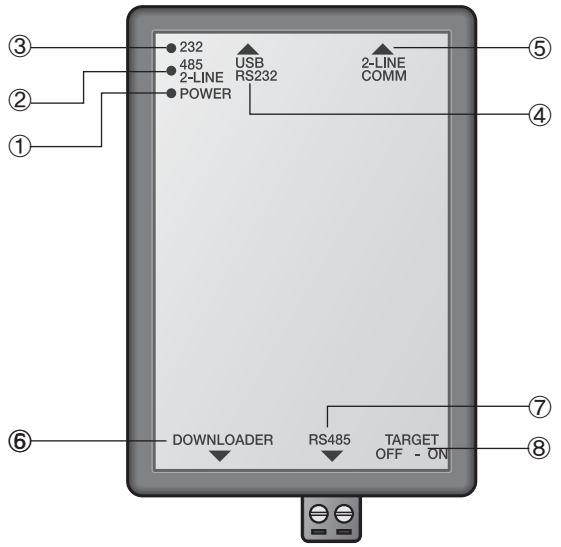
[Test run program]
· S-NET Pro : Conventional communication
· S-NET Pro 2 : New communication

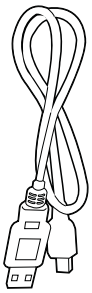


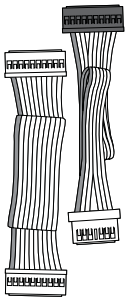
2) Product specification

Power supply			DC 5 V, below 500 mA
Power consumption			Below 3 W
Operating temperature range			0°C~40°C
Operating humidity range			0%RH~90%RH
Communication	RS485	Port Q'ty	1
Maximum length of connection	RS485	m	1000 m

3) Description of parts

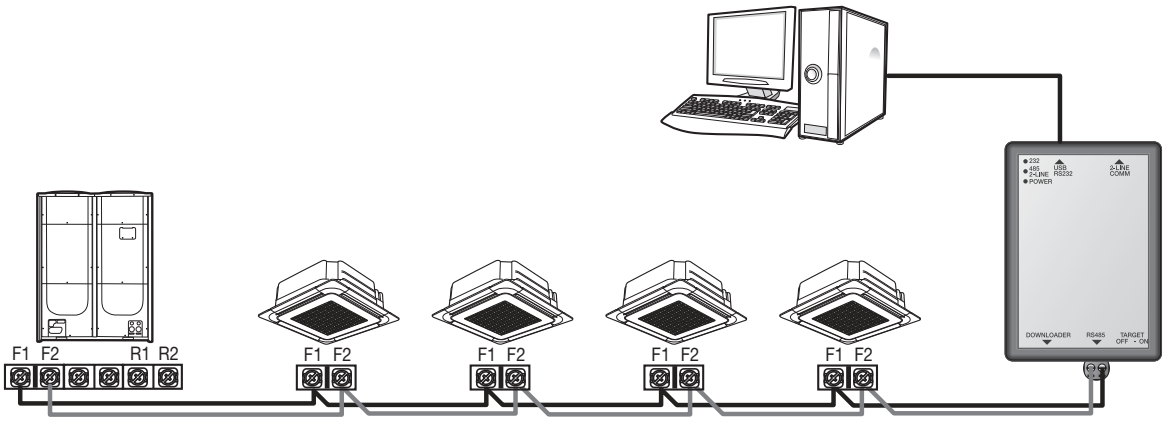



⑨


⑩

No.	Name	Description
①	Power LED	Display power status
②	485 communication / 2 line communication LED	Displays communication status when outdoor uint 2 line remote controller is connected
③	232 LED	Displays communication status with the PC
④	USB-RS232 connection terminal	Connection terminal for communication with the PC
⑤	2 line communication connection terminal	Only applies to new communication indoor unit 2 line communication connection terminal between indoor unit - wired remote controller (For R&D testing)
⑥	Downloader connection terminal	PBA download connection terminal
⑦	RS485 communication connection terminal	Conenction cable for connecting with indoor/outdoor unit's F1, F2 communication terminal
⑧	TARGET OFF – ON button	Only used when S-converter is used as SW downloader for the product - If the S-Converter supplies the power through the PBA of the product that will download the SW, this button resets the power that was supplied through the S-Converter
⑨	USB-to-232 cable	Cable that connects S-Converter and PC
⑩	SW downloader cable	Only used when S-converter is used as SW downloader for the product - Connect S-Converter (20 Pin) and the downloader terminal (10 Pin, 7 Pin) of the product's PCB

4) Connection diagram



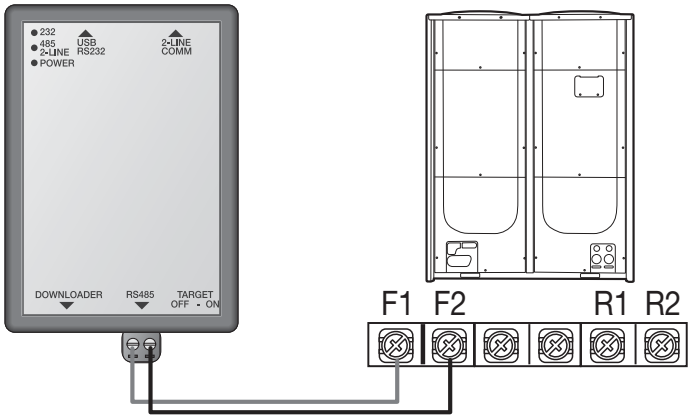
VII Test run tool for system air conditioner installation

2. S-Converter

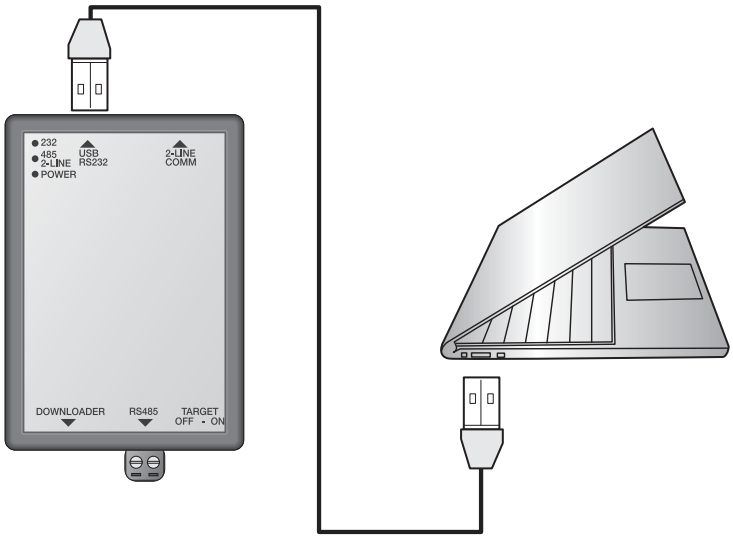
❑ *MIM-C02N*

5) Connecting

Connecting with outdoor unit



Connecting with PC



6) Display

(1) POWER LED

- When connected to Conventional communication outdoor unit - LED blinks
- When connected to new communication outdoor unit - LED is on

(2) 232 LED

- LED blinks every time control signal is transmitted from the Test run program
- If the LED doesn't blink even though the test run program sends control command, check if the program is appropriate for the communication type (Conventional communication/new communication)

(3) 485/ 2-LINE LED

- LED blinks when the data is being transmitted from the 485 or 2-line communication device

  ※ 485 communication cable - outdoor unit connection (Connects test run program)

  2-line communication device - wired remote controller connection (connects program for the developer)
- If the LED doesn't turn on, check if the communication cable is disconnected/short or check if the device is appropriate for the communication type (Conventional communication/new communication)

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