



DVM

Technical Data Book

Control Systems

SAMSUNG

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DVM CONTROL SYSTEMS

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I Individual control system

1. Wireless signal receiver kit

1) Features

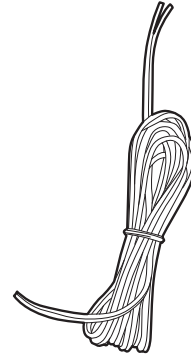
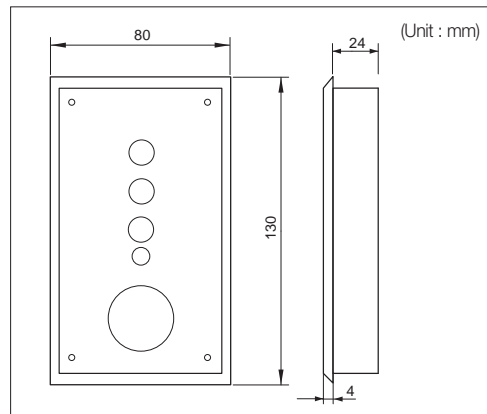
MRK-A00



Wireless signal receiver

- Concealed wireless signal receiver
- Filter replacement sign
- Fan operation display

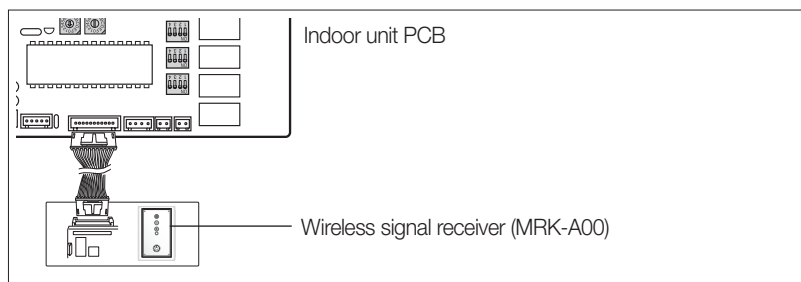
MRW-10A (Receiver wire)



- 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 (MRW-10A) with the receiver kit (MRK-A00).
- Connect the other end of the receiver wire (MRW-10A) with the duct type indoor unit PCB (CN91).



☑ Note

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

2. Wireless remote controller

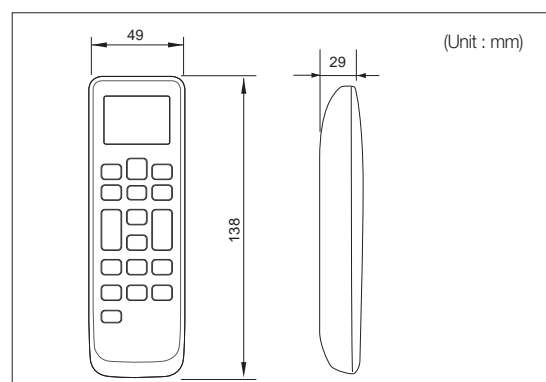
MR-DH00

1) Features

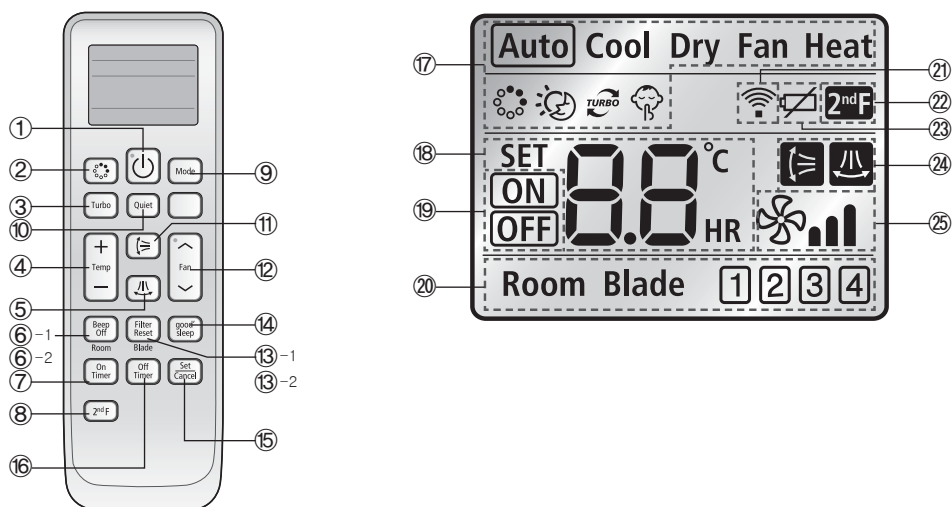


Easy and convenient operation control

- 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 - Buttons and displays



* 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 ^ v 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 system

2. Wireless remote controller

□ MR-DH00

3) Additional function

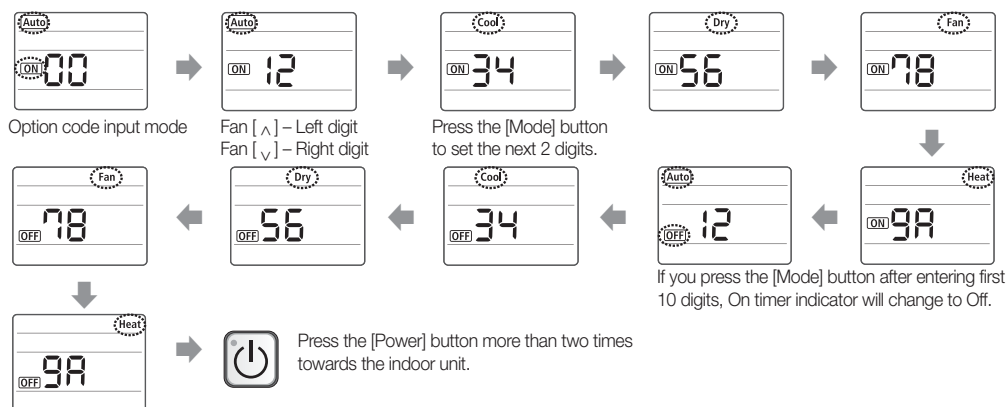
(1) Option code setting

- ① Remove the batteries from the remote controller.
- ② Press the Temp [+] and [-] button at the same time and insert the batteries.
- ③ Set the 2 digits of option code.
If you press the Fan [^] button, you can change the first digit.
If you press the Fan [v] button, you can change the second digit.
- ④ Press the [Mode] button to set the next 2 digits of option code.
Input 20 digits in total.
- ⑤ 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

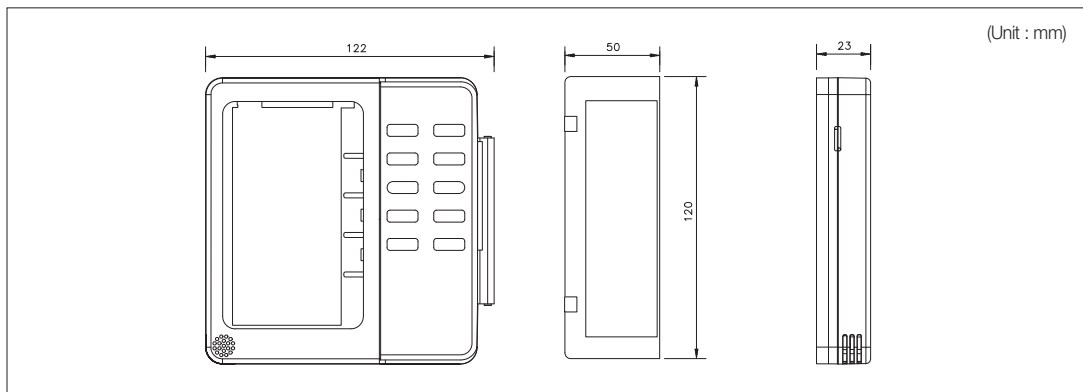
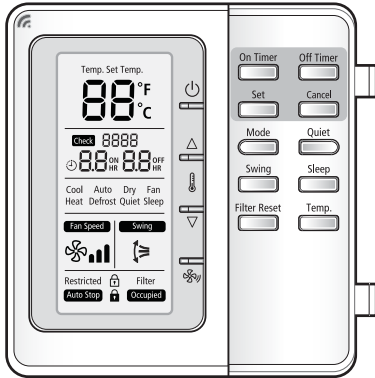
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3. Wired remote controller

① MWR-WH00

1) Features



(1) Easy air conditioner control

- Operation ON/OFF control
- Operation mode, setting temperature, fan speed, air flow direction
- Filter replacement alert reset
- Single indoor unit control or multiple indoor unit group control (Able to control max. 16 indoor units.)
- Error display

(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) User convenience function

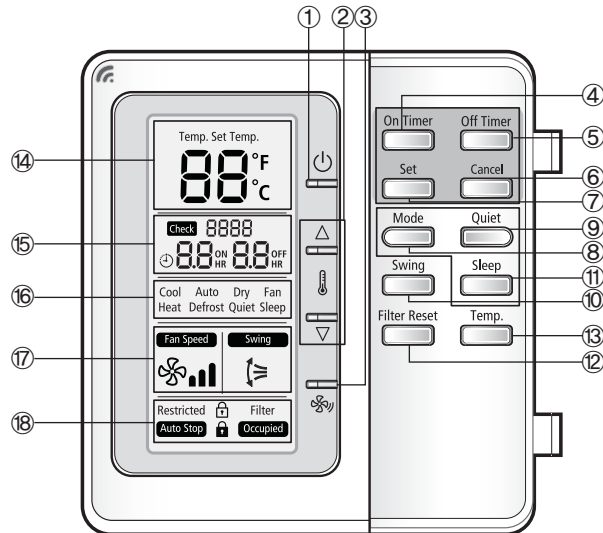
- Child lock
- Different button permission levels (Operation mode, temperature setting, ON/OFF, fan speed)
- Built-in room temperature sensor
- Service mode support
 - Indoor unit cycle data monitoring
 - Indoor unit option code setting and monitoring
- Simple operation ON/OFF timer

I Individual control system

3. Wired remote controller

① MWR-WH00

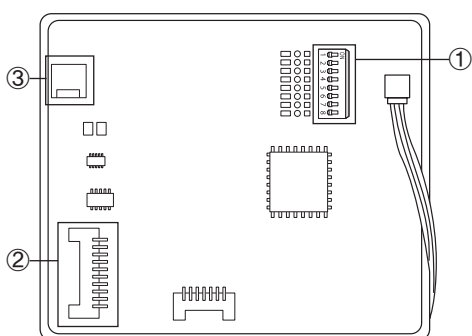
2) Description of parts - Buttons and displays



	Function	
①	Operation On/Off button	Press this button to turn on/off the indoor units
②	Temperature setting button	<p>Set temperature will increase by 1°C(°F) each time Δ or ∇ button is pressed</p> <ul style="list-style-type: none"> Temperature range in Auto/Cool/Dry mode: 18~30°C (65~-86°F) Temperature range in Heat mode: 16~30°C (61~-86°F) When the button is pressed consecutively, set temperature will increased/decrease in 0.5 second interval Temperature can not be adjusted in Fan mode
③	Fan speed button	<p>Press this button to change the fan speed</p> <ul style="list-style-type: none"> Fan speed will be changed in following order: Auto → Low → Medium → High Auto fan speed operation is not available in Fan mode Fan speed will be set to 'Auto' in Auto/Dry mode
④	On Timer button	<p>Press this button to set the On Timer. If this button is pressed during On Timer setting, set time will be changed</p> <ul style="list-style-type: none"> On Timer can be set within range of "0.5 ~ 24 hour" Time can be adjusted in 0.5 hour unit within "0.5~3 hour" range and in 1 hour unit within "3~24 hour" range
⑤	Off Timer button	<p>Press this button to set the Off Timer. If this button is pressed during Off Timer setting, set time will be changed</p> <ul style="list-style-type: none"> Off Timer can be set within range of "0.5 ~ 24 hour" Time can be adjusted in 0.5 hour unit within "0.5~3 hour" range and in 1 hour unit within "3~24 hour" range
⑥	Cancel button	Press this button to cancel the On/Off Timer
⑦	Set button	<ol style="list-style-type: none"> During On/Off Timer setting: Sets the On/Off Timer. However, if the existing timer is already set at the same time, current setting will be canceled Other occasion: Press the button for longer than 3 seconds to enable/disable button lock function
⑧	Mode button	<p>Press this button to set the operation mode</p> <ul style="list-style-type: none"> Mode will be changed in order of Auto → Cool → Dry → Fan → Heat Heat/Auto mode may not be controllable depending on the setting of the Dip switch 1 and 7 (on the wired remote controller)
⑨	Quiet button	<p>Press this button to enable/disable Quiet mode</p> <ul style="list-style-type: none"> Quiet mode is not available during Fan mode Command will be ignored if the connected indoor unit does not support the Quiet mode

Function		
⑩	Swing button	Press this button to set/stop the movement of the indoor unit while air conditioner is operating
⑪	Sleep button	Press this button to set/cancel the sleep mode <ul style="list-style-type: none"> ▪ Sleep mode is not available if the air conditioner is not operating in either Cool or Heat mode ▪ Command will be ignored if the connected indoor unit does not support the Sleep mode
⑫	Filter reset button	Transmit filter reset command to the indoor unit
⑬	Temp. button	Press this button to display the room temperature for 3 seconds. Displayed temperature value will be measured from the temperature sensor on the wired remote controller
⑭	Set temperature/Room temperature display	<ol style="list-style-type: none"> 1. Set temperature display <ul style="list-style-type: none"> ▪ Set temperature will be displayed in general. However, set temperature is not displayed during Fan mode 2. Room temperature display <ul style="list-style-type: none"> ▪ When the Temp. button is pressed, room temperature will be displayed (Value of the displayed temperature will be measured by the temperature sensor on the wired remote controller.) ▪ Range of the room temperature (in Celsius) : -9 ~ 40°C ▪ Range of the room temperature (in Fahrenheit) : 0 ~ 99°F ▪ If the room temperature is not within the range, 'LO' or 'HI' will be displayed.
⑮	On/Off Timer and Error indicator	<ul style="list-style-type: none"> ▪ Displays the status of On/Off timer ▪ Displays the error code when error occurs
⑯	Operation mode indicator	Indicates the operation mode of the indoor unit (Cool/Auto/Dry/Fan/Heat)
⑰	Fan speed indicator	<p>Displays the fan speed setting</p> <p>Low Medium High</p> <p>Fan Speed Fan Speed Fan Speed</p> <p>Auto/Turbo</p> <p>Fan Speed Fan Speed Fan Speed</p> <p>Vertical air swing On</p> <p>Swing</p>
⑱	Special function display	<p>Restricted : This indicator will blink for 3 seconds when selected function is not supported by indoor unit.</p> <p> : This indicator will be displayed when part of the buttons are locked.</p> <p>Filter : This indicator will be displayed when filter replacement time is reached.</p> <p>Auto Stop : This indicator will be displayed when automatic stop function is set.</p> <p> : This indicator will be displayed when all the buttons are locked.</p> <p>Occupied : This indicator will be displayed when the wired/wireless remote controller usage is restricted by upper layer controller.</p>

PCB description



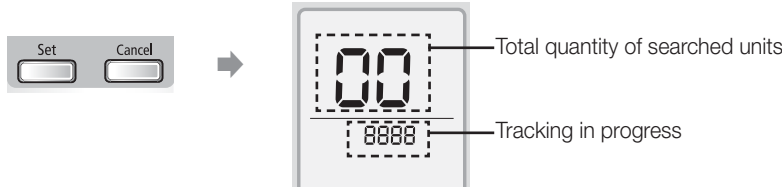
No.	Name	Description
①	Option switches	Sets the additional functions for wired remote controller
②	Software upgrade connector	It is used to upgrade the software
③	Communication & Power Wiring terminal	<ul style="list-style-type: none"> • Red/Blue wire : Communication connection with indoor unit (F3/F4) • Orange/Yellow wire : Power connection with indoor units (V1/V2)

I Individual control system

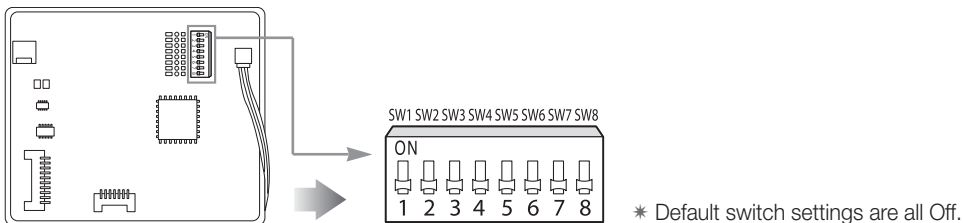
3. Wired remote controller

① MWR-WH00

3) Additional function

▶ Indoor unit tracking function	
Function	Wired remote controller tracks the connected indoor units.
Control	<p>Press the [Set] and [Cancel] button at the same time for 5 seconds. Error indicator will show that tracking is in progress and when the tracking is done, number of searched indoor units will be displayed on the Temperature display.</p> 

4) Option switches



Switch No.	OFF(Default)	ON
SW 1	For heat pump models	For cooling only models
SW 2	Allow both wireless and wired remote controller usage	Disallow wireless remote controller usage
SW 3	Set wired remote controller as Master	Set wired remote controller as Slave
SW 4	Display temperature in Celsius (°C)	Display temperature in Fahrenheit (°F)
SW 5	Use the indoor unit temperature sensor for the indoor unit control	Use the temperature sensor in the wired remote controller for the indoor unit control
SW 6	No function	Use the average value of the indoor unit sensor and the wired remote controller sensor for the indoor unit control
SW 7	Enable auto mode	Disable auto mode
SW 8	No function	No function

▶ SW 2

- ① If you set 'Disallow wireless remote controller usage' from the wired remote controller, indoor unit can not be controlled by 'Auto Key or Wireless remote controller. However, Indoor unit can be controlled with 'Wired remote controller, Key-Tag interface module, External Contact or Centralized controller'.
- ② If you set the Level from Centralized control system (such as Centralized controller, DMS2, S-NET3), indoor unit cannot be controlled by 'Wired remote controller, Key-Tag interface module, External Contact, Auto Key, Wireless remote controller', and it can be only control by centralized control system.

▶ SW 5/6

- ① It received command from Master wired remote controller (84H) and ignores command from the Slave wired remote controller (86H).
- ② When Dip SW 6 setting is ON, air conditioner will use the average value of the temperature sensor in wired remote controller and indoor unit regardless of the setting on the Dip SW5.


5) User setting mode

► User setting mode

Function

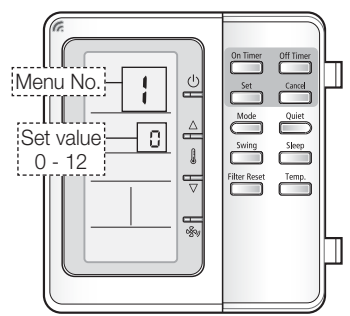
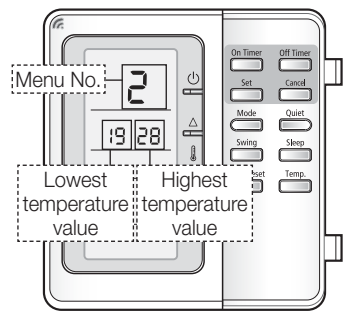
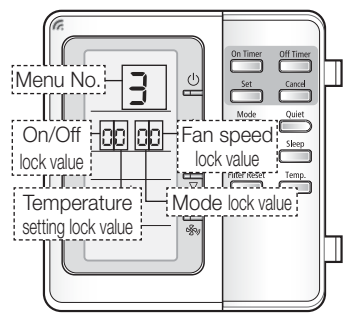
If you want to use the following functions, you can set it from the user setting mode:

- ① Auto stop function
- ② Temperature setting restriction function
- ③ Partial lock function



Displays number of the menu

Press the 'Off Timer' button for more than 3 seconds.

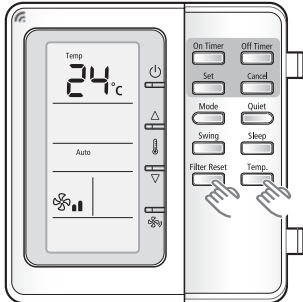
Menu	Description	Control buttons and display
1	<p>This function will stop the operation automatically after certain period of time from the last use of the wired remote controller.</p> <ol style="list-style-type: none"> 1. From menu no. '1', press the 'Set' button. 2. Set the time with the 'Temp. Δ or ∇' button. <ul style="list-style-type: none"> ▪ Time will be adjusted in 1 hour unit each time the button is pressed and it can be adjusted from 0~12 hour range. ▪ If you set the time to 0, auto stop function will be disabled. 3. Press the 'Set' button to complete the auto stop setting. <ul style="list-style-type: none"> ▪ If the 'Cancel' button is pressed changes will be canceled. ▪ If centralized control is set, auto stop function will not be executed. ▪ Auto stop setting will be remained even after power reset. 	
2	<p>This function will restrict set temperature range for cool and heat mode.</p> <ol style="list-style-type: none"> 1. From menu no. '2', press the 'Set' button. 2. Set the lowest temperature with the 'Temp. Δ or ∇' button. <ul style="list-style-type: none"> ▪ Temperature will be adjusted in 1°C unit each time the button is pressed. 3. Press the 'Set' button and set the highest temperature with the 'Temp. Δ or ∇' button. <ul style="list-style-type: none"> ▪ Lowest temperature can be set within 16~30°C, and highest temperature can be set from 18~30°C. (Lowest temperature in cool mode will remain 18°C even though the setting may be 16°C.) 4. Press the 'Set' button to complete the setting. <ul style="list-style-type: none"> ▪ If the 'Cancel' button is pressed changes will be canceled. ▪ If the 'Cancel' button is pressed for more than 3 seconds, set temperature restriction will be canceled. ▪ Set temperature restriction setting will be remained even after power reset. 	
3	<p>This function will lock part of the wired remote controller.</p> <ol style="list-style-type: none"> 1. From menu no. '3', press the 'Set' button. 2. Press the 'Temp. Δ or ∇' to adjust the value for 'Operation On/Off lock', 'Set temperature lock', 'Operation mode lock' and 'Fan speed lock'. Press the 'Set' button after adjusting each value to complete the setting. <p>0: Unlock function 1: Lock function</p> <ul style="list-style-type: none"> ▪ If the 'Cancel' button is pressed changes will be canceled. ▪ If the all button lock function is set, partial lock function will not be effective. ▪ Set temperature restriction setting will be remained even after power reset. 	

I Individual control system

3. Wired remote controller

① MWR-WH00

6) Service mode



* Press the [Filter Reset] and [Temp.] button at the same time for more than 5 seconds to access the service mode.

Menu	Monitoring description	Modification
1	Indoor unit option code	Available
2	Indoor unit Main/RMC address	
3	Indoor unit cycle data	
4	Indoor temperature compensation for the wired remote controller	Available
5	RPM compensation	
6	EEV step of the stopped indoor unit during heat mode	
7	Filter replacement time setting	
8	Temperature compensation value under heat mode	
9	Centralized control usage	
10	Drain pump usage	
11	Electric heater usage	
12	Water coil usage	
13	External control usage	
14	Quantity of connected indoor unit	
15	Option switch setting of the wired remote controller	
16	Software version of the wired remote controller	

- All the displayed information in service mode is the information of Master indoor unit. (When there are multiple indoor units connected)
- If the wired remote controller is connected to an indoor unit which does not support additional functions, only following functions will be available : Menu No.4, 14, 15 and 16
- 'NONE' will be displayed if the indoor unit does not support the function.

Menu	Detail description	Control buttons and display
	<p>Setting/Checking the indoor unit option code</p> <ul style="list-style-type: none"> ▪ Option code : Detail option such as indoor unit model type, indoor unit capacity, blackout backup and drain pump control, can be set with couple of sets of 6 digit numbers (Ex: 0d7800-198091) ▪ Instruction <ol style="list-style-type: none"> 1) Select menu number 1 and press the [Set] button. 2) Press the [Temp. Δ or ∇] buttons and the [Set] button to set the 6 digits of the first page. 3) Press the [Mode] button to change the page number and set the next 6 digits. 4) Press the [On/Off] button to save the changed setting. ▪ If you have put the wrong number, press the [Cancel] button to exit without setting. 	

Menu	Detail description	Control buttons and display										
<p style="font-size: 2em; text-align: center;">2</p>	<p>Checking Main/RMC address</p> <p>1) Main address: Indoor unit's own address used for communication and individual control</p> <p>2) RMC address: Address used for group control</p> <ul style="list-style-type: none"> ▪ RMC (1) : Set channel for interface module ▪ RMC (2) : Address for group of indoor units 											
<p style="font-size: 2em; text-align: center;">3</p>	<p>Checking Indoor unit cycle data</p> <table border="1" data-bbox="375 683 869 896"> <thead> <tr> <th>Menu</th> <th>Data</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Room temperature</td> </tr> <tr> <td>2</td> <td>EVA IN temperature</td> </tr> <tr> <td>3</td> <td>EVA OUT temperature</td> </tr> <tr> <td>4</td> <td>EEV step of indoor unit</td> </tr> </tbody> </table>	Menu	Data	1	Room temperature	2	EVA IN temperature	3	EVA OUT temperature	4	EEV step of indoor unit	
Menu	Data											
1	Room temperature											
2	EVA IN temperature											
3	EVA OUT temperature											
4	EEV step of indoor unit											
<p style="font-size: 2em; text-align: center;">4</p>	<p>Setting Indoor temperature compensation for the wired remote controller</p> <ul style="list-style-type: none"> ▪ Current temperature: Adds temperature compensation value to the actual temperature measured by the temperature sensor in the wired remote controller. (Ex: Measure temperature 20°C, temperature compensation 5°C -> Current temperature shows 25°C. ▪ Temperature compensation; From '-9.9°C ~ 9.9°C' range, you can set the temperature compensation in 0.1°C unit. Set value will remain even after the power reset. 											
<p style="font-size: 2em; text-align: center;">5</p>	<p>Checking the status of indoor unit Fan RPM compensation</p> <ul style="list-style-type: none"> ▪ 0 : RPM compensation used ▪ 1 : No RPM compensation used 											
<p style="font-size: 2em; text-align: center;">6</p>	<p>Checking the EEV step of the stopped indoor unit during heat mode</p> <ul style="list-style-type: none"> ▪ 0 : 0 or 80 steps Auto control ▪ 1 : Fixed step to 80 											

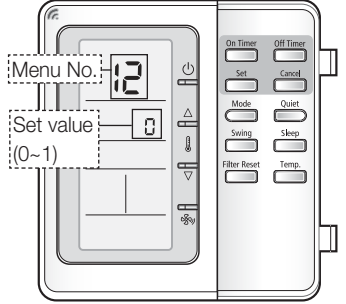
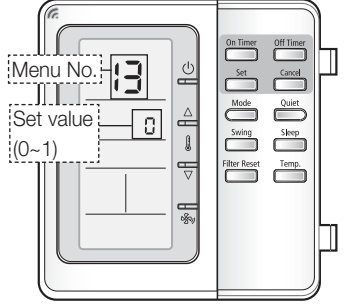
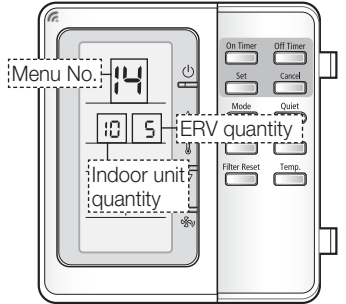
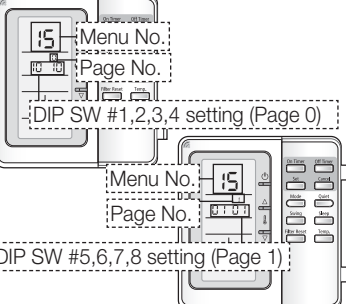
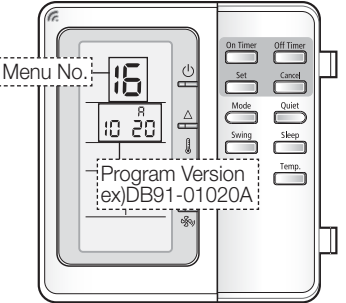
I Individual control system

3. Wired remote controller

① MWR-WH00

6) Service mode

Menu	Detail description	Control buttons and display
7	<p>Checking the filter replacement time setting</p> <ul style="list-style-type: none"> 0 : 2000 hours 1 : 1000 hours 	
8	<p>Checking the temperature compensation value under heat mode</p> <ul style="list-style-type: none"> 0 : 5°C 1 : 2°C <p>Above compensation value will not be effective if the setting is saved to use the value from the temperature sensor of the wired remote controller. (Check the setting on option switch 5 and 6 of the wired remote controller)</p>	
9	<p>Checking the Centralized control usage</p> <ul style="list-style-type: none"> 0 : Use 1 : No use 	
10	<p>Checking the Drain pump usage</p> <ul style="list-style-type: none"> 0 : Use 1 : No use 	
11	Menu not in use	

Menu	Detail description	Control buttons and display
<p style="font-size: 2em; text-align: center;">12</p>	<p>Checking the Water coil usage</p> <ul style="list-style-type: none"> ▪ 0 : Use ▪ 1 : No use 	
<p style="font-size: 2em; text-align: center;">13</p>	<p>Checking the External control usage</p> <ul style="list-style-type: none"> ▪ 0 : Use ▪ 1 : No use 	
<p style="font-size: 2em; text-align: center;">14</p>	<p>Checking the quantity of connected indoor unit and ERV</p>	
<p style="font-size: 2em; text-align: center;">15</p>	<p>Checking the Option switch setting of the wired remote controller</p> <ul style="list-style-type: none"> ▪ Page 0 : Set value of the DIP switch 1~4 ▪ Page 1 : Set value of the DIP switch 5~8 ▪ Press the [Temp. Δ or ▽] buttons to change the page ▪ DIP switch in Off status will be displayed as '0' and On status will be displayed as '1' 	
<p style="font-size: 2em; text-align: center;">16</p>	<p>Checking the Software version of the wired remote controller</p> <ul style="list-style-type: none"> ▪ Ex : If the program code is DB91-01020A, it will be displayed as '01020A' 	

I Individual control system

3. Wired remote controller

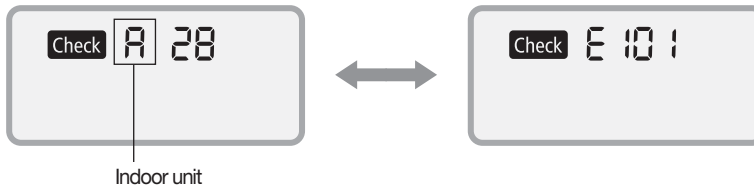
① MWR-WH00

7) Error display

▶ When the indoor/outdoor unit error occurs

- Main (COM1) address(A) of the indoor unit where error occurred and error code are displayed in turns.

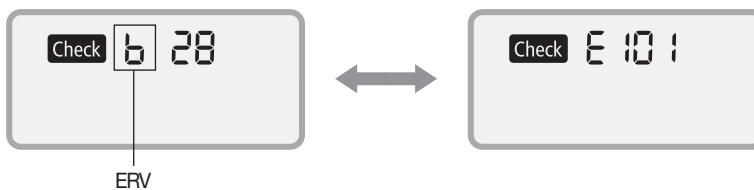
Ex) 101 error occurred in #28 indoor unit



▶ When the ERV error occurs

- Main (COM1) address (B) of the ERV where error occurred and error code are displayed in turns.

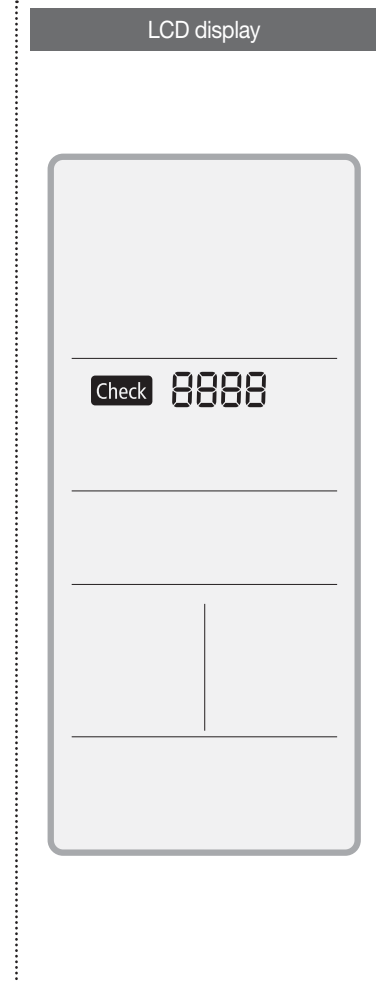
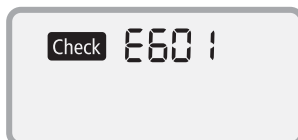
Ex) 101 error occurred in #28 ERV



▶ When the wired remote controller error occurs

- Error code is displayed only (Address will not be displayed.)

Ex) 601 error occurred in the wired remote controller



Error display priority

- ▶ Priority 1 : Wired remote controller error > Indoor/Outdoor unit error

Priority 2 : Displays master indoor unit error

(Master Indoor unit = Indoor unit whose option switch K10 is set OFF)

Priority 3 : Displays the error code of the indoor unit which has earlier Main (COM1) address

Priority 4 : Displays the error code of the indoor unit which has earlier COM2 address when Main (COM1) addresses is overlapped

Display	Explanation	Remark
607	<ul style="list-style-type: none"> ▪ Error occurs when 2 wired remote controllers are set as Master and installed in one communication cable. ▪ If communication cable is connected to opposite polarity, detection is impossible. ▪ Error is detected only in Master wired remote controller. 	High Priority
626	<ul style="list-style-type: none"> ▪ Error of independent ERV installation. ▪ When ERV is installed without an indoor unit. ▪ Error is detected only in Master wired remote controller. 	
627	<ul style="list-style-type: none"> ▪ Slave wired remote controller installation error. ▪ Error occurs when 2 slave wired remote controllers are set as Slave and installed in one communication cable. ▪ Error is detected only in Master wired remote controller. 	

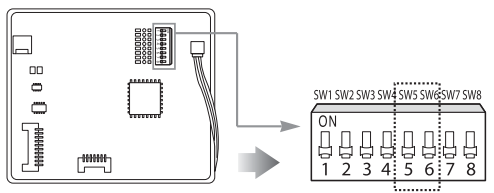
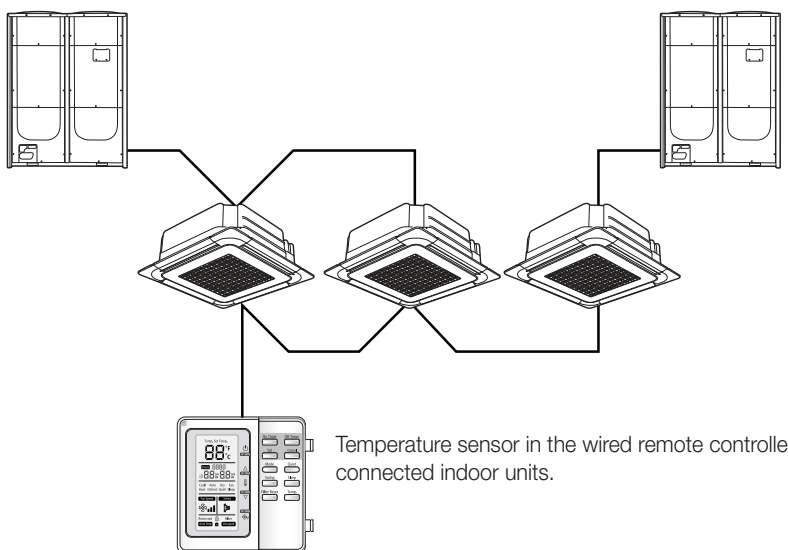
Display	Explanation	Remark
604	Communication Tracking Error.	<div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 10px;">High Priority</div> <div style="font-size: 2em; margin-right: 10px;">↑</div> <div style="font-size: 2em; margin-right: 10px;">↓</div> <div style="margin-left: 10px;">Low Priority</div> </div>
602	<ul style="list-style-type: none"> ▪ Mater ↔ Slave wired remote controller communication error. ▪ Error is detected only in Slave wired remote controller. 	
601	Wired remote controller ↔ indoor unit/ERV communication error.	
653	Temperature sensor OPEN/SHORT error.	
654	FRAM READ/WRITE error.	
619	<ul style="list-style-type: none"> ▪ Mixed installation of Celsius (°C)/Fahrenheit (°F) indoor unit error. ▪ Error occurs when indoor units with Celsius (°C)/Fahrenheit (°F) settings are installed together. ▪ Error is detected only in Master wired remote controller. 	
620	<ul style="list-style-type: none"> ▪ Celsius (°C)/Fahrenheit (°F) setting error of the wired remote controller. ▪ Error occurs when the indoor unit is set as Celsius and the wired remote controller is set as Fahrenheit or vice versa. ▪ Change the setting of DIP switch 4 when the 620 error occurs. 	

Note

- Refer to the installation manual of each device (Indoor/Outdoor Unit) for error code references.

8) Built-in temperature sensor of wired remote controller

Temperature control with built-in temperature sensor



DIP switch		Function
SW5	OFF	Use the temperature sensor in the indoor unit.
	ON	Use the temperature sensor in the wired remote controller.
SW6	OFF	Reserved.
	ON	Use the average value of the temperature sensors in the indoor unit(s) and the wired remote controller (SW5 in ON). Here, the wired remote controller chooses the indoor unit of the lowest MAIN address, or one of the indoor units at random.

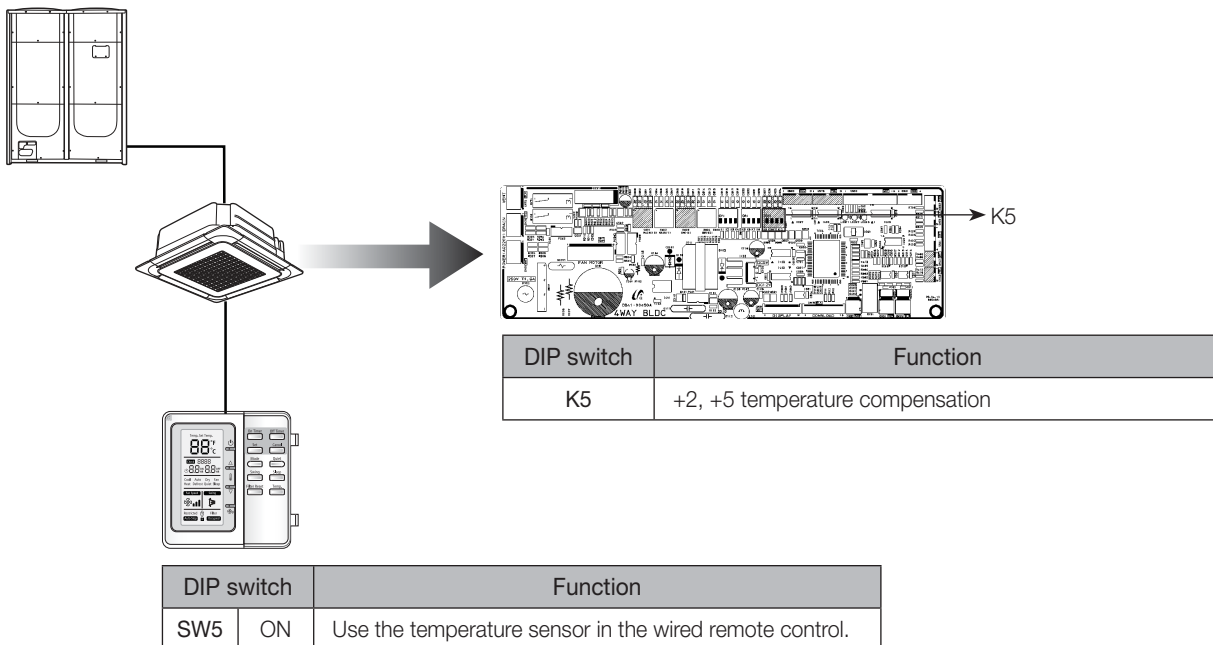
I Individual control system

3. Wired remote controller

① MWR-WH00

8) Built-in temperature sensor of wired remote controller

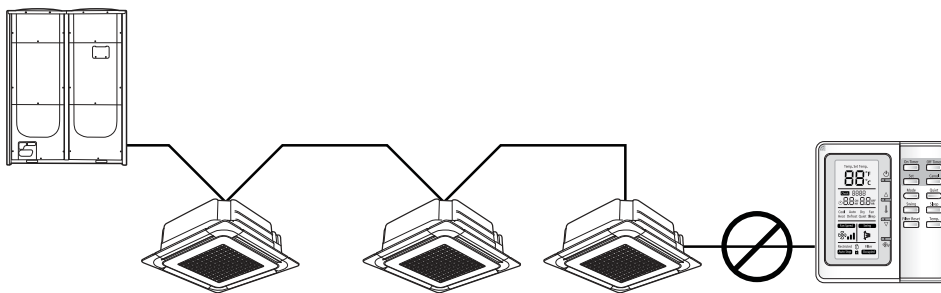
Heating mode temperature compensation



What happens to heating mode temperature compensation (+2°C or +5°C) when the use of the wired R/C built-in temperature is enabled?

- The heating mode temperature compensation is cleared. (0°C)

Power failure of wired remote controller



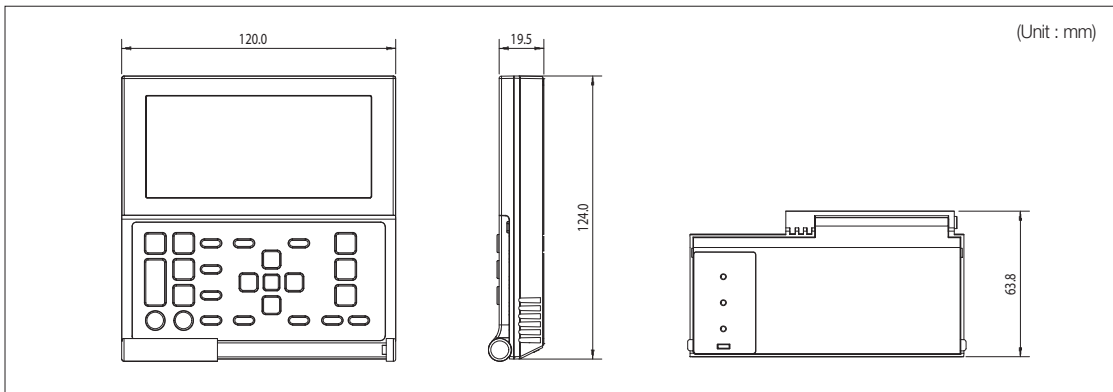
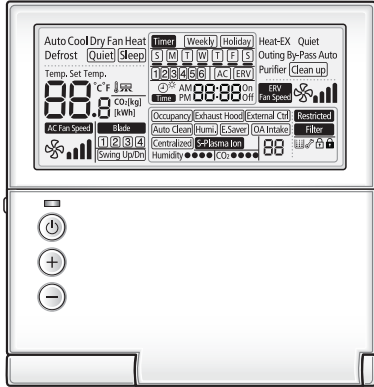
What if communication block occurs on the wired remote controller when its built-in temperature use is enabled?
(Block due to either power failure or disconnection only)

- When communication is blocked over 3 minutes,
 - ① Indoor unit ignores the built-in temperature sensor and accepts its sensor in the indoor unit.
 - ② Use setting temperature compensation in heating mode option. (Indoor unit K5)
- When communication resumes,
 - ① Built-in temperature use is recovered.
 - ② Setting temperature compensation in heating mode changes to 0°C.

3. Wired remote controller

② MWR-WE10

1) Features



(1) Air conditioner / ERV control

- 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
(Operation 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

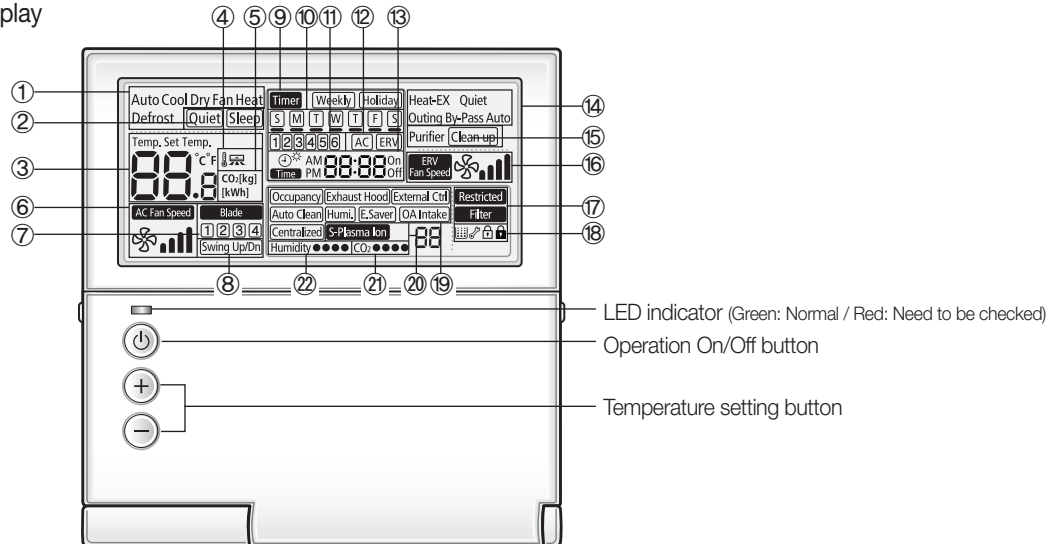
I Individual control system

3. Wired remote controller

② MWR-WE10

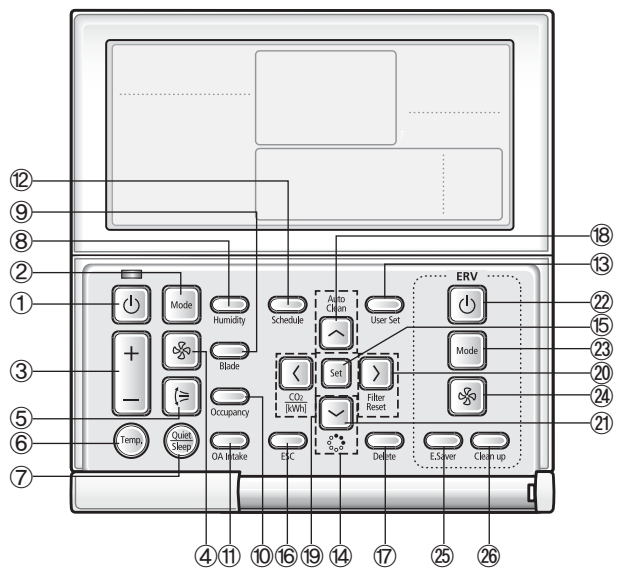
2) Description of parts

(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 88.8 °C CO ₂ (kg) (kWh)	Displays discharge temperature control
	⑤ AC Fan Speed	Displays CO ₂ /power consumption
	⑥ Blade 1 2 3 4	Displays AC fan speed
	⑦ Swing Up/Dn	Displays Blade selection
	⑧	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 AM 88:88 On PM 88:88 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 Occupancy Exhaust Hood External Ctrl Auto Clean Humi. E.Saver OA Intake Centralized	Displays occupancy detection/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

(2) Buttons



Classification	Button	Function	
Air conditioner related button	①	Operation On/Off button	Turn the air conditioner power On/Off
	②	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. button	Checks the indoor temperature
	⑦	Quiet/Sleep button	Selects quiet or sleep operation for the air conditioner
	⑧	Humidity button	Turns the AHU humidifying function On/Off
	⑨	Blade button	Selects a blade for individual control
	⑩	Occupancy detection button	Set the power to automatically turn off if there is nobody in the room
	⑪	Outdoor air intake	Select the AHU Outdoor intake function
Common function related button	⑫	Schedule Button	Select the schedule setting function
	⑬	User Set Button	Select the detailed setting function
	⑭	Navigational buttons	Move between items or change the item value
	⑮	Set button	Save new setting
	⑯	ESC button	Return to general mode from schedule and detailed setting screens
	⑰	Delete button	Cancel the schedule setting
	⑱	Auto Clean button	Use the auto cleaning function for your air conditioner
	⑲	CO ₂ /[kWh] button	Display the amount of CO ₂ and the power consumption
	⑳	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 button	Select the desired operation for the Ventilator(ERV)
	㉔	Fan speed button	Change the fan speed for your Ventilator(ERV)
	㉕	E. Saver button	Begin Energy Saving Operation
	㉖	Clean up button	Select air purification through the in/out load controls

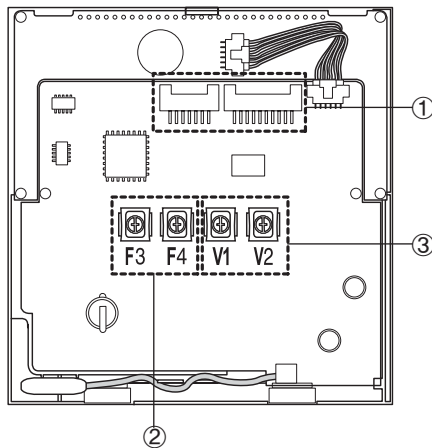
I Individual control system

3. Wired remote controller

② MWR-WE10

2) Description of parts

(3) PCB

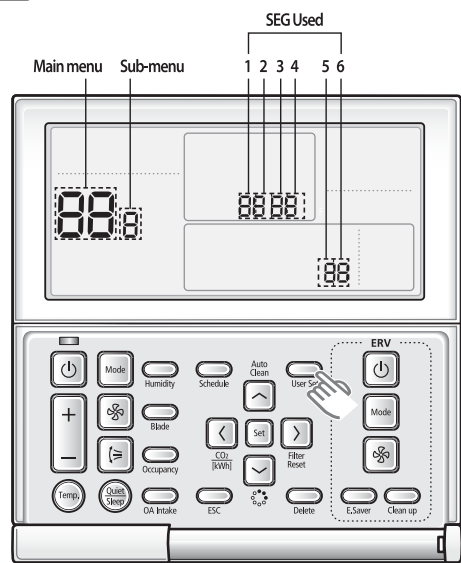


No.	Name	Description
①	Software upgrade connector	It is used to upgrade the software
②	Communication wiring terminal	Communication connection with indoor unit (F3/F4)
③	Power wiring terminal	Power connection with indoor units (V1/V2)

3) 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	Lock of partial button	All lock	1	0	0 – Unlock, 1 – Lock	-	
		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 Temperature 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	-	

How to set the user mode

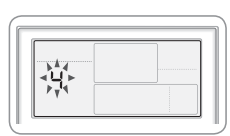


- (1) If you want to set the detailed settings, press the [User Set] button.
 - You will enter the User Set mode, and the [Main Menu] will be displayed.
- (2) Refer to the Wired Remote Controller's User Set list on the next page to select the desired menu.
 - Using the [^]/[v] buttons, select a main menu number and press the [>] button to enter the sub-menu setting screen.
 - Using the [^]/[v] 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 [^]/[v] 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.

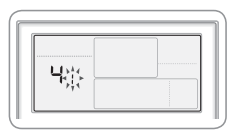
Note

- While setting the data, you can use the [^]/[v] 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.

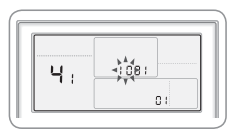
Current time setting (Example)



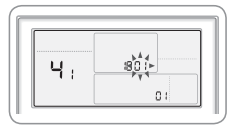
- (1) Press the [User Set] button.
 - (Main Menu) will be displayed, and you can press the [^]/[v] buttons to select No.4, which will set the current time.



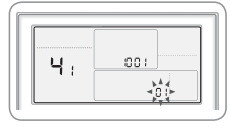
- (2) Press the [>] button to select 'Year, Month, Date' in the [Sub-menu].
 - Press the [^]/[v] buttons to select No. 1. You can modify the year/month/date setting.



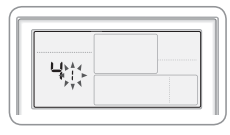
- (3) Press the [>] button to select the 'Year'.
 - Press the [^]/[v] buttons to select the year ('00~'99).



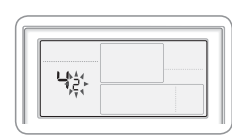
- (4) Press the [>] button to select the 'Month'.
 - Press the [^]/[v] buttons to select month(01~12).



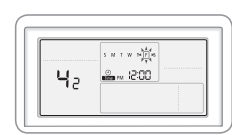
- (5) Press the [>] button to select the 'Day'.
 - Press the [^]/[v] buttons to select day(01~31).



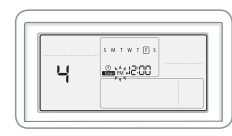
- (6) Press the [Set] button to complete your setting of 'Year, Month, Day'.
 - The setting changes will be applied and you can exit to the sub-menu.



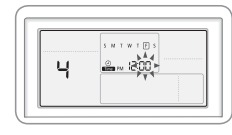
- (7) In the sub-menu, select 'day, AM/PM, hour, minute'.
 - Press the [^]/[v] buttons to select no. 2. You can set the 'day, AM/PM, hour, minute'.



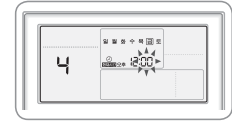
- (8) Press the [>] button to select the 'Day'.
 - Press the [^]/[v] buttons to select day (Sun~Sat).



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



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



- (11) Press the [>] button to select the 'Minute'.
 - Press the [^]/[v] 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 system

3. Wired remote controller

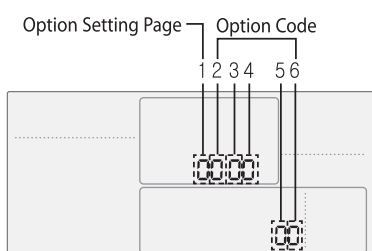
② MWR-WE10

4) Service mode

Main menu	Sub menu	Function	SEG Used	Default	Range	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	-	
	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	Temperature control reference	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	-

Main menu	Sub menu	Function	SEG Used	Default	Range	Unit	
4	1	Indoor unit main address checking	1, 2	-	Main address (0~63)	-	
		Indoor unit main address setting	3, 4	-	Main address (0~63)	-	
		Indoor unit RMC address setting / checking	5, 6	-	RMC address (00H~2FH)	-	
	2	Indoor unit option code setting / checking	1)*	-	Indoor unit option code (24 bits)	-	
	3	Indoor unit option switch setting / checking	1)*	-	Refer to the indoor unit installation manual for details	-	
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	AHU discharge temperature setting /checking	Use of discharge temperature control	1	-	0-No use, 1-Use	-
			Cooling discharge temperature	3, 4	-	10~25°C	1°C
			Heating discharge temperature	5, 6	-	28~43°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 Plus fan RPM setting / checking	Air supply RPM	1, 2	-	10~27RPM	1 RPM
	Air exhaust RPM		3, 4	-	10~27RPM	1 RPM	
0		Factory setting	1	-	0- No use, 1-Factory setting	-	

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



► 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	-

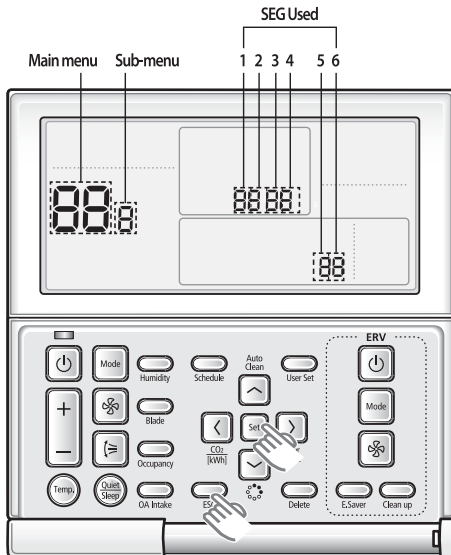
I Individual control system

3. Wired remote controller

② MWR-WE10

4) Service mode

How to set the user 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 [^]/[v] buttons, select a main menu number and press the [>] button to enter the sub-menu setting screen.
- Using the [^]/[v] 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 [^]/[v] 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.

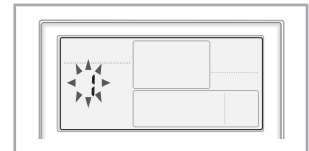
☑ Note

- While setting the data, you can use the [^]/[v] 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

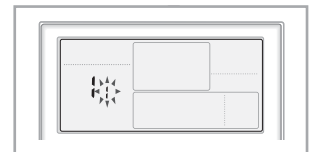
(1) Press the [Set] and [ESC] buttons at the same time for more than 3 seconds.

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



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

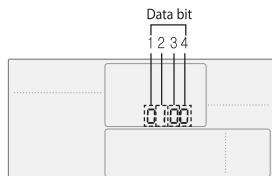
- Press the [^]/[v] button and select no.1



(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

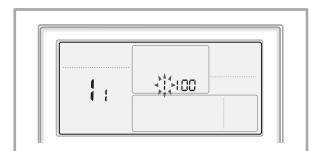


SEG1: Heat pump indoor unit
 SEG2: Use wireless remote controller
 SEG3: Master wired remote controller
 SEG4: Temperature display – Celsius (°C)



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

- Press the [^]/[v] 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.

5) Error display

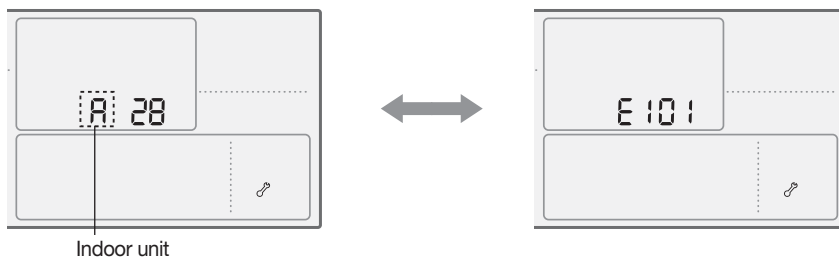
Error codes for the Wired Remote Controller and the product connected to the Wired Remote Controller will be displayed in the LCD display.



LCD Display

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

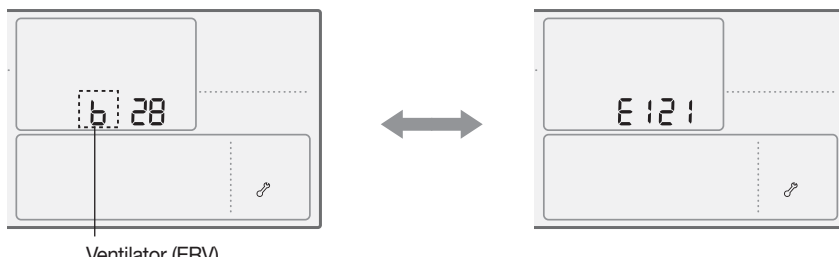
- The product address for the error will be displayed, followed by the error code.
Example : Error 101 occurs for indoor unit No. 28.



Indoor unit

► When an error occurs in your ventilator (ERV) (Product group display: b)

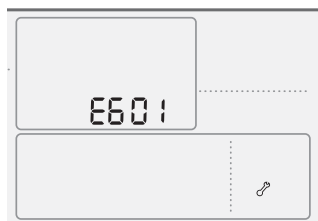
- The product address for the error will be displayed, followed by the error code.
Example : Error 121 has occurred at ventilator (ERV) No. 28.



Ventilator (ERV)

► 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 system

3. Wired remote controller

② MWR-WE10

5) Error display

Wired remote controller error codes

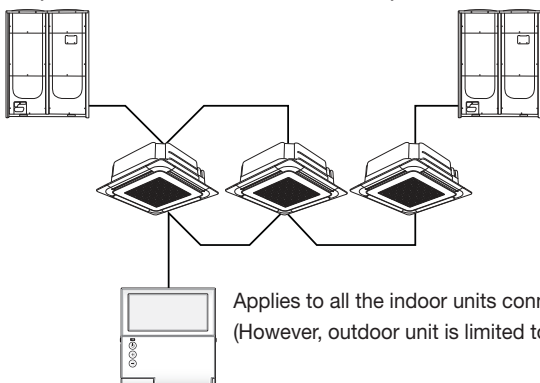
Display	Description	Remarks
601	Communication error between wired remote controller and indoor/ERV units after successful communication	
602	No communication between Master (Main) and Slave(Sub) wired remote controllers	
604	No communication between wired remote controller and indoor/ERV units	
606	Wired 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)	
621	Slave (Sub) wired remote controller has different option setting with Maser (MAIN)	
627	Two or more wired remote controllers set as Slave (SUB)	
630	No By-Pass function on ERV unit but wired remote controller is set to use By-Pass	
631	No Auto function on ERV unit but wired remote controller is set to use Auto	
653	Temperature sensor Open/Short error	Detection available in models with temperature sensor
654	<ul style="list-style-type: none"> • Memory error • No damper feedback 	

Note

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

6) Wireless remote controller built-in temperature sensor

Temperature control with built-in temperature sensor

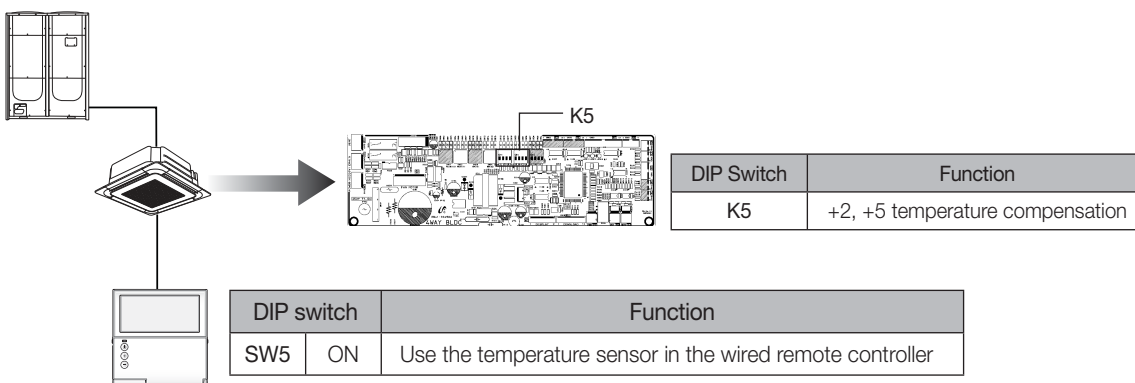


Applies to all the indoor units connected within a group.
(However, outdoor unit is limited to DVM PLUS II, III, IV, Mini DVM and FJM)

* 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	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



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	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	-

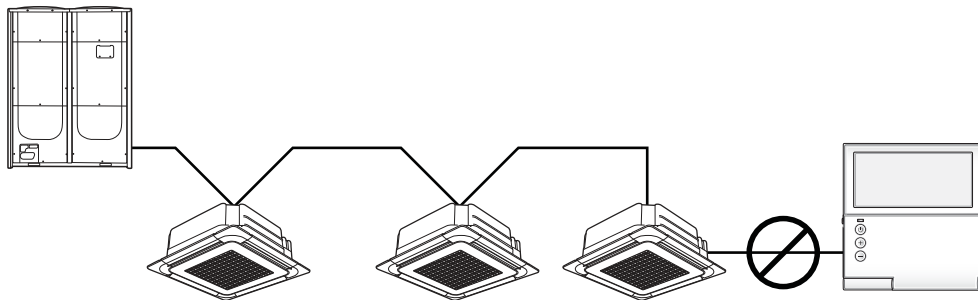
I Individual control system

3. Wired remote controller

② MWR-WE10

6) Wireless remote controller built-in temperature sensor

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



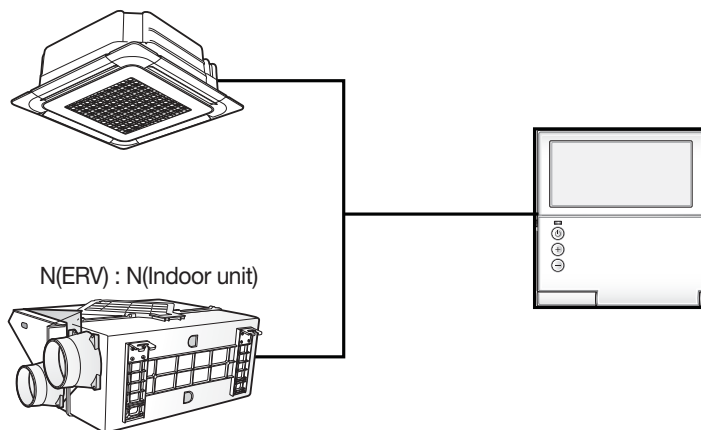
► When communication error occurs over 3 minutes,

- 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.

► When communication resumes,

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

7) Energy saving operation mode



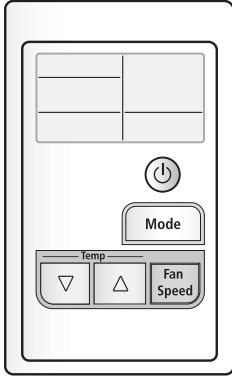
* Energy saving operation mode is available only when there is at least one indoor unit and ERV is connected.

- 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.

3. Wired remote controller

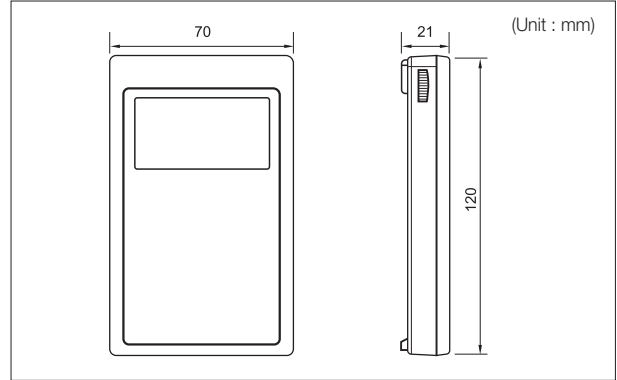
③ MWR-SH00

1) Features

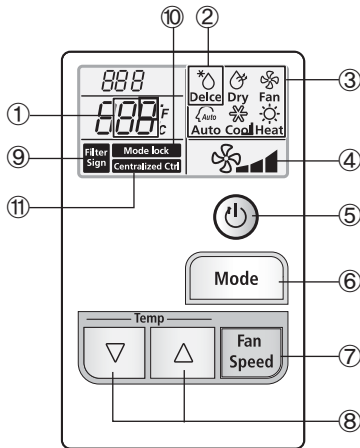


Easy air conditioner control

- Compact design.
- Operation On /Off control.
- Set operation mode and fan speed.
- Operation mode lock.
- Filter replacement alarm and reset.



2) Description of parts



No.	Name	Description
①	Set temperature display	Indicates the set temperature of the indoor unit.
②	Defrost operation icon	Displayed when Defrost operation is started.
③	Operation mode icon	Displays the current operation mode.
④	Fan speed display	Displays the fan speed setting among Auto, Low, Medium, or High.
⑤	Operation On/Off button	Press this button to turn on all indoor units connected to a wired remote controller. Press once again to turn off all the connected indoor units.
⑥	Operation mode setting button	Press this button to select the operation mode in the following order: Auto → Cool → Dry → Fan → Heat
⑦	Fan speed button	Press the button to select one fan speed from Auto, Low, Medium, or High.
⑧	Temperature setting button	Press button to decrease the set temperature by 1°C. Press to increase the set temperature by 1°C.
⑨	Filter replacement notice display	Indicates if the filter replacement time is reached.
⑩	Operation mode lock display	Indicates that the operation mode lock function is set.
⑪	Central control display	Indicates that the remote controller prohibition option is set. (Only upper controller, such as the Centralized controller, can control indoor unit)

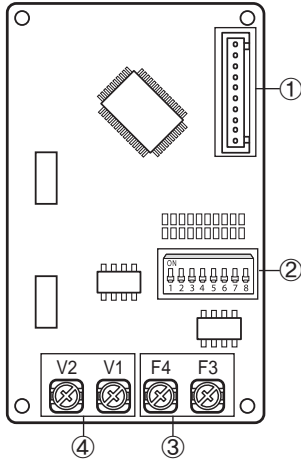
I Individual control system

3. Wired remote controller

③ MWR-SH00

2) Description of parts

PCB description



No.	Name	Description
①	Software upgrade connector	It is used to upgrade the micro-controller's software.
②	Option switches	It is possible to set additional functions for wired remote controller.
③	Communication wiring terminal	Connection to indoor unit (F3/F4).
④	Power wiring terminal (12V DC)	Connection to indoor unit (V1/V2).

3) Additional functions

Function keys

► Filter replacement reset keys

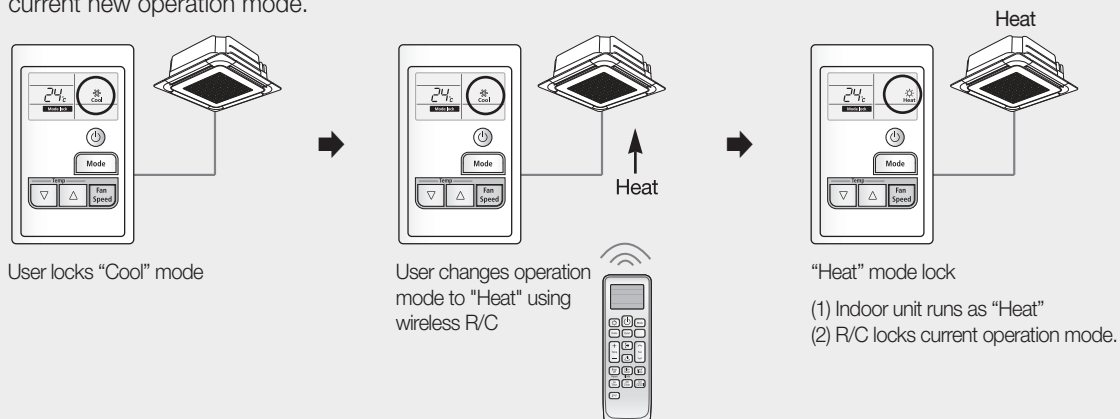
Function	Filter replacement alarm display disappears. Indoor units recount the filter replacement time.
Control	<p>Press the temperature setting buttons for 5 seconds, filter replacement alarm display disappears.</p>

► Operation mode lock keys

Function	Disable the operation mode selection.
Control	<p>Press both Mode button and Fan speed button for 5 seconds to fix the current operation mode. (At that time, it is possible to set temperature control, and fan speed.) Press both Mode button and Fan speed button for 5 minutes to release the operation mode lock function.</p>

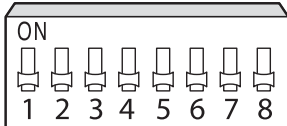
Caution

- ◆ During operation mode lock, if user change operation mode using other controller, then MWR-SH00 locks current new operation mode.



Option switches

SW1 SW2 SW3 SW4 SW5 SW6 SW7 SW8



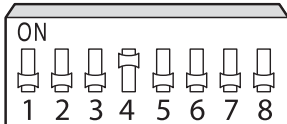
Able to set an additional function in a simple way with 8 option switches on the wired remote controller PCB.

* Default switch settings are all OFF.

Switch No.	OFF	ON
SW 1	For cooling and heating model	For cooling model only (If the operation mode is selected, heating operation display is skipped.)
SW 2	Temperature display in Celsius (°C)	Temperature display in Fahrenheit (°F)
SW 3	Able to use both wireless remote controller and wired remote controller for indoor unit control	Unable to use wireless remote controller
SW 4	Use Auto mode	Auto mode skip
SW 5	Mode lock release in case of power reset or failure	Automatic mode lock even in case of power reset or failure
SW 6	-	-
SW 7	-	-
SW 8	If two wired remote controllers are used to control 1 indoor unit, it is set as a Master wired remote controller	If two wired remote controllers are used to control 1 indoor unit, it is set as a Slave wired remote controller

Auto mode skip function

SW1 SW2 SW3 SW4 SW5 SW6 SW7 SW8



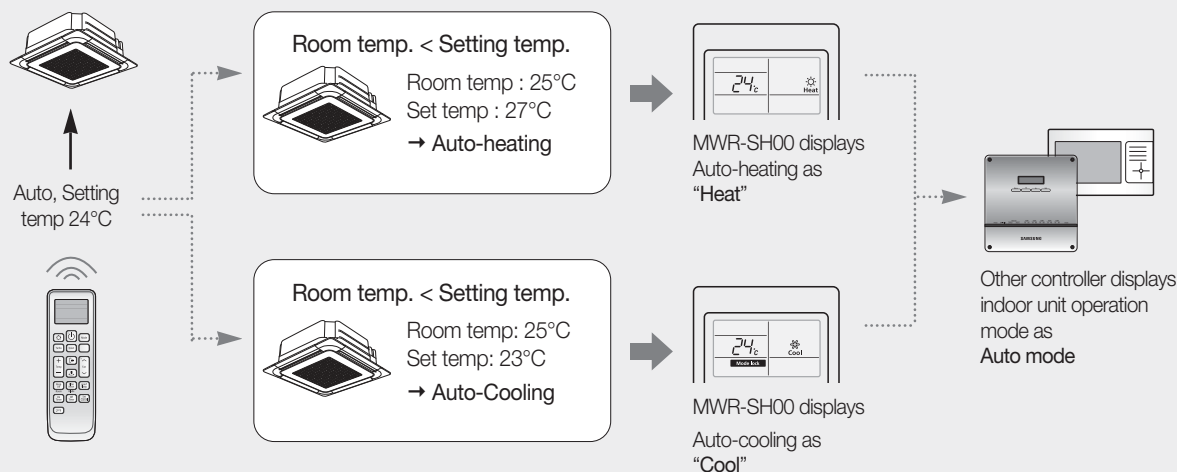
Option switch K4 = ON

When user press mode button, operation mode will be changed following below order.

→ Cool → Fan → Dry → Heat →

Caution

- ◆ If other controller gives Auto mode signal to indoor unit, MWR-SH00 can display different operation mode.



When SW4 is ON, MWR-SH00 never displays "Auto"

I Individual control system

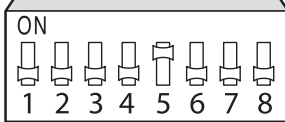
3. Wired remote controller

③ MWR-SH00

3) Additional functions

Initial mode lock state

SW1 SW2 SW3 SW4 SW5 SW6 SW7 SW8



Option switch K5 = ON

As soon as power is applied, MWR-SH00 locks indoor unit operation mode.

SW5 - Off	SW5 - On
<p>After power reset, "Mode lock" is released.</p>	<p>As soon as power recovers, MWR-SH00 keeps indoor unit operation to the locked mode.</p>
<p>Press "Mode"+"Fan" together to lock operation mode</p>	<p>Press "Mode"+"Fan" together to release lock</p>

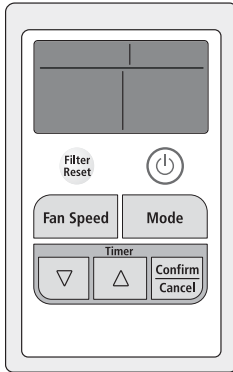
Operation checking

Operation	Display
Power input	<p>LCD is turned on for about 1second, all segments are lit.</p>
Indoor unit Tracking	<p>Temperature display indicates Tracking is under way. When communication with indoor units is made it displays the total number of indoor units connected with the wired remote controller (ex: if 4 indoor units are connected).</p>
Normal connection of indoor unit	<p>Display the operation statue of the connected indoor units.</p>
Communication error	<p>Error 604 display. (Communication error between the wired remote controller and an indoor unit). After checking the communication line wiring between the indoor unit and the wired remote controller, reset the power of wired remote controller.</p>

3. Wired remote controller

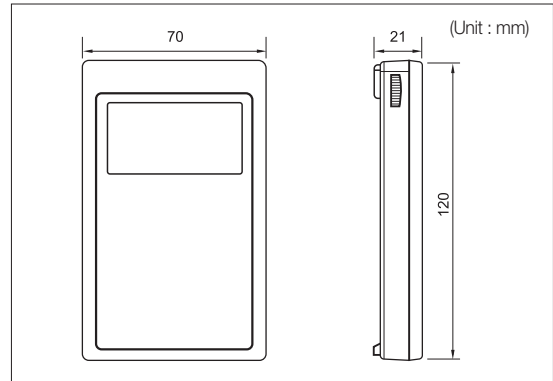
4) MWR-VH02

1) Features

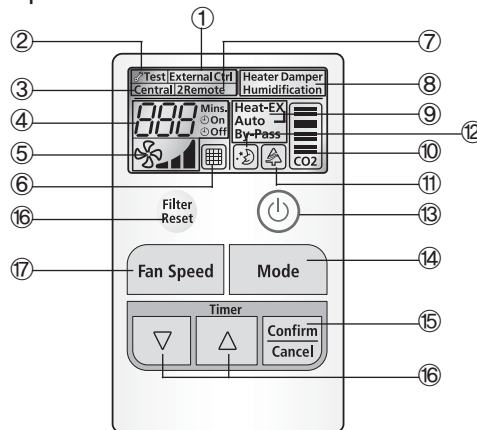


Heat exchange unit (ERV) Control & Monitoring

- Operation On/Off control.
- Set ventilation mode, Fan speed.
- Filter replacement alarm and reset.
- Set operation On/Off timer.
- Set operation delay time.
(In case of synchronous operation with system air conditioner)



2) Description of parts



No.	Name	Description
①	External control display	Display when ERV is controlled synchronously with DVM indoor unit.
②	Test display	Indicates that an error occurs in ERVs.
③	Centralized controller display	Indicates that the remote controller prohibition option is set. (Only upper controller, such as the Centralized controller, can control indoor unit)
④	Time / Error display	1) When synchronously controlled with system air conditioner : Displays operation delay time. 2) When not synchronously with the system air conditioner : Displays scheduled operation time. 3) When an error occurs: Displays error code.
⑤	Display fan speed	Indicates the Fan speed. (Low → High → Turbo)
⑥	Filter replacement alarm icon	Indicates if the filter replacement time is reached.
⑦	2 remote control display	Indicates if two remote controllers are used for one ERV.
⑧	Display when external device is in use (Option).	Indicates if the optional items are in use, such as heater, damper and humidifier.
⑨	Ventilation mode display	Display the ventilation mode setting. Heat exchange mode: Heat-Ex/Auto ventilation mode : Auto/ Normal ventilation mode: By-Pass
⑩	CO ₂ Sensor level display (Option)	Displays CO ₂ concentration levels.
⑪	Air purification mode icon	Indicates that air purification mode has been selected.
⑫	Sleep mode icon	Indicates that Sleep mode has been selected.
⑬	Operation On/Off button	Press this button to turn on all connected ERVs. Press once again to turn off all connected ERVs.
⑭	Operation mode selection button	Press this button to select ERV operation mode. Each press of the button changes operation modes.
⑮	Confirm/Cancel button	If not controlled synchronously with DVM indoor unit: complete or cancel the Operation timer setting. If controlled synchronously with DVM indoor unit: complete or cancel synchronization time delay setting.
⑯	Timer or synchronization time delay selection button	If ERV is on : Select minutes to turn off ERV , If ERV is off: select minutes to turn off ERV
⑰	Fan speed button	Press this button to change the fan speed in the following order (Medium → High → Turbo).
⑱	Filter replacement alarm reset button	Press this button to clear the filter replacement alarm and reset the filter time.

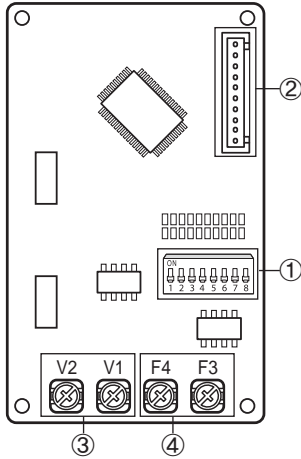
I Individual control system

3. Wired remote controller

④ MWR-VH02

2) Description of parts

PCB description



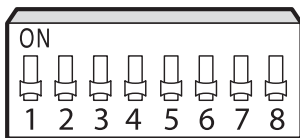
No.	Name	Description
①	Option switches	It is possible to set additional functions for wired remote controller.
②	Software upgrade connector	It is used to upgrade the software
③	Power wiring terminal	Power connection with ERV (V1/V2)
④	Communication wiring terminal	Communication connection with ERV (F3/F4)

3) Function keys

▶ Tracking function

Function	<p>① If an additional ERV is connected to the ERV remote controller, ② if a connected ERV is removed, ③ if ERV remote controller is replaced, it is compulsory to carry out Tracking in the ERV remote controller for ERVs.</p>
Control	<p>Press both Fan speed and Mode button on the ERV remote controller for 5 seconds. Then LCD backlight is turned on and a sign of Tracking (Eb) appears on the time display.</p> <div style="text-align: center;"> </div> <p>After tracking, if the operation is started, operation mode is turned to "heat exchange" while Fan speed is turned to "high". (ERV does not support blackout recovery Function)</p>

4) Option switches



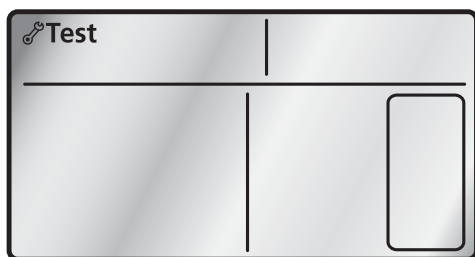
* Default switch setting

DIP 01

Switch No.	OFF	ON	Remarks
SW 1	Disuse auto mode	Use auto mode	Switch to use only when the Ventilator has Auto mode
SW 2	Disuse air purifying mode	Use air purifying mode	Switch to use only when the Ventilator has Air purifying function
SW 3	Disuse external control mode	Use external control mode	Switch to use only when the System Air Conditioner is connected
SW 4	Disuse sleep mode	Use sleep mode	Classified by residential/commercial use
SW 5	Disuse by-Pass mode	Use by-Pass mode	Switch to use only when the Ventilator has By-Pass mode
SW 6	-	-	-
SW 7	-	-	-
SW 8	Master ERV wired remote control	Slave ERV wired remote control	Classified by Master/Slave

5) Error code display

LCD displays the errors of the ERV wired remote control and ventilator.



- If **Test** is indicated, the corresponding error codes are indicated as well.
- When LCD displays the same error of several ventilators, the ventilator with the lower address is displayed first.

ERV wired remote controller error display

Display	Explanation	Remarks
601	Communication error between ERV wired remote control and ventilator (After the communication is cut off for continuous 3 minutes)	-
602	Communication error between Master ERV wired remote control and Slave ERV wired remote control (After the communication is cut off for continuous 3 minutes)	-
603	Communication Packet error	-
604	Tracking error between ERV wired remote control and ventilator over 10 times	-
605	Communication cut off between ERV wired remote control 7-day scheduler for 3 minutes	-
606	Cross installation error of COM1/COM2 of ERV wired remote control	-
607	Communication error when both remote controls are set as Master	When using 2- remote control
608	No ventilators installed (No ventilators found after tracking)	-
609	Not yet installed the external device (The external device is not yet detected after setting up the option for external device and tracking)	When using external device
618	<ul style="list-style-type: none"> ▪ Exceeding maximum number of indoor units (16 units) ▪ After checking the number of indoor units (Micom Reset) 	-
621	DIP switch setting option error for Master/Slave ERV wired remote control	-
627	Error is detected if model name connects other 2 Slave wired remote controller	-

I Individual control system

3. Wired remote controller

④ MWR-VH02

5) Error code display

ERV wired remote controller error display while detecting ventilation system

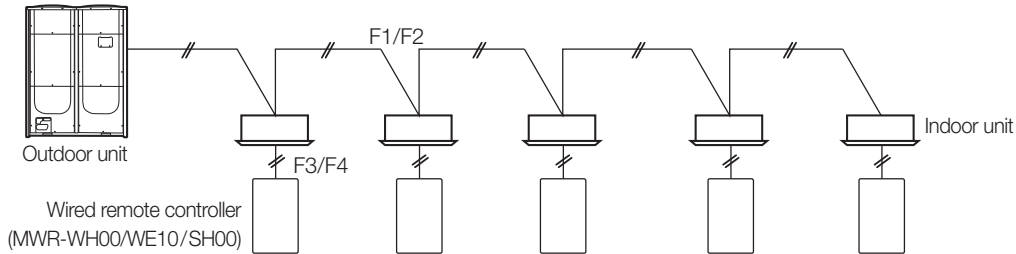
Display	Explanation	Remarks
10 1	Communication error for 3 minutes after detecting COM1	-
12 1	Indoor temperature sensor error (Short/Open)	-
13 7	VOC Sensor is not connected or Short	-
13 8	GAS Sensor is not connected or Short	-
13 9	CO ₂ sensor error (Short/Open)	Detected only by the ventilator which has CO ₂ sensor
16 2	EEPROM error	-
18 6	SPI is not connected or has an error	Detected only by the ventilator which is connected to SPI
19 5	Cover is opened	-
20 1	Tracking error or Master ventilator (After 5 times of tracking, Slave ventilators can not be detected.)	-
20 2	System failure due to communication error after tracking	-
22 1	Outdoor temperature sensor error (Short/Open)	-
56 1	Supply Air fan motor sensor error	-
56 2	Exhaust Air fan motor sensor error	-
56 4	Clean Fan operation error	-
60 1	Communication error between ERV wired remote control and ventilator (After the communication is cut off for continuous 3 minutes)	-
60 6	When the ERV wired remote control is connected to the Indoor Unit's COM1	-
65 2	Communication error by installing COM1 dual Master	-
65 3	Temperature sensor error (Open/Short)	Detected only by the ventilator which has temperature sensor
65 4	Damper error (When there is no switch input for 100 seconds while monitoring the damper)	-

3. Wired remote controller

5 Installation

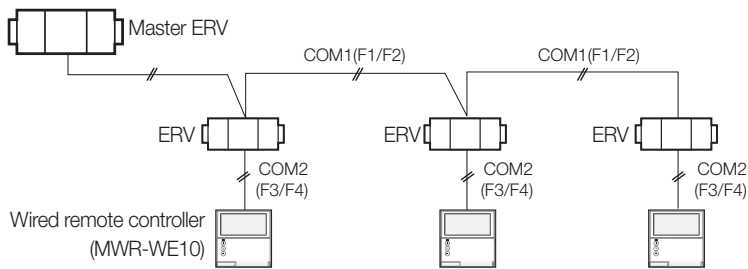
1) MWR-WH00/WE10/SH00

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



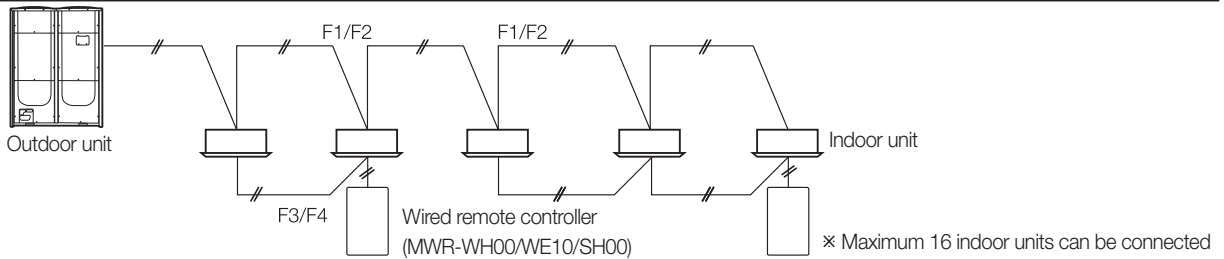
Control	All connected indoor units
Display	Operation status of the connected indoor unit

Individual control (2) Control 1 ERV with 1 wired remote controller (Only applies to MWR-WE10)



Control	All connected ERV
Display	Operation status of the connected ERV

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



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

I Individual control system

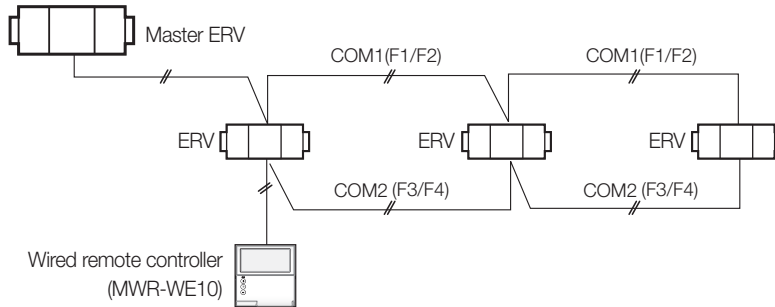
3. Wired remote controller

5 Installation

1) MWR-WH00/WE10/SH00

Group control (2)

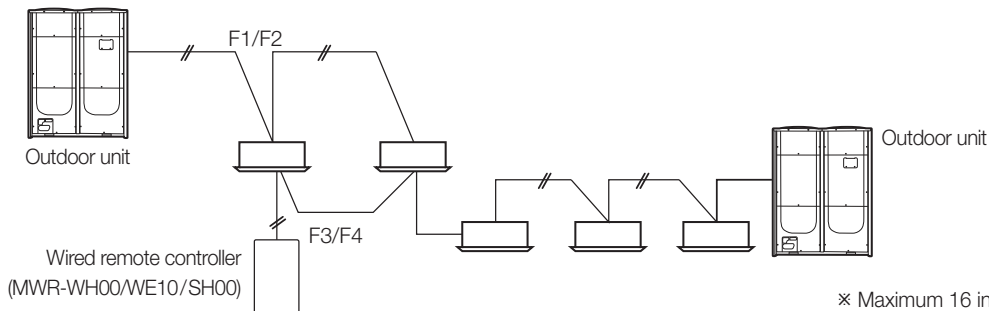
Control multiple ERV units with 1 wired remote controller (Only applies to MWR-WE10)



Control	All connected ERV
Display	Display the status of ERV which has the earliest Main address

Group control (3)

Control multiple indoor units connected to different outdoor units with 1 wired remote controller

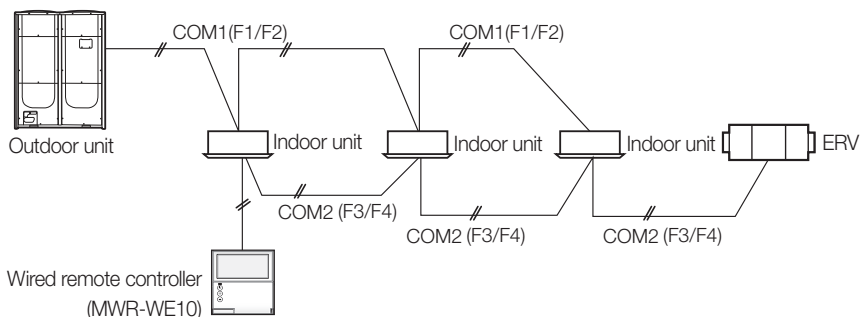


× Maximum 16 indoor units can be connected

Control	All connected indoor units
Display	Priority 1. Display the status of Master indoor unit Priority 2. Display the status of indoor unit which has the earliest Main address (Only applies to MWR-WE10, MWR-WH00)

Group control (4)

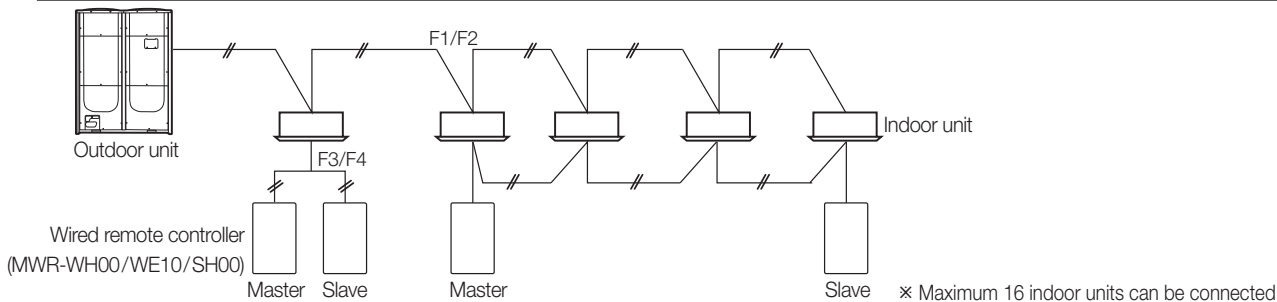
Control multiple indoor units and ERV with 1 wired remote controller (Only applies to MWR-WE10)



Control	All connected indoor units and ERV
Display	<p>[Indoor units]</p> <ul style="list-style-type: none"> ▪ Priority 1. Display the status of Master indoor unit ▪ Priority 2. Display the status of indoor unit which has the earliest Main address <p>[ERV]</p> <ul style="list-style-type: none"> ▪ Display the status of ERV which has the earliest Main address

Group control (5)

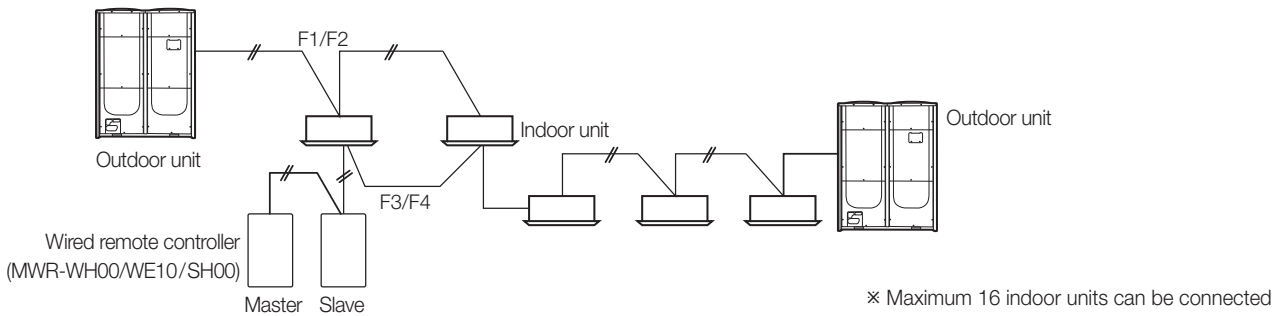
Control 1 or multiple indoor units with 2 wired remote controllers



Control	All connected indoor units
Display	Priority 1. Display the status of 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 (6)

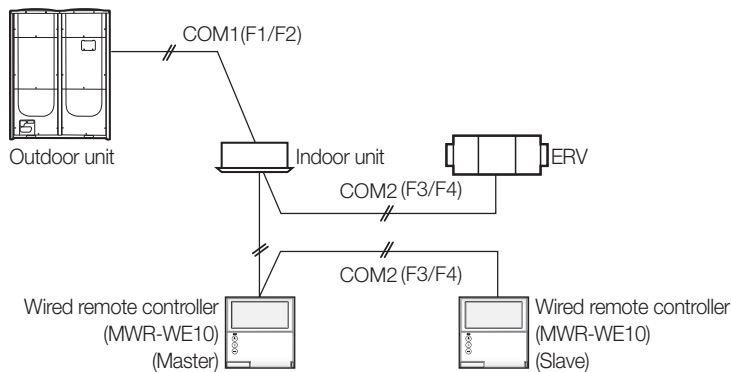
Control multiple indoor units connected to different outdoor units with 2 wired remote controller



Control	All connected indoor units
Display	Priority 1. Display the status of 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 (7)

Control multiple indoor units and ERV with 2 wired remote controller (Only applies to MWR-WE10)



Control	All connected Indoor units and ERVs
Display	Two wired remote controllers identically display the operation status

I Individual control system

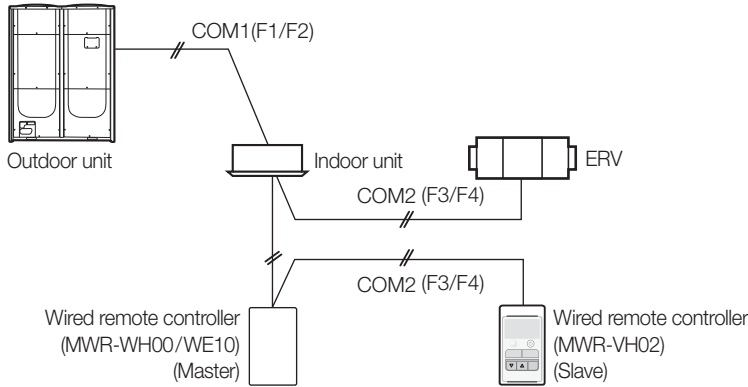
3. Wired remote controller

5 Installation

1) MWR-WH00/WE10/SH00

Group control (8)

Control multiple indoor units and ERV with 1 indoor unit wired remote controller and 1 ERV wired remote controller (Only applies to MWR-WE10, MWR-WH00, MWR-VH02)



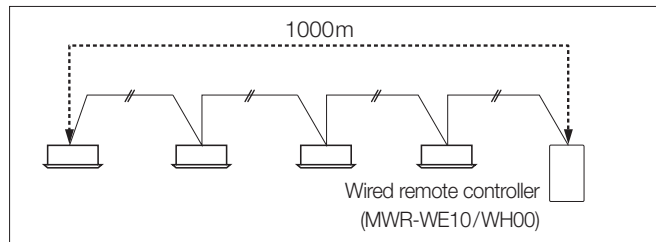
× It is allowed to set MWR-VH02 wire remote controller as Master and MWR-WE10/WH00 wired remote controller as Slave .

Control	Indoor units and ERVs
Display	MWR-WH00 will display the status of indoor units. MWR-VH02 will display the status of ERV. However, MWR-WE10 will display both indoor unit and ERV status.

Connecting 2 wired remote controllers (Master/Slave)

	MWR-WH00	MWR-WE10	MWR-SH00	MWR-VH02
MWR-WH00	○	○	×	○
MWR-WE10	○	○	×	○
MWR-SH00	×	×	○	×
MWR-VH02	○	○	×	○

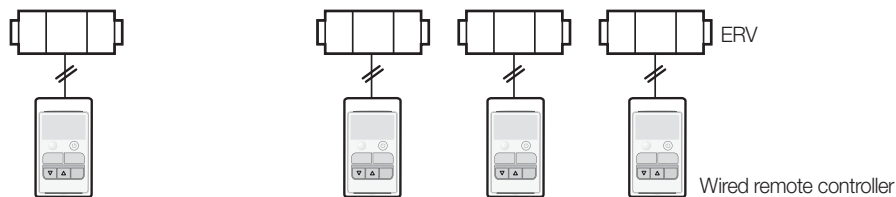
Max. distance between the farthest indoor unit and wired remote controller: 1000m



2) MWR-VH02

Individual control

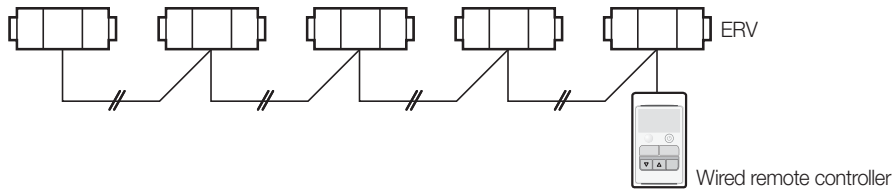
Control 1 ERV with 1 wired remote controller



Connection	1 : 1
Control	Connected ERV
Display	Operation status of the connected ERV
Error occurrence	Displays on ERV error

Group control (1)

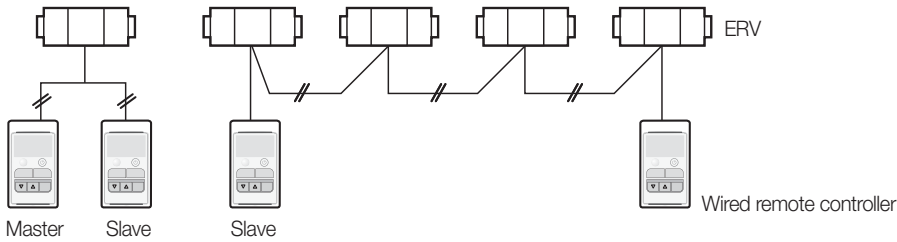
Control multiple ERVs with 1 wired remote controller



Connection	1 : N (Max. 16 ERV units)
Control	All connected ERVs
Display	Operation status of one connected ERV on random basis
Error occurrence	Displays the error if there is an error occurred in one of ERVs

Group control (2)

Control multiple ERVs with 2 wired remote controllers



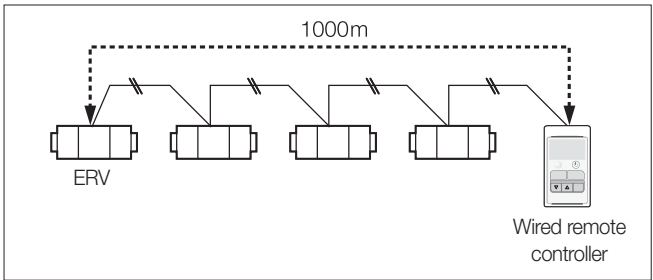
Connection	2 : N (Max. 16 ERV units)
Control	All connected ERVs
Display	Two remote controllers display identical operation status of one connected ERV on a random basis
Error occurrence	Displays the error if there is an error occurred in one of ERVs

Note

- ◆ While setting the Applicable model : ERV
- ◆ Power (V1/V2) : DC 12V / 50mA
- ◆ Communication (F3/F4) : RS485 communication (non-polarity), VCTF (0.75~1.5mm²)
- ◆ No. of ERVs possible to connect to 1 ERV remote controller : max. 16 units

Length of transmission wiring

Max. distance between the farthest ERV and ERV remote controller: 1000m



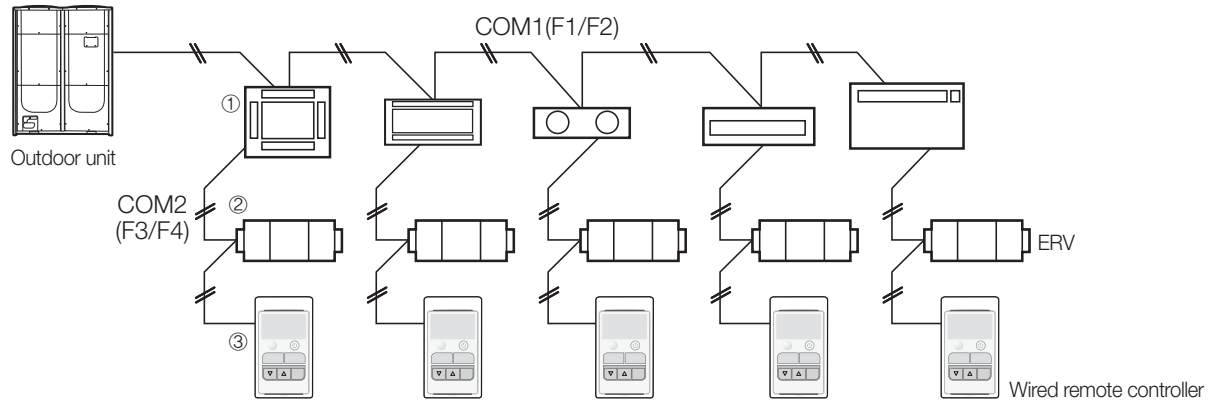
I Individual control system

3. Wired remote controller

5 Installation

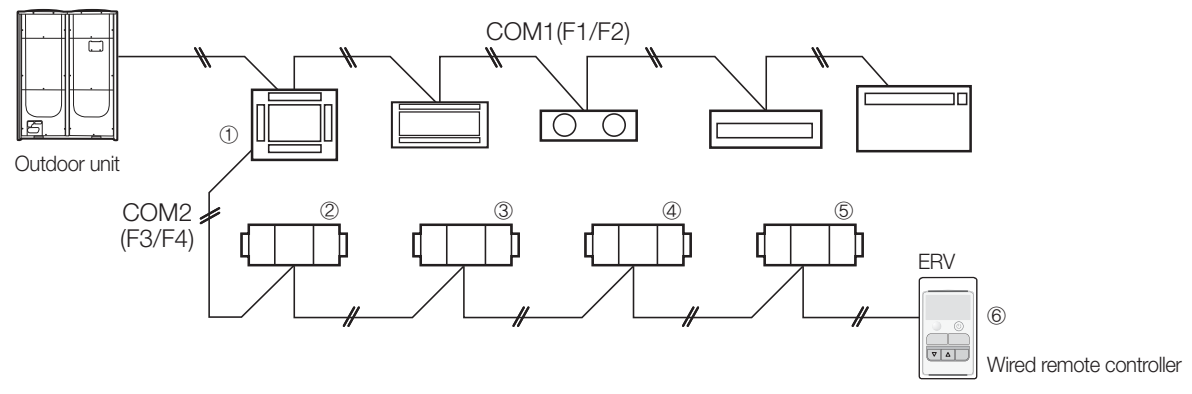
2) MWR-VH02

DVM indoor unit synchronization 1 : 1 : 1 synchronous control



Connection	Indoor unit : ERV : ERV remote controller = 1 : 1 : 1
Control	<p>ERV operates along with On/Off status of the indoor unit which is connected by the same COM2 line. At that time, it is possible to control ERV with the connected ERV remote controller. ERV remote controller is not applicable for the indoor unit control.</p> <p>Control example)</p> <p>A. Indoor unit ① is turned Off → ERV ② is automatically turned Off.</p> <p>B. Indoor unit ① is turned On → ERV ② is automatically turned On.</p> <p>C. Turn ERV remote controller ③ Off → Turn ERV ② Off only, no operation change in the indoor unit ①.</p>
Display	Operation status of ERV
Error occurrence	<ul style="list-style-type: none"> ▪ When indoor unit error occurs : Displays the indoor unit error code. ▪ When an error occurs at ERV : Displays the error if there is an error in one of the ERVs. ▪ When errors occur at both indoor unit and ERV : Displays the error code with the higher value.

DVM indoor unit synchronization 1 : N : 1 Synchronous control



- The total number of indoor units and ERVs that can be connected to one ERV remote controller is Max.16.

Connection	Indoor unit : ERV : ERV remote controller = 1 : N : 1
Control	<p>ERVs operate along with On/Off status of the indoor unit which are connected by the same COM2 line. At that time, it is possible to control ERVs with the connected ERV remote controller. ERV remote controller is not applicable for the indoor unit control.</p> <p>Control example)</p> <p>A. Indoor unit ① is turned Off → ERV ②~⑤ are automatically turned Off.</p> <p>B. Indoor unit ① is turned On → ERV ②~⑤ are automatically turned On.</p> <p>C. Turn ERV remote controller ⑥ Off→ERV ②~⑤ are turned Off, no change in the operation status of indoor unit ①.</p>
Display	Displays the operation status of one of connected ERVs on a random basis.
Error occurrence	<ul style="list-style-type: none"> ▪ When indoor unit error occurs: Displays the indoor unit error code. ▪ When an error occurs at ERV : Displays the ERV error code ▪ When errors occur at both indoor unit and ERVs : Displays the error code with the higher value.

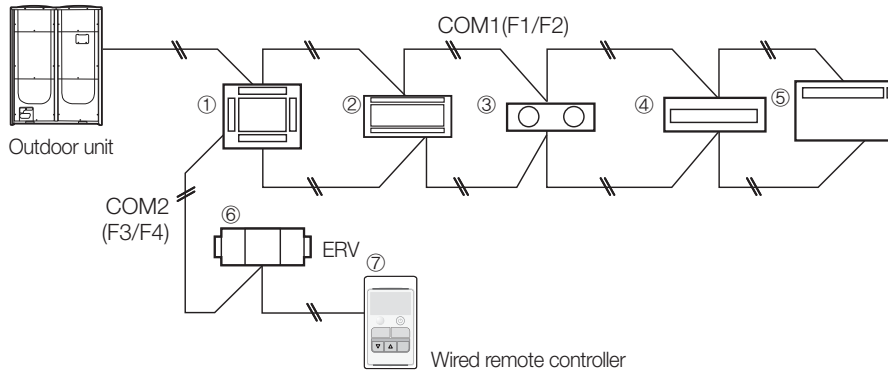
I Individual control system

3. Wired remote controller

5 Installation

2) MWR-VH02

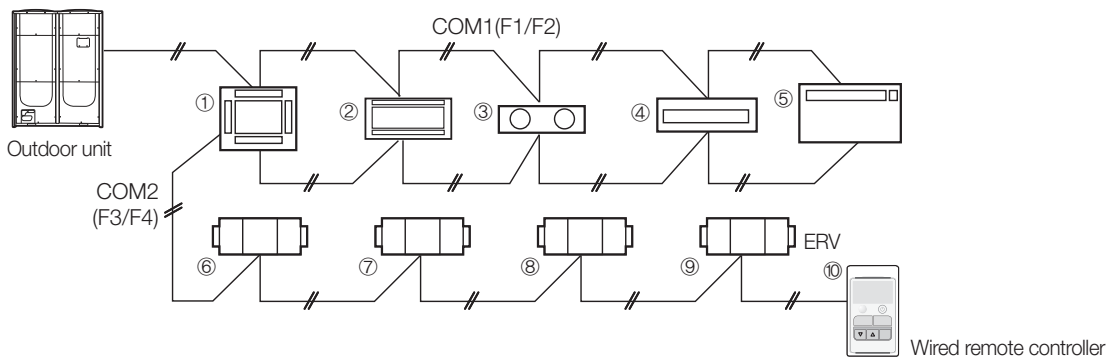
DVM indoor unit synchronization N : 1 : 1 Synchronous control



- The total number of indoor units and ERVs that can be connected to one ERV remote controller is Max.16.

Connection	Indoor unit : ERV : ERV remote controller = N : 1 : 1
Control	<p>If even only one indoor unit is turned on, ERV connected by the same COM2 communication line operates accordingly. If all indoor units are turned off, ERV stops to operate. At that time, it is possible to control ERV with the connected ERV remote controller. ERV remote controller is not applicable for the indoor unit control.</p> <p>Control example)</p> <p>A. 1 Indoor unit is turned On among all indoor units ①~ ⑤ → ERV ⑥ is automatically turned On.</p> <p>B. 1 Indoor unit is turned Off among all indoor units ①~ ⑤ → No operation status change in ERV ⑥.</p> <p>C. All indoor units ①~ ⑤ are turned Off → ERV ⑥ is automatically turned Off.</p> <p>D. Turn ERV remote controller ⑦ On → Only ERV ⑥ is turned On, no changes in indoor unit ①~ ⑤'s operation status.</p>
Display	Displays the operation status of one of connected ERV.
Error occurrence	<ul style="list-style-type: none"> ▪ When an error occurs at one of the indoor units: Displays the error code of the indoor unit. ▪ When an error occurs at ERV: Displays the ERV error code. ▪ When errors occur at both indoor units and ERV: Displays the error code with higher value.

DVM indoor unit synchronization **N : N : 1 Synchronous control**



- Remote controller for indoor units (MWR-WH00/WE10/SH00) cannot be connected to the same COM2 communication line with the ERV remote controller.
- The total number of indoor units and ERVs that can be connected to one ERV remote controller is Max.16.

Connection	Indoor unit : ERV : ERV remote controller = N : N : 1
Control	<p>If even only one indoor unit is turned on, all ERVs connected by the same COM2 communication line operate accordingly. If all indoor units are turned off, ERVs stop to operate. At that time, it is possible to operate the connected ERVs only with an ERV remote controller. ERV remote controller is not applicable for the indoor unit control.</p> <p>Control example)</p> <p>A. 1 Indoor unit is turned On among all indoor units ①~⑤ → ERV ⑥~⑨ are automatically turned On.</p> <p>B. 1 Indoor unit is turned Off among all indoor units ①~⑤ → No operation status change in all ERV ⑥~⑨.</p> <p>C. All indoor units ①~⑤ are turned Off → All ERV ⑥~⑨ are automatically turned Off.</p> <p>D. Turn ERV remote controller ⑩ On → Only ERV ⑥~⑨ are all turned On, no operation status changes in indoor unit ①~⑤.</p>
Display	Displays the operation status of one of connected ERV units on a random basis.
Error occurrence	<ul style="list-style-type: none"> ▪ When an error occurs in the indoor unit : Displays the indoor unit error code. ▪ When an error occurs in ERV : Displays the ERV error code. ▪ When errors occur in both indoor unit and ERV : Displays the error code with the higher value.

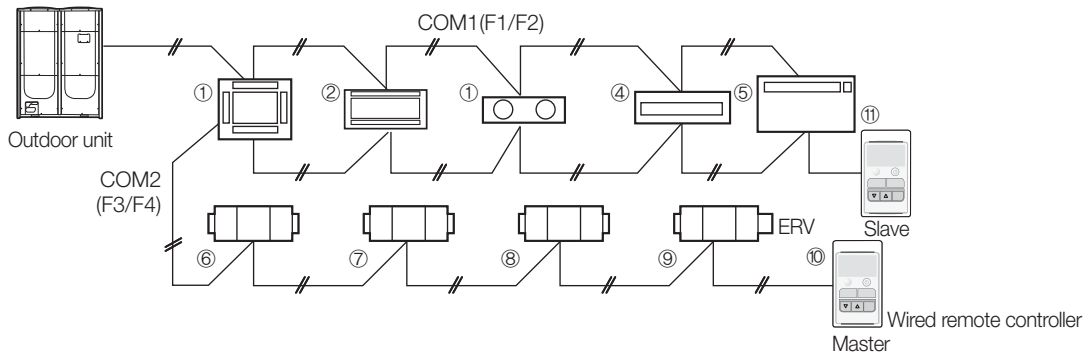
I Individual control system

3. Wired remote controller

5 Installation

2) MWR-VH02

DVM indoor unit synchronization N : N : 2 Synchronous control



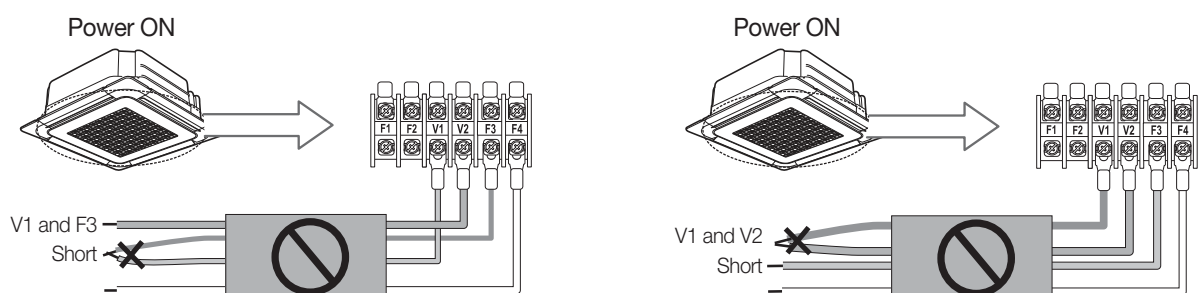
- Remote controller for indoor units (MWR-WH00/WE10/SH00) cannot be connected to the same COM2 communication line with the ERV remote controller.
- The total number of indoor units and ERVs that can be connected to one ERV remote controller is Max.16.

Connection	Indoor unit : ERV : ERV remote controller = N : N : 2
Control	<p>If even only one indoor unit is turned on, all ERVs connected by the same COM2 communication line operate accordingly. If all indoor units are turned off, ERVs stop to operate. At that time, it is possible to operate the connected ERVs only with the ERV remote controllers. ERV remote controllers are not applicable for the indoor unit control.</p> <p>Control example)</p> <p>A. 1 Indoor unit is turned On among all indoor units ①~⑤ → ERV ⑥~⑨ are automatically turned On.</p> <p>B. 1 Indoor unit is turned Off among all indoor units ①~⑤ → No operation status change in all ERV ⑥~⑨.</p> <p>C. All indoor units ①~⑤ are turned Off → All ERV ⑥~⑨ are automatically turned Off.</p> <p>D. Turn ERV remote controller ⑩ On → ERV ⑥~⑨ are all turned On, no operation status changes in indoor unit ①~⑤.</p>
Display	Two remote controllers display identical operation status of one of connected ERV which has the earliest Main address.
Error occurrence	<ul style="list-style-type: none"> ▪ When an error occurs in the indoor unit: Displays the indoor unit error code. ▪ When an error occurs in ERV: Displays the ERV error code. ▪ When errors occur in both indoor unit and ERV: Displays the error code with the higher value.

3) Installation caution

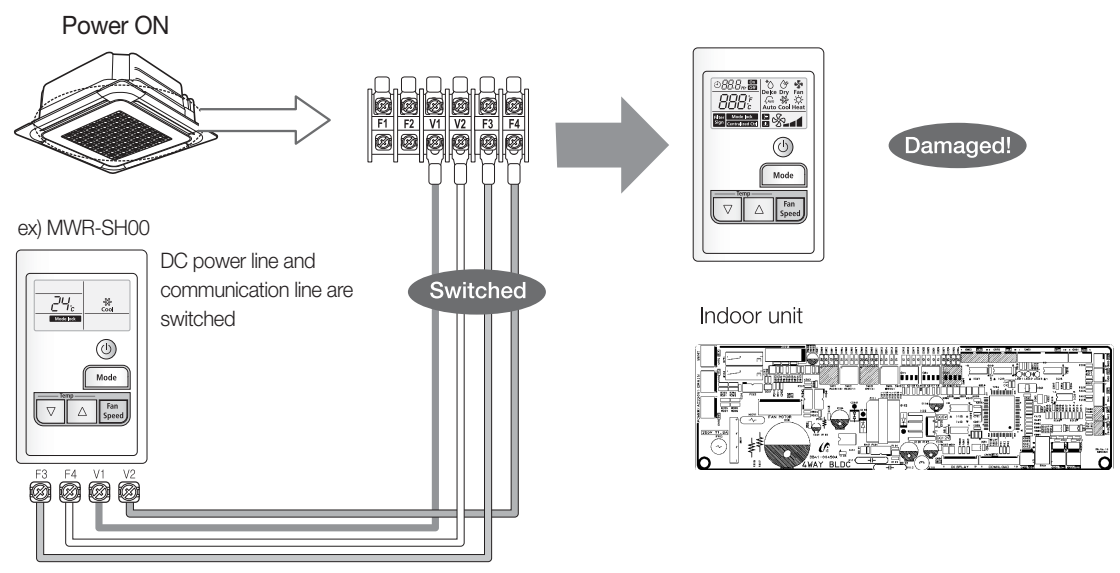
Turn off the indoor unit power before making connections of wired remote controllers.

- ▶ **Case 1** If wire V1 makes contact to F3 or F4 with the indoor unit powered ON, the indoor unit PCB could be damaged (COM2) by abrupt overload to communication terminals.
- ▶ **Case 2** Contact of V1 and V2 makes the indoor unit PCB electrically short, which damages indoor unit power supply by excessive current drive.

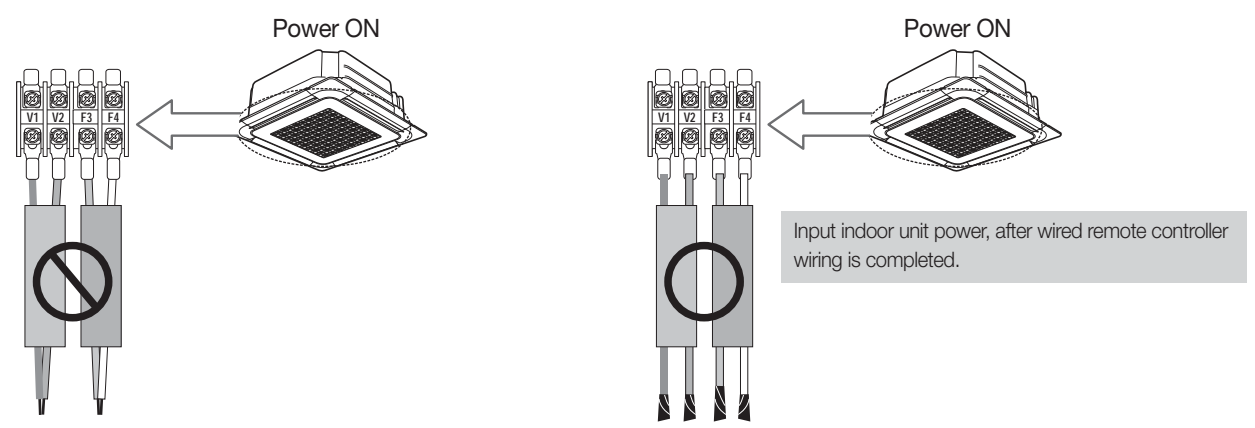


Do not switch V1/V2 and F3/F4

Wired R/C and indoor unit PCB can be damaged by DC power line(V1/V2) and communication line (F3/F4) contact.



Be careful not to contact DC power line (V1/V2) and communication line (F3/F4)



DC power line and communication line contact.

If indoor unit power ON, then indoor unit PCB can be damaged

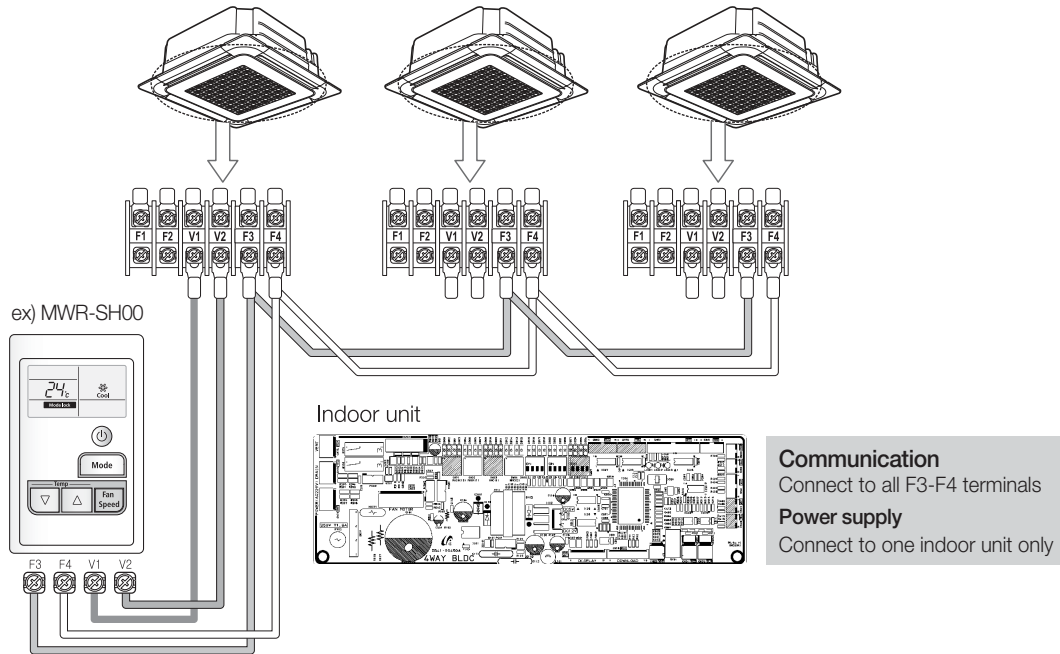
I Individual control system

3. Wired remote controller

5 Installation

3) Installation caution

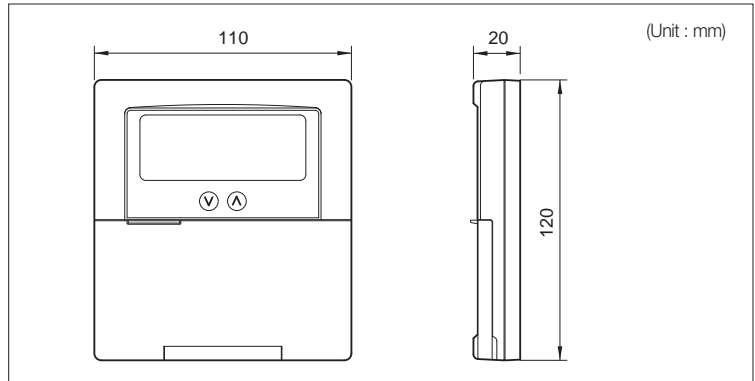
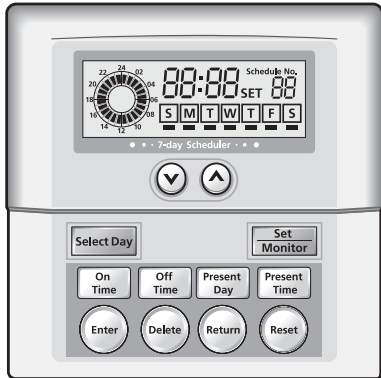
Do not connect V1/V2 to all indoor units (In case of indoor unit group control)



4. 7-day scheduler

□ MWR-BS00

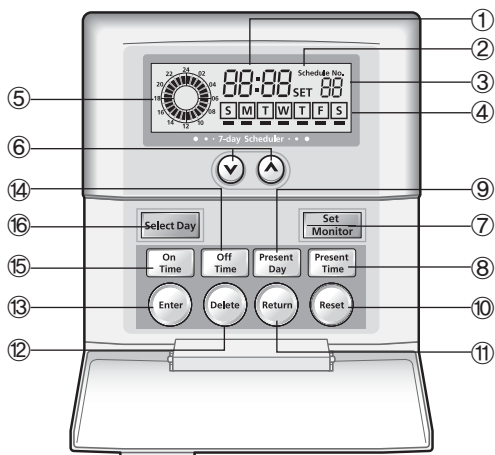
1) Features



Weekly operation schedule setup

- Air conditioner On/Off schedule setting
- Automatic schedule operation repeat
- Max. 124 schedule operation settings
- Current time and day display

2) Description of parts



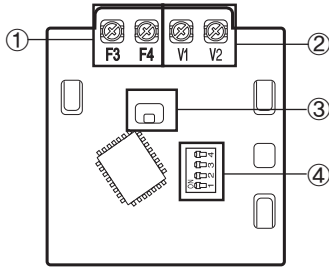
No.	Name	Description
①	Digital time display	Displays the current time in the monitoring mode, while displaying schedule time in the scheduling mode.
②	Display mode	For the scheduling set mode, SET is displayed. Whereas the monitoring mode does not display.
③	Schedule indication	If the scheduler function is being used, it displays (rotation). Otherwise, it displays .
④	Schedule day	Displays the present day and indicates if there is an operation schedule for each day.
⑤	Analog watch	Displays the On time/ Off time for the specific schedule.
⑥	Time adjustment button	Press Up/Down buttons to adjust the operating schedule time and the current time.
⑦	Schedule setup button	Press this button to enter or exit the schedule setting mode.
⑧	Current time button	Press this button to set or check the current time (refer to the user manual).
⑨	Current day button	Press this button to set or check the current day (refer to the user manual).
⑩	Reset button	Press this button to delete all schedule settings. At this time, the current time returns to the default mode.
⑪	Return button	Press this button to return from the schedule setup mode to the monitoring mode.
⑫	Delete button	After selecting On or Off time schedule, press this button to cancel the schedule.
⑬	Enter button	Press this button to confirm the setting.
⑭	Off time button	Press this button to set or check the Off time schedule.
⑮	On time button	Press this button to set or check the On time schedule.
⑯	Day selection button	Press this button to change and select the days in the following order

I Individual control system

4. 7-day scheduler

MWR-BS00

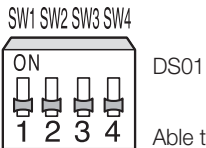
2) Description of parts



No.	Name	Description
①	Communication wiring terminal	Connection to a wired remote controller(F3/F4) or centralized controller(R1/R2)
②	Power wiring terminal (12VDC)	Connection to a wired remote controller(V1/V2) or 12VDC adaptor
③	Communication LED	Communication with the wired remote controller
④	Option switches	It is possible to set additional functions for wired remote controller.

3) Additional functions

Option Switches



Able to set additional functions with the four option switches in the 7-day scheduler PCB.

* Default switch settings are all OFF.

Switch No.	OFF	ON
SW 1	-	-
SW 2	Able to use the On/Off button in wired remote controller connected to a 7-day scheduler	Unable to use the On/Off button in wired remote controller connected to a 7-day scheduler (Available for other buttons)
SW 3	-	-
SW 4	-	-

4) Installation

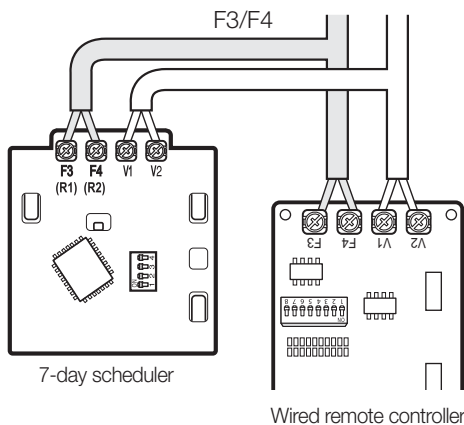
Required product

To use 7-day scheduler, it should be connected to the one of these products one-by-one.

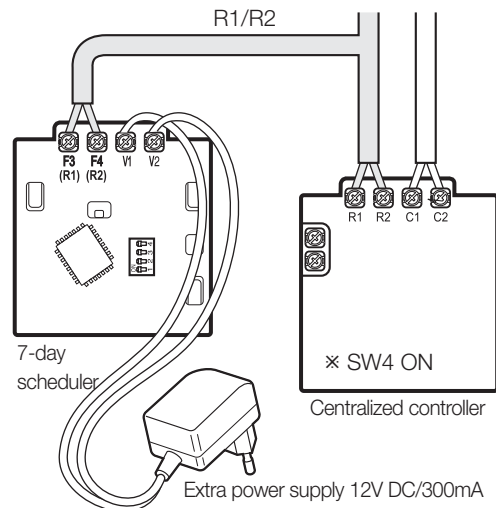
- Wired remote controller : MWR-SH00/VH02
- Centralized controller : MCM-A202D

Wiring

- Wired remote controller: MWR-SH00/VH02



- Centralized controller: MCM-A202D



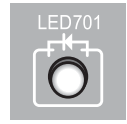
Operation checking

Display after applying the power

- ❶ Right after the power application, LCD and all segments will turn on for about 1 second.
- ❷ Displays the current time and schedule reservation status.

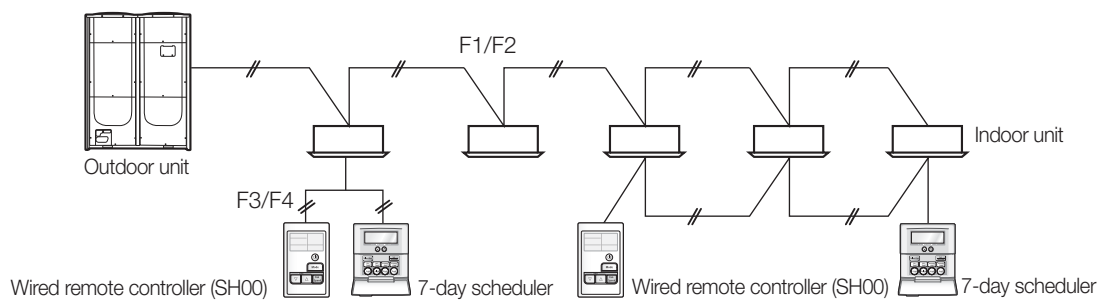
Checking the communication status

- LED701 on PCB : Displays the communication status between the wired remote controller and centralized controller. If it is flashing, it indicates normal operation.



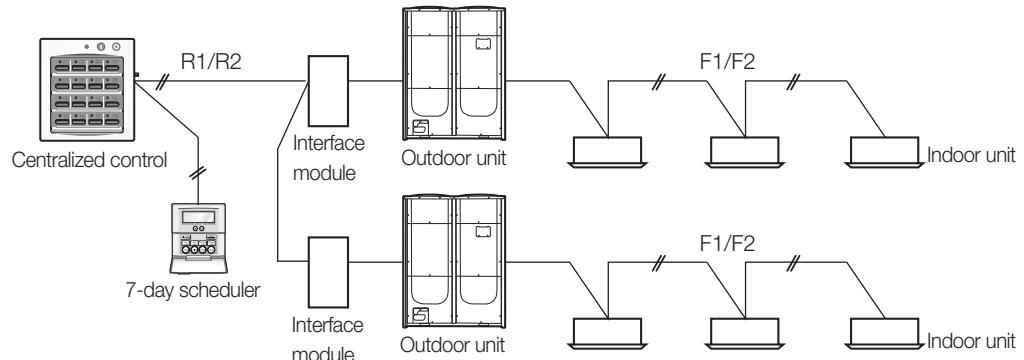
5) Connection examples

Connected to the wired remote controller



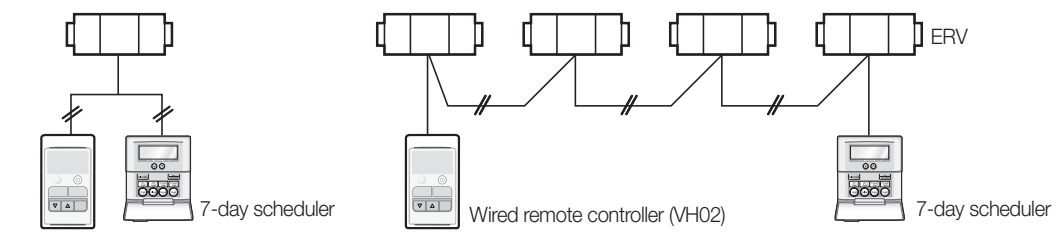
Control	Apply schedule operation to all indoor units connected to the wired remote controller
---------	---

Connected to the centralized controller



Control	Apply schedule operation to all indoor units connected to the centralized controller
---------	--

Connected to the wired remote controller



Control	Apply schedule operation to all ERV units connected to the wired controller
---------	---

☑ Note

- ◆ Applied indoor unit types: cassette, duct, wall-mounted, ceiling, console
(When 7-day scheduler is used with a wired remote controller, COM2 (F3/F4) supports indoor units only.)
- ◆ Power (V1/V2): DC 12V / 50mA
- ◆ Communication (F3/F4): RS485 communication (non-polarity)
- ◆ Max. number of controllable indoor units:
- ◆ Max. 16 indoor units when 7-day scheduler is used with a wired remote controller
- ◆ Max. 16 groups when 7-day scheduler is used with a centralized controller



DVM CONTROL SYSTEMS

II. Centralized control system

1	Interface module	60
2	Centralized controller	68
3	Function controller	76
4	Operation mode selection switch	82

III Centralized control system

1. Interface module

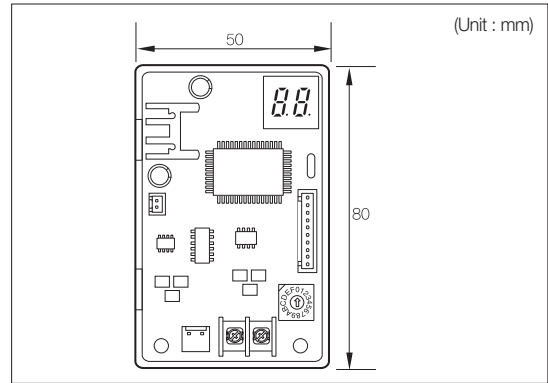
① MIM-B13D

1) Features



Interface module that supports up to 16 groups

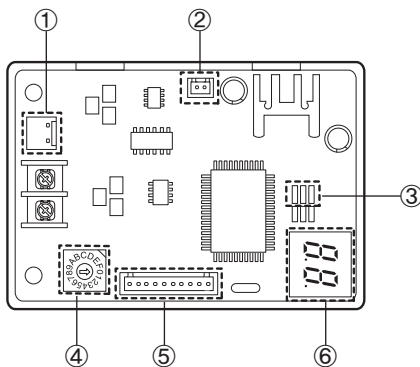
- Communication transmitter between upper level controller and the indoor/outdoor units
- Mainly used to connect with centralized controller such as DMS2/centralized controllers /functions controllers.
- 1 interface module for 1 outdoor unit
- Individual control – Max. 64 indoor units
- Group control – 16 groups



2) Product specification

Communication method	RS 485 communication
Power	DC 12V
Maximum number of connection	F1/F2 – 1 outdoor unit (Max. 64 indoor units), R1/R2 – 1 upper level controller

3) Description of parts



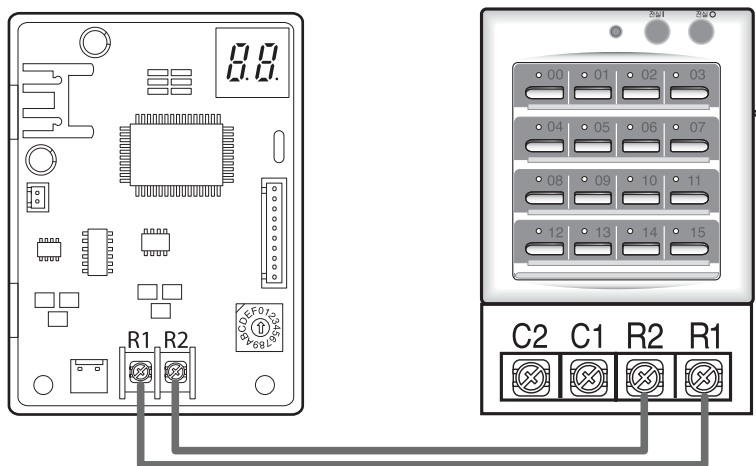
No.	Name	Description
①	F1/F2 communication connector	Communication connector that connects to outdoor unit/ERV F1/F2
②	Power connector	DC 12V
③	Communication LED	Check communication with upper level controllers (Red LED blinks while communicating)
④	Address setting switch	Sets the address of interface 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

4) Compatible models

Outdoor unit	DVM PLUS II/III/IV, Mini DVM, ERV, FJM, DVM PLUS III HR/IV HR × Note : If ERV Plus is connected to the outdoor unit, use MIM-B13D.
Upper level controller	Centralized controller, S-NET mini, DMS2.

5) Connecting with upper level controller

Connecting with Centralized controller



▶ 1 centralized controller connection is supported

- Connect to R1/R2 : 16 groups can be controlled with centralized controller.

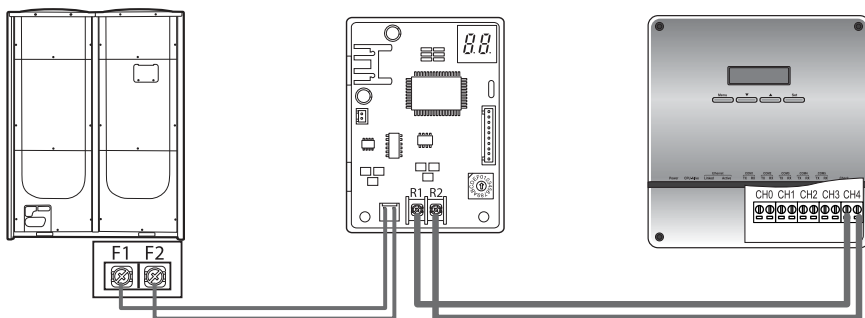
Note

- ♦ When number of groups exceeds 16, use MIM-B13E

Ex) Connecting 40 indoor units to a single outdoor unit

Controlling within 10 groups → Use MIM-B13D / Controlling within 40 groups → Use MIM-B13E

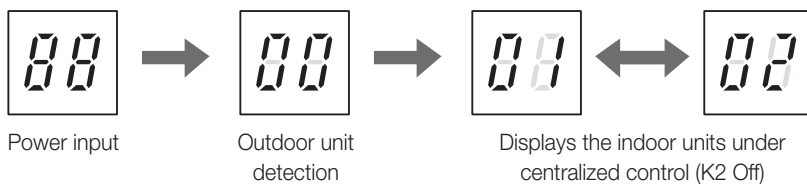
Installation with DMS2



▶ 1 DMS2 connection is supported

- Connect to R1/R2: All the indoor units will be controlled.

6) Operation display

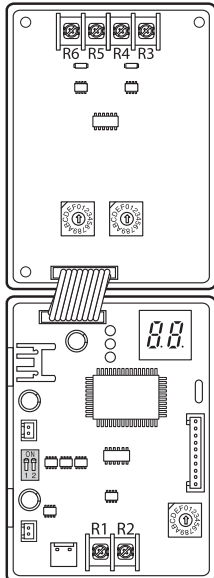


II Centralized control system

1. Interface module

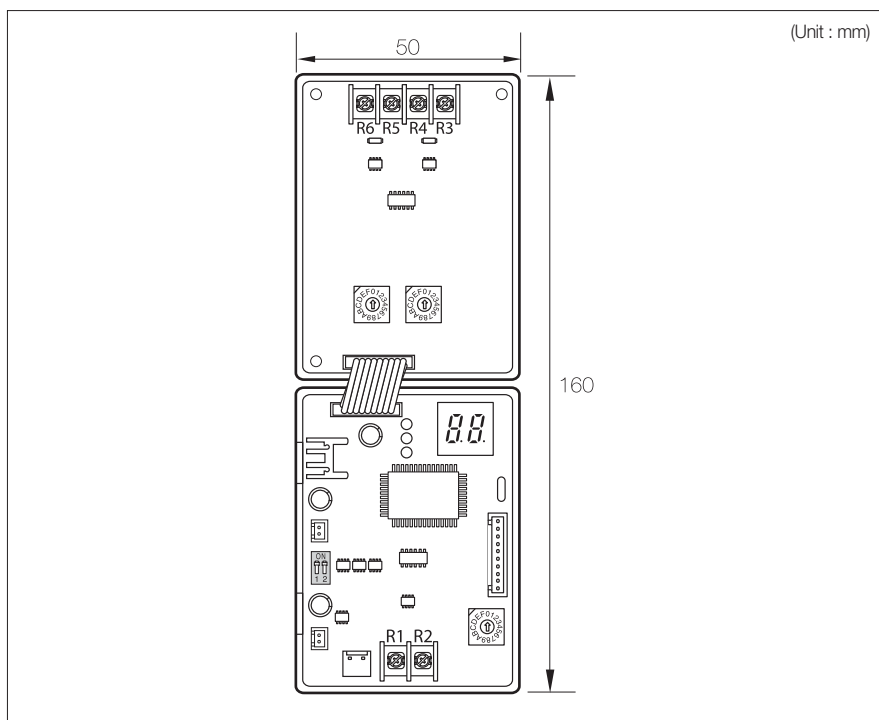
② MIM-B13E

1) Features



Interface module that supports up to 48 groups

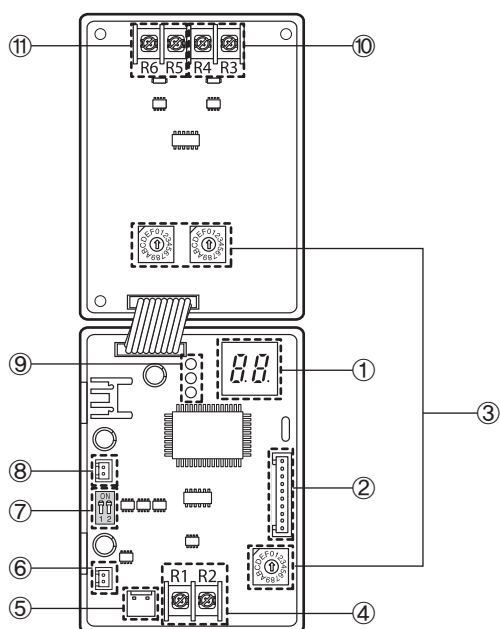
- Communication transmitter between upper level controller and the indoor/outdoor units
- Mainly used to connect with centralized controller such as DMS2/ centralized controllers/functions controllers.
- 1 interface module for 1 outdoor unit
- Individual control – Max. 64 indoor units
- Group control – 48 groups



2) Product specification

Communication method	RS 485 communication
Power	DC 12V
Maximum number of connection	F1/F2 – 1 outdoor unit (Max. 64 indoor units), R1/R2 – 3 upper level controllers

3) Description of parts



No.	Name	Description
①	Communication checking 7-Segment	Displays communication status between the indoor and outdoor units
②	Software update connector	Using this connector, interface module can be updated
③	Address setting switch	Sets the address of interface module
④	Upper level controller connection channel 0	<ul style="list-style-type: none"> ▪ Centralized controller – Connect to R1/R2 ▪ DMS2 – Connect to A/B
⑤	Outdoor unit communication connector	Connect to F1/F2 communication line of outdoor unit(or indoor unit)
⑥	Power connector (DC 5V)	DC 5V power input connector (Connect to outdoor unit PCB)
⑦	Power setting switch	<ul style="list-style-type: none"> ▪ Using DC 12V, DC 5V together: All switches must be off ▪ Using DC 12V only: All switches must be on
⑧	Power connector (DC 12V)	DC 12V power input connector (Connect to outdoor unit PCB)
⑨	Communication LED	Check communication with upper level controllers
⑩	Upper level controller connection channel 1	<ul style="list-style-type: none"> ▪ Centralized controller – Connect to R1/R2 ▪ DMS2 – Connect to A/B
⑪	Upper level controller connection channel 2	<ul style="list-style-type: none"> ▪ Centralized controller – Connect to R1/R2 ▪ DMS2 – Connect to A/B

4) Compatible models

Outdoor unit	DVM PLUS II/III/IV, Mini DVM, ERV, FJM, DVM PLUS III HR/IV HR ※ Note : If ERV Plus is connected to the outdoor unit, use MIM-B13D.
Upper level controller	Centralized controller, S-NET mini, DMS2.

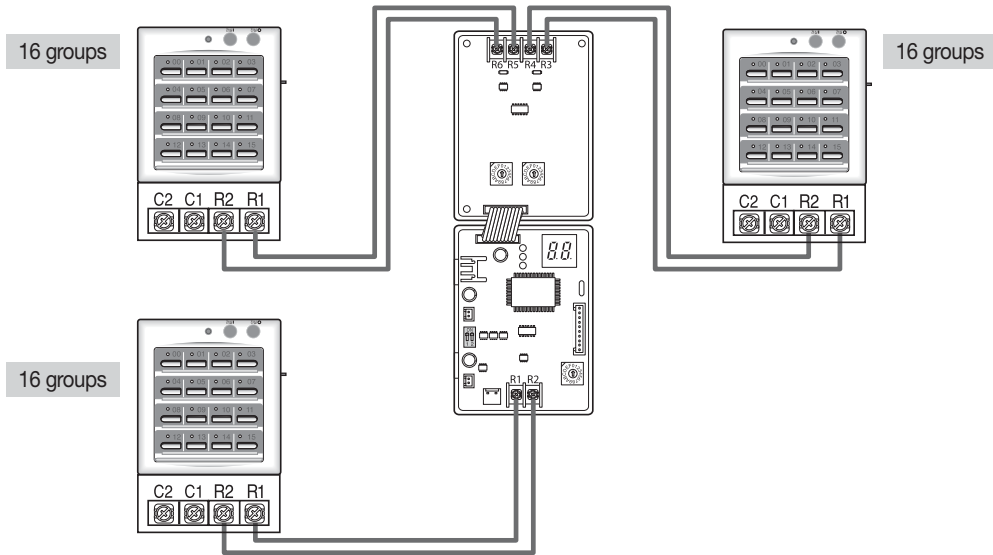
II Centralized control system

1. Interface module

② MIM-B13E

5) Connecting with upper level controller

Connecting with Centralized controller

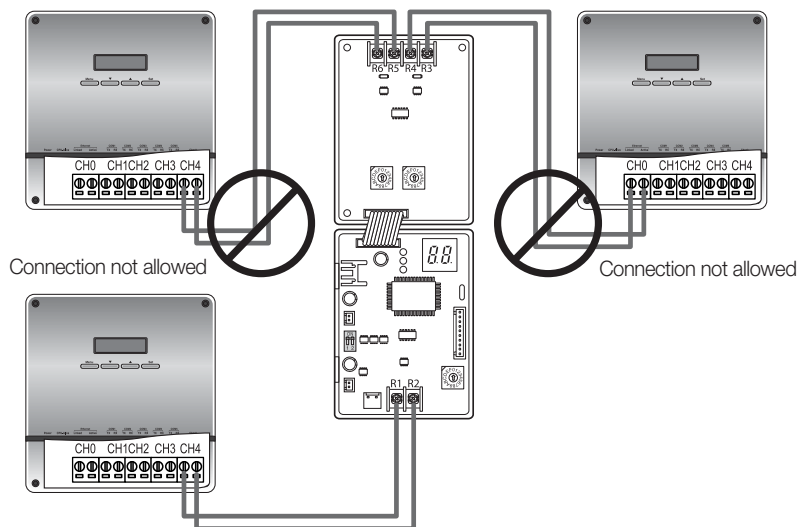


► 3 centralized controller connection is supported

- Connect 1 centralized controller to channel 0, 1 and 2.
- 16 groups can be controlled with each channel.
- Indoor units can be controlled within maximum of 48 groups.

Channel 0 connection	Control 16 groups of indoor units with RMC(1) address set as 0
Channel 1 connection	Control 16 groups of indoor units with RMC(1) address set as 1
Channel 2 connection	Control 16 groups of indoor units with RMC(1) address set as 2

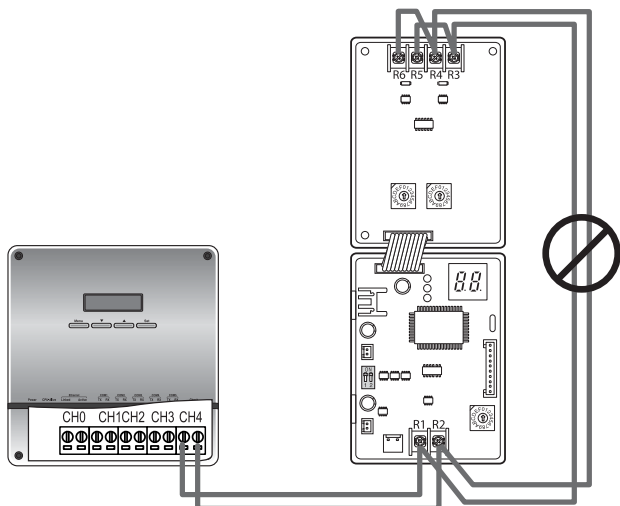
Installation with DMS2



► Available channel for DMS2 connection

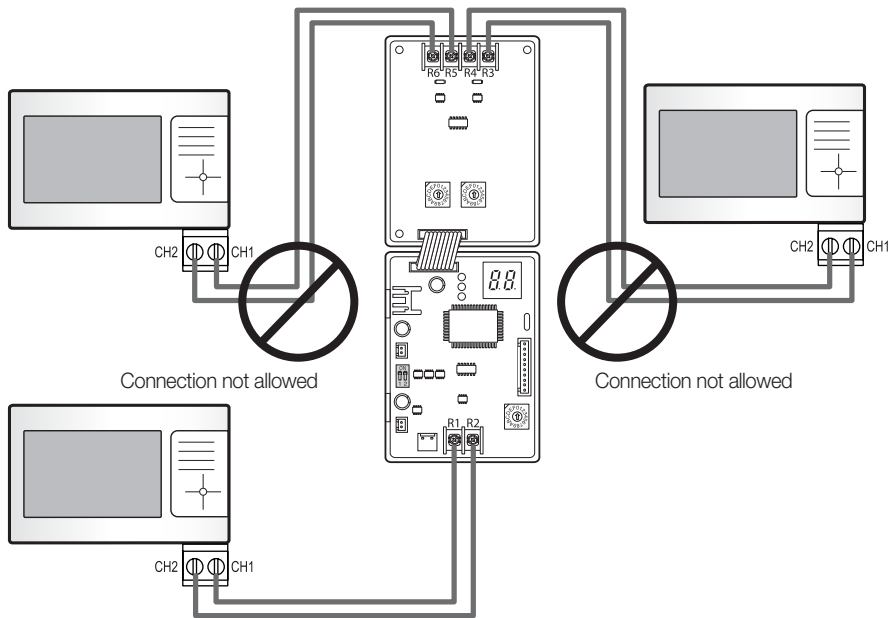
- DMS2 can only be connected to channel 0 and all indoor units can be controlled.

Caution when connecting DMS2



► DMS2 must be connected to a single channel.

Connecting with S-NET mini



- Available channel for S-NET mini connection
- S-NET mini can only be connected to channel 0 and all indoor units can be controlled.

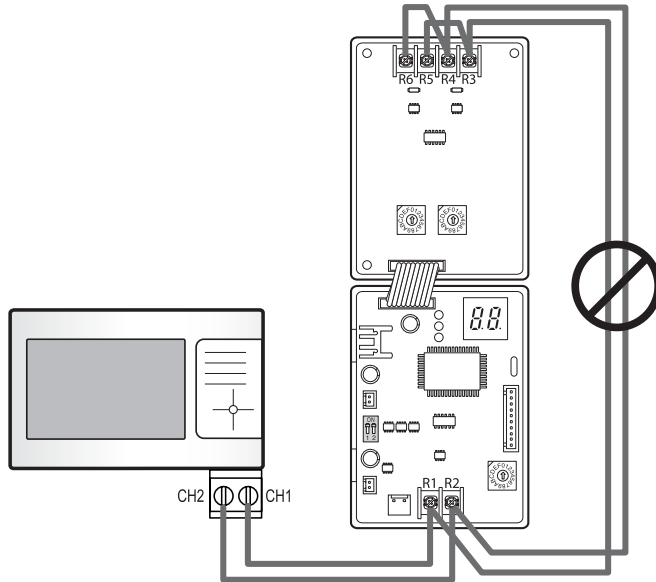
II Centralized control system

1. Interface module

② MIM-B13E

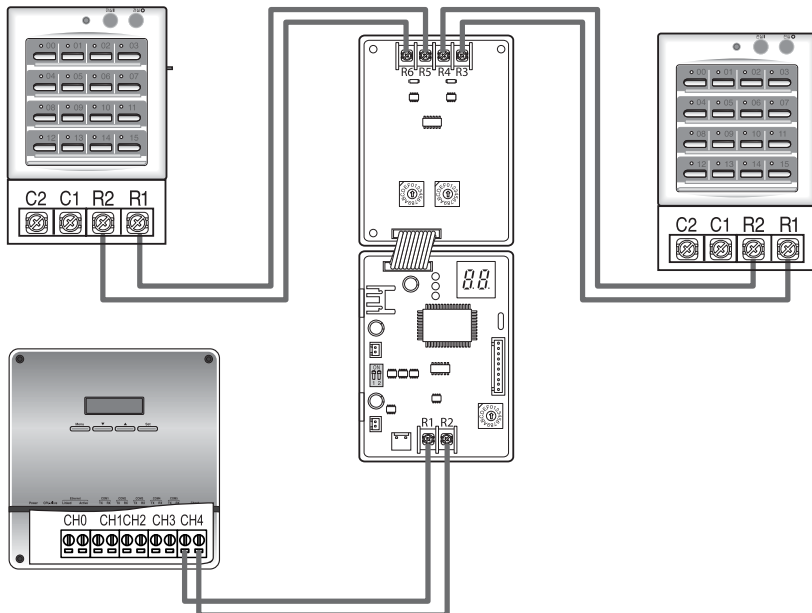
5) Connecting with upper level controller

Caution when connecting S-NET mini



► S-NET mini must be connected to a single channel.

Connecting with DMS2 and Centralized controller simultaneously



► Connecting with DMS2 and Centralized controller simultaneously

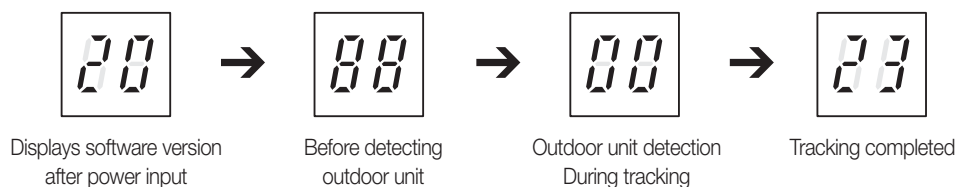
- DMS2 2 must be connected to channel 0. Centralized controller can be connected to every channel(0,1,2)
Be aware that connection channel for centralized controller is decided by the RMC (1) address of the indoor unit.

Connect Centralized controller to channel 1	Control 16 groups of indoor units with RMC(1) address set as 1
Connect Centralized controller to channel 2	Control 16 groups of indoor units with RMC(1) address set as 2
Connect DMS2 to channel 0	Control all indoor units

※ Indoor unit control priority is equal among Centralized controller and DMS2.

6) Operation display

(1) When interface module is connected to outdoor unit (F1/F2)



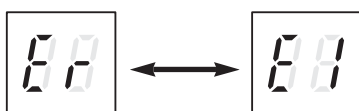
※ Display all indoor unit main addressed alternately (for all indoor units with K2 switches off in indoor unit PCB)

(2) When interface module is connected to centralized controller (R1/R2)

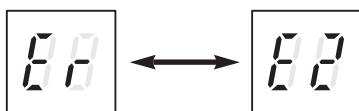
- Red : Red LED will be flickering when interface module communicates with CH0 centralized controller.
- Green : Green LED will be flickering when interface module communicates with CH1 centralized controller.
- Yellow : Yellow LED will be flickering when interface module communicates with CH2 centralized controller.

Error display

▶ Communication error between outdoor unit and interface module



▶ Communication error between centralized controller and interface module after tracking has been completed



※ When E1 and E2 error occurs simultaneously, only E1 will be displayed.

▶ Interface module tracking failure

- IDU quantity recognized by outdoor unit ≠ IDU quantity recognized by I/M.



▶ Indoor unit communication checking

a. No indoor unit response.

(During the normal communication mode after tracking process. Outdoor unit and interface module communicate normally)

b. When all the K2 switches of the indoor unit is on. (Centralized control disable status)

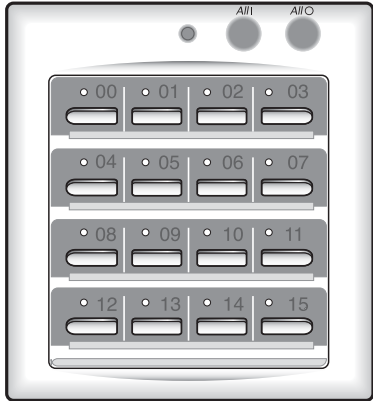


II Centralized control system

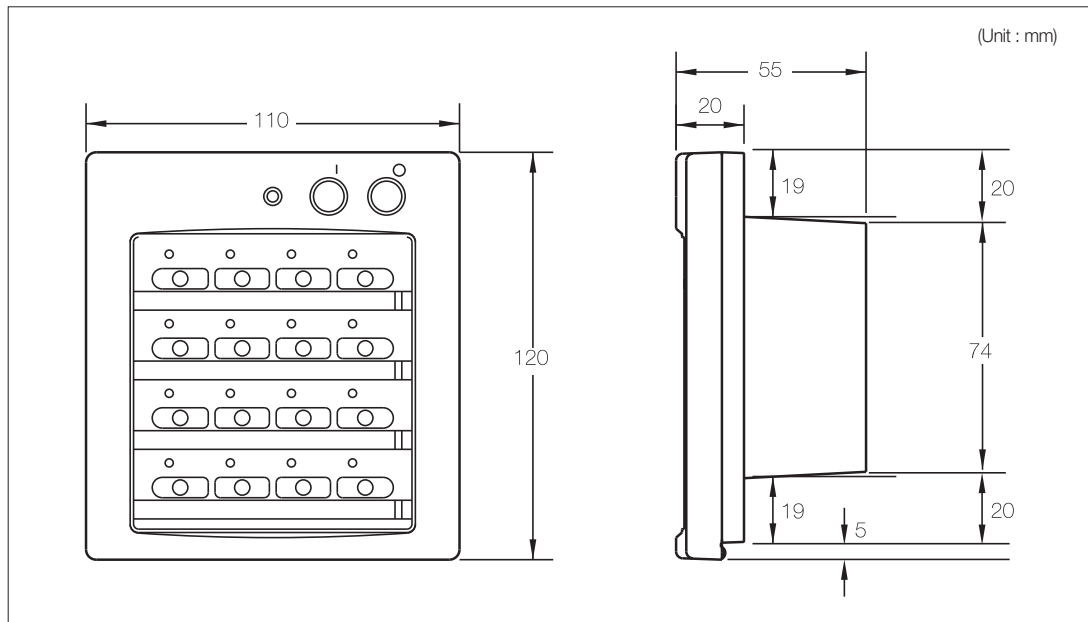
2. Centralized controller

□ MCM-A202D

1) Features



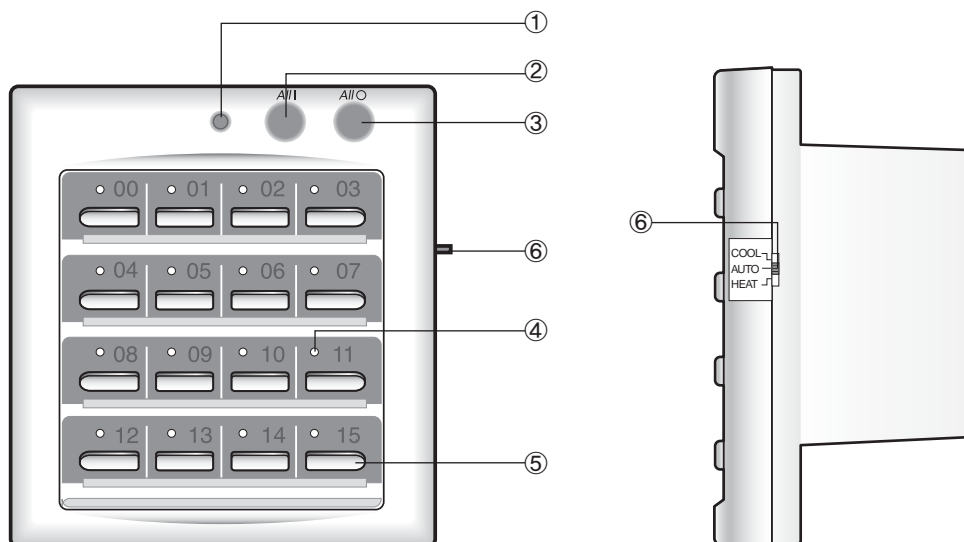
- Maximum 16-group controller (Max. 256 Indoor units)
- Whole/Group/Individual indoor unit control (On/Off)
- Restriction on the use of wireless/wired remote controllers and external contact control
- Cooling and heating mode control
- Indoor unit error display



2) Specification

Power supply	AC 220VAC, 50/60Hz
Power consumption	Max. 5W
Communication length	Max. 1000m from the end to the other end of RS485 connection
Interface	<ul style="list-style-type: none"> ▪ Lower level : R1/R2 (Interface module, 7-day scheduler) ▪ Upper level : C1/C2 (Function controller, DMS2, S-NET mini)
Number of interface device	<ul style="list-style-type: none"> ▪ Interface module : Max.16 ▪ 7-day scheduler : 1

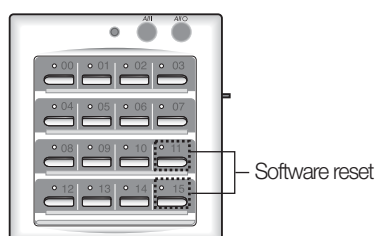
3) Description of parts



No.	Name	Description
①	Indoor unit operation LED	<ul style="list-style-type: none"> It lights on when more than one indoor unit operates. It flickers during indoor unit tracking process after power reset.
②	All ON button	<ul style="list-style-type: none"> Press All ON button to turn on all the indoor units. It is also used to prohibit use of wired/wireless remote controllers for indoor units under Level 3.
③	All OFF button	Press All OFF button to turn off all the indoor units.
④	Group indoor unit operation LED	<ul style="list-style-type: none"> It lights on when its equivalent indoor unit operates. It also flickers when the indoor unit has an error. During tracking, number that represents the interface module address will flicker.
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.

Note

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



II Centralized control system

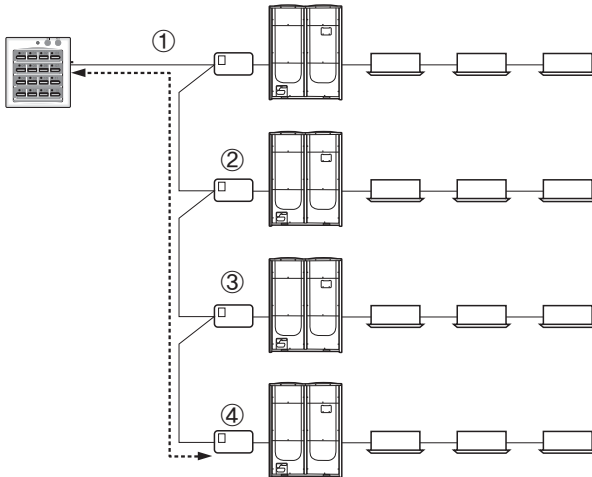
2. Centralized controller

□ MCM-A202D

4) Wiring

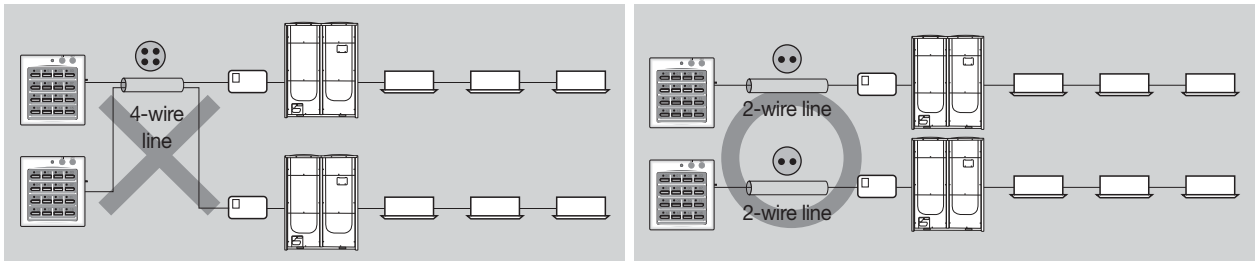
(1) Communication wiring length

- Maximum communication wiring length is 1000m between the centralized controllers to the farthest interface module.
- ① + ② + ③ + ④ < 1000m

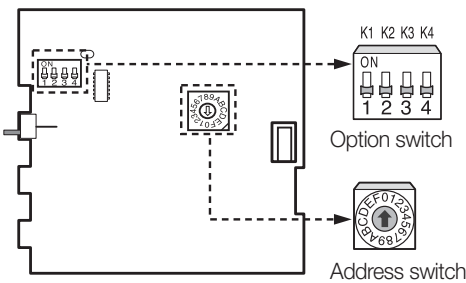


(2) Precaution on wiring with interface modules

- Each connection between the centralized controller and the interface modules must be made using the separate communication wires to prevent crosstalk.

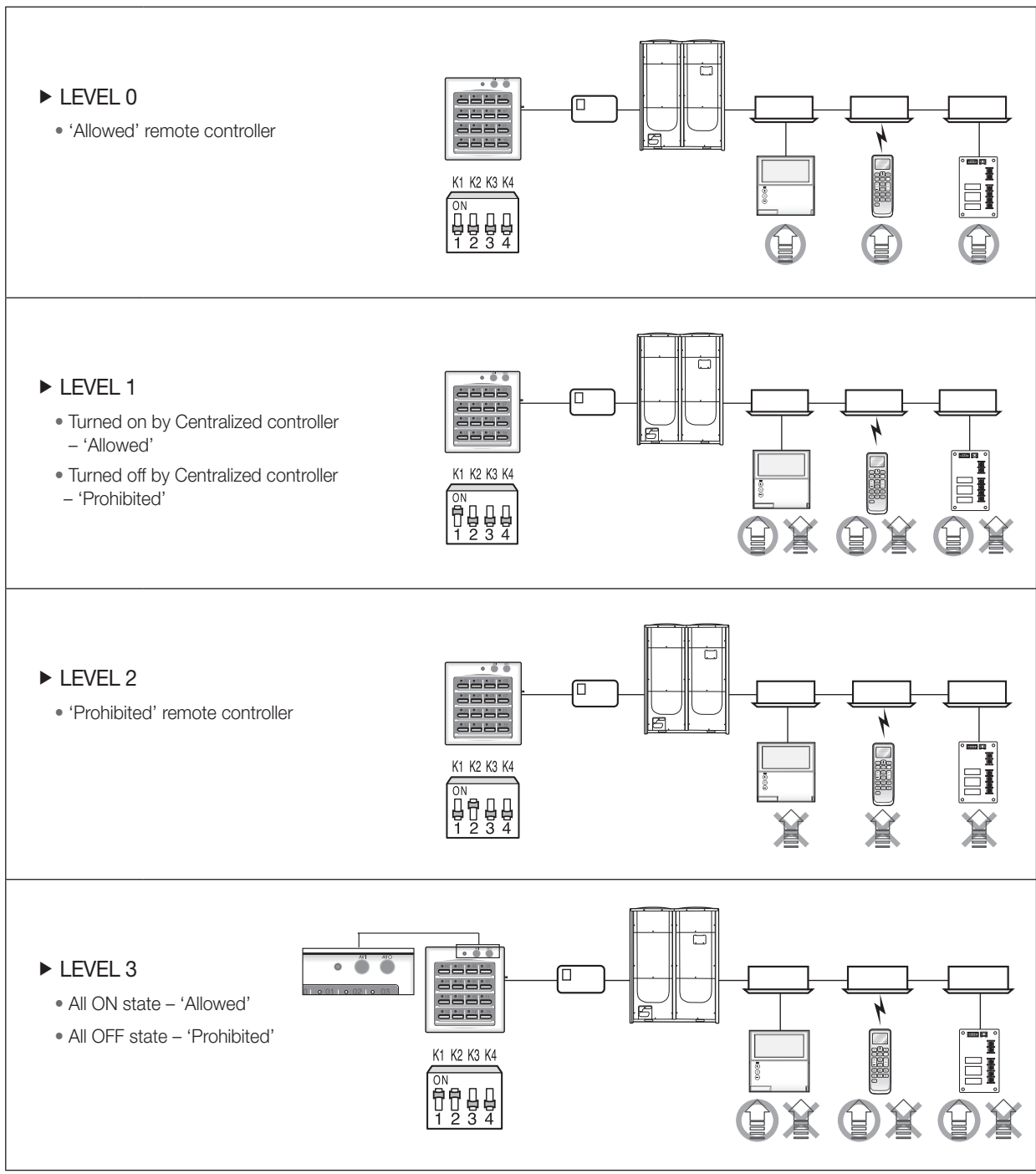


5) Address & option switch



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 centralized controller. When indoor units are OFF by the centralized 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	Dynamic switching of remote control use between 'Allowed' and 'Prohibited' by using All ON button
K3		Group/Room tracking mode <ul style="list-style-type: none"> ▪ OFF : Group mode tracking ▪ ON : Room mode tracking ※ Under Group mode, button control is allowed and not under Room mode
K4		Upper controller compatibility setting <ul style="list-style-type: none"> ▪ OFF : Support DMS2 or S-NET mini supported ▪ ON : Support function controller

Option switch K1, K2 – Remote control use



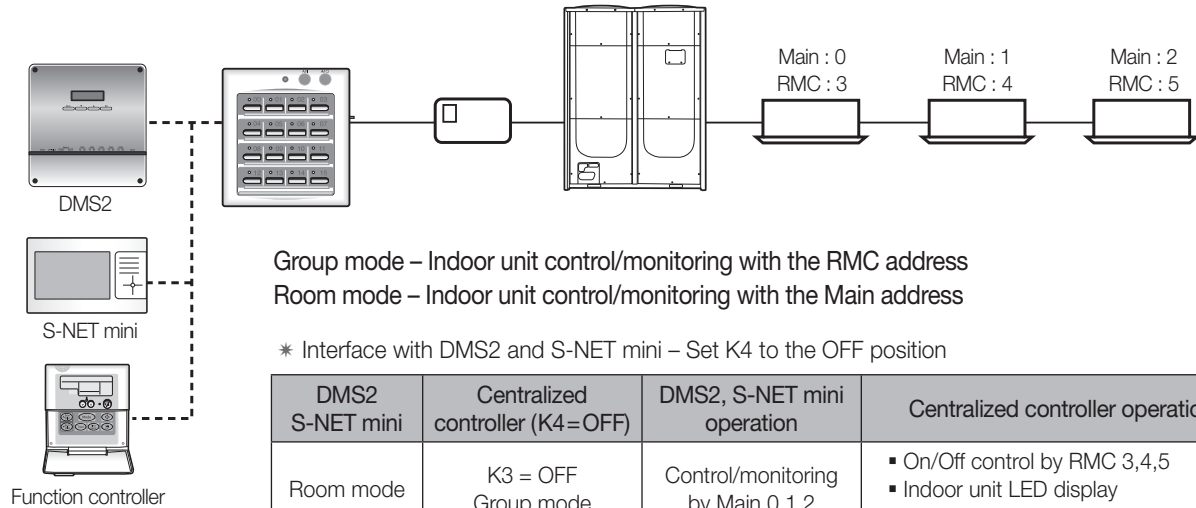
II Centralized control system

2. Centralized controller

MCM-A202D

5) Address & option switch

Option switch K3 – Tracking mode setting



Group mode – Indoor unit control/monitoring with the RMC address
 Room mode – Indoor unit control/monitoring with the Main address

* Interface with DMS2 and S-NET mini – Set K4 to the OFF position

DMS2 S-NET mini	Centralized controller (K4=OFF)	DMS2, S-NET mini operation	Centralized controller operation
Room mode	K3 = OFF Group mode	Control/monitoring by Main 0,1,2	<ul style="list-style-type: none"> On/Off control by RMC 3,4,5 Indoor unit LED display All ON LED display
Room mode	K3 = ON Room mode	Control/monitoring by Main 0,1,2	<ul style="list-style-type: none"> Indoor unit control is not allowed Indoor unit LEDs are always turned off All ON LED is always turned on

* Interface with function controller – Set K4 to the ON position

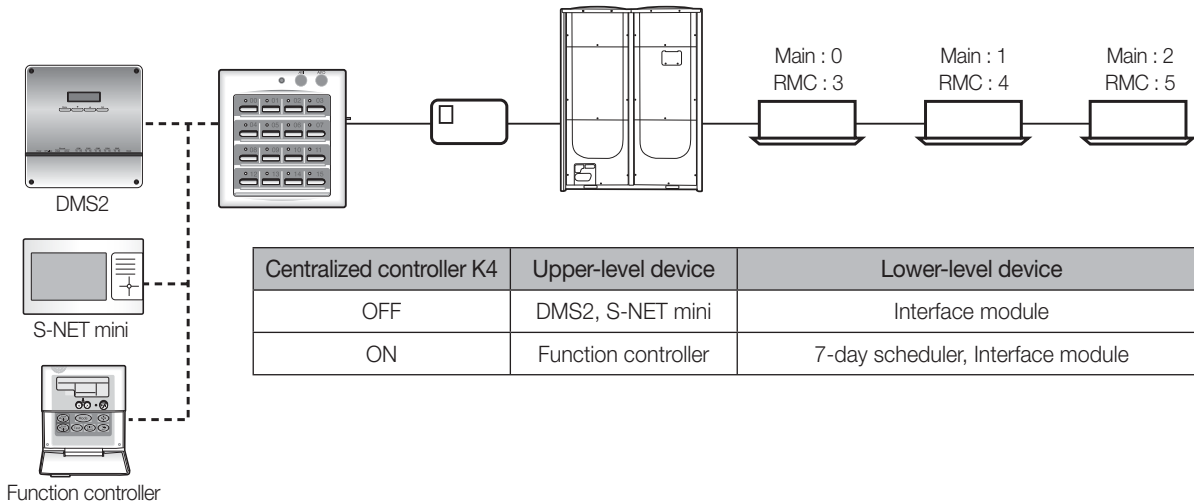
Function controller	Centralized controller (K4=ON)	Function controller operation	Centralized controller operation
Group mode	K3 = Not used	Control/monitoring by RMC 3,4,5	<ul style="list-style-type: none"> On/Off control by RMC 3,4,5 Indoor unit LED display All ON LED display

※ Function controller controls indoor units based on their RMC address.
 Room mode is not supported for interface with the function controller.

Option switch K4 – Upper-level device compatibility

(1) Upper- level controller interface

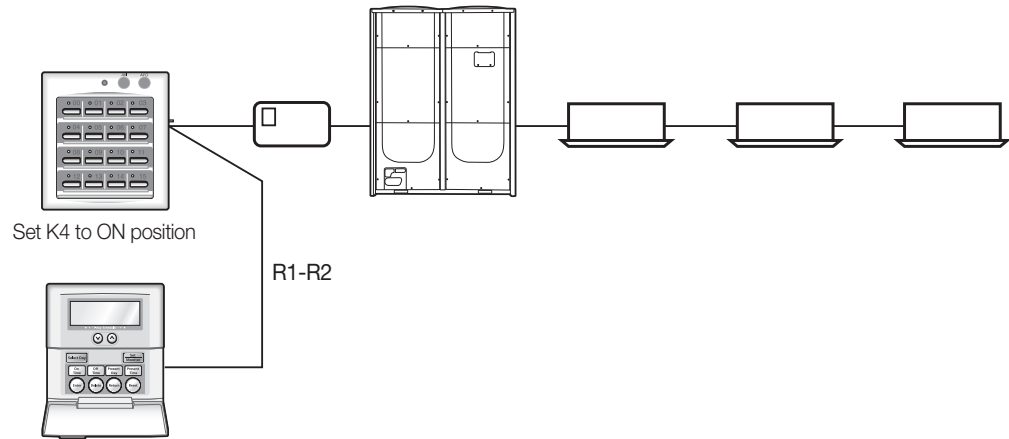
- Upper-level devices can be chosen for interface with the centralized controller based on the option.



Centralized controller K4	Upper-level device	Lower-level device
OFF	DMS2, S-NET mini	Interface module
ON	Function controller	7-day scheduler, Interface module

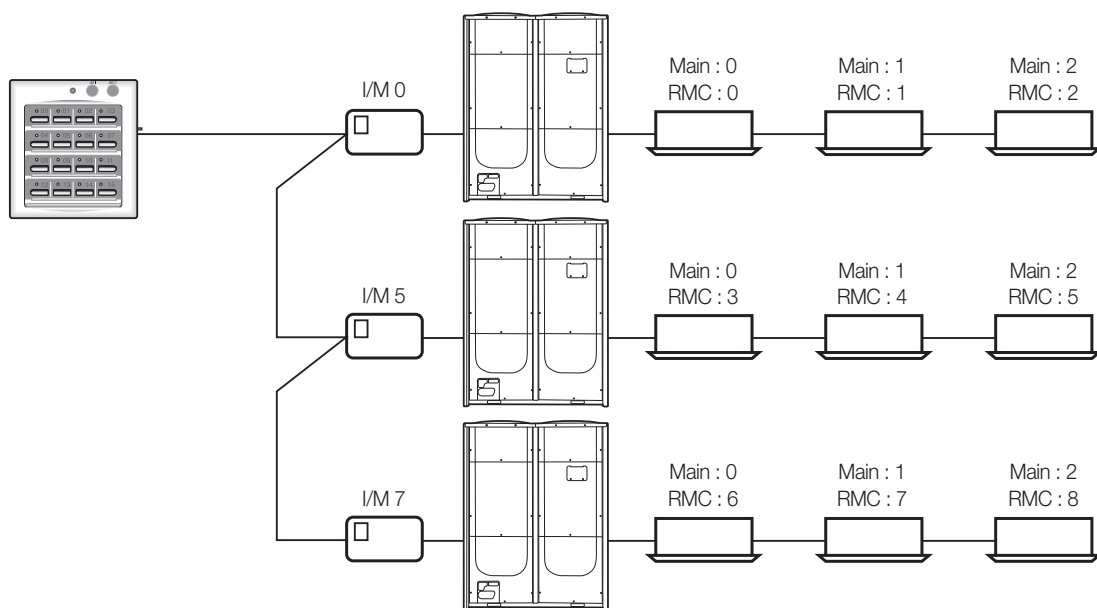
(2) 7-Day scheduler interface

- All the indoor units controlled by the centralized controller can be also managed by the 7-day scheduler according to the schedule settings.



6) Various LED display

After power reset to the centralized controller, it carries out indoor unit tracking process through the interface modules.



(1) During tracking interface modules, LED whose number is equivalent to interface module address instantaneously flickers.

- In LED 00 → LED 05 → LED 07 order

(2) If one of the interface modules does not response for certain period of time, centralized controller will skip corresponding interface module and complete the tracking process.

II Centralized control system

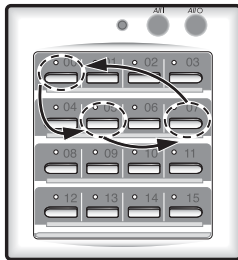
2. Centralized controller

□ MCM-A202D

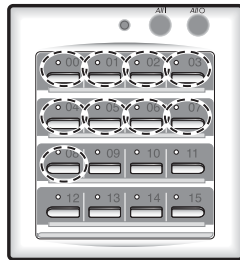
6) Various LED display

Option switch K4 – Upper-level device compatibility

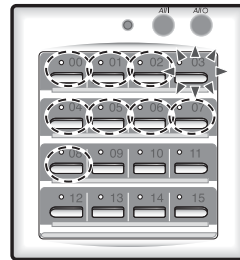
- 1 When there occurred an error in one of the indoor units, RMC-matching LED on the centralized controller flickers.
- 2 If communication between them are blocked for some reasons, entire RMC-matching LEDs on the centralized controller blink at the same time.



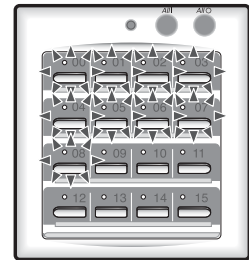
Under tracking



Tracking completed



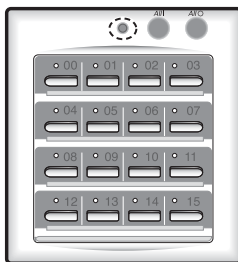
Error in RMC3 indoor unit
LED 03 blinking



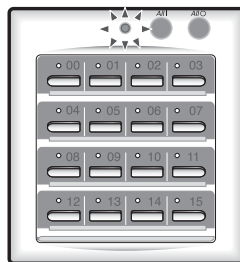
Communication block in interaction
with I/Ms → All LEDs blinking.

Under room mode tracking (K3 to ON)

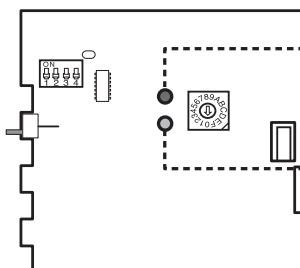
- 1 After completion of indoor unit tracking, all LEDs stay in the OFF state.
- 2 When interface module communication block occurs, only All ON LED blinks.



Indoor unit operation
→ All ON LED lighting



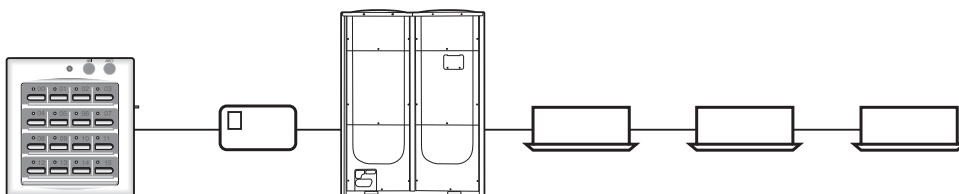
Error in I/M, indoor units
→ All ON LED blinking



Red LED
It flickers during communication with upper-layer devices
(DMS2, S-NET mini, Function controller)

Green LED
It flickers while interacting with interface modules.

7) Compatibility with interface module

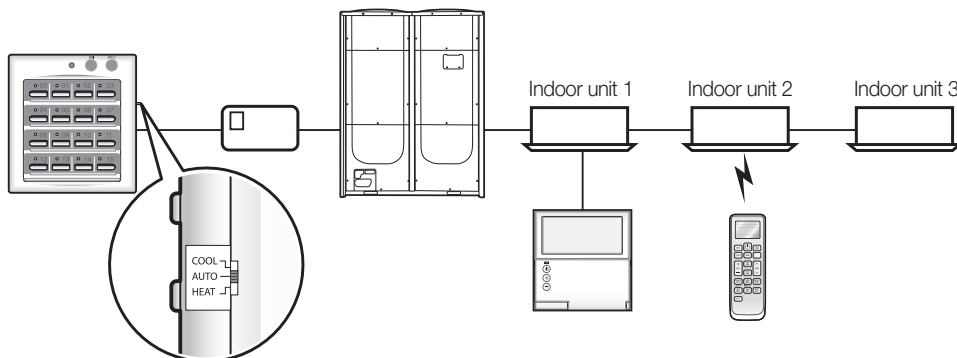


- MIM-B13D : DVM series, FJM, CAC, ERV, ERV Plus
- MIM-B13E : DVM series, FJM, CAC, ERV

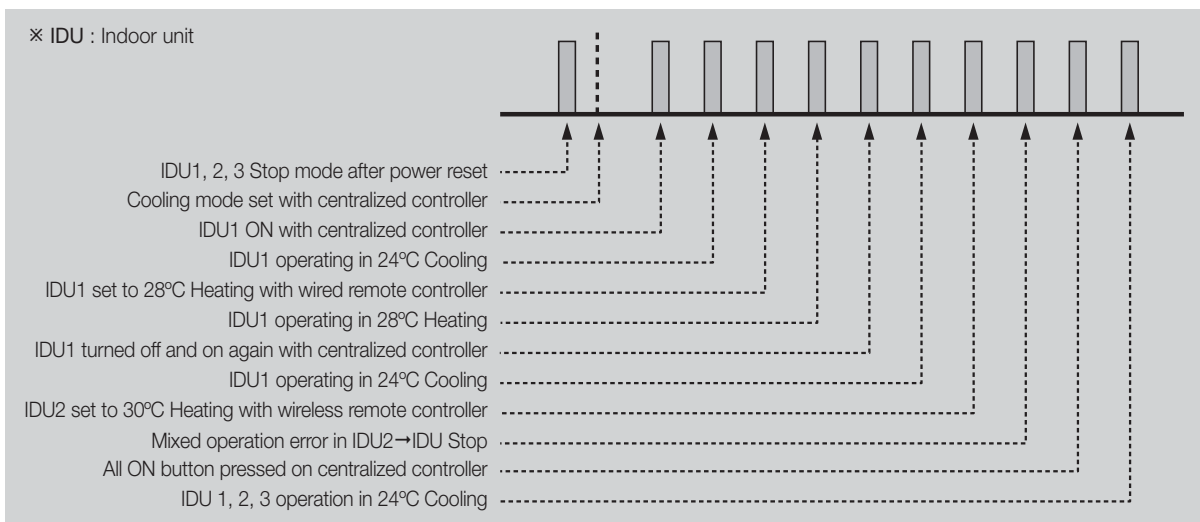
* Old versions MIM-B13/B13A/B13B, MIM-B00, MIM-B04/B04A are also supported to MCM-A202D.

8) Operation mode selection switch

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



Operation sequence



Indoor unit operation

(1) When all the indoor units are in the OFF state after power reset,

- Cooling mode set → Cooling operation in 24 °C set temperature, Auto airflow and Stop fan direction.
- Heating mode set → Heating operation in 27 °C set temperature, Auto airflow and Stop fan direction.
- Auto mode set → Indoor units is controlled by the last operation status.

(2) When the indoor units are operated in certain mode,

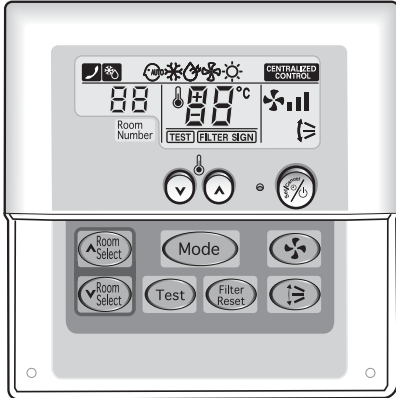
- If the selected mode is matched to the current operation mode, indoor units keep their current operation mode.
 - If the selected and current modes are not matched, indoor units are controlled to the set mode of the centralized controller.
 - Cooling mode set → Cooling operation in 24°C set temperature, Auto airflow and Stop fan direction.
 - Heating mode set → Heating operation in 27 °C set temperature, Auto airflow and Stop 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 avoid "Mixed operation error."

II Centralized control system

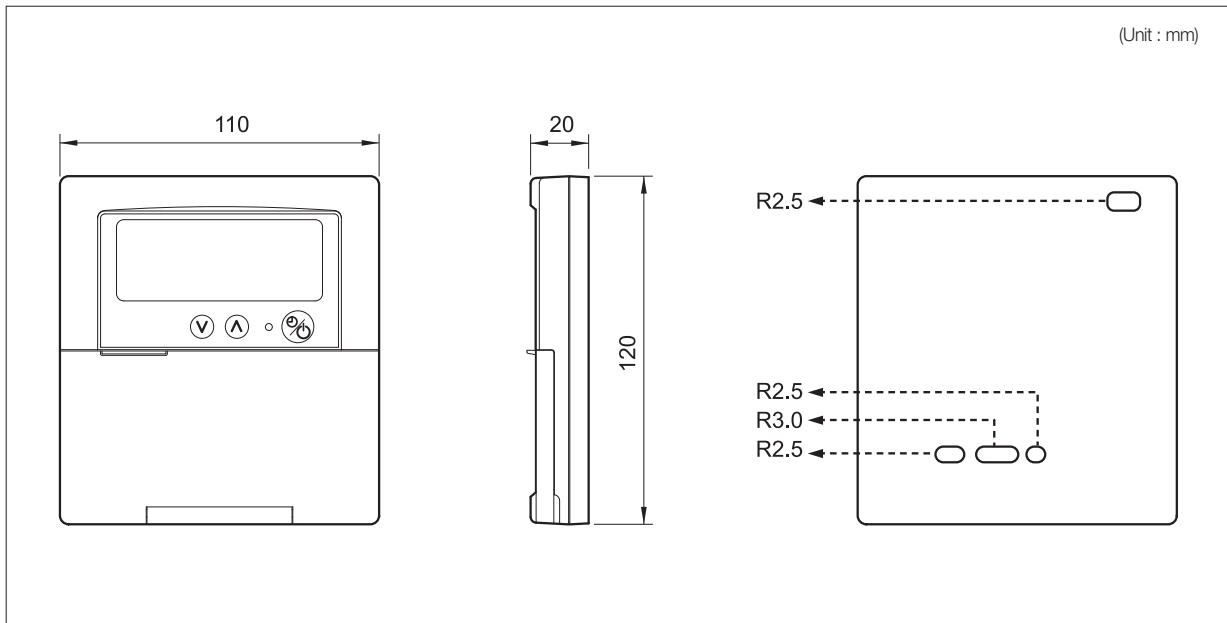
3. Function controller

□ MCM-A100

1) Features



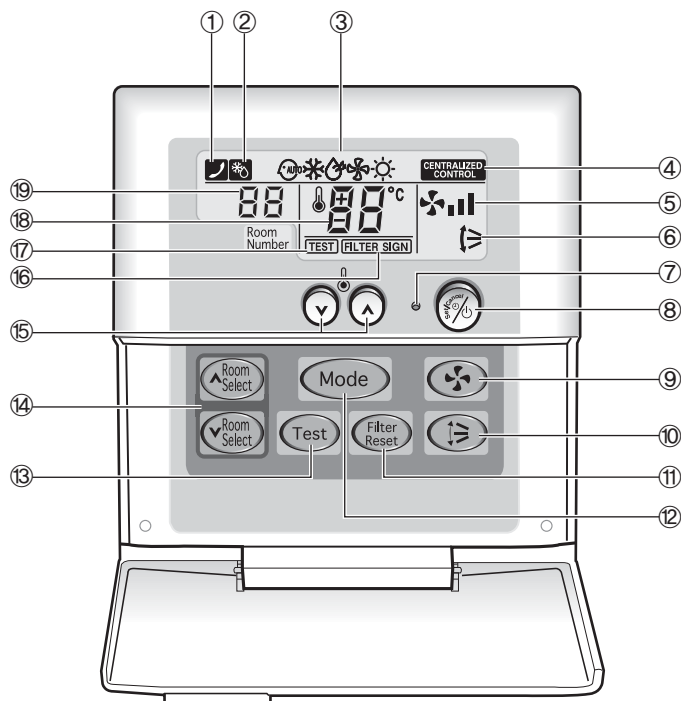
- Indoor unit control/monitoring of up to 16 groups (Max. 256 indoor units)
- On/Off control
- Operation mode, temperature setting, airflow direction, fan speed
- Error display (Indoor & Outdoor units)
- Filter replacement sign and reset



2) Specification

Power supply	9V DC ~ 12V DC, 100mA
Communication length	Max. 1000m (to centralized controller)
Connected device	Centralized controller (1:1 connection)
Connection limit	Maximum 16 group control (Control is available only on indoor units with their Main address within '0~31' range.)

3) Description of parts



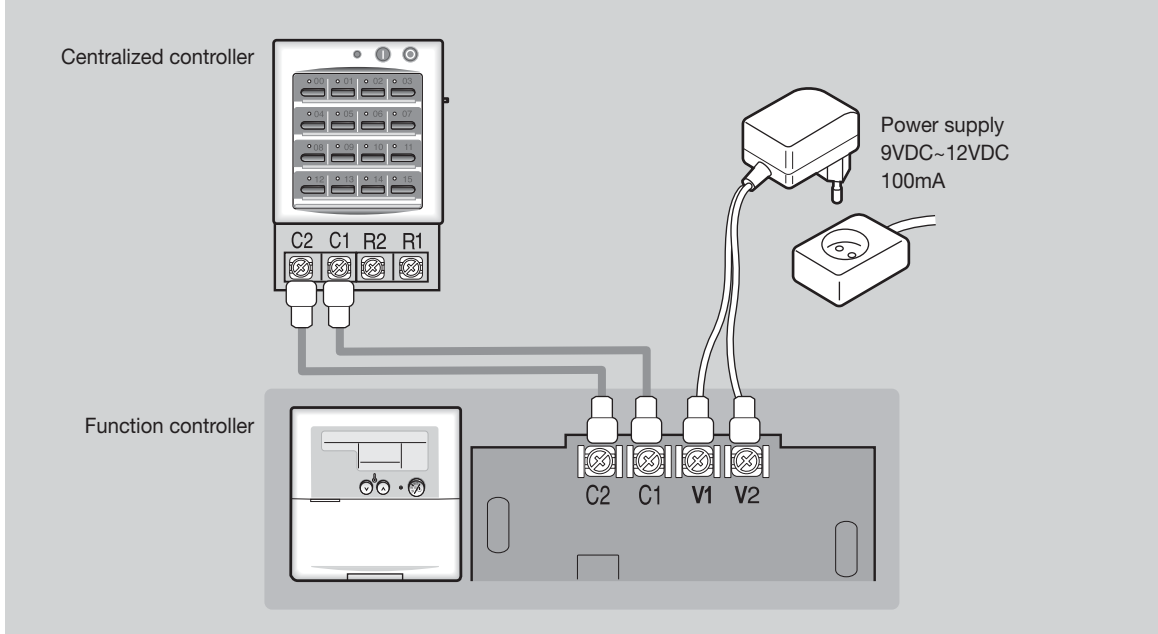
No.	Name	Description
①	Error indicator	It is displayed when errors occurred in indoor/outdoor units.
②	Defrost indicator	Certain indoor unit enters Defrosting operation mode.
③	Operation mode indicator	Indoor unit operation mode. Auto, Cooling, Dehumidify, Fan, Heating.
④	Centralized control	It indicates that certain indoor unit is not controlled by wired/wireless controllers.
⑤	Fan speed indicator	It indicates indoor unit fan speed.
⑥	Air flow direction indicator	It indicates indoor unit airflow direction.
⑦	Operation LED	<ul style="list-style-type: none"> It indicates indoor unit operation. It also flickers during initial tracking process.
⑧	On/Off button	Indoor unit can be turned On/Off.
⑨	Fan speed button	Indoor unit fan speed can be selected.
⑩	Air flow direction button	Indoor unit airflow direction can be selected.
⑪	Filter reset button	When filter replacement indicator is ON, press the filter reset button to clear filter indication.
⑫	Operation mode button	Indoor unit operation mode can be selected.
⑬	Error check button	When error indicator is displayed, press this button to check the error code.
⑭	Indoor unit selection button	Press Up/Down button to select the indoor unit.
⑮	Temperature set button	Press this button to set temperature.
⑯	Filter replacement indicator	This warning is displayed when filter replacement is required.
⑰	Test run indicator	No function
⑱	Set temperature display	It displays the current set temperature. When errors occur, equivalent error code is also displayed.
⑲	Indoor unit RMC address	RMC address of the selected indoor unit is displayed. When an error occurred, it shows the RMC address of the indoor unit where the error occurred.

II Centralized control system

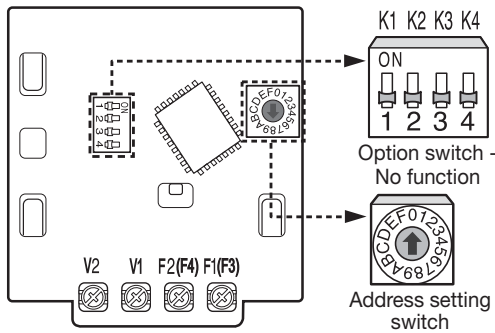
3. Function controller

□ MCM-A100

4) Connection with centralized controller

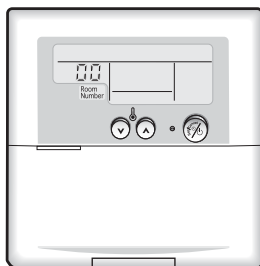


5) Address & option switch



DIP SW No	Function	
	OFF	ON
1	Cooling	Cooling and Heating
2	No function	No function
3	°C	-
4	No function	No function

6) Initial LCD display

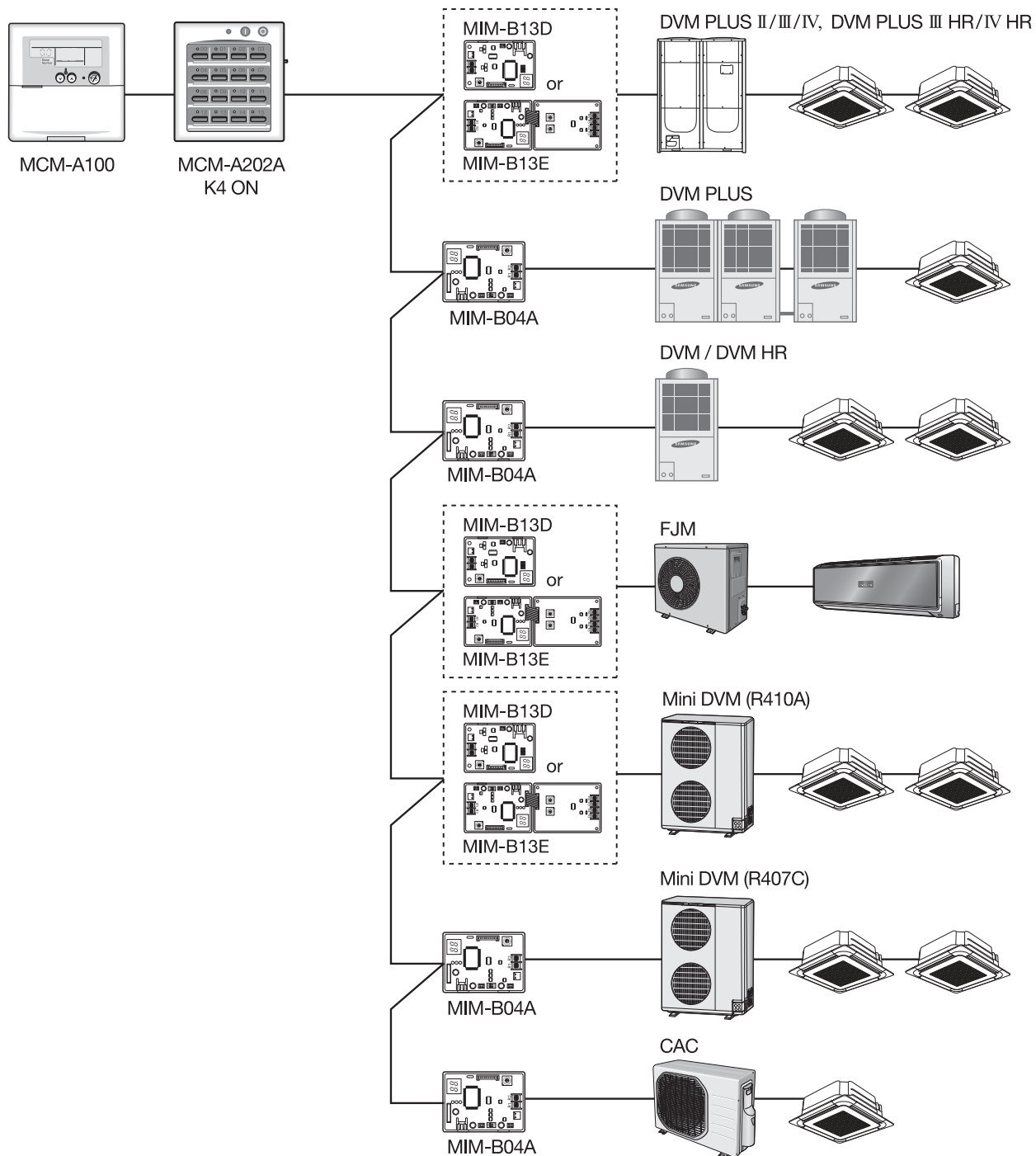


Power ON



Press ON button during tracking is in process

7) Connection diagram



Note

- ◆ One centralized controller must be connected to one functional controller.
- ◆ Address of the centralized controller must be matched to that of the function controller.

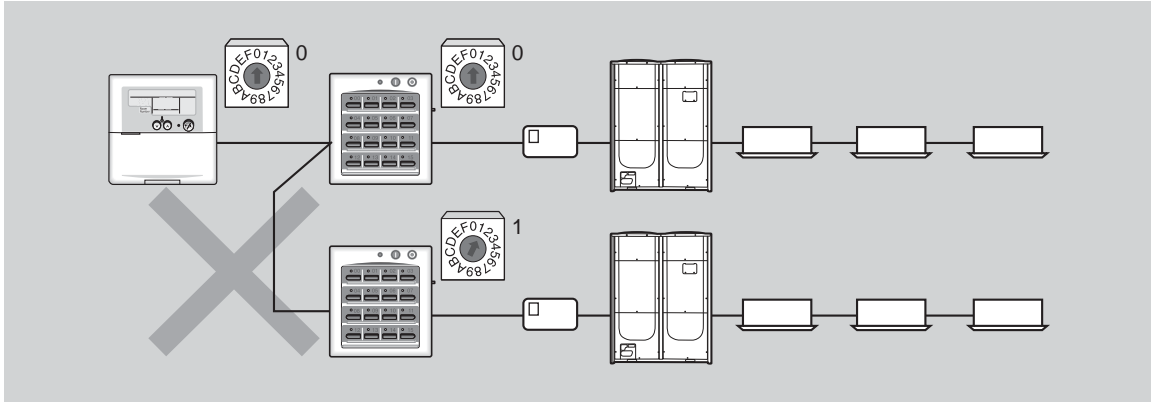
III Centralized control system

3. Function controller

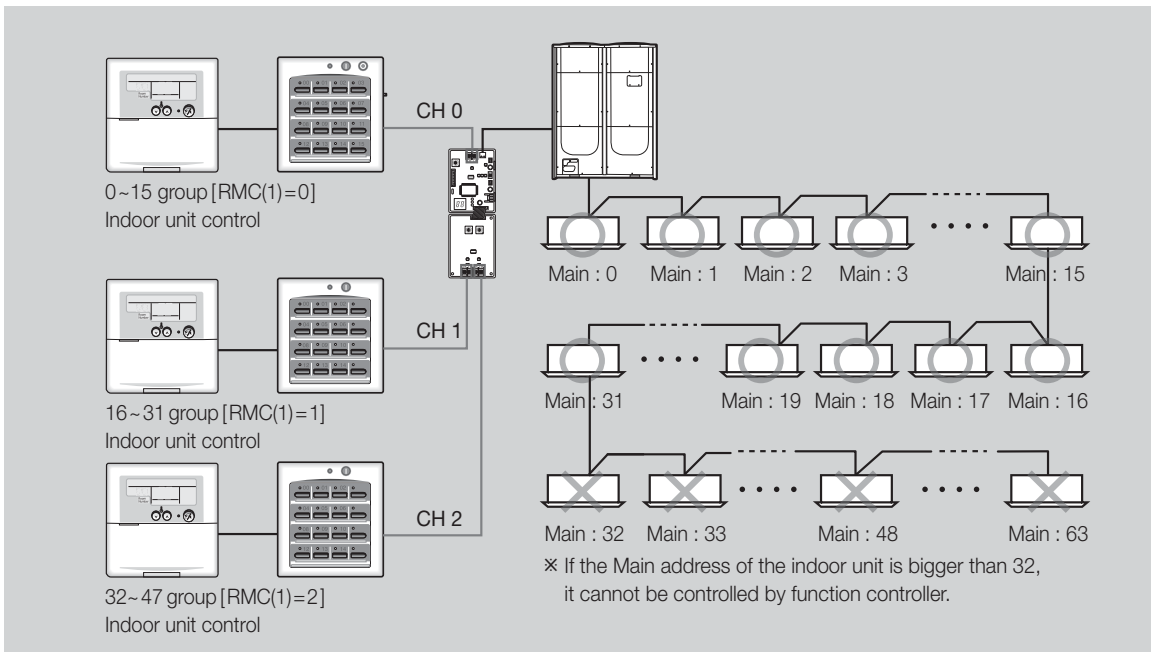
□ MCM-A100

8) Precaution on wiring with the centralized controller

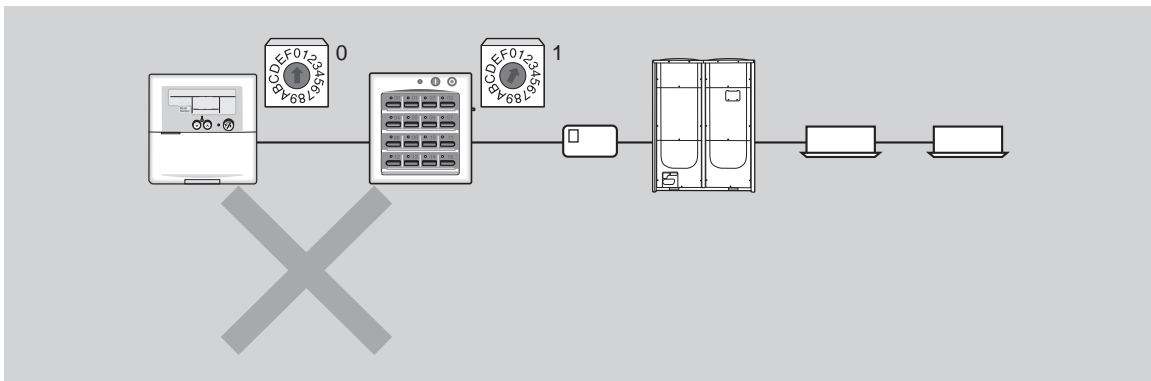
- ▶ Multiple centralized controllers cannot be connected to one functional controller.



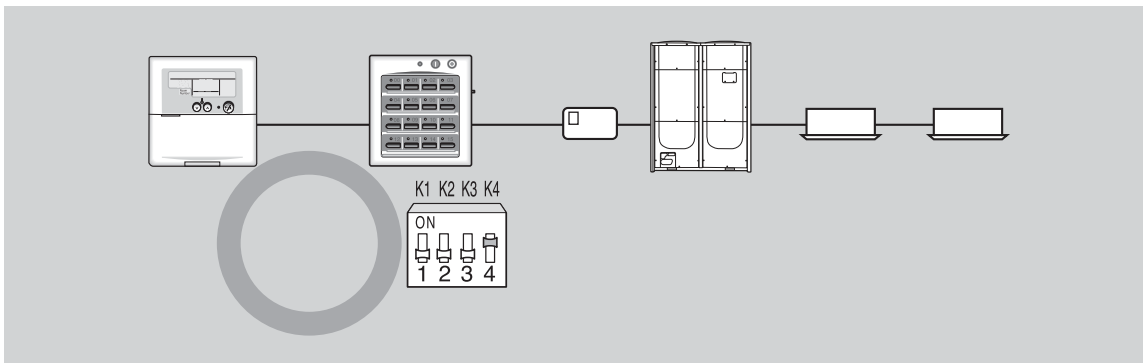
- ▶ Control is available only on indoor units with their Main address within '0~31' range.



- ▶ Centralized controller address must be matched to function controller address. If not matched, function controller does not complete initial tracking process.



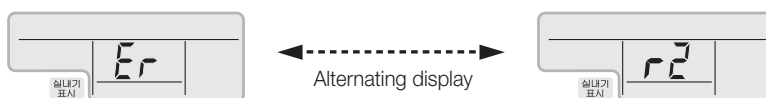
► K4 switch in the centralized controller must in the ON position.



9) Error display

No	Display	Description	Note
1	Er → EA	Centralized controller → Function controller communication error (no response from the centralized controller)	Communication error
2	Er → Eb	No data from indoor units to centralized controller. (Normal communication between centralized controller and function controller)	
3	Er → EC	Indoor unit communication error	
4	Er → Ax	Indoor unit evaporator IN sensor separation	x : Indoor unit address
5	Er → Bx	Indoor unit evaporator OUT sensor separation	
6	Er → Cx	Indoor unit EEV Open error	
7	Er → Dx	Indoor unit EEV Close error	
8	Er → Fx	Indoor unit evaporator IN/OUT sensor separation	
9	Er → G2	Outdoor unit refrigerant leakage/activation failure	
10	Er → G3	Outdoor unit condenser sensor separation	
11	Er → ox	Indoor unit floating switch error	
12	Er → qx	Indoor unit room sensor error (Open/Short)	
13	Er → rx	Indoor unit evaporator IN sensor error (Open/Short)	
14	Er → sx	Indoor unit evaporator OUT sensor error (Open/Short)	
15	Er → tx	Indoor unit EEPROM error	
16	Er → Ux	Indoor unit EEPROM option error	
17	Er → vx	Indoor unit fan operation error	
18	Er → Eo	Outdoor unit error which causes indoor units to stop <ul style="list-style-type: none"> ▪ Outdoor unit sensor error (temperature/pressure) ▪ EEV Open/Close 6th detection ▪ Wrong 3-phase power connection/Phase missing ▪ Communication error 	

Ex) Evaporator IN sensor Open/Short error in indoor unit of RMC address 2.

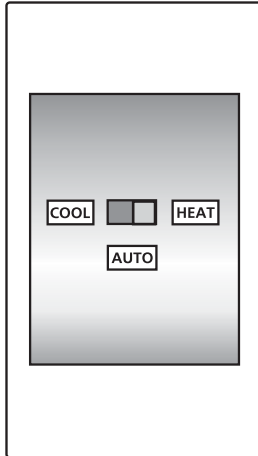


II Centralized control system

4. Operation mode selection switch

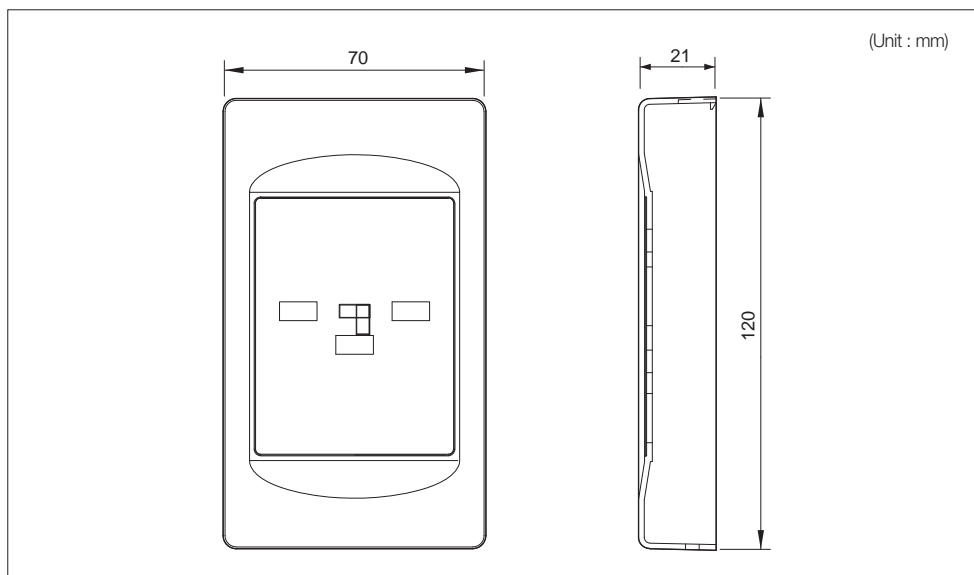
MCM-C200

1) Features

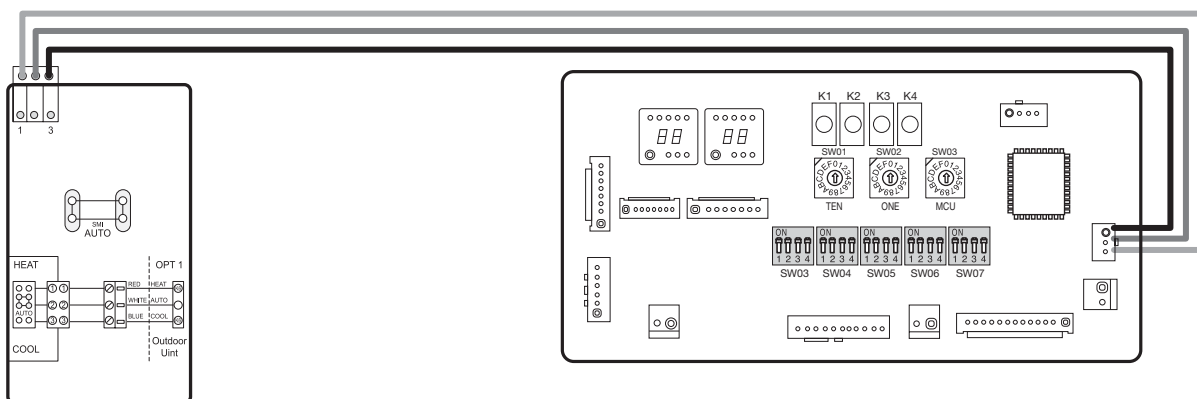


Operation mode selection switch

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

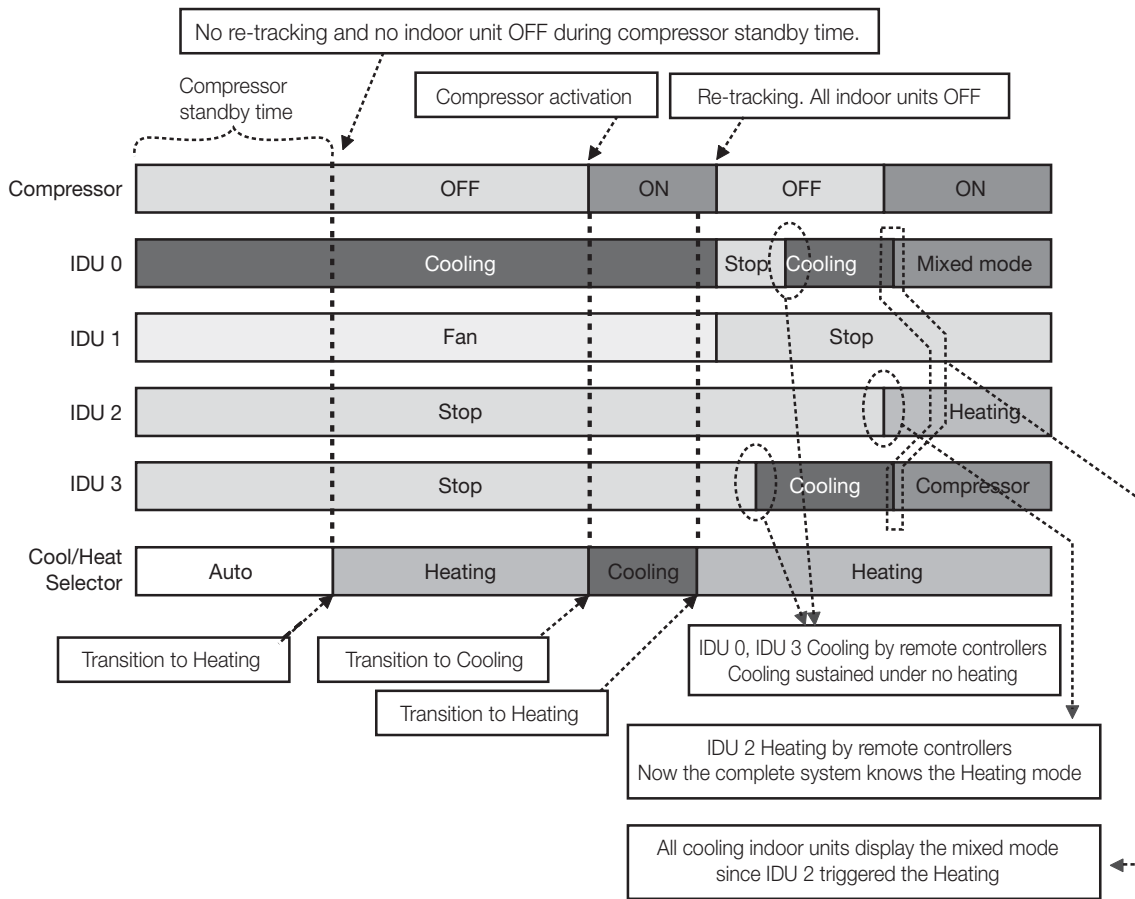


2) Installation



- 1 operation mode selection switch must be connected to 1 outdoor unit.
- Set the operation mode of the MCM-C200 and press the outdoor unit K3 button to reset the outdoor unit.
- If the compressor is operating, outdoor unit will reset itself automatically.
- ※ Max. distance between the outdoor unit PCB and the MCM-200: 100m

3) Control example



II Centralized control system

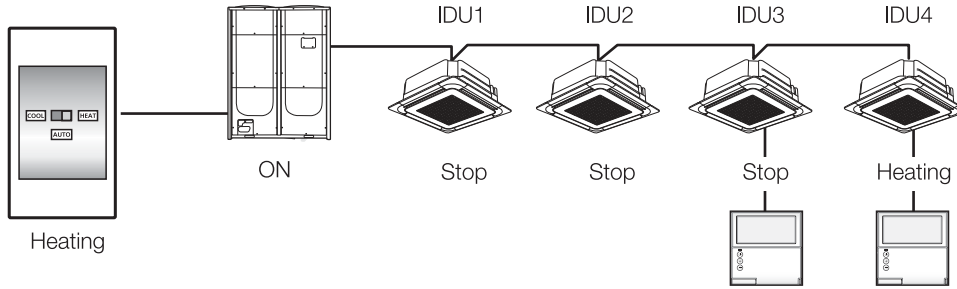
4. Operation mode selection switch

□ MCM-C200

3) Control example

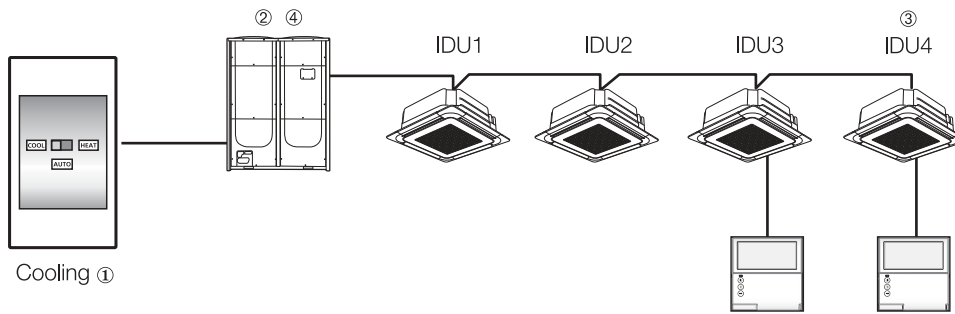
Initial condition

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



Sequence 1

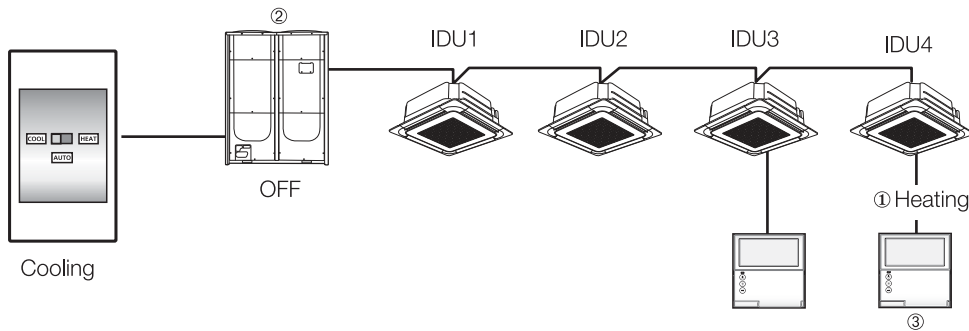
Set the Cool/Heat selector to the Cooling position



Result	① Change Cool/Heat Selector to Cooling
	② Automatically compressor OFF
	③ Running IDU4 stops
	④ Outdoor unit software reset (Re-tracking)

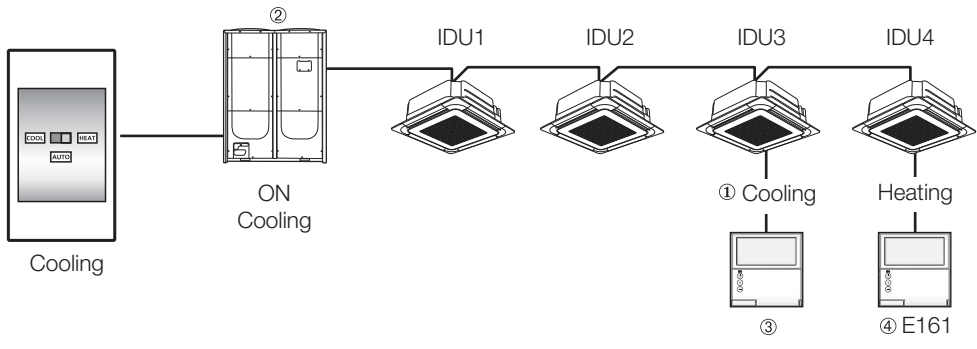
Sequence 2

Set IDU4 to Heating with Remote controller



Result	① IDU4 runs as heating mode
	② Compressor keeps OFF(Compressor doesn't operate heating)
	③ No mixed mode warning

Sequence 3 Set IDU3 to Cooling with Remote controller



Result	① IDU3 runs as cooling
	② Compressor ON → Compressor runs as cooling
	③ IDU3 normal operation
	④ IDU4 displays "Mixed mode warning"

☑ Note

- ◆ Indoor unit "Mixed operation error"
It occurs when indoor unit operation mode is not matched with outdoor unit operation mode
- ◆ Operation mode selection switch fixed outdoor unit operation mode.
→ It doesn't avoid "Mixed operation error"



DVM CONTROL SYSTEMS

III. Integrated management system

1	DMS2	88
2	S-NET3	125
3	S-NET mini	141

Integrated management system

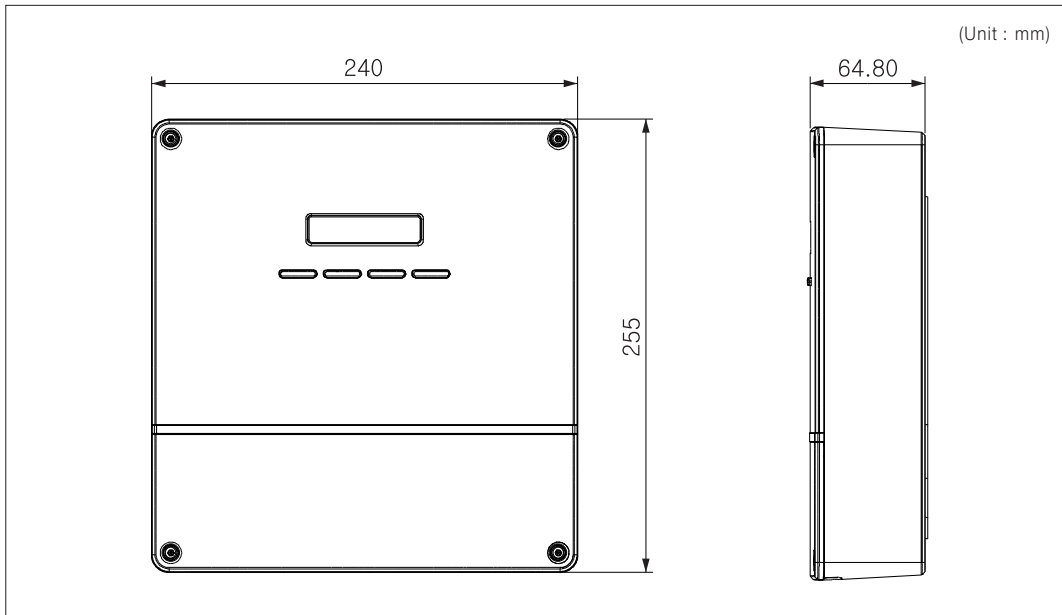
1. DMS2

□ MIM-D00A

1) Features



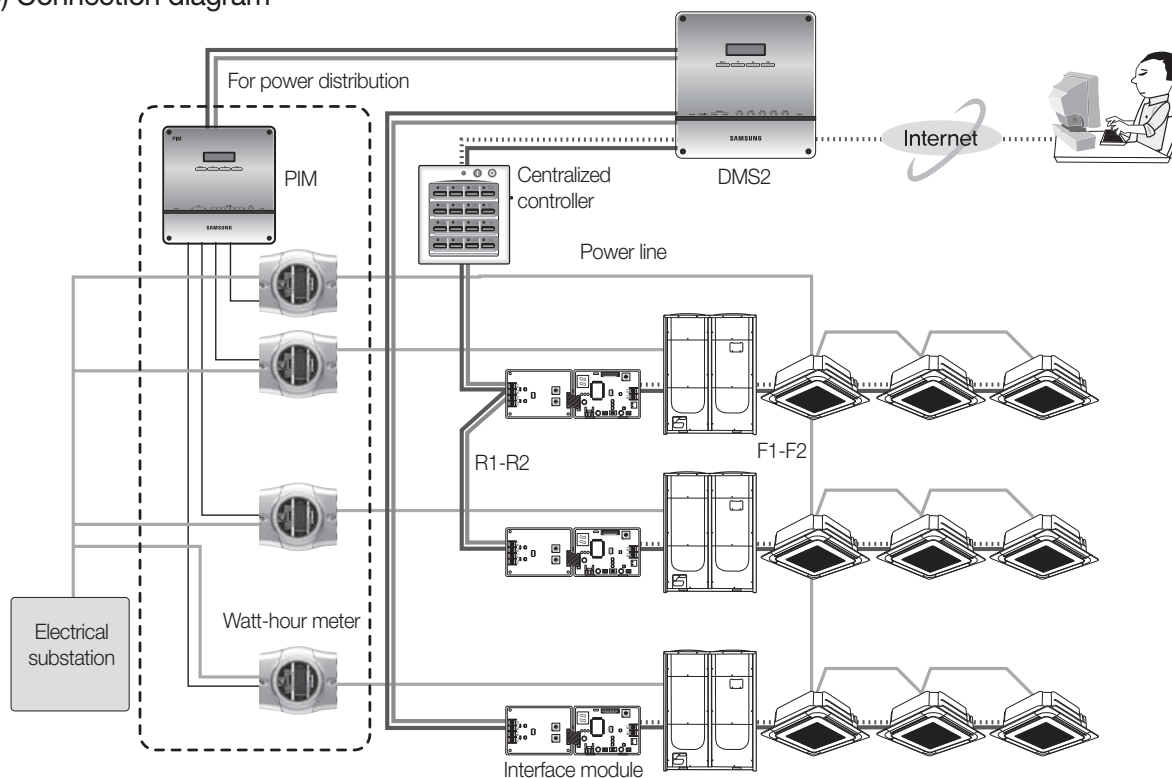
- Built-in web server for PC-independent management and remote access control
- Multiple upper-layer control access (S-NET 3, S-NET Mini, Web-client)
- Weekly/Daily schedule control
- Power distribution function
- Current time management even during power failure (for 24 hours)
- Emergency stop function 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
Operational humidity range		0%RH ~ 90%RH
Storage temperature range		-20°C ~ 70°C
Communication method		<ul style="list-style-type: none"> ▪ Lower level : RS485 (Interface module/ Centralized controller) ▪ Upper level : Ethernet 100 Base-T (S-NET3, S-NET Mini, Web Browser)
Maximum number of connection		<ul style="list-style-type: none"> ▪ Lower level : 16 centralized controllers, 80 interface modules ▪ Upper level : No limit

3) Connection diagram



4) Compatible devices

Type	Model	Maximum device connection	Remarks
Interface module	MIM-B13D MIM-B13E	Maximum 80 connections when only interface module is connected to DMS2	DVM PLUS II, DVM PLUS III, DVM PLUS IV, Mini DVM, ERV
Centralized controller	MCM-A202D	Maximum 16 connections when only centralized controller is connected to DMS2	-
Upper level controller	S-NET3 S-NET Mini	-	To use multiple number of upper level controllers, HUB or other network environment must be established
PIM	MIM-B16	Maximum 8 connection	-
Watt-hour meter	Pulse type	Connected with PIM Pulse width: 20~400(ms) Pulse: 1~10000(Wh/pulse)	-

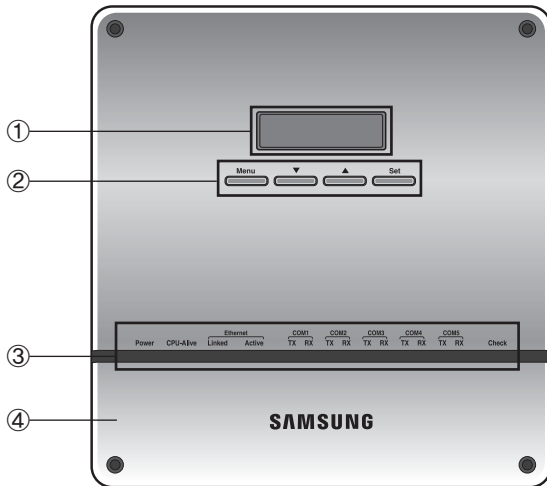
Integrated management system

1. DMS2

□ MIM-D00A

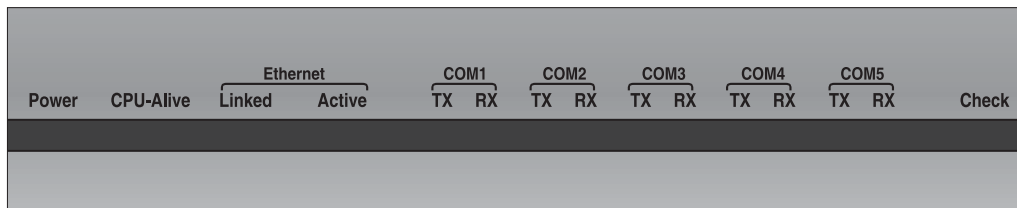
5) Description of parts

Front



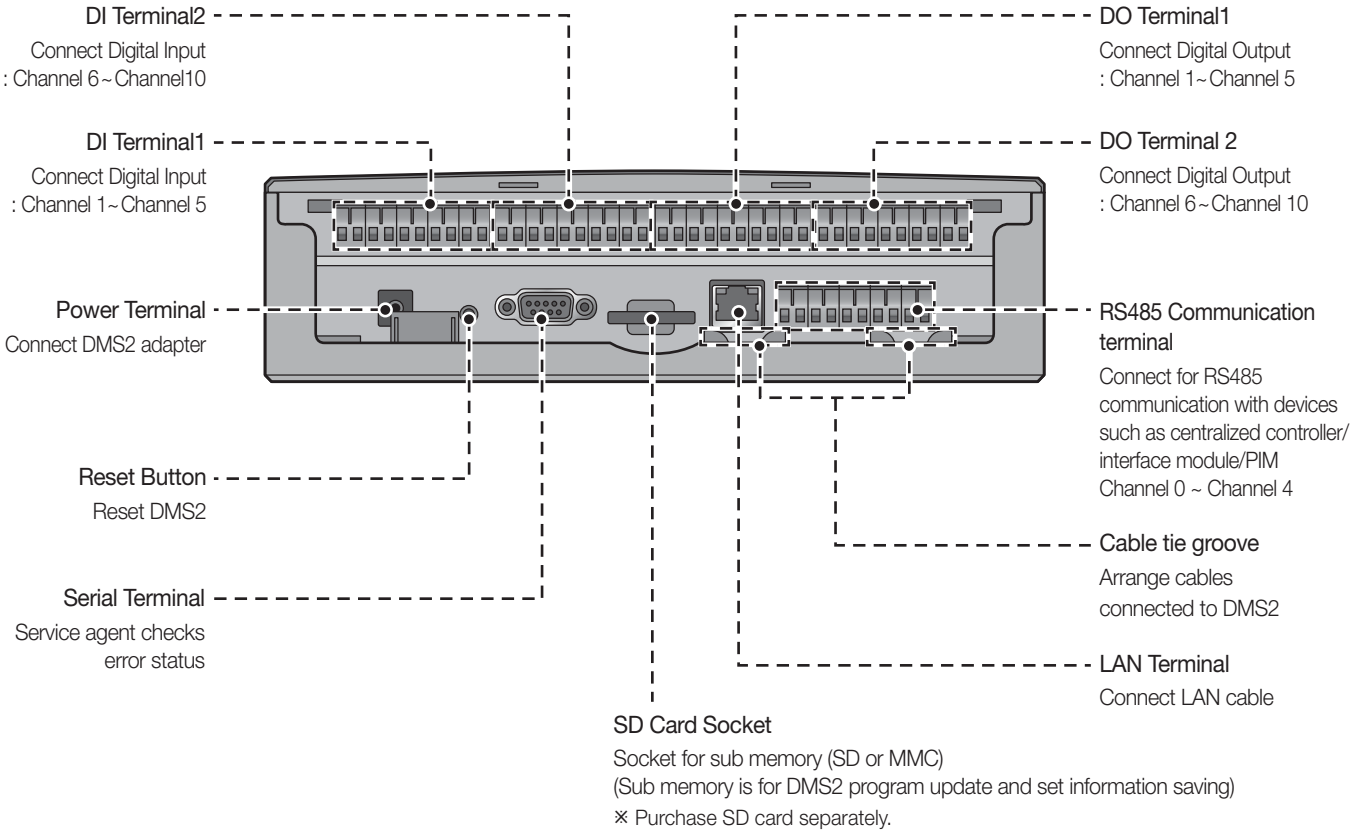
No	Name	Function
①	LCD display	Shows current time and IP address. Various messages will be displayed depending on button input.
②	LCD operation button	There are 4 buttons (Menu, ▼(Down), ▲(Up), Set) and you can access to menu and move, check the menu.
③	LED Indicator	Check 15 LED status such as Power, 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

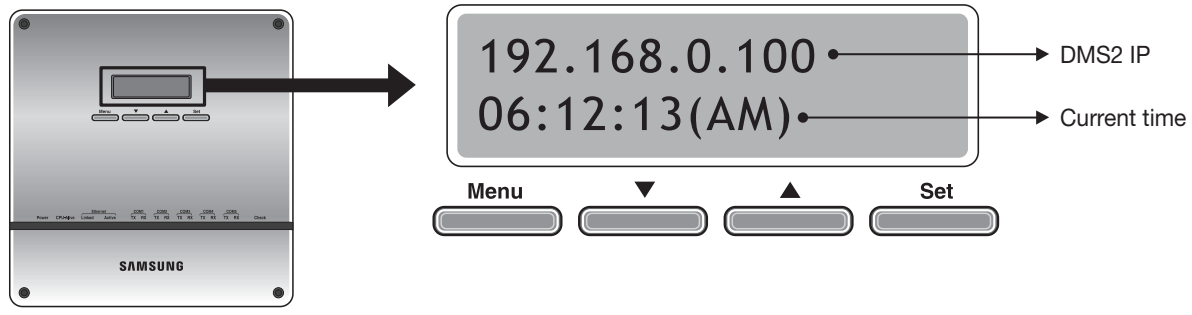


Item	Name	Status
Power	Power indicator	Turns blue when the power is supplied
CPU Alive	CPU operation indicator	Blinks in orange with 1 second intervals during normal operation
Ethernet - Linked	Internet connection indicator	Turns green during normal connection
Ethernet - Active	Internet data transmission/reception indicator	Blinks in orange during normal transmission/reception
COM1~5 - TX	Centralized controller/interface module data transmission indicator	Blinks in green during normal transmission
Com1~5 - RX	Centralized controller/interface module 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

Bottom



Menu and display



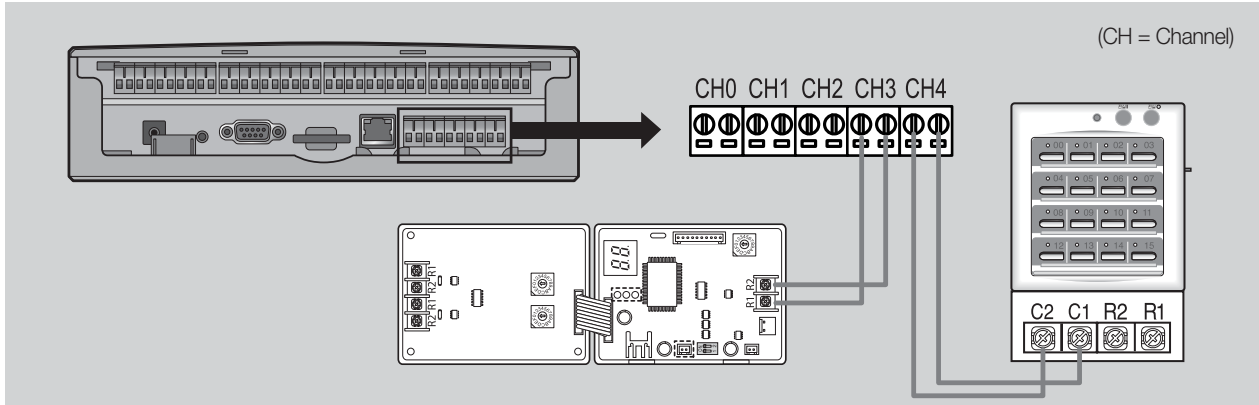
Button	Detail description
LCD display	<ul style="list-style-type: none"> General display : Displays IP address of the DMS2 and current time In Menu : Displays menu information and set value
Menu 	<ul style="list-style-type: none"> Access menu and select main menu Cancel menu setting
▼ 	<ul style="list-style-type: none"> Move between menu Change the menu settings
▲ 	<ul style="list-style-type: none"> Move between menu Change the menu settings
Set 	<ul style="list-style-type: none"> Access sub menu Save the change of menu settings

Integrated management system

2. DMS2

□ MIM-D00A

6) Connection



(1) Connecting interface module alone

- Maximum 16 interface modules can be connected to each channel
- Total 80 interface modules can be connected

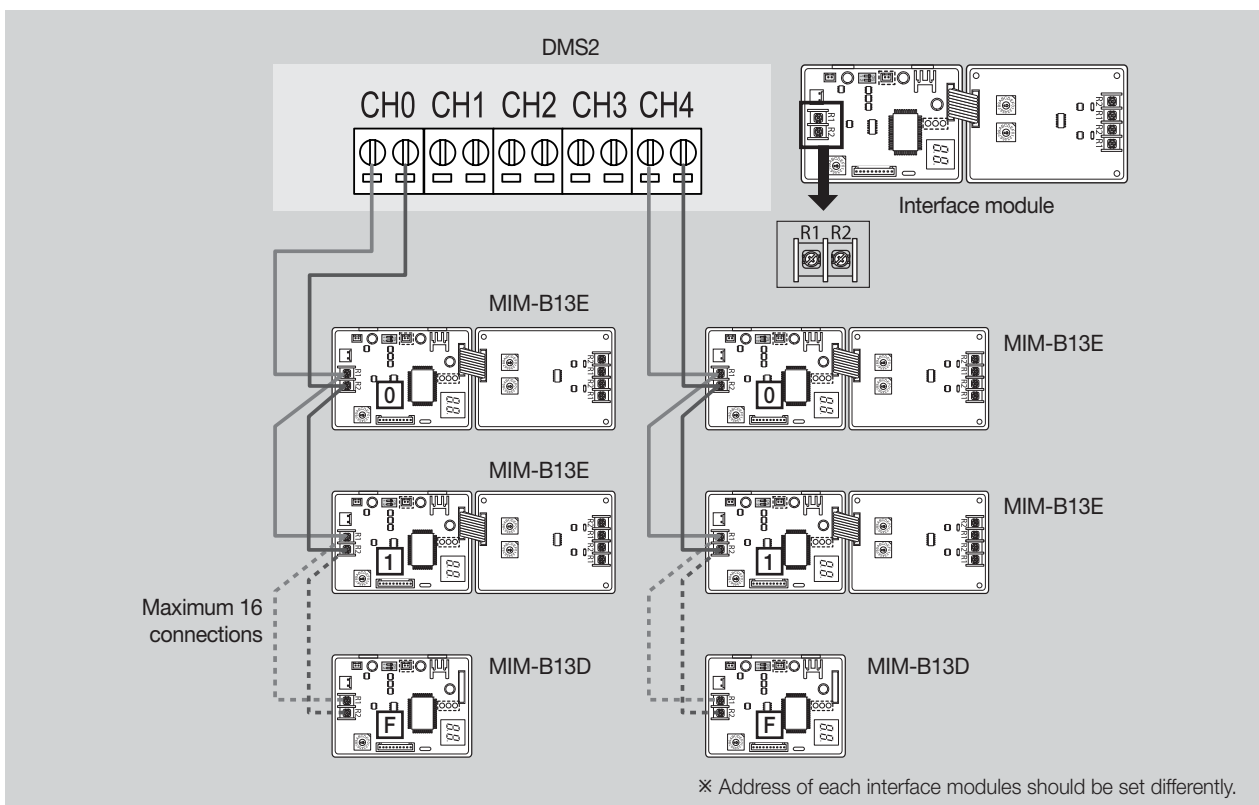
(2) Connecting centralized controller alone

- Maximum 16 centralized controllers can be connected

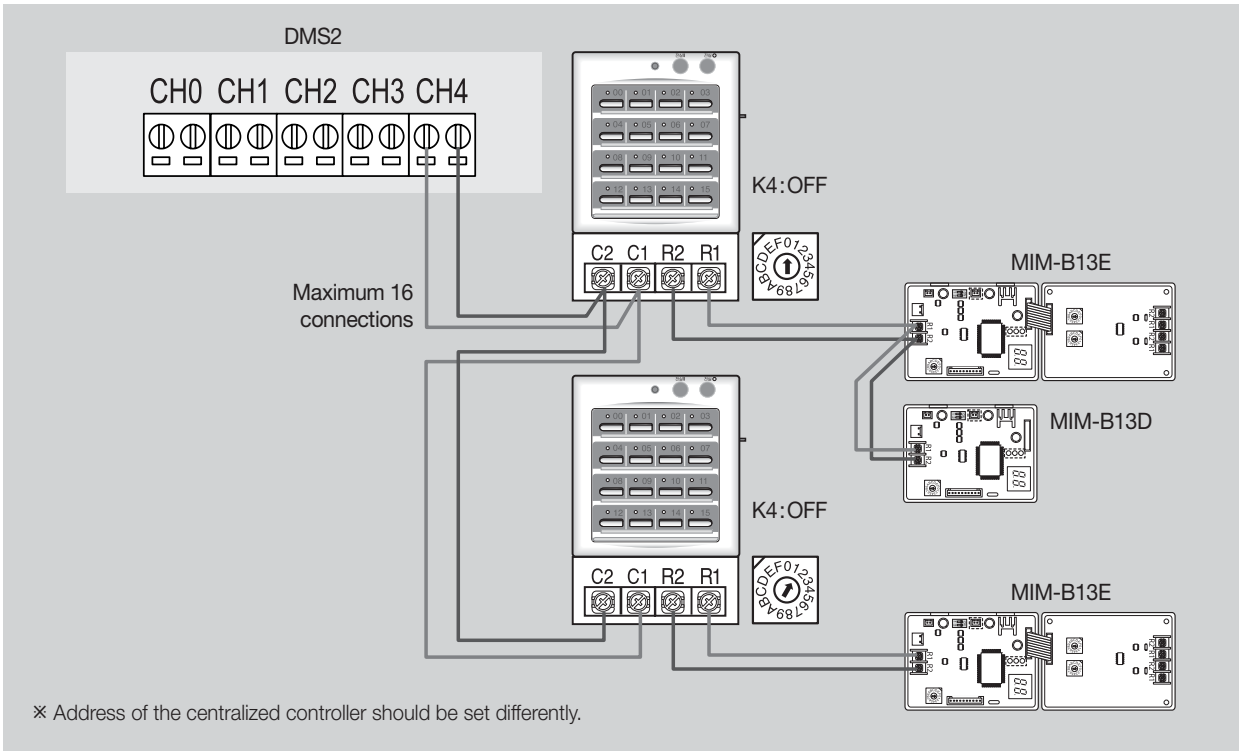
☑ Note

- ◆ DMS2 can connect interface module and centralized controller at the same time.
- ◆ Channel is partitioned to connect interface module and centralized controller separately.
- ◆ Interface module and centralized controller cannot be connected to 1 communication channel at the same time.

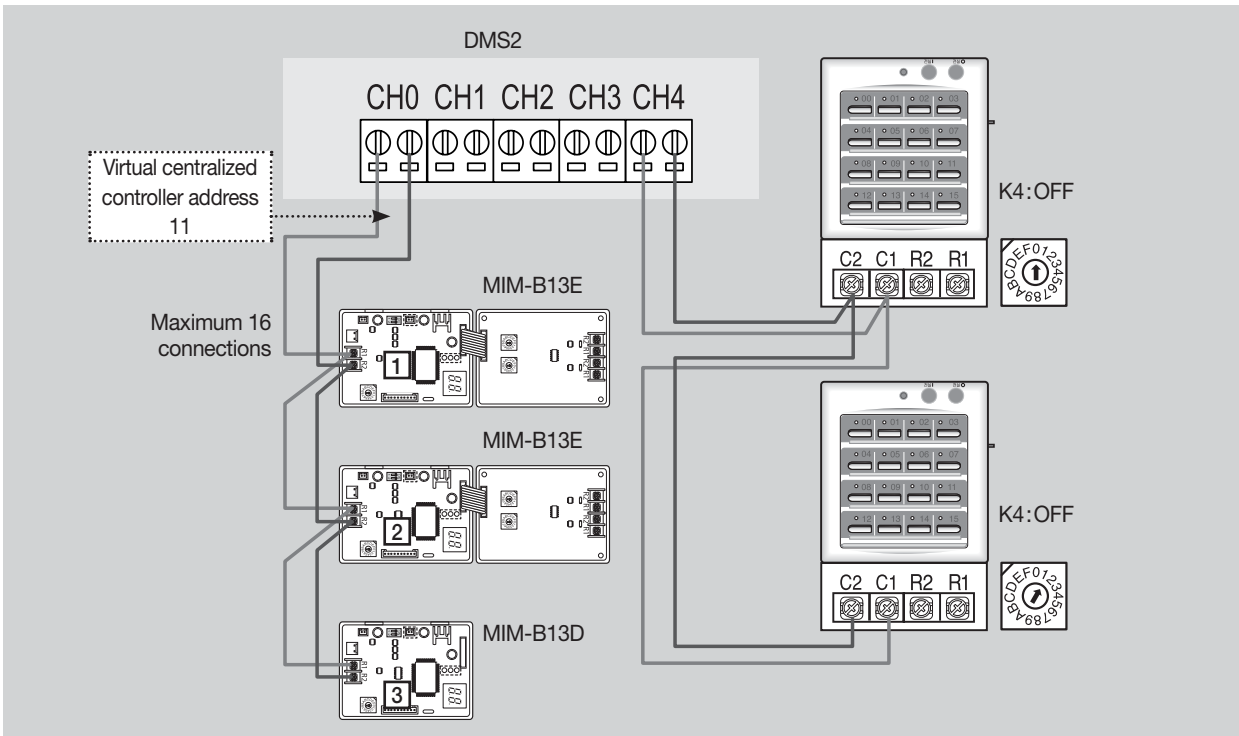
Connecting with Interface module



Connecting with Centralized controller



Connecting with Interface module and Centralized controller



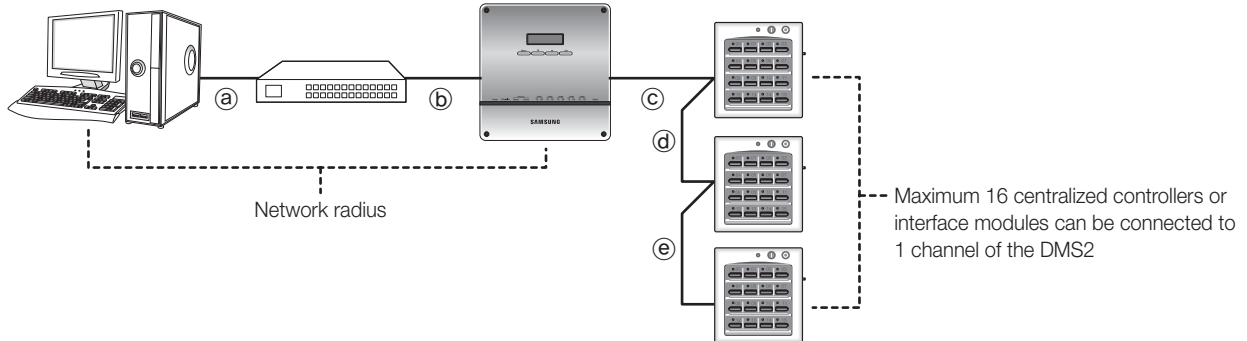
- ▶ Virtual centralized controller address will be assigned to the channel where interface module is connected. When actual centralized controller is connected to different channel, make sure that the virtual address is not same with address of the actual centralized controller.
- When interface module is connected to channel 0 : Virtual centralized controller address 11
- When interface module is connected to channel 1 : Virtual centralized controller address 12
- When interface module is connected to channel 2 : Virtual centralized controller address 13
- When interface module is connected to channel 3 : Virtual centralized controller address 14
- When interface module is connected to channel 4 : Virtual centralized controller address 15

Integrated management system

1. DMS2

MIM-D00A

7) Wiring distance

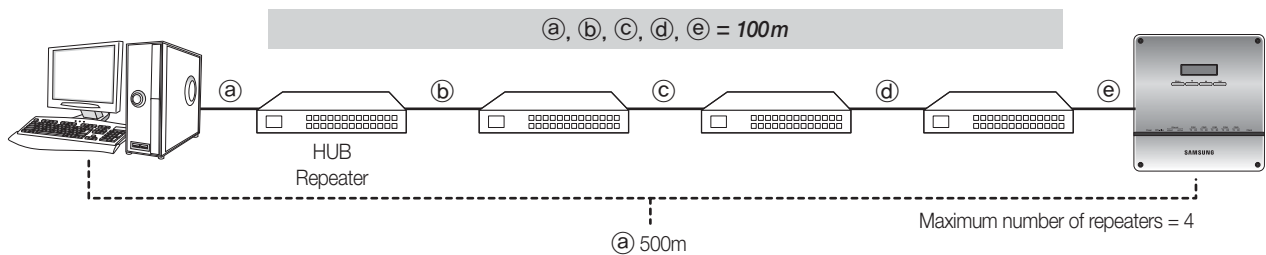


▶ Distance between DMS2 and Centralize controller/Interface module

- Distance from the DMS2 to the furthest centralized controller cannot exceed 1000m.
- $(c) + (d) + (e) \leq 1000m$

▶ 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.



8) Accessing DMS2

	Local access	External access
Access	Only PC connected to local network can access	External access is available through internet
LAN cable	Cross LAN cable (1:1 connection) Direct LAN cable (Using HUB)	Direct LAN cable
IP setting	Use private IP	Use public IP
E-mail malfunction report service	Unavailable	Available

Note

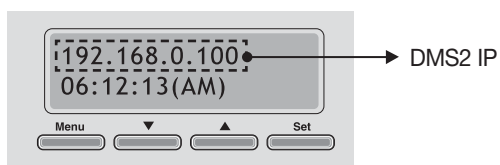
System requirements to access DMS2

- Windows XP SP2 or higher version, Windows 2000 SP4 or higher version
- Internet explorer version 7.0 or higher version (Internet Explorer 6.0 version is supported but not recommended.)
- Silverlight 2.0 or higher version.

▶ Run internet explorer and enter the IP address of the DMS2 to access DMS2.

× Default IP address of the DMS2 is set as 192.168.0.100.

Current IP of the DMS2 can be checked from the LCD display.

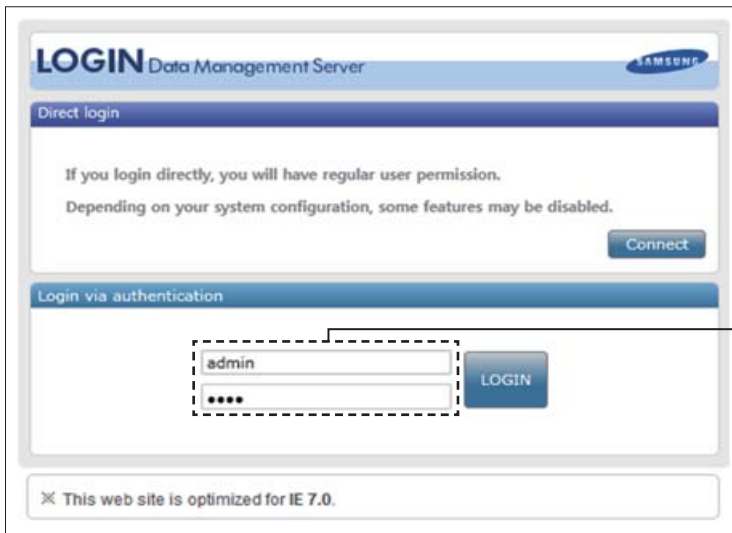


- ▶ To use DMS2, Silverlight 2.0 or higher version should be installed.
If it is the first access to DMS2, download link will appear automatically.
Click the link to install Silverlight.



Main access screen

- ▶ Enter the ID and password.



ID : admin
Password : 1234

Tracking

- ▶ Tracking is an operation that finds connected devices (such as A/C, ERV, AHU etc.) to control and monitor from DMS2.

Reset the connection mode of each channel

Tracking

SIM / PIM 0 EA	Central controller 0 EA	Interface module 0 EA	Indoor unit 0 EA
Communication mode by channel			
Channel 0	<input checked="" type="radio"/> Interface module <input type="radio"/> Central controller		
Channel 1	<input checked="" type="radio"/> Interface module <input type="radio"/> Central controller		
Channel 2	<input checked="" type="radio"/> Interface module <input type="radio"/> Central controller		
Channel 3	<input checked="" type="radio"/> Interface module <input type="radio"/> Central controller		
Channel 4	<input checked="" type="radio"/> Interface module <input type="radio"/> Central controller		

RS485 communication channel

Select the type of device connected to each channel

* The communication mode of a channel where the device is connected cannot be changed.

Edit Save

Edit the type of device connected to each channel

Integrated management system

1. DMS2

MIM-D00A

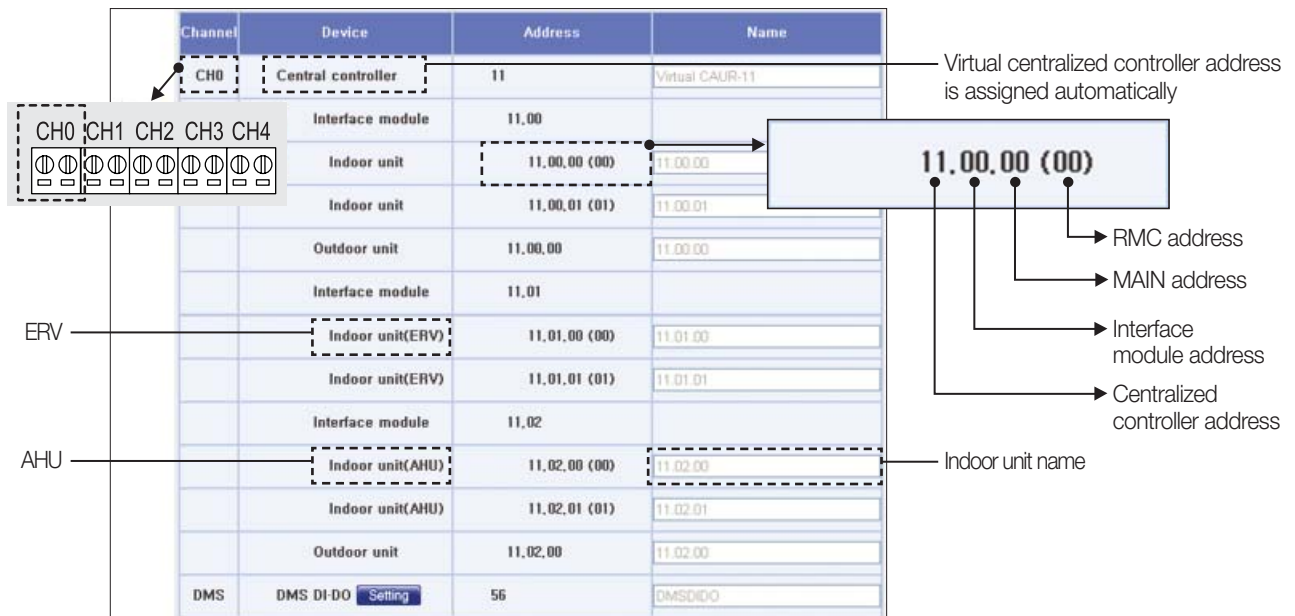
8) Accessing DMS2

Tracking

▶ Address system of connected devices

WHM = Watt - hour meter

Connected device	Address range	Remarks
Interface module	CH 0:00 ~15 ~ CH 4:00~15	Maximum 80 connections
Centralized controller	CH 0:00 ~15 ~ CH 4:00~15	Maximum 16 connections
Virtual centralized controller	CH 0:11, CH 1:12, CH 2:13, CH 3:14, CH 4:15	Fixed address, Maximum 5 connections
PIM	(PIM: 16~23). (WHM: 1~8) Ex) 16.1/16.2/23.8	Fixed address, Maximum 64 connections
Virtual WHM interface module, Virtual WHM	(Virtual WHM interface module: 24~31) . (WHM: 1~16)	Fixed address, Maximum 128 connections
Digital Input	56.00.03~56.00.10	Fixed address, Maximum 8 connections
Digital Output	56.01.03~56.01.08	Fixed address, Maximum 6 connections



9) Additional function

Setting contact point control pattern

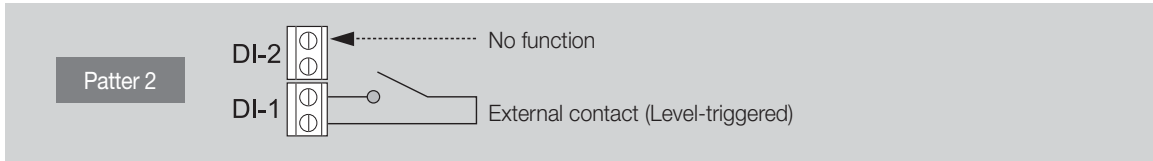
▶ You can select emergency operation pattern

Select the contact point control pattern

Pattern1
 Pattern2
 Pattern3
 Pattern4

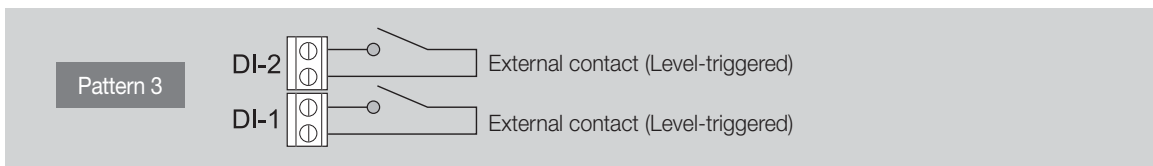
Modify Save

(1) Pattern 2



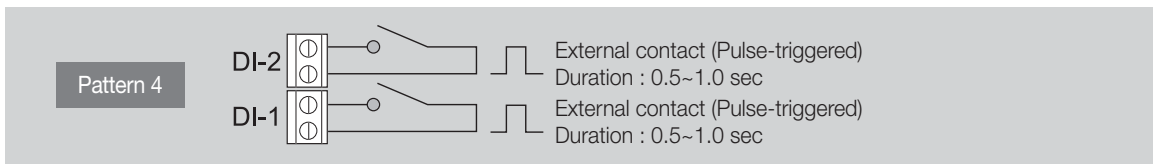
- ▶ **Short external contact : Emergency stop**
 - Turns off all the indoor units when there is an ON signal input
 - All the remote control use is disabled
 - Control from S-NET3, S-NET mini is unavailable
 - Disable schedule control
- ▶ **Open external contact : Resume operation**
 - After Emergency 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.

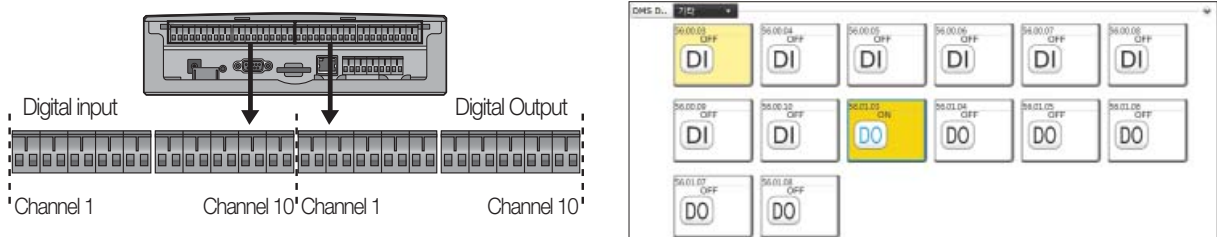
(3) Pattern 4



- ▶ **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 : No-power 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. (Open / Short)

☑ 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.

Integrated management system

1. DMS2

□ MIM-D00A

9) Additional function

Indoor unit usage restriction

- Operation limit : To prevent the mixed operation error, 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.

Address	Name	Limit mode	Control mode	Lower temperature limit in Cool mode	Upper temperature limit in Heat mode
00.00.00(00)	00.00.00	Cool-only	Fan Cool	Disable Enable 22 °C	Disable Enable °C
00.00.01(01)	00.00.01	Cool-only	Fan Cool	Disable Enable 22 °C	Disable Enable °C
00.00.02(02)	00.00.02	Cool-only	Fan Cool	Disable Enable 22 °C	Disable Enable °C
00.00.03(03)	00.00.03	Cool-only	Fan Cool	Disable Enable 22 °C	Disable Enable °C

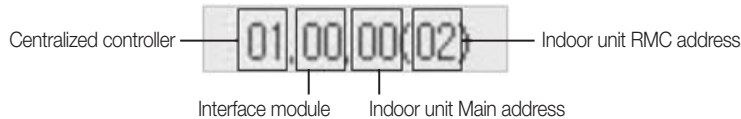
① Indoor unit address

② Operation mode restriction

③ Alternative mode selection setting

④ Setting Upper temperature limit in Heating, Lower temperature limit in Cooling

① Check the indoor unit address.



② 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 when you use below interface module and centralized controller model.
 - Interface module : MIM-B13A or higher model.
 - Centralized controller : MCM-A202A or higher model.
 - * Other models should set the operation mode restriction manually for each indoor unit.

③ Select the Control mode that will operate when restricted mode is selected.

- Ex) When the restricted mode is set to [Cool-only] and the [Control mode] is set to [Fan] ;
Indoor unit in Heating mode → DMS2 recognizes wrong operation mode → DMS2 changes operation mode to Fan mode.

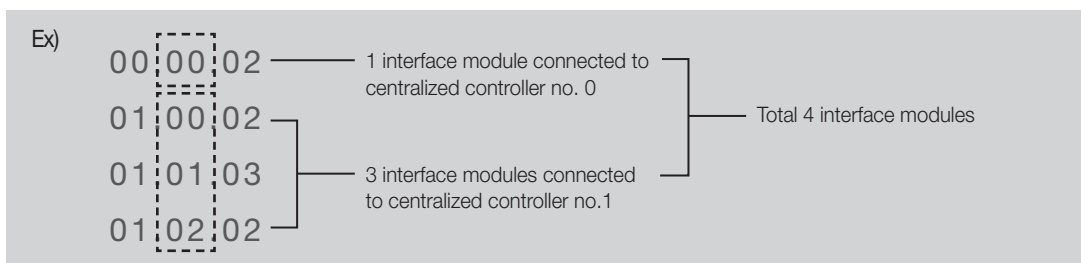
④ Set the Upper temperature limit in Heating and Lower temperature limit in Cooling.

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

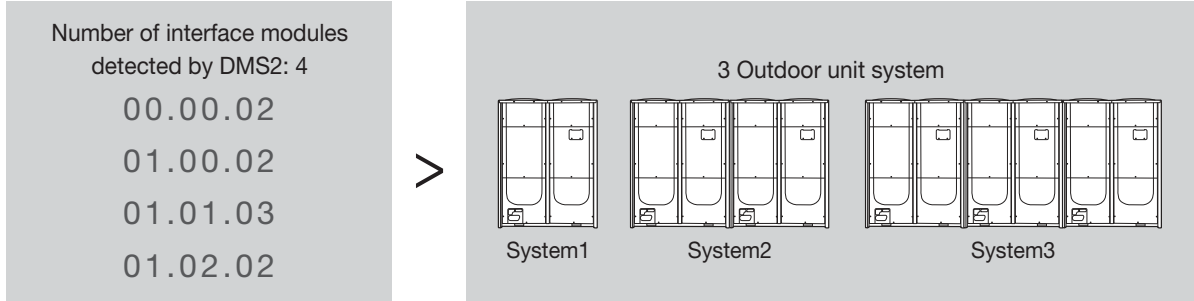
Checking interface module channel usage

▶ When conventional model such as MIM-B13, MCM-A202 is connected, below contents must be checked.

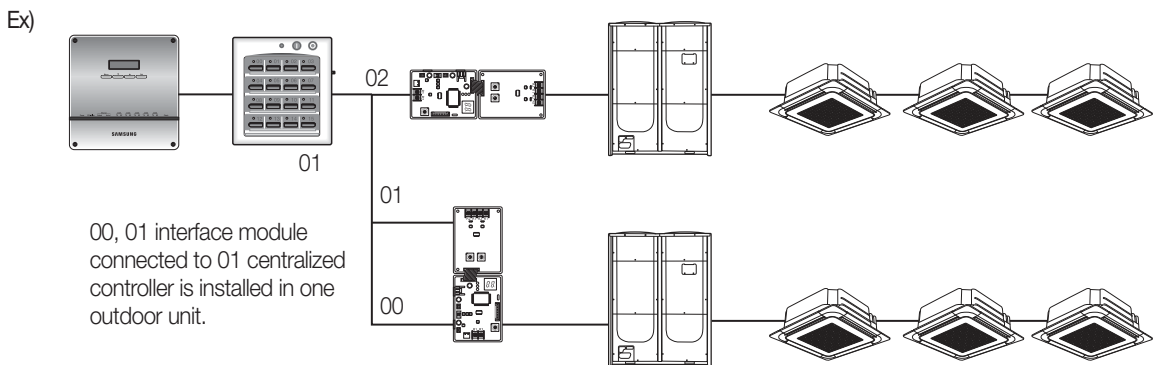
① Click “Indoor unit usage restriction” and check the indoor unit address.



- ② Check the number of interface modules.
- ③ When the number of interface module is greater than actual number of outdoor unit system, outdoor unit must be checked individually to find out interface module channel usage. [Check blueprint of the site (When there are more than 16 indoor units) or check the product itself.]



- ④ When the outdoor unit with interface module channel usage is found, address checking is required. Please write down the address of each interface module and centralized controller under 1 outdoor unit system. When you set [Limit mode], refer these addresses and set same operation mode to whole indoor units of 1 outdoor unit system.



- ※ Indoor units which uses channel, must be restricted in same mode.
 - As shown in the example, 00 and 01 interface modules connected to 00 centralized controller is installed to same outdoor unit and therefore same mode should be selected.
- ※ Temperature limit of each indoor unit can be set differently.

▶ Caution on setting indoor unit usage restriction

32 indoor units, as shown in the figure, can be restricted between two Limit modes when interface module channel is in use.

For example, when indoor units 0~15 are set as [Cool-only] and the 16~31 as [Heat-only], mixed operation error will occur since indoor units are set to operate in different mode even though they are connected to one outdoor unit.

Therefore, when interface module is being used, each indoor unit within the channel must be set to same mode.

Integrated management system

1. DMS2

□ MIM-D00A

9) Additional function

Logic control

What is logic control?

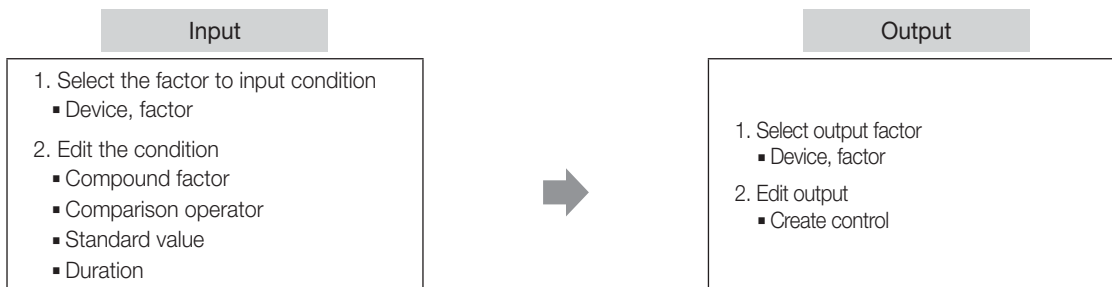
User can control the air conditioner, ERV, AHU and digital output depending on the conditions, such as room temperature and outdoor temperature, set by the user. Input condition can be used with parameter and it will be calculated with arithmetic equation. Schedule function executes operation by time 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 26°C in public places. When the room temperature is lower than 26°C, 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?



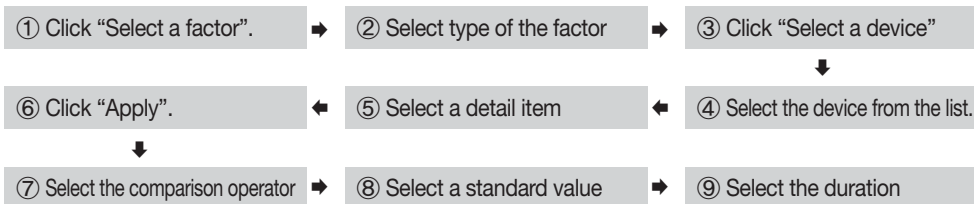
Edit factor		
Single factor	Power Current temp. Desired temp. Outdoor temp. Mode Fan speed Air flow Enable/Disable RC	
Arithmetic factor	+ -	Current temp. Desired temp. Outdoor temp.
Function factor	Average	Current temp. Desired temp. Outdoor temp.

Compound factor	Comparison operator	Command
AND	=	Power
OR	=>	Desired temp.
	=<	Mode
	>	Fan speed
	<	Air swing
	≠	Enable/Disable RC

(1) Editing input factor

The screenshot shows the 'Factor edit' interface with several numbered callouts (1-9) indicating the steps for editing an input factor. A 'Device selection' pop-up window is also visible, showing a list of devices with their addresses and names.

Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
	Select a factor	=	None	Cancel / Apply 1
AND	Select a factor	>	None	Cancel / Apply 1
AND	Select a factor	<	None	Cancel / Apply 1



► Single factor : 1 device and 1 factor.

The screenshot shows the 'Factor edit' interface for a single factor configuration. The 'Factor edit' dropdown is set to 'Single'. The 'Device' dropdown is set to 'Outside ter'. The 'Standard value' dropdown is set to 'None'. The 'Duration' dropdown is set to 'Apply 1'.

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

The screenshot shows the 'Factor edit' interface for an arithmetic factor configuration. The 'Factor edit' dropdown is set to 'Arithmetic'. The 'Device 1' dropdown is set to 'Current terr'. The 'Arithmetic operator' dropdown is set to '+'. The 'Device 2' dropdown is set to 'Current terr'.

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

The screenshot shows the 'Factor edit' interface for a function factor configuration. The 'Factor edit' dropdown is set to 'Function'. The 'Function' dropdown is set to 'Average'. The 'Device 1' through 'Device 5' dropdowns are set to 'Current terr'.

Integrated management system

1. DMS2

□ MIM-D00A

9) Additional function

Logic control

(1) Editing input factor

Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
	00.00.00.Outside temp.	=	<input type="text"/> <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1
<input type="checkbox"/> AND	Select a factor	=	<input type="text"/> None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1
<input type="checkbox"/> OR	Select a factor	=	<input type="text"/> None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1

- 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

factor edit: Single

Only 'Single' will be listed

Device: Select a device

Device selector pop-up:

Address	Name
00.00.00	00.00.00
00.00.01	00.00.01
00.00.02	00.00.02
00.00.03	00.00.03
00.00.04	00.00.04

* Click 'Select' or the device name: a pop-up window appears and you can select a device to check the settings.

"Current temp." and "Outdoor temp." cannot be selected

Output:

Factor	Command
Select a factor	None <input type="radio"/> Select a factor
Select a factor	None <input type="radio"/> Select a factor
Select a factor	None <input type="radio"/> Select a factor

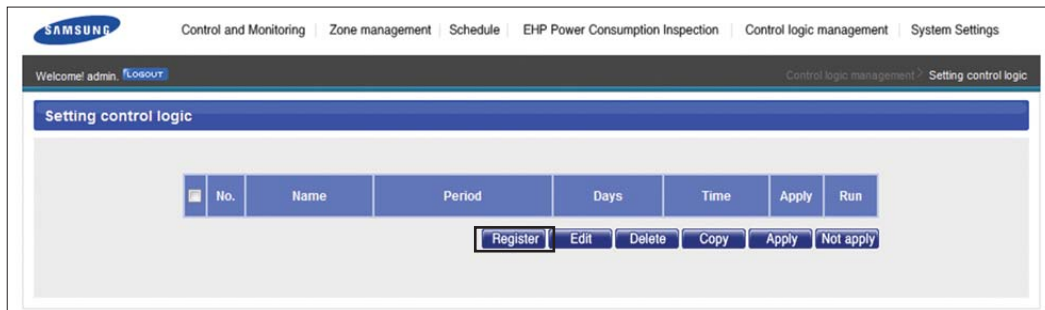
Buttons: Apply, Save, Add, Delete

- Click "Select a factor".
- Click "Select a device".
- Select the device from the list.
- Select a detail item to control.
- Click "Apply".
- Select "Command".
- Click "Save".

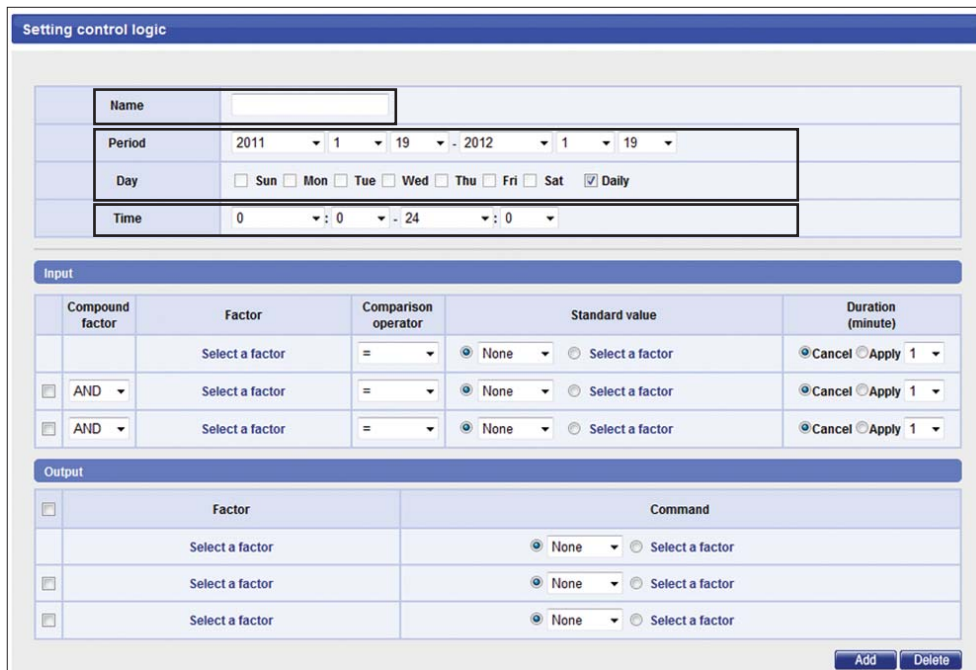
(3) Control example – Setting

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

① Click [Control logic management] → [Setting control logic] from DMS2 menu. Click [Register] to create new control logic.



② Enter Name, period/day and time for new control logic.



③ Create input condition : Click [Select a factor] from the 'Input' window.



Integrated management system

1. DMS2

MIM-D00A

9) Additional function

Logic control

(3) Control example – Setting

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

* Click 'Select' or the device name: a pop-up window appears and you can select a device. Select a device to check the settings.

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

* Click 'Select' or the device name: a pop-up window appears and you can select a device to check the settings.

Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
	Select a factor	=	<input checked="" type="radio"/> None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1
<input type="checkbox"/> AND	Select a factor	=	<input checked="" type="radio"/> None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1
<input type="checkbox"/> AND	Select a factor	=	<input checked="" type="radio"/> None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1

- 6 **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.

Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
	00.00.00.Power	=	<input checked="" type="radio"/> Off <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1
<input type="checkbox"/> AND	Select a factor	=	<input checked="" type="radio"/> None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1
<input type="checkbox"/> AND	Select a factor	=	<input checked="" type="radio"/> None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1

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

The screenshot shows the 'Factor edit' window with a 'Device selection' pop-up. The pop-up has two columns: 'Address' and 'Name', with values ranging from 00.00.00 to 00.00.04. The main window has an 'Input' table and an 'Output' table.

Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
	00.00.00.Power	=	<input checked="" type="radio"/> Off <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1
<input type="checkbox"/> AND	Select a factor	=	<input checked="" type="radio"/> None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1
<input type="checkbox"/> AND	Select a factor	=	<input checked="" type="radio"/> None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1

Factor	Command
Select a factor	<input checked="" type="radio"/> None <input type="radio"/> Select a factor
Select a factor	<input checked="" type="radio"/> None <input type="radio"/> Select a factor
Select a factor	<input checked="" type="radio"/> None <input type="radio"/> Select a factor

- 8 Create output : Select "Power" as a factor of the selected device and click [Apply].

The screenshot shows the 'Factor edit' window with the 'Device' dropdown menu open, showing '00.02.00 Power' selected. The 'Apply' button is visible at the bottom right.

- 9 Create output : From the output window, select the control to be executed when input condition is satisfied.
- Turn off the ERV no. 0

The screenshot shows the 'Output' window with a table where the 'Command' dropdown for the factor '00.02.00.Power' is set to 'Off'. The 'Add' and 'Delete' buttons are at the bottom right.

Factor	Command
00.02.00.Power	<input checked="" type="radio"/> Off <input type="radio"/> Select a factor
Select a factor	<input checked="" type="radio"/> None <input type="radio"/> Select a factor
Select a factor	<input checked="" type="radio"/> None <input type="radio"/> Select a factor

- 10 Click [Save] when the setting is completed.

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

The screenshot shows the 'Setting control logic' window with a table of logic rules and control buttons at the bottom.

<input checked="" type="checkbox"/>	No.	Name	Period	Days	Time	Apply	Run
<input checked="" type="checkbox"/>	1	Test	2011-01-19 ~ 2012-01-19	Daily	00:00 ~ 24:00	No	No

Buttons: Register, Edit, Delete, Copy, Apply, Not apply

Integrated management system

1. DMS2

MIM-D00A

9) Additional 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	<input type="checkbox"/> Sun <input checked="" type="checkbox"/> Mon <input checked="" type="checkbox"/> Tue <input checked="" type="checkbox"/> Wed <input checked="" type="checkbox"/> Thu <input checked="" type="checkbox"/> Fri <input type="checkbox"/> Sat <input type="checkbox"/> Daily						
Time	8	:	0	-	18	:	0

Input				
Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
	00,00,00,Outdoor temp.	=>	30 <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input checked="" type="radio"/> Apply 5
<input type="checkbox"/> AND	Select a factor	=	None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1
<input type="checkbox"/> AND	Select a factor	=	None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1

Output				
	Factor	Command		
<input checked="" type="checkbox"/>	00,00,00,Power	<input checked="" type="radio"/> On <input type="radio"/> Select a factor		
<input checked="" type="checkbox"/>	00,00,01,Power	<input checked="" type="radio"/> On <input type="radio"/> Select a factor		
<input checked="" type="checkbox"/>	00,00,02,Power	<input checked="" type="radio"/> On <input type="radio"/> Select a factor		
<input checked="" type="checkbox"/>	00,00,03,Power	<input checked="" type="radio"/> On <input type="radio"/> Select a factor		

① Input : When outdoor temperature is 30°C or higher. ② When condition 1 lasted for 5 minute. ③ Output : Turn on 4 indoor units.

Control logic 2

Name	PowerOff_Temp26						
Period	2010	3	23	-	2011	3	23
Day	<input type="checkbox"/> Sun <input checked="" type="checkbox"/> Mon <input checked="" type="checkbox"/> Tue <input checked="" type="checkbox"/> Wed <input checked="" type="checkbox"/> Thu <input checked="" type="checkbox"/> Fri <input type="checkbox"/> Sat <input type="checkbox"/> Daily						
Time	8	:	0	-	18	:	0

Input				
Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
	00,00,00,Outdoor temp.	=<	26 <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1
<input type="checkbox"/> AND	Select a factor	=	None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1
<input type="checkbox"/> AND	Select a factor	=	None <input type="radio"/> Select a factor	<input checked="" type="radio"/> Cancel <input type="radio"/> Apply 1

Output				
	Factor	Command		
<input checked="" type="checkbox"/>	00,00,00,Power	<input checked="" type="radio"/> Off <input type="radio"/> Select a factor		
<input checked="" type="checkbox"/>	00,00,01,Power	<input checked="" type="radio"/> Off <input type="radio"/> Select a factor		
<input checked="" type="checkbox"/>	00,00,02,Power	<input checked="" type="radio"/> Off <input type="radio"/> Select a factor		
<input checked="" type="checkbox"/>	00,00,03,Power	<input checked="" type="radio"/> Off <input type="radio"/> Select a factor		

① Input : When outdoor temperature is 26°C or lower. ② Output : Turn off 4 indoor units.

Register control logic

Setting control logic

<input checked="" type="checkbox"/>	No.	Name	Period	Days	Time	Apply	Run
<input checked="" type="checkbox"/>	1	PowerOn_Temp30	2011-01-19 ~ 2012-01-19	Daily	00:00 ~ 24:00	No	No
<input checked="" type="checkbox"/>	2	PowerOff_Temp26	2011-01-19 ~ 2012-01-19	Daily	00:00 ~ 24:00	No	No

1 Click



Control logic applied

Setting control logic

<input type="checkbox"/>	No.	Name	Period	Days	Time	Apply	Run
<input type="checkbox"/>	1	PowerOn_Temp30	2011-01-19 ~ 2012-01-19	Daily	00:00 ~ 24:00	Yes	No
<input type="checkbox"/>	2	PowerOff_Temp26	2011-01-19 ~ 2012-01-19	Daily	00:00 ~ 24:00	Yes	No

2 Click

Application completed

Integrated management system

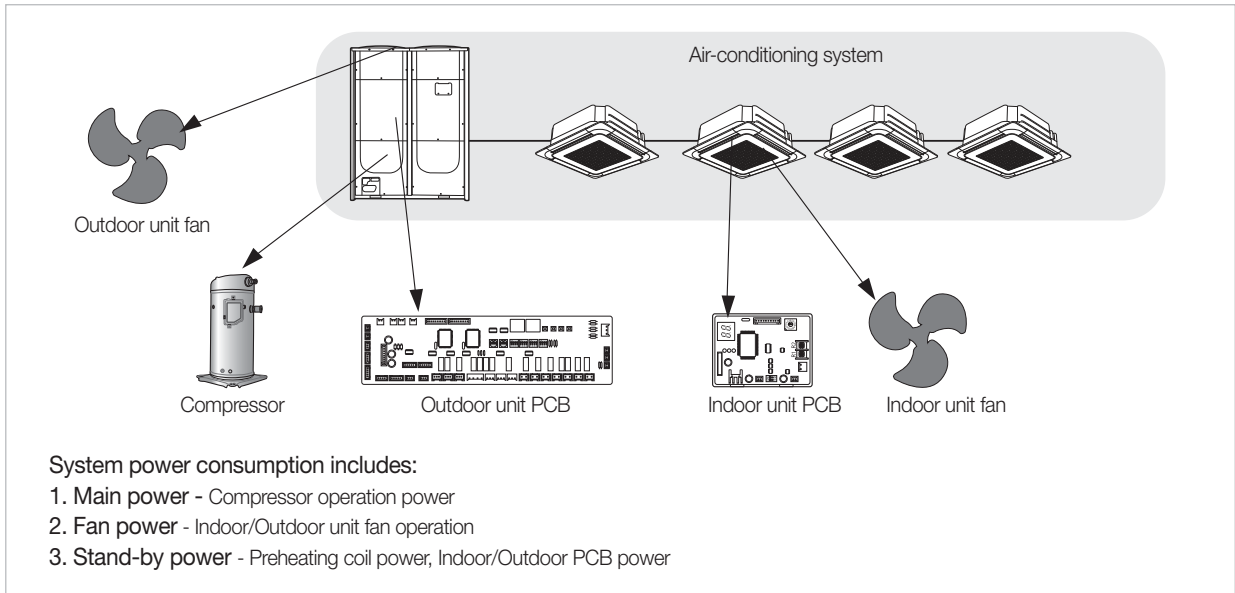
1. DMS2

□ MIM-D00A

9) Additional function

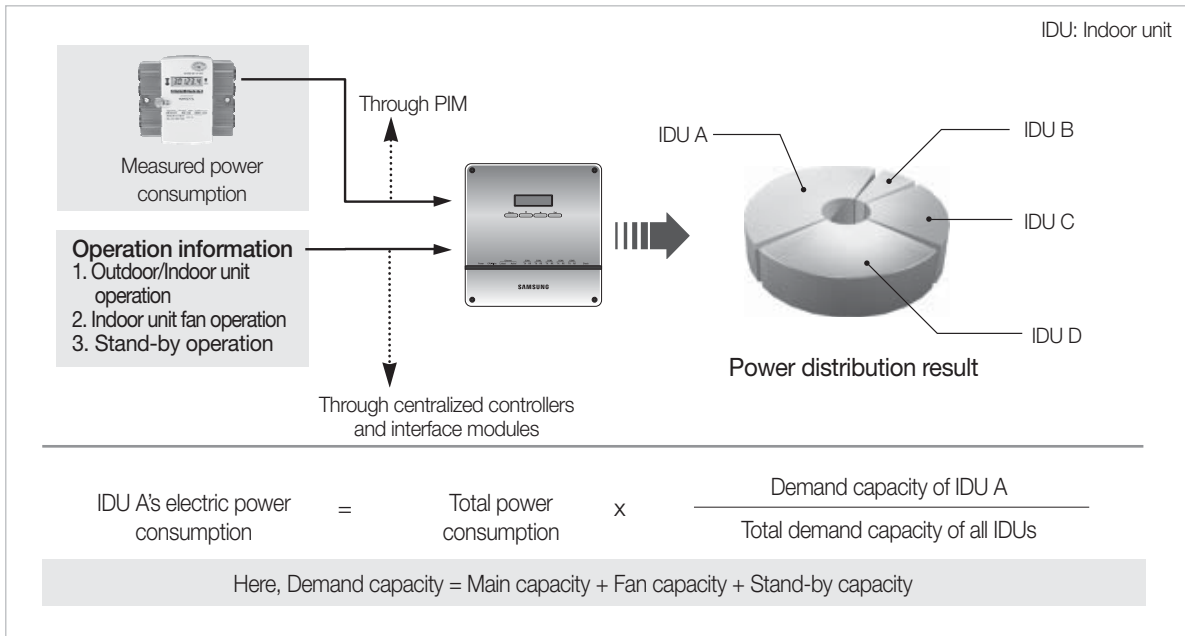
Power distribution

- Where does power consumption occurs?



(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.



☑ 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?

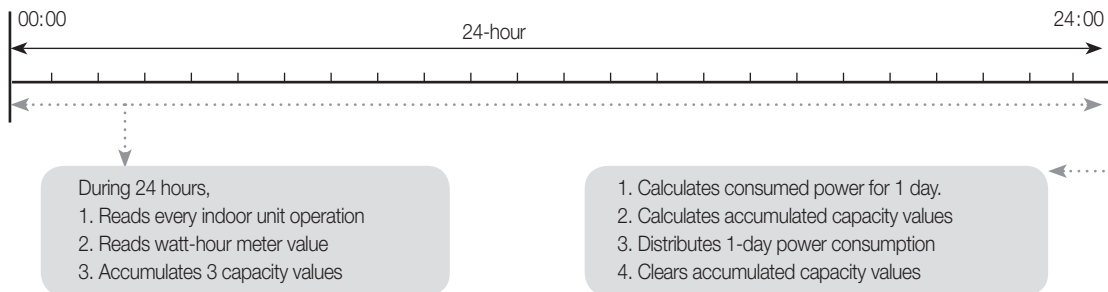
If the room temperature begins to reach the set temperature, the indoor unit does not have to extract the full refrigerant amount to keep the set condition. Capacity from the indoor unit goes down to indicate the outdoor unit that it does not need refrigerant at the full capacity state.

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.

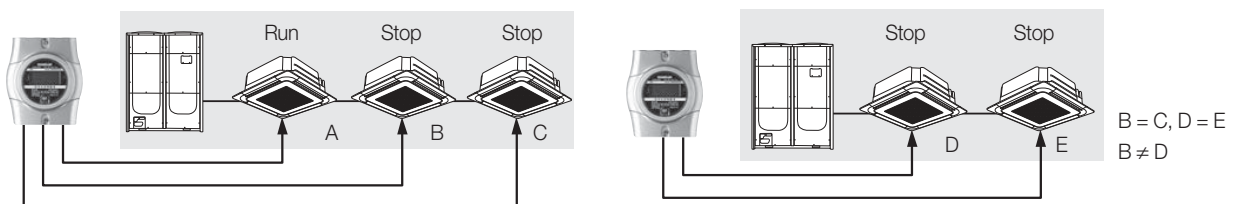


(7) Undesirable situation protection

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.



Integrated management system

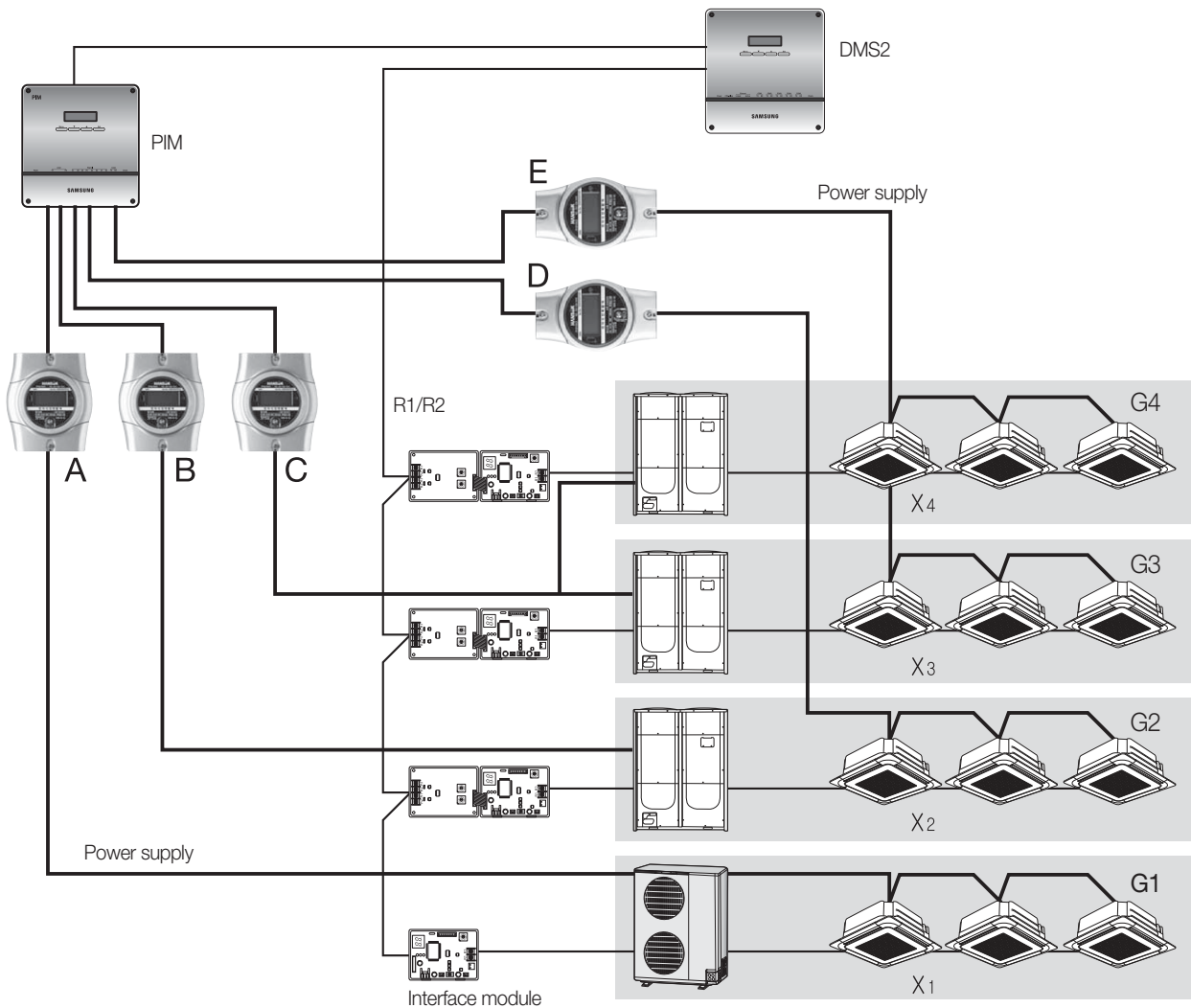
1. DMS2

□ MIM-D00A

9) Additional function

Power distribution

Power distribution equation

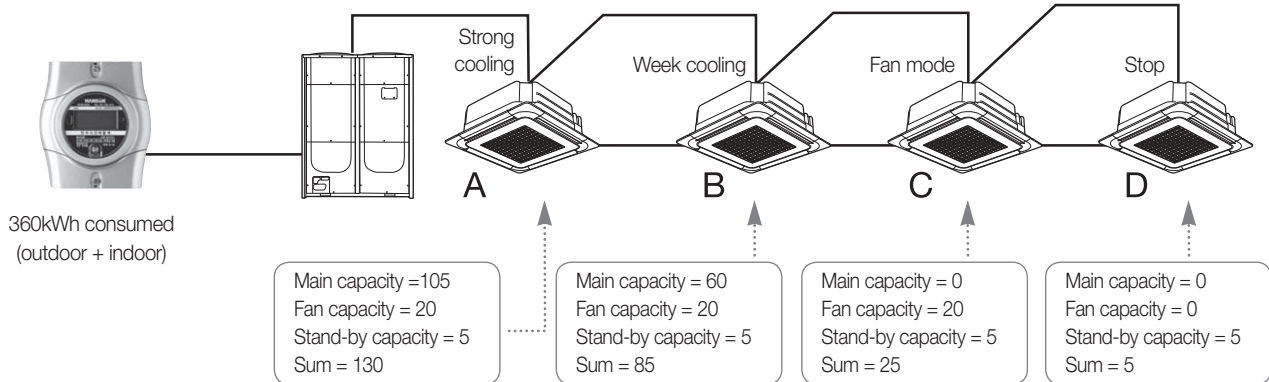


- When configuring the DMS2 and the whole system, mapping of watt-hour meters for indoor/outdoor units must be precisely assigned for correct power distribution.

Indoor unit power X in G1 = Watt-hour A x	$\frac{\text{Main + Fan + Stand-by capacity of indoor unit X}}{\text{Total capacity of G1}}$
.....	
Indoor unit power X in G2 = Watt-hour B x	$\frac{\text{Main + Fan + Stand-by capacity of indoor unit X}}{\text{Total capacity of G2}}$
+ Watt-hour D x	$\frac{\text{Fan + Stand-by capacity of indoor unit X}}{\text{Total Fan/Stand-by capacity of G2}}$
.....	
Indoor unit power X in G3+G4 = Watt-hour C x	$\frac{\text{Main + Fan + Stand-by capacity of indoor unit X}}{\text{Total capacity of G3 + G4}}$
+ Watt-hour E x	$\frac{\text{Fan + Stand-by capacity of indoor unit X}}{\text{Total Fan/Stand-by capacity of G3 + G4}}$

Example

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



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

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

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

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

Integrated management system

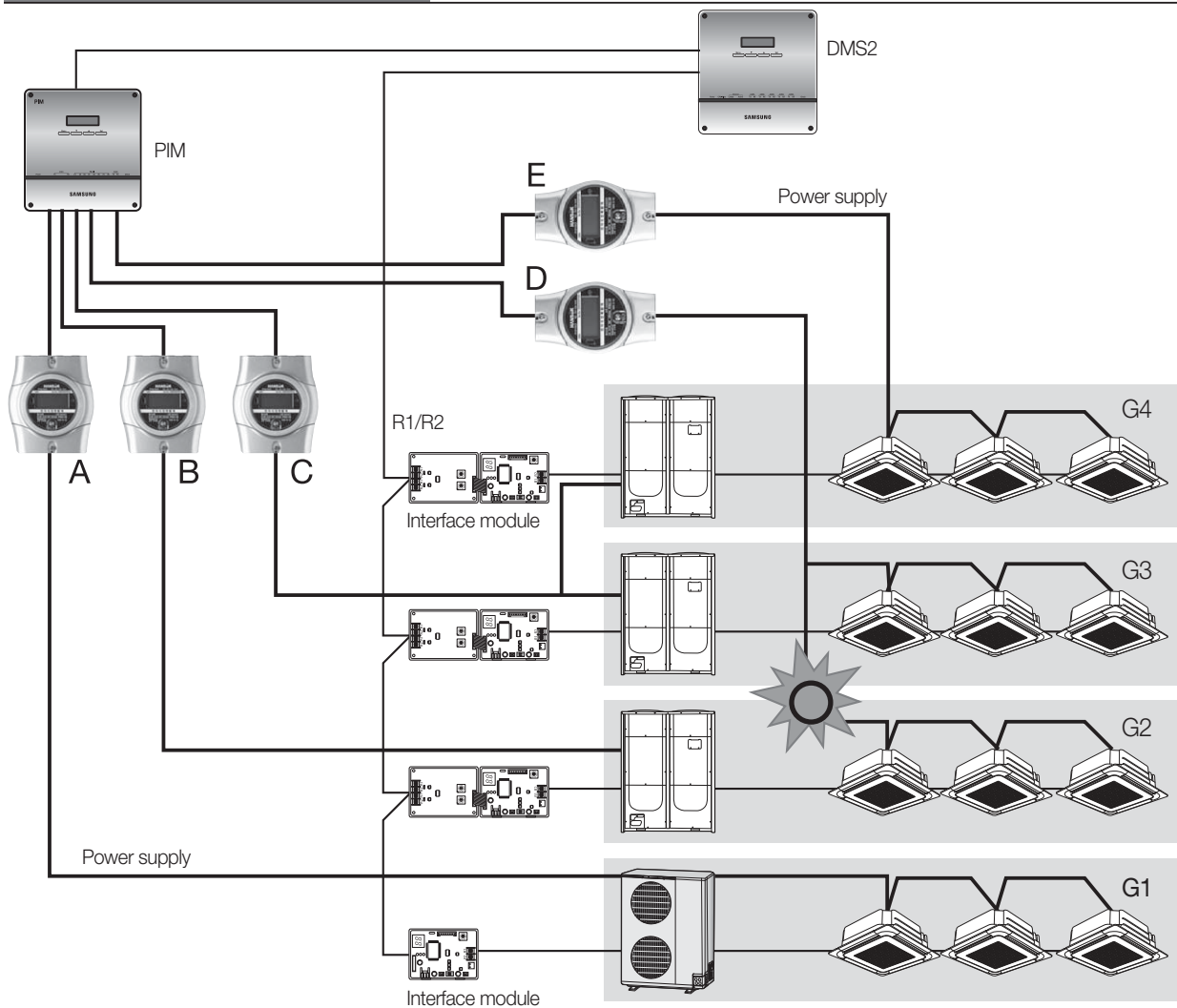
1. DMS2

MIM-D00A

9) Additional function

Power distribution

Installation example (Allowed)



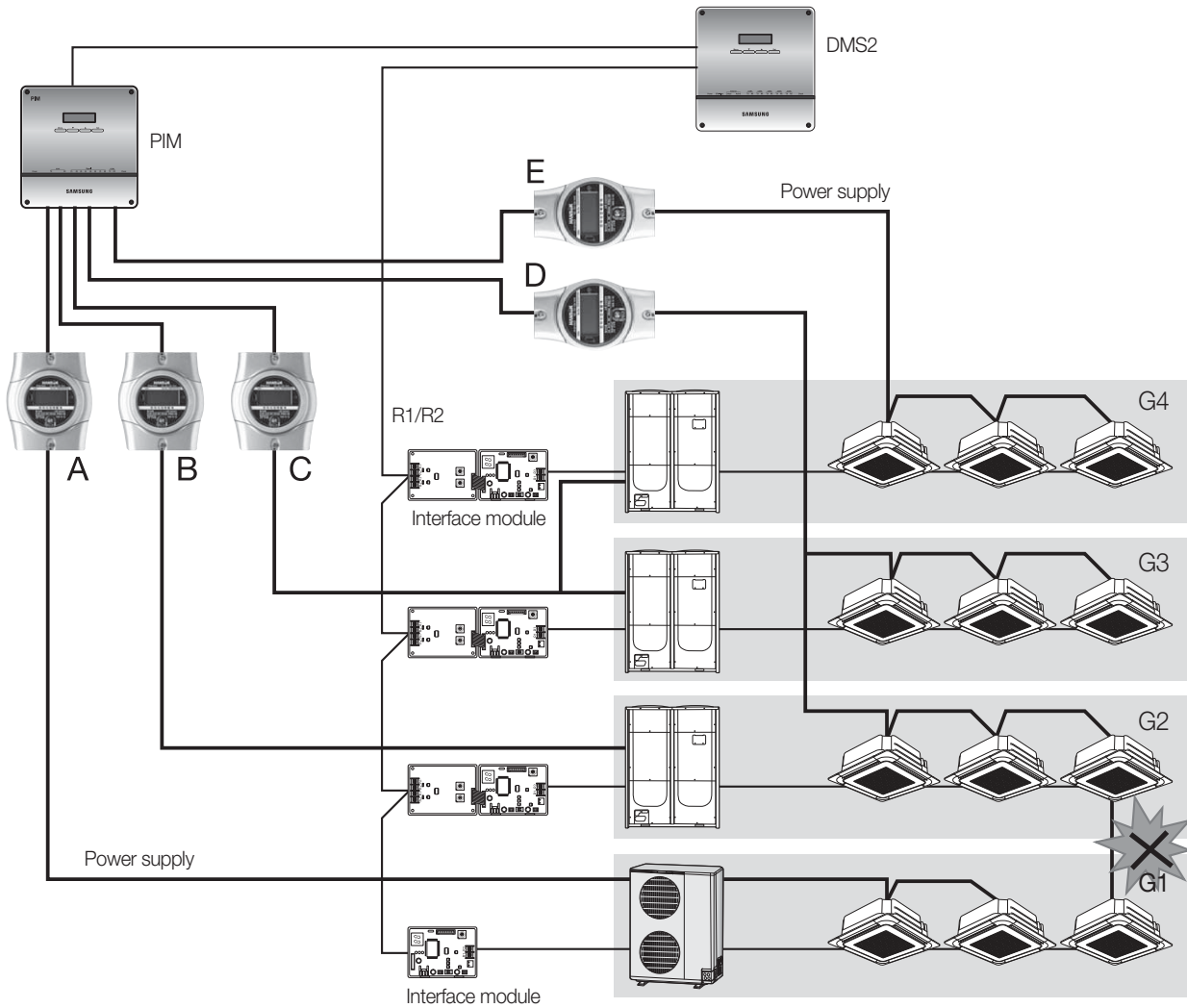
Mapping watt-hour meters to indoor/outdoor units

- 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.

Integrated management system

1. DMS2

MIM-D00A

9) Additional 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.

The screenshot shows a web interface titled "Setting the inspection section". It contains two main panels. The first panel, "Set the section", has three radio button options: "1 Section", "2 Section", and "3 Section", with "3 Section" being selected. The second panel, "Set the time", displays a horizontal timeline from 00:00 to 24:00. The timeline is divided into five segments labeled A, B, C, B, and A from left to right. Below each segment is a small input field. At the bottom right of the interface are "Edit" and "Save" buttons.

(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.

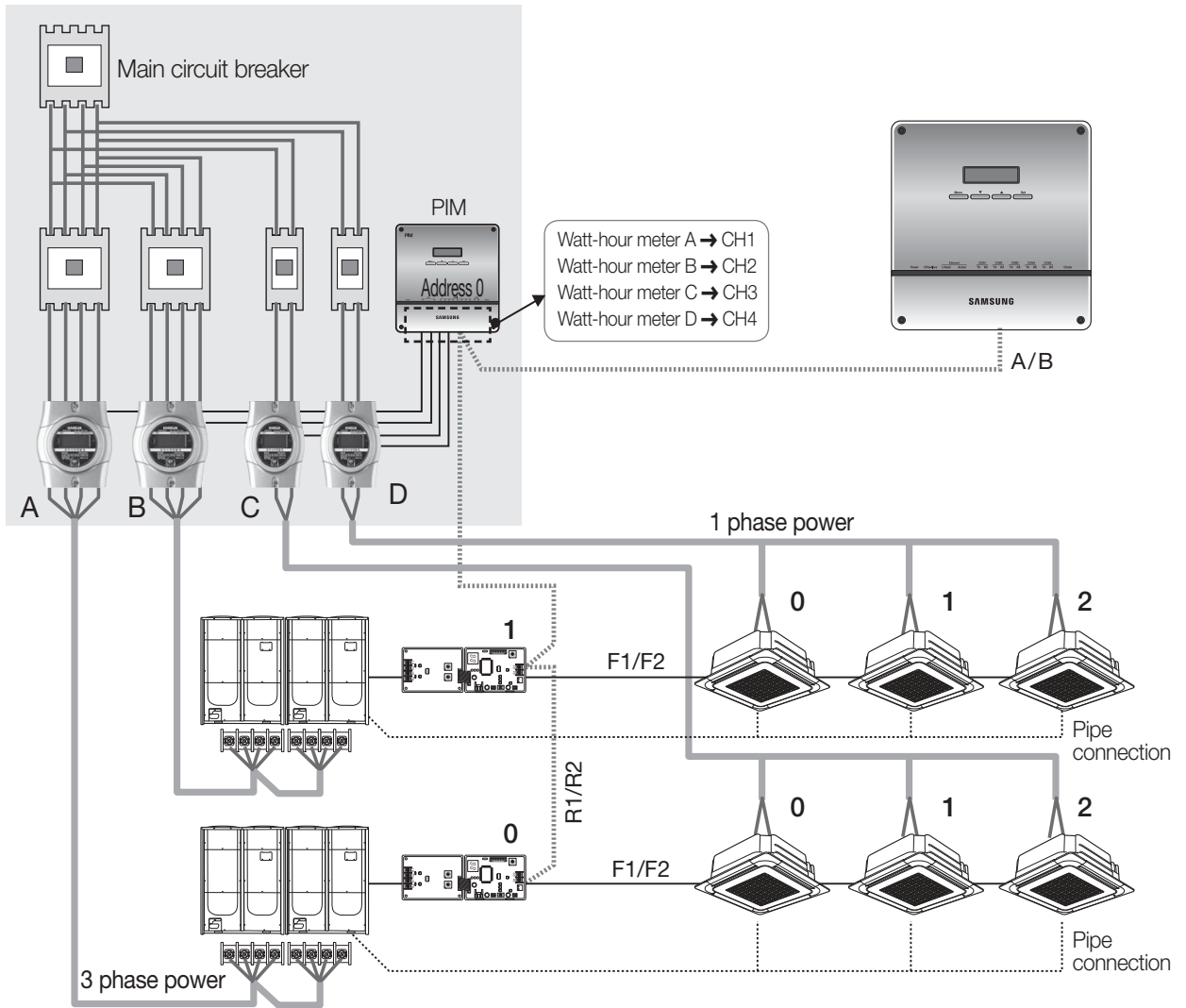
Then PIM channel must be set according to the outdoor unit.

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
00.00.00	00.00.00	16.1	16.2		
00.00.01	00.00.01	16.1	16.2		
00.00.02	00.00.02	16.1	16.2		
00.00.03	00.00.03	16.1	16.2		
00.00.04	00.00.04	16.1	16.2		
00.00.05	00.00.05	16.1	16.2		

Example of watt hour meter installation ①

Installing watt-hour meter to outdoor/ indoor unit



INTEGRATED MANAGEMENT SYSTEM

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
00.00.00	00.00.00	16.1	16.3		
00.00.01	00.00.01	16.1	16.3		
00.00.02	00.00.02	16.1	16.3		
01.00.00	01.00.00	16.2	16.4		
01.00.01	01.00.01	16.2	16.4		
01.00.02	01.00.02	16.2	16.4		

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

Integrated management system

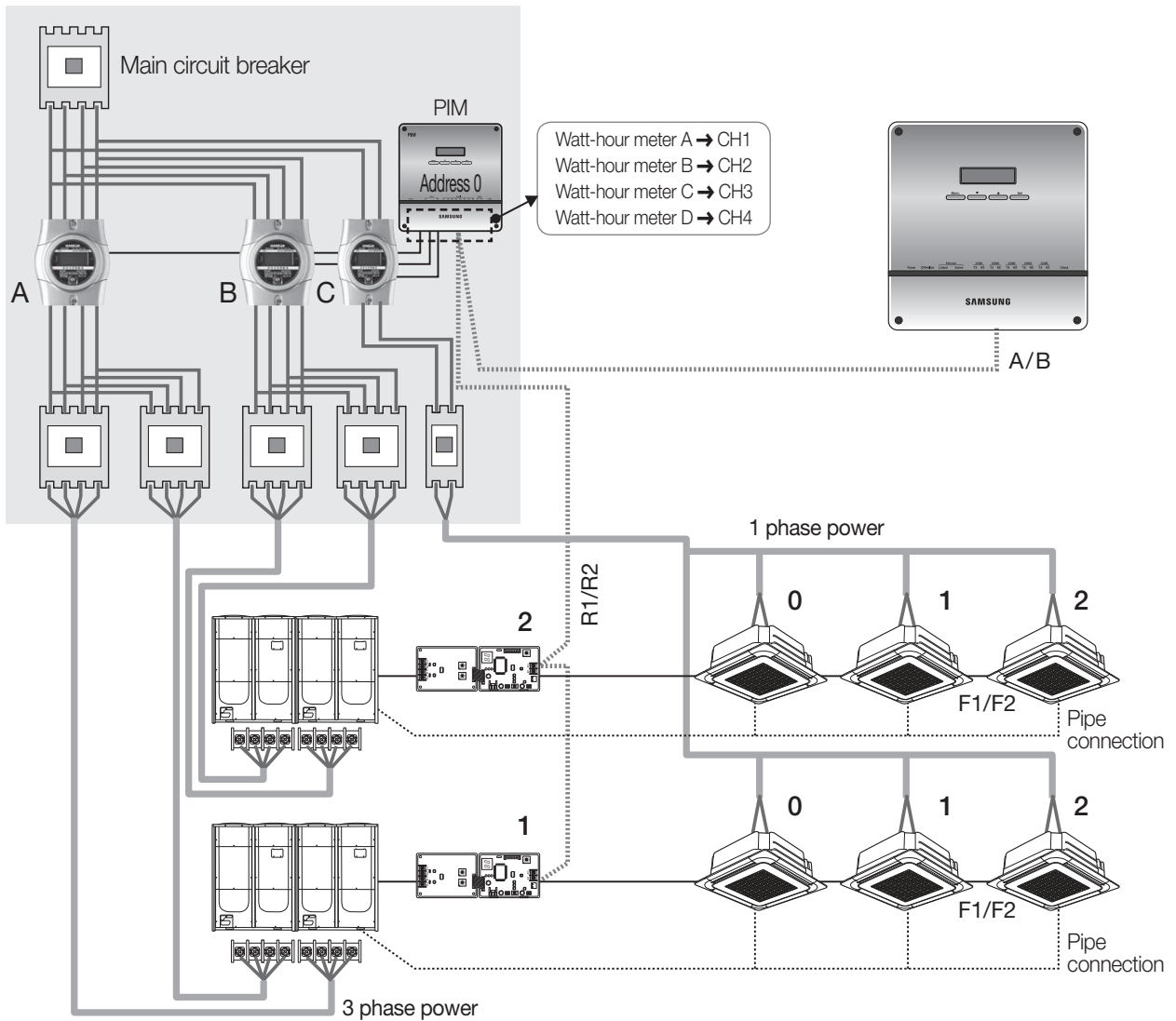
1. DMS2

MIM-D00A

9) Additional function

Power distribution

Example of watt hour meter installation ② Installing 1 watt-hour meter to all indoor units

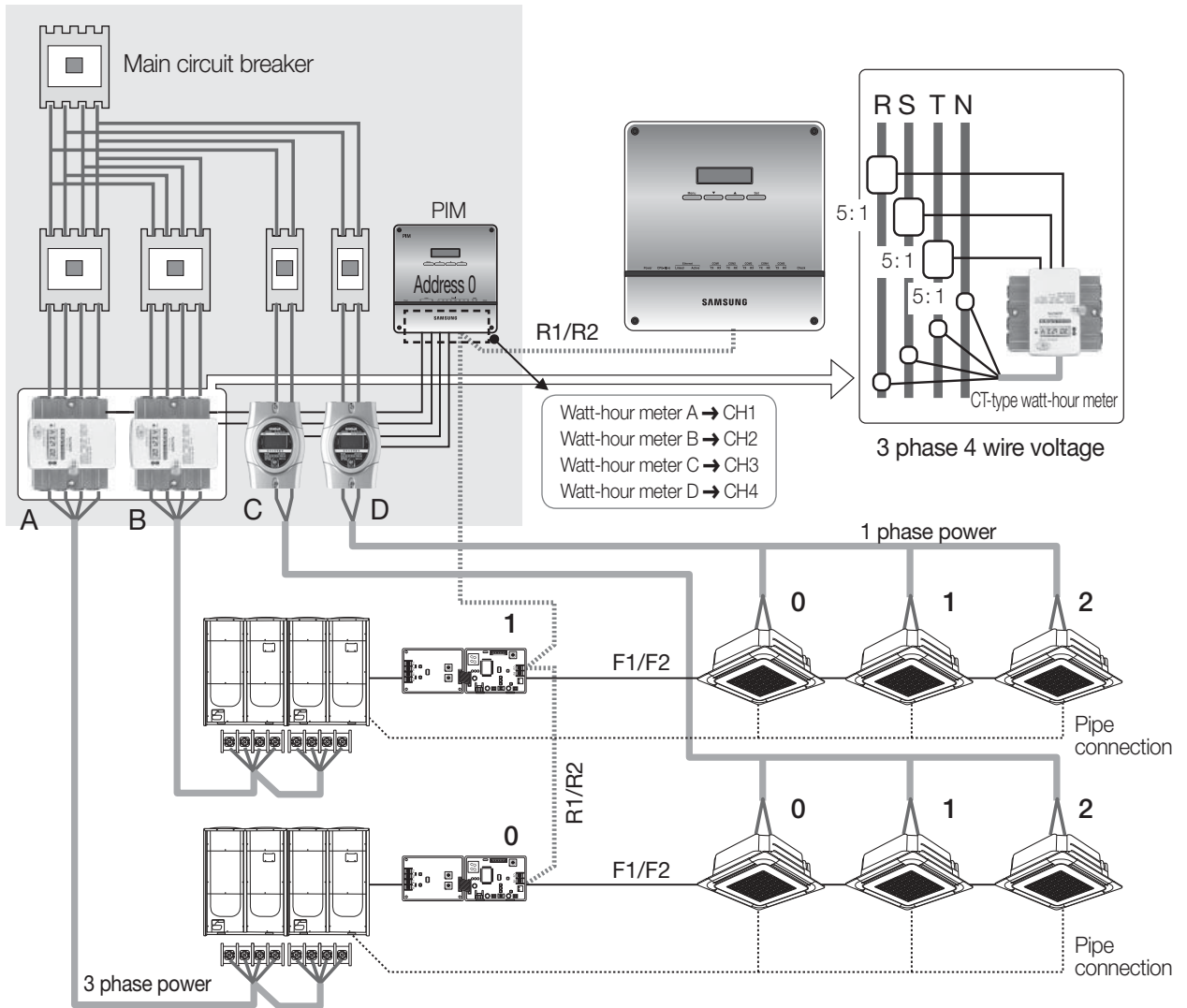


Channel setting by indoor unit					
Indoor unit address	Indoor unit name	Outdoor unit SIM / PIM channel	Indoor unit SIM / PIM channel	Outdoor unit virtual channel	Indoor unit virtual channel
00.00.00	00.00.00	17.1	17.3		
00.00.01	00.00.01	17.1	17.3		
00.00.02	00.00.02	17.1	17.3		
01.00.00	01.00.00	17.2	17.3		
01.00.01	01.00.01	17.2	17.3		
01.00.02	01.00.02	17.2	17.3		

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 ③

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.

Integrated management system

1. DMS2

MIM-D00A

9) Additional function

Power distribution

Checking the watt-hour meter connection

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

Setting and checking watt-hour meter			
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

Kilowatt-hour setting & inquiry								
SIM / PIM Address		16						
2011	1	15	~	2011	1	18	Check	
Date	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8
2011-01-15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2011-01-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2011-01-17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2011-01-18	1940.9	240.4	3199.7	299.9	0.0	0.0	0.0	0.0

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

Setting and checking virtual channel

Virtual Channel	Name
24.1	24.1
24.2	24.2
24.3	24.3
24.4	24.4
24.5	24.5
31.11	31.11
31.12	31.12
31.13	31.13
31.14	31.14
31.15	31.15
31.16	31.16

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

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
00.00.00	00.00.00	<input type="text"/>	<input type="text"/>	24 . 1	24 . 3
00.00.01	00.00.01	<input type="text"/>	<input type="text"/>	24 . 1	24 . 3
00.00.02	00.00.02	<input type="text"/>	<input type="text"/>	24 . 1	24 . 3
00.00.03	00.00.03	<input type="text"/>	<input type="text"/>	24 . 2	24 . 4
00.00.04	00.00.04	<input type="text"/>	<input type="text"/>	24 . 2	24 . 4
00.00.05	00.00.05	<input type="text"/>	<input type="text"/>	24 . 2	24 . 4

Note

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

Integrated management system

1. DMS2

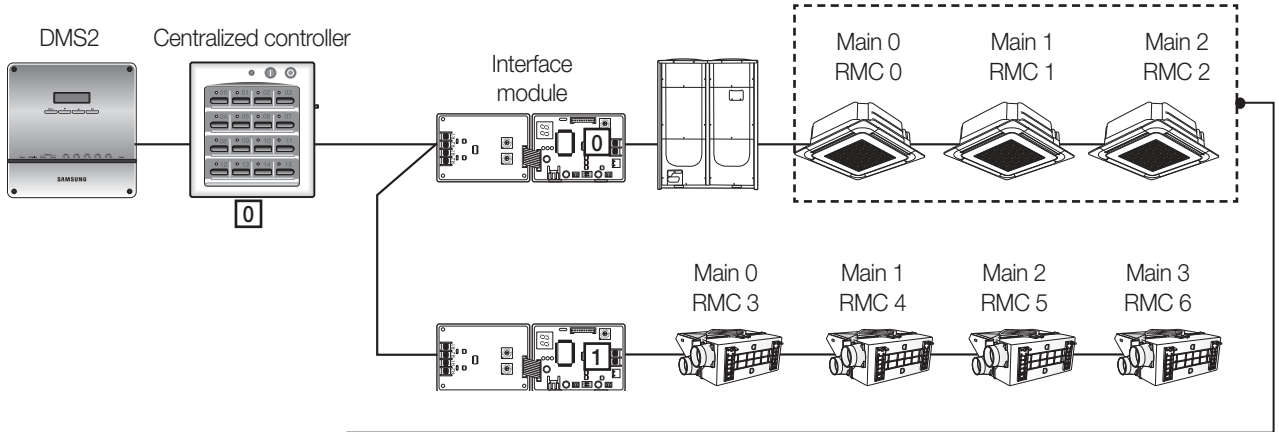
MIM-D00A

9) Additional function

Power distribution

Caution

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



2010-3-30 ~ 2010-3-30		
Indoor unit address	Indoor unit name	Used power consumption (kWh)
00,00,00	00,00,00	3.061
00,00,01	00,00,01	3.061
00,00,02	00,00,02	3.061

Only applies to indoor unit

※ ERV is excluded from power distribution function.

User authorization management

User authorization management

Menu	Admin	Manager	Regular user
Control and Monitoring	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Zone management	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Schedule	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EHP Power Consumption Inspection	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Control logic management	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
System Settings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- 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

Menu	Admin	Manager	Regular user
Control and Monitoring	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Zone management	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schedule	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EHP Power Consumption Inspection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control logic management	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
System Settings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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

Integrated management system

1. DMS2

MIM-D00A

9) Additional function

User management

User management					
ID	Password	Name	Description	Registration date	Authorization
admin	1234	admin	admin	2009.1.1	Admin
guest	guest	guest	guest	2009.1.1	Regular user

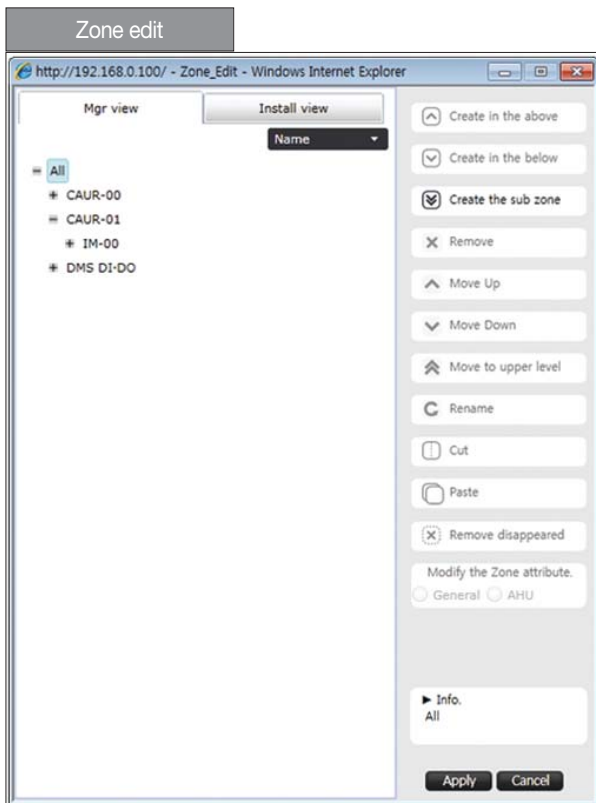
► You can add or delete the user who access DMS2 through web.

ID	<input type="text"/>
Password	<input type="text"/>
Name	<input type="text"/>
Description	<input type="text"/>
Registration date	<input type="text" value="2011.1.19"/>
Authorization	<input type="text" value="Admin"/> <ul style="list-style-type: none"> Admin Admin Manager Regular user <input type="button" value="OK"/> <input type="button" value="Cancel"/>

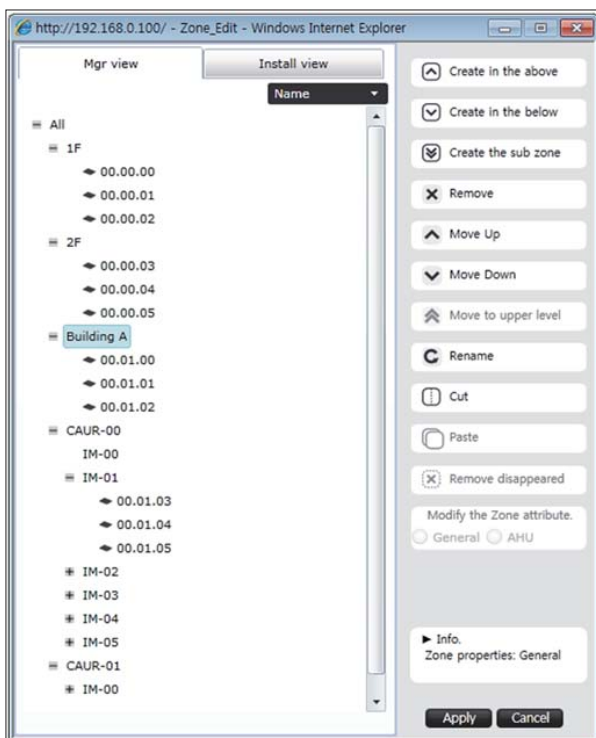
► Authorization of the added user can be set from [Admin], [Manager], [Regular user].

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.



Initial setting



Zone edit :

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

Integrated management system

1. DMS2

MIM-D00A

9) Additional function

Setting the user authorization

Zone Setting & Edit

1F

	ID	Name	Registration date	Description	Authorization
<input type="checkbox"/>	guest	guest	2009.1.1	guest	Regular user
<input checked="" type="checkbox"/>	samsung	Mr.Lee	2011.1.19	Manager	Manager

※ The setting of user view permission can be saved only for the users in the selected zone. Save

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

- ① Select the zone and select a user ID who can access the zone.
 - Access authorization can be set by zone.
- ② After setting, click [Save] to complete the authorization setting.

Zone Setting & Edit

1F

	ID	Name	Registration date	Description	Authorization
<input type="checkbox"/>	guest	guest	2009.1.1	guest	Regular user
<input checked="" type="checkbox"/>	samsung	Mr.Lee	2011.1.19	Manager	Manager

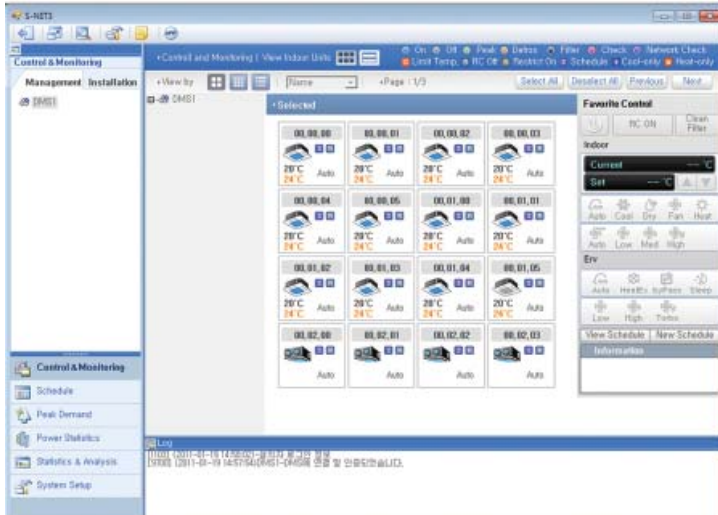
※ The setting of user view permission can be saved only for the users in the selected zone. Save

▶ 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

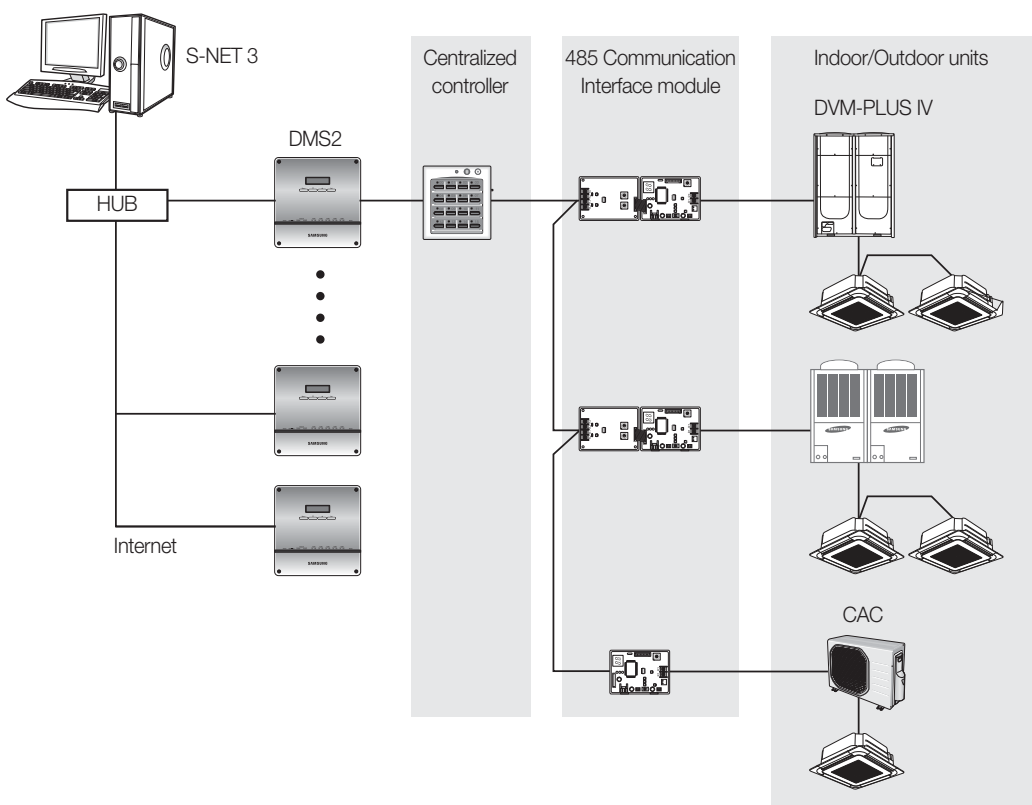
2) PC specifications

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



Integrated management system

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, centralized 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.

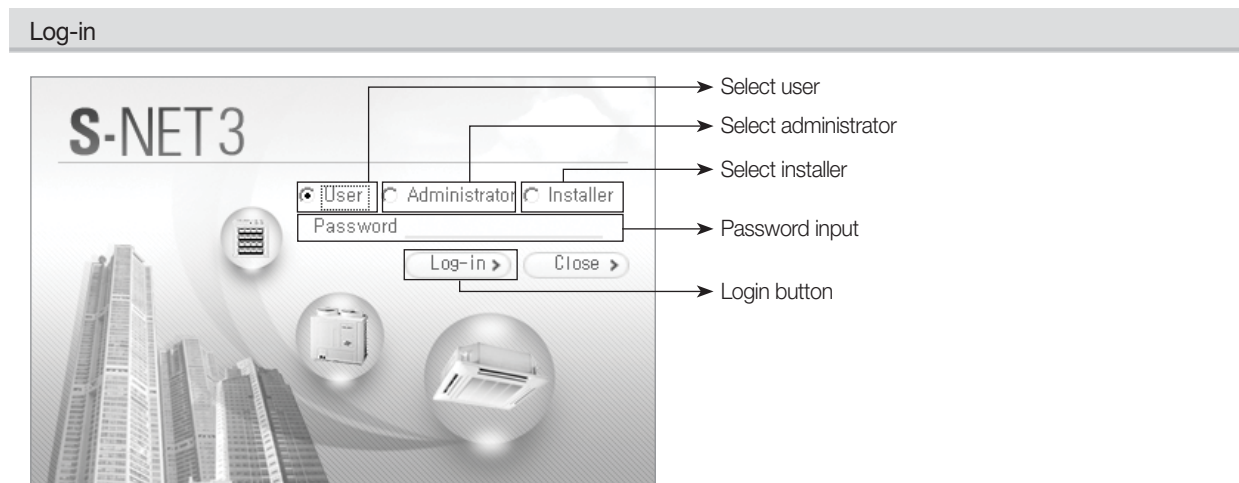
(2) User functions

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



Integrated management system

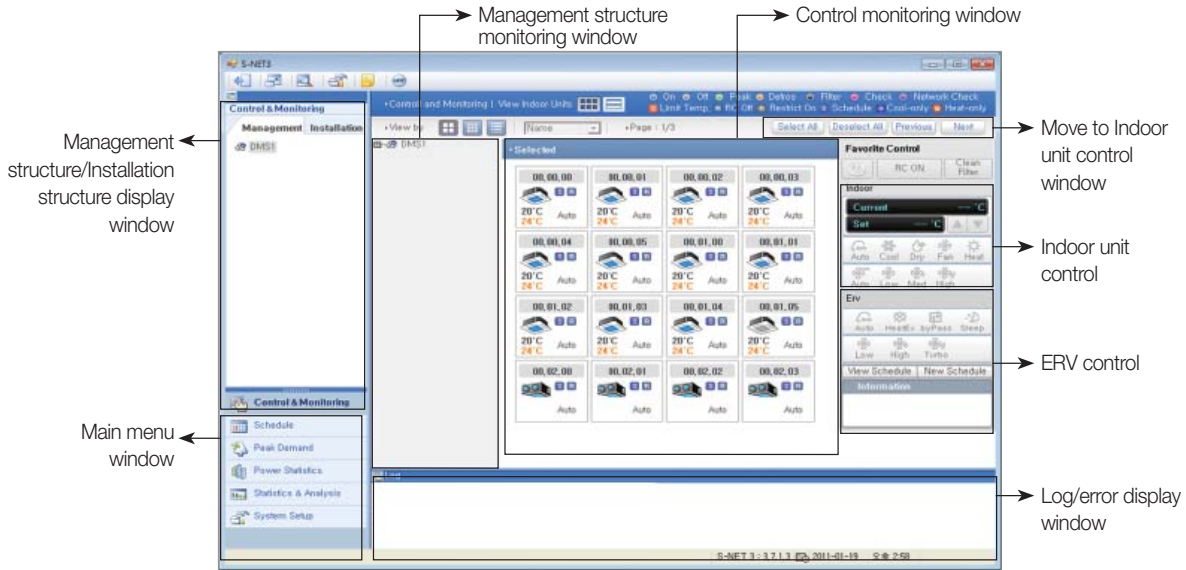
2. S-NET3

MST-P3P

5) Detail function description

(1) S-NET3 display

Control and monitoring



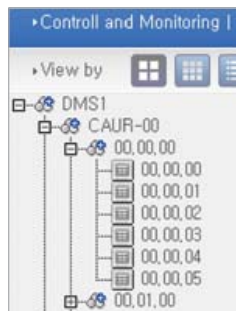
Installation structure window

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 centralized controller.

If indoor or outdoor unit is selected at the installation structure, it is possible to check the hardware information of the selected device.

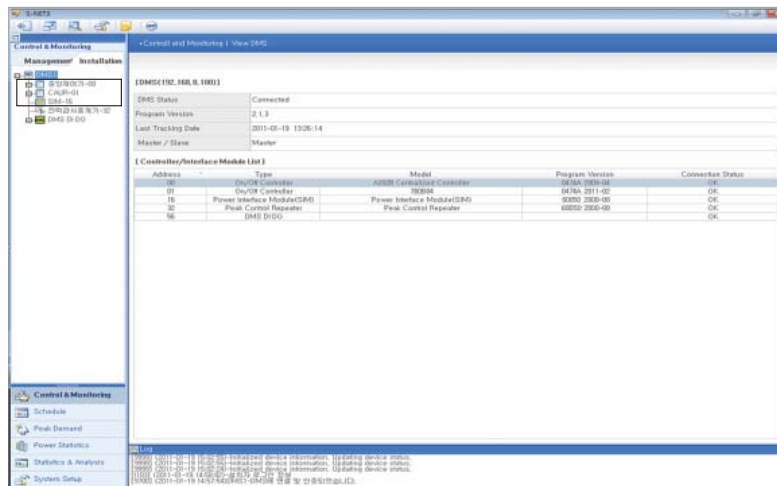


Selecting management structure



Selecting installation structure

► When DMS2 & centralized 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

The screenshot shows the 'Control & Monitoring' window with the 'Installation' tree on the left. The main area displays data for three compressors (Comp 1, Comp 2, Comp 3) under the heading '[Outdoor]'. The data is organized into columns for each compressor and rows for various parameters.

Comp 1		Comp 2		Comp 3	
Start	Start	Start	Start	Start	Start
Defrost status	---	Suction temperature	20°C	Operation Status	On standby
Oil temperature	10°C	Low pressure data	3kgf/air	Operation Mode	On standby
Condenser temperature	0°C	High pressure data	17kgf/air	Discharge temperature	22°C
Oil balancing	---	Oil recovering	---	Operation Status (start-up)	-
Condenser outlet temperature	33°C	Outdoor temperature	25°C	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°C
I/M Model	B13B Interface Module	I/M Version	0676B 2009-03	Outdoor Fan Step	30STEP
Discharge-2 temperature	22°C	Discharge-3 temperature	22°C	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

The screenshot shows the 'Control & Monitoring' window with the 'Installation' tree on the left. The main area displays data for four indoor units under the heading '*Selected'. The data is organized into columns for each unit and rows for various parameters.

Address 00.00.00		Name 00.00.00		RMC 00	
Operation Mode	Auto	Current Temp.	20°C	SPI	-
On/Off	On	Desired Temp.	24°C	Damper	-
Desired Capacity	0.1 kW	EEV	120STEP	Out Cool	-
Eva In Temp.	50°C	Eva Out Temp.	50°C	Desired Humidity	-
Error Status	-	Human Sensor	-	Current Humidity	-
Discharge T(Heat)	-	Discharge T(Cool)	-	Current Discharge T	-
Humidification	-	Model	2 Way Type	Auto Clean	-

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

Integrated management system

2. S-NET3

MST-P3P

5) Detail function description

(1) S-NET3 display

Installation structure window

► When DI is selected

Address	Port type	Device type	Short name	Value	Unit	Min value	Max value
56.00.03		di	56.00.03	Off	Power	OFF	ON
56.00.04		di	56.00.04	Off	Power	OFF	ON
56.00.05		di	56.00.05	Off	Power	OFF	ON
56.00.06		di	56.00.06	Off	Power	OFF	ON
56.00.07		di	56.00.07	Off	Power	OFF	ON
56.00.08		di	56.00.08	Off	Power	OFF	ON
56.00.09		di	56.00.09	Off	Power	OFF	ON
56.00.10		di	56.00.10	Off	Power	OFF	ON

Log

```

152291 (2011-01-19 15:00:55)-Initialized device information. Updating device status.
152292 (2011-01-19 15:00:55)-Initialized device information. Updating device status.
152293 (2011-01-19 15:00:55)-Initialized device information. Updating device status.
152294 (2011-01-19 15:00:55)-Initialized device information. Updating device status.
  
```

► When DO is selected

Address	Port type	Device type	Short name	Value	Unit	Min value	Max value
56.01.03		do	56.01.03	Off	Power	OFF	ON
56.01.04		do	56.01.04	Off	Power	OFF	ON
56.01.05		do	56.01.05	Off	Power	OFF	ON
56.01.06		do	56.01.06	Off	Power	OFF	ON
56.01.07		do	56.01.07	Off	Power	OFF	ON
56.01.08		do	56.01.08	Off	Power	OFF	ON

Log

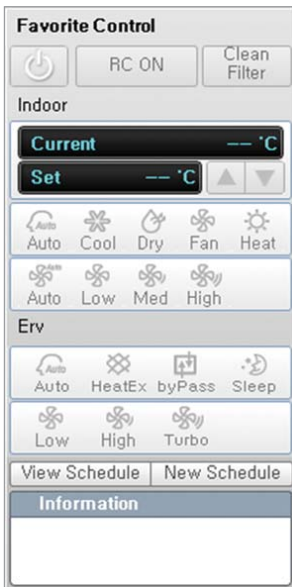
```

152291 (2011-01-19 15:00:55)-Initialized device information. Updating device status.
152292 (2011-01-19 15:00:55)-Initialized device information. Updating device status.
152293 (2011-01-19 15:00:55)-Initialized device information. Updating device status.
152294 (2011-01-19 15:00:55)-Initialized device information. Updating device status.
  
```

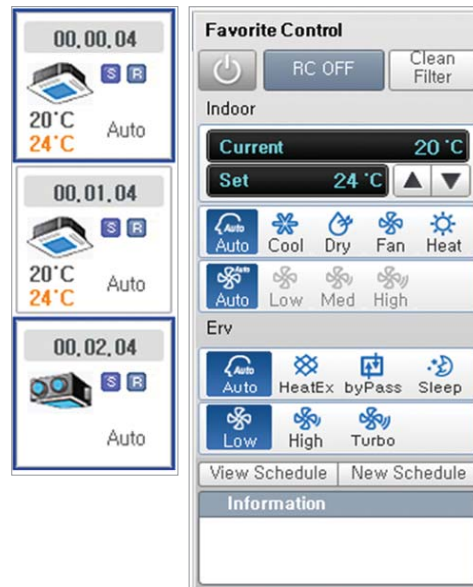

Control

- 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



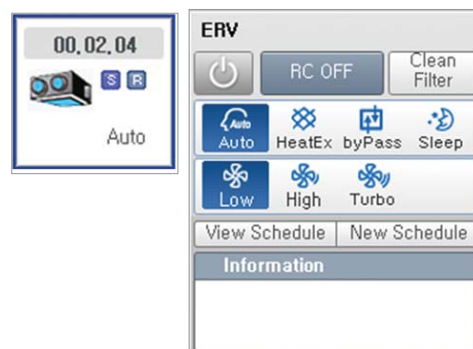
► Selecting indoor unit and ERV together



► Selecting indoor unit



► Selecting ERV



Integrated management system

2. S-NET3

□ MST-P3P

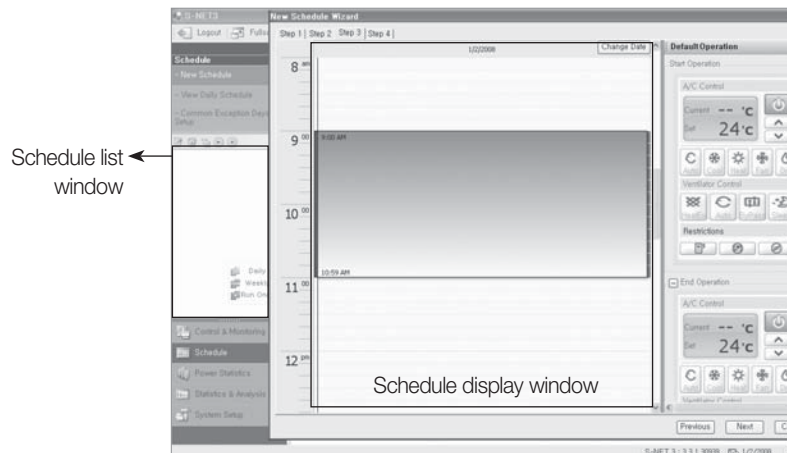
5) Detail function description

(1) S-NET3 display

Schedule control

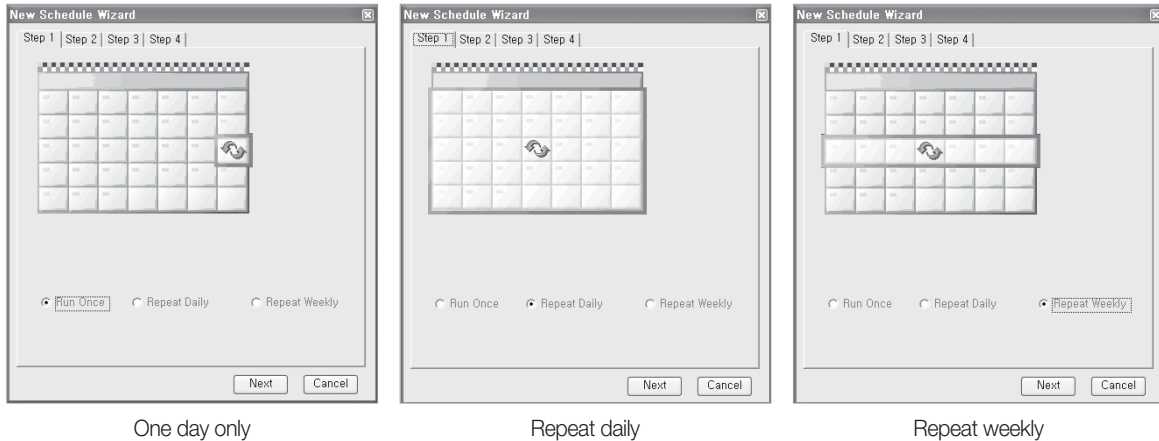
① Schedule setting

- 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)



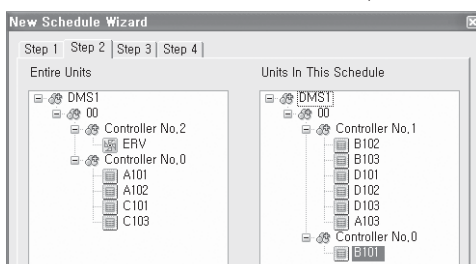
One day only

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, Centralized 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).

Control panel

Click twice

Time setting by dragging (based on 30-min. unit)

Change Schedule Operation

Start Operation: 06:20 | End Operation: 09:59

Indoor Control: Set 24 °C

Ventilator Control: Auto, HeatEx, byPass, Sleep

Time modification (based on minutes)
Temperature setting
Operation mode
Remote control use

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 name: B102_6Units

Start: 1/2/2008 | End: 1/2/2008

Exception Days: January 2008

Schedule name

Schedule period setting

Schedule exception date setting

► Schedule setting completion

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

Display the name of set schedule.

Display set schedule

Integrated management system

2. S-NET3

MST-P3P

5) Detail function description

(1) S-NET3 display

Schedule control

2) 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.

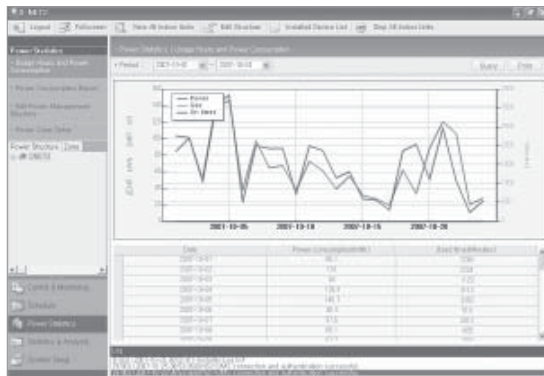


- Add/ Delete indoor unit for schedule control.
- Delete a set schedule.
- Modify a schedule name.

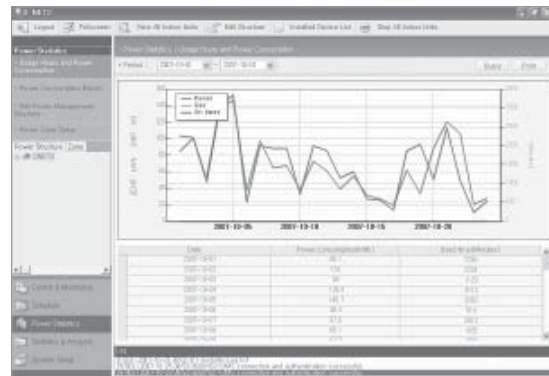
Usage time and power consumption

1) 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, Centralized controller, individual indoor unit. Centralized controller, individual indoor unit.



Total indoor unit usage reference



Individual indoor unit usage reference

2) 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.

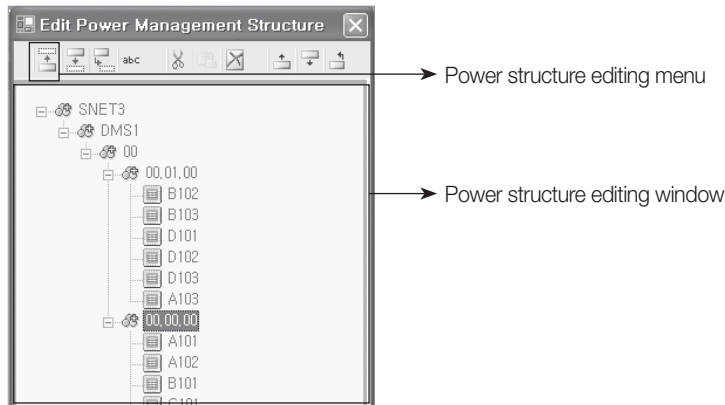
Name	DMS	Address	Zone	Power Consumption (kWh)	Amount	Device Type
0001-01				1000.000	1000	
0001-02				1000.000	1000	
0001-03				1000.000	1000	
0001-04				1000.000	1000	
0001-05				1000.000	1000	
0001-06				1000.000	1000	
0001-07				1000.000	1000	
0001-08				1000.000	1000	
0001-09				1000.000	1000	
0001-10				1000.000	1000	
0001-11				1000.000	1000	
0001-12				1000.000	1000	
0001-13				1000.000	1000	
0001-14				1000.000	1000	
0001-15				1000.000	1000	
0001-16				1000.000	1000	
0001-17				1000.000	1000	
0001-18				1000.000	1000	
0001-19				1000.000	1000	
0001-20				1000.000	1000	
0001-21				1000.000	1000	
0001-22				1000.000	1000	
0001-23				1000.000	1000	
0001-24				1000.000	1000	
0001-25				1000.000	1000	
0001-26				1000.000	1000	
0001-27				1000.000	1000	
0001-28				1000.000	1000	
0001-29				1000.000	1000	
0001-30				1000.000	1000	
0001-31				1000.000	1000	
0001-32				1000.000	1000	
0001-33				1000.000	1000	
0001-34				1000.000	1000	
0001-35				1000.000	1000	
0001-36				1000.000	1000	
0001-37				1000.000	1000	
0001-38				1000.000	1000	
0001-39				1000.000	1000	
0001-40				1000.000	1000	
0001-41				1000.000	1000	
0001-42				1000.000	1000	
0001-43				1000.000	1000	
0001-44				1000.000	1000	
0001-45				1000.000	1000	
0001-46				1000.000	1000	
0001-47				1000.000	1000	
0001-48				1000.000	1000	
0001-49				1000.000	1000	
0001-50				1000.000	1000	
0001-51				1000.000	1000	
0001-52				1000.000	1000	
0001-53				1000.000	1000	
0001-54				1000.000	1000	
0001-55				1000.000	1000	
0001-56				1000.000	1000	
0001-57				1000.000	1000	
0001-58				1000.000	1000	
0001-59				1000.000	1000	
0001-60				1000.000	1000	
0001-61				1000.000	1000	
0001-62				1000.000	1000	
0001-63				1000.000	1000	
0001-64				1000.000	1000	
0001-65				1000.000	1000	
0001-66				1000.000	1000	
0001-67				1000.000	1000	
0001-68				1000.000	1000	
0001-69				1000.000	1000	
0001-70				1000.000	1000	
0001-71				1000.000	1000	
0001-72				1000.000	1000	
0001-73				1000.000	1000	
0001-74				1000.000	1000	
0001-75				1000.000	1000	
0001-76				1000.000	1000	
0001-77				1000.000	1000	
0001-78				1000.000	1000	
0001-79				1000.000	1000	
0001-80				1000.000	1000	
0001-81				1000.000	1000	
0001-82				1000.000	1000	
0001-83				1000.000	1000	
0001-84				1000.000	1000	
0001-85				1000.000	1000	
0001-86				1000.000	1000	
0001-87				1000.000	1000	
0001-88				1000.000	1000	
0001-89				1000.000	1000	
0001-90				1000.000	1000	
0001-91				1000.000	1000	
0001-92				1000.000	1000	
0001-93				1000.000	1000	
0001-94				1000.000	1000	
0001-95				1000.000	1000	
0001-96				1000.000	1000	
0001-97				1000.000	1000	
0001-98				1000.000	1000	
0001-99				1000.000	1000	
0001-100				1000.000	1000	

Types of document to be stored

Usage time and power consumption

3 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.



4 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.

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Start Date	A				B				A																
End Date	0				8				16																
Weight	100				100				100																

↓
Able to adjust the sections by inputting relevant time.

Integrated management system

2. S-NET3

MST-P3P

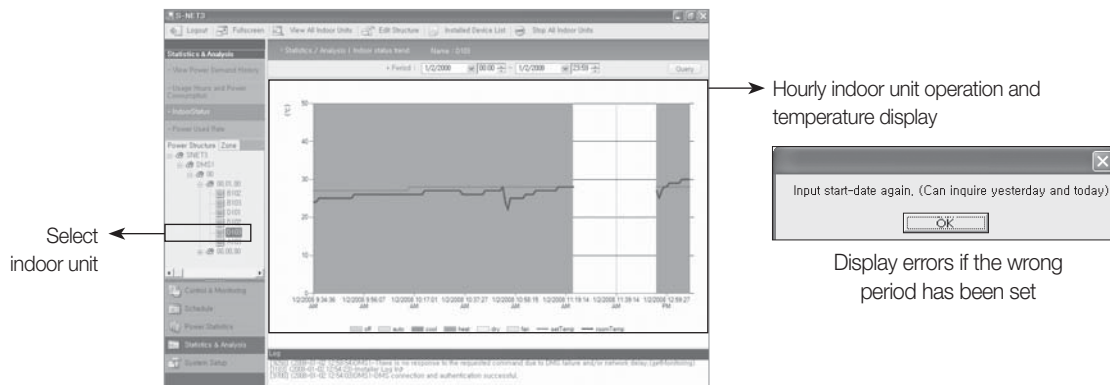
5) Detail function description

(1) S-NET3 display

Statistics and analysis

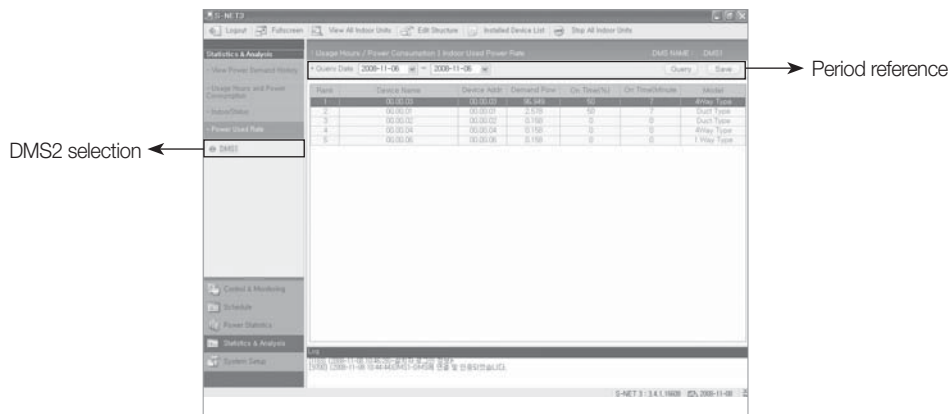
1 Indoor unit status

- 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.



2 Power consumption of indoor units

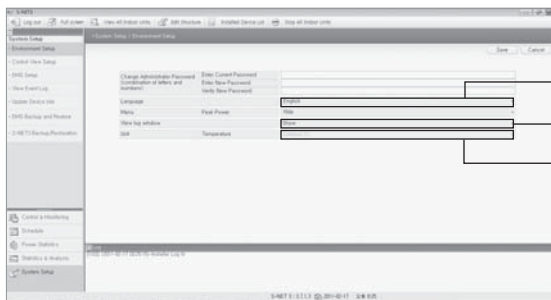
- Displays the use time and power consumption ratios for the indoor units connected to each DMS2.



System management

1 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).



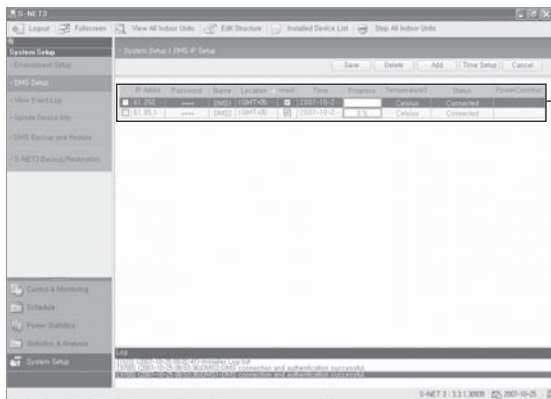
Language setting

Log date view setting

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

2 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

IP Address	Password	Name	Location	mast	Time	Progress	TemperatureS	Status	PowerConstruc
61.250.1	****	DMS1	(GMT+05:00)	<input checked="" type="checkbox"/>	2007-10-2...		Celsius	Connected	
61.85.1	****	DMS2	(GMT+05:00)	<input checked="" type="checkbox"/>	2007-10-2...	0%	Celsius	Connected	

DMS2's access IP input

Password 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.

Integrated management system

2. S-NET3

□ MST-P3P

5) Detail function description

(1) S-NET3 display

System management

3 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.

Set the list of events

Query period setting

Event display

Category	Unit Name	Device Address	Occurred	Resolved	Error Code	Error Details	Details
Error	Indoor	16	2007-10-27 13		01	MEMORY ERROR of SW	Details
Warning	Outdoor	17	2007-10-28 18		02	DIRECTOR ← TRGM	Details
Warning	Outdoor	16	2007-10-28 18		02		Details
Warning	Outdoor	18	2007-10-28 18		02		Details
Warning	Outdoor	19	2007-10-28 18		02		Details
Warning	Outdoor	17	2007-10-29 08		02		Details
Warning	Outdoor	18	2007-10-29 08		02		Details
Warning	Outdoor	19	2007-10-29 08		02		Details
Warning	Outdoor	16	2007-10-29 08		02		Details
Warning	Outdoor	17	2007-10-29 08		02		Details
Warning	Outdoor	18	2007-10-29 08		02		Details
Warning	Outdoor	19	2007-10-29 08		02		Details

4 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.

List of control devices connected to DMS2

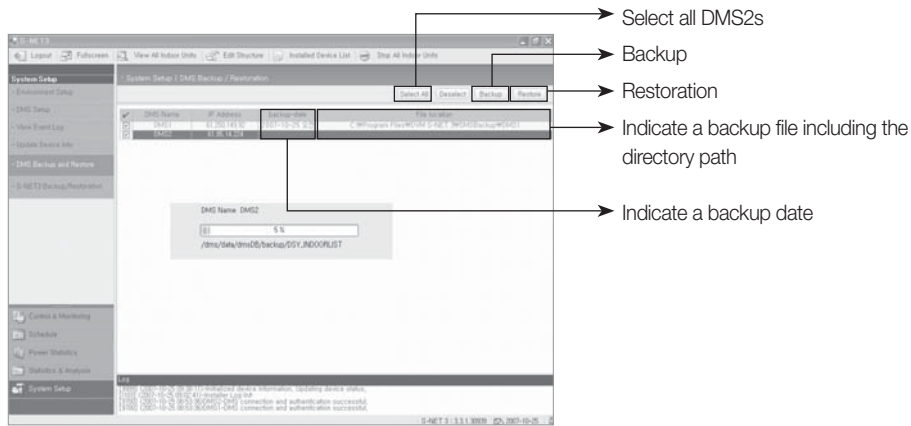
Tracking is under way

Name	Address	Device Type	Model	Manufacturer	Interface/Model
MST P3P	16	Indoor	DMAC		E15 Interface M1
MST P3P	17	Outdoor	DMAC		E15 Interface M1
MST P3P	18	Outdoor	DMAC		E15 Interface M1
MST P3P	19	Outdoor	DMAC		E15 Interface M1
MST P3P	16	Indoor	DMAC		E15 Interface M1
MST P3P	17	Outdoor	DMAC		E15 Interface M1
MST P3P	18	Outdoor	DMAC		E15 Interface M1
MST P3P	19	Outdoor	DMAC		E15 Interface M1

System management

5 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.



6 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.





Integrated management system

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

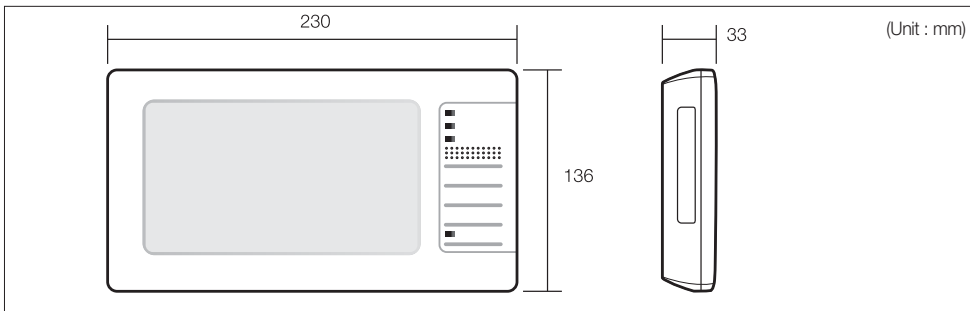
3. S-NET mini

□ MST-S3W

1) Features



- Flexible connection options
(With DMS2, centralized controllers, interface modules)
- Touch screen
- Control and monitoring of up to 256 indoor units
- USB keyboard supported
- Zone control
- Schedule function
- Wired/Wireless remote control restriction
- Individual/Group management
- Applied to DVM, DVM PLUS, DVM PLUS II, DVM PLUS III, DVM PLUS IV, HR system, FJM, CAC, ERV
- Error display
- 7-inch wide LCD



Power supply	12V DC, 3.0A
Maximum communication length	RS485 : Maximum 1km from the end to the other end
Communication connection	DMS2, Centralized controller, Interface module
Maximum number of interface	4 DMSs 16 centralized controllers 16 interface modules 256 indoor units
Ethernet	10Base-T supported
Operating temperature range	0°C ~ 40°C
Operating humidity range	30%RH ~ 90%RH

2) Main panel



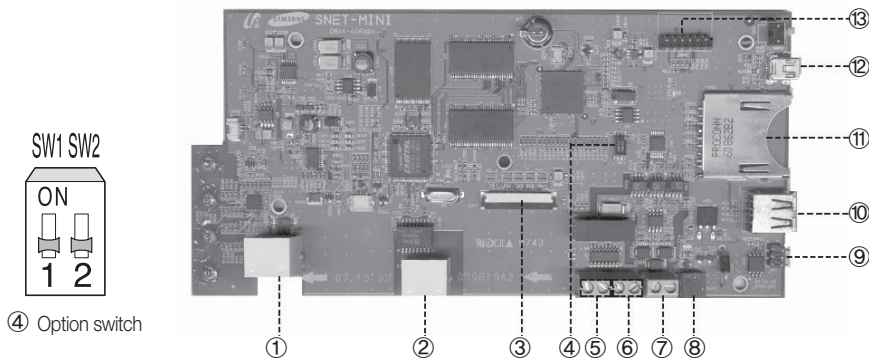
No.	Name	Operation status
①	LAN indicator	Blinks in green during internet communication (Sent/Receive)
②	Data indicator	Blinks in green during 485 communication (Sent/Receive)
③	Error indicator	Turns in red when error occurs
④	Speaker	Plays sound
⑤	Menu button	Press this button to display main menu
⑥	Soft keyboard button	Press this button to display keyboard on the screen
⑦	Lock button	Lock all the buttons
⑧	Power button	Turns On/Off the S-NET mini
⑨	Power indicator	Turns in red when power is on

Integrated management system

3. S-NET mini

MST-S3W

3) Connectors

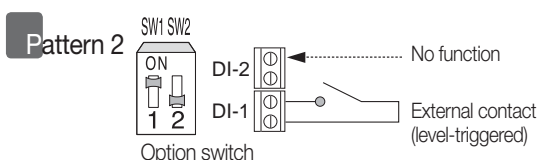


No	Name	Description
①	System debugging connector	RS232 interface for system configuration, data management and software debugging
②	LAN connector	LAN connection to DMS2
③	LCD ASS'Y cable	LCD ASS'Y cable for RGB data
④	Option switch	Control specification setting for external inputs
⑤	External input 1	Mechanical contact input1 (Load : 12V DC/5mA)
⑥	External input 2	Mechanical contact input2 (Load : 12V DC/5mA)
⑦	RS485 connector	RS485 connection to centralized controllers or interface modules. It has polarity which causes error in communication with lower-layer devices if reverse-polarized connection is made.
⑧	Power supply connector	12V DC, 3A
⑨	Software upgrade connector	For software upgrade of system debugging engine
⑩	USB interface	USB interface for a key board or memory stick
⑪	Flash memory card	SD-type flash memory interface for data back-up
⑫	1394 interface	IEEE 1394 interface
⑬	Bootload connector	For OS bootloading

4) Option switch

- DIP switch (SW1) : Use only for external contact signal control.

Pattern	DIP switch no.		Control details	Contact input
	1	2		
1	ON	ON	No function (Default setting)	Not applied
2	ON	OFF	1. Emergency stop / Resume operation Other additional functions are temporarily disabled under Emergency stop.	Level-triggered
3	OFF	ON	1. Indoor unit ON/OFF control 2. Permitted/Prohibited remote control use Other additional functions are not interrupted.	Level-triggered
4	OFF	OFF	1. Indoor unit ON/OFF control Other additional functions are not interrupted.	Pulse-triggered

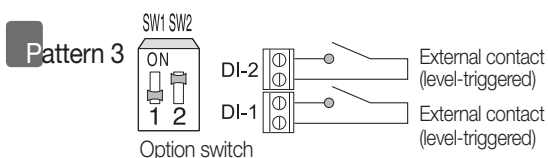


▶ **Short external contact : Emergency stop**

- Turns off all the indoor units when there is an ON signal input.
- All the remote control use is disabled.
- DMS2 will ignore any request from the upper-layer controllers.
- Schedule control is disabled temporarily.

▶ **Open external contact : Resume operation**

- After Emergency stop, the indoor units stay the current OFF states.
- All the remote control use is restored to the previous state.
- Schedule controller is enabled again.

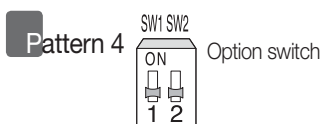


▶ **External contact input to DI-1**

- **Short contact** : Starts all indoor unit operation.
- **Open contact** : Stops all indoor unit operation.

▶ **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.
- Schedule control is not interrupted in Pattern 3.



▶ **External contact pulse input to DI-1**

- **Short pulse-triggered** : Starts all indoor unit operation.

▶ **External contact pulse input to DI-2**

- **Short pulse-triggered** : Stops all indoor unit operation.
Schedule control is not interrupted in Pattern 4.

Integrated management system

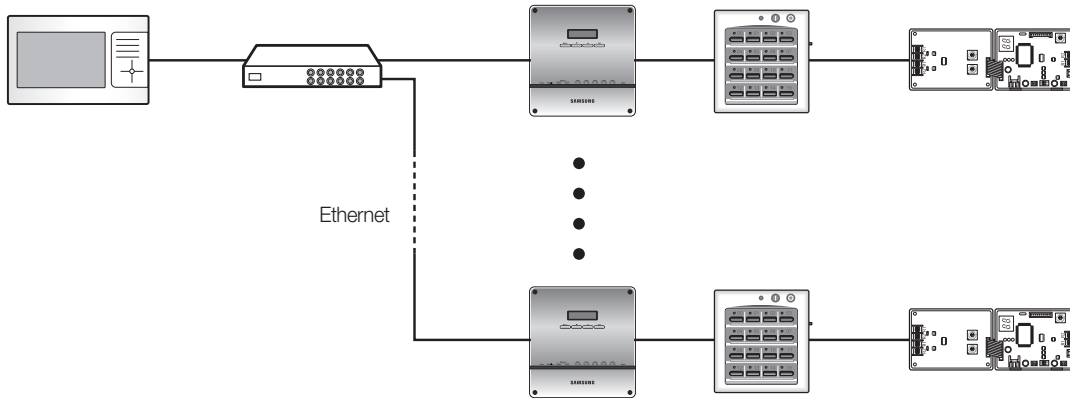
3. S-NET mini

□ MST-S3W

5) Flexible communication connection

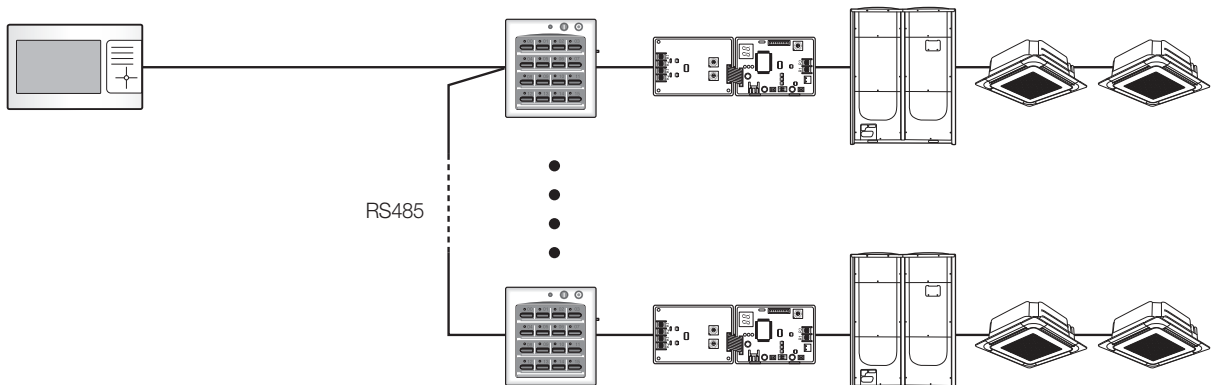
(1) Ethernet connection to up to 4 DMS2s

- Up to 256 indoor units of 4 DMS2s can be controlled.



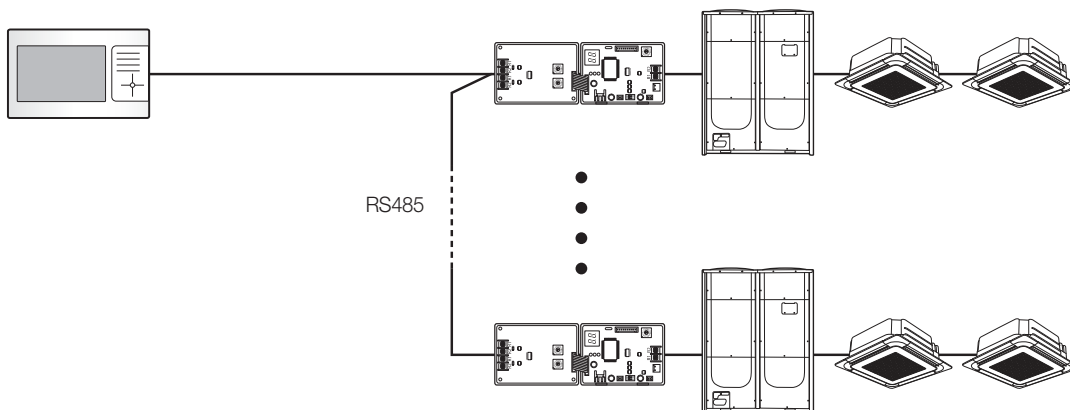
(2) RS485 connection to up to 16 centralized controllers (C1-C2 connection)

- Up to 256 indoor units are controlled through the centralized controllers.



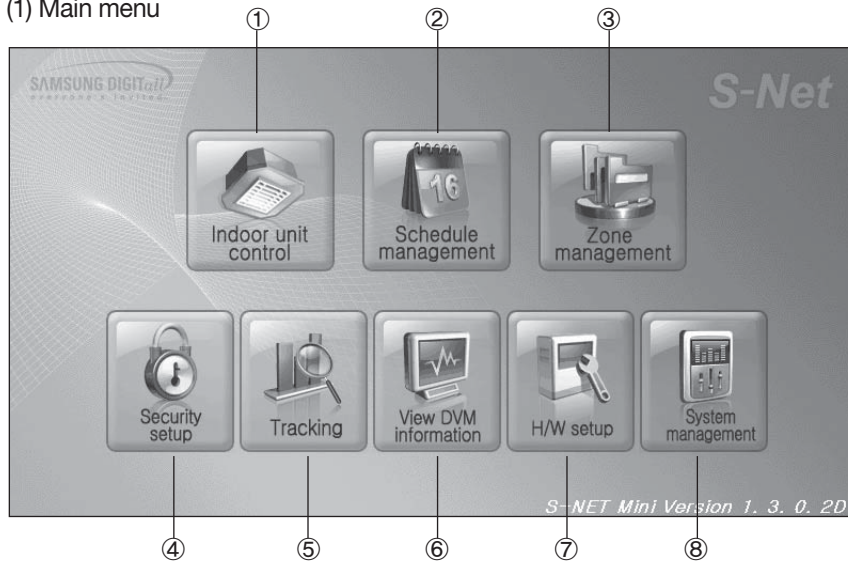
(3) RS485 connection to up to 16 interface modules (R1-R2 connection)

- Up to 256 indoor units are controlled through the interface modules.



6) Menu

(1) Main menu



No.	Name	Description
①	Indoor unit control	<ul style="list-style-type: none"> ▪ Operation control and monitoring (up to 256 indoor units) ▪ Operation mode, temperature setting, airflow direction and fan speed ▪ Upper/lower temperature limit setting ▪ Multiple control of indoor units ▪ Wired/Wireless remote control restriction ▪ Schedule/Zone monitoring ▪ Full display of indoor units ▪ Operation mode restriction
②	Schedule management	<ul style="list-style-type: none"> ▪ Adding/Editing/Deleting schedules ▪ Daily/Weekly schedule setting ▪ Exception date setting
③	Zone management	<ul style="list-style-type: none"> ▪ Convenient control management for the user ▪ Adding/Editing/Deleting zone setting ▪ Saving zone setting to file
④	Security setup	<ul style="list-style-type: none"> ▪ Access password setting ▪ Password change/confirmation
⑤	Tracking	<ul style="list-style-type: none"> ▪ Interface device registration ▪ Device information storage
⑥	View DVM information	<ul style="list-style-type: none"> ▪ Device installation monitoring ▪ Detailed monitoring of Indoor units ▪ Error history query
⑦	H/W setup	<ul style="list-style-type: none"> ▪ Current date/time setting ▪ Screen/Volume adjustment ▪ IP setting
⑧	System management	<ul style="list-style-type: none"> ▪ Lower-level interface setting ▪ System initialization ▪ DMS2 IP setting ▪ Time synchronization

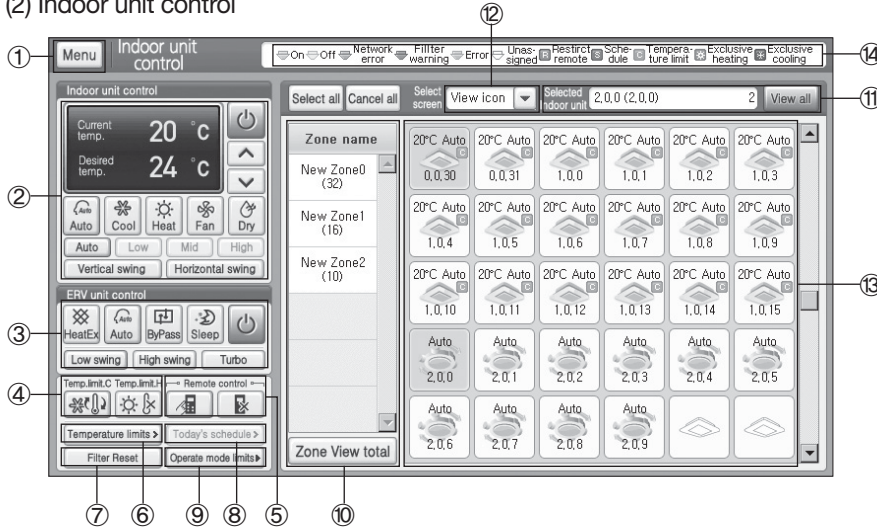
Integrated management system

3. S-NET mini

□ MST-S3W

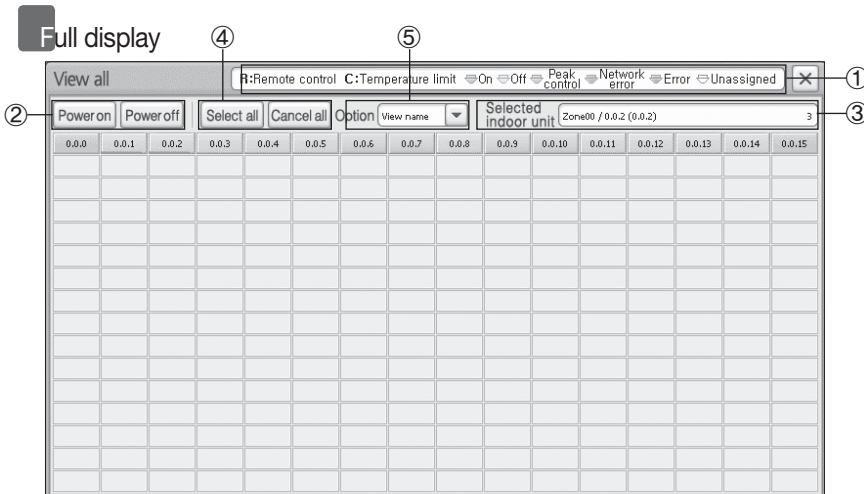
6) Menu

(2) Indoor unit control



No.	Description
①	Menu button
②	Indoor unit control window ▪ Control selected indoor unit : On/Off, temperature, Fan speed, Air swing, Operation mode,
③	ERV unit control window ▪ Control selected ERV : Operation mode, Fan speed
④	Temperature limit setting ▪ Apply Upper/Lower temperature limit for selected indoor unit
⑤	Remote control setting ▪ Enable/Disable remote control usage restriction
⑥	Temperature limit setting ▪ Set the Upper/Lower temperature for the selected indoor unit
⑦	Filter reset ▪ Reset filter replacement alert

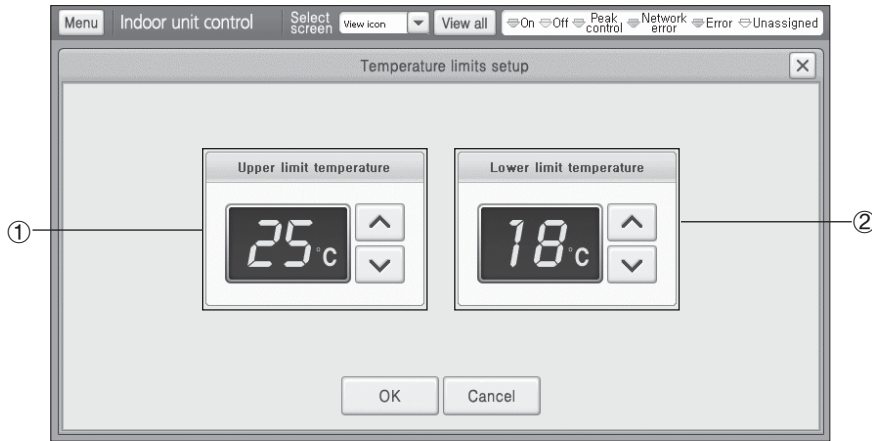
No.	Description
⑧	Today's schedule ▪ View today's schedule (which is effective) of the selected indoor unit
⑨	Operation mode limits ▪ Restrict operation mode of selected indoor unit (Cooling only, Heating only)
⑩	Zone management monitoring
⑪	Selected indoor unit display ▪ Displays name and quantity of the selected indoor unit(s).
⑫	Select screen ▪ Select from View icon, View list
⑬	Indoor unit display window
⑭	Indoor unit status legend



No.	Description
①	State display of indoor units Blue : Operation Gray : Stop Red : Indoor unit error Pink : Network error White : Not registered indoor unit R : Remote control restriction C : Temperature limit

No.	Description
②	Indoor unit ON/OFF control
③	Selected indoor unit name display
④	Entire indoor unit selection/deselection
⑤	Optional display (Name/Temperature/Remote control display)

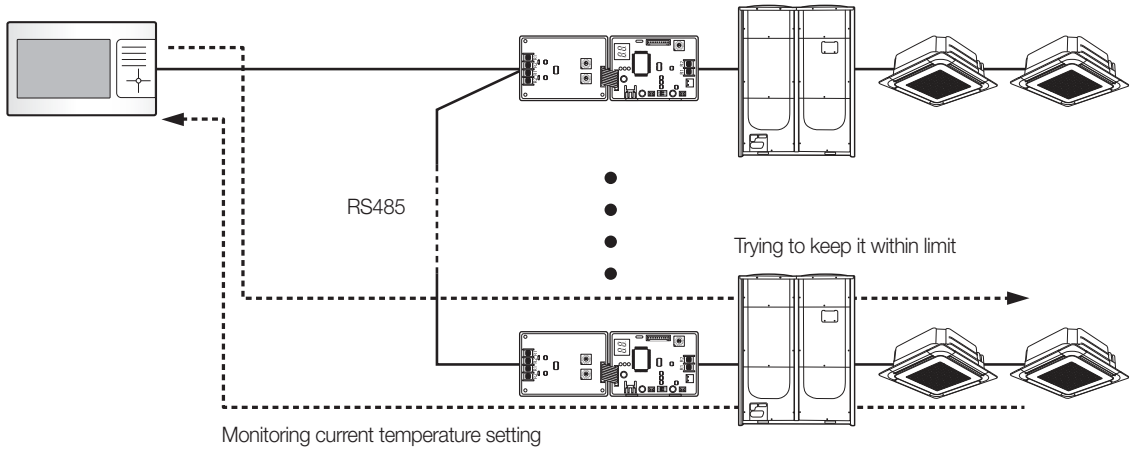
Temperature limit setup



No.	Description
①	Upper temperature limit setting
②	Lower temperature limit setting

► Restriction on temperature setting

Restriction on temperature setting is accomplished by incessant monitoring of indoor unit temperature setting through S-NET mini - device communication. If the temperature is not within the set limit, S-NET mini tries to set temperature repetitively to keep it within the range.



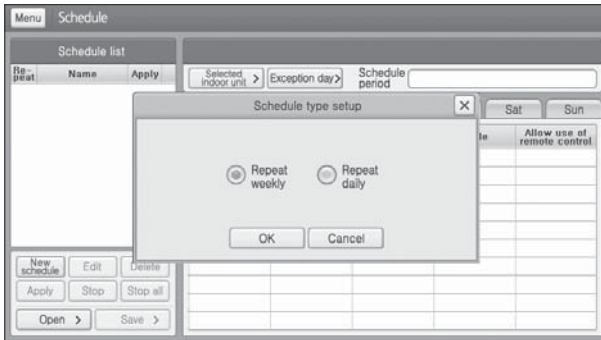
Integrated management system

3. S-NET mini

MST-S3W

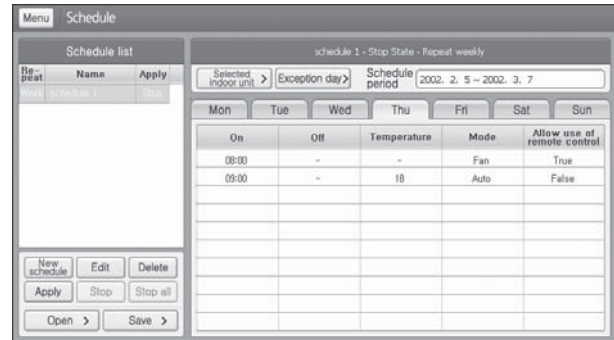
6) Menu

(3) Schedule management



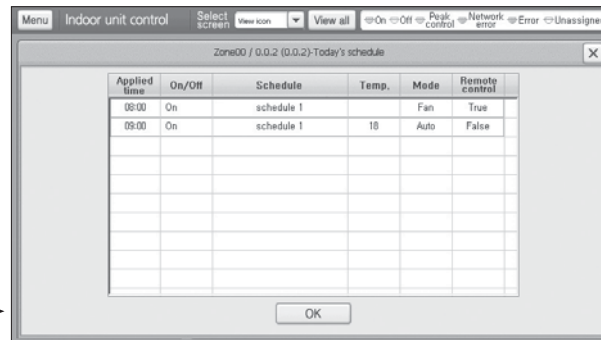
► Making new schedule

- 1 Weekly/Daily schedule setting



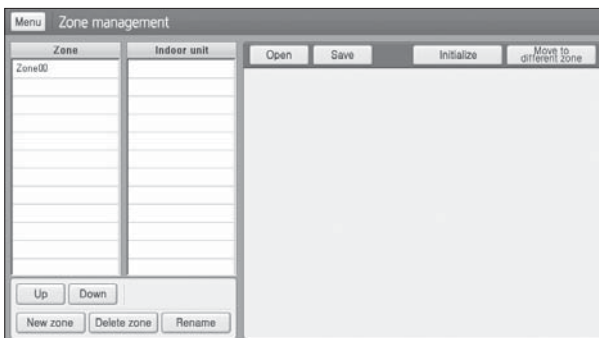
► Schedule edition

- 1 On/Off time setting
- 2 Temperature/Mode setting
- 3 Wireless/Wired remote control restriction

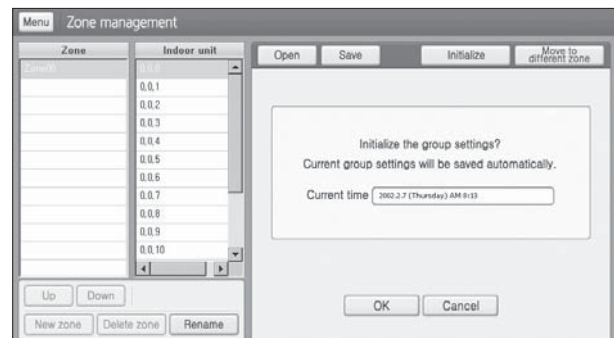


► Today's schedule monitoring

(4) Zone management

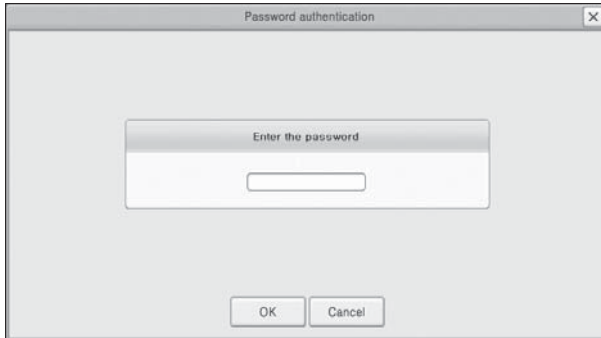


- Making new zone
- Deleting selected zone
- Zone naming
- Zone positioning
- Saving zone setting to file

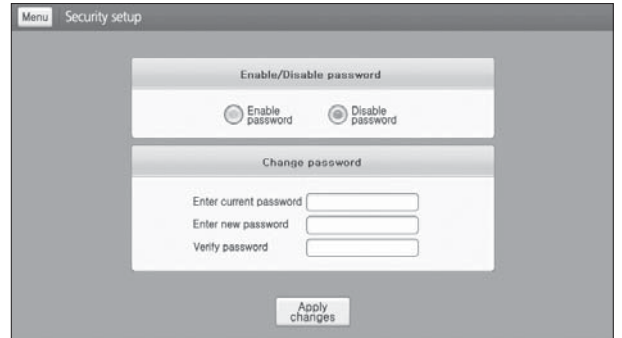


► Zone initialization (automatic back-up)

(5) Security setup

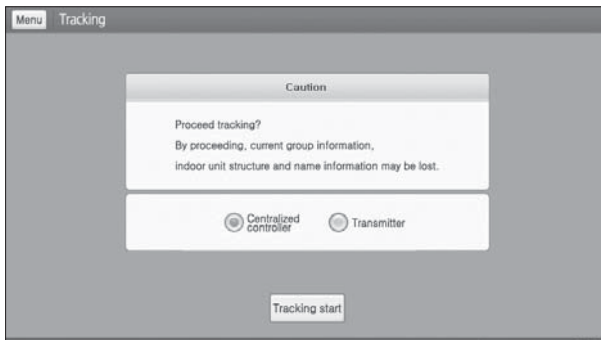


- ▶ Default password : 0000

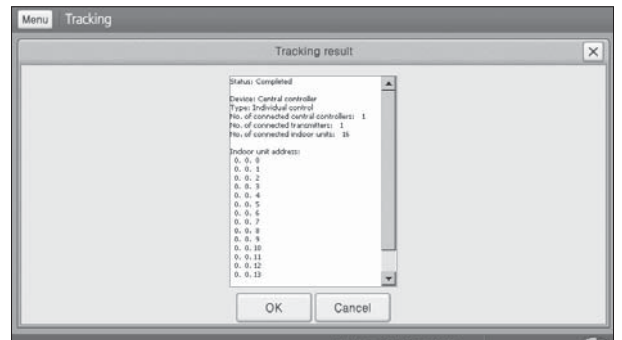


- ▶ Password Enable/Disable
- ▶ Changing password

(6) Tracking

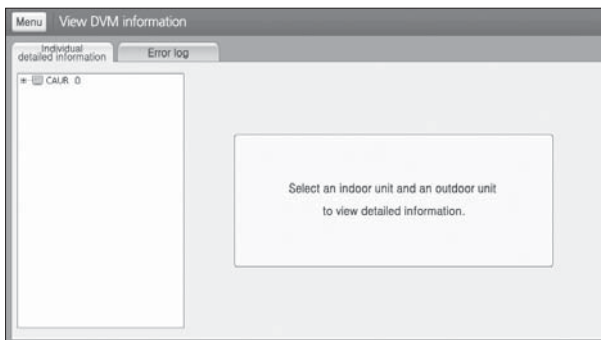


- ▶ Lower-level device selection
(Centralized controller or interface module)

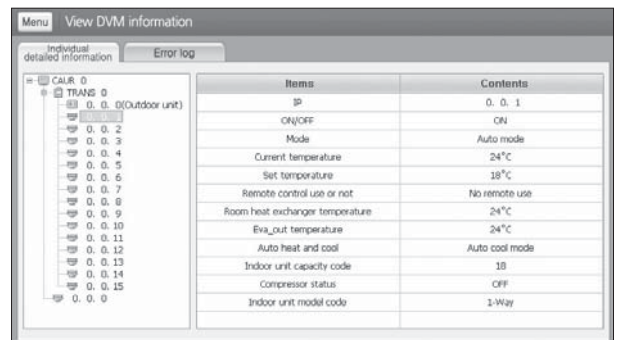


- ▶ Device connection display
- ▶ Indoor unit address display

(7) View DVM information



- ▶ System installation display



- ▶ Detailed indoor unit monitoring

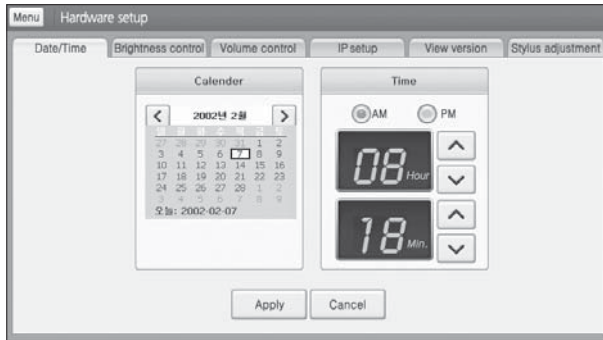
Integrated management system

3. S-NET mini

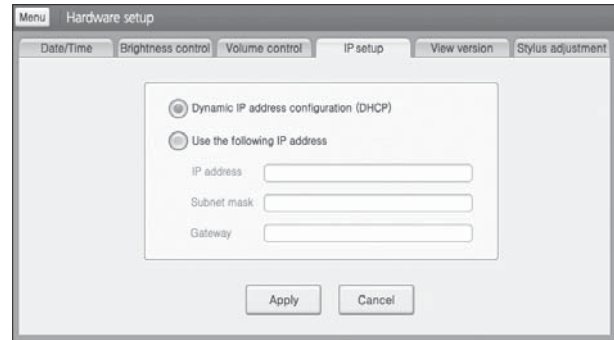
MST-S3W

6) Menu

(8) H/W setup

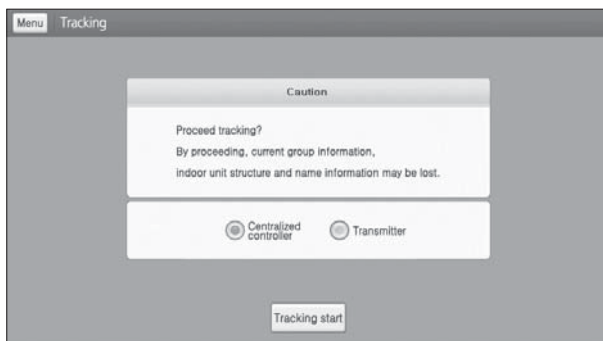


► Current date/time setting



► Static or dynamic IP setting

(9) System management



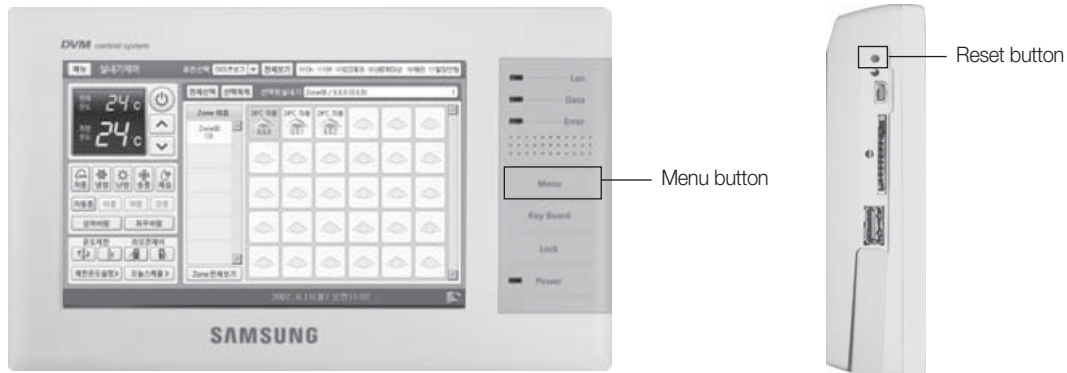
► Interface configuration

- ① Ethernet connection to DMS2
- ② RS485 connection to centralized controller or interface module

7) Upgrading

(1) OS upgrade

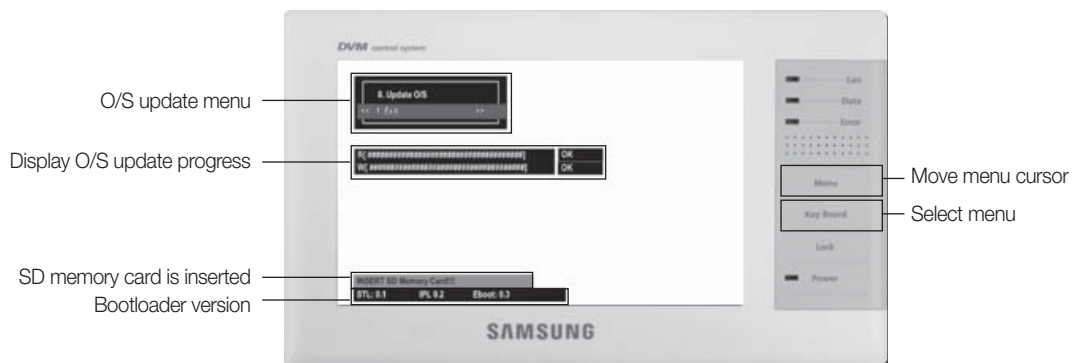
- 1 Press the [Menu] button while pressing the [Reset] button.



- 2 Insert the SD memory card with the OS software to the card slot.

When memory card is inserted : **Memory Card is DETECTED.**

When memory card is not inserted : **INSERT SD Memory Card!!!**



- 3 Select "0.Update O/S"
- 4 Begin O/S update
- 5 When update is completed, select 1.EXIT to reboot.



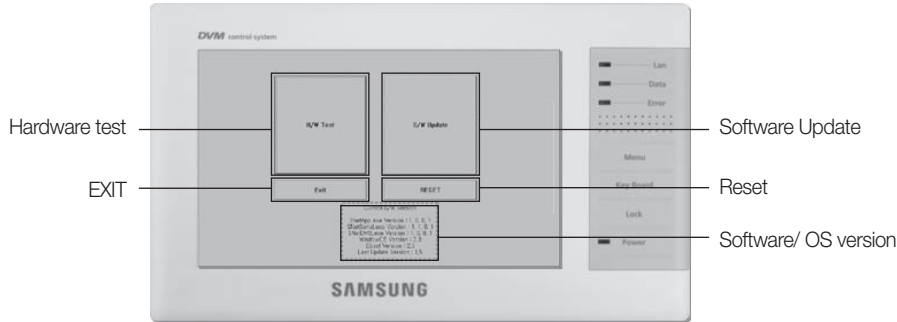
Integrated management system

3. S-NET mini

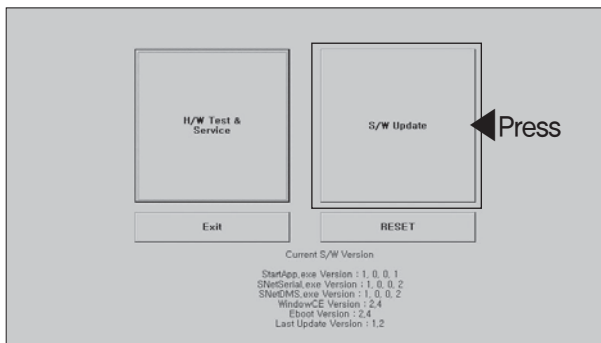
MST-S3W

7) Upgrading

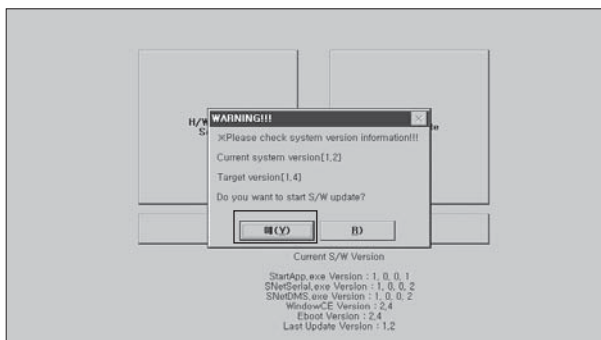
(2) Software upgrade



- 1 Prepare SD memory card. (Larger than 265MB)
- 2 Copy the files to the memory card.
 - [AppRecover.exe, SNet_Mini_ver_xx_xx.dat, SNet_Mini_Ver_xx_xx.lst]
- 3 While the power is on, insert the memory card to the S-Net mini -> Update screen will run automatically.
- 4 Press the S/W update.



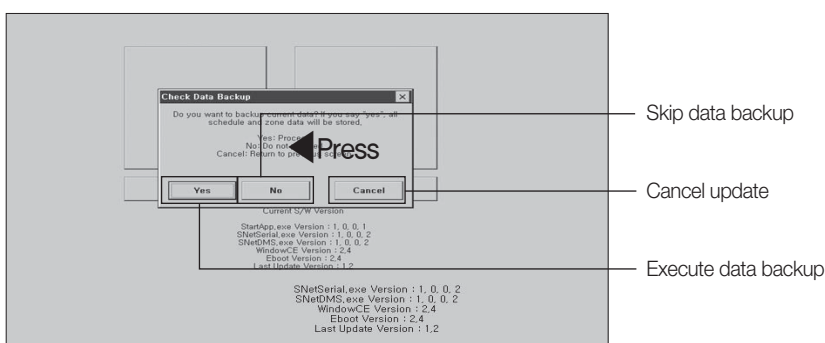
- 5 Check the warning window regarding on checking the software and start update.



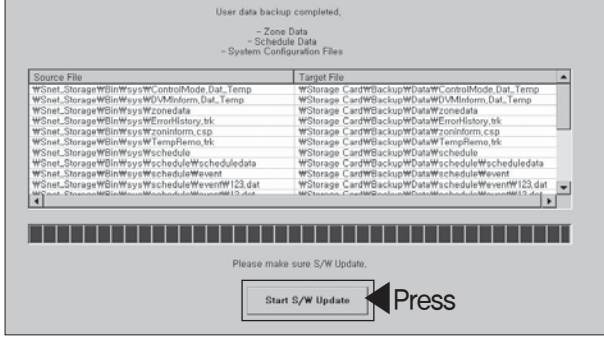
Note

- ♦ H/W Test & Service: Testing S-NET mini hardware and provide other service options.
- ♦ Exit: End
- ♦ Reset: Reboot

- 6 Check data backup
 - Editing zone
 - Schedule
 - System setting status

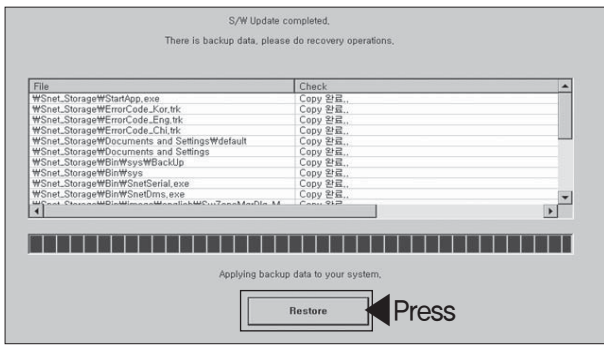


7 When data backup is completed, click "Start S/W Update".

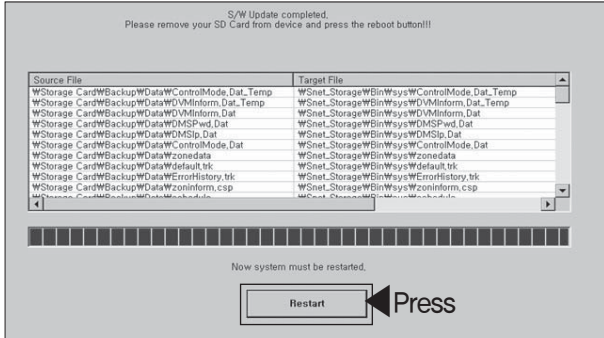


Note
 • After software upgrade, user data will not be initialized.

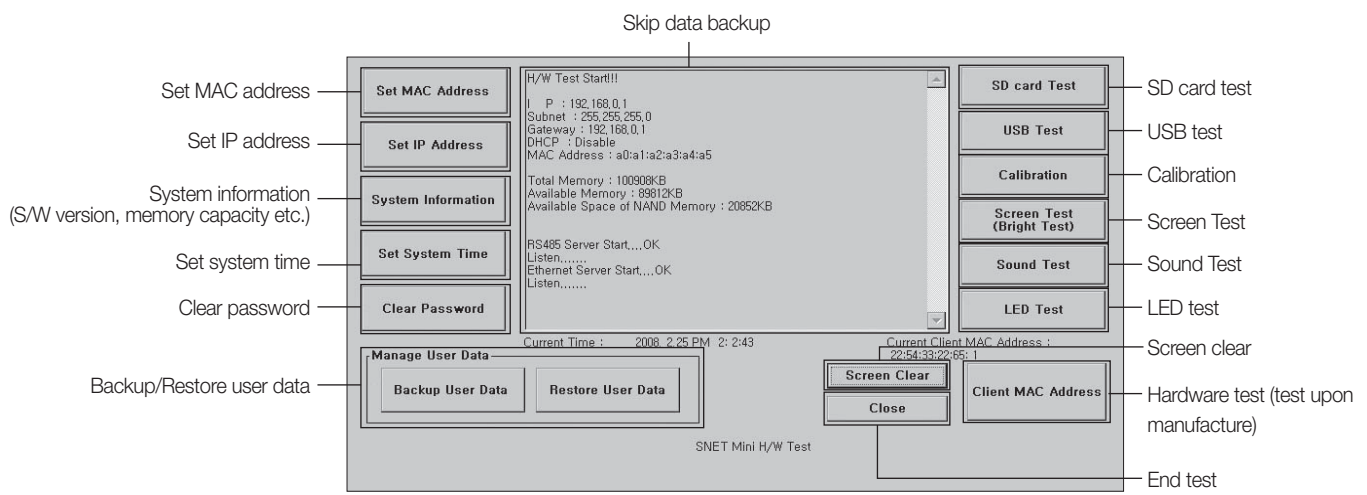
8 To upload saved user data to the updated software, click "Restore" button.
 ■ Restore button will only appear when user data backup is established.



9 When software update and data restore has been completed, remove the SD memory card and press "Restart"
 ■ When memory card has not been removed, software update window will reappear after rebooting.



8) Hardware test

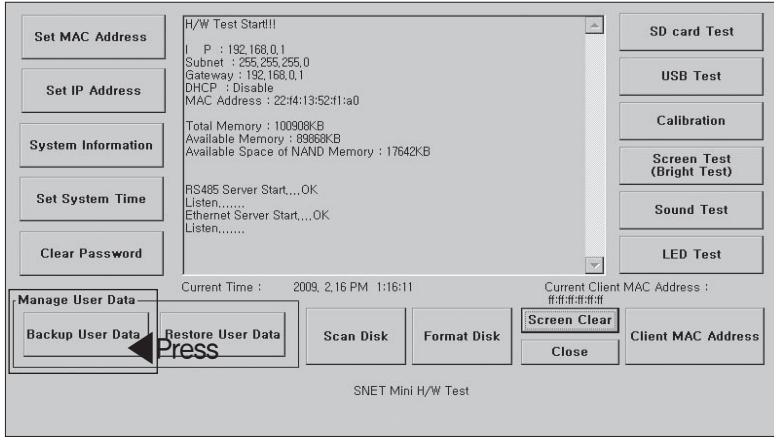


Integrated management system

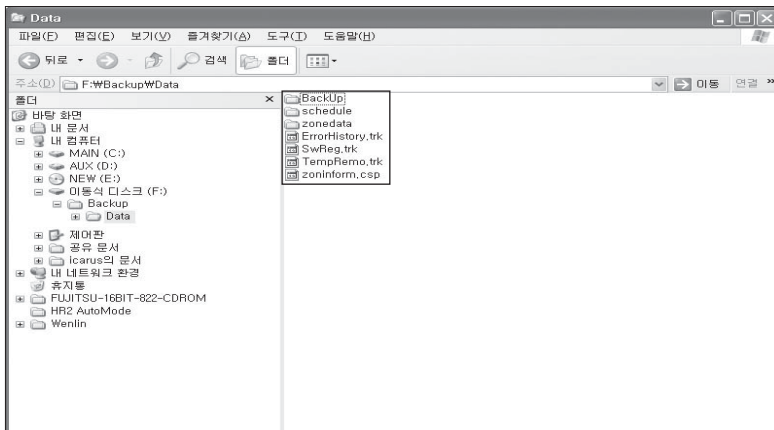
3. S-NET mini

MST-S3W

9) Data backup



- Data will be backed up to SD memory card. (Zone setting/Schedule/System setting/Error history)



IV. Power distribution system

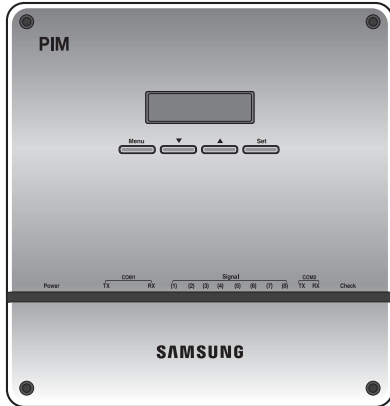
- 1 Electricity meter interface module. 156

IV Power distribution system

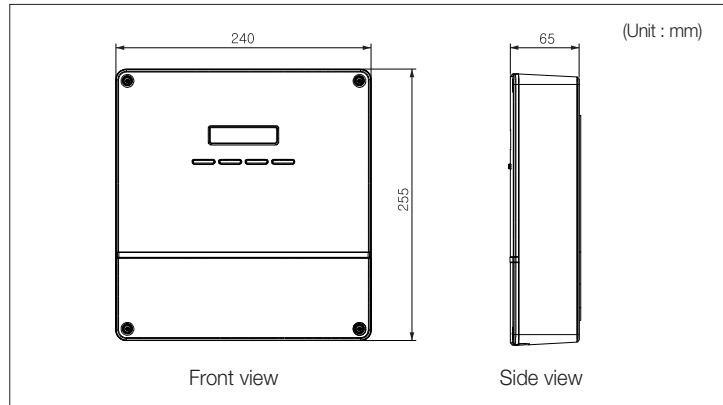
1. Electricity meter interface module

□ MIM-B16

1) Features

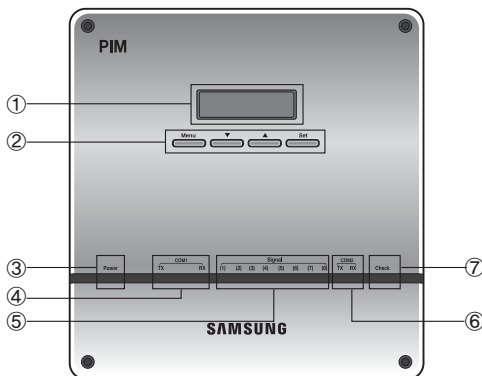


- Pulse output electricity meter interface unit (max. 8 meters)
- 8-channel energy consumption display in real time
- System configuration with button manipulation
- Various text messages in LCD
- Current communication state indication



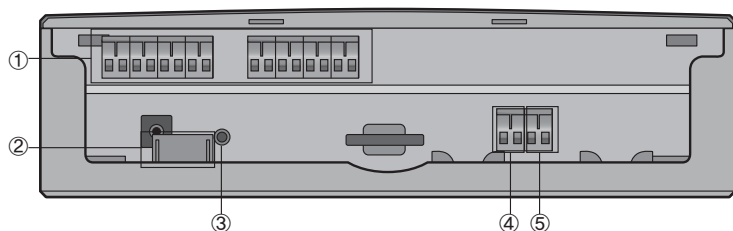
Power supply (adapter)	Input : 100~240V AC, 50/60Hz, 1.0A Output : 12V DC, 3.0A
Operating temperature range	0°C ~ 40°C
Operating humidity range	30%RH ~ 90%RH
Storage temperature range	-20°C ~ 70°C
Maximum wiring length	DMS2 : 1000m Electricity meter : 200m
Number of interfaces	Electricity meter : max. 8 units DMS2 : 1 unit

2) Display and buttons



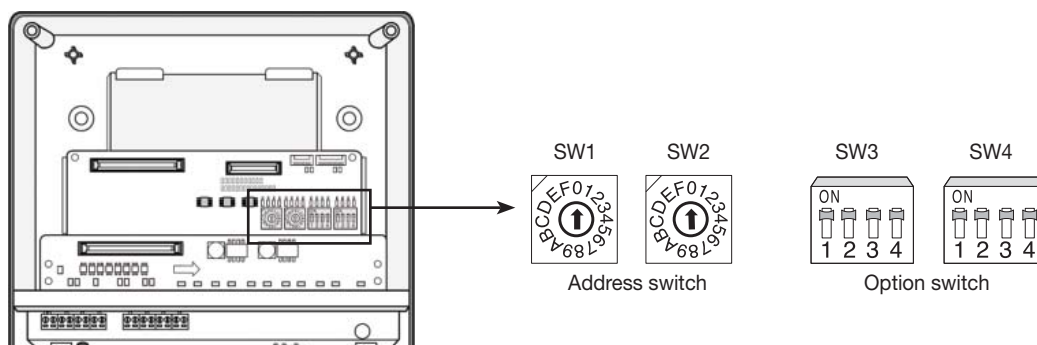
No.	Name	Description
①	LCD window	Information on current electricity readings, settings and operation state is displayed (16 character x 2 line LCD).
②	Menu button	Various menus are selected to monitor current electricity readings, to make configuration settings for electricity meters, and to check the 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

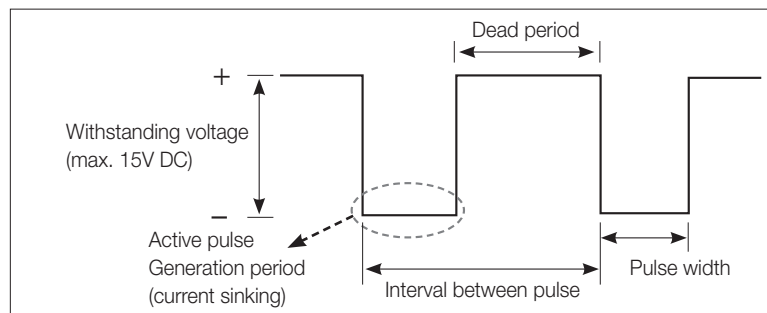
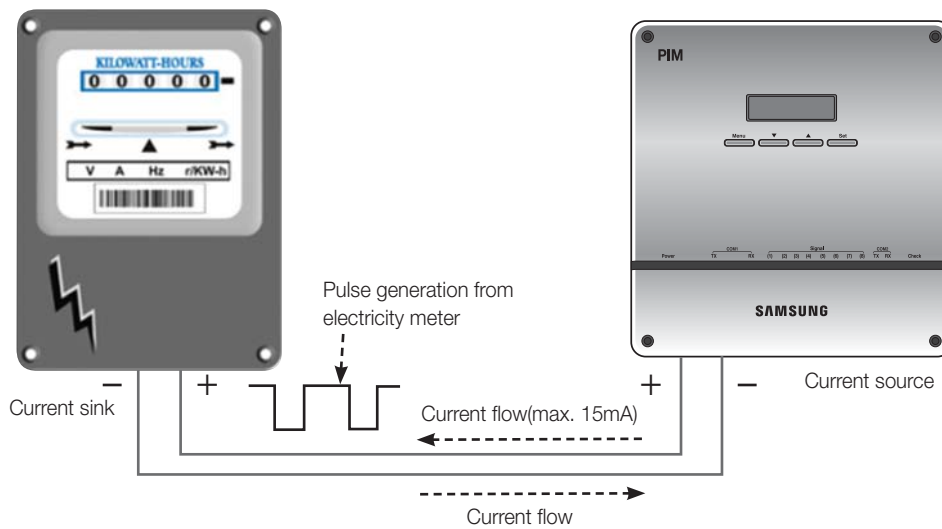
IV Power distribution system

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



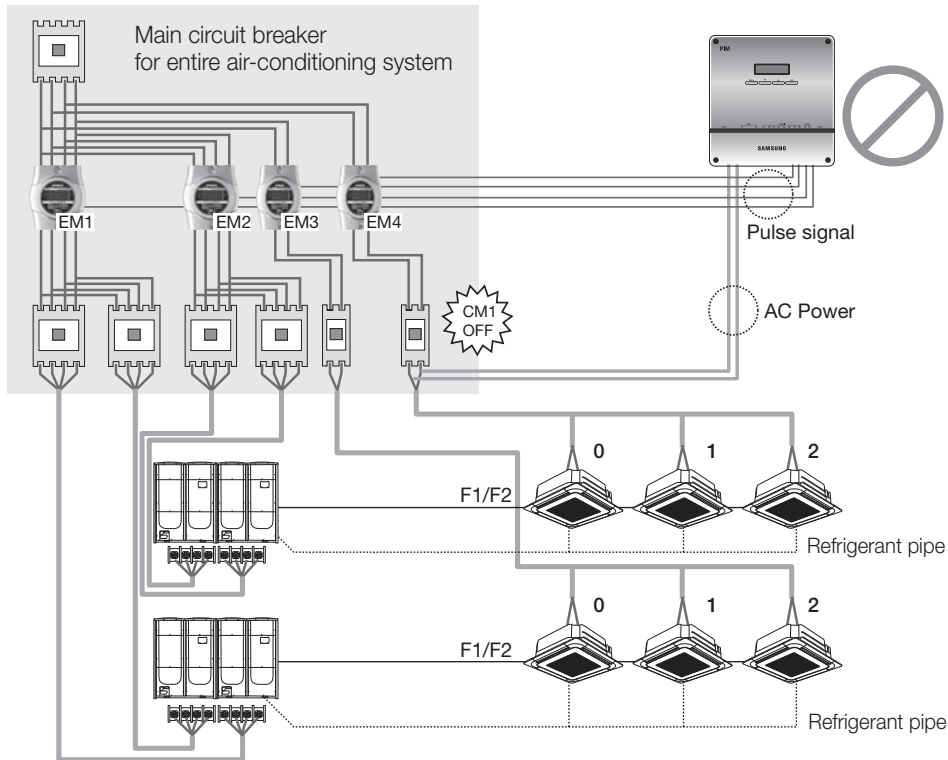
☑ Note

- ♦ 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.

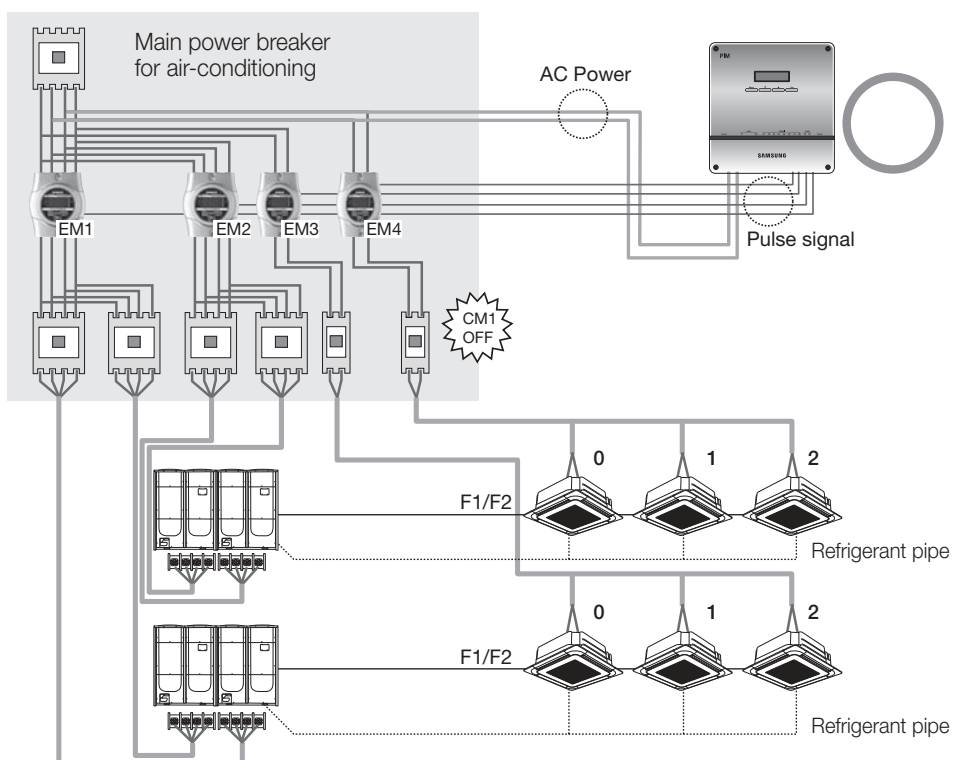
6) Installation

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

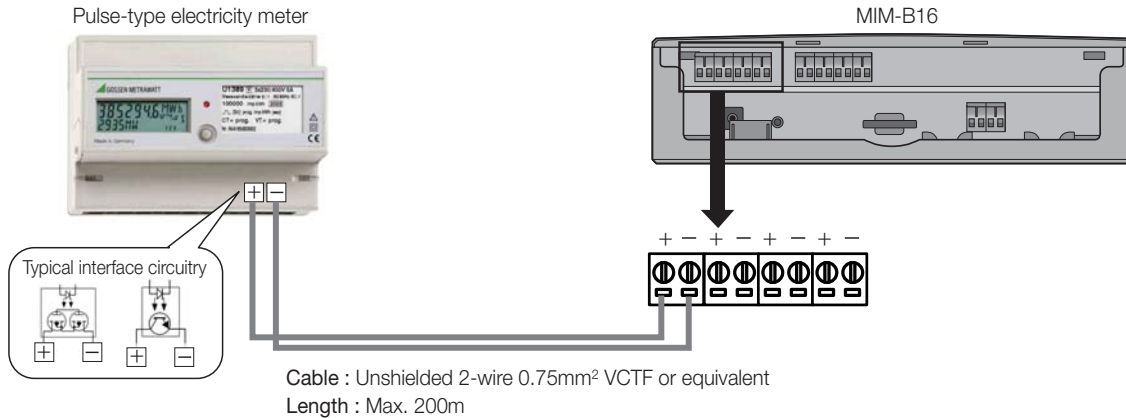
1. Electricity meter interface module

□ MIM-B16

7) Wiring

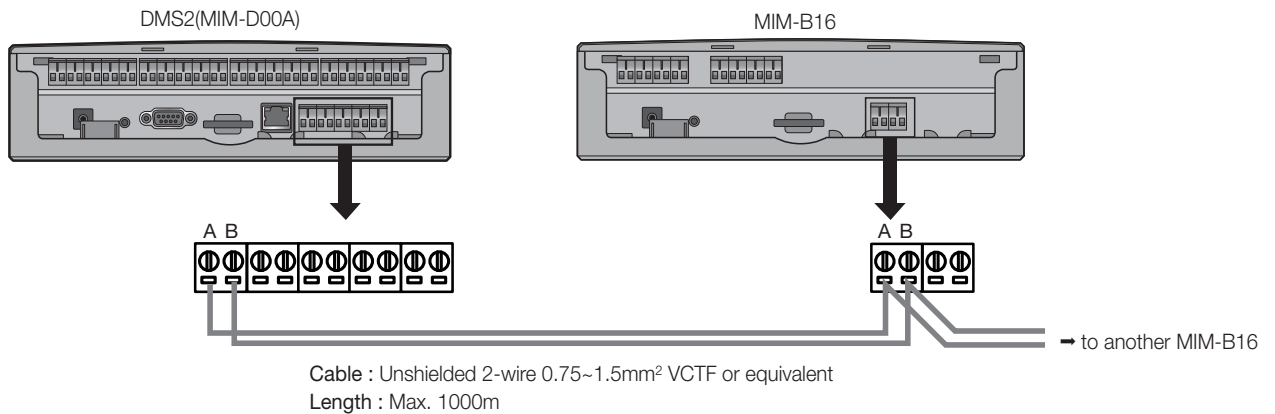
► Wiring to electricity meter

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



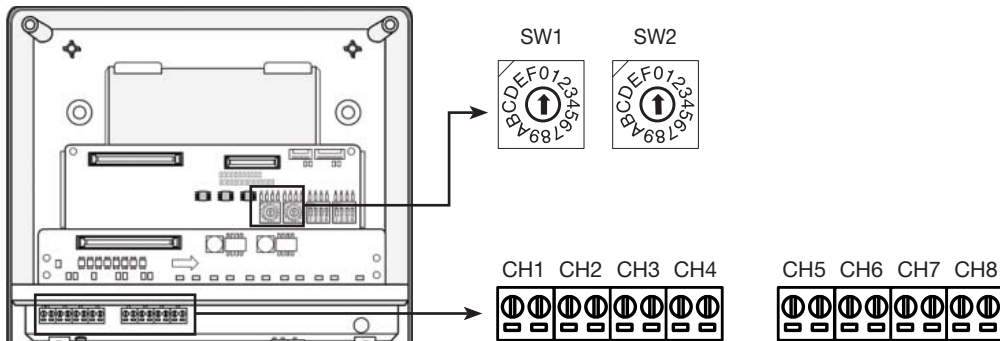
► Wiring to DMS2

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



8) Address assignment

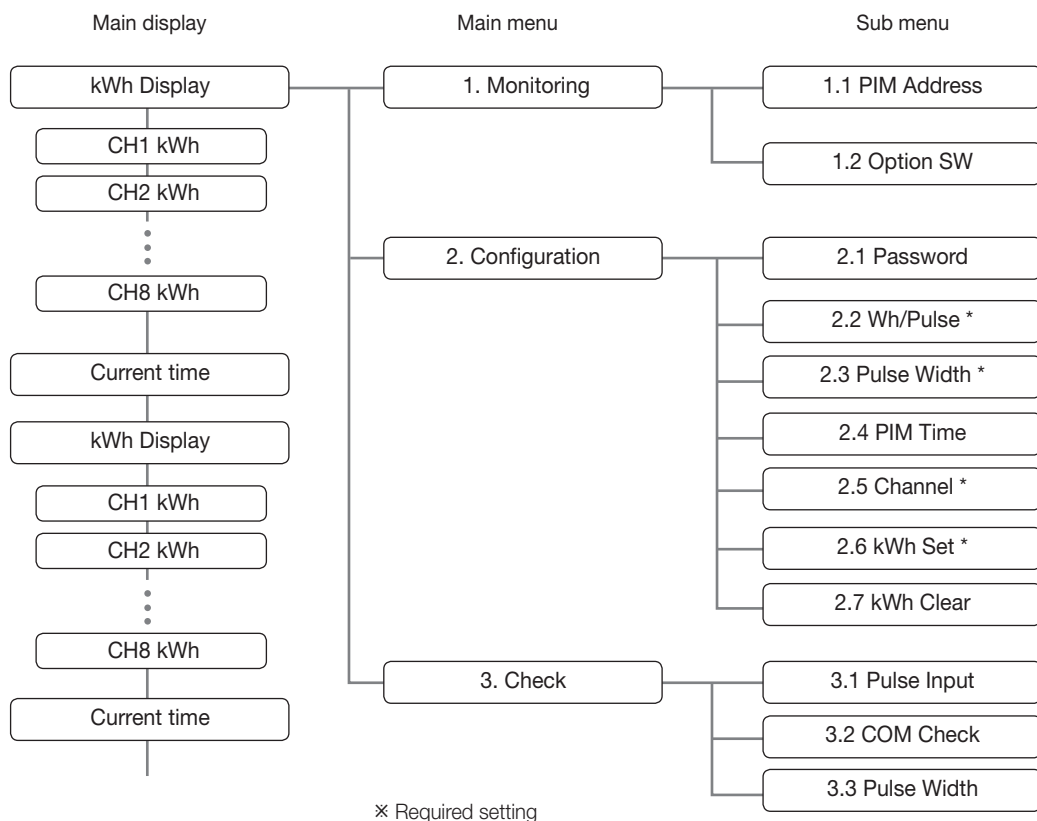
Each of the electricity meters is assigned with the dedicated address depending on MIM-B16 address setting and the position of the pulse input terminals.



► 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

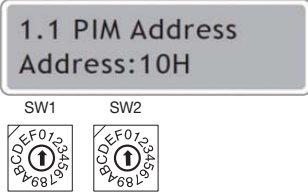

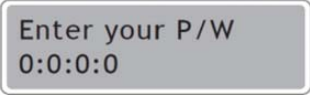

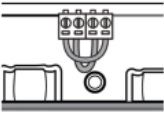
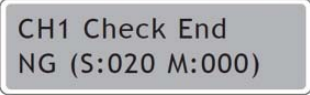


IV Power distribution system

1. Electricity meter interface module

□ MIM-B16

9) MIM-B16 menu structure

Main menu	Sub menu	Description										
Monitoring	PIM Address	<p>The MIM-B16 address is displayed with the physical address SW2 added by 10H on the LCD window.</p> <p>Ex)</p> <table border="1"> <tr> <td>LCD</td> <td>SW2 setting</td> </tr> <tr> <td>10H</td> <td>0</td> </tr> <tr> <td>11H</td> <td>1</td> </tr> <tr> <td>...</td> <td>...</td> </tr> <tr> <td>17H</td> <td>7</td> </tr> </table> 	LCD	SW2 setting	10H	0	11H	1	17H	7
	LCD	SW2 setting										
10H	0											
11H	1											
...	...											
17H	7											
Option SW	<p>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'.</p> <p>Ex)</p> 											
Configuration	Password	<p>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'.</p> <p>Ex)</p> 										
	Wh/Pulse	<p>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.</p>										
	Pulse Width	<p>The width of the pulse from an electricity meter must be in the range between 20ms and 400ms during current sink into the meter.</p>										
	PIM Time	<p>Current time is recommended to set for future use.</p>										
	Channel	<p>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.</p>										
	kWh Set	<p>Initial electricity reader value must be set as a starting point for each of the enabled interface channels.</p>										
	kWh Clear	<p>Each or all the initial kWh values are cleared when selected.</p>										
Check	Pulse Input	<p>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.</p> 										
	COM Check	<p>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.</p>  <p>When the COM1 communication channel is normal, the message 'OK' is displayed on the LCD window.</p>										
	Pulse Width	<p>The pulse width test result is displayed with the messages "OK" or "NG" followed by the set and measured width values.</p>  <p>S : set value M : measured value</p>										

10) Setting parameters on DMS2 (MIM-D00A)

► The following parameters for MIM-B16 can be also set and monitored on DMS2 (MIM-D00A)

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

The screenshot displays the 'PIM Settings' page in a web browser. At the top, there is a navigation bar with 'SAMSUNG' and several menu items: 'Control and Monitoring', 'Zone management', 'Schedule', 'EHP Power Consumption Inspection', 'Control logic management', and 'System Settings'. Below this, a breadcrumb trail shows 'Welcome! admin. Logout' and 'EHP Power Consumption Inspection > PIM Settings'. The main content area is titled 'PIM Settings' and contains a table with the following structure:

PIM CH	Time Setting	Power (kWh)	Pulse Width (ms)	Pulse (Wh/p)	Channel Status
16	Time Setting		400	10000	Enable
16	PIM Password		400	10000	Enable
16	Watt-hour meter (kWh)		400	10000	Enable
16	Pulse Width (ms)		400	10000	Enable
16	Pulse (Wh/p)		400	10000	Enable
16	Channel Status		400	10000	Enable
16.3	99999.9	99999.9	400	10000	Enable
16.4	99999.9	99999.9	400	10000	Enable
16.5	99999.9	99999.9	400	10000	Enable
16.6	99999.9	99999.9	400	10000	Enable
16.7	99999.9	99999.9	400	10000	Enable
16.8	99999.9	99999.9	400	10000	Enable

Below the table, there are two sections: 'Time Setting' with a digital clock display showing '10:02:04 12:53:06 (YY-MM-DD HH:MM:SS)' and 'PIM Password' with a four-digit input field showing '0000'. 'Cancel' and 'Save' buttons are located at the bottom right.

× DMS2 setting for MIM-B16 parameters

11) Error

Error code	Description
E613	Communication error between DMS2 (MIM-D00A) 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 contact control system

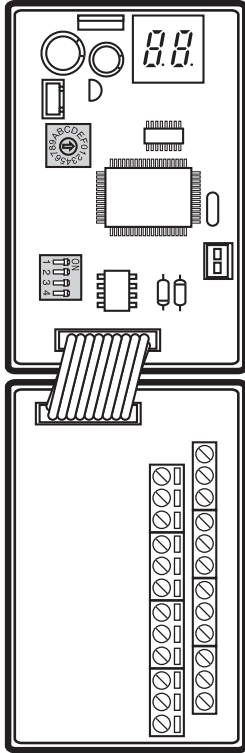
- 1 Key-tag interface module 166
- 2 External contact interface modul 171

V External contact control system

1. Key-tag interface module

□ MIM-B02

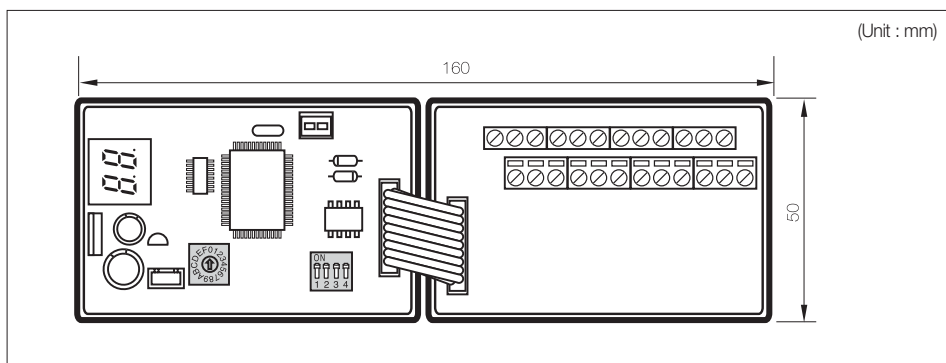
1) Features



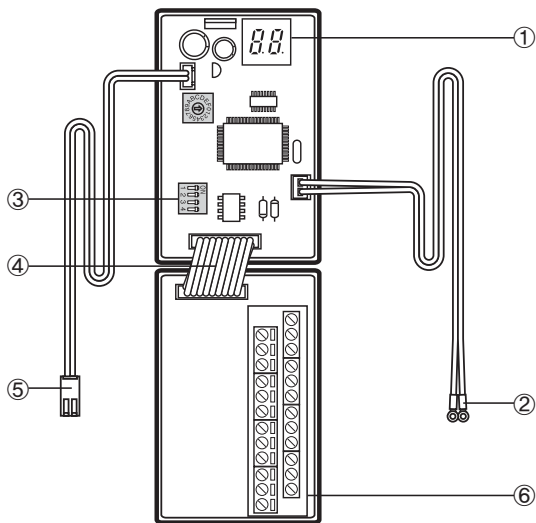
Interlock DVM air-conditioner with external controller

Key-tag interface module is mainly used for accommodation facilities to control indoor units by using the contact of a card-key holder.

- Indoor unit On/Off control by the external contact (Usable equipment: Card-key, Timer, Sensor)
- Max.16 indoor units can be controlled.



2) Description of parts

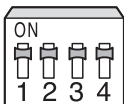


No.	Name	Description
①	Communication checking 7-Segment	Display indoor units' Main addresses when Key-tag I/M communicates with outdoor unit normally.
②	Communication connector (Key-tag I/M ↔Outdoor unit)	Connect to outdoor unit (Indoor unit) F1/F2.
③	Option switch	Indoor unit operation patterns can be set.
④	Interface cable	Connect the key-tag I/M main board and External contact terminal board.
⑤	Power connector	DC12V power input connector. (Connect to outdoor unit PCB)
⑥	External contact terminal board	Terminal board for external contact connection. Max 16 contacts can be connected.

3) Additional functions

Option switch setting

SW1 SW2 SW3 SW4



These can set indoor unit operation patterns when the external contact is input.

DIP SW	State	Note	Description
K1	ON	K3 = ON	When the I/M contact is Close, indoor unit turns OFF (When the contact is Close, remote controller can't be used).
	OFF		When the I/M contact is Open, indoor unit remains in the OFF state (When the contact is Open, remote controller can be used).
	ON	K3 = OFF	When the I/M contact is Close, indoor unit turns ON. When the I/M contact is Close, indoor unit turns OFF. (Remote controller can be used.)
	OFF		When the I/M contact is Close, indoor unit turns OFF. When the I/M contact is Open, indoor unit turns ON. (Remote controller can be used.)
K2	ON		When outdoor unit uses key-tag I/M only(DVM, DVM PLUS, DVM PLUS II, FJM, mini DVM).
	OFF		When outdoor unit uses key-tag I/M and centralized controller together (Only for DVM HR/PLUS II HR).
K3	ON		The external contact turns indoor unit OFF only.
	OFF		The external contact turns indoor unit ON and OFF.
K4	ON		After power reset, ignore initial I/M contact state. And start to control indoor unit by next contact state.
	OFF		After power reset, start to control indoor unit by initial I/M contact state. Available for Indoor unit which doesn't support Auto restart. ▪ When indoor unit turns ON by initial contact state, Indoor unit runs Auto mode. Setting temperature 24, Auto fan speed.

※ When K3 =ON, K4 doesn't work

※ Remote controller: Wired/Wireless remote controller

V External contact control system

1. Key-tag interface module

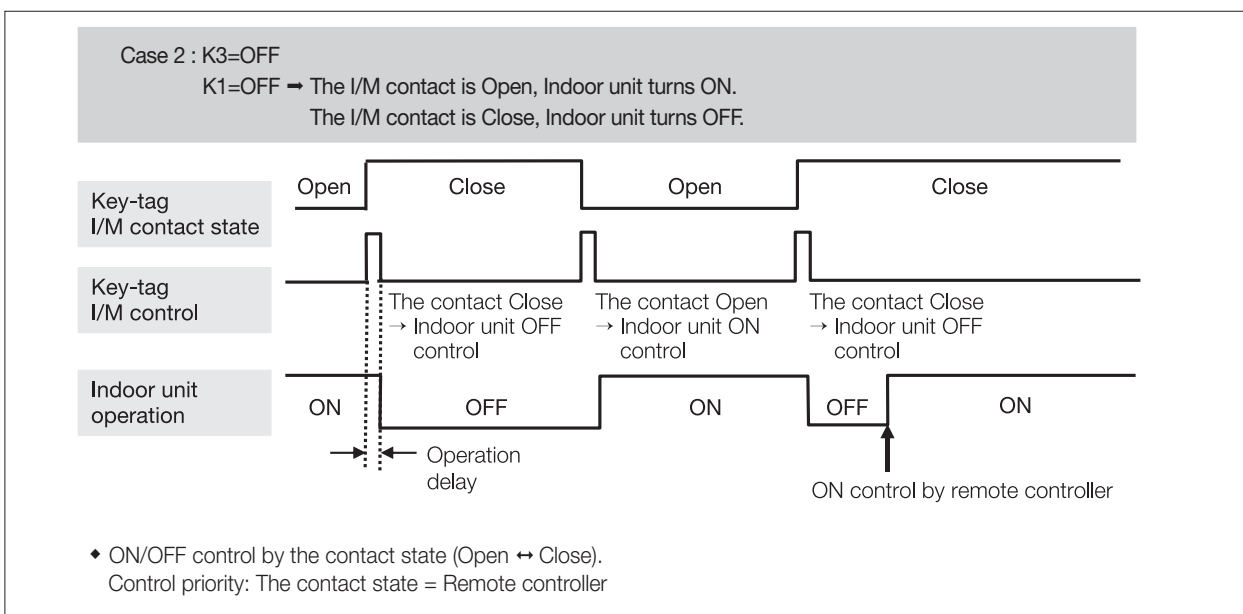
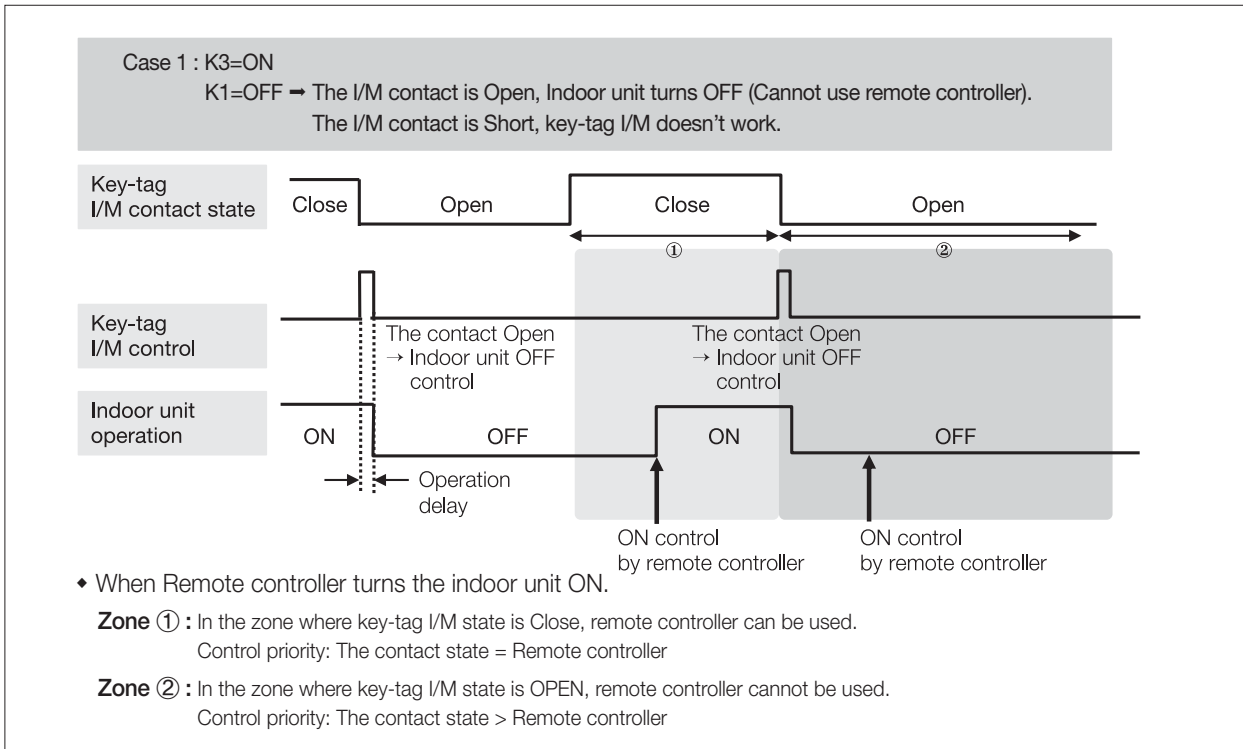
□ MIM-B02

3) Additional functions

Control timing example

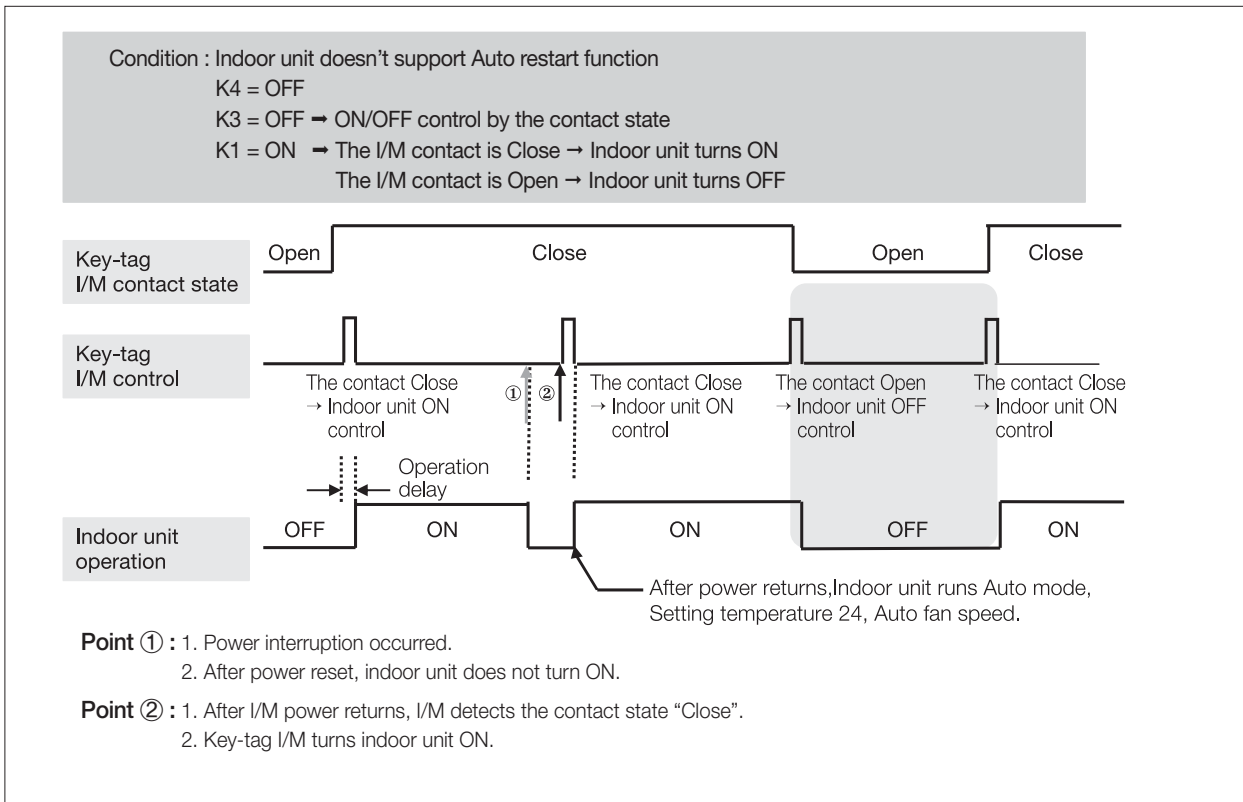
(1) Option switch K3

- ON : The external contact control indoor unit OFF only.
- OFF : The external contact control indoor unit ON and OFF.



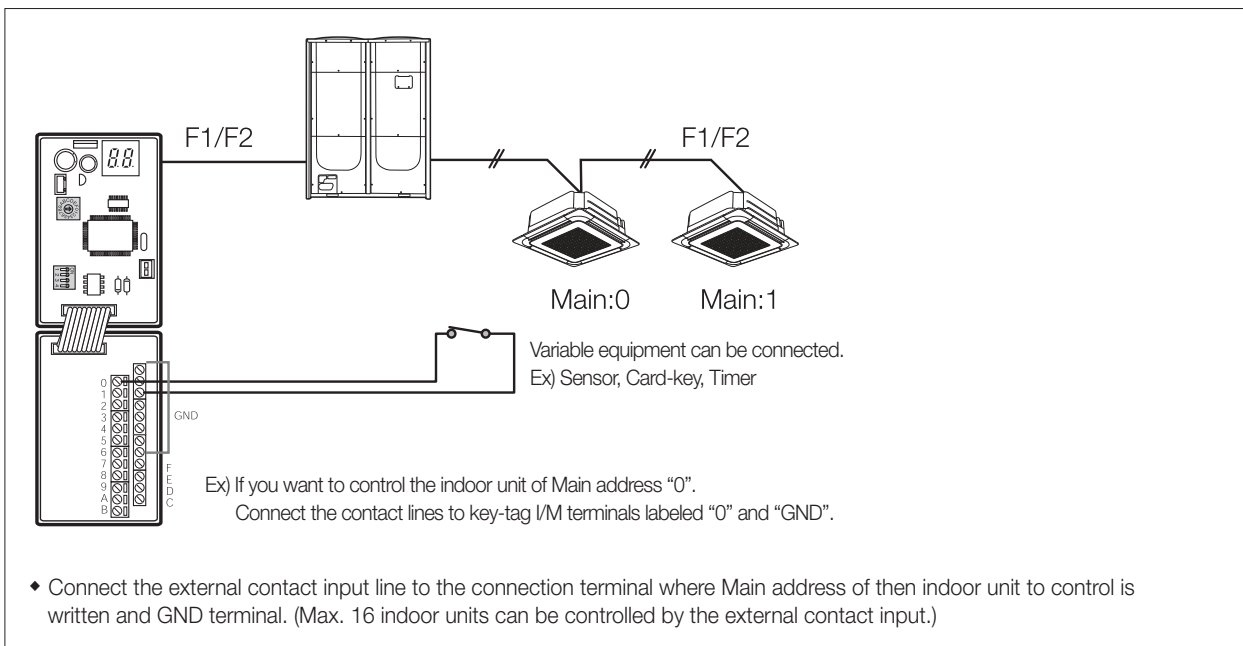
(2) Option switch K4

- ON : After power reset, ignore initial I/M contact state. And start to control indoor unit by next contact state.
- OFF : After power reset, start to control indoor unit by initial I/M contact state.



4) Installation

External contact line wiring



☑ Note

- ◆ External operation input load: 5V DC/5mA
- ◆ The length of wiring between key-tag I/M and external control equipment is 100m max.





V External contact control system

1. Key-tag interface module

MIM-B02

4) Installation

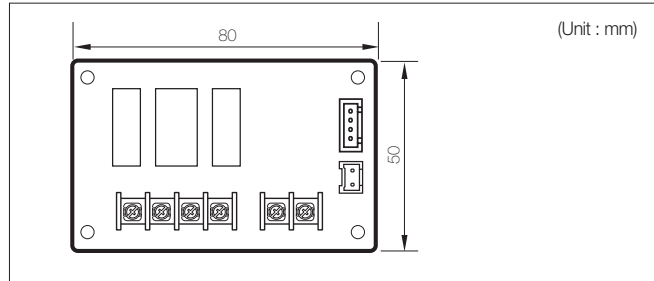
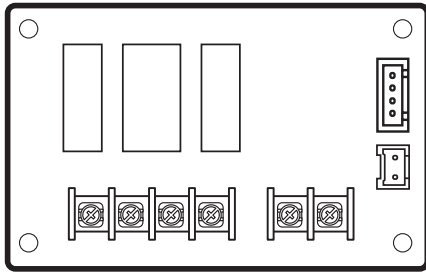
Operation display

Note	Description
Power input and during tracking	 During tracking, display "00".
Normal communication between outdoor unit and key-tag I/M	 Display indoor units' Main addresses alternatively at the left segment. ex) When I/M communicates with indoor unit of Main address "5".
Outdoor unit and key-tag I/M communication failure	 ↔  Display alternating Er ↔ E1.

2. External contact interface module

□ MIM-B14

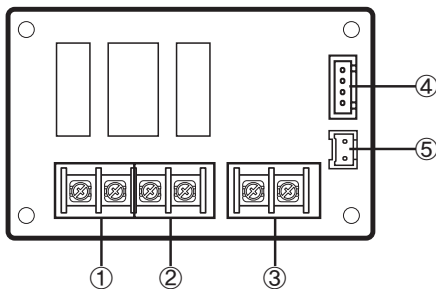
1) Features



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

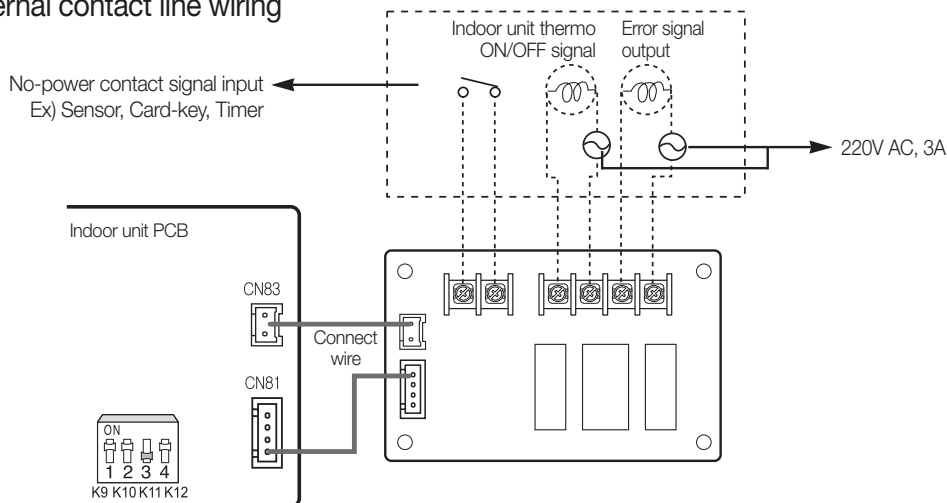
2) Description of parts



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 K12 switch setting on Indoor unit PCB)	220V AC, 3A	[Indoor PCB] [Output signal] K12↑ Thermo On/Off K12↓ 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 control by external signal, K11 switch of indoor unit's PCB must be set to "OFF".
- ◆ 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 operation status before it was turned off.

V External contact control system

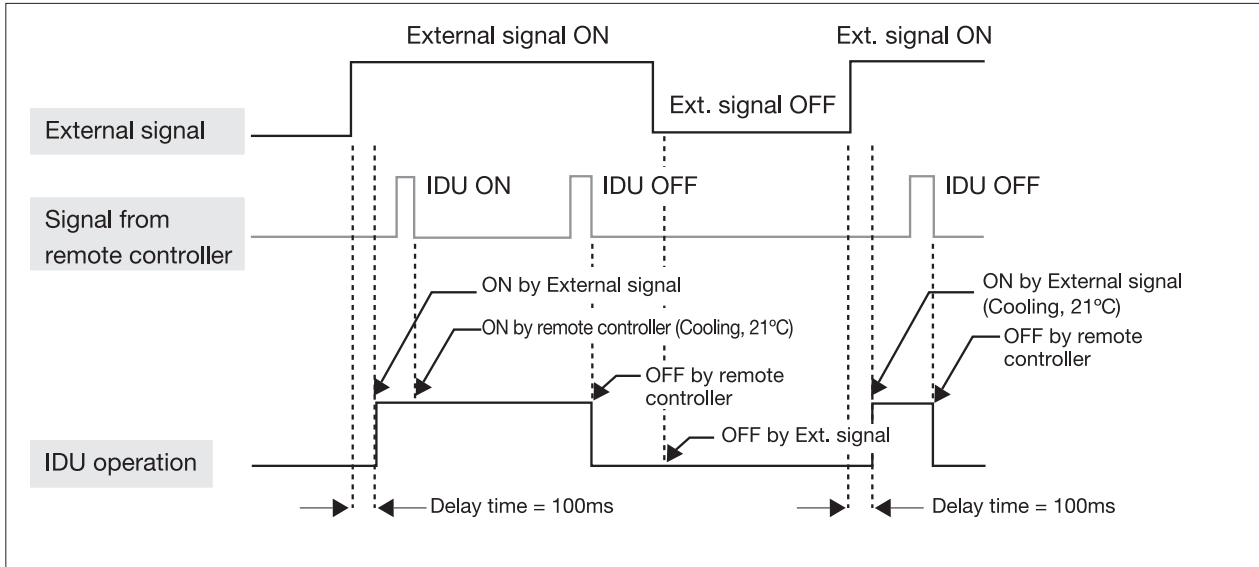
2. External contact interface module

□ MIM-B14

4) Control

Timing diagram for external contact control

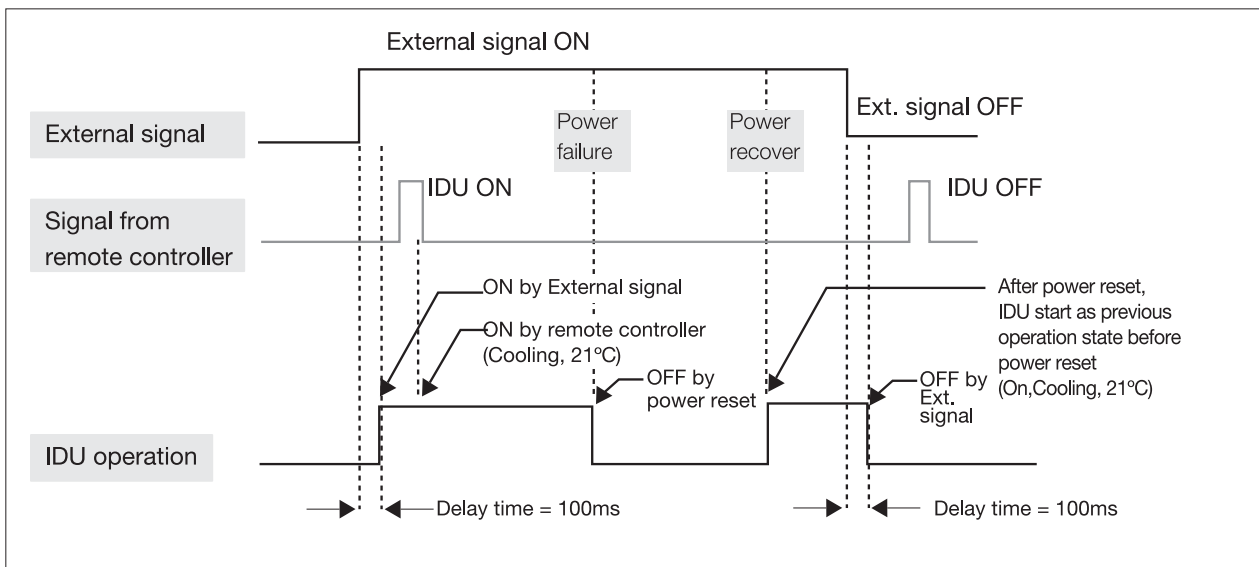
Ex1)



☑ Note

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

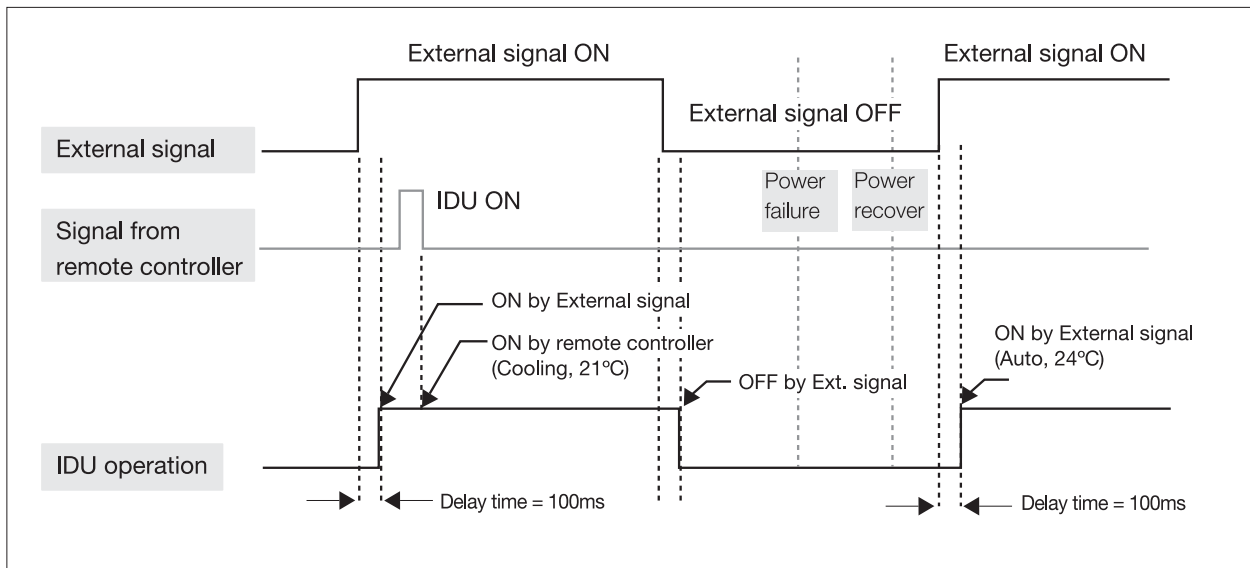
Ex2)



☑ Note

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

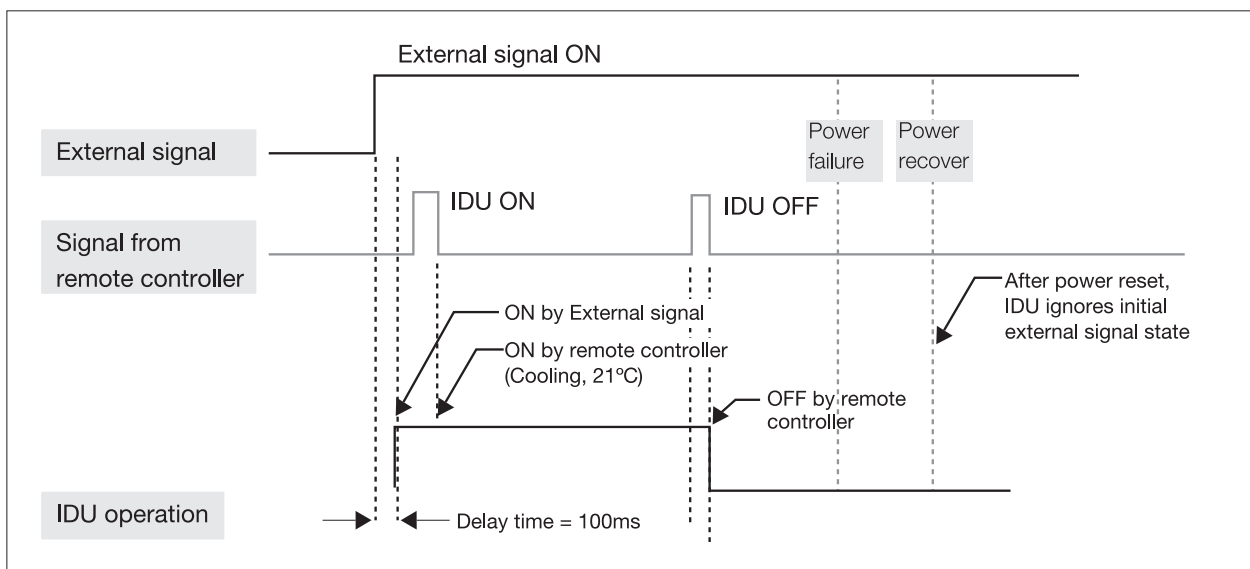
Ex3)



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.

V External contact control system

2. External contact interface module

□ MIM-B14

4) Control

► 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 1. General (Controls On/Off)	Method 2. Turn Off	Remote controller	
				Method 1	Method 2
Indoor unit status by external contact		Short → Indoor unit On	Short → Standby	Available	Available
		Open → Indoor unit Off	Open → Indoor unit Off	Available	Unavailable
Applied model	DVM Plus II	General setting	1. MICOM upgrade to DVM Plus III 2. Change option code (SEG 6+8)		
	DVM Plus III, IV	General setting	1. Change option code (SEG 6+8)		

► Operation output

	DVM Plus III (before 2009.03)	DVM Plus III (after 2009.03), DVM Plus IV
Output signal	Thermo On/Off	[Indoor PCB] K12↑ K12↓ [Output signal] Thermo On/Off Operation On/Off
Output signal delay time	In cooling : Max. 20 sec In heating : Max.120 sec	None
Error signal	<ul style="list-style-type: none"> ▪ Open circuit signal : Error occurred ▪ Short circuit signal : Nomal status 	

- Above specification does not apply to Wall-mounted type indoor units.
- Thermo off : Status where refrigerant is not flowing in either cooling/heating operation because desired temperature has been reached.

VI. Building management system

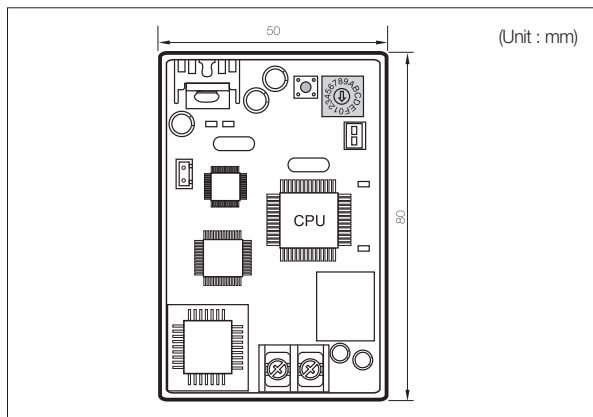
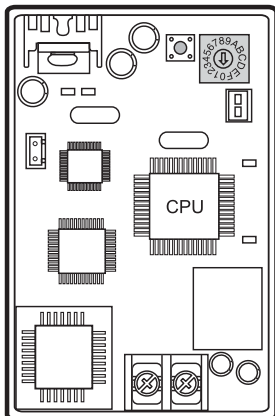
- 1 LonWork interface module 176
- 2 LonWork Gateway 180
- 3 BACnet Gateway 193

VI Building management system

1. LonWork interface module

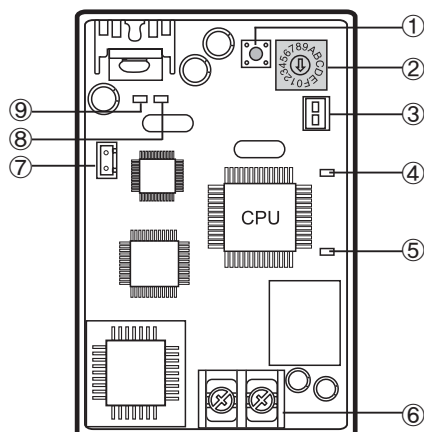
□ MIM-B07

1) Features



- LonWorks I/M is mainly used to control the air-conditioning system with the open protocol for easy interface to known third-party companies.

2) Description of parts



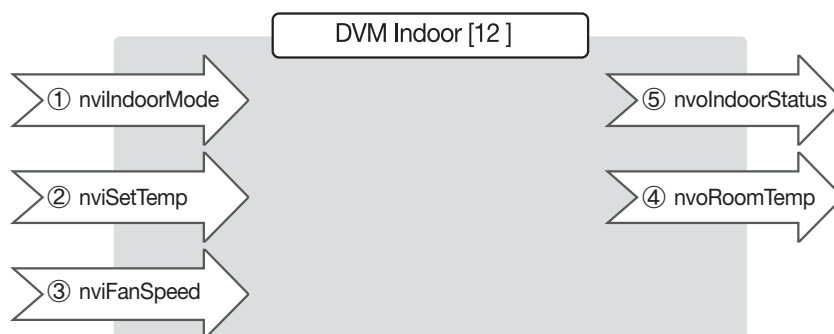
No.	Name	Description												
①	Service button	Press the button to bind with other I/Ms.												
②	Address setting switch	Set LonWorks I/M address (Range : 0~3).												
③	Connection I/M ↔ Outdoor unit / ERV	Connect to outdoor unit / ERV / Indoor unit F1/F2.												
④	Service LED	<table border="1"> <thead> <tr> <th>Operation</th> <th>State</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>Normal</td> <td>-</td> </tr> <tr> <td>Flickering</td> <td>Unconfigured</td> <td>Connecting(Re-Commission) is needed.</td> </tr> <tr> <td>ON</td> <td>No application</td> <td>Software download is needed.</td> </tr> </tbody> </table>	Operation	State	Description	OFF	Normal	-	Flickering	Unconfigured	Connecting(Re-Commission) is needed.	ON	No application	Software download is needed.
		Operation	State	Description										
		OFF	Normal	-										
		Flickering	Unconfigured	Connecting(Re-Commission) is needed.										
ON	No application	Software download is needed.												
⑤	Communication LED 1	LED flickers when I/M receives commends from LonWorks network (0.2s)												
⑥	Communication I/M ↔ LonWorks MMI (FTT-10A communication)	Connect to LonWorks MMI (Use twisted pair communication line). Non-polarity.												
⑦	Power connector	DC12V power input connector (Connect to outdoor unit / ERV PCB).												
⑧	Communication LED 2 (RS-485, Receive)	Flickering when I/M receives data from communication line F1-F2.												
⑨	Communication LED 3 (RS-485, Send)	Flickering when I/M sends data to outdoor/indoor units.												

3) Function

Control and monitoring

	Function	Description
Control	On/Off	Operation on/off
	Set operation mode	<ul style="list-style-type: none"> Indoor unit : Auto/Cool/Heat/Fan ERV: Heat exchange/Auto/By-pass/Sleep
	Set temperature (only of indoor unit)	<ul style="list-style-type: none"> Cooling mode: 18~30°C Heating mode: 16~30°C
	Set fan speed	<ul style="list-style-type: none"> Indoor unit : Auto/Low/Middle/High ERV: Low/High
Monitoring	On/Off	Operation on/off state
	Operation mode	Operation mode state
	Room temperature (Only for indoor unit)	Current room temperature
	Error	Error occurrence status, Error code

SNVT configuration



No.	NV name	Index	NV type	Description
①	nviIndoorMode [12]	2-13	SNVT_hvac_mode	On/Off status and operation mode setting
②	nviSetTemp [12]	14~25	SNVT_temp_f	Temperature setting
③	Temperature setting	26~37	SNVT_switch	Fan speed setting
④	nvoRoomTempm [12]	38~49	SNVT_temp_f	Current room temperature monitoring
⑤	nvoIndoorStatus [12]	50~61	SNVT_hvac_status	On/Off, Mode, Error monitoring

(1) nviIndoorMode

SNVT_hvac_mode	Operation	DVM operation mode	ERV operation mode
HVAC_OFF	OFF	Last operation mode	Last operation mode
HVAC_AUTO	ON	Auto mode	Auto ventilation mode
HVAC_COOL	ON	Cooling mode	Heat exchange mode
HVAC_HEAT	ON	Heating mode	Normal ventilation mode
HVAC_FAN_ONLY	ON	Fan mode	Sleep mode

(2) Setting temperature range : Cooling mode 18 ~ 30°C, Heating mode 16 ~ 30°C

VI Building management system

1. LonWork interface module

MIM-B07

3) Function

SNVT configuration

(3) nviFanSpeed

State	Value	Operation	ERV fan speed
Any (0 or 1)	0.0(default)	Auto	-
	0.5	Low	-
	1.0	Middle	Low
	1.5	High	High

(4) nvolIndoorStatus

Field	Type	Description
mode	hvac_t	On/Off, control mode
heat_output_primary	signed long	Indoor unit MAIN address
heat_output_secondary	signed long	Not used
cool_output	signed long	Not used
econ_output	signed long	Not used
fan_output	signed long	Error code
in_alarm	unsigned short	Error (1: Error, 0: No error)

- Indoor unit MAIN address : $\text{heat_output_primary} \times 1000 / 5$
- Error code : $\text{fan_output} \times 1000 / 5$

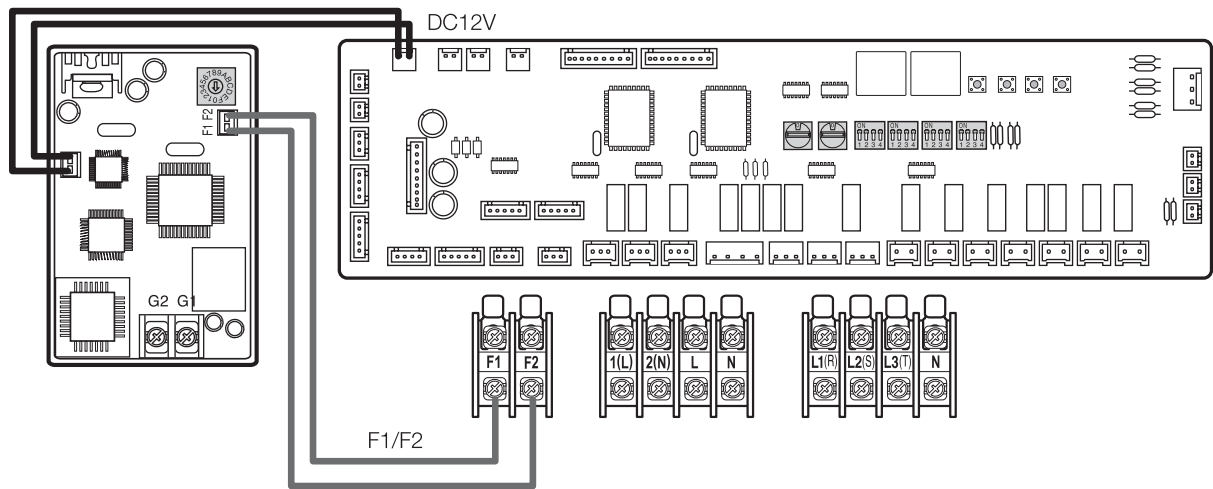
4) Installation

Specification

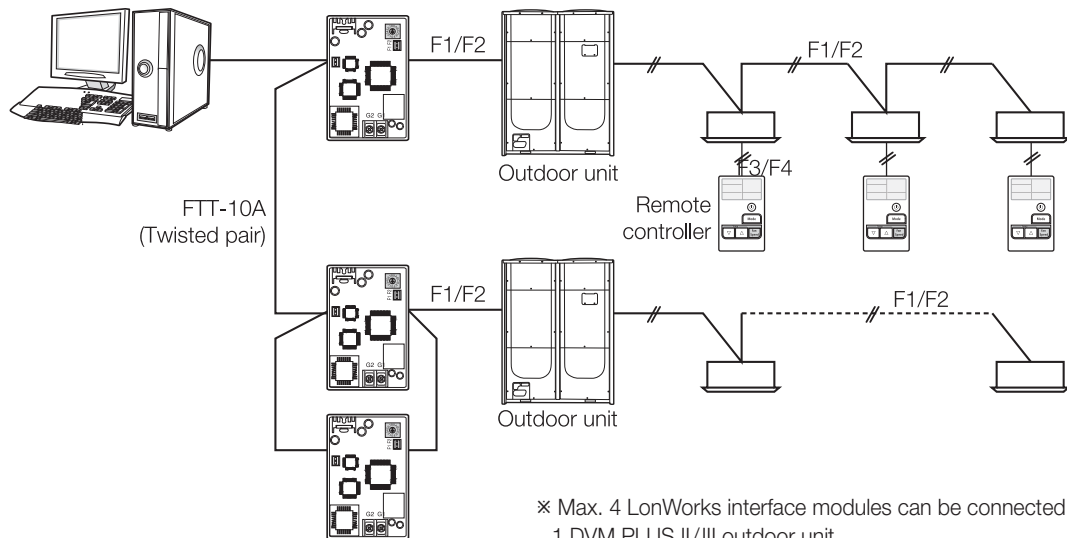
- CPU : Neuron 3150 Smart Transceiver
- Communication : RS485 to FTT-10A
- Transmission speed : FTT-10A 78Kbps
- Wiring : Free topology (Non-polarity)
- Supports SNVT for BMS interface
- Supports auto-binding mode
- Power supply : DC 12V
- Max. 4 LonWorks interface modules can be connected to 1 outdoor unit.
(12 indoor units per 1 LonWorks interface module)
- 12 ERVs per 1 LonWorks interface module. (1 ERV must be set as master)
- 1 LonWorks interface module cannot connect indoor unit and ERV together.

Wiring

- ▶ Connection between LonWorks interface module and outdoor unit. (example : DVM PLUS II)



- ▶ Connection between LonWorks interface module and LonWork MMI



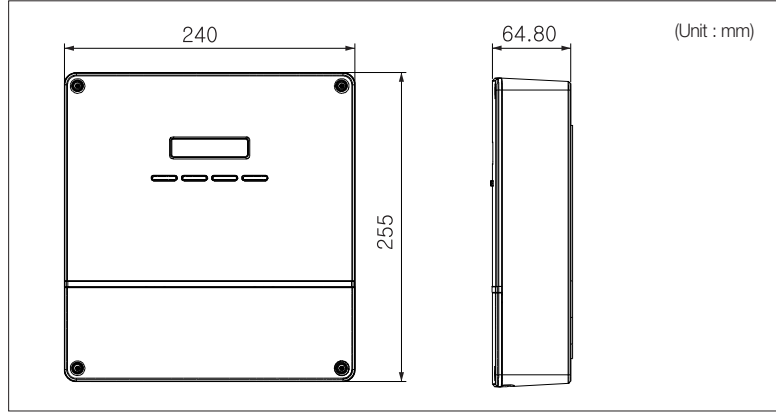
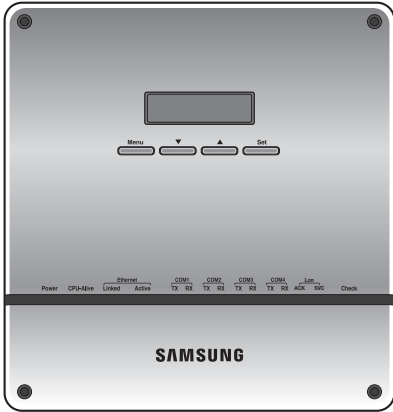
LonWorks I/M	Indoor unit Main address	Remarks
0	0~11	<ul style="list-style-type: none"> ▪ 1 LonWorks I/M can manage 12 indoor units. ▪ LonWorks I/M address must be set from 0. (Default setting address is 0.) ▪ Up to 2 LonWorks I/Ms can be connected to one outdoor unit module. ▪ It is impossible to connect with DVM I/M. (ex. MIM-B04A, MIM-B13A)
1	12~23	
2	24~25	
3	36~47	

VI Building management system

2. LonWork Gateway

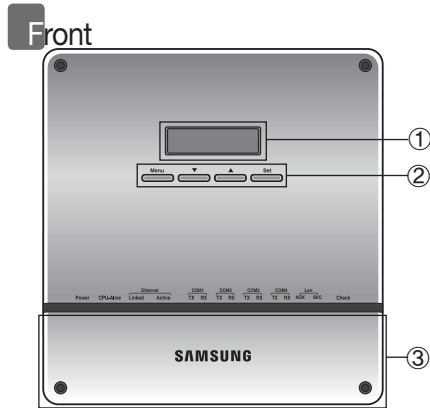
□ MIM-B18

1) Features



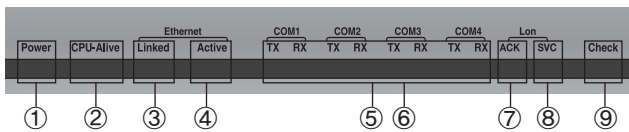
- For LonWork protocol system.
- Support DMS2 control function at the same time.

2) Description of parts



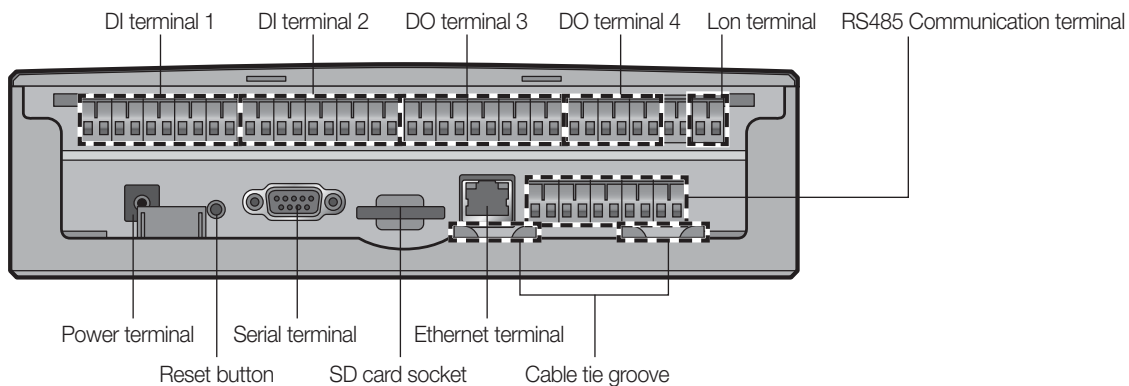
No	Name	Function
①	LCD display	Displays current time or menu.
②	Menu button	Access the setting menu.
	▲/▼ button	Select function or setting item in the setting menu.
	Set button	Enter or check setting item in the setting menu.
③	Bottom cover	Unscrew 2 screws on the bottom to remove the cover and check 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 Centralized controller/Interface module Data transmission indicator	Blinks in green during normal transmission.
⑥	Com1~4-RX	Channel 1~4 Centralized 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.

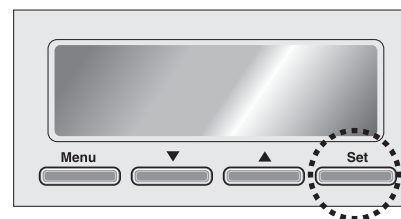
Bottom



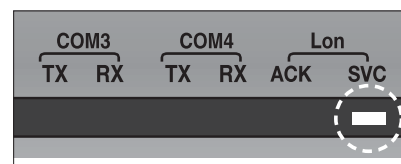
Name	Description
DI terminal 1	Digital Input connection terminal, Channel1~Channel5
DI terminal 2	Digital Input connection terminal, Channel6~Channel10
DO terminal 3	Digital Output connection terminal, Channel1~Channel5
DO terminal 4	Digital Output connection terminal, Channel6~Channel8
Lon terminal	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 centralized controller / interface module
Ethernet Terminal	Connect LAN cable
Cable tie groove	Groove for arranging cables

3) Commission

- For Commission operation with BMS, press the [Set] button for more than 3 seconds.
- Pressed time will be displayed in the LCD display



- When commission operation is normal, [SVC] LED of the front panel will lit up.



4) 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

VI Building management system

2. LonWork Gateway

MIM-B18

5) Specification

Item	MIM-B07	MIM-B18
Max. number of indoor units	12	128
Connection type	Interface module	Centralized control
Number of objects	11	24 (15)
Number of NV	62	4096
Application type	Neuron-based	Host-based FTXL
Interface	TP/FT-10	TP/FT-10
Control/monitoring indoor unit	O	O
Control/monitoring ERV	X	O
Additional functions	X	Emergency stop, DI/DO support
Other features	-	Connection with upper level interface module/ Centralized controller

6) Hardware specification

ITEM	Description
Transmission	LonWorks: FT-10 (Free Topology) 78Kbps
Rated power supply	DC 12V 3A adaptor (100~240V 50/60Hz 1.0A)
Operable temperature range	-10 ~ 50°C
Storage temperature range	-20 ~ 60°C
Installation	Enclosed in electrical panel
Interface	RS-485 5 Channel
	Ethernet 10/100Mbps
	DI/DO 12V Digital 10 Channels
Display	16 char. X 2 Line character LCD
External memory	SD card (option, separate purchase)
Dimensions (WxHxD)	240x225x64.8 mm
Weight	1.48kg
Others	Serial port, reset button

7) 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
	Additional functions	Power consumption
		Operation time
		Emergency stop
		DMS2 DI/DO
		DMS2 lock
		DMS2 error information
System error information		

8) 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	nvoEnergyComp	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) Outdoor unit/ System object

No.	Name	Type	M/O	Description
1	nviDigitalOut[6]	SNVT_switch	O	Set Digital output
2	nviAllOff	SNVT_hvac_emerg	O	Set emergency stop
3	nvoDigitalOut[6]	SNVT_switch	O	Display Digital output status
4	nvoDigitalIn[8]	SNVT_switch	O	Display Digital input status
5	nvoSystemLock	SNVT_switch	O	Display System Lock status
6	nvoDMS2Alarm	SNVT_count	O	Display communication error
7	nvoSystemAlarm	SNVT_count	O	Display error satus

(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

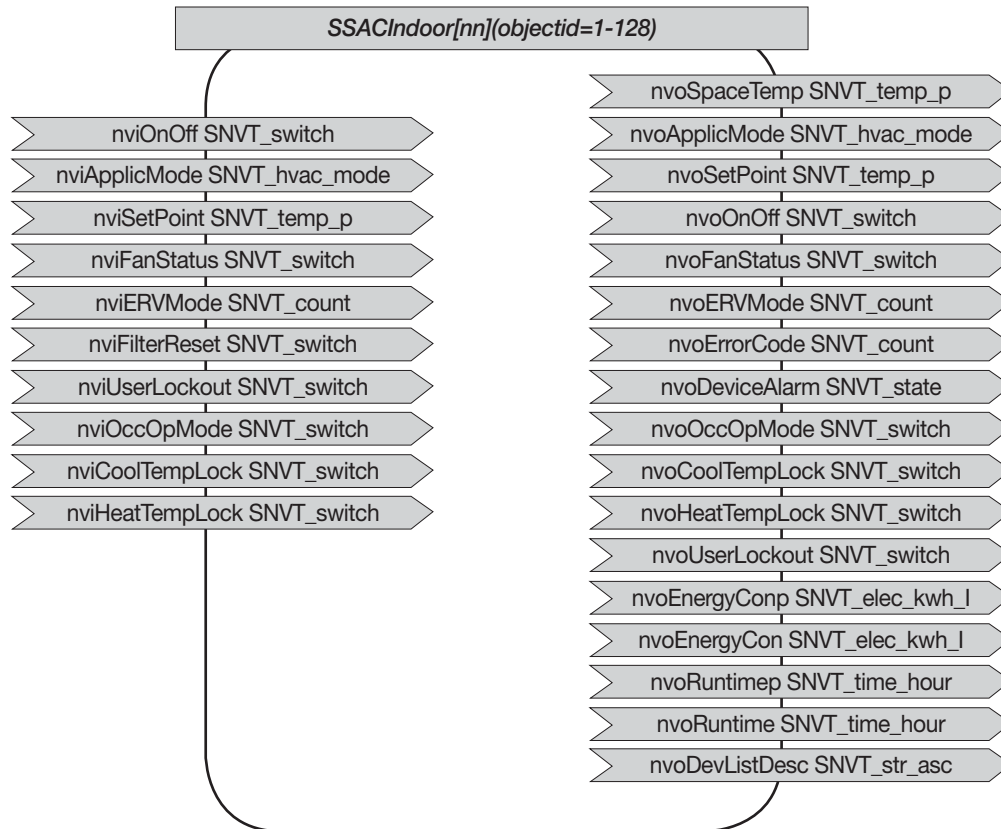
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2. LonWork Gateway

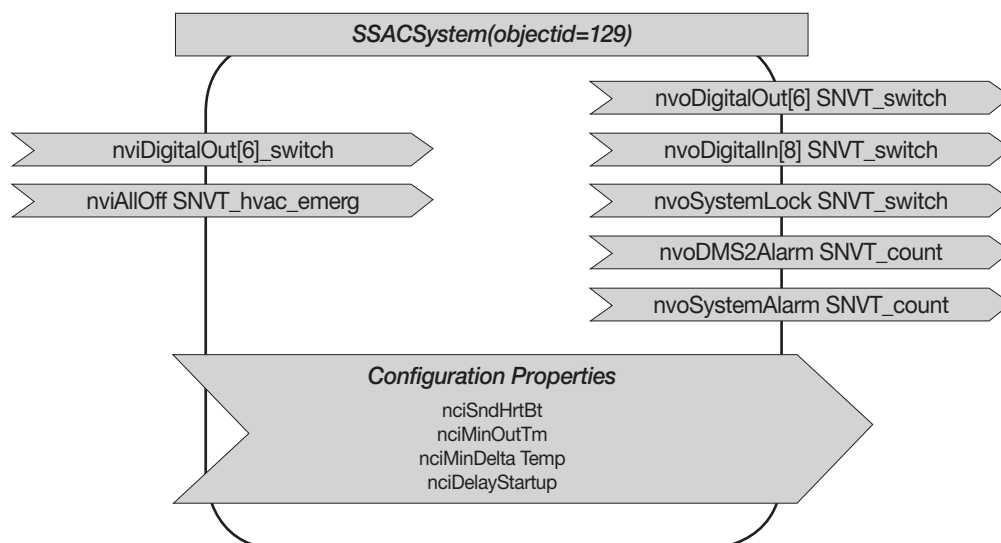
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9) Network parameter chart

(1) Indoor unit/ ERV/ AHU kit object



(2) Outdoor unit/ System object



10) Network variable list for Indoor unit/ ERV/ AHU kit

- 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	nvoEnergyComp	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

11) Detail description of network variable

(1) Indoor unit/ ERV/ AHU kit object

1-1. nviOnOff

- Description : Indoor unit ON/OFF
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
0.0	0	Off	-
100.0	1	On	-

1-3. nviSetpoint

- Description : Set temperature
- SNVT : SNVT_temp_p
- Operation

Auto/Cool/Dry	18 ~ 30°C
Heat	16 ~ 30°C

1-2. nviApplicMode

- Description : Indoor unit operation mode
- SNVT : SNVT_hvac_mode
- Operation

Hvac_t	Operation	Remark
1	Heat	-
3	Cool	-
6	Off	-
9	Fan	-
14	Dry(dehumid)	-
0	Auto	-

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11) Detail description of network variable

(1) Indoor unit/ ERV/ AHU kit object

1-4. nviFanStatus

- Description : Setting fan swing and speed
- SNVT : SNVT_switch
- Operation

	Value	State
Auto	0	-
Low	1	-
Mid	2	-
High	3	-
Eco	4	-
Turbo	5	-
Auto	Any > 5	-
Stop	-	0
Up-Down	-	0
Left-Right	-	1
Up-Down-Left-Right	-	1

1-5. nviERVMode

- Description : ERV mode
- SNVT : SNVT_count
- Operation

Value	Operation	Remark
0	Auto	Auto ventilation mode
1	H/R	Heat exchange ventilation mode
2	Air purification	Air purification mode
3	Sleep	Sleep mode
4	-	By-pass mode

1-6. nviFilterReset

- Description : Filter reset command
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
0.0	0	No Alarm	-
100.0	1	Alarm	-

1-7. nviUserLockout

- Description : Setting the restriction of remote control use
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
0.0	0	Unlock	-
100.0	1	Level 1	-
100.0	2	Lock	-

1-8. nviOccOpMode

- Description : Setting cooling only mode/ heating only mode
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
0.0	0	Unlock	-
100.0	1	Cooling only	-
100.0	2	Heating only	-

1-9. nviCoolTempLock

- Description : Setting the low temperature limit
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
Any	0	Unlock	-
18~30	1	Lock	-

1-10. nviHeatTempLock

- Description : Setting the high temperature limit
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
Any	0	Unlock	-
16~30	1	Lock	-

2-1. nvoSpaceTemp

- Description : Display indoor temperature
- SNVT : SNVT_temp_p
- Operation : -10°C ~ 50°C

2-2. nvoApplicMode

- Description : Display operating mode
- SNVT : SNVT_hvac_mode
- Operation

Hvac_t	Operation	Remark
1	Heat	-
3	Cool	-
9	Fan	-
14	Dry(dehumid)	-
0	Auto	Review needed (VOC on deleting Auto mode)

2-3. nvoSetpoint

- Description : Display desire temperature
- SNVT : SNVT_temp_p
- Operation

Auto/Cool/Dry	18 ~ 30°C
Heat	16 ~ 30°C

2-4. nvoOnOff

- Description : Display ON/OFF status
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
0.0	0	Off	-
100.0	1	On	-

2-5. nvoFanStatus

- Description : Display fan speed
- SNVT : SNVT_switch
- Operation

	Value	State
Auto	0	-
Low	1	-
Mid	2	-
High	3	-
Eco	4	-
Turbo	5	-
Auto	Any > 5	-
Stop	-	0
Up-Down	-	0
Left-Right	-	1
Up-Down-Left-Right	-	1

2-6. nvoERVMode

- Description : ERV Display ERV operating mode
- SNVT : SNVT_count
- Operation

Value	Operation	Remark
0	Auto	Auto ventilation mode
1	H/R	Heat exchange ventilation mode
2	Air purification	Air purification mode
3	Sleep	Sleep mode
4	-	By-pass mode

2-7. nvoErrorCode

- Description : Display Error code
- SNVT : SNVT_count
- Operation : Error code refers to integrated error code of system air conditioner

2-8. nvoDeviceAlarm

- Description : Filter Sign, Thermo ON/OFF, Error occurrence status display
- SNVT : SNVT_state
- Operation

Byte	Bit1	Bit0	Operation	Remark
Flag_1	0	0	Unlock	nviUser Lockout
	0	1	Level1	
	1	0	Lock	

Byte	Bit1	Bit0	Operation	Remark
Flag_2	2	0	No alarm	Filter alert
	2	1	Alarm	
	1	0	Thermo On	Thermo On/ Off
	1	1	Thermo Off	
	0	0	No Error	nvoError Code
	0	1	Error	

2-9. nvoOccOpMode

- Description : Cooling only/Heating only setup status display
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
0.0	0	Permit	-
100.0	1	Cooling only	-
100.0	2	Heating only	-

2-10. nvoCoolTempLock

- Description : Low temperature limit setting status display
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
Any	0	Unlock	-
18~30	1	Lock	-

2-11. nvoHeatTempLock

- Description : High temperature limit setting status display
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
Any	0	Unlock	-
16~30	1	Lock	-

2-12. nvoUserLockout

- Description : Lock status
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
0	0	Unlock	-
1	1	Level 1	-
2	1	Level 2	-

2-13. nvoEnergyComp

- Description : Display electricity usage (Time Period)
- SNVT : SNVT_elec_kwh_I
- Operation

Value	Operation	Remark
0...99999.9	Electricity usage	First decimal place

2-14. nvoEnergyCon

- Description : Display electricity usage (Basic date)
- SNVT : SNVT_elec_kwh_I
- Operation

Value	Operation	Remark
0...99999.9	Electricity usage	First decimal place

2-15. nvoRuntimep

- Description : Display used hours (Period)
- SNVT : SNVT_time_hour
- Operation

Value	Operation	Remark
0...65535	Accumulated used hour	-

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11) Detail description of network variable

(1) Indoor unit/ ERV/ AHU kit object

2-16. nvoRuntime

- Description : Display used hours (Basic date)
- SNVT : SNVT_time_hour
- Operation

Value	Operation	Remark
0..65535	Accumulated used hour	First decimal place

2-17. nvoDevListDesc

- Description : Display indoor unit status
- SNVT : SNVT_str_asc
- Operation : ex) a1b2c3_00.00.01_0

		Description	Character	Value
ascii.	[0]	Model information	Alphabet or digit	-
	[1]			
	[2]			
	[3]			
	[4]			
	[5]			
	[6]	Separator	Underbar (_)	095
	[7]	Centralized controller address	Second significant digit	-
	[8]		First significant digit	
	[9]	Separator	Period (.)	046
	[10]	Interface Module address	Second significant digit	-
	[11]		First significant digit	
	[12]	Separator	Period (.)	046
	[13]	Indoor Unit Address	Second significant digit	-
	[14]		First significant digit	
	[15]	Separator	Underbar (_)	095
	[16]	Unit type	0: Indoor unit, 1: AHU, 2: ERV	-
	[17]	Separator	Underbar (_)	095
	[18]	Operation mode	0,1,2,3,4	-
	[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]	Set temperate	Second significant digit (SSD)	-
	[25]		First significant digit (FSD)	
	[26]		First decimal place (FDP)	
	[27]	Space temperate	SSD	minus sign
	[28]		FSD	SSD
	[29]		FDP	FSD
[30]	Null padding	Null (ASCII 0)		048

(2) Indoor

1-1. nviDigitalOut

- Description : DMS2 DO status control
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
0.0	0	Off	-
100.0	1	On	-

1-2. nviAllOff

- Description : All indoor units turn off
- SNVT : SNVT_hvac_emerg
- Operation

Value	Operation	Remark
0	-	-
4	ShutDown	-

1-3. nvoDigitalOut

- Description : DMS2 DO status monitoring
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
0.0	0	Off	-
100.0	1	On	-

1-4. nvoDigitalIn

- Description : DMS2 DI status monitoring
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
0.0	0	Off	-
100.0	1	On	-

1-5. nvoSystemLock

- Description : Display all indoor unit off command status
- SNVT : SNVT_switch
- Operation

Value	State	Operation	Remark
0.0	0	Unlock	-
100.0	1	Lock	-

1-6. nvoDMS2Alarm

- Description : DMS2 related error
- SNVT : SNVT_str_asc
- Operation

1-7. nvoSystemAlarm

- Description: Indoor unit related error
- SNVT: SNVT_count
- Operation

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2. LonWork Gateway

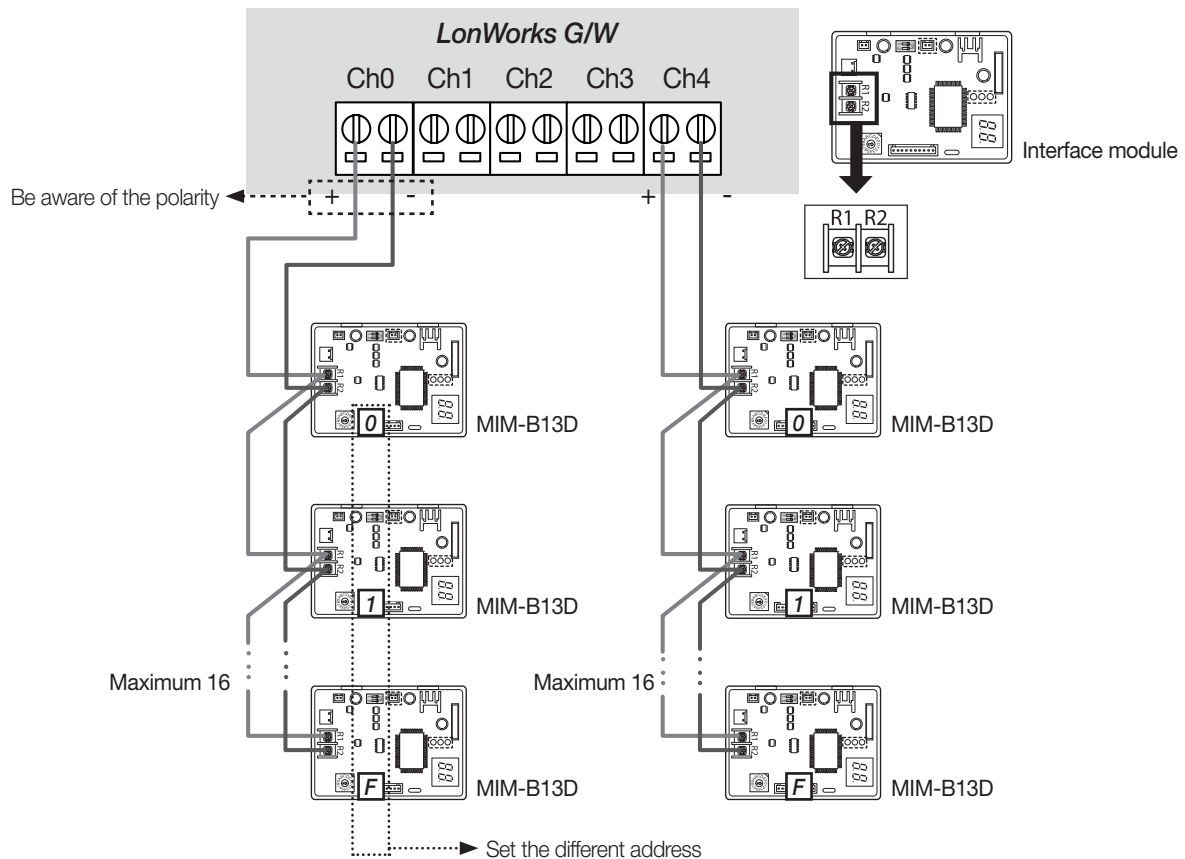
□ MIM-B18

12) Installation

(1) Connecting communication

Connecting interface module communication

- Connect R1/R2 of interface module to RS485 channel of the LonWorks G/W.
(Can connect to any channel. Just remember to keep the associated channel number)



Maximum number of interface module connection = Max. 16 x (5 channels) = 80 interface modules connection

※ Total number of indoor unit must be under 128.

※ Support connection with old version MIM-B13/B13A/B13B, MIM-B04/B04A.

► Caution 1

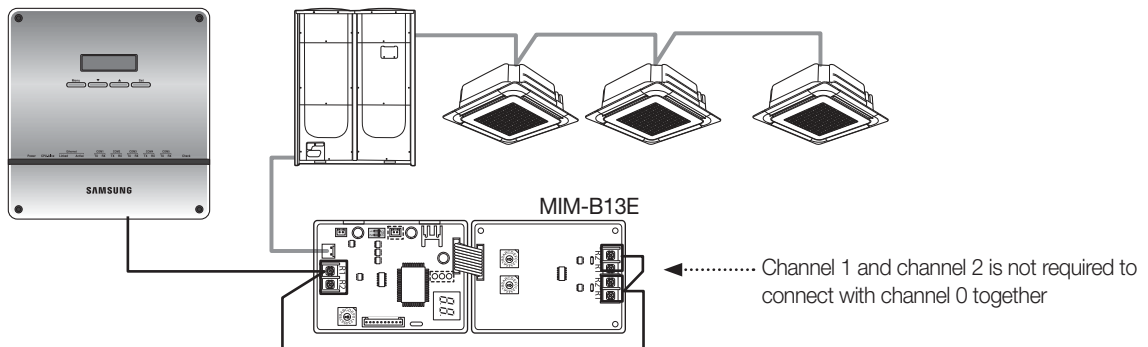
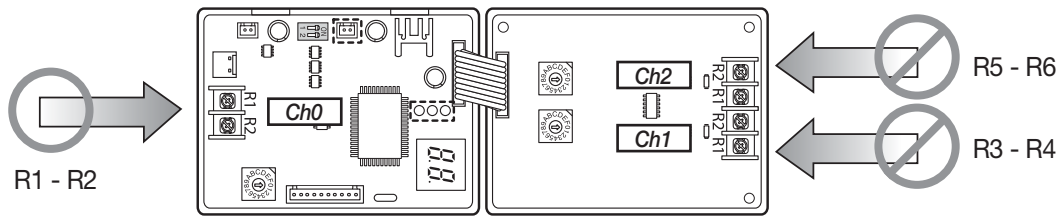
- In many interface module are connected one channel, each interface module must be set different address.

► Caution 2

- Be aware that A(+) and B(-) part of the RS485 terminal on LonWorks G/W has polarity. Make sure that the connection is not reversed.

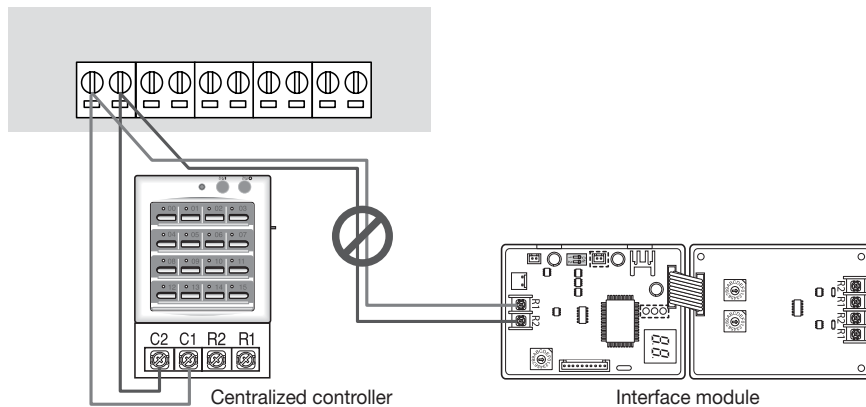
► **Caution 3**

- When you connect LonWorks G/W with MIM-B13B or MIM-B13E, LonWorks G/W must be connected to channel 0 of the interface module. (If it is connected to channel 1 or 2, tracking will fail)



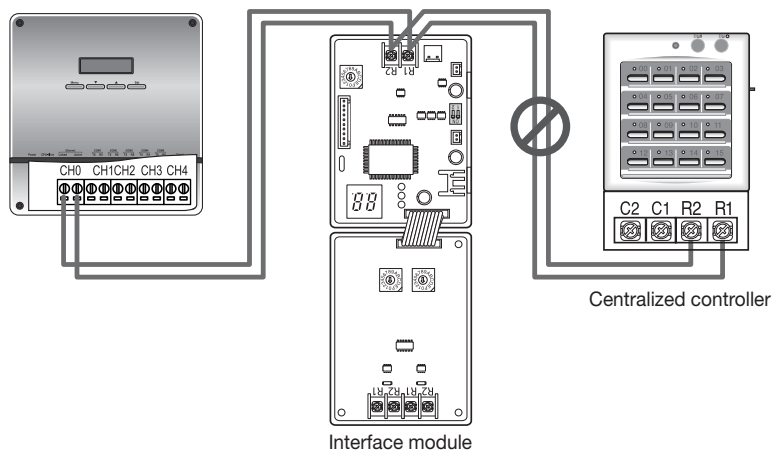
► **Caution 4**

- Do not connect interface module and centralized controller to the same RS485 communication terminal of the LonWorks G/W.



► **Caution 5**

- Centralized controller and LonWorks G/W cannot be connected to the same channel of the interface module.



► **Caution 6**

- Use ring terminal or Y terminal for the communication lines that will be connected to R1/R2 of the interface module.

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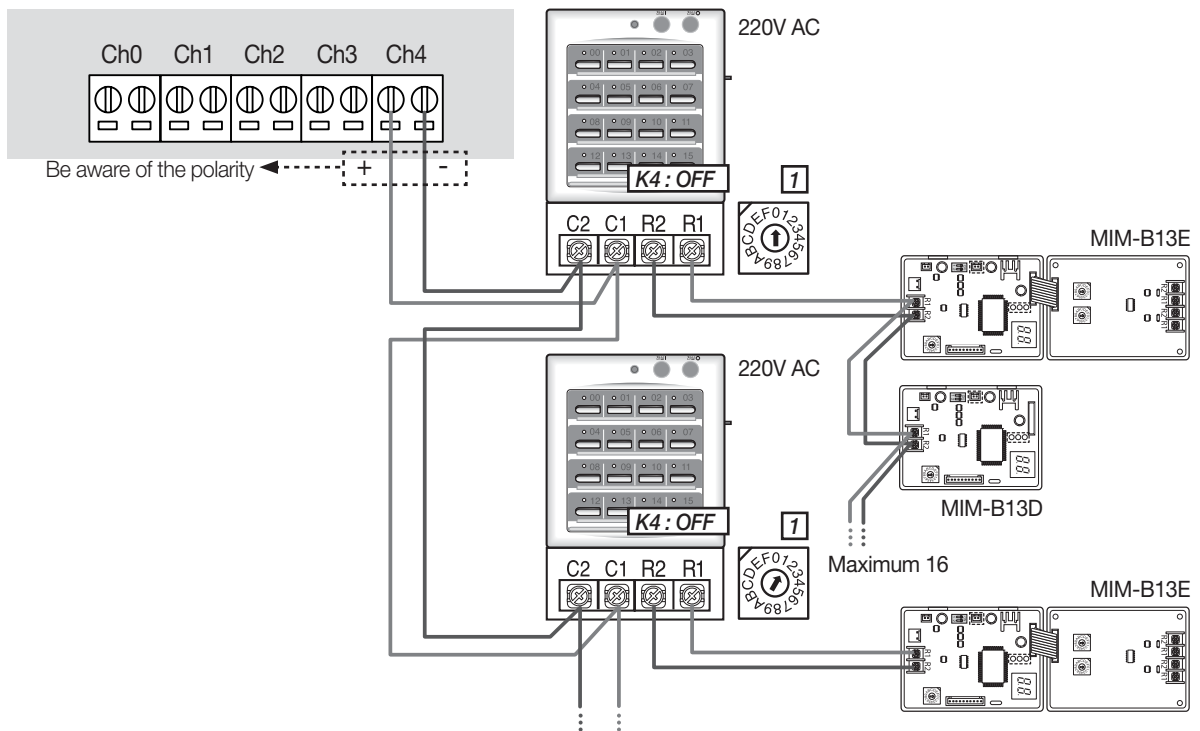
2. LonWork Gateway

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12) Installation

(1) Connecting communication

Connecting centralized controller communication



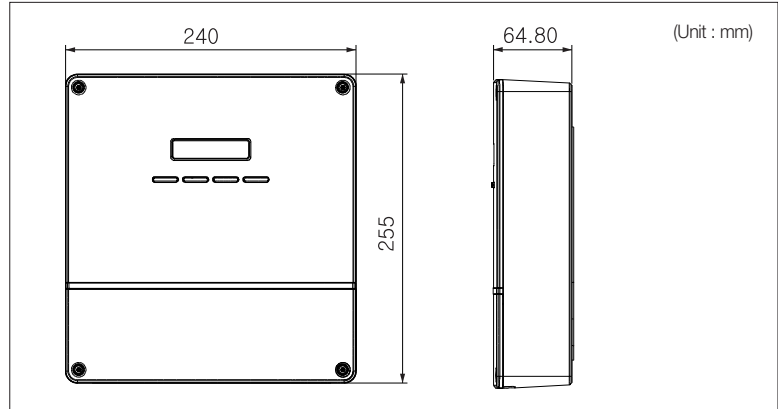
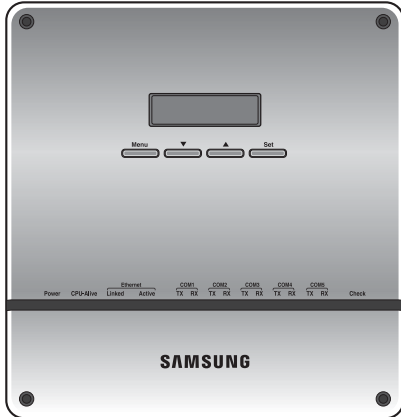
Maximum 16 centralized controllers can be connected to 5 RS485 communication terminal of the LonWorks G/W.

× Total number of indoor unit must be under 128

3. BACnet Gateway

□ MIM-B17

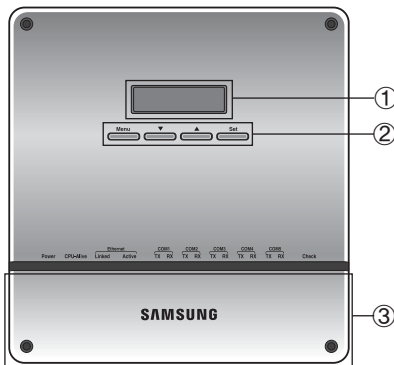
1) Features



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

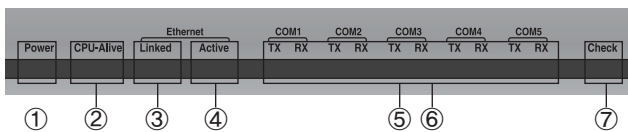
2) Description of parts

(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 Centralized controller/Interface module Data transmission indicator	Blinks in green during normal transmission
⑥	COM1~5 - RX	Channel 1~5 Centralized 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

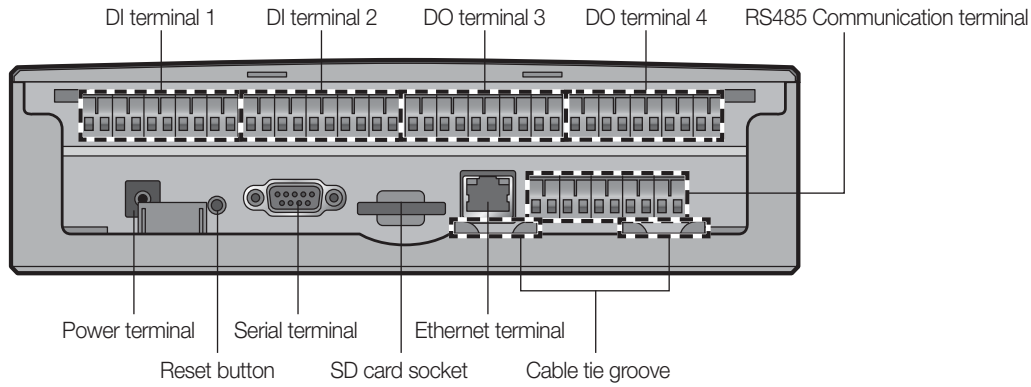
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3. BACnet Gateway

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2) 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	Service check port
SD card socket	Sub memory (for program update and set information saving) socket
RS485 communication terminal	RS485 port for communication with centralized controller / interface module
Ethernet Terminal	Connect LAN cable
Cable tie groove	Groove for arranging cables

3) Maximum number of connectable devices

WHM = Watt-hour meter

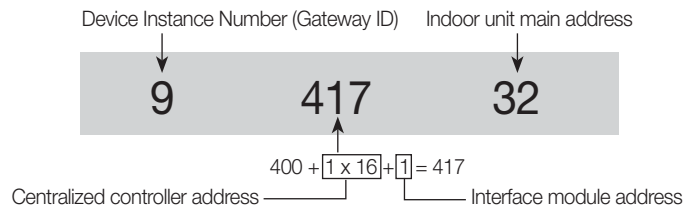
Device	Maximum number of connection	Description
Indoor units	256	Tracking error will occur when exceeds maximum number of connection
Centralized controller	16	Tracking error will occur when exceeds maximum number of connection
Interface module	<ul style="list-style-type: none"> ▪ Connecting interface module alone : 80 ▪ Connecting interface module with centralized controller : 256 	Maximum 16 devices can be connected to 1 channel. Maximum 80 devices can be connected when all channels are used.
SIM / PIM	8	Support 8 SIM or PIM device in all communication ports
WHM	64	Support 8 WHMs per each SIM or PIM device

4) Device ID

Item	DNET-Range [Digit 2]	CPP-Range [Digit 3]	INDOOR-Range [Digit 2]
Centralized controller	0~15	000~015	64
SIM / PIM	0~15	100~115	64
DMS2 DI/DO	0~15	300~315	64
Interface module	0~15	400~655 (16 x 16)	64
Indoor Unit/ERV/AHU kit	0~15	400~655	0~63
Gateway	0~15	900	64

Ex)

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



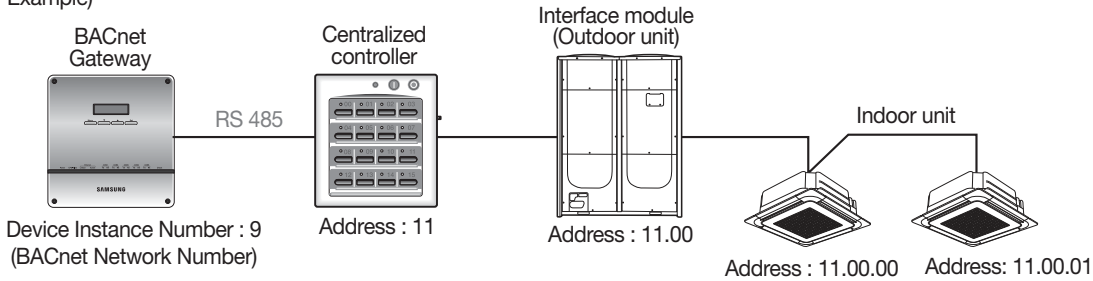
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3. BACnet Gateway

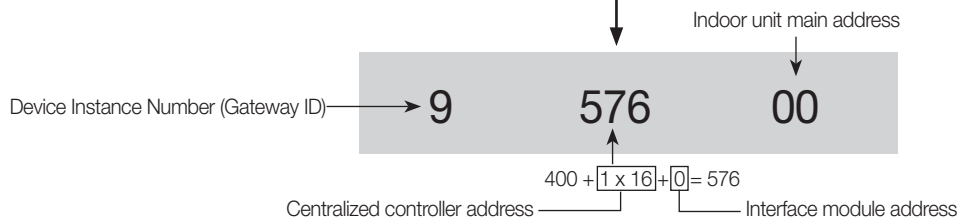
MIM-B17

5) System structure

Example)



		BACnet Gateway	Centralized Controller	Interface Module	Indoor Unit	
SAMSUNG	Address	Device Instance No.: 9	11	11.00	11.00.00	11.00.01
BACnet	Device Object Instance No.	990064	901164	957664	957600	957601
	Description	DMS2_BACnetIP [ver1.00]	Centralized Controller_[11]	Interface Module_[11.00]	Indoor Unit_[11.00.00]	Indoor Unit_[11.00.01]
	Indoor Unit_[11.00.01]	1 : ALL_OFF 2 : DMS2_Status 3 : BACnetApp_Error_code	Central_Controller_Error_Code	Repeater_Error_Code	29 Object	29 Object



6) Checking device ID from DMS2

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

Channel	Device	Address	Name	Object ID	Error
CH2	Central controller	00	CAUR-00	000000	
	Interface module	00.00			
	Indoor unit	00.00.00 (00)	00 00 00	0	
	Indoor unit	00.00.01 (01)	00 00 01	1	
	Indoor unit	00.00.02 (02)	00 00 02	2	
	Indoor unit	00.00.03 (03)	00 00 03	3	
	Indoor unit	00.00.04 (04)	00 00 04	4	
	Indoor unit	00.00.05 (05)	00 00 05	5	
	Indoor unit	00.00.06 (06)	00 00 06	6	
	Indoor unit	00.00.07 (07)	00 00 07	7	
	Indoor unit	00.00.08 (08)	00 00 08	8	
	Indoor unit	00.00.09 (09)	00 00 09	9	
	Outdoor unit	00.00.00	00 00 00		
DMS	DMS (DMS2) Setting	56	D00	999964	

Property Identifier	Value
Object_Identifier	200
Object_Name	00.02.00
Object_Type	Device
System_Status	OPERATIONAL
Firmware_Revision	1.0.0

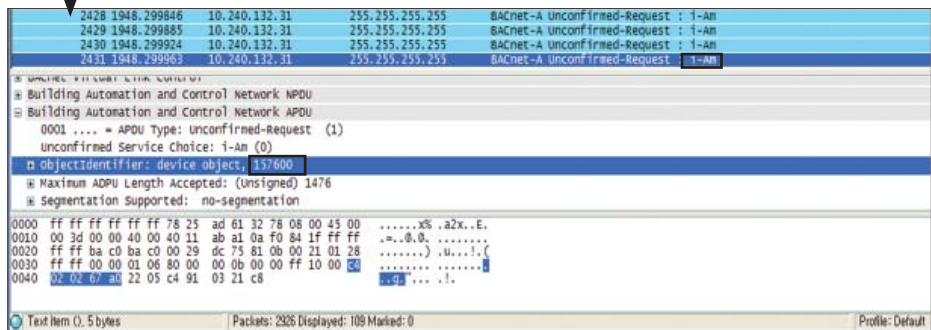
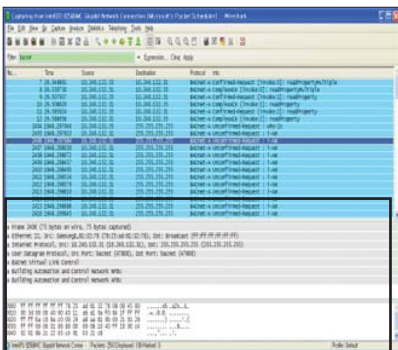
7) Tracking & Who-is (I-Am)

- Device list will be change after tracking process.
If address of the device (Indoor unit/ Interface module/ Centralized controller) is changed after tracking process, be aware of device instance numbers changed . .
- [BACnet Configuration] à [Device Configuration]
When tracking is executed, device instance number will be assigned to each indoor units as shown in the below picture.



	Indoor unit	11.00.00 (00)	11.00.00	157600
	Indoor unit	11.00.01 (01)	11.00.01	157601
	Indoor unit	11.00.02 (02)	11.00.02	157602

- When Who-is command is requested from MMI, devices which are displayed shown in the upper picture will response in i-am as shown in the below picture.



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8) Object list

(1) Indoor unit

Instance	Control and monitoring	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	°C					
2	Lower limit temperature status	AV	AC_Cool_LimitTemp_xx_xxxxxx	°C					
3	Upper limit temperature status	AV	AC_Heat_LimitTemp_xx_xxxxxx	°C					
4	Set temperature	AV	AC_Temp_set_xx_xxxxxx	°C					
5	Setting lower limit temperature	BV	AC_Cool_Limit_set_xx_xxxxxx	°C					
6	Setting upper limit temperature	BV	AC_Heat_Limit_set_xx_xxxxxx	°C					
7	Indoor unit electric value after baseline	AI	AC_Baseline_kWh_xx_xxxxxx	kWh					
8	Indoor unit usage after baseline	AI	AC_Baseline_Minute_xx_xxxxxx	Minute					
9	Electric value within the period	AI	AC_Period_kWh_xx_xxxxxx	kWh					
10	Indoor unit usage within period	AI	AC_Period_Minute_xx_xxxxxx	Minute					
11	Power On/Off status	BV	AC_Power_xx_xxxxxx	Off	On				
12	Filter alert status	BI	AC_FilterSign_xx_xxxxxx	Off	On				
13	Filter alert reset	BO	AC_FilterSign_Reset_xx_xxxxxx	Off	On				
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	Fan swing status	MV	AC_FanFlow_xx_xxxxxx	Stop	Up Down	Left Right	Up Down / Left Right		
17	Operation mode restriction status	MV	AC_Mode_Limit_xx_xxxxxx	No Limit	Cool Only	Heat Only			
18	Remote control usage restriction status	MV	AC_Remocon_Limit_xx_xxxxxx	Enable RC	Disable RC	Level 1			
19	Integrated Indoor/ outdoor unit error code	AI	AC_Error_Code_xx_xxxxxx	Refer to Samsung integrated error code list					

× Range of temperature setting is different depending on the operation mode

Auto : 18°C~30°C / Cool : 18°C~30°C / Heat : 16°C~30°C / Fan : temperature cannot be adjusted / Dry : 18°C~30°C

(2) AHU kit

Instance	Control and monitoring	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	°C					
2	Lower limit temperature status	AV	AHU_Cool_LimitTemp_xx_xxxxxx	°C					
3	Upper limit temperature status	AV	AHU_Heat_LimitTemp_xx_xxxxxx	°C					
4	Set temperature	AV	AHU_Temp_set_xx_xxxxxx	°C					
5	Setting lower limit temperature	BV	AHU_Cool_Limit_set_xx_xxxxxx	°C					
6	Setting upper limit temperature	BV	AHU_Heat_Limit_set_xx_xxxxxx	°C					
7	Indoor unit electric value after baseline	AI	AHU_Baseline_kWh_xx_xxxxxx	kWh					
8	Indoor unit usage after baseline	AI	AHU_Baseline_Minute_xx_xxxxxx	Minute					
9	Electric value within the period	AI	AHU_Period_kWh_xx_xxxxxx	kWh					
10	Indoor unit usage within period	AI	AHU_Period_Minute_xx_xxxxxx	Minute					
11	Power On/Off status	BV	AHU_Power_xx_xxxxxx	Off	On				
12	Filter alert status	BI	AHU_FilterSign_xx_xxxxxx	Off	On				
13	Filter alert reset	BO	AHU_FilterSign_Reset_xx_xxxxxx	Off	On				
14	Operation mode status	MV	AHU_Operation_Mode_xx_xxxxxx	Auto	Cool	Heat	Fan	Dry	
15	Operation mode restriction status	MV	AHU_Mode_Limit_xx_xxxxxx	No Limit	Cool Only	Heat Only			
16	Remote control usage restriction status	MV	AHU_Remocon_Limit_xx_xxxxxx	Enable RC	Disable RC	Level 1			
17	Integrated Indoor/outdoor unit error code	AI	AHU_Error_Code_xx_xxxxxx	Refer to integrated error code list					

(3) ERV

Instance	Control and monitoring	Object Type	Object Name	Unit	Status value				
				Inactive	Active				
				Text-1	Text-2	Text-3	Text-4	Text-5	
1	Power On/Off status	BV	ERV_Power_xx_xxxxxx	Off	On				
2	Filter alert status	BI	ERV_FilterSign_xx_xxxxxx	Off	On				
3	Filter alert reset	BO	ERV_FilterSign_Reset_xx_xxxxxx	Off	On				
4	Operation mode status	MV	ERV_Operation_Mode_xx_xxxxxx	Auto	Cool	Heat	Fan	Dry	
5	Fan speed status	MV	ERV_FanSpeed_xx_xxxxxx	Auto	Low	Mid	High		
6	Remote control usage restriction status	MV	ERV_Remocon_Limit_xx_xxxxxx	Enable RC	Disable RC	Level 1			
7	Integrated Indoor/outdoor unit error code	AI	ERV_Error_Code_xx_xxxxxx	Refer to integrated error code list					

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9) Detail object description

SIM & PIM

Instance	Control and monitoring	Object Type	Object Name	Status value
1	Integrated Indoor/outdoor unit error code	AI	SIM_Error_Code	Refer to integrated error code list

Centralized controller

Instance	Control and monitoring	Object Type	Object Name	Status value
1	Integrated Indoor/outdoor unit error code	AI	SIM_Error_Code	Refer to integrated error code list

Interface module

Instance	Control and monitoring	Object Type	Object Name	Status value
1	Integrated Indoor/outdoor unit error code	AI	SIM_Error_Code	Refer to integrated error code list

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Instance	Control and monitoring	Object Type	Object Name	Status value
1	All device OFF	BO	ALL_OFF	0 : All device OFF, 1 : All device ON
2	DMS2 Status	AI	DMS2_Status	0 : Normal, 8 : Emergency stop, 105 : Trakcing in progress, 108 : Tracking failed
3	BACnet Error code	AI	BACnetApp_Error_Code	BACnet Error code

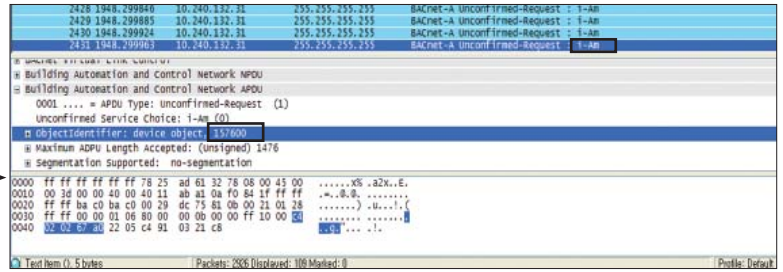
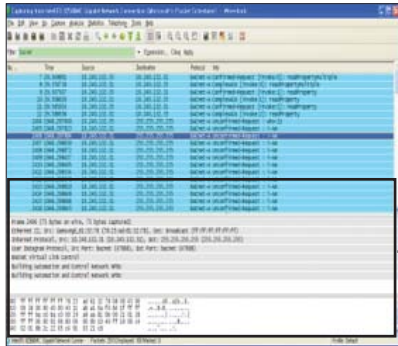
10) Detail description of point (DMS DI/DO)

Instance	Control and monitoring	Object Type	Object Name	Status value
1	DMS DI_1	BI	DI_1	Inactive : Off, Active : On
2	DMS DI_2	BI	DI_2	Inactive : Off, Active : On
3	DMS DI_3	BI	DI_3	Inactive : Off, Active : On
4	DMS DI_4	BI	DI_4	Inactive : Off, Active : On
5	DMS DI_5	BI	DI_5	Inactive : Off, Active : On
6	DMS DI_6	BI	DI_6	Inactive : Off, Active : On
7	DMS DI_7	BI	DI_7	Inactive : Off, Active : On
8	DMS DI_8	BI	DI_8	Inactive : Off, Active : On
9	DMS DI_9	BI	DI_9	Inactive : Off, Active : On
10	DMS DI_10	BI	DI_10	Inactive : Off, Active : On
11	DMS DO_1	BO	DO_1	Inactive : Off, Active : On
12	DMS DO_2	BO	DO_2	Inactive : Off, Active : On
13	DMS DO_3	BO	DO_3	Inactive : Off, Active : On
14	DMS DO_4	BO	DO_4	Inactive : Off, Active : On
15	DMS DO_5	BO	DO_5	Inactive : Off, Active : On
16	DMS DO_6	BO	DO_6	Inactive : Off, Active : On
17	DMS DO_7	BO	DO_7	Inactive : Off, Active : On
18	DMS DO_8	BO	DO_8	Inactive : Off, Active : On

11) Checking BACnet communication through Wireshark

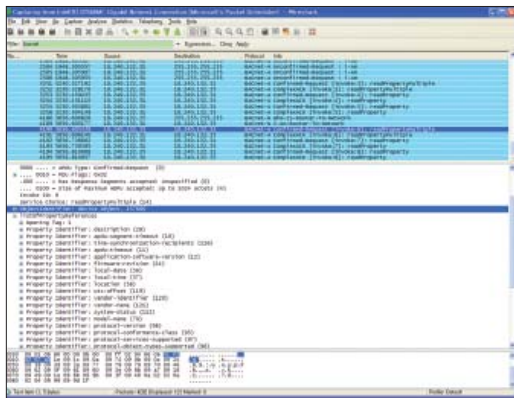
(1) Who-is (I-Am)

- 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.

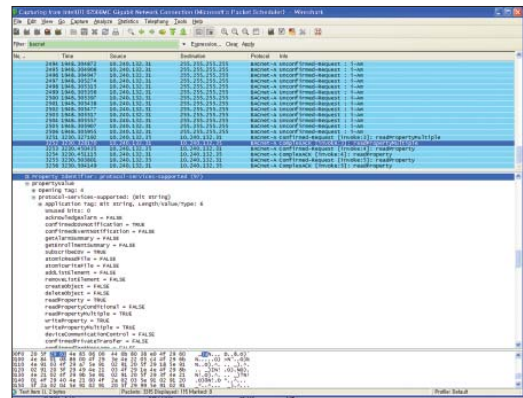


(2) ReadPropertyMultiple

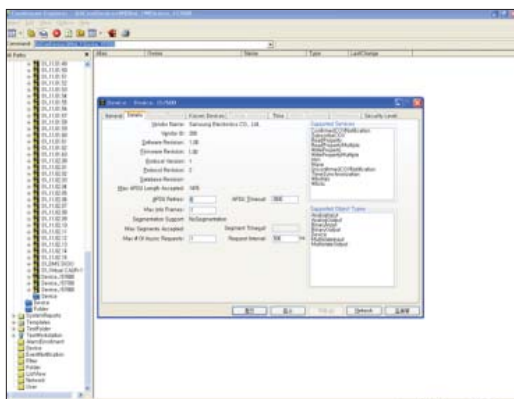
- Request all status data.
- Device description, BACnet network number device node ID, status, BACnet MAC address version, Max APDU length accepted, APDU retries, timeout, supported services, supported object types and so on.



ReadPropertyMultiple Request



ReadPropertyMultiple Response



Continuum CyberStation

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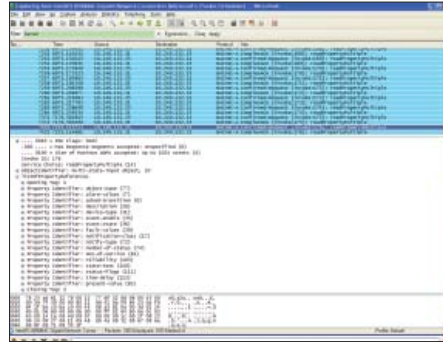
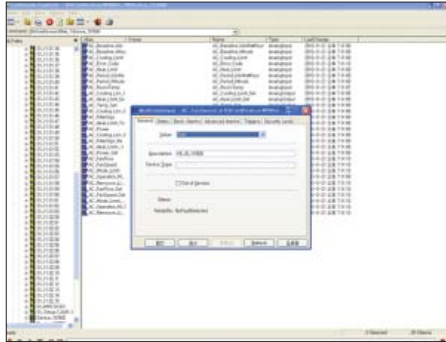
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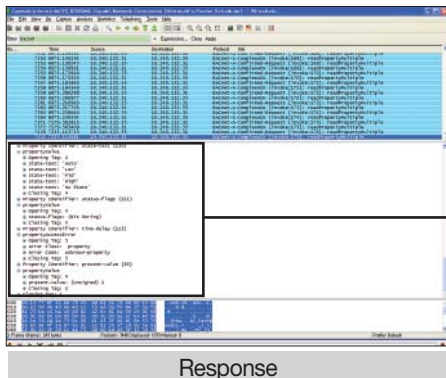
11) Checking BACnet communication through Wireshark

(3) ReadPropertyMultiple

- Object_MultiStateInput



Request

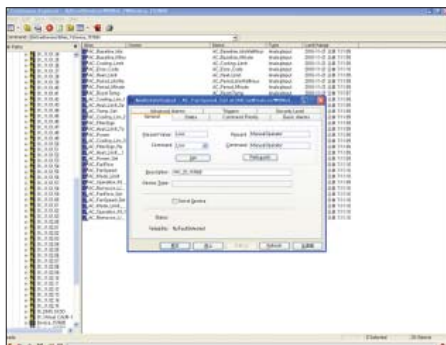


Response

```

    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
    
```

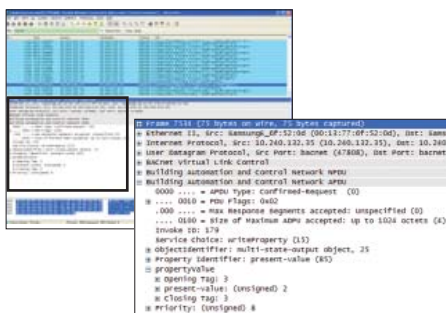
(4) WriteProperty



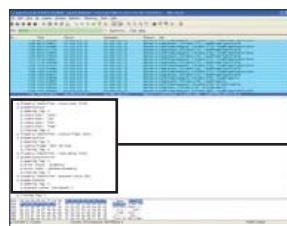
```

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

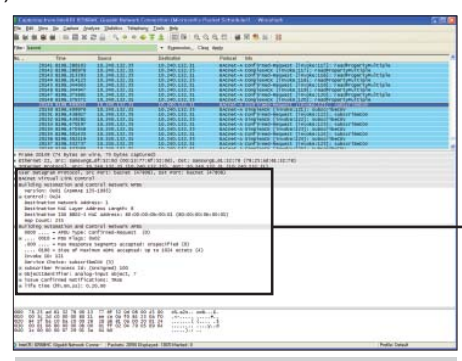


ReadPropertyMultiple

```

    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
    
```

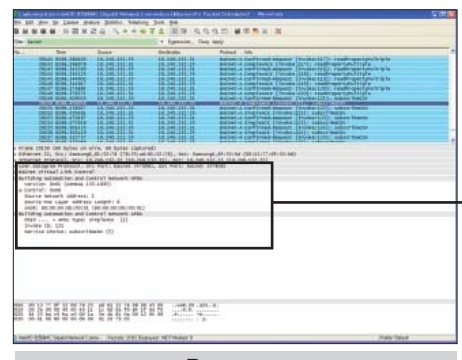

(5) Subscribe COV



Request

```

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
... 0000 .... = 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
    
```

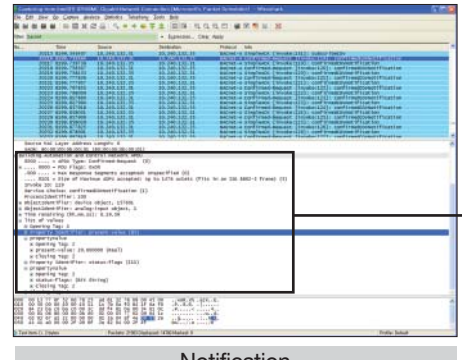


Response

```

+ 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)
    
```

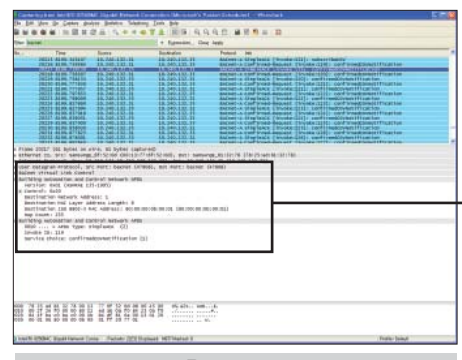
(6) COV Notification



Notification

```

Building Automation and Control Network APDU
0000 .... = APDU Type: Confirmed-Request (0)
... 0000 = PDU Flags: 0x00
... 0000 .... = 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
PropertyIdentifier: present-value (5)
PropertyValue
Opening Tag: 2
present-value: 20.000000 (Real)
Closing Tag: 2
PropertyIdentifier: status-flags (111)
PropertyValue
Opening Tag: 2
status-flags: (bit string)
Closing Tag: 2
Closing Tag: 4
    
```



Response

```

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)
    
```

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12) Standard object type

Object Type	Support	Description
Analog Input	■	[Indoor temperature], [Lower limit temperature], [Upper limit temperature], [Electric value after baseline], [Indoor unit usage after baseline], [Electric value within the period], [Electric value within period], [Indoor unit error code], [Centralized controller error code], [Interface module error code], [SIM interface module error code], [DMS2 status], [DMS2 error]
Analog Output	■	[Set temperature], [Setting lower limit temperature], [Setting upper limit temperature]
Analog Value	<input type="checkbox"/>	
Averaging	<input type="checkbox"/>	
Binary Input	■	[Power On/Off Status], [Filter alert status], [Lower limit function toggle status], [Lower limit function toggle status], [Upper limit function toggle status], [DI]
Binary Output	■	[Power On/Off control], [Filter reset control], [Setting lower limit function toggle], [Setting upper limit function toggle], [DO]
Binary Value	<input type="checkbox"/>	
Calendar	<input type="checkbox"/>	
Command	<input type="checkbox"/>	
Device	■	[DMS2], [A/C Indoor Unit], [ERV], [AHU], [SIM], [Centralized controller], [Interface module], [DMS2 DI/DO]
Event Enrollment	<input type="checkbox"/>	
File	<input type="checkbox"/>	
Group	<input type="checkbox"/>	
Life Safety Point	<input type="checkbox"/>	
Life Safety Zone	<input type="checkbox"/>	
Loop	<input type="checkbox"/>	
Multi-state Input	■	[Operation mode status], [Fan speed status], [Air direction status], [Cooling only/Heating only/Restriction cancellation status], [Allow/Stop Remote control/Level 1 status]
Multi-state Output	■	[Control operation mode], [Control Fan speed], [Control air flow direction], [Setting cooling only/Heating only/Restriction cancellation], [Control allowing/stopping remote control/level 1]
Multi-state Value	<input type="checkbox"/>	
Notification Class	<input type="checkbox"/>	
Program	<input type="checkbox"/>	
Pulse Converter	<input type="checkbox"/>	
Schedule	<input type="checkbox"/>	
Trend Log	<input type="checkbox"/>	
Access Door	<input type="checkbox"/>	
Event Log	<input type="checkbox"/>	
Load Control	<input type="checkbox"/>	
Structured View	<input type="checkbox"/>	
Trend Log Multiple	<input type="checkbox"/>	

13) 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-B17
8	Firmware revision	CharterString	R	V	1.00
9	Application software version	CharterString	R	V	1.00
10	Location	CharterString	O		X
11	Description	CharterString	O	V	DMS2_BACnetIP [ver 1.00]
12	Protocol version	Unsigned	R	V	1.00
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

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13) 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⁾		

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13) 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	CharacterString	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_FAULT_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⁾		

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13) 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 Status_Flags FAULT flag → TRUE
9	Reliability	BACnetReliability	O	V	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⁾		

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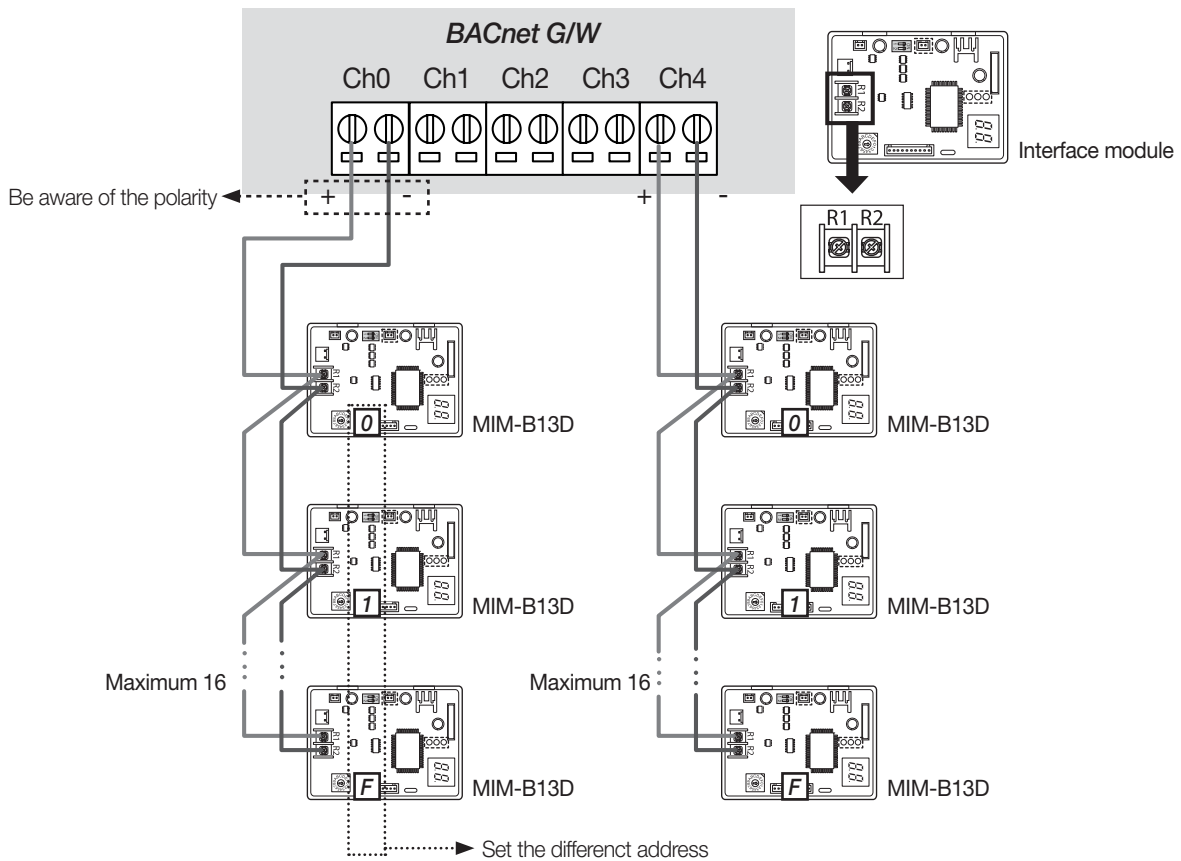
② MIM-B17

14) Installation

(1) Connecting communication

Connecting interface module communication

- Connect R1/R2 of interface module to RS485 channel of the BACnet G/W.
(Can connect to any channel. Just remember to keep the associated channel number)



Maximum number of interface module connection = Max. 16 x (5 channels) = 80 interface modules connection

※ Total number of indoor unit must be under 256.

※ Support connection with old version MIM-B13/B13A/B13B, MIM-B04/B04A.

▶ Caution 1

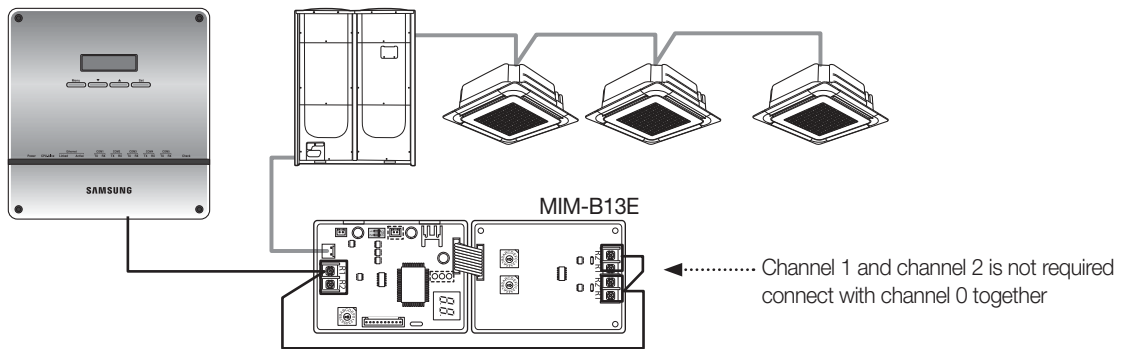
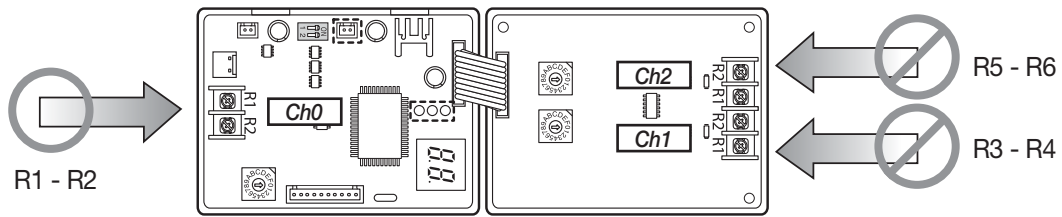
- In many interface module are connected one channel, each interface module must be set different address.

▶ Caution 2

- Be aware that A(+) and B(-) part of the RS485 terminal on LonWorks G/W has polarity. Make sure that the connection is not reversed.

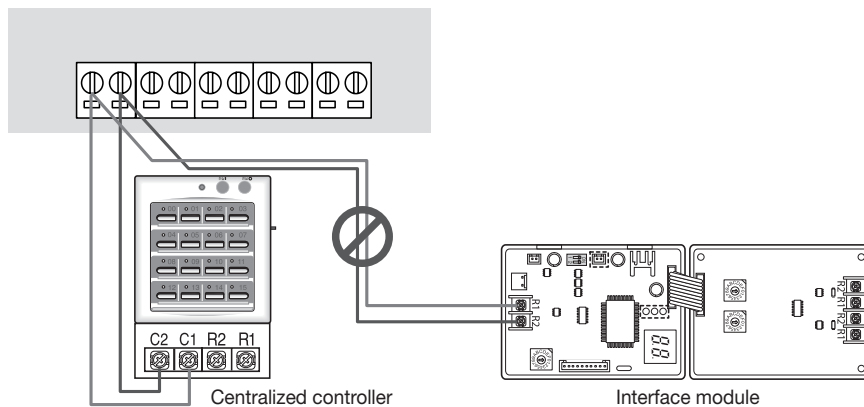
► **Caution 3**

- When you connect BACnet G/W with MIM-B13D or MIM-B13E, BACnet G/W must be connected to channel 0 of the interface module. (If it's connected to channel 1 or 2, tracking will fail)



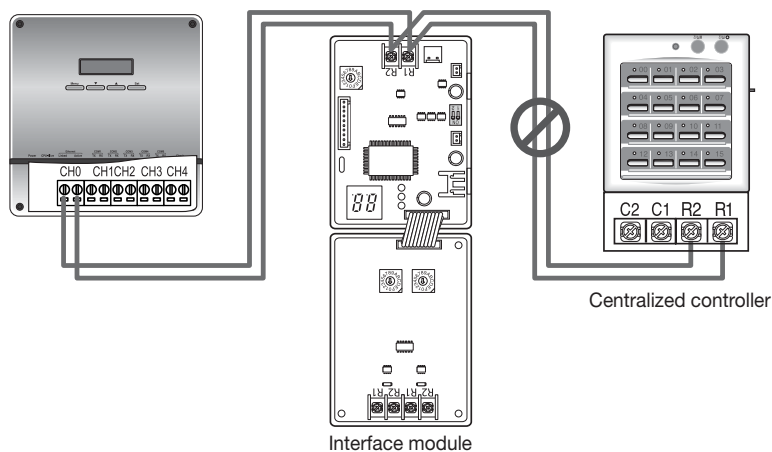
► **Caution 4**

- Do not connect interface module and centralized controller to the same RS485 communication terminal of the BACnet G/W.



► **Caution 5**

- Centralized controller and BACnet G/W cannot be connected to the same channel of the interface module.



► **Caution 6**

- Use ring terminal or Y terminal for the communication lines that will be connected to R1/R2 of the interface module.

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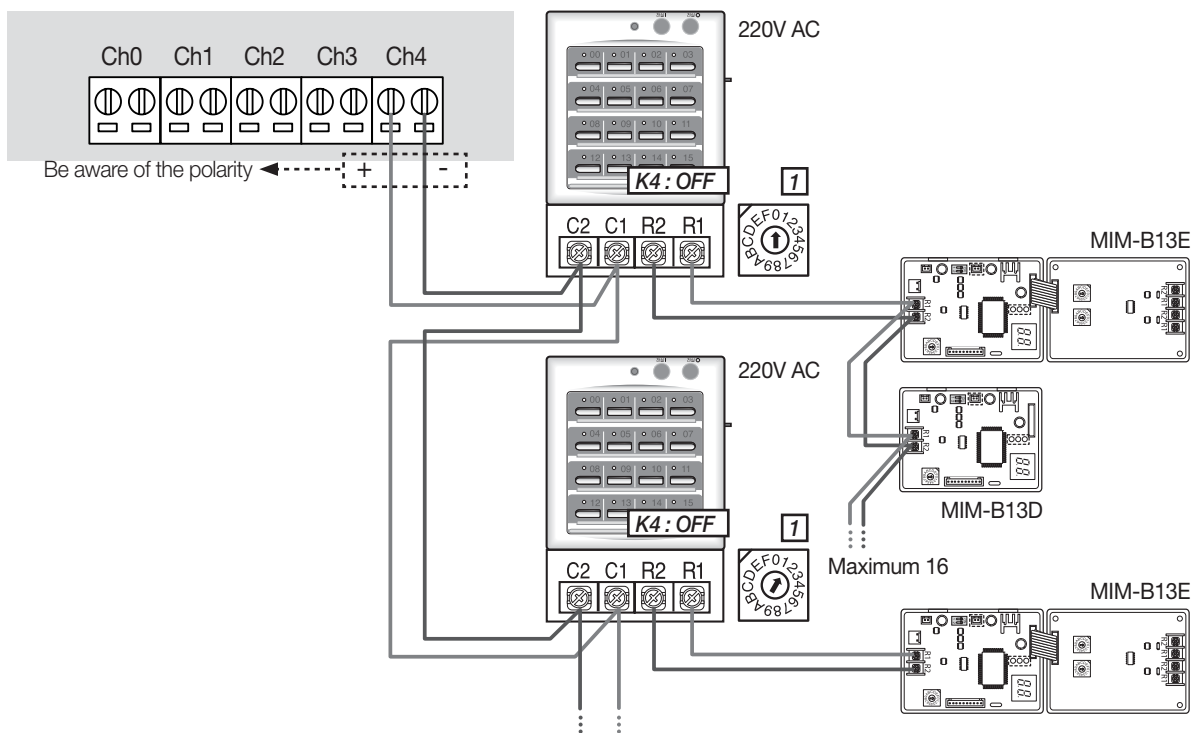
3. BACnet Gateway

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14) Installation

(1) Connecting communication

Connecting centralized controller communication



Maximum 16 centralized controllers can be connected to 5 RS485 communication terminal of the BACnet G/W.

× Total number of indoor unit must be under 256.

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Specifications may be subject to change without prior notice for product improvement.