Samsung Controls Product Overview

Agenda

1. Local control
2. Centralized control
3. Integrated management system
4. Building management system
5. Ancillary controls & modules
6. DVM chiller controls

Before we begin…

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Important Notices

Specification Changes

Specifications are subject to change without prior notice.

Every effort has been made to insure that the information included in this presentation is as accurate as possible at the time of it's publication.

Use of Training Material

This training module is not intended to replace Samsung service manuals, technical data books, installation/operation manuals or other factory documents.

For technical support issues, always contact a Samsung equipment provider.
www.samsunghvac.com/downloads

Handling of Equipment

Only properly trained, HVAC professionals should attempt to install and start up any Samsung heating and air-conditioning system.

Use of Information

This presentation may only be used with authorization by Samsung HVAC. Unauthorized use, duplication or alteration of this presentation is prohibited.

High Voltage Caution:
Extra care must be taken when working on or around the system equipment due to numerous high voltage components. Whether installing or servicing Samsung RLC equipment in the field or while attending Samsung HVAC training classes which include powered simulators and equipment, be aware of the potential dangers of high voltage **Use Caution**

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Samsung Control System

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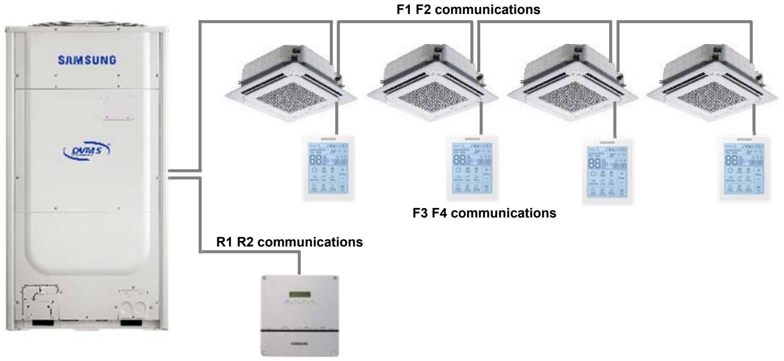
Samsung N.A.S.A

Network Architecture for System Air Conditioners


F1 F2 communications
SAMSUNG
DVMS
F3 F4 communications
R1 R2 communications

Integrated digital communications Samsung "NASA" Communication Protocol

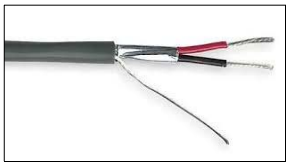
Proprietary to all Samsung DVMS VRF systems

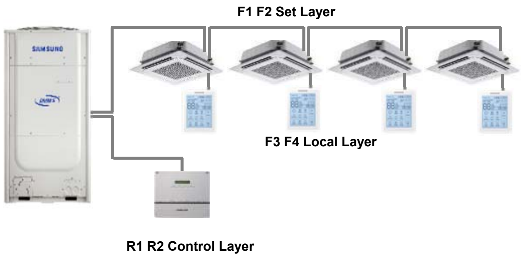
Basic 2-conductor control wire design simplifies installation

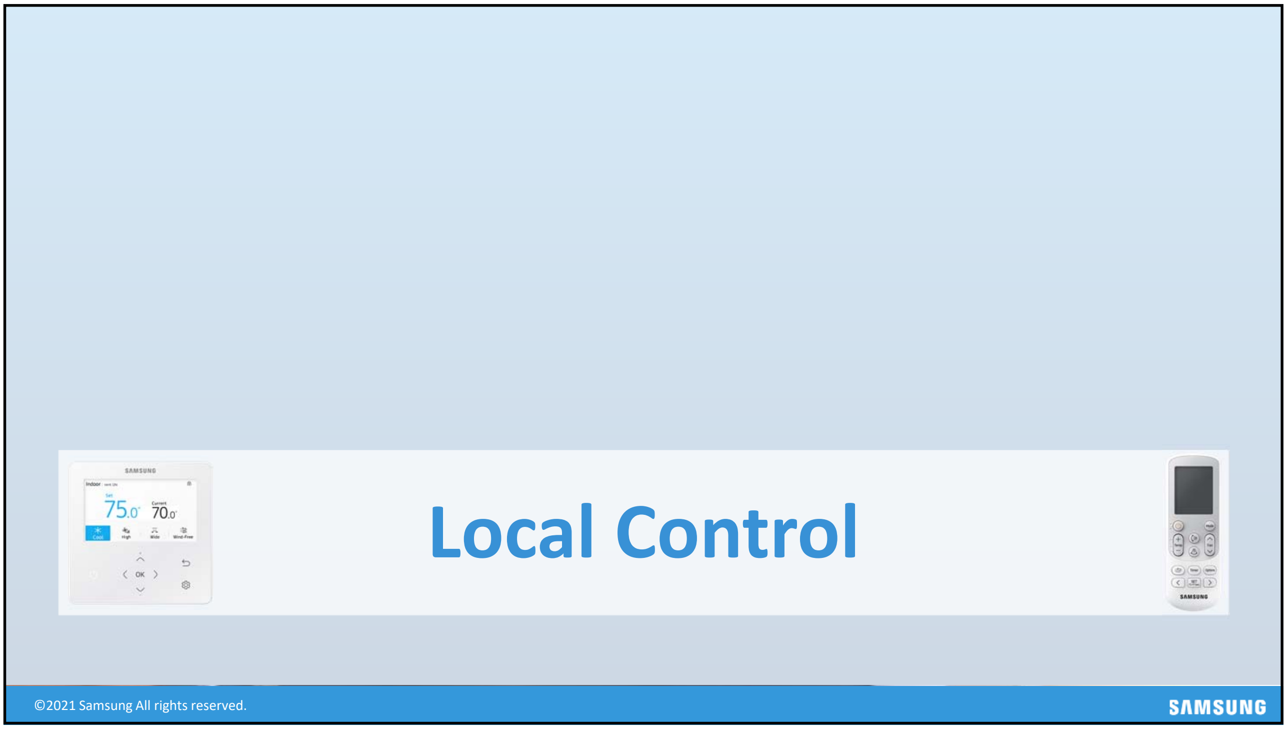
Reliable Daisy-chain communication wiring – 0.5vdc.

Control Wiring NASA Digital Control Layers

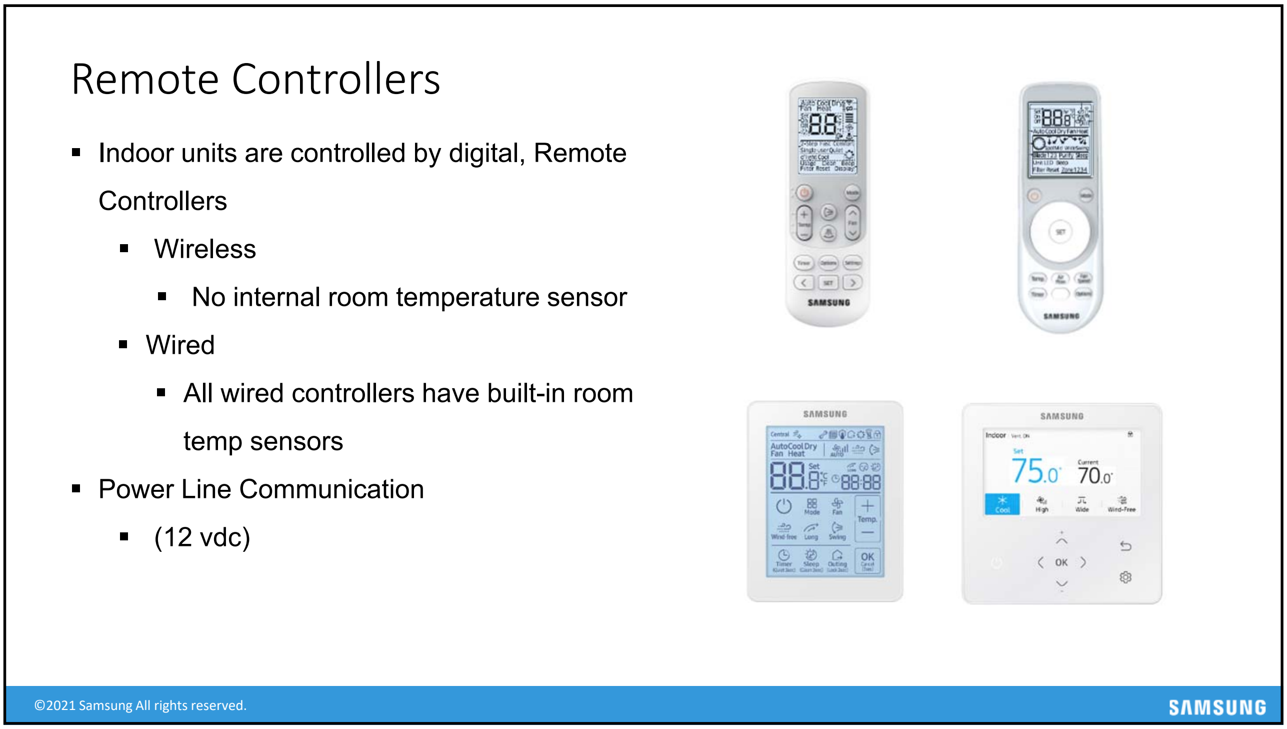
- F1 F2 – Set Layer:
  - ODU to IDU's & MCU'S
  - (incl. multiport EEV Kit)
  - Daisy chain connections
    - 0.5 VDC
- F3 F4 – Local Layer:
  - Wired Remote Controller to indoor unit
    - 12 VDC
- R1 R2 – Control Layer:
  - Outdoor Unit to upper-level controllers
    - 5 VDC
- Control Wire:
  - 16/2 AWG stranded with shield
  - Never use solid core thermostat wire




F1 F2 Set Layer
F3 F4 Local Layer
R1 R2 Control Layer

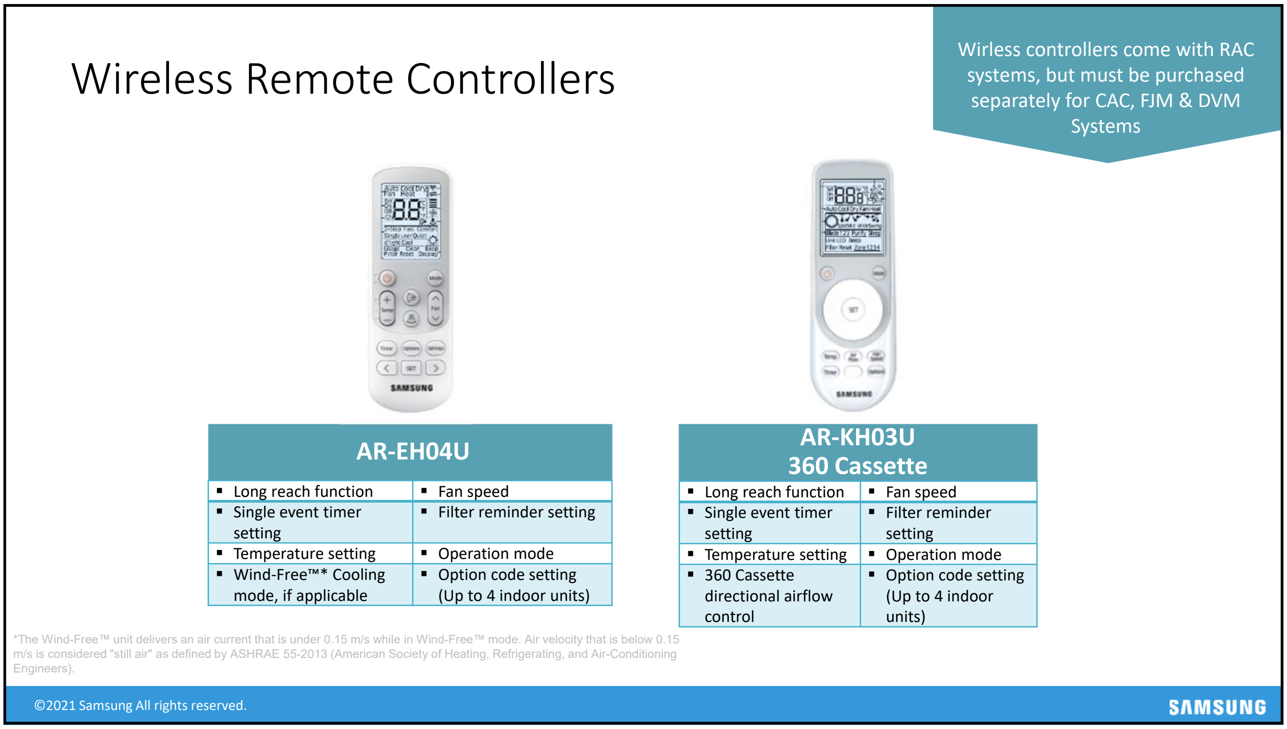


Local Control



Remote Controllers

- Indoor units are controlled by digital, Remote Controllers
  - Wireless
    - No internal room temperature sensor
  - Wired
    - All wired controllers have built-in room temp sensors
- Power Line Communication
  - (12 vdc)



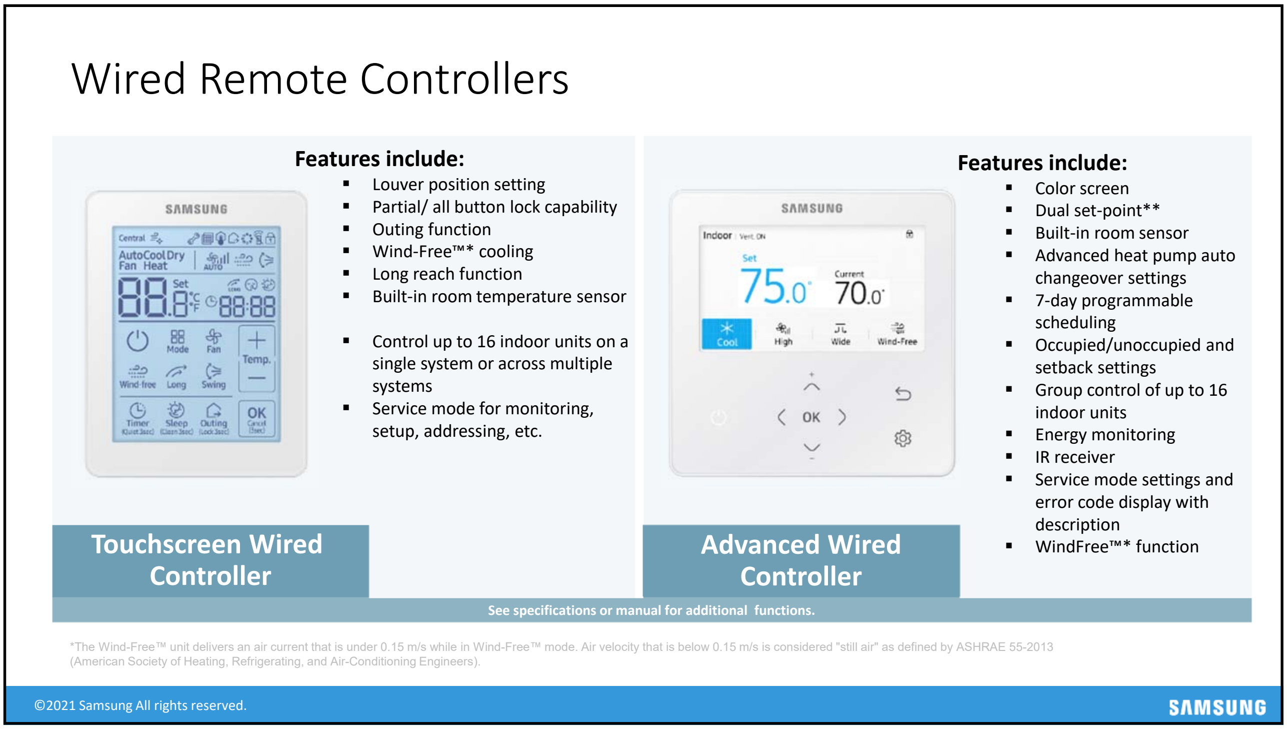
Wireless Remote Controllers

Wirless controllers come with RAC systems, but must be purchased separately for CAC, FJM & DVM Systems

AR-EH04U	
▪ Long reach function	▪ Fan speed
▪ Single event timer setting	▪ Filter reminder setting
▪ Temperature setting	▪ Operation mode
▪ Wind-Free™* Cooling mode, if applicable	▪ Option code setting (Up to 4 indoor units)

AR-KH03U 360 Cassette	
▪ Long reach function	▪ Fan speed
▪ Single event timer setting	▪ Filter reminder setting
▪ Temperature setting	▪ Operation mode
▪ 360 Cassette directional airflow control	▪ Option code setting (Up to 4 indoor units)

*The Wind-Free™ unit delivers an air current that is under 0.15 m/s while in Wind-Free™ mode. Air velocity that is below 0.15 m/s is considered "still air" as defined by ASHRAE 55-2013 (American Society of Heating, Refrigerating, and Air-Conditioning Engineers).



Wired Remote Controllers

Features include:

- Louver position setting
- Partial/ all button lock capability
- Outing function
- Wind-Free™* cooling
- Long reach function
- Built-in room temperature sensor
- Control up to 16 indoor units on a single system or across multiple systems
- Service mode for monitoring, setup, addressing, etc.

Touchscreen Wired Controller

Features include:

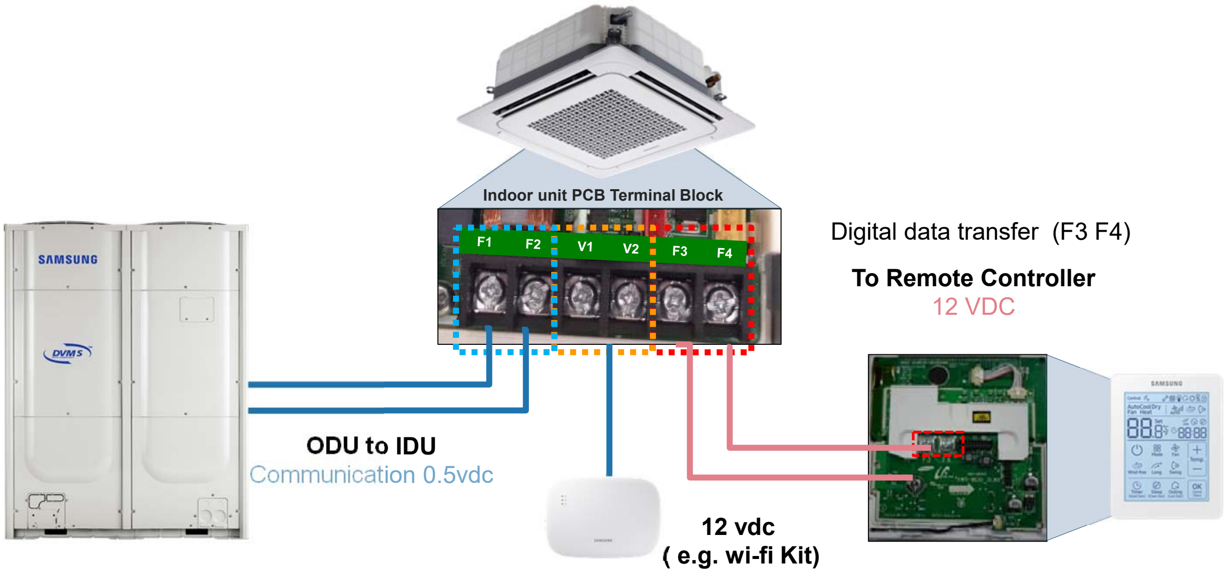
- Color screen
- Dual set-point**
- Built-in room sensor
- Advanced heat pump auto changeover settings
- 7-day programmable scheduling
- Occupied/unoccupied and setback settings
- Group control of up to 16 indoor units
- Energy monitoring
- IR receiver
- Service mode settings and error code display with description
- WindFree™* function

Advanced Wired Controller

See specifications or manual for additional functions.

*The Wind-Free™ unit delivers an air current that is under 0.15 m/s while in Wind-Free™ mode. Air velocity that is below 0.15 m/s is considered "still air" as defined by ASHRAE 55-2013 (American Society of Heating, Refrigerating, and Air-Conditioning Engineers).

Control Wiring Connections


Indoor unit PCB Terminal Block
F1
F2
V1
V2
F3
F4
SAMSUNG
DVM S

Digital data transfer (F3 F4)

To Remote Controller

12 VDC

ODU to IDU

Communication 0.5vdc

12 vdc

(e.g. wi-fi Kit)

Wired Remote Controller – Built-in Sensor

- Room temperature control
- Default
  - Indoor unit return air sensor
- Options
  - Wired remote controller’s built-in room sensor
  - Average room temperature between the indoor unit and remote controller

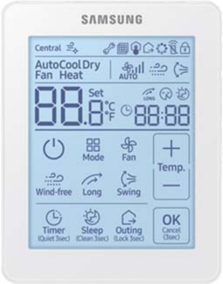
MWR-SH11UN

MWR-WG00UN

Room temperature sensor

MWR-SH11UN “Simple Touch” Wired Remote Controller

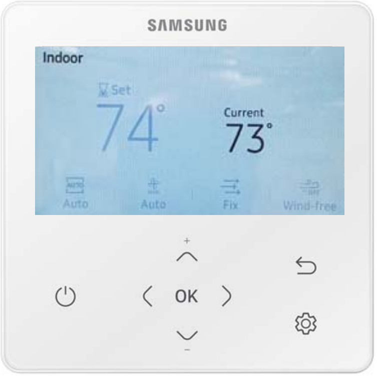
- Built-in room sensor
- Backlit LCD display
- Wind-Free™* Control
- Clean Function
- Long Reach
- Error display
- Built-in infrared receiver
  - allows control with wireless remotes
- Button lock feature: All buttons or selected buttons
- Temperature display option
  - “Set Temperature”
  - “Room Temperature”
- Address and option code setting
- For detailed functions and operations refer to IOM manual



*The Wind-Free™ unit delivers an air current that is under 0.15 m/s while in Wind-Free™ mode. Air velocity that is below 0.15 m/s is considered "still air" as defined by ASHRAE 55-2013 (American Society of Heating, Refrigerating, and Air-Conditioning Engineers).

MWR-WG00UN Wired Remote Controllers

- Built-in IR receiver and temperature room sensor
- Dual Set Point (DSP) Setting (for supported indoor units)
- **Wind-Free™*** function settings
- 360 cassette functions
- Backlit LCD display
- Advanced HP auto changeover
- Error display
- Weekly operating schedule
- Upper/lower temperature limit setting
- Child lock
- Button lockout options
- Wireless remote-control restriction
- MDS (motion detection sensor) Indirect/Direct setting
- Service mode support
- Address and option code setting
- For detailed functions and operations refer to IOM manual



*The Wind-Free™ unit delivers an air current that is under 0.15 m/s while in Wind-Free™ mode. Air velocity that is below 0.15 m/s is considered "still air" as defined by ASHRAE 55-2013 (American Society of Heating, Refrigerating, and Air-Conditioning Engineers).

AR-EH04U Wirless Remote Controller

- Compatible with all indoor units equipped with an IR receiver
  - (excl. 360 cassette)
- 4 channels for individual unit control
- No built-in room temp sensor
- Powered louver control
- WindFree* function
- Address and option setting
- Ducted units require Wireless Receiver Kit
- 4-Way Cassette each louver can be set individually
  - 32° to 65°
- For detailed functions and operations refer to IOM manual

Set
24
°C
Auto
Zone 1
Blade 1
Mode
Temp
Fan
Timer
Options
SET
SAMSUNG

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AR-KH03U Wirless Remote Controller

360 Cassette

- Air flow direction control for 360 cassettes
  - Individual booster fan control
- No built-in room temp sensor
- 4 channels for individual unit control
- Buzzer sound mute
- Address and option setting

Set
On
Off
88.8
Auto Cool Dry Fan Heat
Spot Mid Wide Swing
Blade 1 2 3 Purify Sleep
Unit LED Beep
Filter Reset Zone 1 2 3 4
Mode
SET
Temp.
Air Flow
Fan Speed
Timer
Options
SAMSUNG

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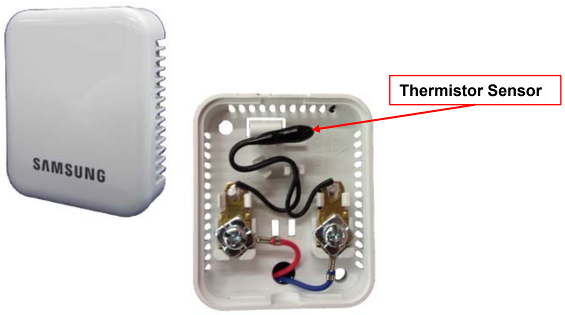
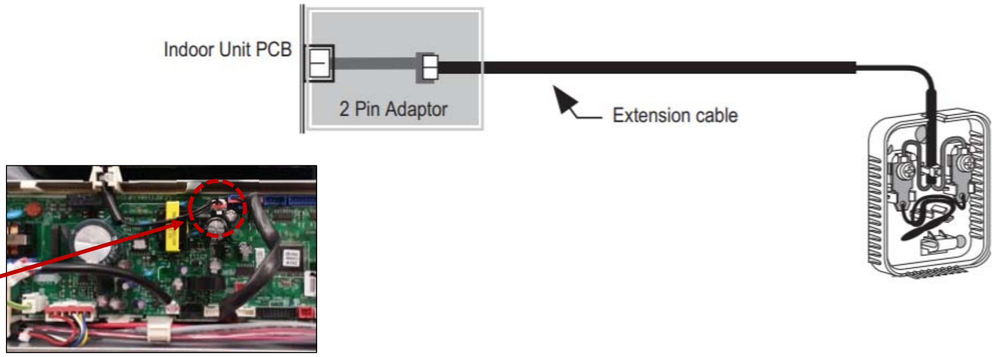
MRW-TA External Room Sensor

- Provides for more accurate room temperature control when indoor unit is installed in high ceiling, or has outside fresh air ducted into the return,
- 2-wire connection to indoor unit PCB


SAMSUNG
Thermistor Sensor

MRW-TA External Room Sensor

- Replaces input from return air sensor and provides temperature sensing for remote controllers without internal sensor
- Applies to all indoor units
- Includes a 39 ft. 2-conductor connection cable

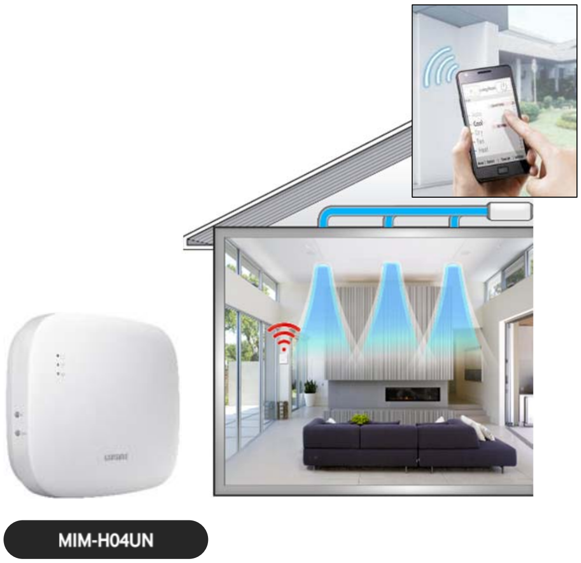

Indoor Unit PCB
2 Pin Adaptor
Extension cable

Unplug the IDU return air sensor (CN412) and plug in the MRW-TA wire in it's place

Centralized Control

WIFI Adapter MIM-H04UN

- “Samsung Smart Things” app required
- Android and Apple devices
- Control up to 16 indoor units
- Scheduling / 7 day
- Grouping On/Off control
- Energy Monitoring
  - Daily
  - Weekly
  - monthly



WIFI Adapter MIM-H04UN

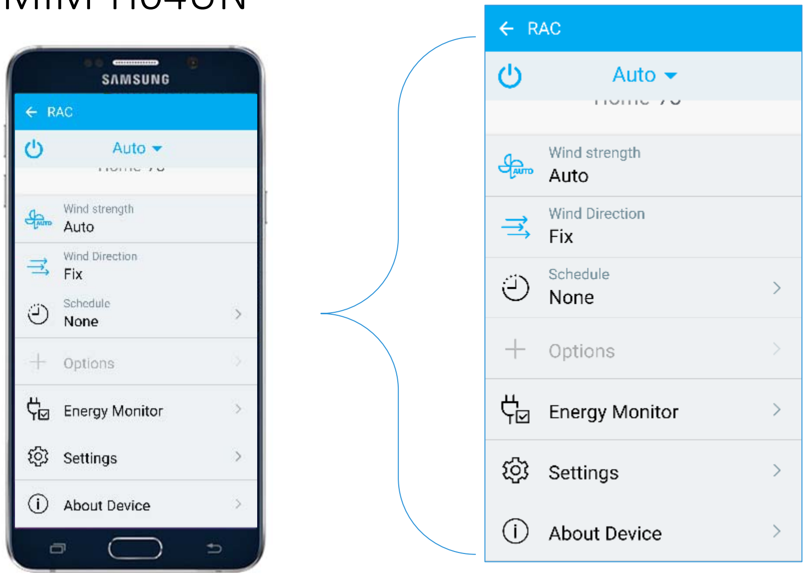
Remote Control

1 Way

4 Way

Ducted

Ceiling



RAC

Auto

Wind strength
Auto

Wind Direction
Fix

Schedule
None

Options

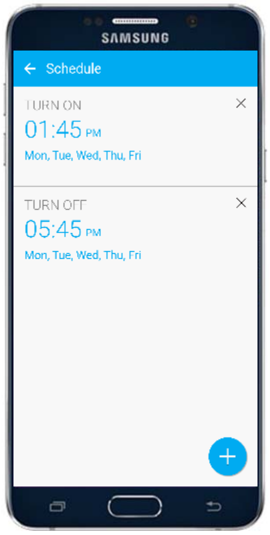
Energy Monitor

Settings

About Device

WIFI Adapter MIM-H04UN

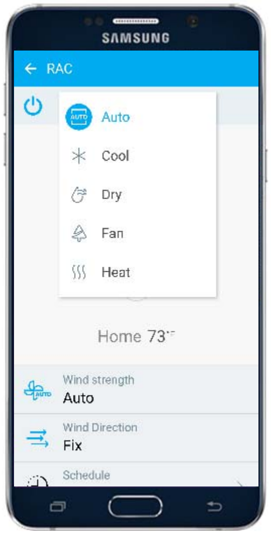
Schedule and Settings



Schedule

TURN ON
01:45 PM
Mon, Tue, Wed, Thu, Fri

TURN OFF
05:45 PM
Mon, Tue, Wed, Thu, Fri



RAC

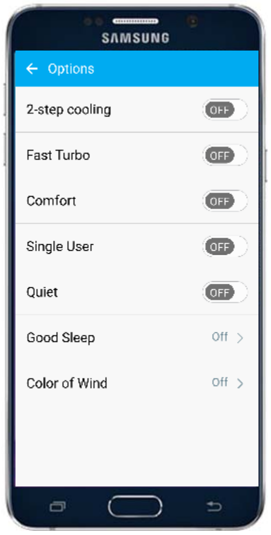
Auto
Cool
Dry
Fan
Heat

Home 73°

Wind strength
Auto

Wind Direction
Fix

Schedule



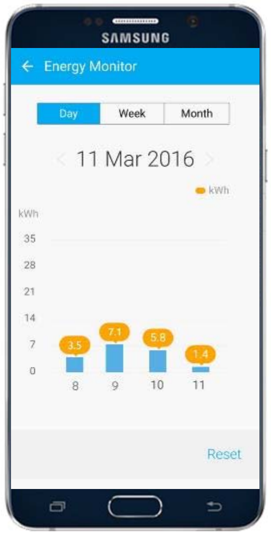
Options

2-step cooling	OFF
Fast Turbo	OFF
Comfort	OFF
Single User	OFF
Quiet	OFF
Good Sleep	Off
Color of Wind	Off

WIFI Adapter MIM-H04UN

Energy Monitoring

- Display of power output
- Different than consumption found on utility bills
- View kWh by
    - Day
    - Week
    - Month


SAMSUNG
Energy Monitor
Day
Week
Month
11 Mar 2016
kWh
kWh
35
28
21
14
7
0
3.5
7.1
5.8
1.4
8
9
10
11
Reset

Touch Centralized Controller MCM- A300UN

- 7” Touchscreen Controller
- Maximum 128 indoor units
- Maximum of 16 systems on a single R1/R2 upper-level comm. Line
    - Control of multiple systems
- Can connect to one system on the set layer F1/F2
    - Control of one system

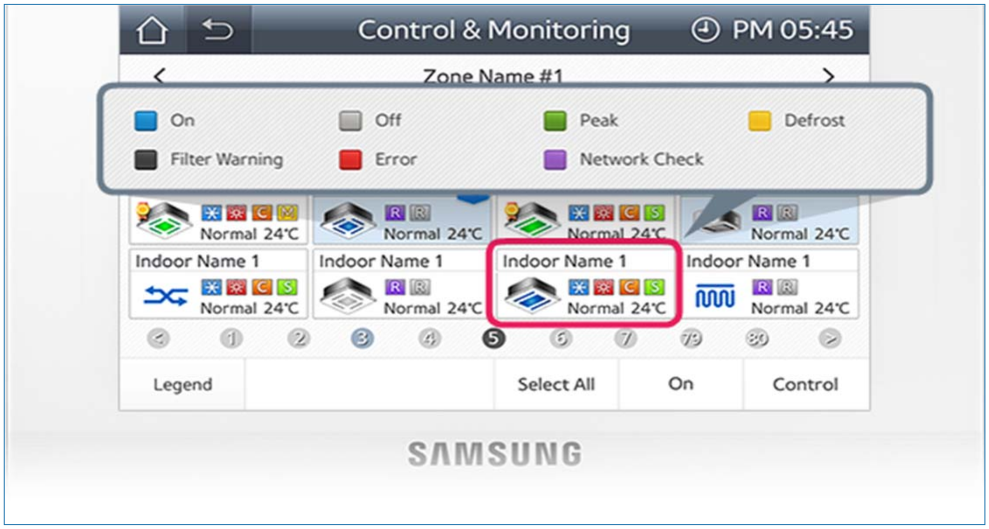
11:08
SAMSUNG
Touch Centralized controller
Control & Monitoring
Schedule
Setting
SAMSUNG

Touch Centralized Controller MCM- A300UN

- Creation of zones for indoor unit grouping
  - Max 12
- Digital output interlocked with indoor unit operation
  - Operation error
- SD card slot for data backup and future software updates
- 100 – 240vac power supply
  - Requires code compliant installation

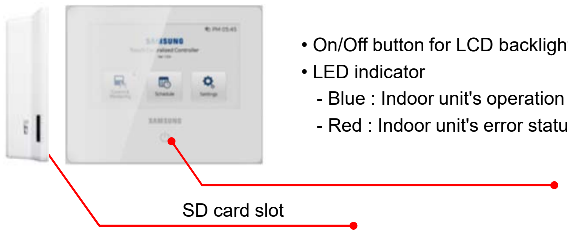
11:00 AM
SAMSUNG
Touch Centralized Controller
Control & Monitoring
Schedule
Setting
SAMSUNG
SAMSUNG
Touch Centralized Controller
7 inch touch LCD controller
Zone control (max. 12)
Multiple indoor unit control (max. 128)
Scheduler (max. 10 schedules for a week)
1 SD card slot (back up data & update S/W)

Touch Centralized Controller MCM- A300UN


Control & Monitoring
PM 05:45
Zone Name #1
On
Off
Peak
Defrost
Filter Warning
Error
Network Check
Normal 24℃
Normal 24℃
Normal 24℃
Normal 24℃
Indoor Name 1
Indoor Name 1
Indoor Name 1
Indoor Name 1
Normal 24℃
Normal 24℃
Normal 24℃
Normal 24℃
1
2
3
4
5
6
7
79
80
Legend
Select All
On
Control
SAMSUNG

Touch Centralized Controller MCM- A300UN

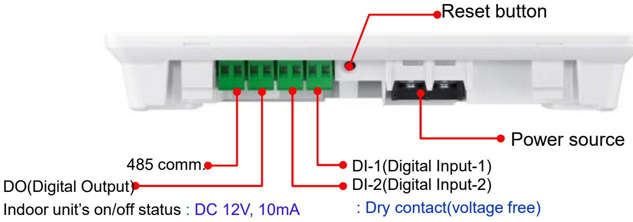
- **Front**



- On/Off button for LCD backlight
- LED indicator
  - Blue : Indoor unit's operation status.
  - Red : Indoor unit's error status.

SD card slot

- **Bottom**



Reset button

Power source

485 comm.

DO(Digital Output)

Indoor unit's on/off status : DC 12V, 10mA

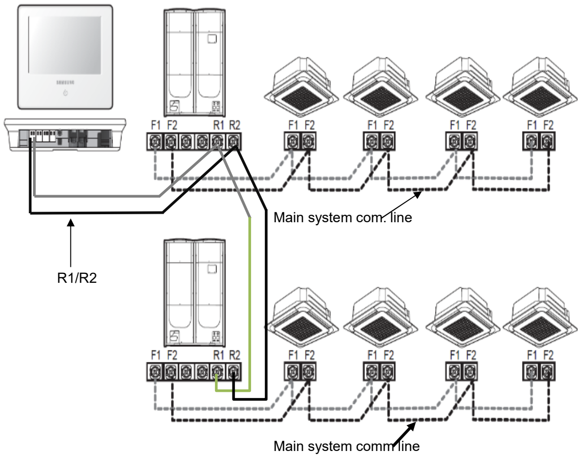
DI-1(Digital Input-1)

DI-2(Digital Input-2)

: Dry contact(voltage free)

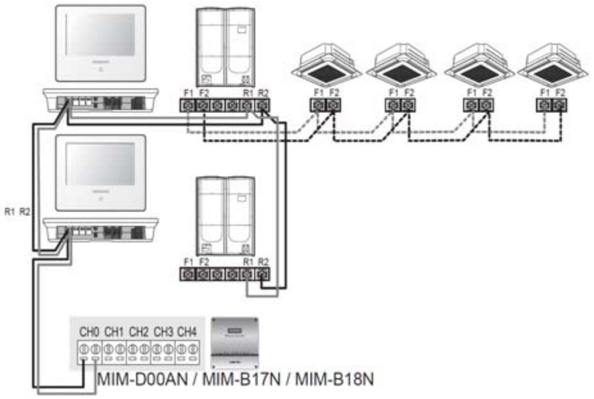
Touch Centralized Controller MCM- A300UN

- To connect to multiple systems the controller must be connected to the R1/R2 Connection
- Must be daisy chained
- Maximum 16 systems on R1/R2
  - (single controller most common)
- 128 units maximum



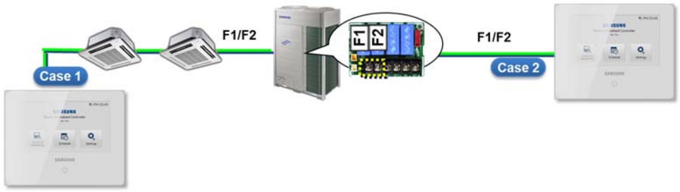
Touch Centralized Controller MCM- A300UN

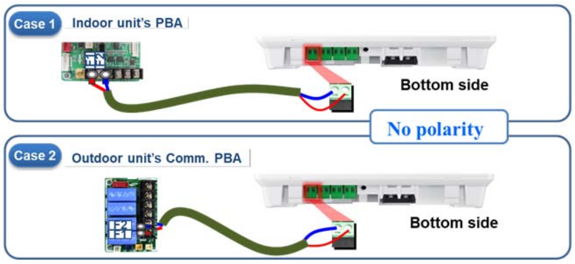
- Can be used in conjunction with other upper-level controls
  - DMS 2.5
  - BACnet
- Multiple central controllers can be used in the network.


F1 F2
R1 R2
R1 R2
F1 F2
F1 F2
F1 F2
F1 F2
F1 F2
R1 R2
CH0 CH1 CH2 CH3 CH4
MIM-D00AN / MIM-B17N / MIM-B18N

Touch Centralized Controller MCM- A300UN

- Connection can be made at indoor or outdoor unit
- Not polarity sensitive
- Max of 64 units on F1/F2

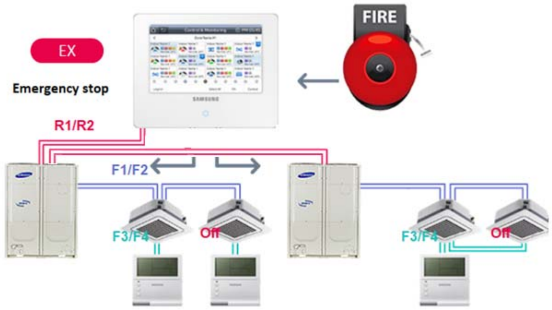

F1/F2
F1/F2
Case 1
Case 2
F1
F2


Case 1
Indoor unit's PBA
Bottom side
No polarity
Case 2
Outdoor unit's Comm. PBA
Bottom side

Touch Centralized Controller MCM- A300UN

External Device Interlock

- Simple operation control
- 2 Digital inputs
  - Stop signal (stops all equipment)
  - Signal to lock/unlock local controllers
- Interlock with external contact



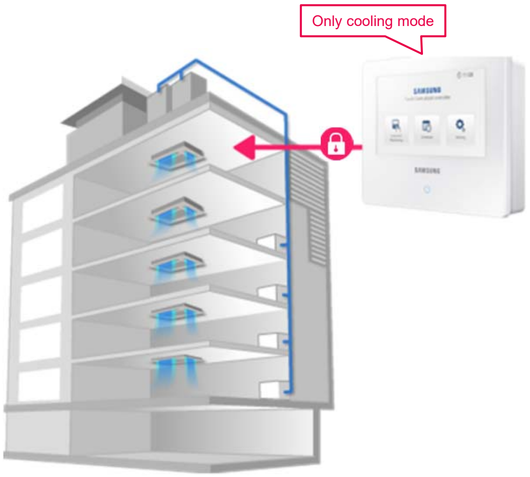
Touch Centralized Controller MCM- A300UN

Three operation patterns

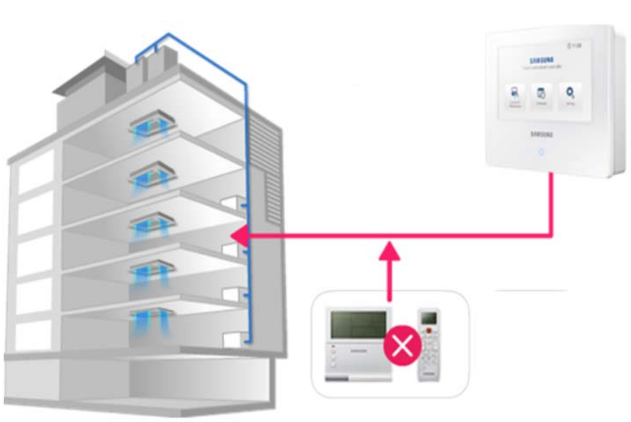
Pattern	Control	Contact Input
1	No function (Default setting)	Not applied
2	DI 1. Emergency stop operation. (Short : Stop / Open : standby) All indoor units stop operating and any command is ignored	Short / open **contact**
	DI 2. no function	
3	DI 1. All indoor unit ON/OFF control (Short : off / Open: on) ※ It is different from DMS 2.5 (Short : on / Open : off)	Short / open **contact**
	DI 2. Permitted/Prohibited remote controller use (Short : Permitted / Open : Prohibited)	
4	DI 1. All indoor unit ON control	Short **pulse**
	DI 2. All indoor unit OFF control	

Touch Centralized Controller MCM- A300UN

Operation Mode Restriction


Only cooling mode

Remote Controller Restriction



Integrated Management System

Data Management Server 2.5

- Directly compatible with
  - All NASA Systems
  - DVM, Current CAC & FJM,
- Fresh Access™ Split DOAS

SAMSUNG
DMS2.5
Remote Web access control
2D Layout View
Weekly / Daily schedule control
Power distribution function
User editable control logic
Operation & Error history management
SAMSUNG

SAMSUNG

Data Management Server 2.5

- Compatible with use of adaptors
  - Non-NASA Systems
    - With adaptor MIM-N01
  - Fresh Access™ ERV'S
    - With adaptors
      - MIN-N10
      - MXD-K200VN
  - RAC
    - With adaptor

MIM-N01

MIM-N10

MXD-K200V

Accessory are physically the same, but the software is different. Take care when installing to make sure the correct part number is with the correct components

MIM-R10UN

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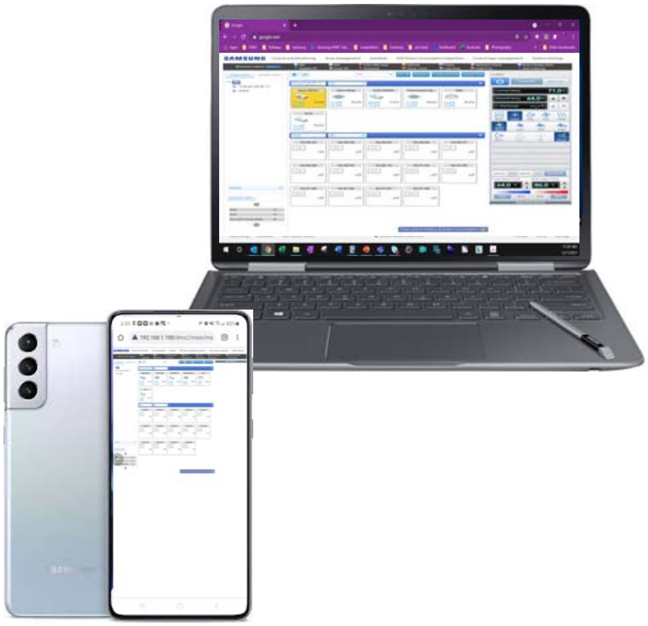
Interface Requirements

- Windows PC or mobile device utilizing any of the following internet browsers
  - Edge
  - Internet Explorer
  - Chrome
  - Safari
    - Firmware 2.9.0.15 or greater is required



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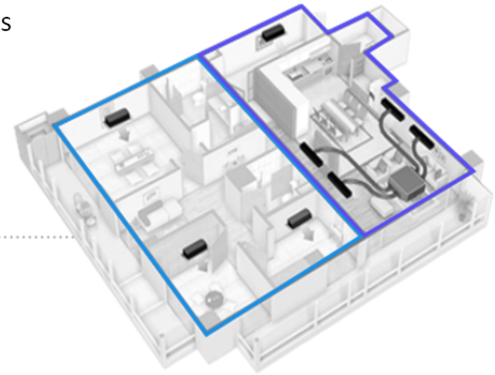
DMS 2.5 Control & Monitoring

- Individual/Zone management up to 256 indoor units
- Remote control via LAN/Internet



Example

A zone	Cooling only / No remote controller / Minimum cooling setpoint: 68°F
B zone	Cooling only / Remote controller use

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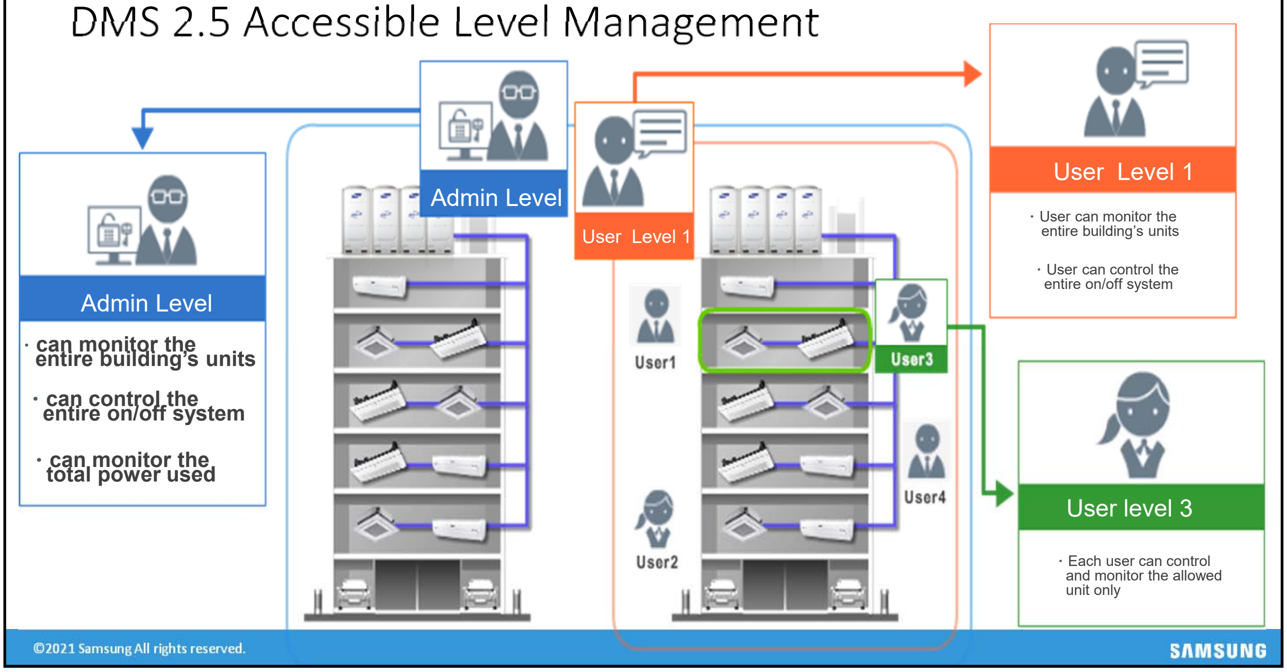
DMS 2.5 Accessible Level Management



Admin Level

- can monitor the entire building's units
- can control the entire on/off system
- can monitor the total power used

Admin Level

User Level 1

User Level 1

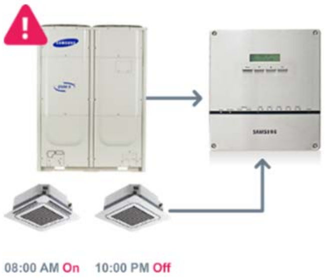
- User can monitor the entire building's units
- User can control the entire on/off system

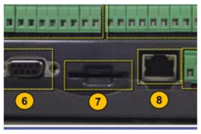
User level 3

- Each user can control and monitor the allowed unit only

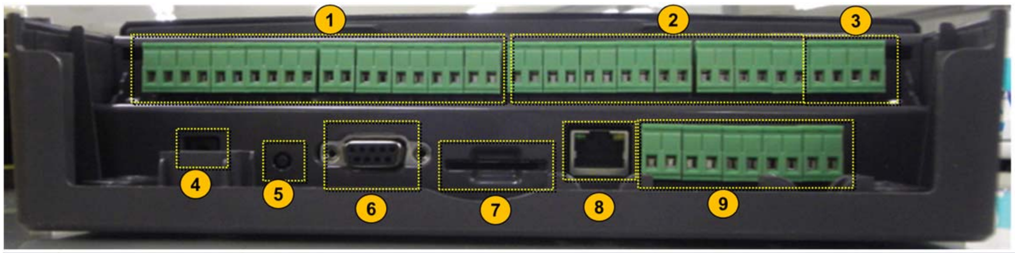
DMS 2.5 Recorded History Management

- Indoor unit operation history
- Schedule history
- Control logic operation history
- System environment setting history
- Error history
- SD card allows data storage when the DMS memory fills.





DMS 2.5 Connections

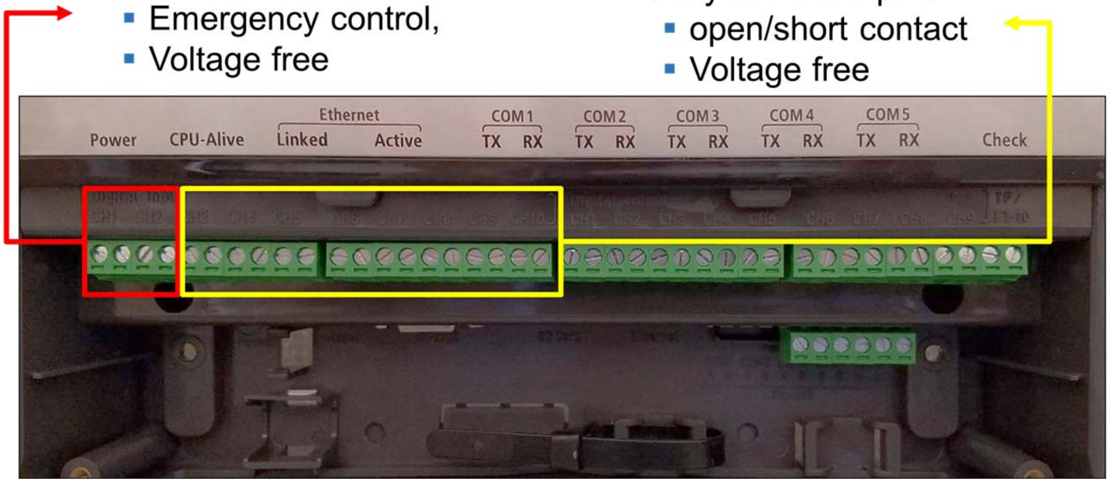


No	Name	Description
1	Digital Input	All indoor unit operation and wired/wireless remote controller use are controlled according to the option switch setting. (10Channel) Have fixed addresses
2	Digital Output	DC signal voltage is output in case of error in more than one indoor unit and outdoor unit. Output voltage : 12VDC, 200mA 8Channel have fixed addresses
3	Reserved	Not use
4	Power	Power supply to DMS. 12VDC/3.0A (adapter)
5	Reset button	Press the reset button to restart DMS.
6		Only use for R&D
7	SD card slot	SD card slot for data storage and updating software
8	LAN port	LAN connection with upper-layer devices.
9	RS485	Connect for RS485 communication with devices (5 Channel)

DMS 2.5 Connections: DI/DO

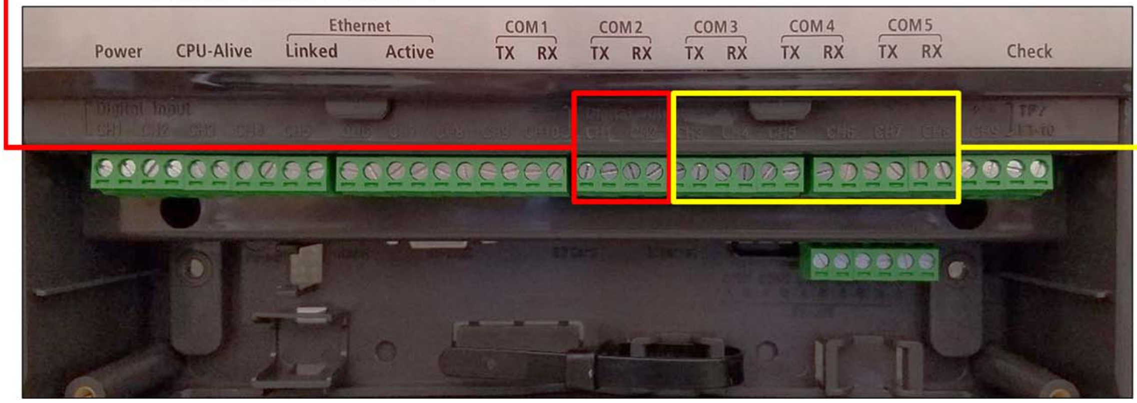
- 2 dedicated DI
  - Emergency control,
  - Voltage free

- 8 dry contact inputs
  - open/short contact
  - Voltage free


Power
CPU-Alive
Ethernet
Linked
Active
COM1
TX
RX
COM2
TX
RX
COM3
TX
RX
COM4
TX
RX
COM5
TX
RX
Check

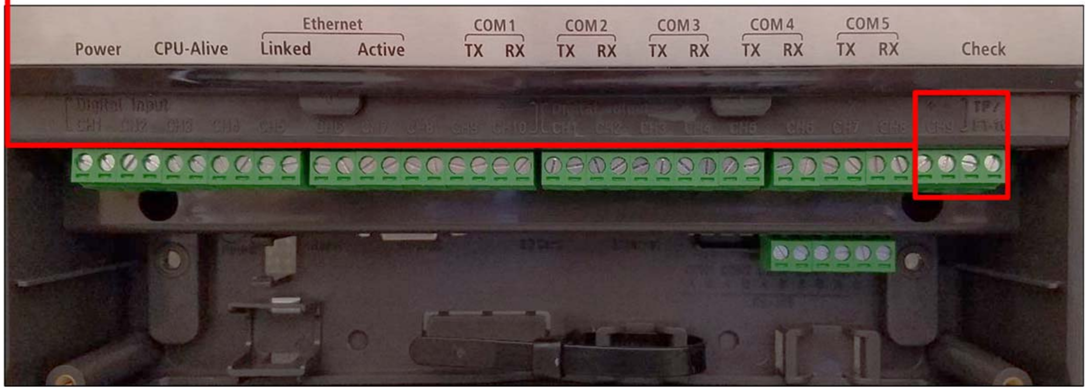
DMS 2.5 Connections: DI/DO

- 2 dedicated DO
  - Operation/Error
  - 12vdc max. 200mA
- 6, Non dedicated 12vdc outputs
  - External interlocking systems


Power
CPU-Alive
Ethernet
Linked
Active
COM1
TX
RX
COM2
TX
RX
COM3
TX
RX
COM4
TX
RX
COM5
TX
RX
Check

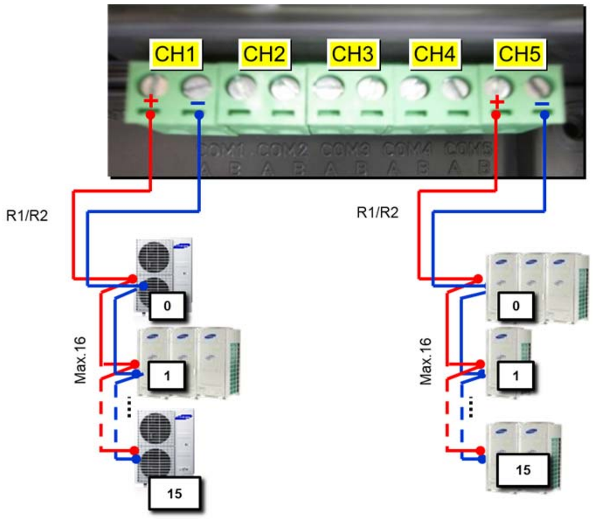
DMS 2.5 Connections: DI/DO

- 2 reserved outputs for future use


Power
CPU-Alive
Ethernet
Linked
Active
COM1
TX
RX
COM2
TX
RX
COM3
TX
RX
COM4
TX
RX
COM5
TX
RX
Check

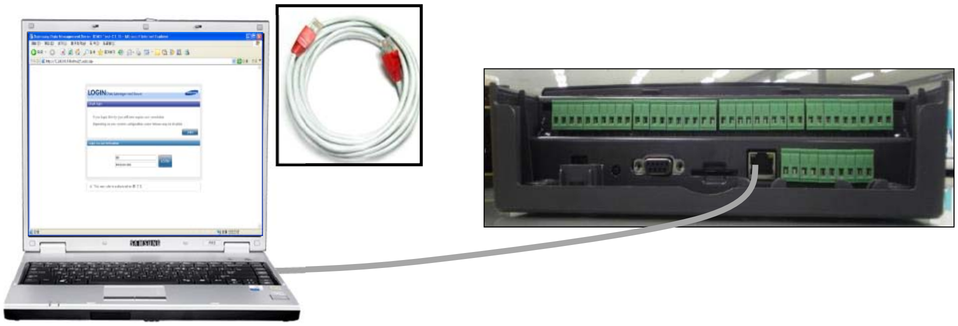
DMS 2.5 Wiring Detail

- 5 Channels
- Max 16 systems per channel
  - 16 Systems X 5 channels
  - Max 80 systems
- Any channel configuration
- Max 128 indoor units and MCU's per channel
- Max 256 indoor units Per DMS 2.5


CH1
CH2
CH3
CH4
CH5
+
−
+
−
COM1 COM2 COM3 COM4 COM5
R1/R2
R1/R2
Max.16
Max.16
0
1
15
0
1
15

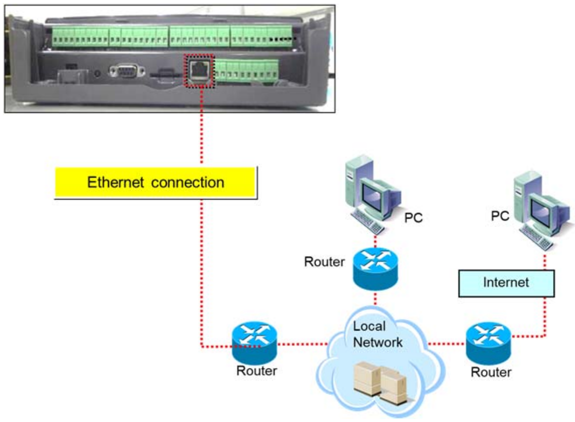
DMS 2.5 Connections

- Dedicated computer or integrated with a building network



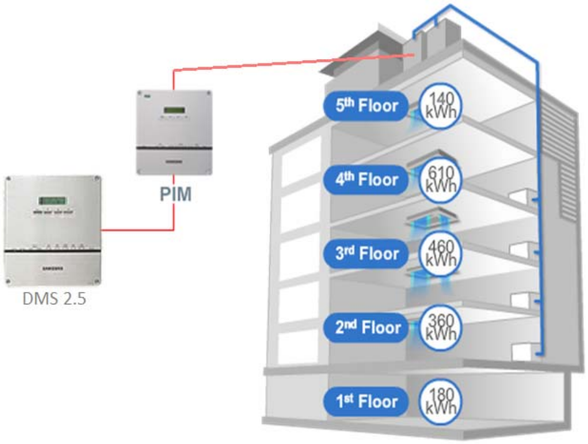
DMS 2.5 Connection Example

- Local or Remote Access available
- IP address of remote computers must be registered in the DMS
- VPN maybe required if using a computer in multiple locations


Ethernet connection
PC
PC
Router
Internet
Local Network
Router
Router

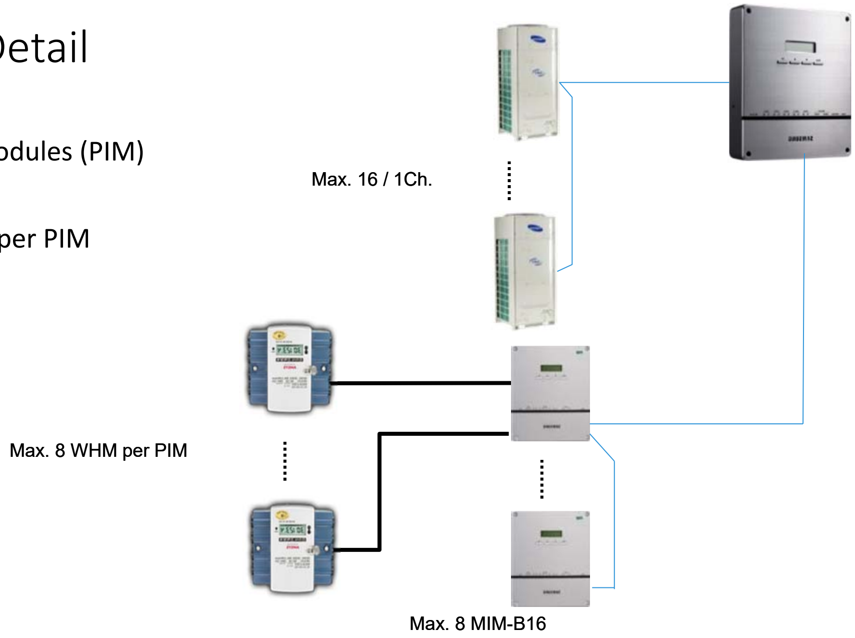
DMS 2.5 Power Distribution

- Maximum 8 MIM-B16UN per DMS 2.5
- Maximum 8 pulse type watt hour meters
- 1-year power distribution data storage
- Data query for
  - watt-hour, use time and use ratio
  - Current power consumption monitoring
- Current-type electricity meter support
  - (CT ratio input)
- Pulse Input Module required
- (PIM) MIM-B16UN
- Export data to Microsoft Excel


PIM
DMS 2.5
5th Floor
140 kWh
4th Floor
610 kWh
3rd Floor
460 kWh
2nd Floor
360 kWh
1st Floor
180 kWh

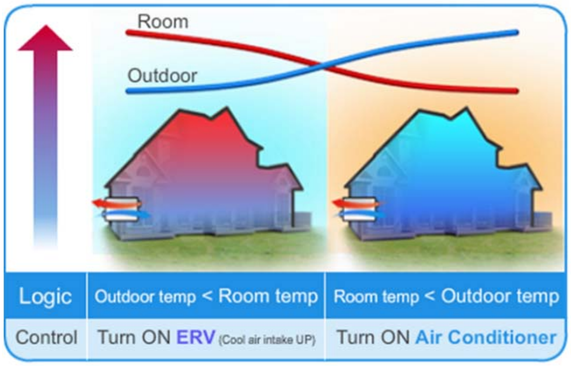
DMS 2.5 Wiring Detail

- Max 8 Power Interface Modules (PIM)
    - MIM-B16UN
- Max 8 Watt Hour Meters per PIM



DMS 2.5 Configurable Control Logic

User can edit control logic with different variable parameters



Logic	Outdoor temp < Room temp	Room temp < Outdoor temp
Control	Turn ON ERV (Cool air intake UP)	Turn ON Air Conditioner

ERV / AHU Parameters
Temperature, Power, Mode, External signal(DI)

+ AND OR +

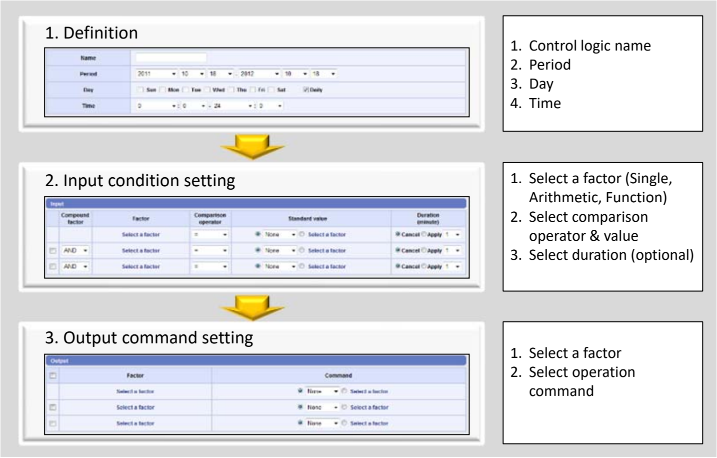
Arithmetic Equation Function
< , >, = , ≠, =>, =<, Average

\=

ERV / AHU Parameters change
Setting temp, Power, Mode, DO, Fan speed, …

DMS 2.5 Configurable Control Logic

Sequence of Control Logic Setting



1. Definition

Name	
Period	2011 10 18 - 2012 10 18
Day	☐ Sun ☐ Mon ☐ Tue ☐ Wed ☐ Thu ☐ Fri ☐ Sat ☑ Daily
Time	0 : 0 - 24 : 0

1. Control logic name
2. Period
3. Day
4. Time

2. Input condition setting

Input

	Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
		Select a factor	=	● None ○ Select a factor	●Cancel ○Apply 1
☐	AND	Select a factor	=	● None ○ Select a factor	●Cancel ○Apply 1
☐	AND	Select a factor	=	● None ○ Select a factor	●Cancel ○Apply 1

1. Select a factor (Single, Arithmetic, Function)
2. Select comparison operator & value
3. Select duration (optional)

3. Output command setting

Output

☐	Factor	Command
	Select a factor	● None ○ Select a factor
☐	Select a factor	● None ○ Select a factor
☐	Select a factor	● None ○ Select a factor

1. Select a factor
2. Select operation command

DMS 2.5 Configurable Control Logic

- Example 1 – Cool Mode
- Changing mode based on average room temperature vs. set temperature

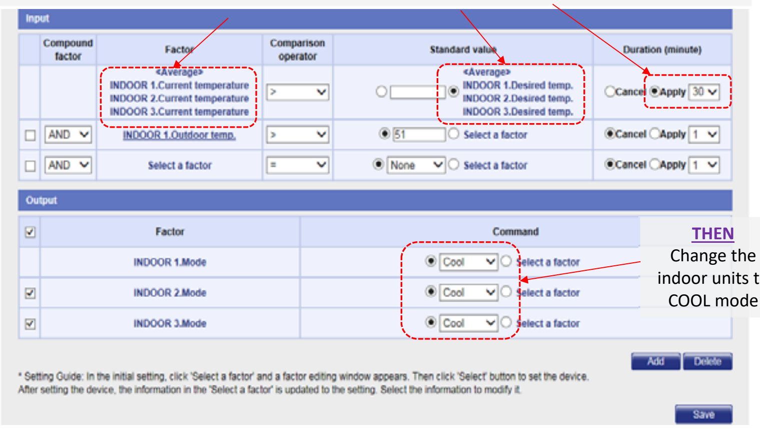
IF

The average room temperature is greater than the average set temperature

AND

Outdoor temperature is greater than 51°F

For 30 minutes



Input

	Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
		<Average> INDOOR 1.Current temperature INDOOR 2.Current temperature INDOOR 3.Current temperature	>	○ ● <Average> INDOOR 1.Desired temp. INDOOR 2.Desired temp. INDOOR 3.Desired temp.	○Cancel ●Apply 30
☐	AND	INDOOR 1.Outdoor temp.	>	● 51 ○ Select a factor	●Cancel ○Apply 1
☐	AND	Select a factor	=	● None ○ Select a factor	●Cancel ○Apply 1

Output

☑	Factor	Command
	INDOOR 1.Mode	● Cool ○ Select a factor
☑	INDOOR 2.Mode	● Cool ○ Select a factor
☑	INDOOR 3.Mode	● Cool ○ Select a factor

THEN

Change the indoor units to COOL mode

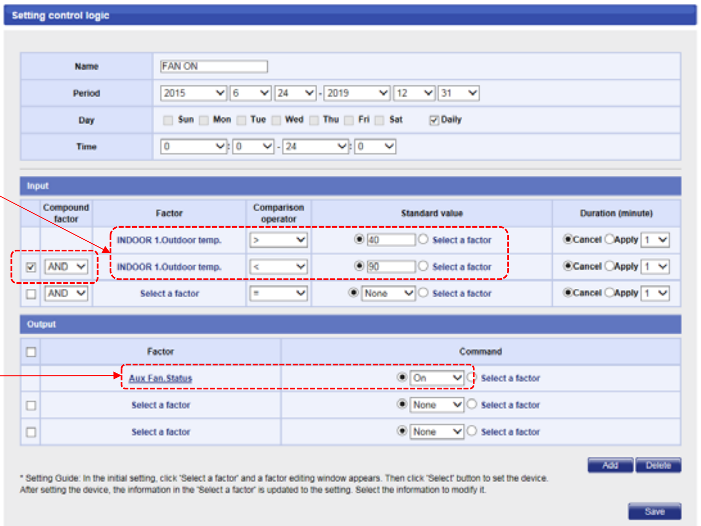
* Setting Guide: In the initial setting, click 'Select a factor' and a factor editing window appears. Then click 'Select' button to set the device. After setting the device, the information in the 'Select a factor' is updated to the setting. Select the information to modify it.

DMS 2.5 Configurable Control Logic

- Example 4
- Activate an outside air device based on OA and indoor temperature

IF
Outdoor temperature is between 40 ~ 90°F

THEN
Activate Digital Output (renamed as “AUX FAN”)



Setting control logic

Name	FAN ON
Period	2015 6 24 - 2019 12 31
Day	☐ Sun ☐ Mon ☐ Tue ☐ Wed ☐ Thu ☐ Fri ☐ Sat ☑ Daily
Time	0 : 0 - 24 : 0

Input

	Compound factor	Factor	Comparison operator	Standard value	Duration (minute)
		INDOOR 1.Outdoor temp.	>	● 40 ○ Select a factor	● Cancel ○ Apply 1
☑	AND	INDOOR 1.Outdoor temp.	<	● 90 ○ Select a factor	● Cancel ○ Apply 1
☐	AND	Select a factor	=	● None ○ Select a factor	● Cancel ○ Apply 1

Output

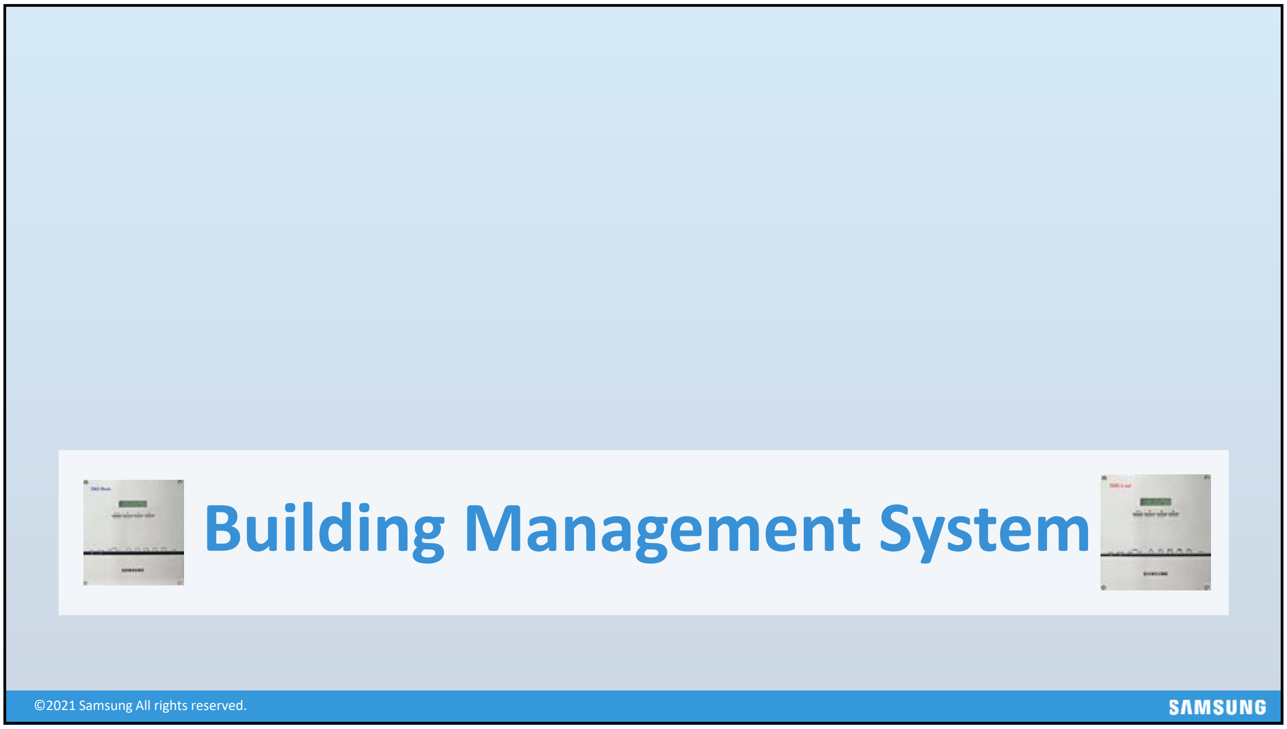
☐	Factor	Command
	Aux Fan.Status	● On ○ Select a factor
☐	Select a factor	● None ○ Select a factor
☐	Select a factor	● None ○ Select a factor

* Setting Guide: In the initial setting, click 'Select a factor' and a factor editing window appears. Then click 'Select' button to set the device. After setting the device, the information in the 'Select a factor' is updated to the setting. Select the information to modify it.

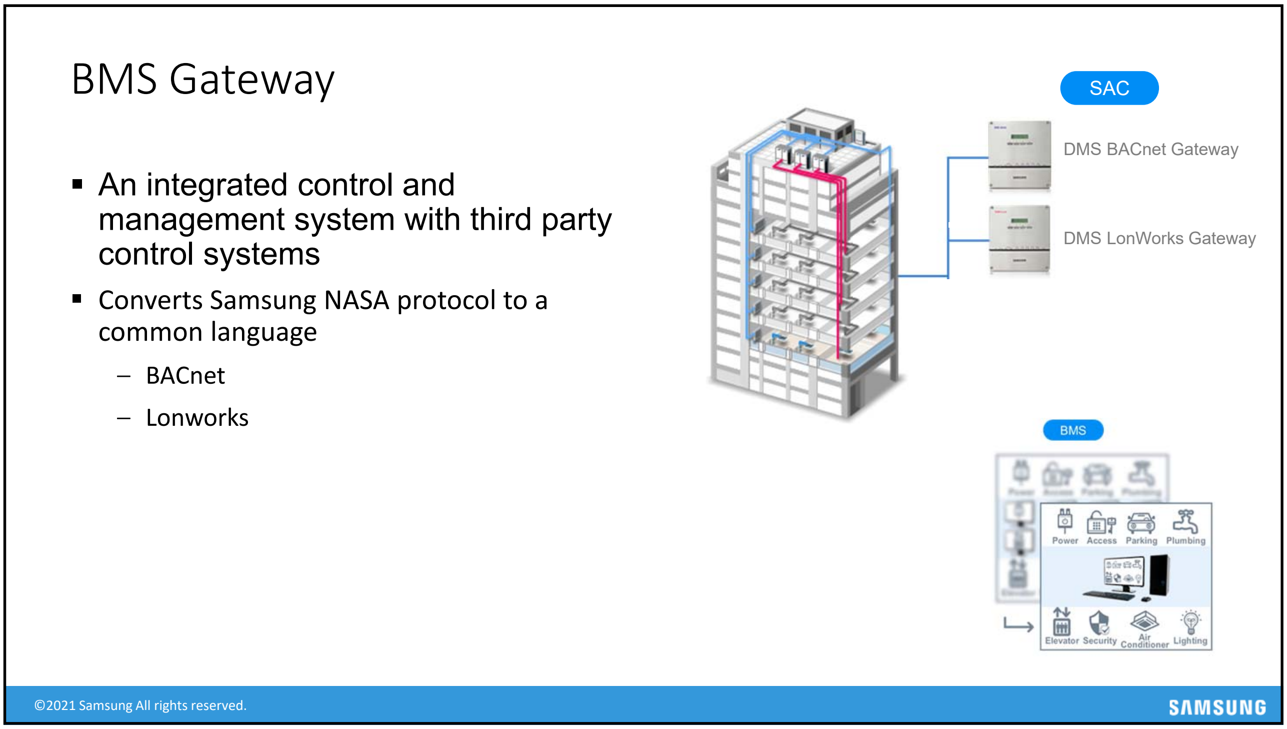
DMS 2.5 Configurable Control Logic

Basic logic tips

- If input conditions are true and output commands are being executed, the output command type cannot be changed for that unit
- Additional control logic programs must be created to undo what your logic programs may have done
  - Example 1: If you activated an ERV in bypass mode for “free cooling”, make sure that there is also a program to turn it off later if room temperature is below set temperature.
  - Example 2: If you activated a valve for backup radiant heating with a DO, make another program to turn it off once set temperature is reached.



Building Management System



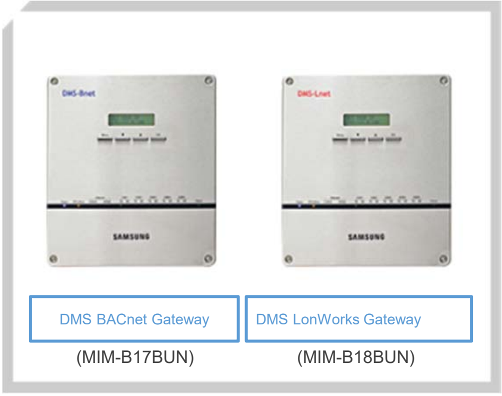
BMS Gateway

- An integrated control and management system with third party control systems
- Converts Samsung NASA protocol to a common language
  - BACnet
  - Lonworks

SAC
DMS BACnet Gateway
DMS LonWorks Gateway
BMS
Power
Access
Parking
Plumbing
Elevator
Security
Air Conditioner
Lighting

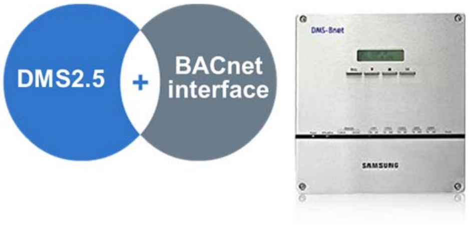
BMS Gateway

- Open protocol gateways for Building Management Systems (BMS)
- Same interface as DMS 2.5

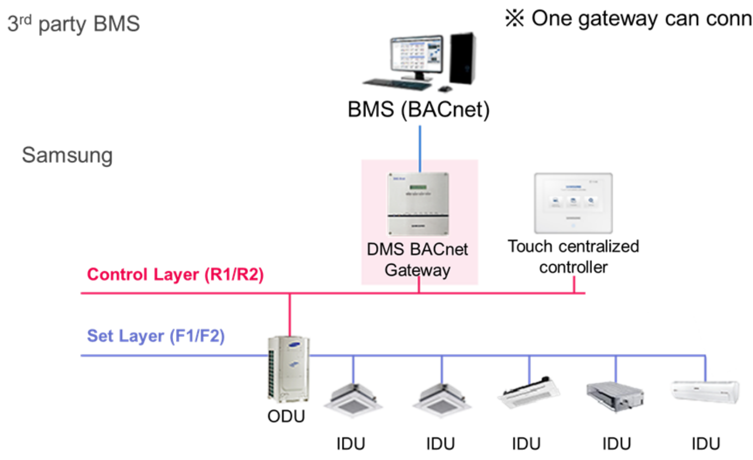

DMS-Bnet
SAMSUNG
DMS-Lnet
SAMSUNG
DMS BACnet Gateway
(MIM-B17BUN)
DMS LonWorks Gateway
(MIM-B18BUN)

DMS BACnet Gateway MIM-B17BUN

- Interface for BACnet Building Management System
- Included DMS2.5 function
- Communication connection
  - Lower layer: RS485 to Samsung Systems
- Upper layer: Ethernet 10/100 Base-T to internet
- BACnet layer: Ethernet 10/100 Base-T to BMS


DMS2.5
+
BACnet interface
DMS-Bnet
SAMSUNG

DMS BACnet Gateway MIM-B17BUN


3rd party BMS
BMS (BACnet)
Samsung
DMS BACnet Gateway
Touch centralized controller
Control Layer (R1/R2)
Set Layer (F1/F2)
ODU
IDU
IDU
IDU
IDU
IDU

※ One gateway can connect multiple outdoor units.

SAMSUNG

DMS BACnet Gateway MIM-B17BUN

BMS Control Function

- On/Off control
- Temperature setting
- Operation mode
- Fan speed/direction
- Filter alarm reset
- User control restriction
- Operation mode lock & set temp limit
- Emergency stop

Monitoring Function

- On/Off
- Set/Room temperature
- Operation mode
- Fan speed/direction
- Filter alarm
- User control restriction
- Operation mode lock & set temp limit
- Power distribution
- Error information

SAMSUNG

BACnet Control Points – Indoor Units

Instance Number	Object	Object Type	Object Name	Unit	
				Inactive	Active
				Text-1	Text-2
1	Indoor temperature	AI	AHU_RoomTemp_xx_xxxxxx	°C(°F)	
2	Set temperature	AV	AHU_Temp_Set_xx_xxxxxx	°C(°F)	
3	Setting lower temperature limit	AV	AHU_Cool_LimitTemp_xx_xxxxxx	°C(°F)	
4	Setting upper temperature limit	AV	AHU_Heat_LimitTemp_xx_xxxxxx	°C(°F)	
5	The power value of an indoor unit after the basic date	AI	AHU_Baseline_kWh_xx_xxxxxx	kWh	
6	The number of hours usage of an indoor unit after the basic date	AI	AHU_Baseline_Minute_xx_xxxxxx	Minute	
7	Power value within period	AI	AHU_Period_kWh_xx_xxxxxx	kWh	
8	The number of hours usage of an indoor unit within period	AI	AHU_Period_Minute_xx_xxxxxx	Minute	
9	Power On/Off	BV	AHU_Power_xx_xxxxxx	Off	On
10	Applying lower temperature limit setting	BV	AHU_Cool_Limit_set_xx_xxxxxx	False	True
11	Applying upper temperature limit setting	BV	AHU_Heat_Limit_set_xx_xxxxxx	False	True
12	Filter sign status	BI	AHU_FilterSign_xx_xxxxxx	False	True
13	Filter sign reset	BO	AHU_FilterSign_Reset_xx_xxxxxx	False	True

---

BACnet Control Points – Indoor Units

Instance Number	Object	Object Type	Object Name	Unit				
				Inactive				Active
				Text-1				Text-2
14	Operation mode status	MV	AHU_Operation_Mode_xx_xxxxxx	Auto	Cool	Heat	Fan	Dry
15	Operation mode limit status	MV	AHU_Mode_Limit_xx_xxxxxx	No Limit	Cool Only	Heat Only		
16	Remote controller limit status	MV	AHU_Remocon_Limit_xx_xxxxxx	Enable RC	Disable RC	Conditional RC		
17	Integrated error code of both indoor unit and outdoor unit	AI	AHU_Error_Code_xx_xxxxxx	Refer to Samsung integrated error code list				
18(*)	Discharge cooling set temperature	AV	AHU_DisCoolSetTemp_xx_xxxxxx	°C(°F)				
19(*)	Discharge heating set temperature	AV	AHU_DisHeatSetTemp_xx_xxxxxx	°C(°F)				
20(*)	Discharge current temperature	AI	AHU_Dis_CurrentTemp_xx_xxxxxx	°C(°F)				
21(**)	Humidification setting	BV	AHU_Humidification_xx_xxxxxx	Off	On			
22(**)	Outdoor air intake setting	BV	AHU_OAIntake_xx_xxxxxx	Off	On			
23(**)	Outdoor cooling setting	BV	AHU_OutdoorCool_xx_xxxxxx	Off	On			
24(*)	Fan speed status	MV	AHU_FanSpeed_xx_xxxxxx	Low	Mid	High		
25(**)	Set humidity status	MV	AHU_SetHumidity_xx_xxxxxx	Low	Mid	High		
26(**)	Current humidity status	MI	AHU_CurrentHumidity_xx_xxxxxx	Low	Mid	High		
27	AHU Notify	NC	AHU_Notify_xx_xxxxxx	When the error occurred, send event to list of destination in the recipient_list. (Max : 8)				

*Not supported as standard, additional sensors and unit configuration required.

** Not supported for North American AHU models.

BACnet Control Points – Outdoor Units

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

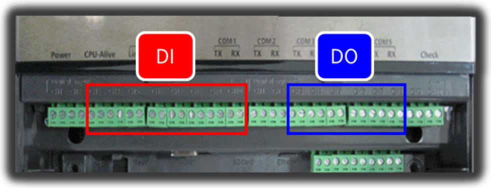
MIM-B17BUN Gateway

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

BACnet Control Points – Digital Inputs & Outputs

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

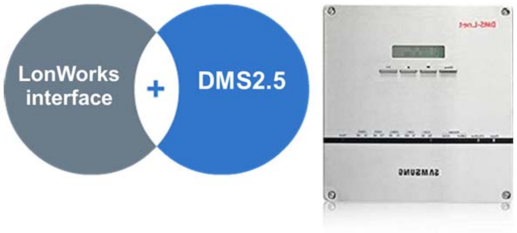
AI: Analog input (read only)
AO: Analog output (read/write)
AV: Analog value (read/write)
BI: Binary input (read only)
BO: Binary output (read/write)
BV: Binary value: (read/write)
MI: Input (read only)
MO: Output (read/write)
MV: Value (read/write)



[1] Reserved for BACnet Gateway emergency input signal
[2] Reserved for BACnet Gateway operation and error output

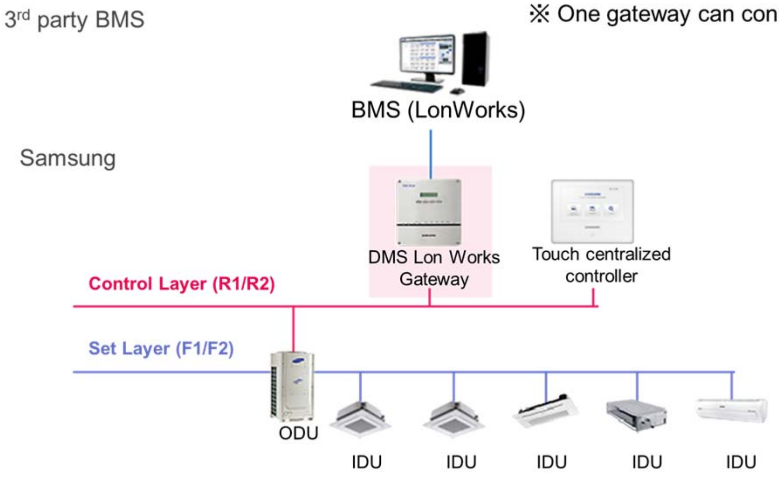
DMS Lonworks Gateway MIM-B18BUN

- Interface for Lonworks Building Management System
- Included DMS2.5 function
- Maximum 128 indoor units per gateway
- Number of objects monitored/controlled varies based on quantity of indoor unit
- Communication connection
  - Lower layer: RS485 Samsung Systems
  - Upper layer: Ethernet 10/100 Base-T To internet
- Lonworks layer: TP/FT-10A to BMS
- Lonworks limited to a max 600 points
  - Example 30 indoor units 20 points each


LonWorks interface
+
DMS2.5

DMS Lonworks Gateway

※ One gateway can connect multiple outdoor units.


3rd party BMS
BMS (LonWorks)
Samsung
DMS Lon Works Gateway
Touch centralized controller
Control Layer (R1/R2)
Set Layer (F1/F2)
ODU
IDU
IDU
IDU
IDU
IDU

DMS Lonworks Gateway MIM-B18BUN

BMS Control Function

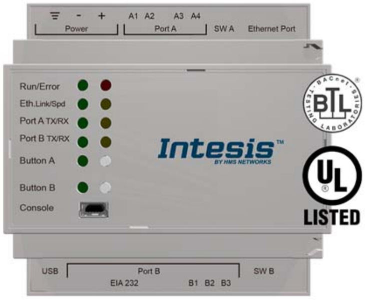
- On/Off control
- Temperature setting
- Operation mode
- Fan speed/direction
- Filter alarm reset
- User control restriction
- Operation mode lock & set temp limit
- Emergency stop

Monitoring Function

- On/Off
- Set/Room temperature
- Operation mode
- Fan speed/direction
- Filter alarm
- User control restriction
- Operation mode lock & set temp limit
- Power distribution
- Error information

Intesis™ BACnet IP-MSTP Interfaces

- Features
  - Direct access to outdoor unit's communication bus.
  - Automatic identification of the units present in the VRF system.
  - Supports BACnet/IP and BACnet MSTP physical layers.
  - Datalogging through external USB port.
  - Configuration through IP or USB (Console) port.
  - Front cover LED indicators to provide easy to check communication status on both the Ethernet and serial ports.
  - Automatic updates for both Intesis MAPS and interface's firmware.
  - Power supply not included. 24 vdc (>=140ma) recommended;

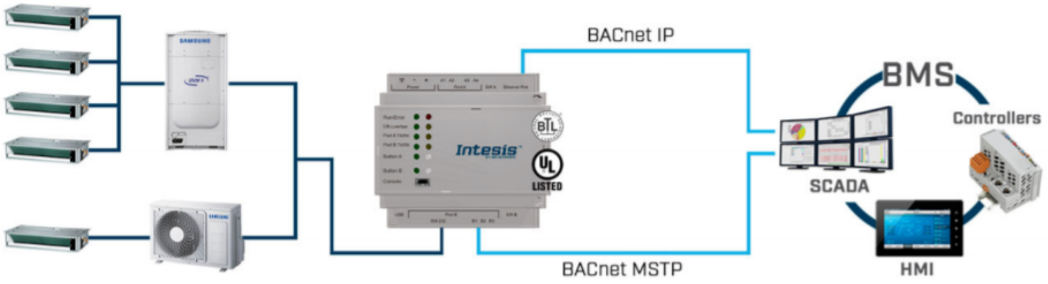

Power
A1 A2 A3 A4
Port A
SW A
Ethernet Port
Run/Error
Eth.Link/Spd
Port A TX/RX
Port B TX/RX
Button A
Button B
Console
Intesis
BY HMS NETWORKS
BTL
UL
LISTED
USB
Port B
EIA 232
B1 B2 B3
SW B

Model	Indoor Unit Quantity
INBACSAM0040000	1 - 4
INBACSAM0080000	1 - 8
INBACSAM0160000	1 - 16
INBACSAM0640000	1 - 64

Intesis™ BACnet IP-MSTP Interfaces

Use Case

Integration of Samsung NASA VRF Air Conditioner Units into a BACnet installation.


BACnet IP
BMS
Controllers
Intesis
SCADA
BACnet MSTP
HMI

Intesis™ Modbus RTU Interface

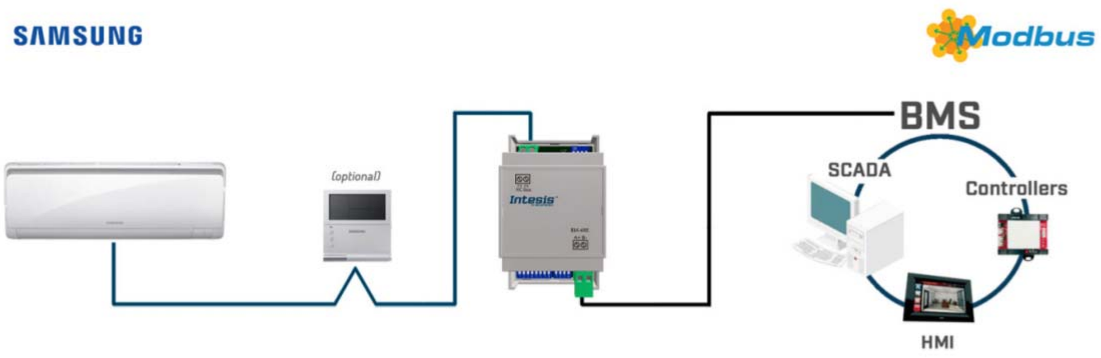
- Allows fully bi-directional communication between NASA units and Modbus RTU networks.
- Features
  - Configuration from both onboard DIP-switches and Modbus RTU.
  - Quick and easy installation
  - External power not required.
  - Simultaneous control of the AC unit by wired/wireless controllers and Modbus RTU.
  - Window contact function allows energy savings.
  - Included components: Intesis Gateway, Installation Manual

F3 F4
RC Bus
Intesis
EIA 485
A+ B-

Intesis™ Modbus RTU Interface

Use Case

Integration of Samsung NASA AC units into a Modbus RTU installation.


SAMSUNG
Modbus
(optional)
Intesis
BMS
SCADA
Controllers
HMI

Ancillary Controls & Modules

Ancillary Controls & Modules

Optional devices to provide various control solutions

Wireless signal receiver
(MRK-A10N)

Operation mode selection switch
(MCM-C200U)

External room sensor
(MRW-TA)

Compatible interface module
(MIM-N01)

Interface Module
Communication Adapter
MIM-R10UN

ERV interface module
(MIM-N10)

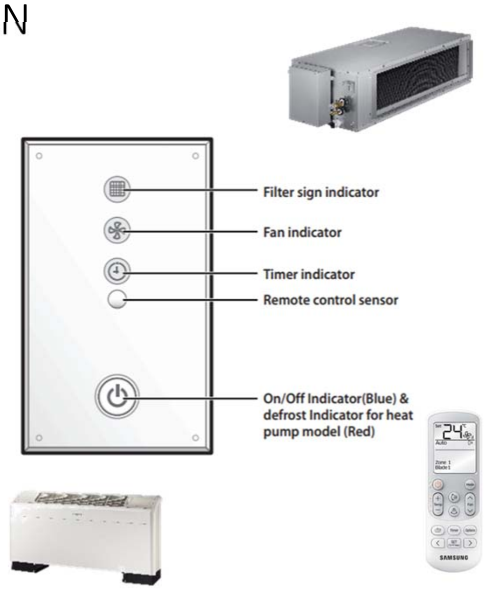
External contact interface module
(MIM-B14)

Multi Tenant Function Controller
(MCM-C210N)

Motion Detection
Sensors

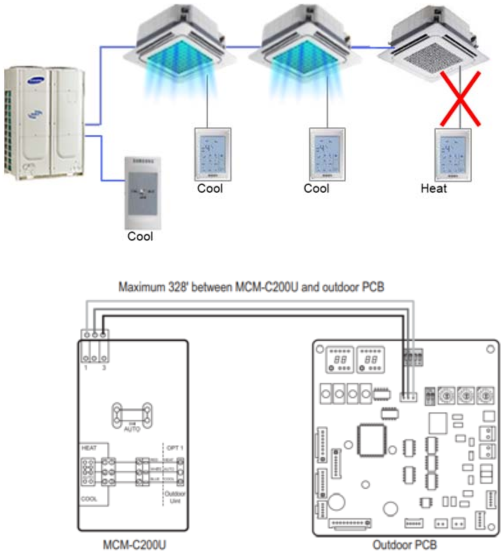
Wireless Signal Receiver – MRK-A10N

- To allow indoor units without an infrared reciver to use a wireless controller
  - Ducted/Console
  - On/Off control
  - Operation indication
  - Filter maintenance indication
  - 32’ connector cable included
- If the unit is using a wired controllers this receiver will not be needed as both our wireless controllers can receive an infrared signal


Filter sign indicator
Fan indicator
Timer indicator
Remote control sensor
On/Off Indicator(Blue) & defrost Indicator for heat pump model (Red)
SAMSUNG

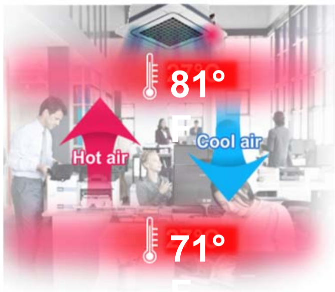
Operation Mode Selector Switch – MCM-C200U

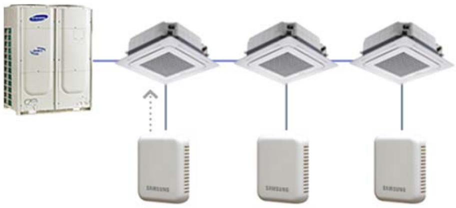
- Manual system mode select
- Heat Pump systems only
  - Cool – Heat – Auto setting options
- Installed in outdoor unit or in building
- Allows manual operation mode change preventing mixed operation
- Max. 328ft of wire between outdoor unit and MCM-C200U
- 3 conductor cable require


Cool
Cool
Heat
Cool
Maximum 328' between MCM-C200U and outdoor PCB
HEAT
COOL
AUTO
OPT 1
Outdoor Unit
MCM-C200U
Outdoor PCB

External Temperature Sensor – MRW-TA

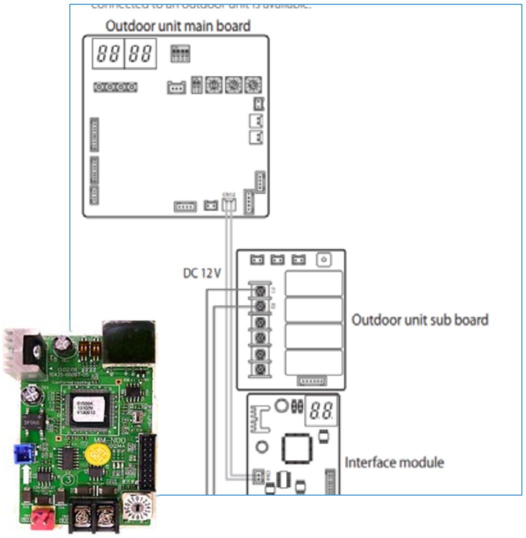
- 2-wire connection to indoor unit PCB
- Replaces unit return air sensor
- Applies to all indoor units
- Includes a 39 ft. 2-conductor cable
- Provides for more accurate room temperature control when
  - Indoor unit is installed in a high ceiling
  - Fresh air is ducted into the return
  - When using a remote controller with no built-in space sensor


81°
Hot air
Cool air
71°



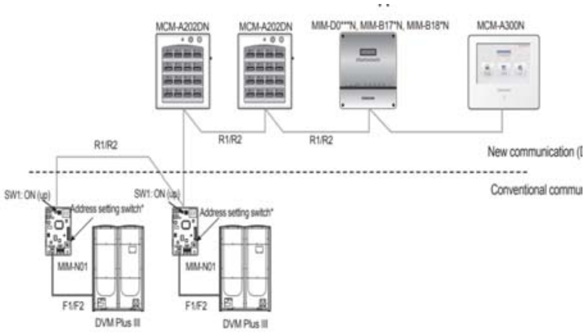
Interface Module Communication Adapter MIM-N01

- Allows connection of DVM S series systems to previous generation central control models
- Allow connection of non-NASA products to NASA communication upper-level controllers
- Installs in the outdoor unit
- Includes wire harness for
  - F1/F2
  - 12 VDC

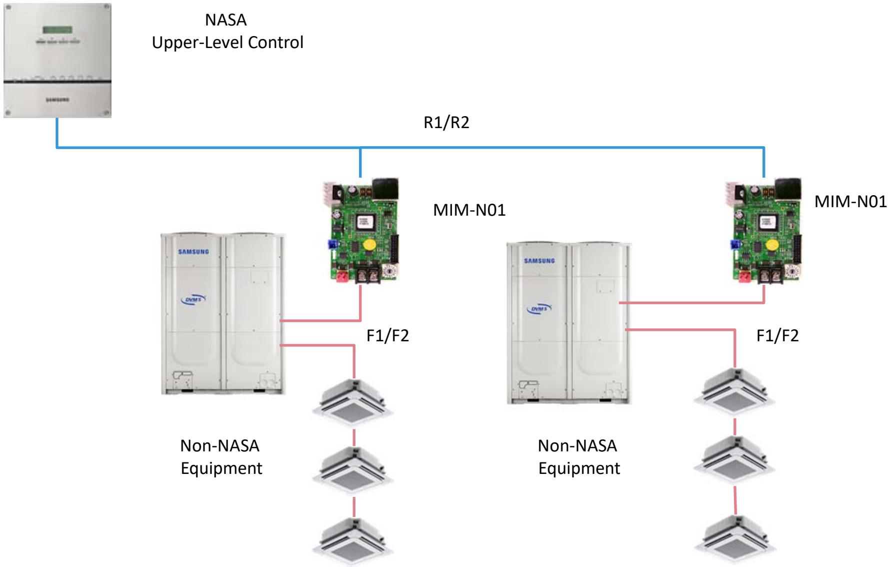

Outdoor unit main board
DC 12V
Outdoor unit sub board
Interface module
MIM-N00

Interface Module Communication Adapter MIM-N01

- Gives older equipment a R1/R2 connection
- Converts eveything to NASA
- Address will be set with a dial,
- Each unit will need a unique address


MCM-A202DN
MCM-A202DN
MIM-D0***N, MIM-B17*N, MIM-B18*N
MCM-A300N
R1/R2
R1/R2
R1/R2
New communication (
Conventional commu
SW1: ON (up)
SW1: ON (up)
Address setting switch*
Address setting switch*
MIM-N01
MIM-N01
F1/F2
F1/F2
DVM Plus III
DVM Plus III

Interface Module Communication Adapter MIM-N01



NASA
Upper-Level Control

R1/R2

MIM-N01

MIM-N01

F1/F2

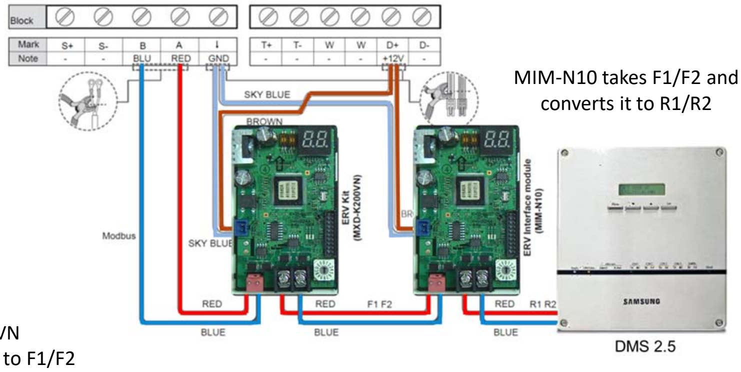
F1/F2

Non-NASA
Equipment

Non-NASA
Equipment

Interface Module Communication Adapter MIM-N10

- Used in conjunction with ERV Kit (MXD-K200VN)
- Control Fresh Access ERV'S
- Communication between upper-level controllers and the ERV units, DMS2.5, Touch centralized controller

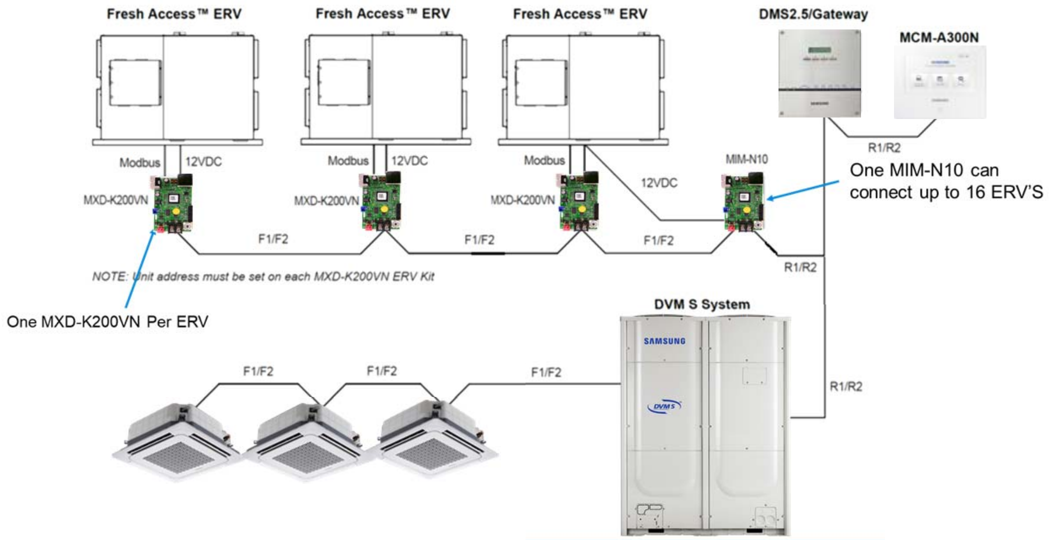

Block
Mark
Note
S+
S-
B
A
⊥
BLU
RED
GND
T+
T-
W
W
D+
D-
+12V
SKY BLUE
BROWN
Modbus
SKY BLUE
BR
ERV Kit (MXD-K200VN)
ERV Interface module (MIM-N10)
RED
BLUE
RED
BLUE
F1 F2
RED
BLUE
R1 R2
SAMSUNG

DMS 2.5

MIM-N10 takes F1/F2 and
converts it to R1/R2

MXD K200VN
converts Modbus to F1/F2

MIM-N10 & MXD-K200VN ERV Interface


Fresh Access™ ERV
Fresh Access™ ERV
Fresh Access™ ERV
DMS2.5/Gateway
MCM-A300N
R1/R2
Modbus
12VDC
Modbus
12VDC
Modbus
12VDC
MIM-N10
MXD-K200VN
MXD-K200VN
MXD-K200VN
F1/F2
F1/F2
F1/F2
R1/R2
DVM S System
F1/F2
F1/F2
F1/F2
R1/R2

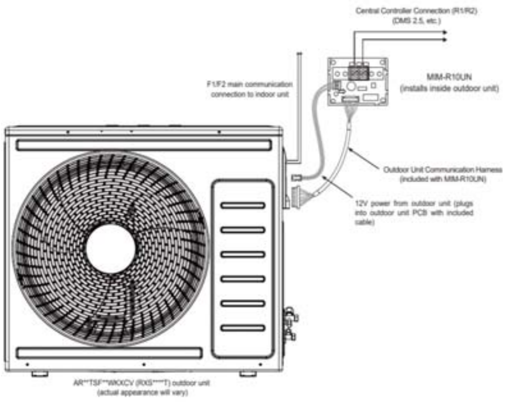
One MIM-N10 can connect up to 16 ERV'S

NOTE: Unit address must be set on each MXD-K200VN ERV Kit

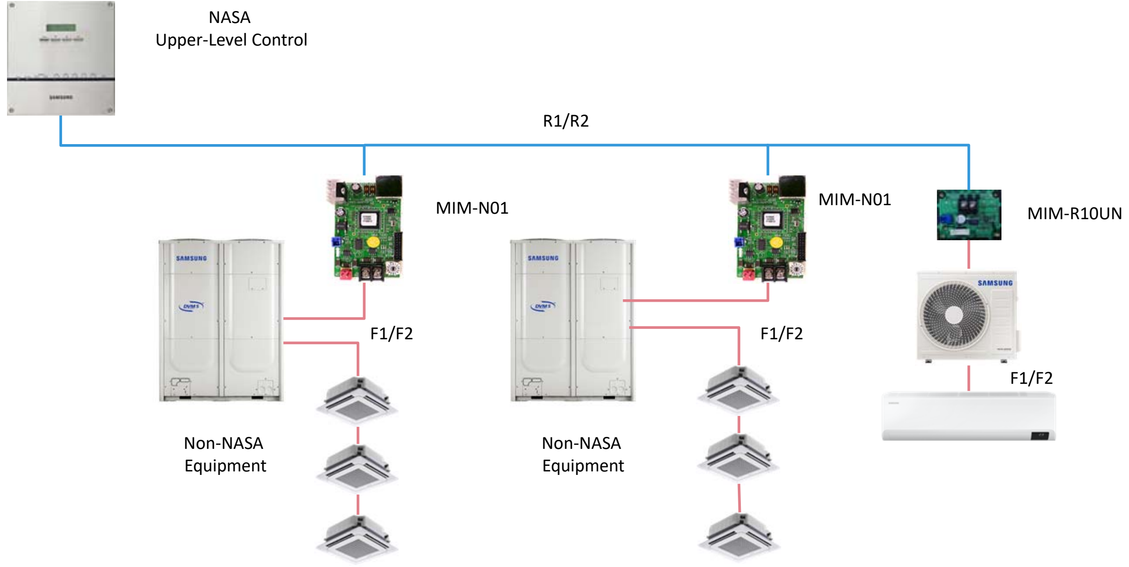
One MXD-K200VN Per ERV

Interface Module Communication Adapter MIM-R10UN

- Allows connection of Samsung 2020 RAC single zone systems to NASA
- Installs in the RAC outdoor unit with included harnesses
- One per outdoor unit is required
- Must manually set a central control channel address

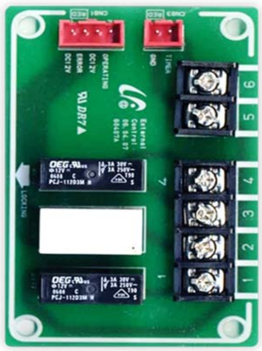

Central Controller Connection (R1/R2)
(DMS 2.5, etc.)
F1/F2 main communication connection to indoor unit
MIM-R10UN
(installs inside outdoor unit)
Outdoor Unit Communication Harness
(included with MIM-R10UN)
12V power from outdoor unit (plugs into outdoor unit PCB with included cable)
AR**TSF**WKXCV (RXS****T) outdoor unit
(actual appearance will vary)

Interface Module Communication Adapter MIM-R10UN

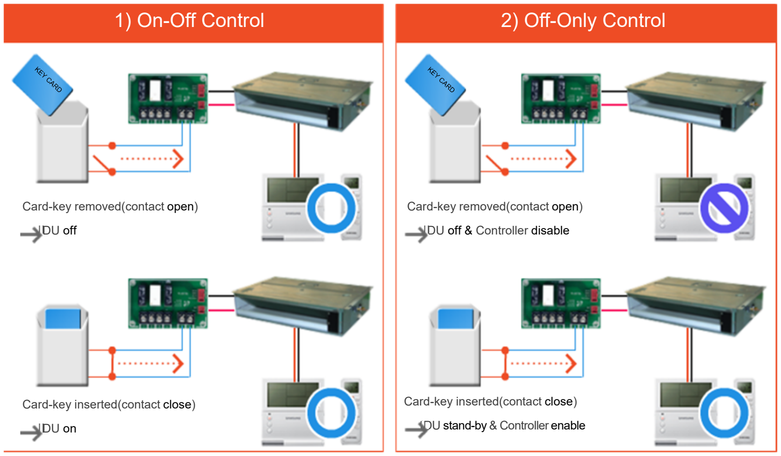

NASA
Upper-Level Control
R1/R2
MIM-N01
MIM-N01
MIM-R10UN
F1/F2
F1/F2
F1/F2
Non-NASA
Equipment
Non-NASA
Equipment

External Contact Controller – MIM-B14

- Direct indoor unit control by external contact signal
- Function examples:
  - Hotel key card switch
  - Door/window switch
  - Occupancy sensor
  - On/Off ventilation control with indoor unit thermo-on/ thermo-off
- Indoor unit operation/error state output through relay contacts
- Emergency control with simple contact input
- Compatible with all DVM S indoor fan coil units



External Contact Controller – MIM-B14



1) On-Off Control

Card-key removed(contact open)

→ IDU off

Card-key inserted(contact close)

→ IDU on

2) Off-Only Control

Card-key removed(contact open)

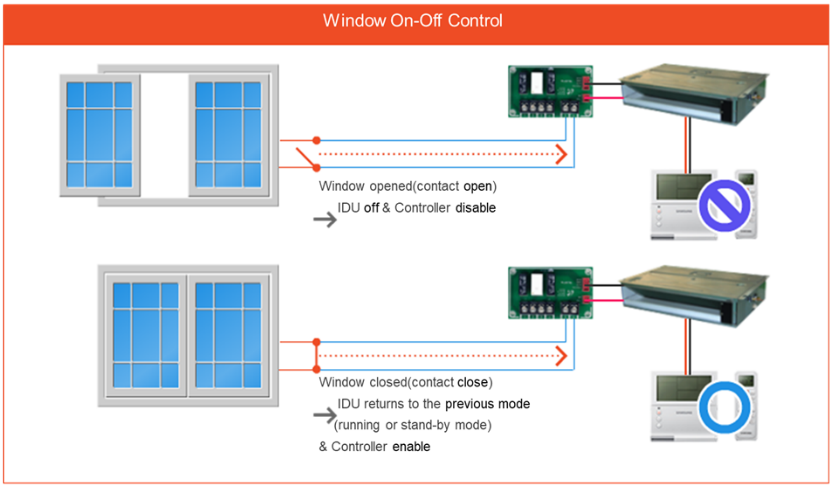
→ IDU off & Controller disable

Card-key inserted(contact close)

→ IDU stand-by & Controller enable

External Contact Controller – MIM-B14

Window synchronized indoor unit control



Window On-Off Control

Window opened(contact open)

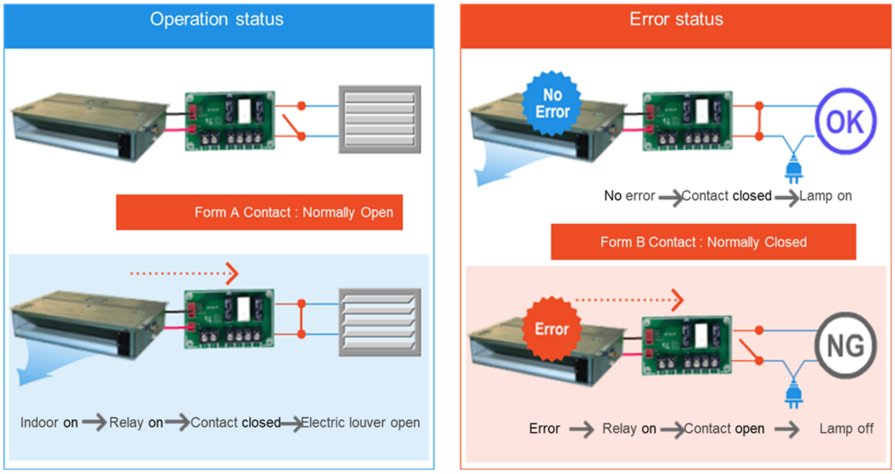
→ IDU off & Controller disable

Window closed(contact close)

→ IDU returns to the previous mode (running or stand-by mode) & Controller enable

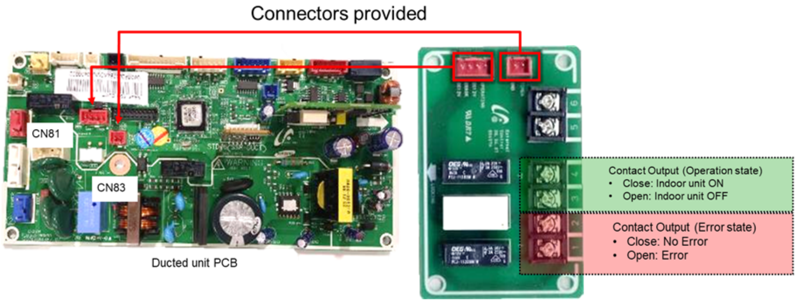
External Contact Controller – MIM-B14

Indoor unit operation/error state output through relay contacts


Operation status
Form A Contact : Normally Open
Indoor on → Relay on → Contact closed → Electric louver open
Error status
No Error
OK
No error → Contact closed → Lamp on
Form B Contact : Normally Closed
Error
NG
Error → Relay on → Contact open → Lamp off

External Contact Controller – MIM-B14

- To control other devices based on indoor unit operation
- Output terminals are open/close contacts 0 volts
- Indoor unit option setting required
    - 02 installation option setting, segment 15
- Max load rating on the Operation & Error terminals
    - 250vac, 3A

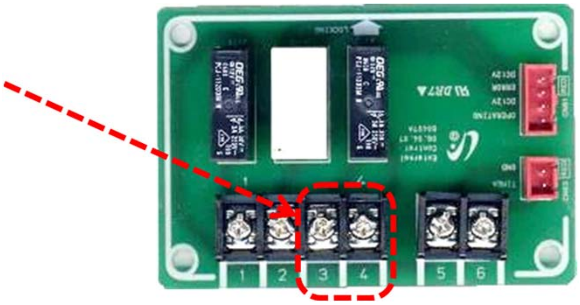

Connectors provided
CN81
CN83
Ducted unit PCB

Contact Output (Operation state)
- Close: Indoor unit ON
- Open: Indoor unit OFF

Contact Output (Error state)
- Close: No Error
- Open: Error

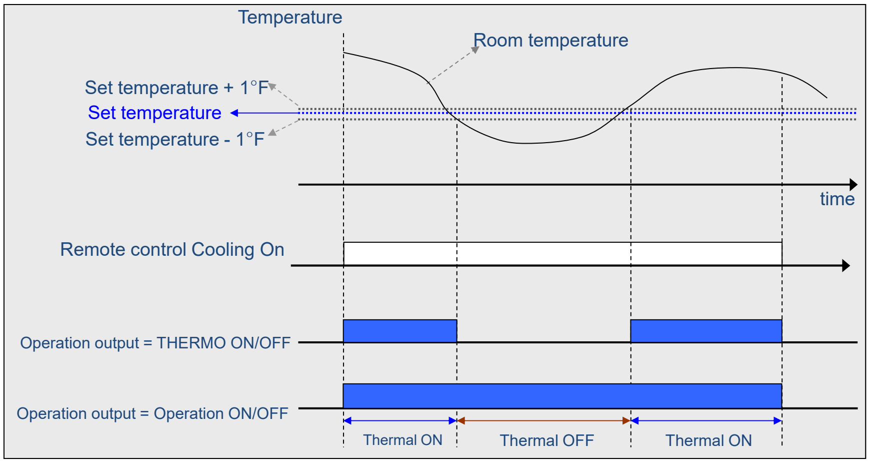
External Contact Controller – MIM-B14

- MIM-B14 Controller operation output can be modified to one of the following at a time
- Operation On/Off
  - Output based on power status of connected indoor unit (On or Off including fan)
- Thermo On/Off
  - Output based on connected indoor unit’s current operation
    - Heating/Cooling trying to condition the space
    - Satisfied set point and in a “Thermo-Off” state
    - Fan mode – contact open
- External Heat control



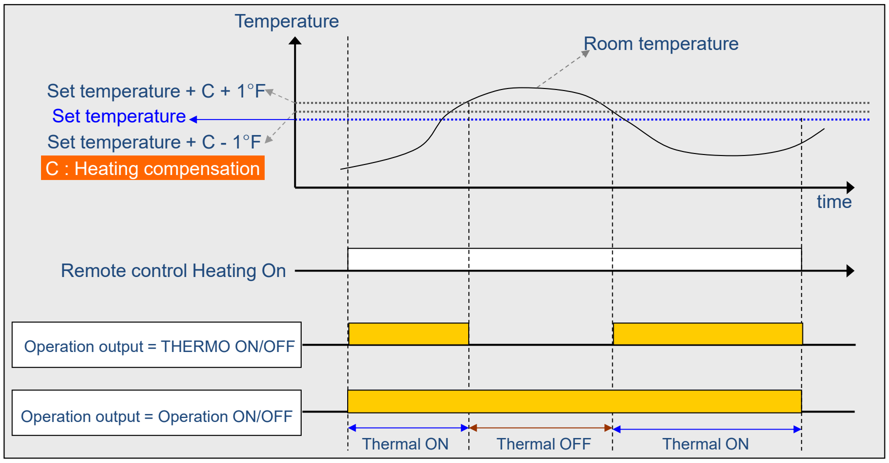
External Contact Controller – MIM-B14

Operation Output Cooling


Temperature
Room temperature
Set temperature + 1°F
Set temperature
Set temperature - 1°F
time
Remote control Cooling On
Operation output = THERMO ON/OFF
Operation output = Operation ON/OFF
Thermal ON
Thermal OFF
Thermal ON

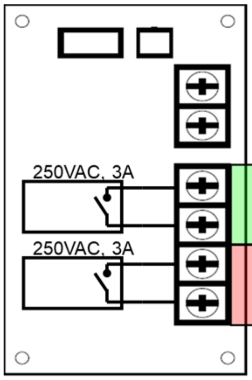
External Contact Controller – MIM-B14

Operation Output Heating



External Contact Controller – MIM-B14

- Thermo-On/Off Operation
  - Output terminals are dry contacts Open/Close with 0 volts
  - Maximum 250vac, 3A can be applied to the operation and error output terminals



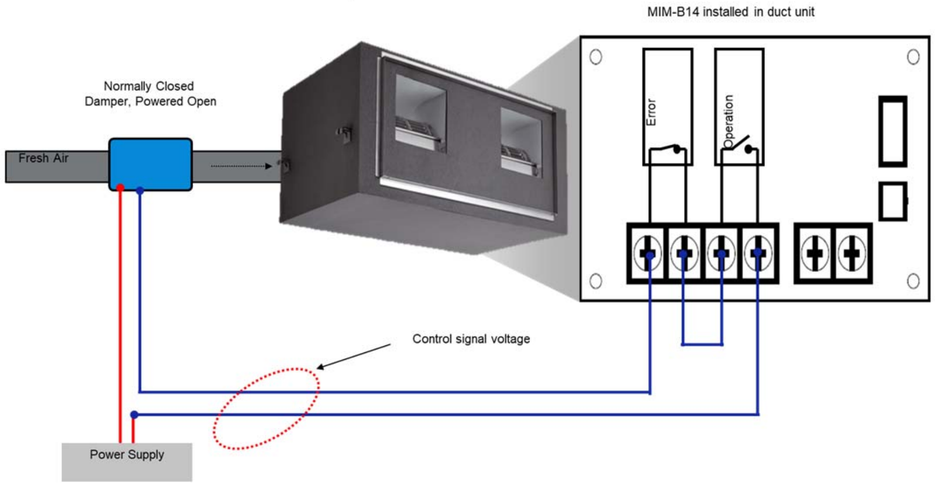
Operation state
- Close: Indoor unit ON
- Open: Indoor unit OFF

Error state
- Close: No Error
- Open: Error

Indoor unit operation	Operation state
Cooling (Thermo **ON**)	Close (20 second delay)
Cooling (Thermo **OFF**)	Open (20 second delay)
Heating (Thermo **ON**)	Close (120 second delay)
Heating (Thermo **OFF**)	Open (120 second delay)
FAN	Open

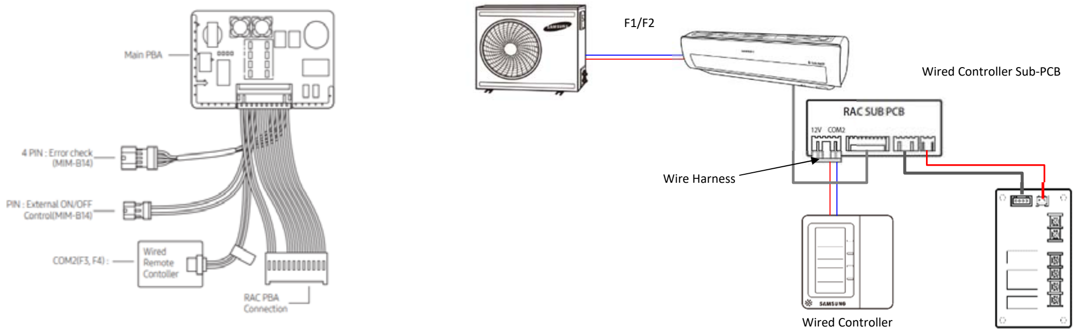
External Contact Controller – MIM-B14

Control fresh air intake damper


MIM-B14 installed in duct unit
Normally Closed
Damper, Powered Open
Fresh Air
Error
Operation
Control signal voltage
Power Supply

External Contact Controller – MIM-B14

- RAC & FJM wall mount units
  - All units require wired controller sub-PCB and wire harness when using the MIM-B14
  - Change installation option setting code to enable the External Contact Controller

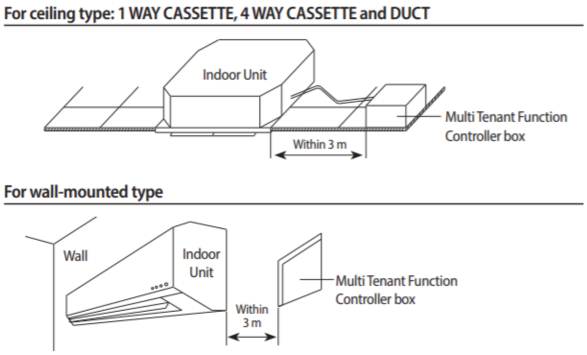

Main PBA
4 PIN : Error check
(MIM-B14)
PIN : External ON/OFF
Control(MIM-B14)
COM2(F3, F4) :
Wired
Remote
Contoller
RAC PBA
Connection
F1/F2
Wired Controller Sub-PCB
RAC SUB PCB
12V
COM2
Wire Harness
Wired Controller

Multi-Tenant Function Controller – MCM-C210N

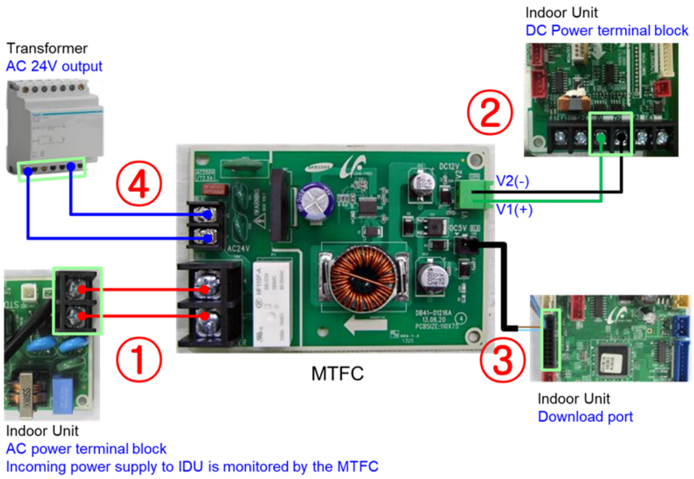
- Used in applications where an indoor unit will not have power for long periods to allow full system operation.
  - If an indoor unit loses power the DVM S system will lock out on an E201 error code after 2 minutes
  - Timing can be changed to 12 or 24 hours
  - MTFC can keep the system online
- One MTFC per DVM S indoor unit
  - Monitors supply voltage to the indoor unit
  - Supplies auxiliary power to maintain communication during power loss
  - Powers the EEV closed during power loss to avoid water damage
    - Condensation
    - Drain pump not powered causing water overflow
    - 5 VDC to maintain communication
    - 12 VDC to power EEV closed for safety

Multi-Tenant Function Controller – MCM-C210N

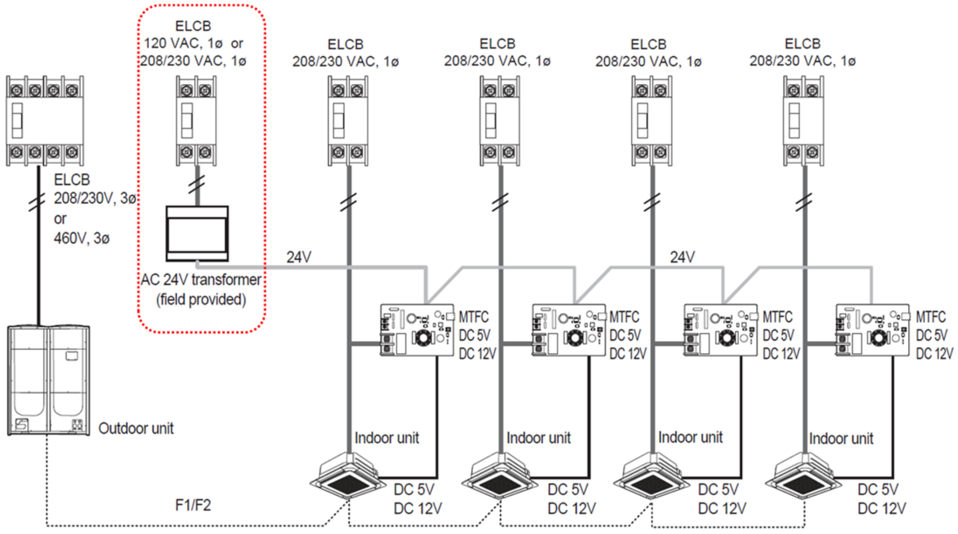
- Controller power supply:
  - 24vac 50/60Hz transformer (not provided)
- Transformer must be powered from a separate circuit
- Indoor unit connection cable
  - Max length 118”
- One Wired Remote controller cannot be connected to multiple indoor units when using the MTFC
- The MTFC must be installed in an NEC approved enclosure (field provided)


For ceiling type: 1 WAY CASSETTE, 4 WAY CASSETTE and DUCT
Indoor Unit
Multi Tenant Function Controller box
Within 3 m
For wall-mounted type
Wall
Indoor Unit
Within 3 m
Multi Tenant Function Controller box

Multi-tenant Function Controller – MCM-C210N


Transformer
AC 24V output
Indoor Unit
DC Power terminal block
②
④
V2(-)
V1(+)
①
MTFC
③
Indoor Unit
Download port
Indoor Unit
AC power terminal block
Incoming power supply to IDU is monitored by the MTFC

Multi-Tenant Function Controller – MCM-C210N


ELCB
120 VAC, 1ø or
208/230 VAC, 1ø
ELCB
208/230 VAC, 1ø
ELCB
208/230 VAC, 1ø
ELCB
208/230 VAC, 1ø
ELCB
208/230 VAC, 1ø
ELCB
208/230V, 3ø
or
460V, 3ø
24V
24V
AC 24V transformer
(field provided)
MTFC
DC 5V
DC 12V
MTFC
DC 5V
DC 12V
MTFC
DC 5V
DC 12V
MTFC
DC 5V
DC 12V
Outdoor unit
Indoor unit
Indoor unit
Indoor unit
Indoor unit
DC 5V
DC 12V
DC 5V
DC 12V
DC 5V
DC 12V
DC 5V
DC 12V
F1/F2

Motion Detect Sensors

- MCR-SMA Motion Sensor
  - Standard Mini 4-Way Cassette
- MCR-SMC Motion Sensor
  - Wind-Free™* 4 Way Cassette
- MCR-SMD Motion Sensor
  - Wind-Free™* Mini 4 Way
- MCR-SME Motion Sensor
  - 360 Cassette

MCR-SMA Motion Sensor – Mini 4-Way Cassette

- Samsung Comfort Logics (activated in "Premium" mode)
- Comfort Flow:
  - MDS prevents cassette from blowing directly on occupants by changing air flow direction
- Comfort Temperature:
  - When the temperature difference between the upper and lower parts of the room is large, the supply air louvers will lower to direct air downward
- Comfort Saving:
  - When no motion is detected, MDS will adjust set temperature to reduce energy consumption (maximum +3.6º F in cooling, and -3.6º F in heating)

Mode	Soft Off (minutes)	Hard Off (minutes)	Function Description
Standard	20	30	SOFT OFF: turns off indoor unit but can restart with motion detection before HARD OFF. HARD OFF: Turns unit off but will not turn back on after motion is sensed. Unit will need to be power ON with a unit controller.
	40	60	
	80	120	
	120	180	
Premium	20	30	SOFT OFF and HARD OFF are the same as Standard Mode. Samsung comfort functions are activated.
	40	60	
	80	120	
	120	180	

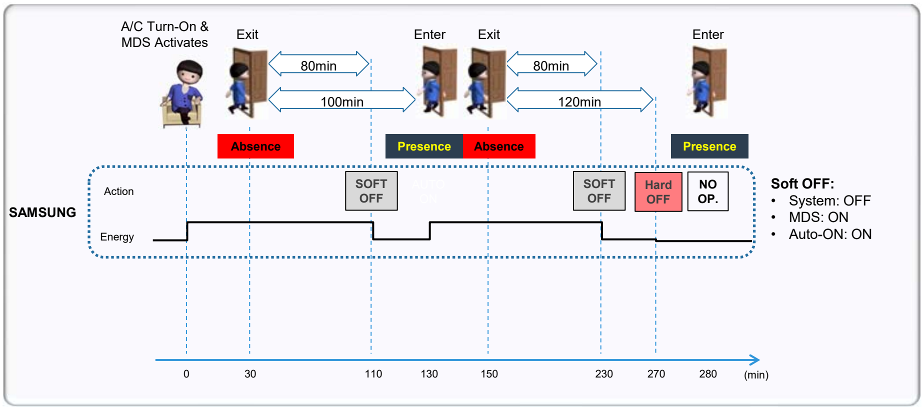
MCR-SMC,D,E Motion Sensor – Mini 4-Way Cassette

- Samsung Comfort Logics (activated in "Premium" mode)
- Comfort Flow:
  - MDS prevents cassette from blowing directly on occupants by changing air flow direction
- Comfort Temperature:
  - When the temperature difference between the upper and lower parts of the room is large, the supply air louvers will lower to direct air downward
- Comfort Saving:
  - When no motion is detected, MDS will adjust set temperature to reduce energy consumption (maximum +3.6º F in cooling, and -3.6º F in heating)

Mode	Soft Off (minutes)	Hard Off (minutes)	Function Description
Standard	20	30	SOFT OFF: turns off indoor unit but can restart with motion detection before HARD OFF. HARD OFF: Turns unit off but will not turn back on after motion is sensed. Unit will need to be power ON with a unit controller.
	40	60	
	80	120	
Premium	20	30	SOFT OFF and HARD OFF are the same as Standard Mode. Samsung comfort functions are activated.
	40	60	
	80	120	

Motion Detect Sensors

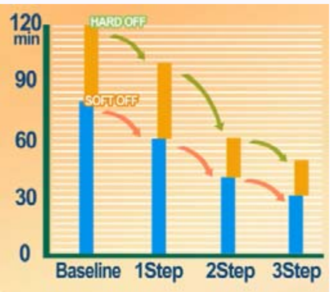
Power On/Off


A/C Turn-On & MDS Activates
Exit
Enter
Exit
Enter
80min
100min
80min
120min
Absence
Presence
Absence
Presence
SAMSUNG
Action
Energy
SOFT OFF
SOFT OFF
Hard OFF
NO OP.
Soft OFF:
System: OFF
MDS: ON
Auto-ON: ON
0
30
110
130
150
230
270
280
(min)

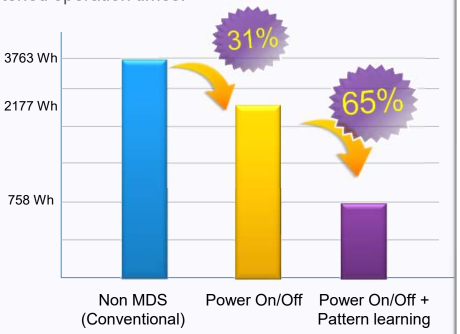
Motion Detect Sensors

Pattern Learning Function Details

- Pattern Learning Function is implemented with ON/OFF function baseline (default OFF times)
- Pattern Learning Function is 3rd step
- If there is a pattern of leaving and not returning, the MDS will slowly decrease the amount of time for Soft OFF and Hard OFF saving energy with shortened operation times.



*ON/OFF Function 120min



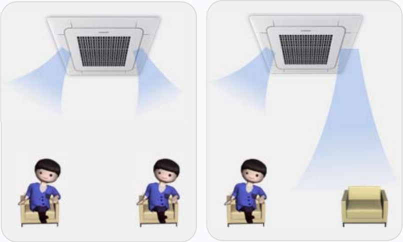
*Cooling set point 64.4° F, 18,000 btu/h Mini 4way 1 set

Motion Detect Sensors

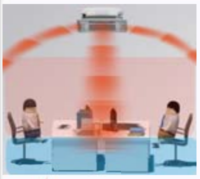
Indirect Air Flow

- People sensing O → avoid direct air flow
- People sensing X → direct air flow

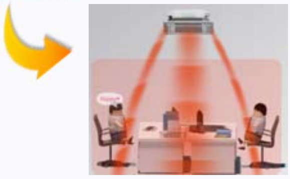
⇒ Feeling comfortable



Floor Temperature Sensing



Ceiling Temperatures sensing - Temperature difference of Floor-Ceiling



Floor – Ceiling Temperatures sensing
Feeling comfortable

24VAC Thermostat Adapter MIM-A60UN

Features

- Allow control of indoor units with a standard 24VAC thermostat
- One adapter per indoor unit connected to F3-F4

Basic control of:

- Power: ON/OFF
- Mode: Heat, Cool, Fan
- Supports 1 or 2 stages cooling inputs, 1 or 2 stages heating inputs

Can be configured to operate the indoor unit as

- Primary heating source
- Secondary heating source
- Cooling only with heat from an external source only

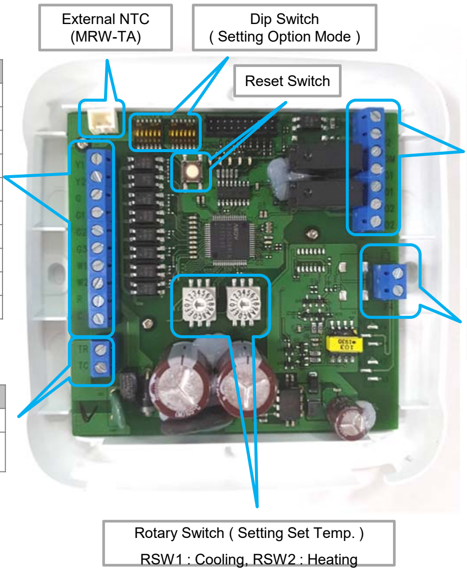
External contact input to disable the unit when contact is opened

---

24VAC Thermostat Adapter MIM-A60UN

No	Name	Description
1	Y1	Stage 1 cooling
2	Y2	Stage 2 cooling
3	G	Fan
4	G1	Low Fan
5	G2	Mid Fan
6	G3	High Fan
7	W1	Stage 1 heating
8	W2	Stage 2 heating
9	R	24VAC (out) to Thermostat
10	C	Common (out) to Thermostat

No	Name	Description
1	TR	24VAC (In) from Transformer
2	TC	Common (In) from Transformer

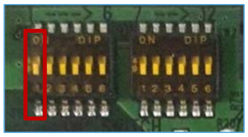

External NTC (MRW-TA)
Dip Switch (Setting Option Mode)
Reset Switch
Rotary Switch (Setting Set Temp.)
RSW1 : Cooling, RSW2 : Heating

No	Name	Description
1	DI1	Dry contact input
2	DI2	Not USE
3	DI-Com	Input common
4	DO1	Error Feedback output
5	DO1	Error Feedback output
6	DO2	E. external heat output
7	DO2	E. external heat output

No	Name	Description
1	F3	RS485 PLC communication (Connected Indoor Unit)
2	F4	

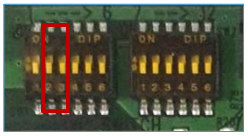
24VAC Thermostat Adapter MIM-A60UN

- Basic priority :
  - Central control and wireless remote control will operate normally. If the indoor unit is controlled by central control or wireless remote control, the displayed indoor status on the thermostat and the actual status of the indoor unit may be different.
- Thermostat priority :
  - The thermostat control will be applied first and will control the indoor unit based on the thermostat demand. Indoor units with this option set to ON will ignore wireless remote control and central control commands including central controller schedule, logic control, etc. Central controllers will only monitor indoor unit status.



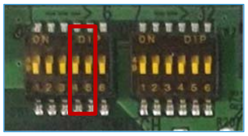
SW1	Operation priority setting
ON	Thermostat priority
OFF	Basic priority (default)

24VAC Thermostat Adapter MIM-A60UN



SW2	Use External DI Function
ON	DI Function enable (dry contact)
OFF	DI Function disable (default)

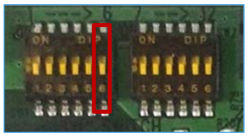
SW3	Use External DO Function
ON	DO Function enable
OFF	DO Function disable (default)



SW4	Select Error Feedback Function
ON	Enable Error Feedback
OFF	Disable Error Feedback (default)

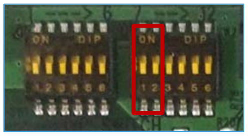
SW5	Select External Heater Function
ON	Enable support for external heat
OFF	Disable support for external heat (default)

24VAC Thermostat Adapter MIM-A60UN



For the external thermistor, use the external room sensor (MRW-TA) supplied by Samsung Electronics.

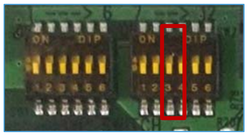
SW6	External Thermistor(NTC) setting
ON	Use External Thermistor
OFF	Do not use External Thermistor (default)



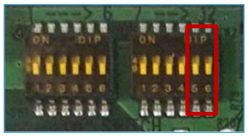
SW7	SW8	Stage 1, 2 Heat sources option
ON	ON	W1 (Stage 1 heat) energized : SAMSUNG AC OFF
		W2 (Stage 2 heat) energized : SAMSUNG AC OFF
ON	OFF	W1 (Stage 1 heat) energized : SAMSUNG AC OFF
		W2 (Stage 2 heat) energized : Turn on SAMSUNG AC with Heat Mode
OFF	ON	W1 (Stage 1 heat) energized : Turn on SAMSUNG AC with Fan Mode
		W2 (Stage 2 heat) energized : Turn on SAMSUNG AC with Heat Mode
OFF	OFF	W1 (Stage 1 heat) energized : Turn on SAMSUNG AC with Heat Mode (default)
		W2 (Stage 2 heat) energized : Turn on SAMSUNG AC with Heat Mode (default)

SAMSUNG

24VAC Thermostat Adapter MIM-A60UN



SW9	SW10	In case of using ‘G’ Input
ON	ON	FAN Speed (LOW)
ON	OFF	FAN Speed (MID)
OFF	ON	FAN Speed (HIGH)
OFF	OFF	FAN Speed : Auto (default)



SW11	SW12	If using ‘G’ Input under thermal off condition
ON	ON	FAN Speed (HIGH)
ON	OFF	FAN Speed (LOW)
OFF	ON	FAN Speed (MID)
OFF	OFF	FAN Speed (HIGH) (default)

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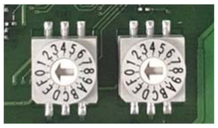
24VAC Thermostat Adapter MIM-A60UN



► RSW1 : Cool mode set temperature (Y1/Y2), (Cooling: 64.4°F ~ 82.4°F)

RSW1	0(Default)		1		2		3		4		5		6		7	
Input	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
°F	73.4	68	68	64.4	69.8	66.2	71.6	68	75.2	71.6	77	73.4	78.8	75.2	80.6	77

	8		9		A		B		C		D		E		F	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
°F	69.8	64.4	71.6	64.4	73.4	64.4	75.2	64.4	77	64.4	78.8	64.4	80.6	64.4	82.4	64.4

► RSW2 : Heat mode set temperature (W1/W2), (Heating: 68°F ~ 86°F)

RSW2	0(Default)		1		2		3		4		5		6		7	
Input	W1	W2	W1	W2	W1	W2	W1	W2	W1	W2	W1	W2	W1	W2	W1	W2
°F	71.6	77	69.8	75.2	73.4	78.8	77	82.4	78.8	84.2	80.6	86	68	86	69.8	86

	8		9		A		B		C		D		E		F	
	W1	W2	W1	W2	W1	W2	W1	W2	W1	W2	W1	W2	W1	W2	W1	W2
°F	71.6	86	73.4	86	75.2	86	77	86	78.8	86	82.4	86	71.6	77	71.6	77

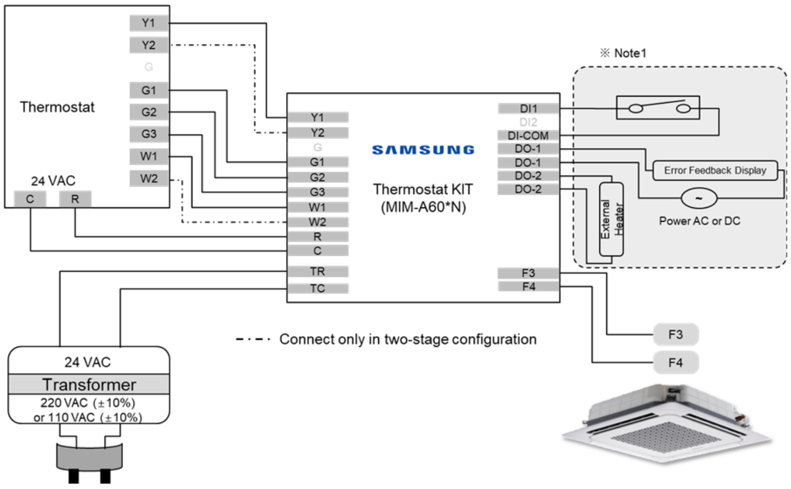
Warning

The indoor unit may not operate properly if it is set to “discharge air temperature” control.

If this situation is encountered, change the setting to “indoor temperature” control (default indoor unit setting).

24VAC Thermostat Adapter MIM-A60UN

One or Two Stage cooling and heating, with dedicated fan speed control


Thermostat
Y1
Y2
G
G1
G2
G3
W1
W2
24 VAC
C
R
Y1
Y2
G
G1
G2
G3
W1
W2
R
C
TR
TC
SAMSUNG
Thermostat KIT
(MIM-A60*N)
DI1
DI2
DI-COM
DO-1
DO-1
DO-2
DO-2
F3
F4
※ Note1
Error Feedback Display
~
Power AC or DC
External Heater
F3
F4
24 VAC
Transformer
220 VAC (±10%)
or 110 VAC (±10%)

-·-· Connect only in two-stage configuration

DVM Chiller Control

Samsung’s DVM Chiller

Capacities and Specifications

SAMSUNG
DVM CHILLER

DVM Chiller~

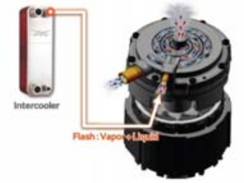
Available capacities - 10 | 15 ton modules (Heat pump only)

- Connect up to 16 units for system capacities up to 240 tons
- 208-230V / 60Hz / 3 Ø or 460V / 60Hz / 3 Ø
- Outdoor unit static pressure up to 0.32” WC
- • Water temperature ranges
  - Cooling: 41°F - 77°F (5°C – 25°C) as standard, 14°F – 77°F (-10°C – 25°C)*
  - Heating: 77°F - 131°F (25°C - 55°C)**

~Requires FCU Interface Module

Samsung’s DVM Chiller

Key Features



MIM-F00N

16 single 10 or 15-ton modular chillers can be combined to achieve 240-tons from a single system.

Capacity Modulation
Its compatibility and high space efficiency makes it perfect for replacing existing chillers as it cuts down maintenance costs and frees-up valuable space while expanding overall capacity.

Advanced Performance and Efficiency
Boasts a highly efficient BLDC inverter compressor with flash injection technology.

Flash Injection
Uses Samsung BLDC scroll compressors with flash injection technology for increased low ambient heating performance.

Control Options*
Optional Fan Coil Unit Control Kits and Fan Coil Interface Modules are available to control and integrate third-party fan coil units to Samsung central and local controls.

*Used with MIM-F00N FCU Control Kits, requires MIM-F10N Interface Module

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Samsung’s DVM Chiller

Controls and Accessories

MCM-A00N

Module Controller

- Required to operate the DVM Chiller
- DVM Chiller ON/OFF control (module/group)
- Operation mode, water outlet temperature setting
- Optional operation setting, module/group setting
- Weekly operation schedule setting

MIM-F10N

FCU (Fan Coil Unit) Interface Module

- Communication interface module between FCU Control Kit and upper-level controller
- Used with MIM-F00N FCU Control Kits
- Supports FCU Control Kit Only
- Maximum connection of 16 FCU Control Kits

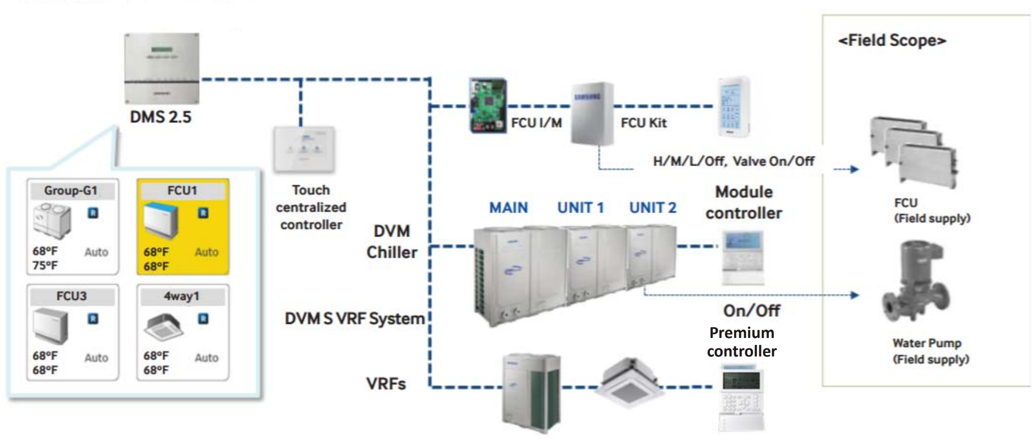
MIM-F00N

FCU (Fan Coil Unit) Control Kit

- Communication and control interfacing kit between 3rd party fan coil unit and Samsung control system
- Requires MIM-F10N Interface Module
- Compatible with MWR-SH11UN, MWR-WE13UN, MWR-WG00UN wired controllers
- Provides external contact input
- Outputs control signal for fan coil unit fan/water valve

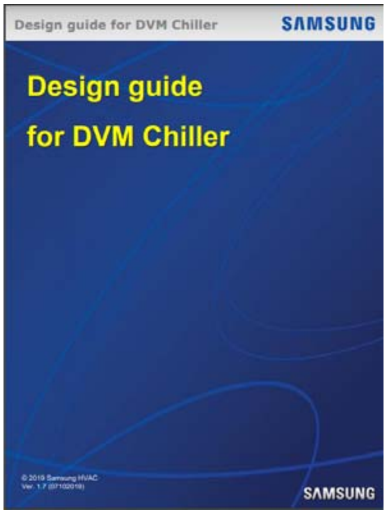
Samsung's DVM Chiller

Integrated System Diagram


DMS 2.5
Group-G1
FCU1
FCU3
4way1
68°F
75°F
Auto
68°F
68°F
Auto
68°F
68°F
Auto
68°F
68°F
Auto
Touch centralized controller
DVM Chiller
DVM S VRF System
VRFs
FCU I/M
FCU Kit
H/M/L/Off, Valve On/Off
MAIN
UNIT 1
UNIT 2
Module controller
On/Off
Premium controller
<Field Scope>
FCU (Field supply)
Water Pump (Field supply)

Control and monitor Samsung standard indoor units along with third-party fan coil units using a FCU control kit with the DMS 2.5 web interface.

DVM Chiller Design Guide



Design guide for DVM Chiller

Design guide
for DVM Chiller

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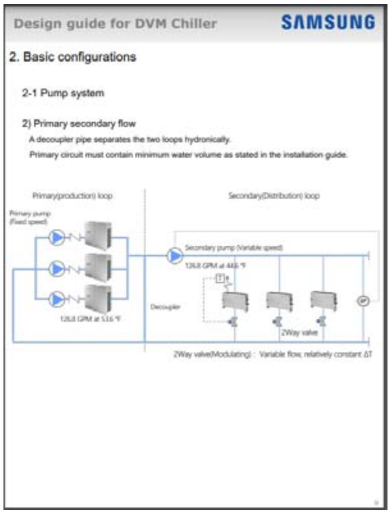

Design guide for DVM Chiller

2. Basic configurations

2-1 Pump system

2) Primary secondary flow

A decoupler pipe separates the two loops hydronically.

Primary circuit must contain minimum water volume as stated in the installation guide.

Primary(production) loop
Secondary(Distribution) loop
Primary pump
(Fixed speed)
Secondary pump (Variable speed)
126.8 GPM at 44.6 °F
126.8 GPM at 53.6 °F
Decoupler
2Way valve

2Way valve(Modulating) : Variable flow, relatively constant ΔT

ANY

Questions?

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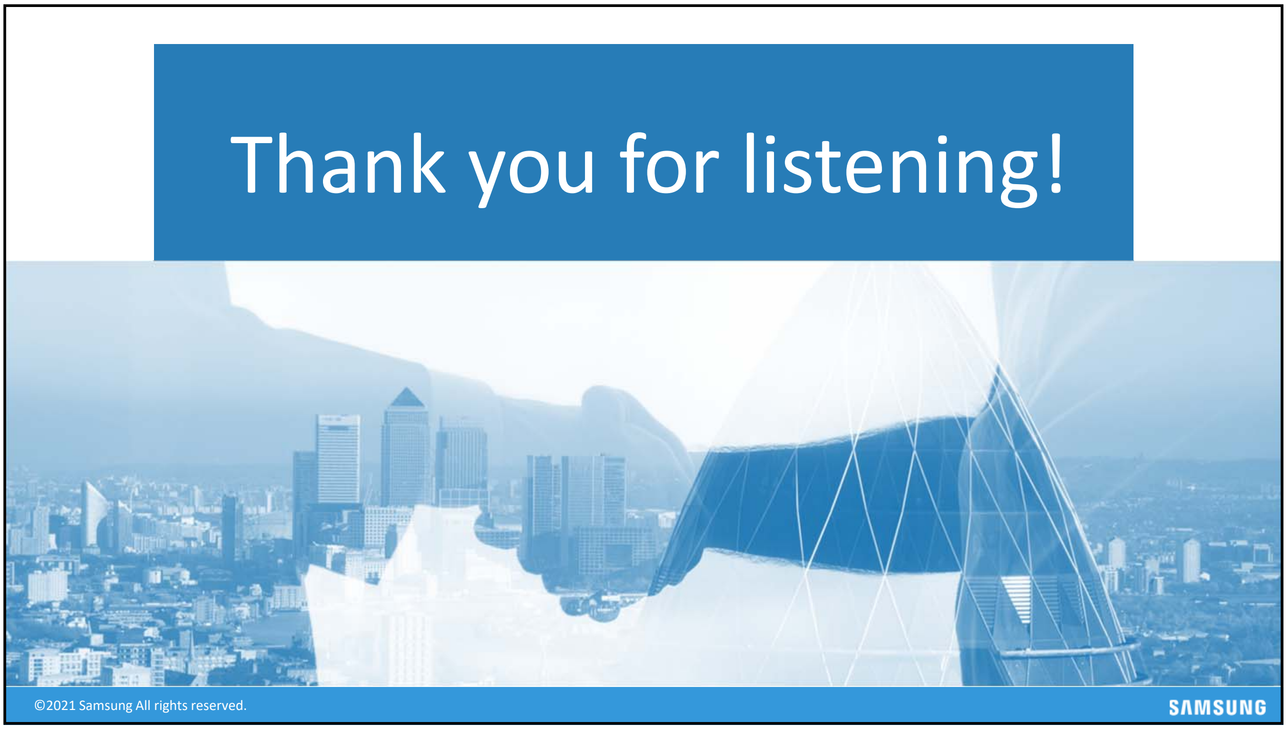
119



Thank you for listening!

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