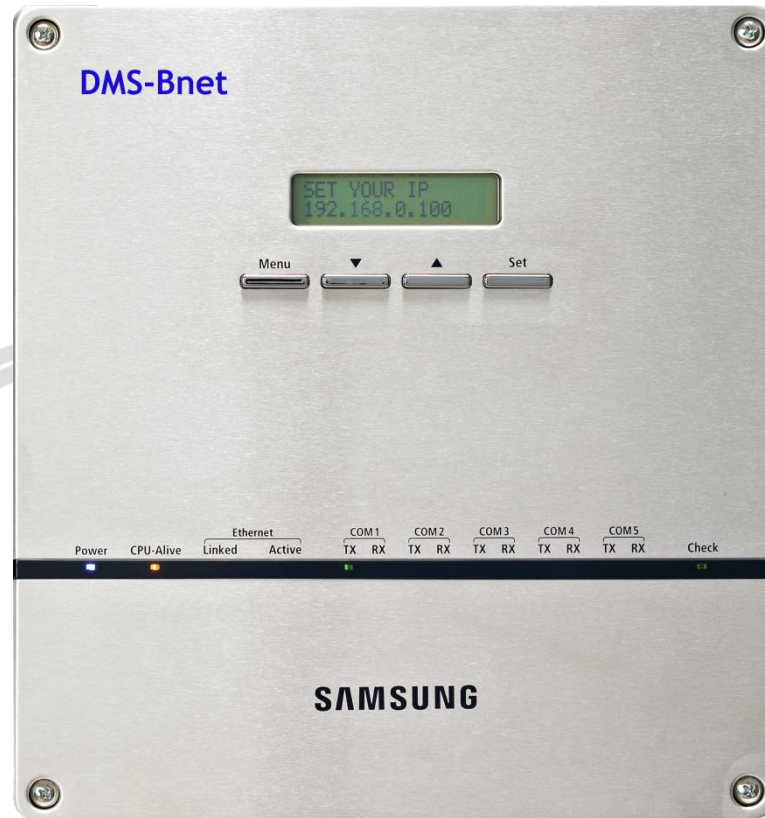
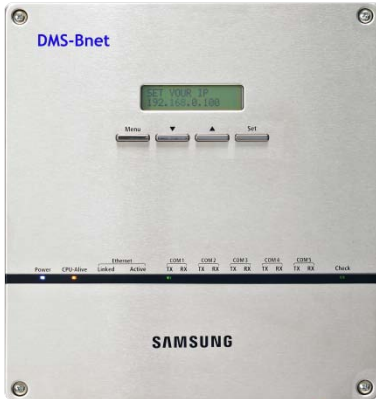


# Open Protocol System



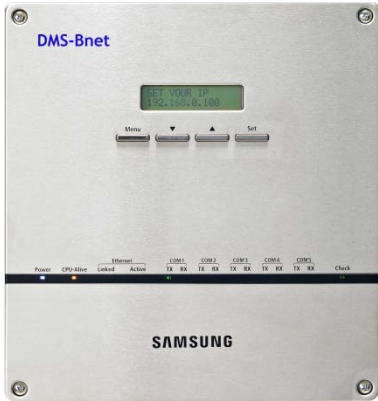
**MIM-B17 – BACnet Gateway**

## - Hardware Specification



Size		240 * 255 * 64.8 mm (Width * Length * Depth)
Power supply	Source	DC Adaptor
	Input	100~240VAC (±10%), 50/60Hz
	Output	12V 3A
Operating humidity range		0%RH ~ 90%RH
Storage temperature range		-20 °C ~ 70 °C
Communication connection		Lower layer : RS485 (to centralized controllers) Upper layer : Ethernet 100Base-T (S-NET3, S-NET mini, Web Browser) BACnet layer :1.0 BACnet Protocol Revision:2.0
Max. communication length		Lower layer : Maximum 1000m (RS485) Upper layer : 100m (for one segment without repeaters)
Max. number of interface		Lower layer : 16 centralized controllers, 80 interface modules Upper layer : Unlimited
BACnet Standardized Device Profile (Annex L)		BACnet Application Specific Controller(B-ASC)

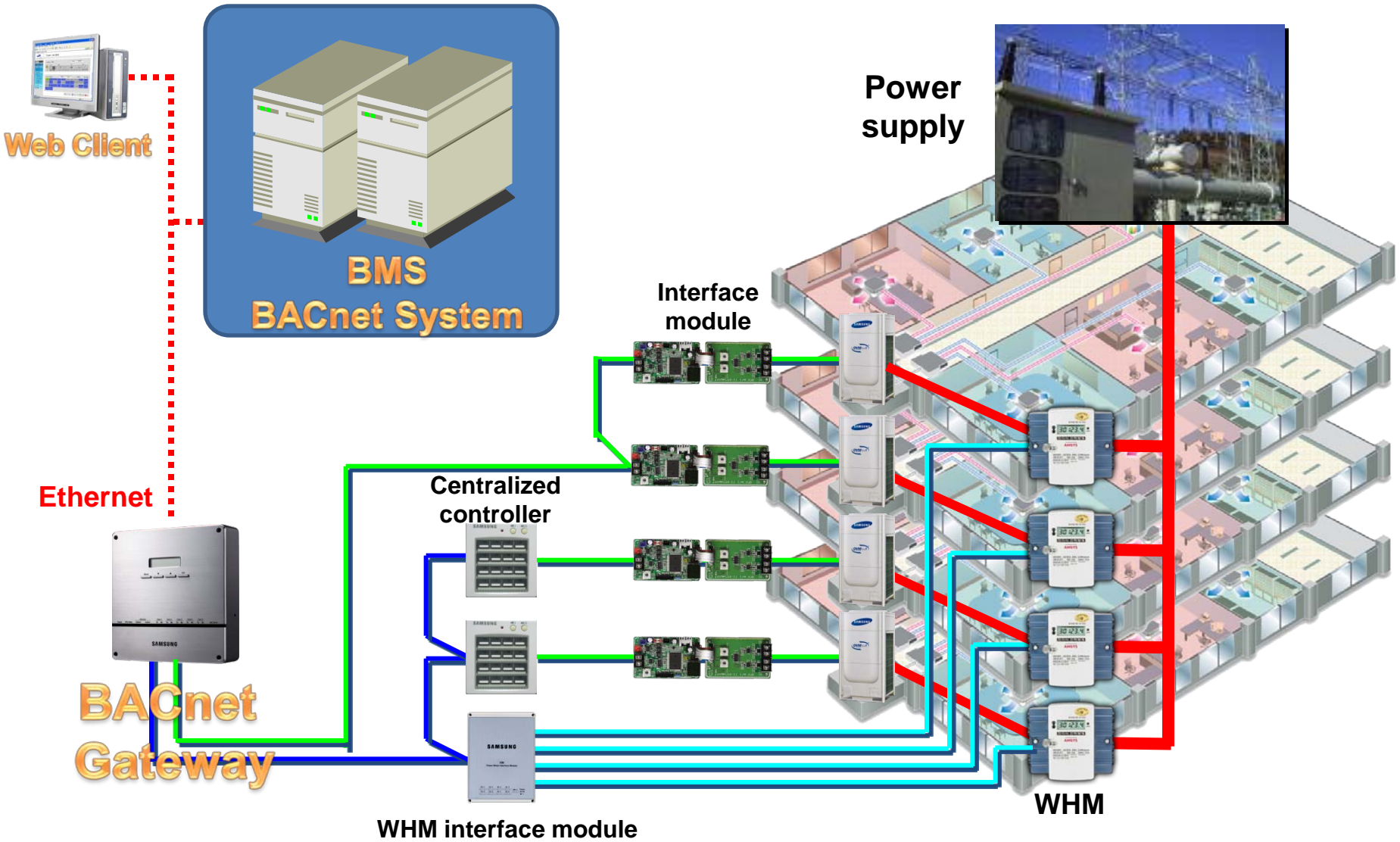
## - Software Specification



<p>General Function</p>	<ul style="list-style-type: none"> <li>• Built-in web server for PC-independent management and remote access control</li> <li>• Multiple upper-layer control access (S-NET 3, S-NET Mini, Web-client)</li> <li>• Weekly/Daily schedule control</li> <li>• Power distribution function</li> <li>• Current time management even during power failure (for 24 hours)</li> <li>• Emergency stop function with simple contact interface</li> <li>• Individual/Group control of up to 128 indoor units include ERV, AHU</li> <li>• User editable control logic</li> <li>• Accessible level management.</li> <li>• Dynamic security management</li> <li>• Operation &amp; error history management</li> <li>• Data storage in non-volatile memory &amp; SD memory</li> </ul>
<p>BACnet Function</p>	<ul style="list-style-type: none"> <li>• Up to 27 network variable settings per one indoor unit.</li> <li>• Support network variable to control and monitor normal indoor unit, ERV and AHU</li> <li>• Monitoring Power distribution data.</li> <li>• Setting the high &amp; low temperature limit</li> <li>• Accessible level management.</li> </ul>

# BACnet Gateway – MIM-B17

## - System Structure

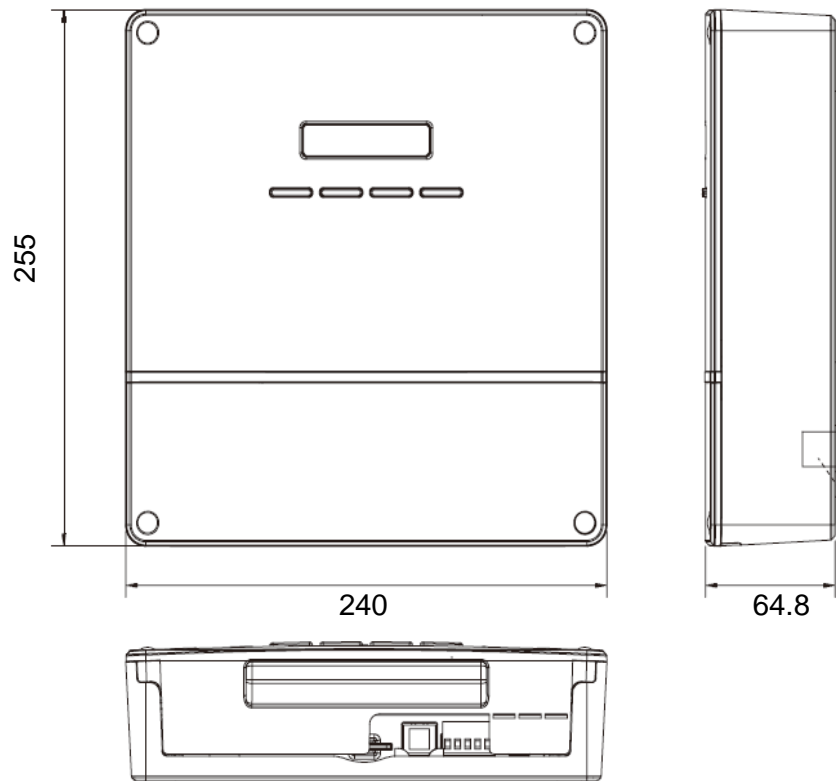


## - Compatible Interface

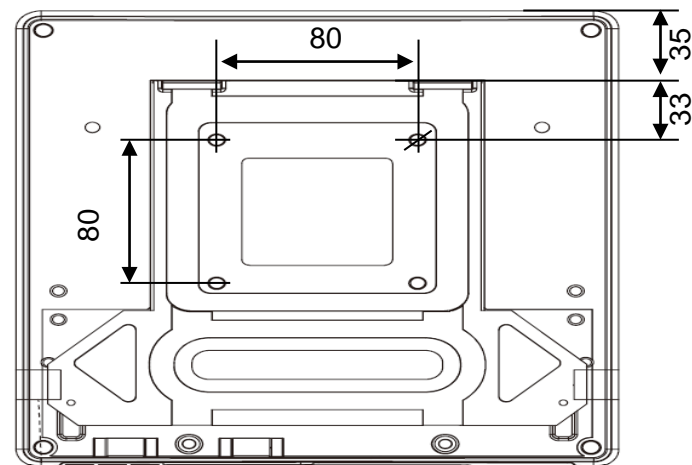
No	Device	Model	Remark
1	Upper-layer device	MST-P3P(S-NET3) MST-S3W(S-NET mini) Web-Client	HUB or network environment is required to support multiple upper-layer devices.
2	Centralized controller	MCM-A202, MCM-A202A MCM-A202B	
3	Interface Module	MIM-B04A, MIM-B13A, MIM-B13B	
4	WHM interface module (Serial Type)	MIM-B12	Up to 8 watt-hour meters are supported for 1 MIM-B12. Specified Korean watt-hour meter
5	WHM interface module (Pulse Type)	MIM-B16	Up to 8 watt-hour meters are supported for 1 MIM-B16. Support local WHM for power distribution system
6	Power meter	Korean watt-hour meter (MIM-B12) Pulse type local watt-hour meter (MIM-B16)	
7	DI/DO	No power dry contact	DI: Max.8, DO: Max.6
8	Outdoor unit	Support all Samsung system air-conditioner outdoor unit	

## - Dimension

Main Part

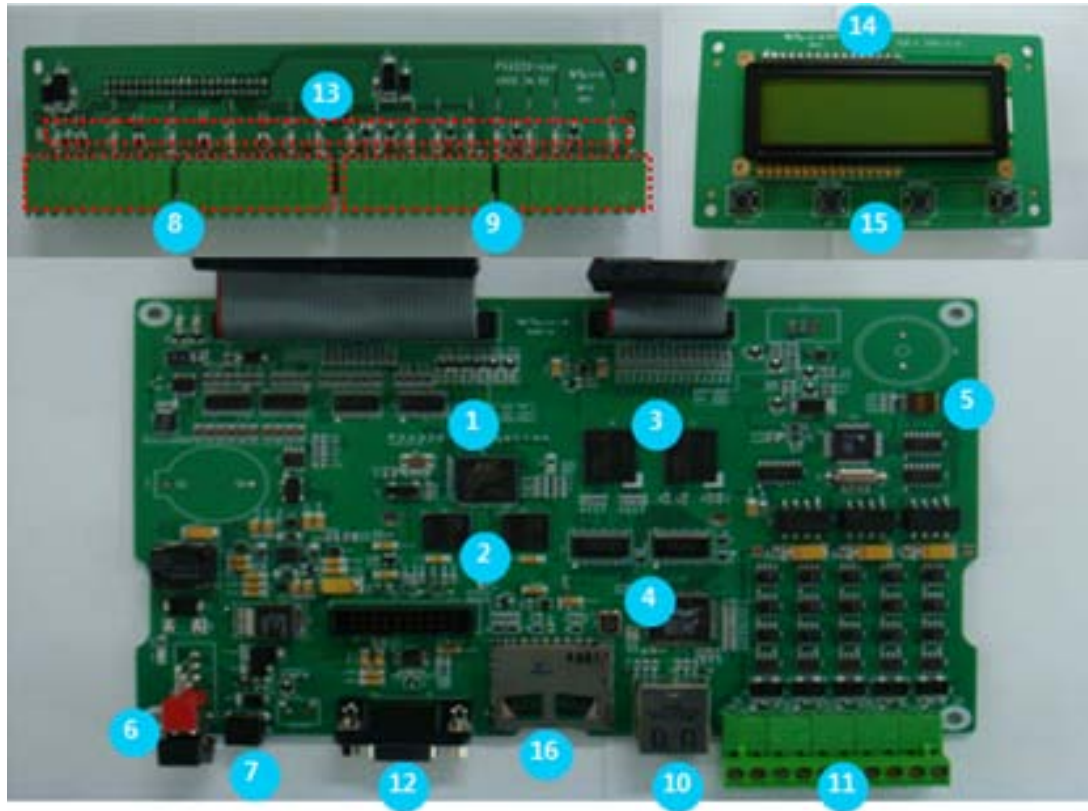


Holder



Unit : mm

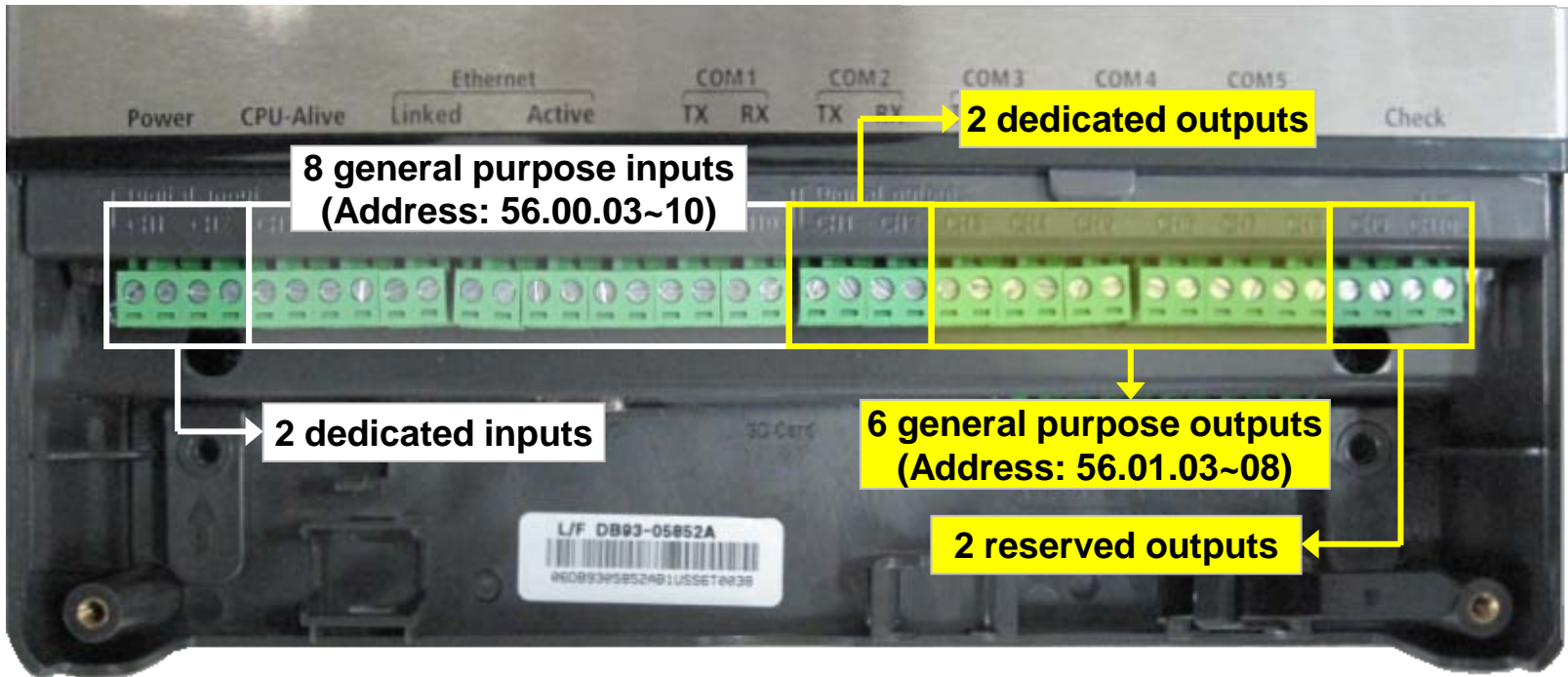
## - Boards & Connectors



- |                    |                |                 |                  |                      |
|--------------------|----------------|-----------------|------------------|----------------------|
| ① Main PCB         | ② SDRAM        | ③ NAND Flash    | ④ Ethernet       | ⑤ Option Switch      |
| ⑥ Power Connector  | ⑦ Reset Button | ⑧ Digital Input | ⑨ Digital Output | ⑩ Ethernet Connector |
| ⑪ RS-485 Connector | ⑫ Serial Port  | ⑬ LED Display   | ⑭ LCD Display    | ⑮ LCD Control Button |
| ⑯ SD Card Port     |                |                 |                  |                      |



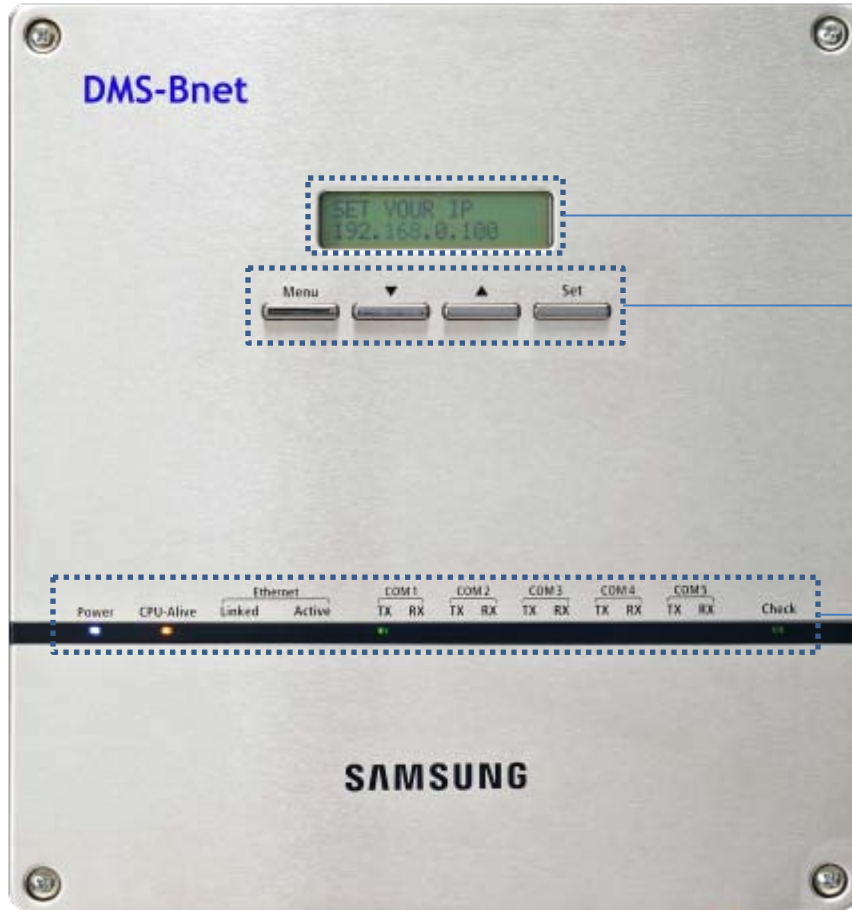
## - Connectors



- Interface with external control system
- 2 dedicated voltage-free inputs (Emergency control and others)
- 8 voltage-free contact inputs for general purposes (Open/short contact input)
- 2 dedicated voltage-free outputs (Operation/Error)
- 6 12-voltage outputs for external interlocking systems
- 2 reserved outputs for later use
- Inputs and outputs have each fixed address
  - Digital input address: 56.00.03~56.00.10
  - Digital output address: 56.01.03~56.01.08



## - Exterior



### LCD Display

Shows current time and IP address. Various messages will be displayed depending on button input.

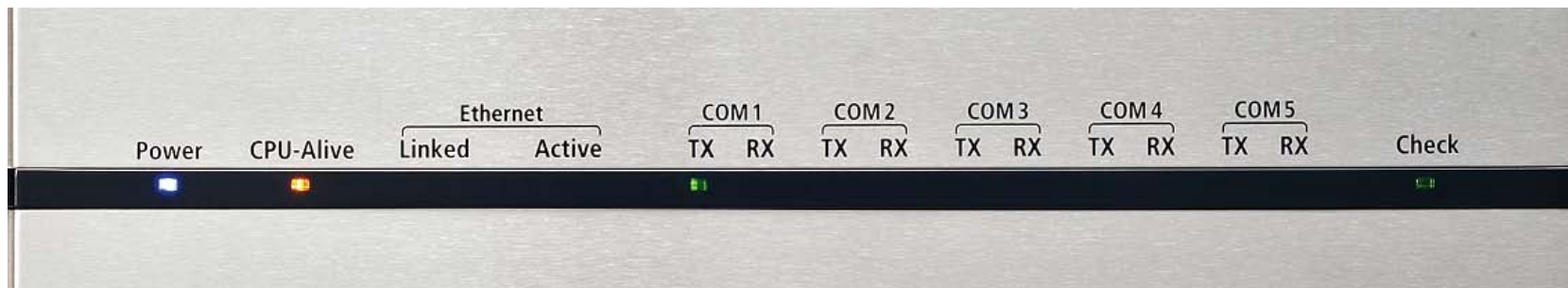
### LCD operation button

There are 4 buttons(Menu, ▼(Down), ▲(Up),Set) and you can access to menu and move, check the menu.

### LED Indicator

Check 15 LED status such as Power, CPU-Alive, Ethernet-Linked/Active, COM1~5-TX/RX, Check.

## - LED Indicator

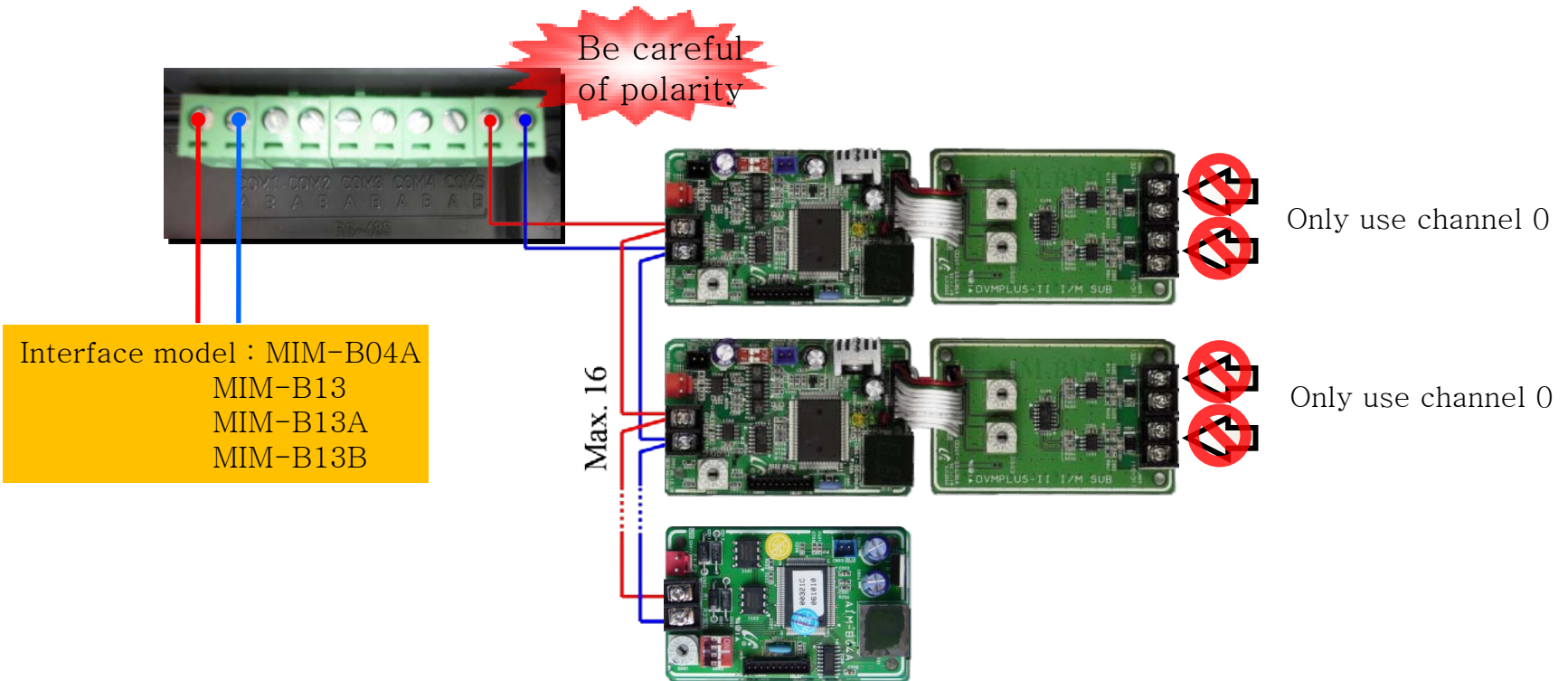


Item	Name	Status
Power	Power indicator	Turns blue when the power is supplied.
CPU Alive	CPU operation indicator	Blinks in orange with 1 second intervals during normal operation.
Ethernet-Linked	Internet connection indicator	Turns green during normal connection.
Ethernet-Active	Internet data transmission/reception indicator	Blinks in orange during normal transmission/reception.
COM1~5 – TX	Channel 1~4 Centralized controller/Interface module Data transmission Indicator	Blinks in green during normal reception.
COM1~5 – RX	Channel 1~4 Centralized controller/Interface module Data reception Indicator	Blinks in green during normal reception.
Check	Indoor/Outdoor unit/Communication check Indicator	Turns green when notice occurs.

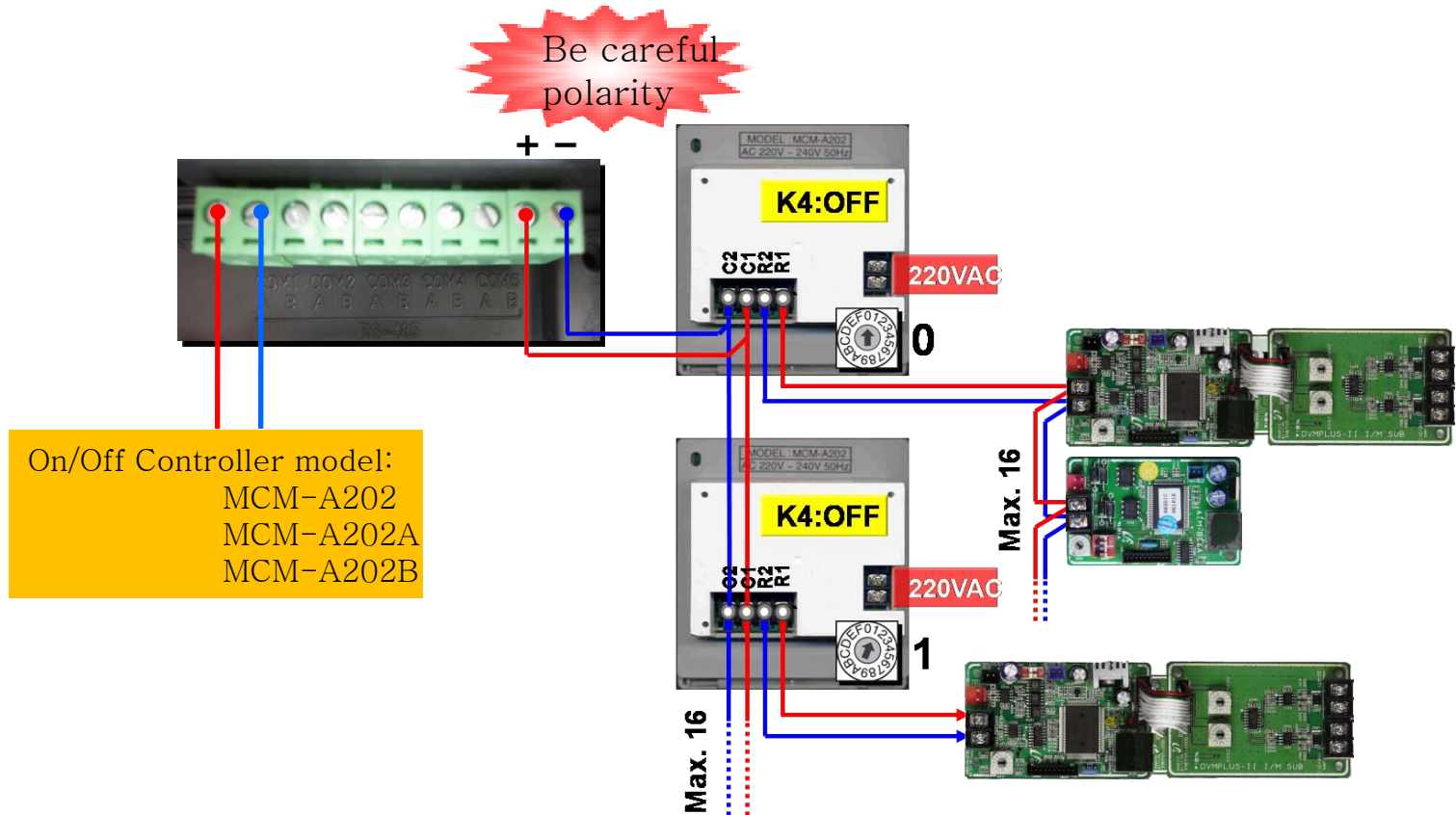
## - Wiring to interface module

BACnet gateway can be directly connect to interface module without On/Off Controller.

Up to 16 interface module connecting per one communication port.



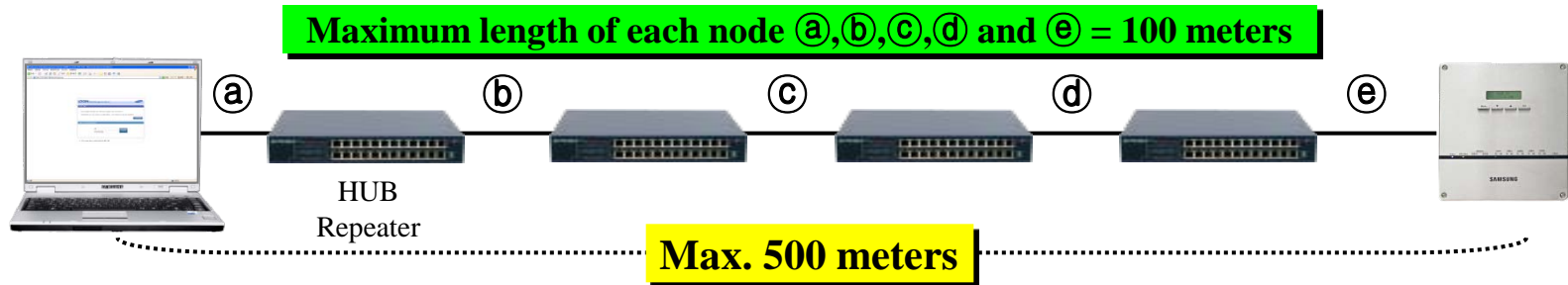
## - Wiring to On/Off Controller



## - Wiring length

### Direct distance of DMS2 to the upper layer

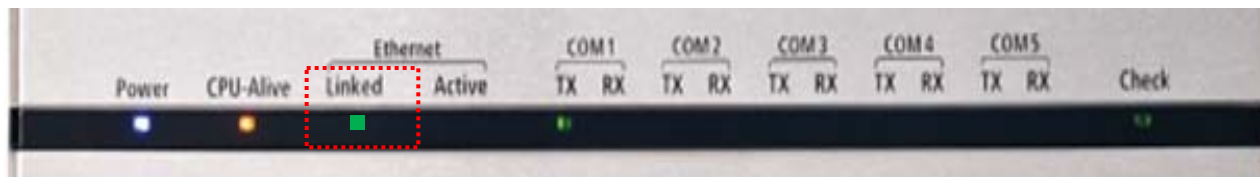
- Direct distance of DMS2 to the upper layer : 100m (Ethernet 10Base-T, UTP cable CAT3,4,5)
- Maximum number of cascaded hub/repeaters in the network diameter : 4
- Distance of upper device to the DMS2 cannot exceed 500 meters.



## - LAN cable connection



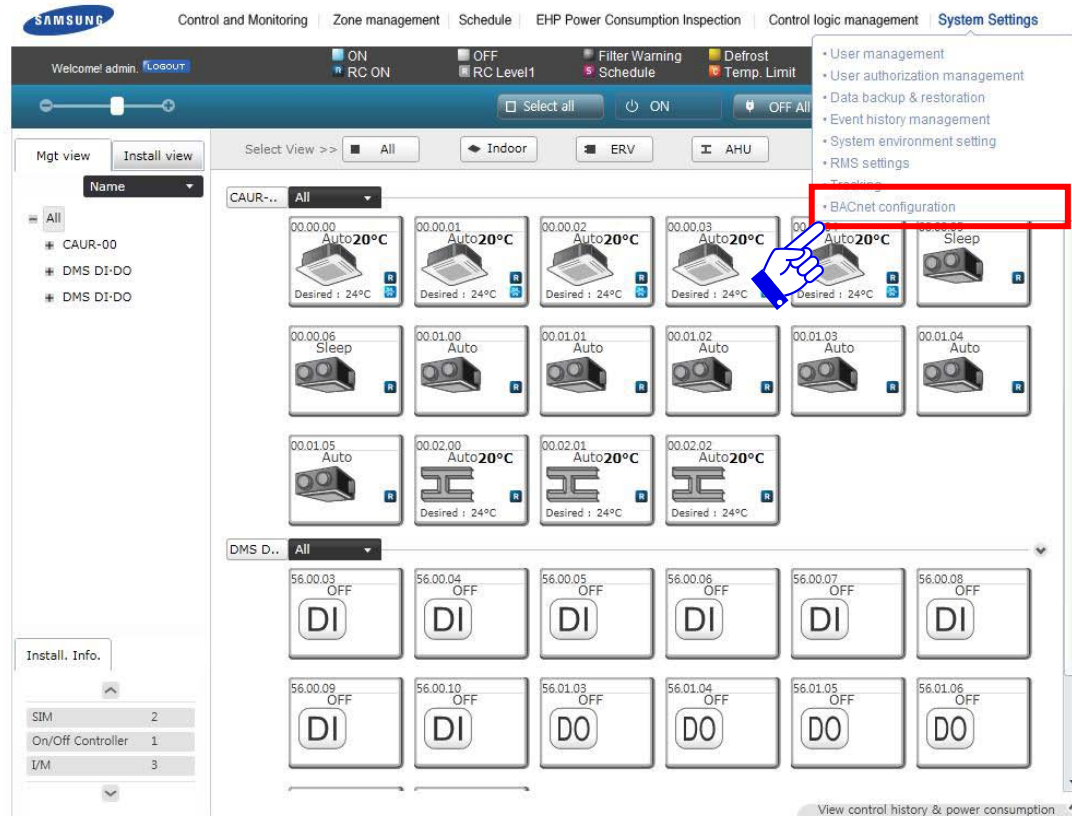
**Linked LED is ON when LAN connection is made between the DMS and the PC.**





## - BACnet configuration

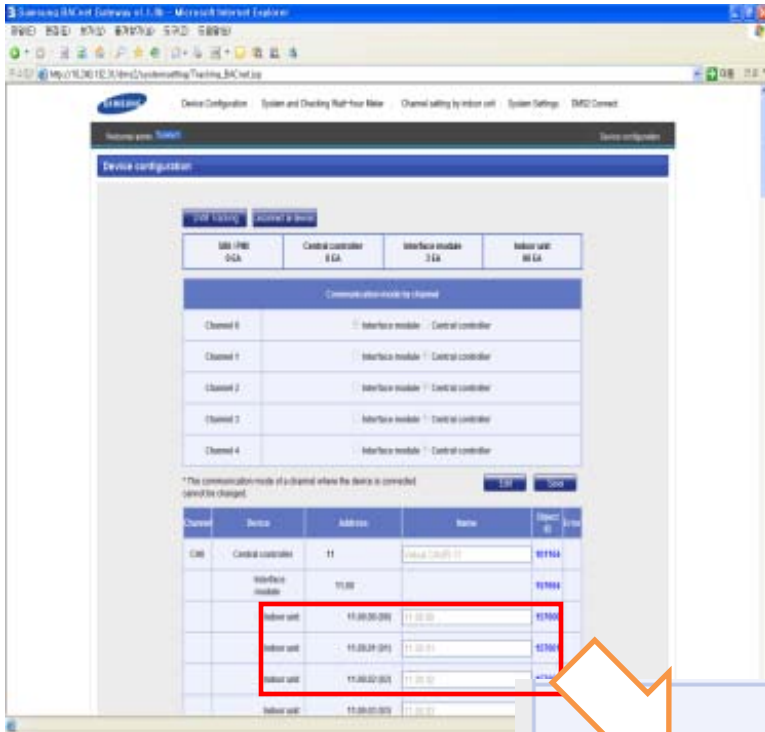
After log-in, click [System Setting] and [BACnet configuration] menu to switch to BACnet Gateway configuration page.



*If you use accounts with authorization level lower than management group or accounts with general authorization level, BACnet configuration will not be displayed on the menu.*

## - BACnet configuration : Device Configuration

After tracking process is completed, system automatically assigned object IDs



Channel	Device	Address	Name	Object ID
000	Central controller	11	Control Controller 11	157600
	Interface module	11.00		157601
	Indoor unit	11.00.00 (00)		157600
	Indoor unit	11.00.01 (01)		157601
	Indoor unit	11.00.02 (02)		157602
	Indoor unit	11.00.03 (03)		157603

*If you change address of devices in our system, object IDs are changed after tracking process. In this case, you should inform BMS manager new object IDs*

## - BACnet configuration : Device Configuration

Click the object ID that you want to see device information, a detail information of the selected device will be displayed in device information

Channel	Device	Address	Name	Object ID	Error
CH2	Central controller	00	CAUR-00	1664	
	Interface module	00.00		64	
	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 D1-D0 Setting	50		501664	

**Click one of the Object ID**

Device Configuration | Setting and Checking Watt-hour meter | Channel setting by indoor unit | System Environment Setting | DMS2 Connect

Device Information

Address : 00.02.00 Device : ahu

<< Back

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

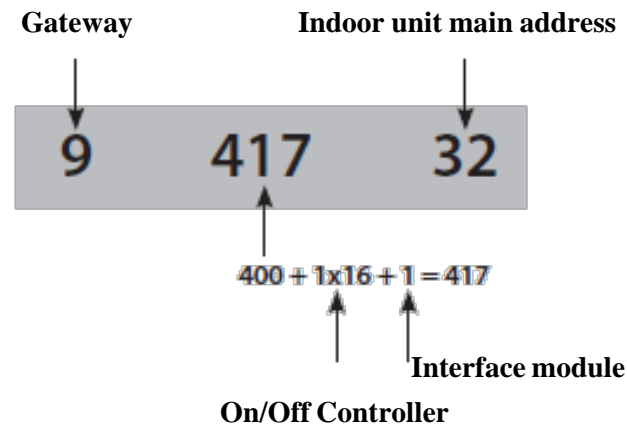
## - BACnet configuration : Object ID Rule

- Device Instance Number range

Item	DNET – Range [Digit 2]	CPP – Range [Digit 3]	Indoor – Range [Digit 2]
On/Off Controller	0 ~ 15	000 ~ 015	64
SIM / PIM	0 ~ 15	100 ~ 115	64
DI / DO	0 ~ 15	300 ~ 315	64
Interface Module	0 ~ 15	400 ~ 655	64
Indoor unit, ERV, AHU	0 ~ 15	400 ~ 655	0 ~ 63
Gateway	0 ~ 15	900	64

- Example

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

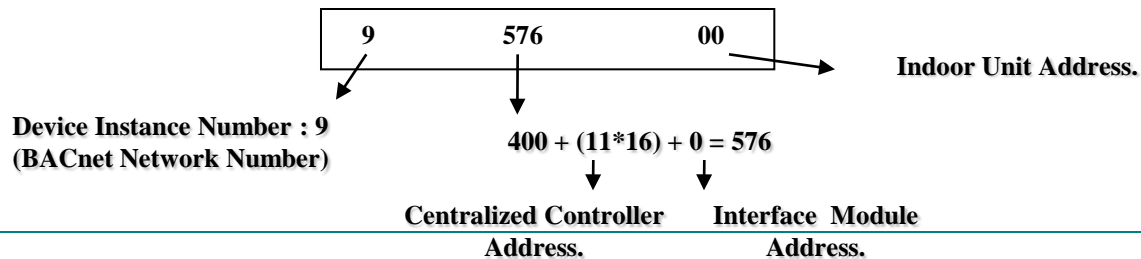


## - BACnet configuration : Object ID Rule

- System 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	Centralized Controller_[11]	Interface Module_[11.00]	Indoor Unit_[11.00.00]	Indoor Unit_[11.00.01]
	Object List	1: ALL_OFF 2: DMS2_Status 3: BACnet App Error Code	Central Controller Error Code	Repeater Error Code	29 Object	29 Object



## - BACnet configuration : System Environment Setting

You can check the detail BACnet gateway information

BACnet gateway information	
Object_Identifier	0
Object_Name	SAMSUNG DVM Gateway
Object_Type	DEVICE
Vendor_Name	Samsung Electronics CO., Ltd.
Vendor_ID	200
Model_Name	MIM-B17
Firmware_Revision	1.00
Application_Software_Version	1.00
Protocol_Version	1.00
Protocol_Revision	2
MAX_APDU_Length_Accepted	1476
Segmentation_Supported	NO_SEGMENTATION
APDU_Timeout	3000
Number_Of_APDU_Retries	3



## - Back to initial screen

If you click [DMS2 Connect] button, screen will be switched to initial screen of the DMS2

The screenshot shows the Samsung BACnet Gateway MIM-B17 web interface. At the top, there is a navigation menu with the following items: Device Configuration, Setting and Checking Wait-hour meter, Channel setting by indoor unit, System Environment Setting, and **DMS2 Connect** (highlighted with a red box and a white arrow). Below the navigation menu, there is a 'Welcome admin' message and a 'Device' link. The main content area is titled 'Device configuration' and contains two tabs: 'DMS Tracking' and 'Connected at Device'. Below the tabs, there is a summary table showing the number of devices connected to each component:

SMT	Central controller	Interface module	Indoor unit
2 EA	1 EA	3 EA	16 EA

Below the summary table, there is a section titled 'Communication mode by channel' with a table for Channels 0 through 4. Each channel has two radio buttons: 'Interface module' and 'Central controller'. Channel 0 is currently set to 'Central controller'. Below this table, there is a note: '\* The communication mode of a channel where the device is connected cannot be changed.' and two buttons: 'Exit' and 'Save'.

At the bottom of the interface, there is a table showing the communication mode for each channel:

Channel	Device	Address	Name	Client #	Error
CH1	Central controller	00	CAUSE 00	1004	
	Interface module	00.00		04	
	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 (ERV)	00.00.05 (05)	00 00 05	5	
	Indoor unit (ERV)	00.00.06 (06)	00 00 06	6	
	Outdoor unit (00.00)	00.00.00	00 00 00		
Interface module	00.01			104	
Indoor unit (ERV)	00.01.00 (00)	00 01 00		100	

## - Object List : Other Devices

### SIM & PIM

Instance	Control and Monitoring	Object Type	Object Name	Status Value
1	Error code	AI	SIM_Error_Code	Refer to list of error code

### On/Off Controller(Centralized controller)

Instance	Control and Monitoring	Object Type	Object Name	Status Value
1	Error code	AI	Central_Error_Code	Refer to list of error code

### Interface Module

Instance	Control and Monitoring	Object Type	Object Name	Status Value
1	Error code	AI	Repeater_Error_Code	Refer to list of error code

### BACnet Gateway

Instance	Control and Monitoring	Object Type	Object Name	Status Value
1	All device OFF	BO	ALL_OFF	Inactive : All devices Off
2	DMS2 status	AI	DMS2_Status	0: Normal, 8: Emergency stop, 105 : Tracking in progress, 108 : Tracking failed
3	Error code	AI	BACnetApp_Error_Code	BACnet error code

## - BACnet Specification

### BACnet Protocol Implementation Conformance Statement

- ✓ Date : May 24. 2010
  - ✓ Vendor Name : SAMSUNG Electronics CO., Ltd.
  - ✓ Product Name : DMS BACnet Gateway
  - ✓ Product Model Number : MIM-B17
  - ✓ Application Software Version:1.0 Firmware Revision:1.0 BACnet Protocol Revision:2.0
  
  - ✓ Product Description
    - This product support BACnet/IP and provide functions to monitor and control status of air conditioners.
  
  - ✓ BACnet Standardized Device Profile(Annex L) :
    - BACnet Application Specific Controller(B-ASC)
-

## - BACnet Specification

### BACnet Protocol Implementation Conformance Statement

	SUPPORTED BIBBS	BIBB NAME	SUPPORTED	REMARKS
Data Sharing	DS-RP-A	Data Sharing-Read Property-A	<input type="checkbox"/>	
	DS-RP-B	Data Sharing-Read Property-B	<input checked="" type="checkbox"/>	
	DS-RPM-A	Data Sharing-ReadPropertyMultiple-A	<input type="checkbox"/>	
	DS-RPM-B	Data Sharing-ReadPropertyMultiple-B	<input checked="" type="checkbox"/>	
	DS-RPC-A	Data Sharing-ReadPropertyConditional-A	<input type="checkbox"/>	
	DS-RPC-B	Data Sharing-ReadPropertyConditional-B	<input type="checkbox"/>	
	DS-WP-A	Data Sharing-WriteProperty-A	<input type="checkbox"/>	
	DS-WP-B	Data Sharing-WriteProperty-B	<input checked="" type="checkbox"/>	
	DS-WPM-A	Data Sharing-WritePropertyMultiple-A	<input type="checkbox"/>	
	DS-WPM-B	Data Sharing-WritePropertyMultiple-B	<input checked="" type="checkbox"/>	
	DS-COV-A	DataSharing-COV-A	<input type="checkbox"/>	
	DS-COV-B	DataSharing-COV-B	<input checked="" type="checkbox"/>	
	DS-COVP-A	DataSharing-COVP-A	<input type="checkbox"/>	
	DS-COVP-B	DataSharing-COVP-B	<input type="checkbox"/>	
	DS-COVU-A	DataSharing-COV-Unsolicited-A	<input type="checkbox"/>	
DS-COVU-B	DataSharing-COV-Unsolicited-B	<input type="checkbox"/>		
Alarm and Event Management	AE-N-A	Alarm&Event-Notification-A	<input type="checkbox"/>	
	AE-N-I-B	Alarm&Event-Notification Internal-B	<input type="checkbox"/>	
	AE-N-E-B	Alarm&Event-Notification External-B	<input type="checkbox"/>	
	AE-ACK-A	Alarm&Event-ACK-A	<input type="checkbox"/>	

## - BACnet Specification

### BACnet Protocol Implementation Conformance Statement

	SUPPORTED BIBBS	BIBB NAME	SUPPORTED	REMARKS
Alarm and Event Management	AE-N-A	Alarm&Event-Notification-A	<input type="checkbox"/>	
	AE-N-I-B	Alarm&Event-Notification Internal-B	<input type="checkbox"/>	
	AE-N-E-B	Alarm&Event-Notification External-B	<input type="checkbox"/>	
	AE-ACK-A	Alarm&Event-ACK-A	<input type="checkbox"/>	
	AE-ACK-B	Alarm&Event-ACK-B	<input type="checkbox"/>	
	AE-ASUM-A	Alarm&Event-Summary-A	<input type="checkbox"/>	
	AE-ASUM-B	Alarm&Event-Summary-B	<input type="checkbox"/>	
	AE-ESUM-A	Alarm&Event-Enrollment Summary-A	<input type="checkbox"/>	
	AE-ESUM-B	Alarm&Event-Enrollment Summary-B	<input type="checkbox"/>	
	AE-INFO-A	Alarm&Event-Information-A	<input type="checkbox"/>	
	AE-INFO-B	Alarm&Event-Information-B	<input type="checkbox"/>	
	AE-LS-A	Alarm&Event-LifeSafety-A	<input type="checkbox"/>	
	AE-LS-B	Alarm&Event-LifeSafety-B	<input type="checkbox"/>	
Scheduling	SCHED-A	Scheduling-A	<input type="checkbox"/>	
	SCHED-I-B	Scheduling-Internal-B	<input type="checkbox"/>	
	SCHED-E-B	Scheduling-External-B	<input type="checkbox"/>	
Trending	T-VMT-A	Viewing and Modifying Trends-A	<input type="checkbox"/>	
	T-VMT-I-B	Viewing and Modifying Trends Internal-B	<input type="checkbox"/>	
	T-VMT-E-B	Viewing and Modifying Trends External-B	<input type="checkbox"/>	
	T-ATR-A	Automated Trend Retrieval-A	<input type="checkbox"/>	
	T-ATR-B	Automated Trend Retrieval-B	<input type="checkbox"/>	
	T-VMMV-A	Viewing and Modifying Multiple Values-A	<input type="checkbox"/>	
	T-VMMV-I-B	View and Modifying Multiple Values Internal-B	<input type="checkbox"/>	
	T-VMMV-E-B	View and Modifying Multiple Values External-B	<input type="checkbox"/>	
	T-AMVR-A	Automated Multiple Value Retrieval-A	<input type="checkbox"/>	
T-AMVR-B	Automated Multiple Value Retrieval-B	<input type="checkbox"/>		

## - BACnet Specification

### BACnet Protocol Implementation Conformance Statement

	SUPPORTED BIBBS	BIBB NAME	SUPPORTED	REMARKS
Device and Network Management	DM-DDB-A	Dynamic Device Binding-A	<input type="checkbox"/>	
	DM-DDB-B	Dynamic Device Binding-B	<input checked="" type="checkbox"/>	
	DM-DOB-A	Dynamic Object Binding-A	<input type="checkbox"/>	
	DM-DOB-B	Dynamic Object Binding-B	<input checked="" type="checkbox"/>	
	DM-DCC-A	DeviceCommunicationControl-A	<input type="checkbox"/>	
	DM-DCC-B	DeviceCommunicationControl-B	<input type="checkbox"/>	
	DM-TM-A	Text Message-A	<input type="checkbox"/>	
	DM-TM-B	Text Message-B	<input type="checkbox"/>	
	DM-TS-A	Time Synchronization-A	<input type="checkbox"/>	
	DM-TS-B	Time Synchronization-B	<input checked="" type="checkbox"/>	
	DM-UTC-A	UTCTime Synchronization-A	<input type="checkbox"/>	
	DM-UTC-B	UTCTime Synchronization-B	<input type="checkbox"/>	
	DM-RD-A	ReinitializeDevice-A	<input type="checkbox"/>	
	DM-RD-B	ReinitializeDevice-B	<input type="checkbox"/>	
	DM-BR-A	Backup&Restore-A	<input type="checkbox"/>	
	DM-BR-B	Backup&Restore-B	<input type="checkbox"/>	
	DM-R-A	Restart-A	<input type="checkbox"/>	
	DM-R-B	Restart-B	<input type="checkbox"/>	
	DM-LM-A	List Manipulation-A	<input type="checkbox"/>	
	DM-LM-B	List Manipulation-B	<input type="checkbox"/>	
	DM-OCD-A	Object Creation & Deletion-A	<input type="checkbox"/>	
	DM-OCD-B	Object Creation & Deletion-B	<input type="checkbox"/>	
	DM-VT-A	Virtual Terminal-A	<input type="checkbox"/>	
	DM-VT-B	Virtual Terminal-B	<input type="checkbox"/>	
	NM-CE-A	Connection Establishment-A	<input type="checkbox"/>	
	NM-CE-B	Connection Establishment-B	<input type="checkbox"/>	
NM-RC-A	Router Configuration-A	<input type="checkbox"/>		
NM-RC-B	Router Configuration-B	<input type="checkbox"/>		



# - BACnet Specification

## BACnet Protocol Implementation Conformance Statement

✓ **Segmentation Capability:**

- Segmented requests supported Window Size 1476
- Segmented responses supported Window Size 1476

✓ **Standard Object Types Supported:**

Object-Type	Supported	Dynamically Creatable	Dynamically Deletable	Writeable Properties
Analog Input	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Present value
Analog Output	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Present value
Analog Value	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Present value
Binary Input	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Present value
Binary Output	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Present value
Binary Value	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Present value
Calendar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Command	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Device	Yes	n/a	n/a	n/a
Event Enrollment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
File	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Loop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Multi-state Input	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Present value
Multi-state Output	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Present value
Notification Class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Schedule	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	