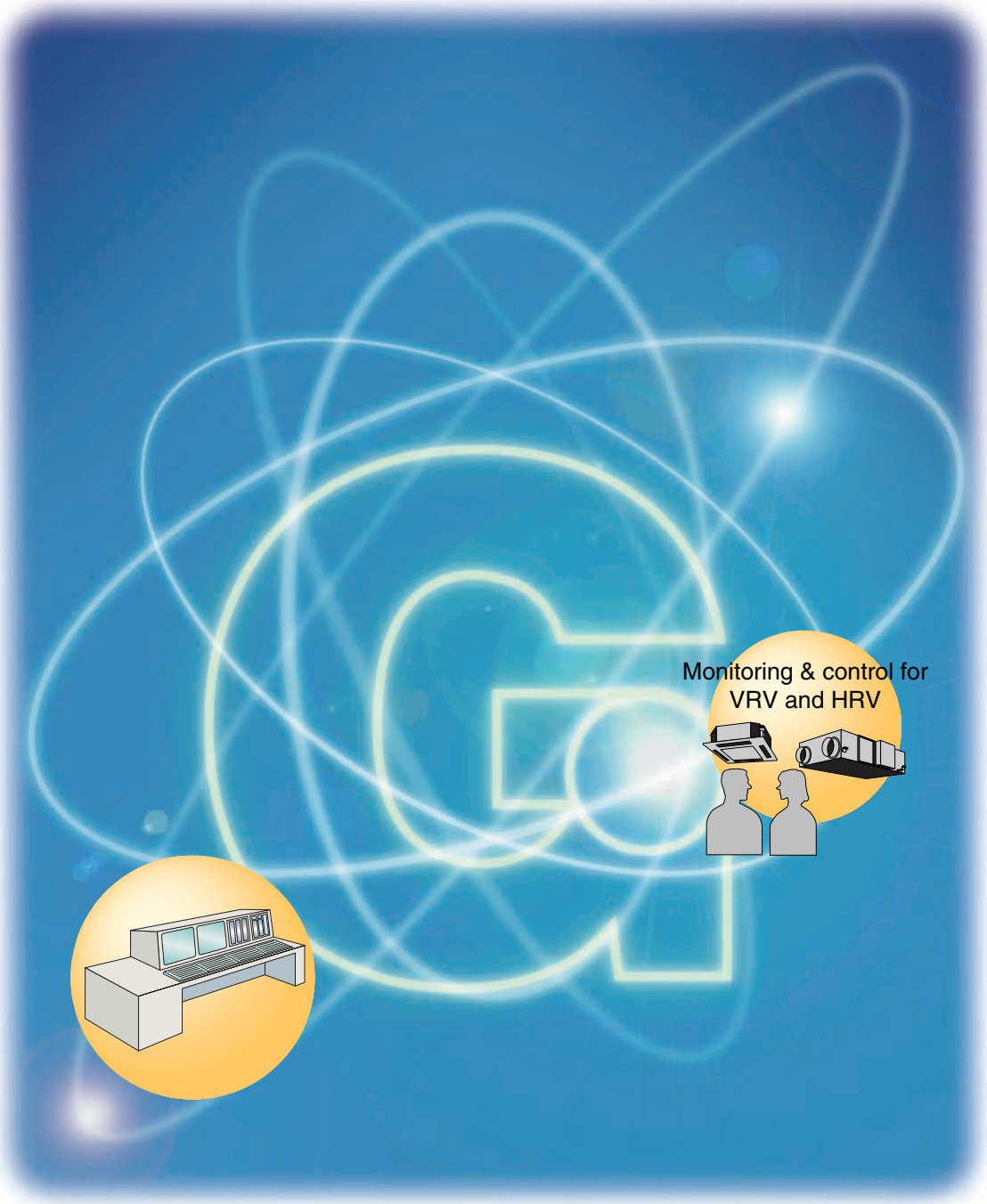
ED 72 - 549

DAIKIN

DESIGN GUIDE

BACnet™ Gateway



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BACnet Explorer is the software tool for system integrators by Cimetrics Inc.

DAIKIN INDUSTRIES, LTD.

Table of Contents

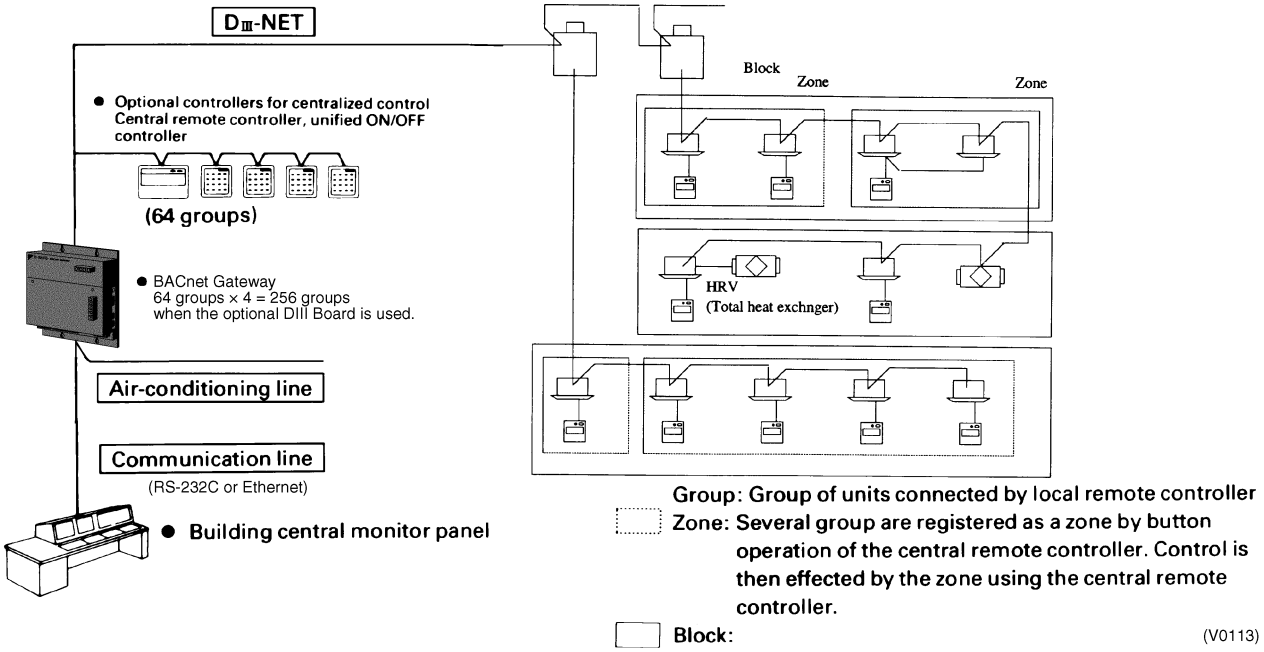
Part 1
Design Guide

1. <DMS502A51 / DAM411A1 / DAM412A1> BACnet Gateway

1.1 Outline and Features

1. Managing the information on 64 groups of air-conditioners (main units only).
2. Up to 256 groups manageable and controllable at once by adding the optional DIII board
3. Packaging of air-conditioner objects
   * Compatible with BACnet (ANSI/ASHRAE-135)
   * Compatible with BACnet/IP (ANSI/ASHRAE-135a)
   * Compatible with IEIEJ/p-0003-2000 (plan) (IEIEJ is Institute of Electrical Installation Engineers of Japan)
4. Conforming to European, Oceanian, Safety and EMC rules and regulations.
5. JIS-specified basic procedures (RS232C system) readily selective.

1.2 System Outline



■ **Outline of air-conditioner management system control devices**

Interface for Use in BACnet® (DMS502A51)	Interface unit to allow communications between VRV and BMS. Operation and monitoring of air conditioning systems through BACnet® communication.
Optional DIII Board (DAM411A1)	Expansion kit, installed on DMS502A51 to provide 3 more DIII-NET communication ports. Not usable independently.
Optional Di Board (DAM412A1)	Expansion kit, installed on DMS502A51 to provide 16 more wattmeter pulse input points. Not usable independently.

Notes:

1. A group consists of several indoor units that can be started or stopped simultaneously. As shown in the figure above, a group consists of several indoor units wired to the same remote controller. For units without a remote controller, each unit is treated as a group.
2. Several groups are registered as a zone with the central remote controller. By pushing 1 button of the central remote controller, all groups within the same zone can be turned on or off simultaneously.

Building management 1 system controls and monitors air-conditioning equipment by the block. A block consists of 1 or more groups (max. 16), and can be set without regard for the zones mentioned above. You must, however, take the following things into consideration.

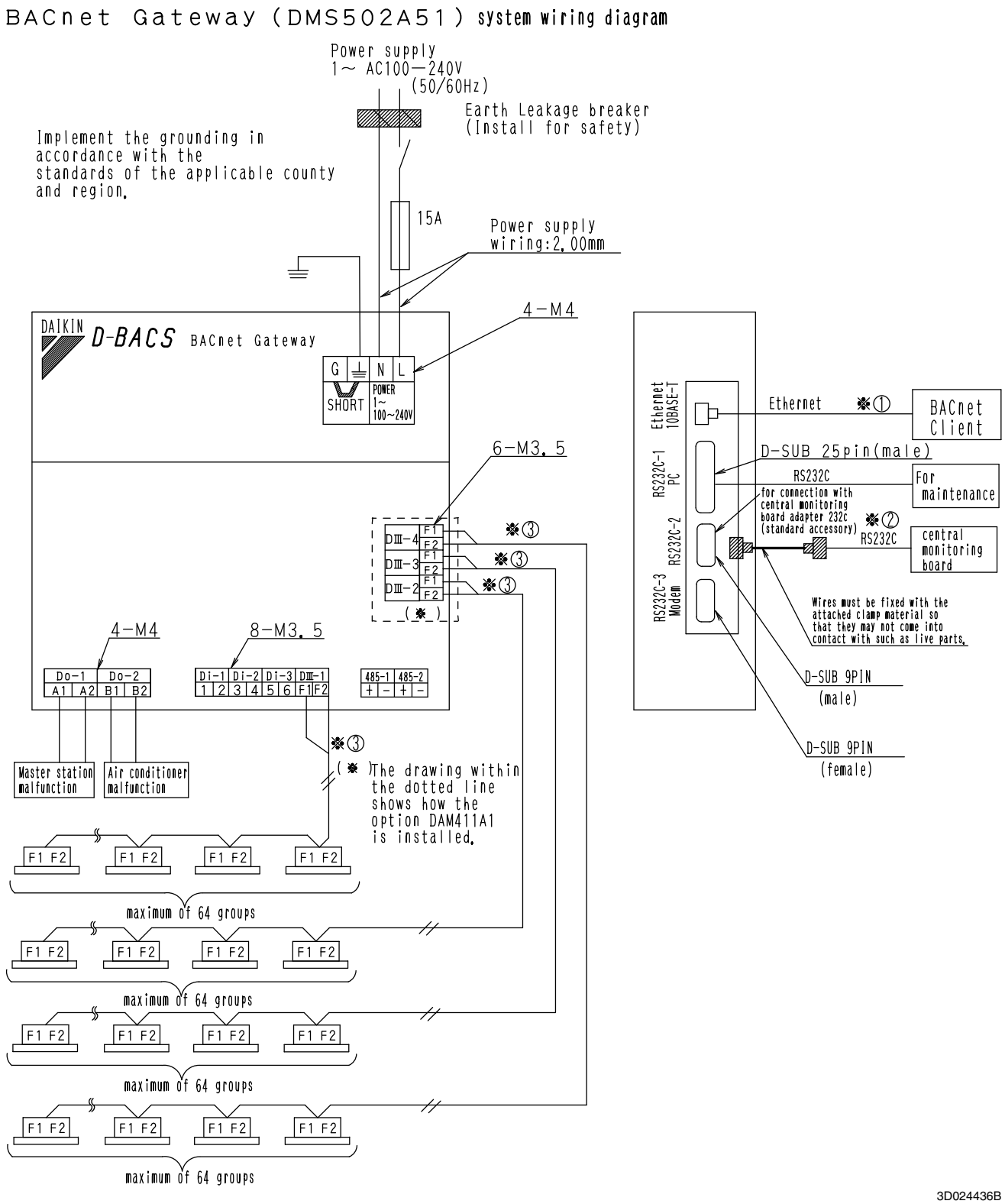
(1) If the air-conditioning mode is switched, as a premise, permission for cool/heat selection for indoor units (by remote controller or central remote controller) must be designated within the program.

(2) Program status is basically monitored by observing the data of a representative unit. The contents which can be monitored are therefore restricted if the representative unit is designated as an adaptor, etc.

Block registration is accomplished through signal transmission from the building control system to the cooler-conditioning system. Because configuration can be changed while receiving power even after operating, maintenance from the maker of the air-conditioning equipment is not required when changing the configuration.

1.3 System Configuration

System Wiring Diagram



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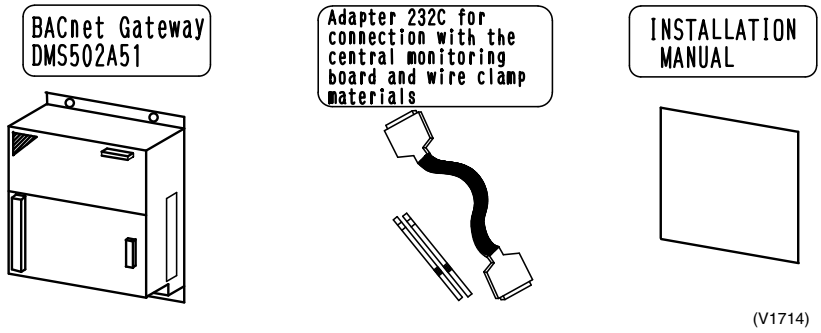
1.4 Specifications and Appearance View

Specification

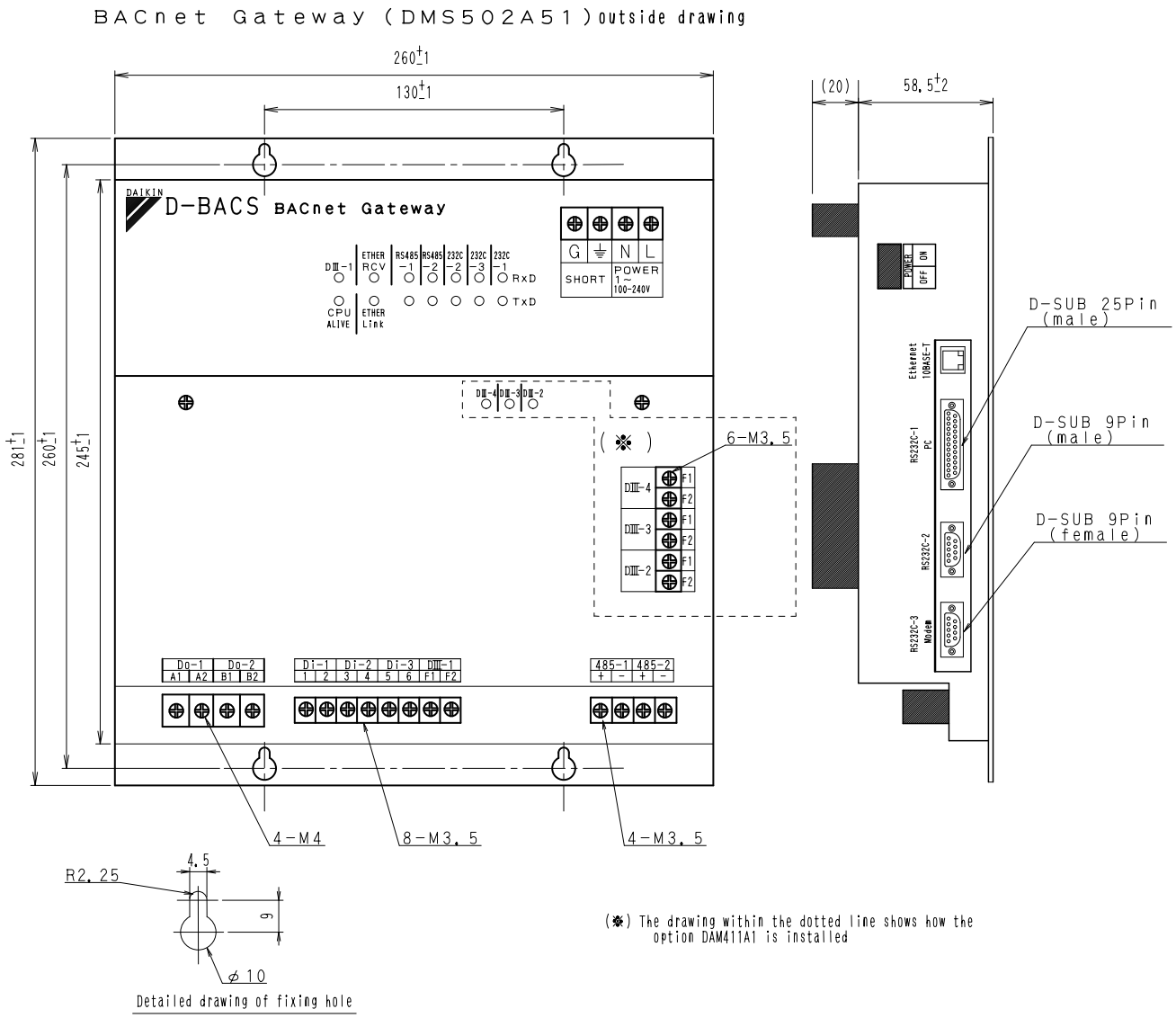
Rated Electrical Conditions	Rated Voltage and Frequency	Single Phase AC 100-240, 50/60 Hz
	Rated Power	Maximum 20W
Conditions for Use	Power Supply Fluctuation	±10% of the Rated Value
	Ambient Temperature	-10~+50°C
	Ambient Humidity	0~98% (Sweating is not acceptable)
	Preservation Temperature	-20~+60°C
Performance	Insulation Resistance	50MΩ or more by DC500 megohmmeter
Mass		4.0 kg
Colour of the Unit	Unit	PANTONE 533C
	Letter	PANTONE 656C
	Lines	PANTONE 656C

Components

The following parts are attached to this unit. Make sure to check them before installation.



Dimensions


BACnet Gateway (DMS502A51) outside drawing
260+1
130+1
(20)
58.5+2
281+1
260+1
245+1
DAIKIN
D-BACS BACnet Gateway
DIII-1
ETHER RCV
RS485 -1
RS485 -2
232C -2
232C -3
232C -1
RxD
CPU ALIVE
ETHER Link
TxD
G
N
L
SHORT
POWER 1~ 100-240V
POWER
OFF ON
Ethernet 10BASE-T
RS232C-1 PC
RS232C-2
RS232C-3 Modem
D-SUB 25Pin (male)
D-SUB 9Pin (male)
D-SUB 9Pin (female)
DIII-4 DIII-3 DIII-2
(※)
6-M3.5
DIII-4 F1 F2
DIII-3 F1 F2
DIII-2 F1 F2
Do-1 Do-2
A1 A2 B1 B2
Di-1 Di-2 Di-3 DIII-1
1 2 3 4 5 6 F1 F2
485-1 485-2
+ - + -
4-M4
8-M3.5
4-M3.5
R2.25
4.5
9
φ10
Detailed drawing of fixing hole
(※) The drawing within the dotted line shows how the option DAM411A1 is installed
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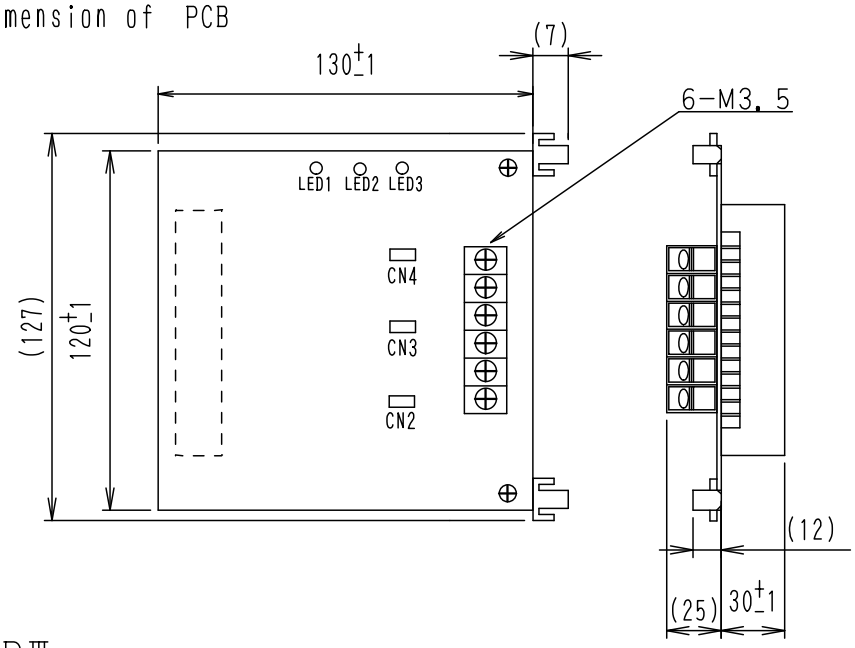
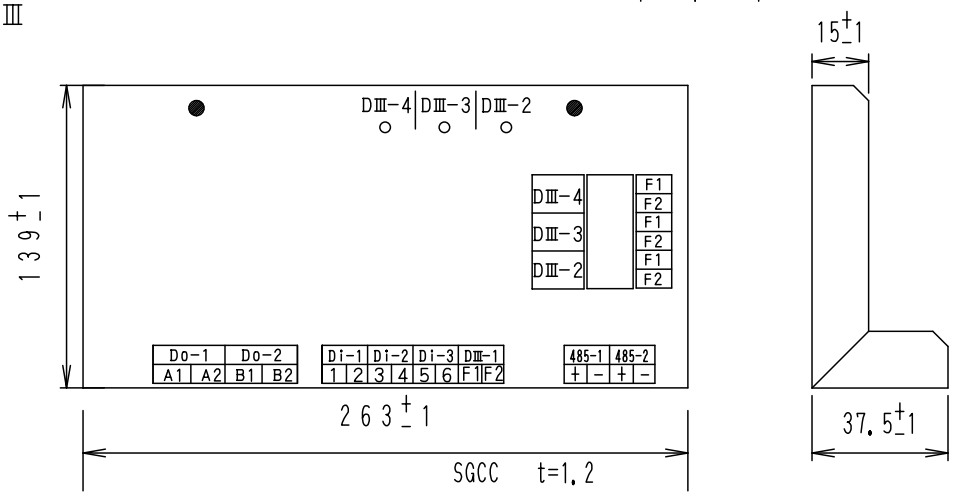
Option DⅢ board (DAM411A1) outside drawing

This kit is for adding 3 ports to the DⅢ−NET communication port by installing it on the BACnet Gateway DMS502A51. The kit can not be solely used.

Outside dimension of PCB

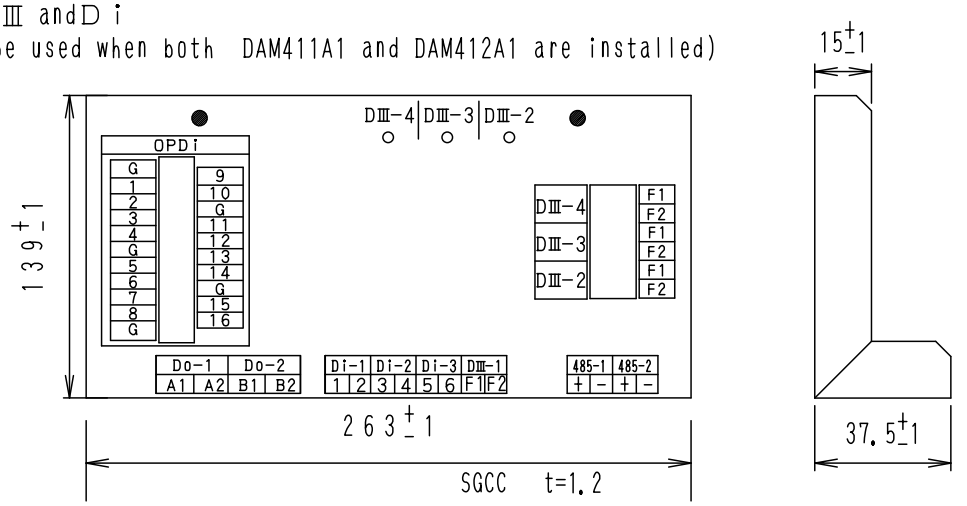


Panel for DⅢ



Panel for DⅢ andDi

(This is to be used when both DAM411A1 and DAM412A1 are installed)



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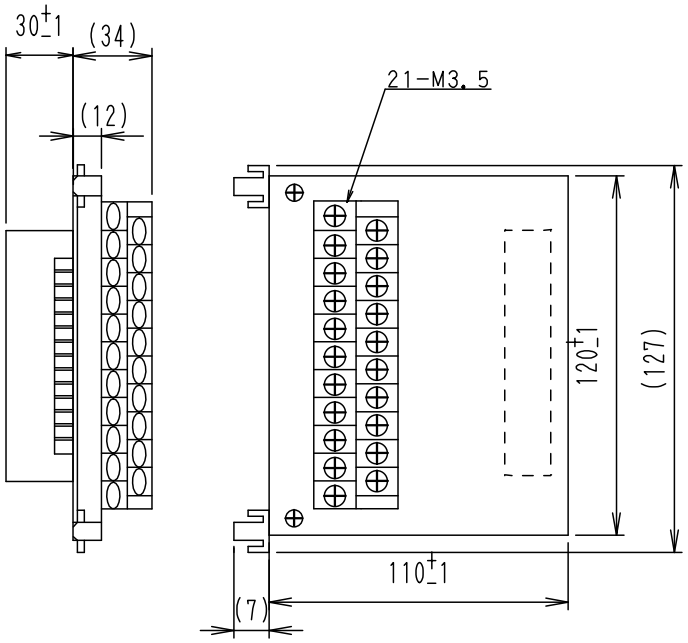
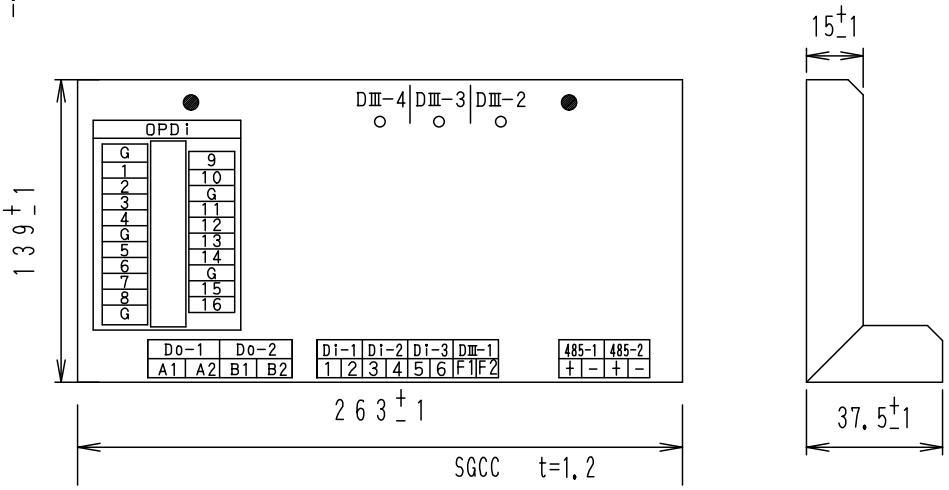
Option Di board (DAM412A1) outside drawing

Expansion kit, installed on the BACnet Gateway (DMS502A51), to provide Max 4 digital inputs such as forced stop.
Not usable independently

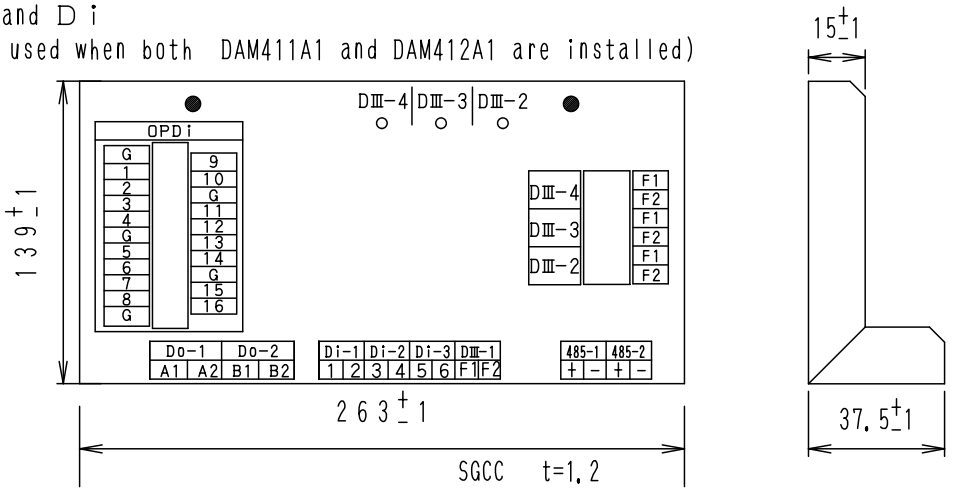
Outside dimension of PCB



Panel for Di



Panel for DIII and Di
(This is to be used when both DAM411A1 and DAM412A1 are installed)



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1.5 Communications Check Sheet

BACnet Object List

No.	Name	Object Name (however, 'XXX' represents an A/C Number)	Object Type	Unit			
				Inactive	Active		
				Text-1	Text-2	Text-3	Text-4
1	ON/OFF (setting) (★2)	StartStopCommand_XXX	BO	OFF	ON		
2	ON/OFF (status)	StartStopStatus_XXX	BI	OFF	ON		
3	Alarm Sign	Alarm_XXX	BI	Normal	Abnormal		
4	Error Code	MalfunctionCode_XXX	MI	Normal	(Specified by manufacturer)		
5	Operation Mode (setting) (★2)	AirConModeCommand_XXX	MO	Cooling	Heating	Ventilation	Auto
6	Operation Mode (status)	AirConModeStatus_XXX	MI	Cooling	Heating	Ventilation	
7	Airflow Rate (setting) (★2)	AirFlowRateCommand_XXX	MO	Weak	Strong		
8	Airflow Rate (status)	AirFlowRateStatus_XXX	MI	Weak	Strong		
9	Measured Room Temperature (★1)	RoomTemp_XXX	AI	Degree			
10	Set Room Temperature (★2)	TempAdjust_XXX	AV	Degree			
11	Filer Limit Sign	FilterSign_XXX	BI	No	Yes		
12	Filter Limit Sign Reset	FilterSignReset_XXX	BV	Reset			
13	Remote Control Operation (ON/OFF)	RemoteControlStart_XXX	BV	Permitted	Prohibited		
14	Remote Control Operation (Operation Mode)	RemoteControlAirConModeSet_XXX	BV	Permitted	Prohibited		
15	Vacant						
16	Remote Control Operation (Set Temperature)	RemoteControlTempAdjust_XXX	BV	Permitted	Prohibited		
(★)17	Remote Control Operation (Sub Group Address Control Rejection)	CL_Rejection_XXX	BV	Permitted	Prohibited		
18	Vacant						
19	Vacant						
20	Communication Status	CommunicationStatus_XXX	BI	Normal Communication	Abnormal Communication		
(★)21	System Forced OFF	SystemForcedOff_XXX	BV	Normal Reset	Forced OFF		
22	Air Direction (setting) (★2)	AirDirectionCommand_XXX	AV				
23	Air Direction (status)	AirDirectionStatus_XXX	AI				
24	Forced Thermostat OFF (setting)	ForcedThermoOFFCommand_XXX	BO	Reset	Set		
25	Forced Thermostat OFF (status)	ForcedThermoOFFStatus_XXX	BI	Reset	Set		
26	Energy Efficiency Command (setting)	EnergyEfficiencyCommand_XXX	BO	Reset	Set		
27	Energy Efficiency Command (status)	EnergyEfficiencyStatus_XXX	BI	Reset	Set		
28	Thermostat Status	ThermoStatus_XXX	BI	OFF	ON		
29	Compressor Status	CompressorStatus_XXX	BI	OFF	ON		
30	Indoor Fan Status	IndoorFanStatus_XXX	BI	OFF	ON		
31	Heater Operation Status	HeaterStatus_XXX	BI	OFF	ON		

(★) CL_Rejection_XXX and System Forced Off_XXX have only 4 Groups Number 000, 064, 128 & 192.

(★1) As the indoor fan stops when the operation is in special operation mode such as thermostat off, at rest or defrosting, the “suction air temperature” is affected by the heat exchanger and the sensor may happen to detect the temperature different from that of the indoor and transmit the signal. Due to the above mentioned reason, consider the temperature as a rule of thumb. If the system control is to be based on this temperature (such as changeover of operation mode and changing the set temperature), the manufacturer of the building management system is kindly requested to carry out on its own responsibility.

(★2) The system is designed to keep the memory of the set conditions even when the air conditioner stops due to a power failure. Each time when the setting of temperature, ON/OFF, heat/cool mode, air flow direction or air volume is changed, it is written into the non-volatile memory. The frequency of writing the setting into the non-volatile memory is limited and if the setting is frequently written into the memory after exceeding the limit, it may cause malfunction.Therefore, **take caution so that the frequency of changing the setting of each indoor unit may not exceed 7000 times/year** when changing the setting of temperature, ON/OFF, heat/cool mode, air flow direction or air volume frequently by automatic control or the like from the central monitoring panel.

1.6 Function

Outline of Functions

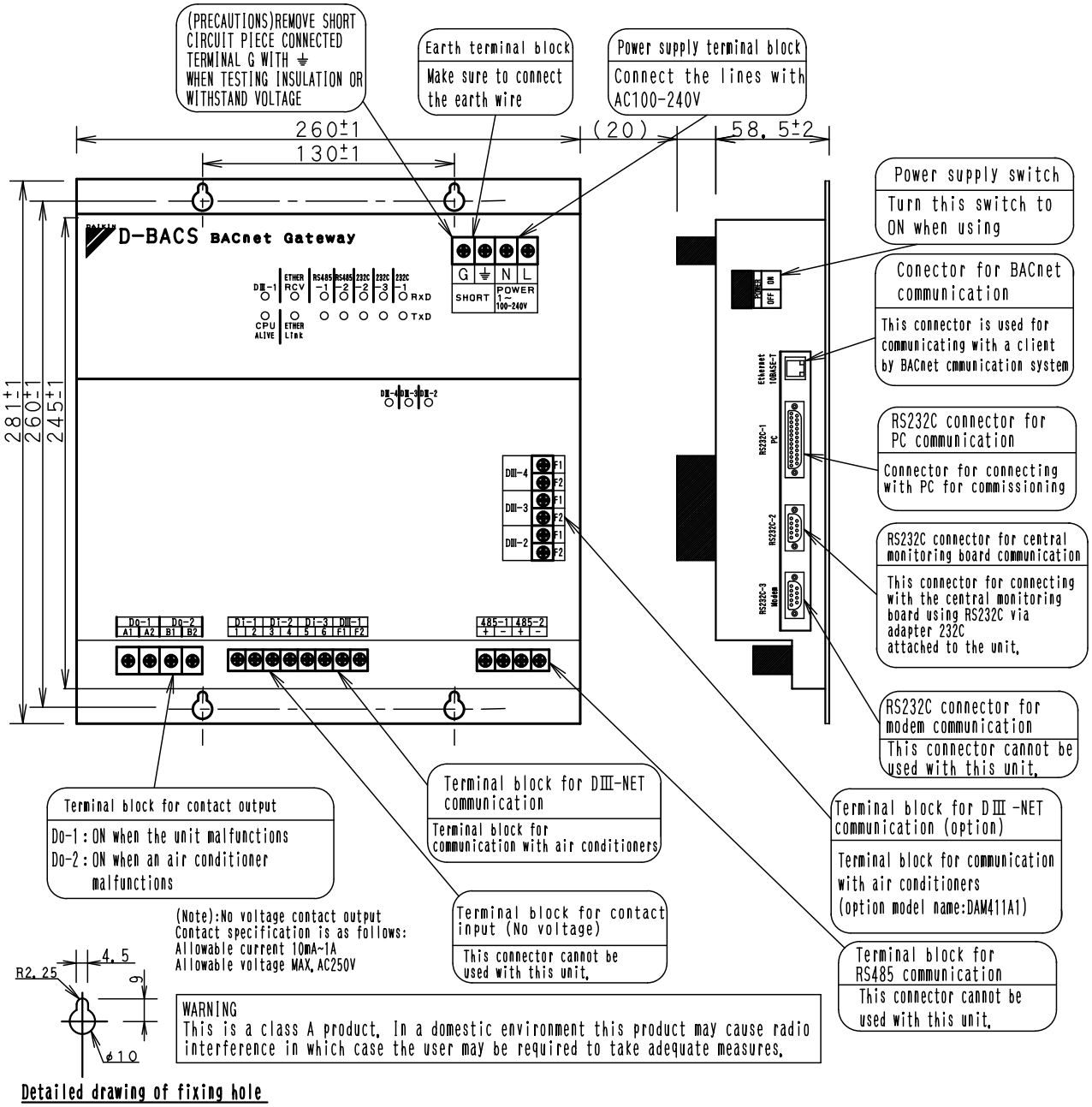
- This BACnet Gateway enables interfacing between the VRV system and central monitoring board.
- Data of up to 256 groups of air conditioner (when the option DIII board is used) are controllable by the BACnet Gateway.
- Air conditioners are operable and the state can be monitored from the central monitoring board by RS232C communication or BACnet communication.

Main Function

The BACnet Gateway can monitor and control air conditioners from a maximum of 256 groups, on a unit by unit basis. Major features are listed below.

1. Switches the ON/OFF operation and monitors operational state.
2. Monitors indoor units for malfunctions.
3. Monitors and changes temperature.
4. Monitors indoor unit temperature.
5. Monitors and resets filter clean sign.
6. Switches the operation mode.
7. Sets remote controller operation.

Names and Functions of Each Part



Detailed drawing of fixing hole

LED display

CPU ALIVE	It flashes when the unit is normal operation.
DⅢ－1	It flashes when it receives/transmits data from/to the equipment connected with DⅢ-1 such as air conditioners
Ether RCV	It flashes when it receives/transmits data from/to BACnet client
Ether Link	It lights when the 10BASE-T cable is connected
RS485-1(RxD)	This LED display cannot be used with this unit
RS485-1(TxD)	This LED display cannot be used with this unit
RS485-2(RxD)	This LED display cannot be used with this unit
RS485-2(TxD)	This LED display cannot be used with this unit

RS232C-1(RxD)	It flashes when it receives data to PC
RS232C-1(TxD)	It flashes when it transmits data to PC
RS232C-2(RxD)	It flashes when it receives data from the central monitoring board
RS232C-2(TxD)	It flashes when it transmits data to the central monitoring board
RS232C-3(RxD)	This LED display cannot be used with this unit
RS232C-3(TxD)	This LED display cannot be used with this unit
DⅢ－2	It flashes when it receives/transmits data from/to the equipment connected with DⅢ-2 such as air conditioners
DⅢ－3	It flashes when it receives/transmits data from/to the equipment connected with DⅢ-3 such as air conditioners
DⅢ－4	It flashes when it receives/transmits data from/to the equipment connected with DⅢ-4 such as air conditioners

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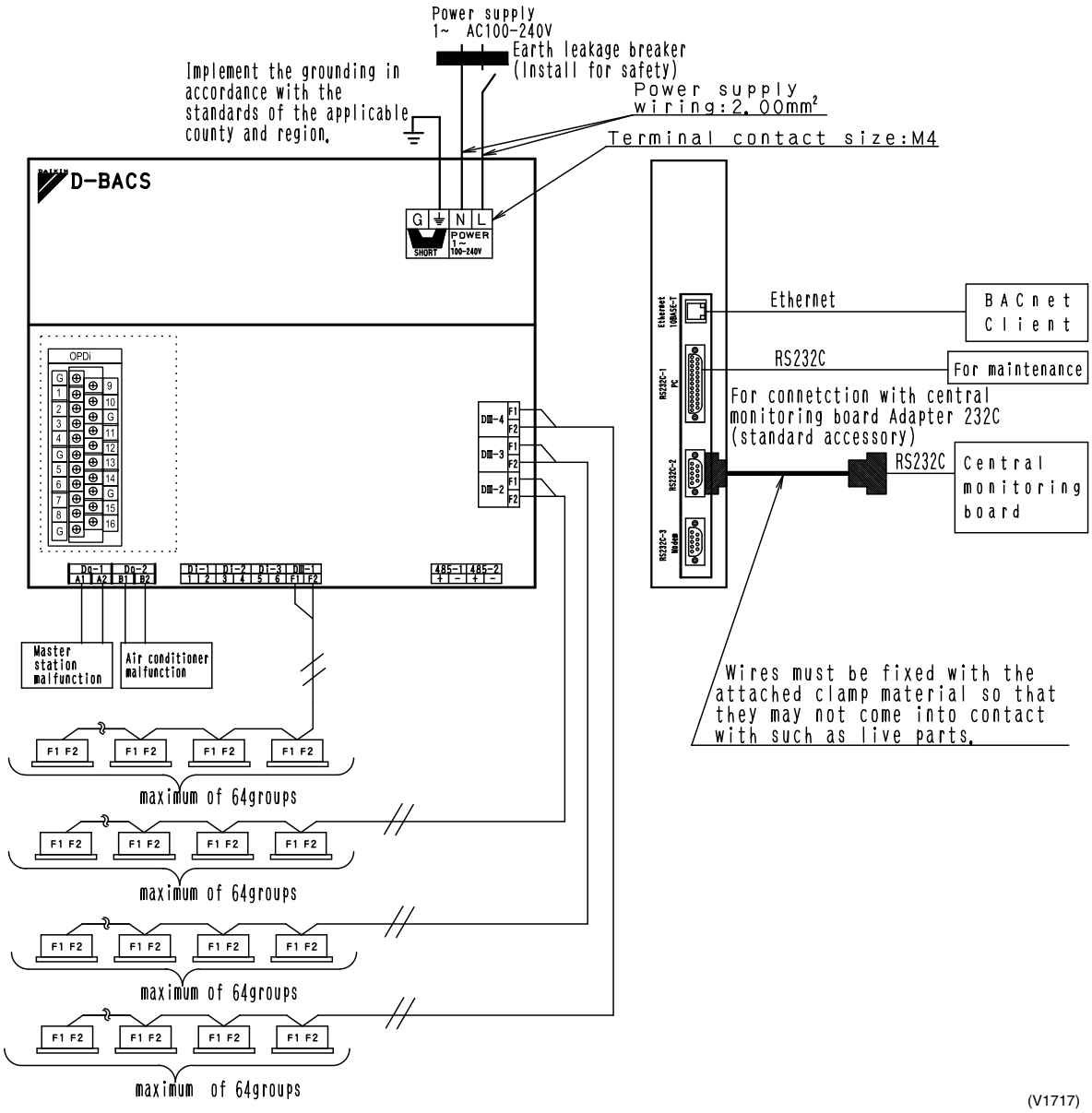
1.7 Wiring and Setting Procedures

System Wiring



(V1717)

[DIII-NET Master] Setting

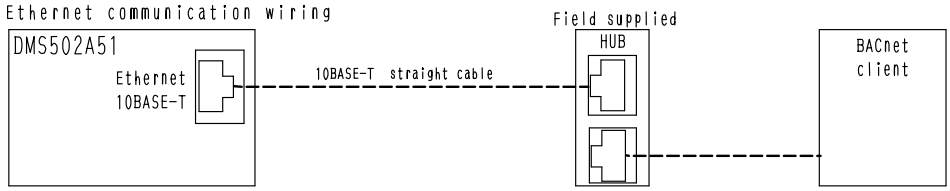
Make sure to connect the unit with 「DIII-NET master」
Remove the master central setting connectors of the centralized management controllers or ON/OFF contorollers When using together with other centralized controllers such as centralized management controllers or ON/OFF controllers.

(V1718)

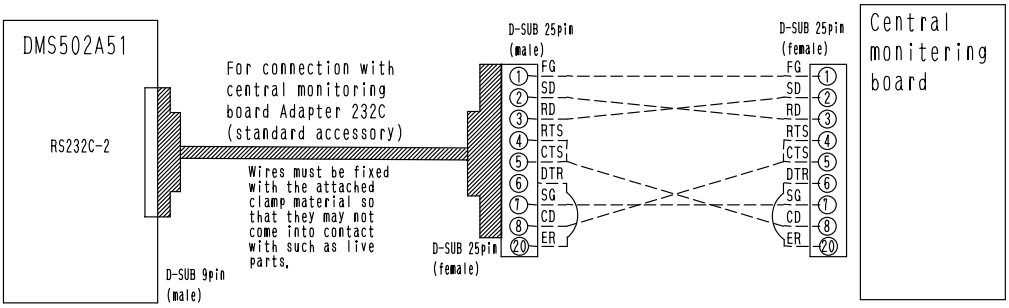
For External Wiring

■Everything relating with field wiring must be supplied in the field.

●Ethernet communication wiring

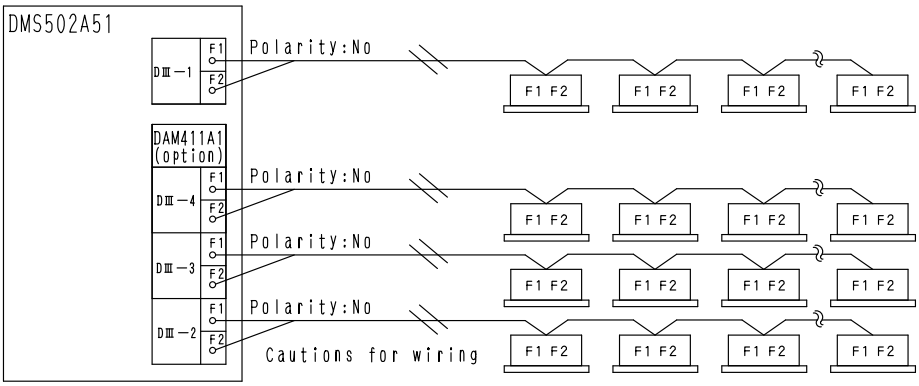


●Communication between central monitoring board



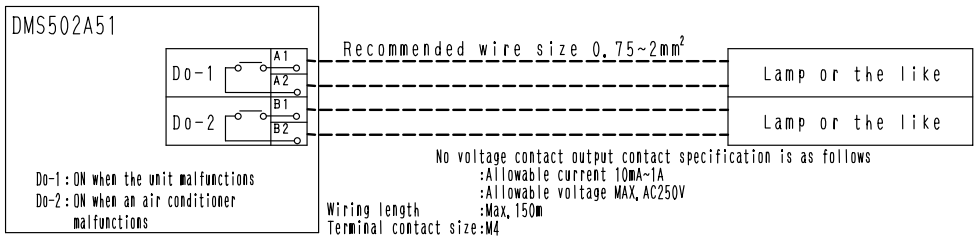
Transfer mode : Half-duplex operation
Interface : RS232C
Baud rate : 9600 or 4800 bps
(Changeover of transmission rate is carried out by serviceman's PC at cmmissioning)
Transmission method : Asynchronous;Start bit:1, Stop bit:1
Control protocol : Polling/Selecting(centralized);Comforms to JISX5002.
Control station :Central monitoring board
Substation :DMS502A51
Transfer code : JIS7 unit +1 parity bit
Error control : Vertical parity check(Even)
: Horizontal parity check(LRC)
: Timer-based montitoring
Wiring length : Max. 15m

●DⅢ-NET wiring



1. Do not use multicore cables with three or more cores.
2. Use wires of sizes between 0.75mm² and 1.25mm²
3. Wire length:Max 1000m
4. Do not bind the wire for DⅢ-NET
5. Wirings for DⅢ-NET must be isolated from the power lines.
6. Terminal contact size:M3.5

●Do-1 and 2



No voltage contact output contact specification is as follows
:Allowable current 10mA~1A
:Allowable voltage MAX. AC250V
Wiring length :Max. 150m
Terminal contact size:M4

Main specifcations

Temperture range	-10~50℃
Humidity range	0~98%(No frost formation)
Power supply	1~AC100-240V 50/60Hz
Power consumption	MAX. 20W
Weight	4.0Kg

Colours of the unit

Unit	PANTONE 533C
Letters	PANTONE 656C
Lines	PANTONE 656C

(V1719)

1.8 Functions

1. Control Functions

The following functions can be realized by central monitoring panel and BACnet Gateway.

Functions	Central monitoring panel	Communication direction	BACnet Gateway	Target unit
Monitoring	Room temperature monitoring (Note 4)	←	When requested, transmits the current suction air temperature.	Delegate unit of block
	Thermostat status monitoring	←	When requested, transmits the operation status of air-conditioner.	Delegate unit of block
	Compressor operation status monitoring	←	When requested, transmits whether compressor connected to the indoor unit is in operation.	Delegate unit of block
	Indoor fan operation status monitoring	←	When requested, transmits whether the indoor unit fan is in operation.	Delegate unit of block
	Heater operation status monitoring	←	When requested, transmits whether the optional heater is in operation.	Delegate unit of block
	Air-conditioner error message	←	Detects change in status, and transmits error code according to status change data communication.	Group
Control/ setting/ monitoring	On/Off control and monitoring (Note 5)	→ ← (Note 1)	When ON/OFF command is received, starts or stops the corresponding equipment and transmits its results. When requested, transmits the operation status (On/Off) and error status. Also transmits the change of status by detecting the status change.	Block
	Temperature setting and monitoring (Note 5)	→ ←	When temperature setting command is received, outputs the setting value to the corresponding equipment and transmits the setting results. When the status is requested, transmits current room temperature setting (changes by local remote controller is also reflected). Also transmits the change of status by detecting the status change.	Setting by block and monitoring by delegate unit
	Air-conditioning mode setting and monitoring (cool/heat/fan/auto) (Note 5)	→ ←	When operation mode setting command is received, outputs the setting value to the corresponding equipment and transmits the setting results. When the status is requested, transmits current operation mode setting (changes by local remote controller is also reflected). Also transmits the change of status by detecting the status change.	Setting by block and monitoring by delegate unit
	Remote controller mode setting and monitoring	→ ←	When command to restrict the local remote controller is received, outputs the setting to the corresponding unit and transmits accordingly. When status request is received, transmits the current remote controller mode setting.	Setting by block and monitoring by delegate unit
	Filter sign monitoring and reset	→ ←	When requested, transmits whether filter sign is ON. When reset command is received, outputs filter sign reset signal and transmits the control results.	Block
	Air direction setting and monitoring (Note 5)	→ ←	When an air direction setting command is received, outputs the air flow direction setting signal to corresponding unit and transmits accordingly. When requested, transmits the air flow direction status.	Setting by block and monitoring by delegate unit
	Air flow rate setting and monitoring (Note 5)	→ ←	When an air flow rate setting command is received, outputs the air flow rate setting signal to corresponding unit and transmits accordingly. When requested, transmits the air flow rate status.	Setting by block and monitoring by delegate unit
	Forced thermostat OFF setting and monitoring	→ ←	When a forced thermostat OFF setting command is received, outputs the setting contents to the corresponding equipment and transmits the control results. When requested, transmits the setting status.	Setting by block and monitoring by delegate unit
	Energy efficiency setting and setting status monitoring	→ ←	When a energy efficiency setting command is received, outputs the setting contents to the corresponding equipment and transmits the control results. When requested, transmits the setting status.	Setting by block and monitoring by delegate unit
	Central/local controller operation rejection and monitoring	→ ←	When a central / local equipment operation rejection command is received, outputs the setting contents to the corresponding equipment and transmits the control results. When requested, transmits the setting status.	BACnet Gateway
	System forced OFF setting and monitoring	→ ←	When a system forced OFF command is received, outputs the setting contents to the corresponding equipment and transmits the control results. When requested, transmits the setting status.	BACnet Gateway
System setting	Clock setting	→	Transmits the received year, month, day and hour data inside the system.	BACnet Gateway
	Block setting	→	Summarizes data according to data corresponding to block No. and group No. (Note 3.)	BACnet Gateway

Notes:

1. The following contents are reported to the central monitoring panel.
   ON: All air-conditioners in the block is normal and at least one unit is running.
   Error operation: 1 or more units in the group has an error, and at least one unit is running.
   Error off: 1 or more air-conditioning unit in the group has an error, and all units are stopped.
   OFF: All the air-conditioners are normal and are stopped.
2. When a control/setting command is received, only equipment in the block not equipped with the corresponding function ignores the command.
   (Example: HRV unit ignores the command when a temperature setting command is transmitted.)
3. If block setting is altered, it effective from next monitoring and control command.

4. As the indoor fan stops when the operation is in special operation mode such as thermostat off, at rest or defrosting, the “suction air temperature” is affected by the heat exchanger and the sensor may happen to detect the temperature different from that of the indoor and transmit the signal. Due to the above mentioned reason, consider the temperature as a rule of thumb. If the system control is to be based on this temperature (such as changeover of operation mode and changing the set temperature), the manufacturer of the building management system is kindly requested to carry out on its own responsibility.
5. The system is designed to keep the memory of the set conditions even when the air conditioner stops due to a power failure. Each time when the setting of temperature, ON/OFF, heat/cool mode, air flow direction or air volume is changed, it is written into the non-volatile memory. The frequency of writing the setting into the non-volatile memory is limited and if the setting is frequently written into the memory after exceeding the limit, it may cause malfunction.Therefore, **take caution so that the frequency of changing the setting of each indoor unit may not exceed 7000 times/year** when changing the setting of temperature, ON/OFF, heat/cool mode, air flow direction or air volume frequently by automatic control or the like from the central monitoring panel.

2. Major functions of air-conditioner devices (incl. adaptors) to be connected

When the air-conditioners are hooked up with the BACnet Gateway, the following functions can be performed and monitored from the master station or the central monitor panel.

Function	Air-conditioner devices				Remarks
	VRV Inverter Series	Interface Adaptor for SkyAir Series (SA Heat Pump)	HRV	Wiring Adaptor for Other Air-Conditioners	
Start/Stop Control and Monitoring	○	○	○	○	
Air-Conditioner Error Notification	○	○	○	○	
Indoor Air Temperature Monitoring	○	○	×	×	
Temperature Setting and Monitoring	○	○ 16~32	×	×	
Air-Conditioning Mode Setting and Monitoring	○	○	×	×	Air-conditioning mode switching is effective only for indoor units for which cool/heat selection is permitted.
★1 Remote Controller Mode Setting and Monitoring	○	○	○	×	
Filter Sign Monitoring and Reset	○	○	○	×	
Cumulative Power Value Monitoring	○	×	×	○	
Thermostat Status Monitoring	○	○	×	×	
Compressor Operation Status Monitoring	○	○	×	×	
Indoor Fan Operation Status Monitoring	○	○	×	×	
Heater Operation Status Monitoring	○	○	×	×	
Air Direction Setting and Monitoring	○	○	×	×	
Air Flow Rate Setting and Monitoring	○	○	×	×	
Forced Thermostat Off Setting and Monitoring	○ ★2	○	×	×	
Energy Efficiency Command (Setting Temperature Shift)	○	×	×	×	

Note:

★1. Remote controller mode is for acceptance or rejection of on/off operation, temperature setting and air-conditioning mode setting by remote controller.

★2. If set locally, the host is not notified. Thus, monitoring cannot be accomplished from the host.

3. The meaning of ○, × are as follows
   ○ : Possible Functions
   × : Impossible Functions

1.9 Backup Systems for Troubles

1. Failure in the system and its backup operation

	Place of failure					Scope of influence by failure (Note1)	Operation when failure occurs. (description of backup)
	Central monitoring panel	BACnet Gateway	Central remote controller	Local remote controller	Air-conditioning unit		
1	○	○	○	○	×	Corresponding air-conditioning unit	Corresponding air-conditioning unit is shut-down. The details of failure is converted into code and transferred to the central monitoring panel by the status change notification system. The contents of failure is displayed on local remote controller or central remote controller.
2	○	○	○	×	○	(corresponding group)	Operation, setting and monitoring is not possible by local remote controller. Disconnect the power of the indoor unit once and turn the power on again, so that the backup operation is carried out by central remote controller.
3	○	○	×	○	○	(corresponding system)	Operation, setting and monitoring is not possible by the central remote controller. The backup operation is carried out by central monitoring panel or local remote controller.
4	○	○	○	○	○	(corresponding system)	Operation, setting and monitoring is not possible by central monitoring panel. Central remote controller and local remote controller can backup the operation.
5	○	×	○	○	○	(corresponding system)	Operation, setting and monitoring is not possible by central monitoring panel. Central remote controller and local remote controller can backup the operation.
6	×	○	○	○	○	(Entire system)	Operation, setting and monitoring is not possible by central monitoring panel. Central remote controller and local remote controller can backup the operation.
7	○	○	×	×	○	(corresponding system)	Operation, setting and monitoring is not possible by central remote controller and local remote controller. Disconnect the power of the indoor unit once and turn the power on again, so that the backup operation is carried out by central remote controller.
8	○	○	×	○	○	(corresponding system)	Operation, setting and monitoring is not possible by central monitoring panel and the central remote controller. The backup operation is carried out by local remote controller.
9	Communication line between indoor unit and local remote controller is shorted or disconnected.					(corresponding group)	Operation, setting and monitoring is not possible by local remote controller. Disconnect the power of the indoor unit once and turn the power on again, so that the backup operation is carried out by central remote controller.
10	Communication line between BACnet Gateway and indoor unit is shorted or disconnected.					(corresponding system)	Operation, setting and monitoring is not possible by central monitoring panel and the central remote controller. The backup operation is carried out by local remote controller.
11	Communication line between BACnet Gateway is shorted or disconnected.					(Entire system)	Operation, setting and monitoring is not possible by central monitoring panel. Central remote controller and local remote controller can backup the operation.

Note:

1. ( ) indicates that backup operation of all or part of functions within the scope of influence by equipment failure is possible.
   "Corresponding group" is a group of air-conditioner controlled by local remote controller, where the failure is occurred.
   "Corresponding system" is a group of air-conditioner controlled by BACnet Gateway, where the failure is occurred.
2. The chance that all local remote controllers and BACnet Gateway becomes out of order is almost negligible, so that the case is not included in the above.

2. Functional Allotment of Air-conditioning Control Equipment

○:Group ◎:System □:Zone ×:No function

Function	Description		D-BACS		Remarks
			Local remote controller	Central remote controller	
ON/OFF	Start/stop command		○	□◎	
Temperature setting	Temperature setting of air-conditioner	1°C increments	○	□	
Operation mode changeover	Changes the operation mode Cool/ heat/fan/auto of air-conditioner		○	□	Effective only for groups for which cool/ heat can be selected.
Timer operation changeover	Sets timer operation by local remote controller		○	×	Not effective if set to “local operation rejection” by central monitoring panel.
Air flow direction setting	Changes Air flow direction of air-conditioner		○	×	(Note 2)
Air flow rate setting	Changes air flow rate from high to low		○	×	
Ventilation mode changeover	Individual/combined operation mode changeover of HRV unit		○	□	
Zone setting	Designates the group of indoor unit to be operated by central remote controller		×	□	Possible to set disregards to the block setting by central monitoring panel.
Test operation	Sets test operation mode		○	□	
Inspection	Calls up the latest contents of failures occurred.		○	□	Possible to display error contents of slave unit in the group (indoor unit not connected directly by the transmission line of VRV system).
Filter sign reset	Transmits the reset signal of filter sign.		○	□	
System forced OFF	Shuts down all the air-conditioners under control by contact input.		×	◎	

Notes:

1. All the items that can receive the commands from more than one controllers are operated by the last command priority mode, unless the operation by local remote controller is rejected.
2. Effective only for the indoor unit equipped with air flow direction changeover function. (ceiling mounted cassette type and ceiling suspended type).

3. Monitoring for Air-conditioning Equipment

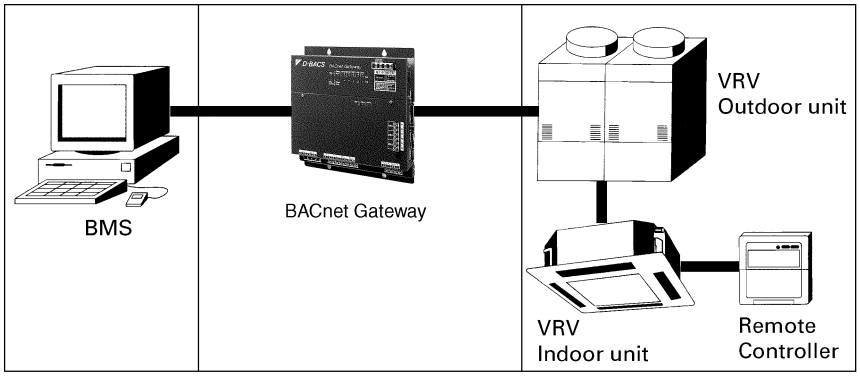
○: Group ◎: System □: Unit ×: No function

Function	Description	D-BACS		Remarks
		Local remote controller	Central remote controller	
Operating status monitoring	■ On/Off	○	○◎	
	■ Operating mode	○	○	
	■ Ventilation mode	○	○	
	■ Temperature setting	○	○	
	■ Air flow direction	○	×	
	■ Air flow rate	○	○	
	■ Local remote controller operation Acceptance/Rejection	○	×	
	■ Room (suction air) temperature	×	×	
Air-conditioning equipment error	Failure monitoring (including inspection mode of filter sign, etc.)	□	□	If more than one error occurs within the same group, the first one detected is given priority for display.
System error monitoring	Monitors, errors due to equipment failure, power failure or poor connection for data station or central remote controller.	×	×	
System display	Displays indoor unit groups and groups for which selection of cool/heat is enabled that are connected to the same outdoor unit.	×	○	

1.10 BMS (Building Management System)

Connecting with BMS, versatile system development can be achieved.

■ **System architecture**



Control functions
Operation / Stop
Temperature setting
Cooling / Heating change-over
Air flow

Monitoring functions
Operation
Trouble
Room temperature.

Management functions
Interlock with security system
Interlock with fire alarm
Energy and power saving control
Total control system.

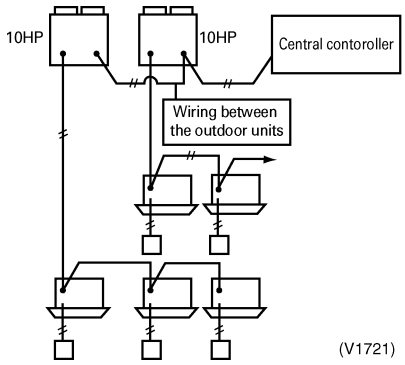
(V1939)

■ **BMS with VRV**

Building Management System	BMS manufacturer in alphabetical order
System 600 MS2000	Siemens
Butics-EX / II	NEC
savic-net	Yamatake
METASYS	Johnson Controls

1.11 Adopting " Super wiring system"

■ **In case of Inverter "K" Series (10HP)×2 system**



(V1721)

New system reduces the number of wiring by integrating the control wiring between indoor and outdoor unit and the transmission wiring to central remote controller into one common wiring.

Part 2
Functional Specifications (DMS502A51)

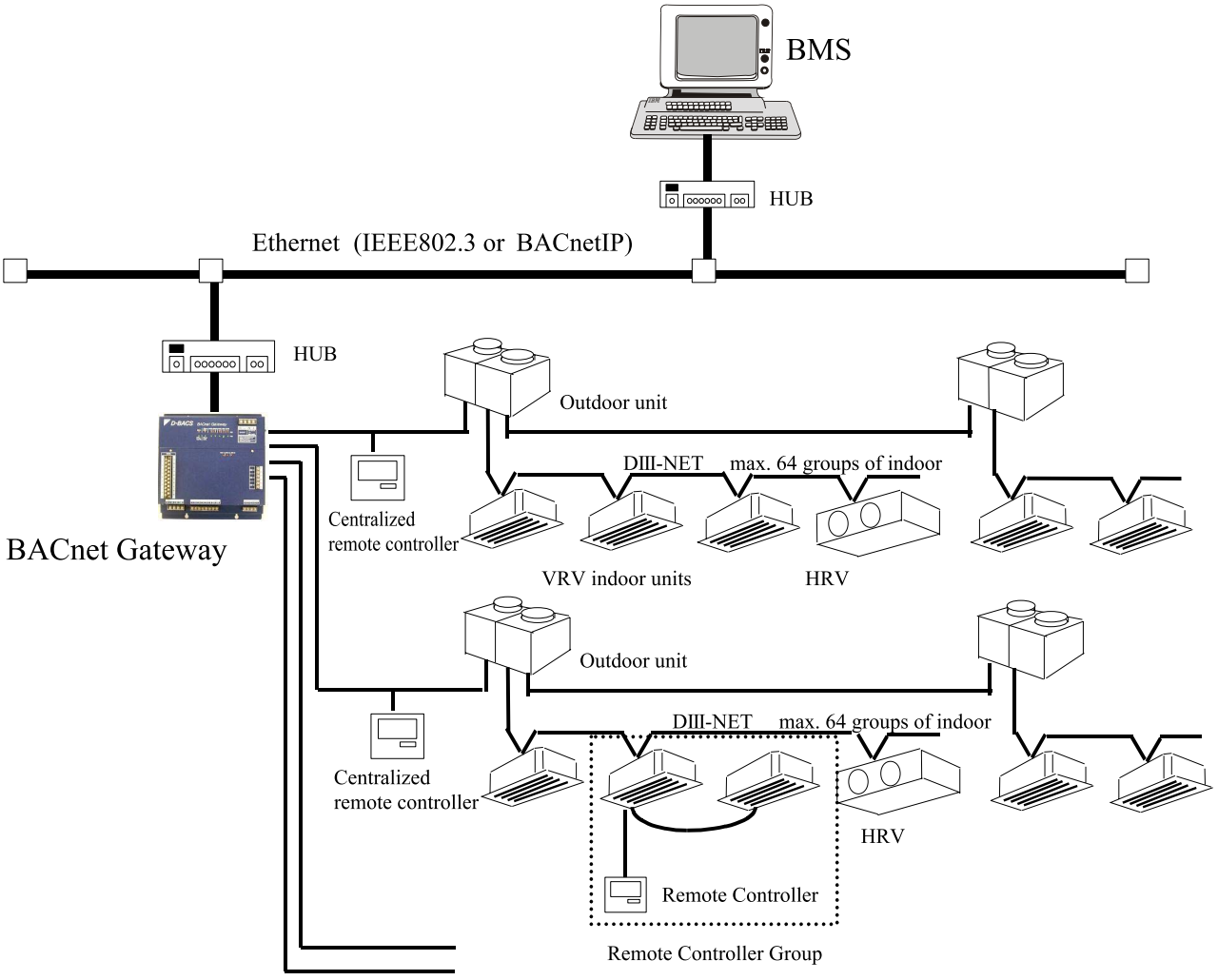
CB02A125A (Ver.3)

1. Summary

In response to the requests from the equipment (BACnet client) considered as a central monitoring panel which supports BACnet-ANSI/ASHRAE135 protocol, the BACnet Gateway actuates as a BACnet server that replies the status information of air conditioners connected to DIII-NET and receives the setting commands to air conditioners through the service specified by BACnet.

2. Configuration of Connection

A BACnet client that supports BACnet-ANSI/ASHRAE135 protocol allows direct connection via generally used HUBs such as Ethernet. The image of its connection configuration is as shown below.



DIII-NET, max. 4 ports (max. 256 groups)

Communication protocol supports both IEEE802.3 and BACnetIP.
The protocol can be switched for use by changing the setting with the Test Run Tool and then restarting the computer.

3. Monitoring and Controlling Items of A/C

The items to monitor and control air conditioners from BACnet communication as well as descriptions of each item are listed below.

Function		Description
Monitoring	ON/OFF Status	Monitors ON/OFF status of the respective air conditioners.
	Alarm Sign	Monitors whether air conditioners are operating normally and, if not, sends out an alarm sign.
	Error Code	Displays error code specified by the respective manufacturer if an abnormality occurs in the system.
	Operation Mode	Monitors status of cooling, heating and ventilation operation.
	Room Temperature (★1)	Monitors room temperature and displays the actual room temperature.
	Filter Limit	Checks the limit of filters in use and monitors if there is a necessity to replace the filters.
	Thermostat Status	Monitors whether the thermostat in the air conditioner is operating properly.
	Compressor Status	Monitors whether compressors in outdoor units that are connected to the indoor units are operating properly.
	Indoor Fan Status	Monitors whether fans in the air conditioners are operating properly.
	Heater Operation Status	Monitors whether heaters in the air conditioners are operating properly.
Operation, Setting and Monitoring	ON/OFF Operation (★2)	Starts and stops the respective air conditioners and monitors control results.
	Operation Mode Setting (★2)	Sets the operation mode (cooling, heating, ventilation or auto mode) and monitors the setting results.
	Room Temperature Setting (★2)	Sets room temperatures of the respective air conditioners and monitors the setting results.
	Filter Limit and Reset	Checks whether there is a use limit for the respective filters and then resets the sign as necessary.
	Remote Control Operation Rejection	Sets the permission/rejection function of remote controllers in order not to allow operation control, such as ON/OFF, operation mode and room temperature, from the remote controllers.
	Sub Group Address Control Operation Rejection	Sets the control permission/rejection function of centralized devices (i.e., air conditioners in a sub group address) connected on the DIII-NET.
	Airflow Rate Setting Operation (★2)	Sets the airflow rate and monitors the setting results.
	Air Direction Setting Operation (★2)	Sets the air direction and monitors the setting results.
	System Forced OFF Setting Rejection	Upon receiving a Forced OFF Command, checks whether it is a normal reset or forced OFF and then operates as necessary.
	Forced Thermostat OFF Setting	Upon receiving a Thermostat OFF command, checks whether it is a rest or set and then monitors setting results.
	Energy Efficiency Setting	Upon receiving an Energy Efficiency Setting command, checks whether it is a rest or set and then monitors setting results.

(★1) As the indoor fan stops when the operation is in special operation mode such as thermostat off, at rest or defrosting, the “suction air temperature” is affected by the heat exchanger and the sensor may happen to detect the temperature different from that of the indoor and transmit the signal. Due to the above mentioned reason, consider the temperature as a rule of thumb. If the system control is to be based on this temperature (such as changeover of operation mode and changing the set temperature), the manufacturer of the building management system is kindly requested to carry out on its own responsibility.

(★2) The system is designed to keep the memory of the set conditions even when the air conditioner stops due to a power failure. Each time when the setting of temperature, ON/OFF, heat/cool mode, air flow direction or air volume is changed, it is written into the non-volatile memory. The frequency of writing the setting into the non-volatile memory is limited and if the setting is frequently written into the memory after exceeding the limit, it may cause malfunction.Therefore, **take caution so that the frequency of changing the setting of each indoor unit may not exceed 7000 times/year** when changing the setting of temperature, ON/OFF, heat/cool mode, air flow direction or air volume frequently by automatic control or the like from the central monitoring panel.

4. Applicable A/C Models and Monitoring and Controlling Items

A/C models that are supported by BACnet Gateway are VRV, Hi Sky Multi, SkyAir, Facility A/C, HRV and RA. Applicable monitoring and controlling items for each model are listed below.

Function	VRV	Hi Sky Multi	SkyAir (with connection adapter for SkyAir)	Facility A/C (with centralized control adapter)	HRV	RA (with general adapter)
ON/OFF Operation and Monitoring	○	○	○	○	○	○
A/C Error Report	○	○	○	○	○	○
Room Temperature Monitoring	○	○	○	○	×	×
Temperature Setting and Monitoring	○	○	○	○	×	×
Thermostat Mode Setting and Monitoring	○	○	○	○	×	×
Remote Control Mode Setting and Monitoring	○	○	○	○	○	×
Filter Sign Monitoring and Reset	○	○	○	×	○	×
Thermostat Status Monitoring	○	○	○	×	×	×
Compressor Operation Status Monitoring	○	○	○	×	×	×
Indoor Fan Operation Status Monitoring	○	○	○	×	○	×
Heater Operation Status Monitoring	○	○	○	×	×	×
Humidifier Operation Status Monitoring	○	○	○	×	×	×
Air Direction Setting and Monitoring	○	○	○	×	×	×
Airflow Rate Setting and Monitoring	○	○	○	×	△(∗2) Only monitoring	×
Forced Thermostat OFF Setting and Monitoring	○(∗1)	○	○	×	×	×
Energy Efficiency Command (Set Temperature Shift)	○	○	×	×	×	×

(∗1): When this is set from the remote controller, it is not reported to the upper system and, therefore, this setting cannot be monitored by the upper system.

(∗2): The triangle mark denotes the function that is only available for some of the models.

5. BACnet Protocol Implementation Conformance Statement (PICS)

BACnet Protocol Implementation Conformance Statement

Date: *30-Aug-2002*
Vendor Name: *DAIKIN Industries LTD.*
Product Name: *D-BACS BACnet Gateway*
Product Model Number: *DMS502A51*
Applications Software Version: *3000* **Firmware Revision:** *3000* **BACnet Protocol Revision:** *3000*

Product Description:

BACnet Standardized Device Profile (Annex L):

- ☐ BACnet Operator Workstation (B-OWS)
- ☐ BACnet Building Controller (B-BC)
- ☐ BACnet Advanced Application Controller (B-AAC)
- ■ BACnet Application Specific Controller (B-ASC)
- ☐ BACnet Smart Sensor (B-SS)
- ☐ BACnet Smart Actuator (B-SA)

Additional BACnet Interoperability Building Blocks Supported (Annex K):
Reference of BIBBs List

Segmentation Capability:

- ■ Segmented requests supported Window Size 1
- ■ Segmented responses supported Window Size 1

Standard Object Types Supported:

An object type is supported if it may be present in the device. For each standard Object Type supported provide the following data:

1) Whether objects of this type are dynamically creatable
2) Whether objects of this type are dynamically deletable
3) List of the optional properties supported
4) List of all properties that are writable where not otherwise required by this standard
5) List of proprietary properties and for each its property identifier, data type, and meaning
6) List of any property range restrictions

Data Link Layer Options:

- ■ BACnet IP, (Annex J)
- ☐ BACnet IP, (Annex J), Foreign Device
- ■ ISO 8802-3, Ethernet (Clause 7)
- ☐ ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
- ☐ ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s) _____
- ☐ MS/TP master (Clause 9), baud rate(s): _____
- ☐ MS/TP slave (Clause 9), baud rate(s): _____
- ☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s): _____
- ☐ Point-To-Point, modem, (Clause 10), baud rate(s): _____
- ☐ LonTalk, (Clause 11), medium: _____
- ☐ Other: _____

Device Address Binding:

Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.) ☐Yes ■ No

Networking Options:

- ☐ Router, Clause 6 - List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.
- ☐ Annex H, BACnet Tunneling Router over IP
- ☐ BACnet/IP Broadcast Management Device (BBMD)

  Does the BBMD support registrations by Foreign Devices? ☐Yes ☐ No

Character Sets Supported:

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

■ ANSI X3.4	☐ IBM™/Microsoft™ DBCS	☐ ISO 8859-1
☐ ISO 10646 (UCS-2)	☐ ISO 10646 (UCS-4)	☐ JIS C 6226

If this product is a communication gateway, describe the types of non-BACnet equipment/networks(s) that the gateway supports:

_____

_____

_____

6. BACnet Interoperability Building Blocks Supported (BIBBs)

6.1 Data Sharing BIBBs

BIBB Type		Supported	BACnet Service	Initiate	Execute
DS-RP-A	Data Sharing-ReadProperty-A	☐	ReadProperty	X	
DS-RP-B	Data Sharing-ReadProperty-B	■	ReadProperty		X
DS-RPM-A	Data Sharing-ReadPropertyMultiple-A	☐	ReadPropertyMultiple	X	
DS-RPM-B	Data Sharing-ReadPropertyMultiple-B	■	ReadPropertyMultiple		X
DS-RPC-A	Data Sharing-ReadPropertyConditiona-A	☐	ReadPropertyConditional	X	
DS-RPC-B	Data Sharing-ReadPropertyConditional-B	☐	ReadPropertyConditional		X
DS-WP-A	Data Sharing-WriteProperty-A	☐	WriteProperty	X	
DS-WP-B	Data Sharing-WriteProperty-B	■	WriteProperty		X
DS-WPM-A	Data Sharing-WritePropertyMultiple-A	☐	WritePropertyMultiple	X	
DS-WPM-B	Data Sharing-WritePropertyMultiple-B	■	WritePropertyMultiple		X
DS-COV-A	Data Sharing-COV-A	☐	SubscribeCOV	X	
			ConfirmedCOVNotification		X
			UnconfirmedCOVNotification		X
DS-COV-B	Data Sharing-COV-B	■	SubscribeCOV		X
			ConfirmedCOVNotification	X	
			UnconfirmedCOVNotification	X	
DS-COVP-A	Data Sharing-COVP-A	☐	SubscribeCOV	X	
			ConfirmedCOVNotification		X
			UnconfirmedCOVNotification		X
DS-COVP-B	Data Sharing-COVP-B	☐	SubscribeCOV		X
			ConfirmedCOVNotification	X	
			UnconfirmedCOVNotification	X	
DS-COVU-A	Data Sharing-COV-Unsolicited-A	☐	UncofirmedCOVNotification		X
DS-COVU-B	Data Sharing-COV-UnsolicitedvB	☐	UncofirmedCOVNotification	X	

6.2 Alarm and Event Management BIBBs

BIBB Type		Supported	BACnet Service	Initiate	Execute
AE-N-A	Alarm and Event-Notification-A	☐	ConfirmedEventNotification		X
			UnconfirmedEventNotification		X
AE-N-I-B	Alarm and Event-Notification Internal-B	■	ConfirmedEventNotification	X	
			UnconfirmedEventNotification	X	
AE-N-E-B	Alarm and Event-Notification External-B	☐	ConfirmedEventNotification	X	
			UnconfirmedEventNotification	X	
AE-ACK-A	Alarm and Event-ACK-A	☐	AcknowledgeAlarm	X	
AE-ACK-B	Alarm and Event-ACK-B	☐	AcknowledgeAlarm		X
AE-ASUM-A	Alarm and Event-Summary-A	☐	GetAlarmSummary	X	
AE-ASUM-B	Alarm and Event-Summary-B	☐	GetAlarmSummary		X
AE-ESUM-A	Event-Summary-A	☐	GetEnrollmentSummary	X	
AE-ESUM-B	Event-Summary-B	☐	GetEnrollmentSummary		X
AE-INFO-A	Alarm and Event-Information-A	☐	GetEventInformation	X	
AE-INFO-B	Alarm and Event-Information-B	☐	GetEventInformation		X
AE-LS-A	Alarm and Event-LifeSafety-A	☐	LifeSafetyOperation	X	
AE-LS-B	Alarm and Event-LifeSafety-B	☐	LifeSafetyOperation		X

6.3 SCHEDuling BIBBs

BIBB Type		Supported	BACnet Service	Initiate	Execute
SCHED-A	Scheduling-A	☐			
	(must support DS-RP-A and DS-WP-A)				
SCHED-I-B	Scheduling-Internal-B	☐			
	(shall support DS-RP-B and DS-WP-B)				
	(shall also support ether DM-TS-B or DS-UTC-B)				
SCHED-E-B	Scheduling-External-B	☐			
	(shall support SCHED-I-B and DS-WP-A)				

6.4 Trending BIBBs

BIBB Type		Supported	BACnet Service	Initiate	Execute
T-VMT-A	Trending - Viewing and Modifying Trends-A	☐	ReadRange	X	
T-VMT-I-B	Trending - Viewing and Modifying Trends Inernal-B	☐	ReadRange		X
T-VMT-E-B	Trending - Viewing and Modifying Trends External-B	☐	ReadRange		X
T-ATR-A	Trending - Automated Trend Retrieval-A	☐	ConfirmedEventNotification		X
			ReadRange	X	
T-ATR-B	Trending - Automated Trend Retrieval-B	☐	ConfirmedEventNotification	X	
			ReadRange		X

6.5 Device Management BIBBs

BIBB Type		Supported	BACnet Service	Initiate	Execute
DM-DDB-A	Device Management - Dynamic Device Binding-A	■	Who-Is	X	
			I-Am		X
DM-DDB-B	Device Management - Dynamic Device Binding-B	■	Who-Is		X
			I-Am	X	
DM-DOB-A	Device Management - Dynamic Object Binding-A	☐	Who-Has	X	
			I-Have		X
DM-DOB-B	Device Management - Dynamic Object Binding-B	■	Who-Has		X
			I-Have	X	
DM-DCC-A	Device Management - DeviceCommunicationControl-A	☐	DeviceCommunicationControl	X	
DM-DCC-B	Device Management - DeviceCommunicationControl-B	☐	DeviceCommunicationControl		X
DM-PT-A	Device Management - PrivateTransfer-A	☐	ConfirmedPrivateTransfer	X	
			UnconfirmedPrivateTransfer	X	
DM-PT-B	Device Management - PrivateTransfer-B	☐	ConfirmedPrivateTransfer		X
			UnconfirmedPrivateTransfer		X
DM-TM-A	Device Management - Text Message-A	☐	ConfirmedTextMessage	X	
			UnconfirmedTextMessage	X	
DM-TM-B	Device Management - Text Message-B	☐	ConfirmedTextMessage		X
			UnconfirmedTextMessage		X
DM-TS-A	Device Management - TimeSynchronization-A	☐	TimeSynchronization	X	
DM-TS-B	Device Management - TimeSynchronization-B	■	TimeSynchronization		X
DM-UTC-A	Device Management - UTCTimeSynchronization-A	☐	UTCTimeSynchronization	X	
DM-UTC-B	Device Management - UTCTimeSynchronization-B	■	UTCTimeSynchronization		X
DM-RD-A	Device Management - ReinitializeDevice-A	☐	ReinitializeDevice	X	
DM-RD-B	Device Management - ReinitializeDevice-B	☐	ReinitializeDevice		X
DM-BR-A	Device Management - Backup and Restore-A	☐	AtomicReadFile	X	
			AtomicWriteFile	X	
			CreateObject	X	
			ReinitializeDevice	X	
DM-BR-B	Device Management - Backup and Restore-B	☐	AtomicReadFile		X
			AtomicWriteFile		X
			ReinitializeDevice		X
DM-R-A	Device Management - Restart-A	☐	UnconfimedCOVNotification		X
DM-R-B	Device Management - Restart-B	☐	UnconfimedCOVNotification	X	
DM-LM-A	Device Management - List Manipulation-A	☐	AddListElement	X	
			RemoveListElement	X	
DM-LM-B	Device Management - List Manipulation-B	■	AddListElement		X
			RemoveListElement		X
DM-OCD-A	Device Management - Object Creation and Deletion-A	☐	CreateObject	X	
			DeleteObject	X	
DM-OCD-B	Device Management - Object Creation and Deletion-B	☐	CreateObject		X
			DeleteObject		X
DM-VT-A	Device Management - Virtual Terminal-A	☐	VT-Open	X	
			VT-Close	X	X
			VT-Data	X	X
DM-VT-B	Device Management - Virtual Terminal-B	☐	VT-Open		X
			VT-Close	X	X
			VT-Data	X	X

6.6 Network Management BIBBs

BIBB Type		Supported	BACnet Network Layer Message	Initiate	Execute
NM-CE-A	Network Management - Connection Establishment-A	☐	Establish-Connection-To-Network	X	
			Disconnect-Connection-To-Network	X	
NM-CE-B	Network Management - Connection Establishment- B	☐	Establish-Connection-To-Network		X
			Disconnect-Connection-To-Network		X
NM-RC-A	Network Management - Router Configuration-A	☐	Who-Is-Router-To-Network	X	
			I-Am-Router-To-Network		X
			I-Could-Be-Router-To-Network		X
			Initialize-Routing-Table	X	
			Initialize-Routing-Table-Ack		X
NM-RC-B	Network Management - Router Configuration-B	☐	Who-Is-Router-To-Network	X	X
			I-Am-Router-To-Network	X	X
			Initialize-Routing-Table		X
			Initialize-Routing-Table-Ack	X	

7. Objects

7.1 Supported Object Type

Monitoring and controlling items of air conditioners supported are assigned with general object types specified by BACnet. Support status of each object type is shown in the table below.

Object Type		Supported	A/C Management Point
Analog-Input	0	■	Measured Room Temperature, Air Direction Level (status)
Analog-Output	1	■	
Analog-Value	2	■	Set Room Temperature, Air Direction Level (setting)
Averaging	18	□	
Binary-Input	3	■	ON/OFF (status), Alarm Sign, Filter Sign status, Forced Thermostat OFF (status), Energy Efficiency Operation Command (status), Thermostat status, Compressor status, Indoor Fan Operation status, Heater Operation status, Communication status
Binary-Output	4	■	ON/OFF (setting), Forced Thermostat OFF (setting), Energy Efficiency Operation Command (setting)
Binary-Value	5	■	Filter Sign Reset, Remote Control Setting (ON/OFF, Operation Mode, Set Temperature), Sub Group Address Control, System Forced OFF
Calendar	6	□	
Command	7	□	
Device	8	■	
Event-Enrollment	9	□	
File	10	□	
Group	11	□	
Life-Safety-Point	21	□	
Life-Safety-Zone	22	□	
Loop	12	□	
Multistate-Input	13	■	Operation Mode (status), Error Code, Airflow Rate (status)
Multistate-Output	14	■	Operation Mode (setting), Airflow Rate (setting)
Multistate-Value	19	□	
Notification-Class	15	■	Alarm Notification Class Information
Program	16	□	
Schedule	17	□	
Trend-Log	20	□	

7.2 Member Objects

Each air conditioner management point is assigned to the respective Instance Number of BACnet Objects.
For the BACnet Objects, Instance Number 22-bit data field is used as below.

31 22	21 16	15 8	7 0
BACnet Object Type	Not Used (Zero)	A/C Number	Member Number

A/C Numbers represent the number of air conditioners managed via the A/C line and are used when specifying A/Cs from BACnet client.
Member Numbers correspond to the management items of each air conditioner and are defined as per the following list.

Member Number	Standard Name	Object Name (however, 'XXX' represents an A/C Number)	Object Type	Unit			
				Inactive	Active		
				Text-1	Text-2	Text-3	Text-4
1	ON/OFF (setting)	StartStopCommand_XXX	BO	OFF	ON		
2	ON/OFF (status)	StartStopStatus_XXX	BI	OFF	ON		
3	Alarm Sign	Alarm_XXX	BI	Normal	Abnormal		
4	Error Code	MalfunctionCode_XXX	MI	Normal	(Specified by manufacturer)		
5	Operation Mode (setting)	AirConModeCommand_XXX	MO	Cooling	Heating	Ventila-tion	Auto
6	Operation Mode (status)	AirConModeStatus_XXX	MI	Cooling	Heating	Ventila-tion	
7	Airflow Rate (setting) (★2)	AirFlowRateCommand_XXX	MO	Weak	Strong		
8	Airflow Rate (status)	AirFlowRateStatus_XXX	MI	Weak	Strong		
9	Measured Room Temperature (★1)	RoomTemp_XXX	AI	Degree			
10	Set Room Temperature (★2)	TempAdjust_XXX	AV	Degree			
11	Filer Limit Sign	FilterSign_XXX	BI	No	Yes		
12	Filter Limit Sign Reset	FilterSignReset_XXX	BV	Reset			
13	Remote Control Operation (ON/OFF)	RemoteControlStart_XXX	BV	Permitted	Prohibited		
14	Remote Control Operation (Operation Mode)	RemoteControlAirConModeSet_XXX	BV	Permitted	Prohibited		
15	Vacant						
16	Remote Control Operation (Set Temperature)	RemoteControlTempAdjust_XXX	BV	Permitted	Prohibited		
(*)17	Remote Control Operation (Sub Group Address Control Rejection)	CL_Rejection_XXX	BV	Permitted	Prohibited		
18	Vacant						
19	Vacant						
20	Communication Status	CommunicationStatus_XXX	BI	Normal Communi cation	Abnormal Communi cation		
(*)21	System Forced OFF	SystemForcedOff_XXX	BV	Normal Reset	Forced OFF		
22	Air Direction (setting) (★2)	AirDirectionCommand_XXX	AV				
23	Air Direction (status)	AirDirectionStatus_XXX	AI				
24	Forced Thermostat OFF (setting)	ForcedThermoOFFCommand_XXX	BO	Reset	Set		
25	Forced Thermostat OFF (status)	ForcedThermoOFFStatus_XXX	BI	Reset	Set		
26	Energy Efficiency Command (setting)	EnergyEfficiencyCommand_XXX	BO	Reset	Set		
27	Energy Efficiency Command (status)	EnergyEfficiencyStatus_XXX	BI	Reset	Set		
28	Thermostat Status	ThermoStatus_XXX	BI	OFF	ON		
29	Compressor Status	CompressorStatus_XXX	BI	OFF	ON		
30	Indoor Fan Status	IndoorFanStatus_XXX	BI	OFF	ON		
31	Heater Operation Status	HeaterStatus_XXX	BI	OFF	ON		

Centralized Control (Sub Group Address Control Rejection) and System Forced OFF are only applicable to A/Cs numbered '000', '064', '128' and '192'.

(★1) As the indoor fan stops when the operation is in special operation mode such as thermostat off, at rest or defrosting, the “suction air temperature” is affected by the heat exchanger and the sensor may happen to detect the temperature different from that of the indoor and transmit the signal. Due to the above mentioned reason, consider the temperature as a rule of thumb. If the system control is to be based on this temperature (such as changeover of operation mode and changing the set temperature), the manufacturer of the building management system is kindly requested to carry out on its own responsibility.

(★2) The system is designed to keep the memory of the set conditions even when the air conditioner stops due to a power failure. Each time when the setting of temperature, ON/OFF, heat/cool mode, air flow direction or air volume is changed, it is written into the non-volatile memory. The frequency of writing the setting into the non-volatile memory is limited and if the setting is frequently written into the memory after exceeding the limit, it may cause malfunction.Therefore, **take caution so that the frequency of changing the setting of each indoor unit may not exceed 7000 times/year** when changing the setting of temperature, ON/OFF, heat/cool mode, air flow direction or air volume frequently by automatic control or the like from the central monitoring panel.

The list of the mappable objects for each model is shown as per the following table.

Number	Name	Object Name ('XXX' represents an A/C Number.)	Object Type	VRV	SkyAir (DTA101A52)	HRV	Split (KRP928A)
1	ON/OFF (setting)	StartStopCommand_XXX	BO	○	○	○	○
2	ON/OFF (status)	StartStopStatus_XXX	BI	○	○	○	○
3	Alarm Sign	Alarm_XXX	BI	○	○	○	○
4	Error Code	MalfunctionCode_XXX	MI	○	○	○	○
5	Operation Mode (setting)	AirConModeCommand_XXX	MO	○	○	×	○ (∗1)
6	Operation Mode (status)	AirConModeStatus_XXX	MI	○	○	×	○ (∗1)
7	Airflow Rate (setting)	AirFlowRateCommand_XXX	MO	○	○	×	×
8	Airflow Rate (status)	AirFlowRateStatus_XXX	MI	○	○	○	×
9	Measured Room Temperature	RoomTemp_XXX	AI	○	○	×	×
10	Set Room Temperature	TempAdjust_XXX	AV	○	○	×	○
11	Filer Limit Sign	FilterSign_XXX	BI	○	○	○	×
12	Filter Limit Sign Reset	FilterSignReset_XXX	BV	○	○	○	×
13	Remote Control Operation (ON/OFF)	RemoteControlStart_XXX	BV	○	○	○	×
14	Remote Control Operation (Operation Mode)	RemoteControlAirConModeSet_XXX	BV	○	○	○	×
15	Vacant						
16	Remote Control Operation (Set Temperature)	RemoteControlTempAdjust_XXX	BV	○	○	○	×
17	Remote Control Operation (Sub Group Address Control Rejection)	CL_Rejection_XXX	BV	○	○	○	○
18	Vacant						
19	Vacant						
20	Communication Status	CommunicationStatus_XXX	BI	○	○	○	○
21	System Forced OFF	SystemForcedOff_XXX	BV	○	○	○	×
22	Air Direction (setting)	AirDirectionCommand_XXX	AV	○	○	×	×
23	Air Direction (status)	AirDirectionStatus_XXX	AI	○	○	×	×
24	Forced Thermostat OFF (setting)	ForcedThermoOFFCommand_XXX	BO	○	○	×	×
25	Forced Thermostat OFF (status)	ForcedThermoOFFStatus_XXX	BI	○	○	×	×
26	Energy Efficiency Command (setting)	EnergyEfficiencyCommand_XXX	BO	○	×	×	×
27	Energy Efficiency Command (status)	EnergyEfficiencyStatus_XXX	BI	○	×	×	×
28	Thermostat Status	ThermoStatus_XXX	BI	○	○	×	×
29	Compressor Status	CompressorStatus_XXX	BI	○	○	×	×
30	Indoor Fan Status	IndoorFanStatus_XXX	BI	○	○	○	×
31	Heater Operation Status	HeaterStatus_XXX	BI	○	○	○	×

(∗1) Does not support 'Ventilation' mode.

Moreover, a slightly more complicated calculation must be employed when actually associating DIII addresses of air conditioners with the Object IDs of each monitoring/controlling item.
The table below is an example of calculating Object IDs associated with ON/OFF (setting) Object of air conditioners.

	D3 Address	A/C Number	Object Name	ObjectID		
Main D3-1	1-00	000	StartStopCommand_000	BO(4) + 0∗256 + 1	BO + 1	16777217
	1-01	001	StartStopCommand_001	BO(4) + 1∗256 + 1	BO + 257	16777473
	----	----	----------	----------	----------	----------
	4-15	063	StartStopCommand_063	BO(4) + 63∗256 + 1	BO + 16129	16793345
Extended D3-2	1-00	064	StartStopCommand_064	BO(4) + 64∗256 + 1	BO + 16385	16793601
	1-01	065	StartStopCommand_065	BO(4) + 65∗256 + 1	BO + 16641	16793857
	----	----	----------	----------	----------	----------
	4-15	127	StartStopCommand_127	BO(4) + 127∗256 + 1	BO + 32513	16809729
Extended D3-3	1-00	128	StartStopCommand_128	BO(4) + 128∗256 + 1	BO + 32769	16809985
	1-01	129	StartStopCommand_129	BO(4) + 129∗256 + 1	BO + 33025	16810241
	----	----	----------	----------	----------	----------
	4-15	191	StartStopCommand_191	BO(4) + 191∗256 + 1	BO + 48897	16826113
Extended D3-4	1-00	192	StartStopCommand_192	BO(4) + 192∗256 + 1	BO + 49153	16826369
	1-01	193	StartStopCommand_193	BO(4) + 193∗256 + 1	BO + 49409	16826625
	----	----	----------	----------	----------	----------
	4-15	255	StartStopCommand_255	BO(4) + 255∗256 + 1	BO + 65281	16842497

As previously explained, Object Types are described using upper 10 bits of a total of 32 bits and the Instance Number of each Object Type is calculated as per following.

Object Type	Object Number	Hexadecimal Number	Decimal Number
AI	0	X'0000 0000'	0
AO	1	X'0040 0000'	4,194,304
AV	2	X'0080 0000'	8,388,608
BI	3	X'00C0 0000'	12,582,912
BO	4	X'0100 0000'	16,777,216
BV	5	X'0140 0000'	20,971,520
MI	13	X'0340 0000'	54,525,952
MO	14	X'0380 0000'	58,720,256

8. Properties

Properties of each object are outlined as per the following table.

8.1 Analog Input Object Type

Property Identifier	Property Datatype	BACnet	DMS502A51	Remarks
Object_Identifier	BACnetObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	ANALOG_INPUT
Present_Value	Real	R1	R	
Description	CharacterString	O	—	
Device_Type	CharacterString	O	—	
Status_Flags	BACnetStatusFlags	R	R	IN_ALARM (TRUE: HIGHER/LOWER LIMIT ERROR occurred) FAULT (TRUE: COMMUNICATION ERROR or SENSOR ERROR) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	R	NORMAL: NORMAL FAULT: COMMUNICATION ERROR / SENSOR ERROR LOW_LIMIT: LOWER LIMIT ERROR occurred HIGH_LIMIT: HIGHER LIMIT ERROR occurred
Reliability	BACnetReliability	O	R	NO_FAULT_DETECTED: NORMAL COMMUNICATION NO_SENSOR: SENSOR ERROR UNRELIABLE_OTHER: COMMUNICATION ERROR
Out_Of_Service	BOOLEAN	R	R	Always FALSE
Update_Interval	Unsigned	O	—	
Units	BACnetEngineeringUnits	R	R	
Min_Pres_Value	REAL	O	—	
Max_Pres_Value	REAL	O	—	
Resolution	REAL	O	—	
COV_Increment	REAL	O2	R	Fixed at 1.0
Time_Delay	Unsigned	O3	R	Fixed at 0
Notification_Class	Unsigned	O3	R	Fixed at 3
High_Limit	Real	O3	W	Default value: +80.0
Low_Limit	Real	O3	W	Default value: -80.0
Deadband	Real	O3	W	Default value: +5.0
Limit_Enable	BACnetLimitEnable	O3	W	All default values are FALSE.
Event_Enable	BACnetEventTransitionBits	O3	R	Fixed at B'101'
Acked_Transitions	BACnetEventTransitionBits	O3	R	All fixed at TRUE
Notify_Type	BACnetNotifyType	O3	R	Fixed at ALARM
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O3	R	Reset by shut off When starting up No Event: Irregular time Event occurred: Detection time
Profile_Name	CharacterString	O	—	

8.2 Analog Value Object Type

Property Identifier	Property Datatype	BACnet	DMS502A51	Remarks
Object_Identifier	BACneObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	ANALOG_VALUE
Present_Value	Real	R4	W	
Description	CharacterString	O	—	
Status_Flags	BACnetStatusFlags	R	R	IN_ALARM (Always FALSE) FAULT (TRUE: COMMUNICATION ERROR) OVERRIDDEN (AlwaysFALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	R	Fixed at NORMAL
Reliability	BACnetReliability	O	R	NO_FAULT_DETECTED: NORMAL COMMUNICATION UNRELIABLE_OTHER: COMMUNICATION ERROR
Out_Of_Service	Boolean	R	R	Always FALSE
Units	BACnetEngineeringUnits	R	R	
PriorityArray	BACnetPriorityArray	O1	R	
RelinquishDefault	Real	O1	R	
COV_Increment	Real	O2	R	Fixed at 1.0
Time_Delay	Unsigned	O3	—	
Notification_Class	Unsigned	O3	—	
High_Limit	REAL	O3	—	
Low_Limit	REAL	O3	—	
Deadband	REAL	O3	—	
Limit_Enable	BACnetLimitEnable	O3	—	
Event_Enable	BACnetEventTransitionBits	O3	—	
Acked_Transitions	BACnetEventTransitionBits	O3	—	
Notify_Type	BACnetNotifyType	O3	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O3	—	
Profile_Name	CharacterString	O	—	

8.3 Binary Input Object Type (supported Intrinsic Reporting)

Property Identifier	Property Datatype	BACnet	DMS502A51	Remarks
Object_Identifier	BACneObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	BINARY_INPUT
Present_Value	BACnetBinaryPV	R1	R	
Description	CharacterString	O	R*	Only supports Alarm Sign Object. Error codes are described using a 2-ASCII-character code.
Device_Type	CharacterString	O	—	
Status_Flags	BACnetStatusFlags	R	R	IN_ALARM (TRUE: ERROR occurred) FAULT (TRUE: COMMUNICATION ERROR) (Exc.: Communication Status Object is fixed at FALSE.) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	R	NORMAL: NO ERROR OFF_NORMAL: ERROR occurred
Reliability	BACnetReliability	O	R	NO_FAULT_DETECTED: NORMAL COMMUNICATION UNRELIABLE_OTHER: COMMUNICATION ERROR
Out_Of_Service	Boolean	R	R	Always FALSE
Polarity	BACnetPolarity	R	R	Fixed at NORMAL
Inactive_Text	CharacterString	O2	—	
Active_Text	CharacterString	O2	—	
Change_Of_State_Time	BACnetDateTime	O3	—	
Chgange_Of_State_Count	Unsigned	O3	—	
Time_Of_State_Count_Reset	BACnetDateTime	O3	—	
Elapsed_Active_Time	Unsigned32	O4	—	
Time_Of_Active_Time_Reset	BACnetDateTime	O4	—	
Time_Delay	Unsigned	O5	R	Fixed at 0
Notification_Class	Unsigned	O5	R	Fixed at 3
Alarm_Value	BACnetBinaryPV	O5	R	Fixed at ACTIVE
Event_Enable	BACnetEventTransitionBits	O5	R	Fixed at B'101'
Acked_Transitions	BACnetEventTransitionBits	O5	R	All fixed at TRUE
Notify_Type	BACnetNotifyType	O5	R	Fixed at ALARM
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O5	R	Reset by shut off When starting up No Event: Irregular time Event occurred: Detection time
Profile_Name	CharacterString	O	—	

8.4 Binary Input Object Type (non-supported Intrinsic Reporting)

Property Identifier	Property Datatype	BACnet	DMS502A51	Remarks
Object_Identifier	BACneObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	BINARY_INPUT
Present_Value	BACnetBinaryPV	R1	R	
Description	CharacterString	O	—	
Device_Type	CharacterString	O	—	
Status_Flags	BACnetStatusFlags	R	R	IN_ALARM (Always FALSE) FAULT (TRUE: COMMUNICATION ERROR) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	R	Fixed at NORMAL
Reliability	BACnetReliability	O	R	NO_FAULT_DETECTED: NORMAL COMMUNICATION UNRELIABLE_OTHER: COMMUNICATION ERROR
Out_Of_Service	Boolean	R	R	Always FALSE
Polarity	BACnetPolarity	R	R	Fixed at NORMAL
Inactive_Text	CharacterString	O2	—	
Active_Text	CharacterString	O2	—	
Change_Of_State_Time	BACnetDateTime	O3	—	
Change_Of_State_Count	Unsigned	O3	—	
Time_Of_State_Count_Reset	BACnetDateTime	O3	—	
Elapsed_Active_Time	Unsigned32	O4	—	
Time_Of_Active_Time_Reset	BACnetDateTime	O5	—	
Time_Delay	Unsigned	O5	—	
Notification_Class	Unsigned	O5	—	
Alarm_Value	BACnetBinaryPV	O5	—	
Event_Enable	BACnetEventTransitionBits	O5	—	
Acked_Transitions	BACnetEventTransitionBits	O5	—	
Notify_Type	BACnetNotifyType	O5	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O5	—	
Profile_Name	CharacterString	O	—	

8.5 Binary Output Object Type

Property Identifier	Property Datatype	BACnet	DMS502A51	Remarks
Object_Identifier	BACneObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	BINARY_OUTPUT
Present_Value	BACnetBinaryPV	W	W	
Description	CharacterString	O	R	
Device_Type	CharacterString	O	—	
Status_Flags	BACnetStatusFlags	R	R	IN_ALARM (Always FALSE) FAULT (TRUE: COMMUNICATION ERROR) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	R	Fixed at NORMAL
Reliability	BACnetReliability	O	R	NO_FAULT_DETECTED: NORMAL COMMUNICATION UNRELIABLE_OTHER: COMMUNICATION ERROR
Out_Of_Service	Boolean	R	R	Always FALSE
Polarity	BACnetPolarity	R	R	Fixed at NORMAL
Inactive_Text	CharacterString	O1	—	
Active_Text	CharacterString	O1	—	
Change_Of_State_Time	BACnetDateTime	O2	—	
Chgange_Of_State_Count	Unsigned	O2	—	
Time_Of_State_Count_Reset	BACnetDateTime	O2	—	
Elapsed_Active_Time	Unsigned32	O3	—	
Time_Of_Active_Time_Reset	BACnetDateTime	O3	—	
Minimum_Off_Time	Unsigned32	O	—	
Minimum_On_Time	Unsigned32	O	—	
Priority_Array	BACnetPriorityArray	R	R	
Relinquish_Default	BACnetBinaryPV	R	R	
Time_Delay	Unsigned	O4	—	
Notification_Class	Unsigned	O4	—	
Feedback_Value	BACnetBinaryPV	O4	—	
Event_Enable	BACnetEventTransitionBits	O4	—	
Acked_Transitions	BACnetEventTransitionBits	O4	—	
Notify_Type	BACnetNotifyType	O4	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O4	—	
Profile_Name	CharacterString	O	—	

8.6 Binary Value Object Type

Property Identifier	Property Datatype	BACnet	DMS502A51	Remarks
Object_Identifier	BACneObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	BINARY_VALUE
Present_Value	BACnetBinaryPV	R1	W	
Description	CharacterString	O	R	
Status_Flags	BACnetStatusFlags	R	R	IN_ALARM (Always FALSE) FAULT (TRUE: COMMUNICATION ERROR) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	R	NORMAL: Other OFF_NORMAL: Filter Sign ON
Reliability	BACnetReliability	R	R	NO_FAULT_DETECTED: NORMAL COMMUNICATION UNRELIABLE_OTHER: COMMUNICATION ERROR
Out_Of_Service	Boolean	R	R	Always FALSE
Inactive_Text	CharacterString	O2	—	
Active_Text	CharacterString	O2	—	
Change_Of_State_Time	BACnetDateTime	O3	—	
Chgange_Of_State_Count	Unsigned	O3	—	
Time_Of_State_Count_Reset	BACnetDateTime	O3	—	
Elapsed_Active_Time	Unsigned32	O4	—	
Time_Of_Active_Time_Reset	BACnetDateTime	O4	—	
Minimum_Off_Time	Unsigned32	O	—	
Minimum_On_Time	Unsigned32	O	—	
Priority_Array	BACnetPriorityArray	O5	R	
Relinquish_Default	BACnetBinaryPV	O5	R	
Time_Delay	Unsigned	O6	—	Fixed at 0
Notification_Class	Unsigned	O6	—	Fixed at 3
Alarm_Value	BACnetBinaryPV	O6	—	Fixed at ACTIVE
Event_Enable	BACnetEventTransitionBits	O6	—	Fixed at B'101'
Acked_Transitions	BACnetEventTransitionBits	O6	—	All fixed at TRUE
Notify_Type	BACnetNotifyType	O6	—	Fixed at ALARM
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O6	—	Reset by shut off When starting up No Event: Irregular time Event occurred: Detection time
Profile_Name	CharacterString	O	—	

8.7 Device Object Type

Property Identifier	Property Datatype	BACnet	DMS502A51	Remarks
Object_Identifier	BACneObjectIdentifier	R	R	Can be set by Test Run Tool.
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	DEVICE
System_Status	BACnetDeviceStatus	R	R	D3 Initialization: CONFIGURATION_IN_PROGRESS Normal: OPERATIONAL
Vendor_Name	CharacterString	R	R	DAIKIN Industries LTD
Vendor_Identifier	Unsigned16	R	R	Fixed at 53
Model_Name	CharacterString	R	R	D-BACS BACnet Gateway
Firmware_Revision	CharacterString	R	R	3000
Application_Software_Version	CharacterString	R	R	3000
Location	CharacterString	O	—	
Description	CharacterString	O	—	
Protocol_Version	Unsigned	R	R	Fixed at 1
Protocol_Conformance_Class	Unsigned(1…6)	R	R	Fixed at 3
Protocol_Services_Supported	BACnetServiceSupported	R	R	SubCOV, AddList, RemoveList, RP, RPM, WP, WPM, I-Am, I-Have, TimeSync, Who-Is, Who-Has, UTCTimeSync
Protocol_Object_Types_Supported	BACnetObjectTypesSupported	R	R	AI, AO, AV, BI, BO, BV, MI, MO, NotificationClass
Object_List	BACnetARRAY[N] of BACnetObjectIdentifier	R	R	
Max_APDU_Length_Accepted	Unsigtned	R	R	IEEE802.3: 1476 BACnetIP: 1024
Segmentation_Supported	BACnetSegmentation	R	R	SEGMENT_BOTH
VT_Class_Supported	List of BACnetVTClass	O1	—	
Active_VT_Sessions	List of BACnetVTSession	O2	—	
Local_Time	Time	O3, 4	R	
Local_Date	Date	O3, 4	R	
UTC_Offset	Signed	O4	R	Can be set by Test Run Tool. Default: -540
Daylight_Saving_Status	Boolean	O4	R	Fixed at FALSE
APDU_Segment_Timeout	Unsigned	O1	R	Can be set between 1000 and 10000 by Test Run Tool. Default: 2000
APDU_Timeout	Unsigned	R	R	Can be set between 1000 and 120000 by Test Run Tool. Default: 3000
Number_Of_APDU_Retries	Unsigned	R	R	Can be set between 0 and 7 by Test Run Tool. Default: 3
List_Of_Session_Keys	List of BACnetSessionKey	O	—	
Time_Synchronization_Recipients	List of BACnetRecipient	O5	—	
Max_Master	Unsigned(1…127)	O6	—	
Max_Info_Frames	Unsigned	O6	—	
Device_Adress_Binding	List of BACnetAddressBinding	R	R	
Database_Revision	Unsigned	R	—	
Configuration_Files	BACnetARRAY[N] of BACnetObjectIdentifier	O7	—	
Last_Restore_Time	BACnetDateTime	O7	—	
Backup_Failure_Timeout	Unsigned16	O8	—	
Active_COV_Subscriptions	List of BACnetCOVSubscription	O9	—	
Profile_Name	CharacterString	O	—	

8.8 Multi-state Input Object Type

Property Identifier	Property Datatype	BACnet	DMS502A51	Remarks
Object_Identifier	BACneObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	MULTI-STATE_INPUT
Present_Value	Unsigned	R1	R	
Description	CharacterString	O	R*	Only supports ERROR CODE. Error codes are described using a 2-ASCII-character code.
Device_Type	CharacterString	O	—	
Status_Flags	BACnetStatusFlags	R	R	IN_ALARM (Always FALSE) FAULT (TRUE: COMMUNICATION ERROR) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	R	Fixed at NORMAL
Reliability	BACnetReliability	O2	R	NO_FAULT_DETECTED: NORMAL COMMUNICATION UNRELIABLE_OTHER: COMMUNICATION ERROR
Out_Of_Service	Boolean	R	R	
Number_Of_States	Unsigned	R	R	
State_Text	BACnetARRAY[N] of CharacterString	O	—	
Time_Delay	Unsigned	O3	—	
Notification_Class	Unsigned	O3	—	
Alarm_Values	List of Unsigned	O3	—	
Fault_Values	List of Unsigned	O3	—	
Event_Enable	BACnetEventTransitionBits	O3	—	
Acked_Transitions	BACnetEventTransitionBits	O3	—	
Notify_Type	BACnetNotifyType	O3	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O3	—	
Profile_Name	CharacterString	O	—	

8.9 Multi-state Output Object Type

Property Identifier	Property Datatype	BACnet	DMS502A51	Remarks
Object_Identifier	BACneObjectIdentifier	R	R	
Object_Name	CharacterString	R	R	
Object_Type	BACnetObjectType	R	R	MULTI-STATE_OUTPUT
Present_Value	Unsigned	W	W	
Description	CharacterString	O	—	
Device_Type	CharacterString	O	—	
Status_Flags	BACnetStatusFlags	R	R	IN_ALARM (Always FALSE) FAULT (TRUE: COMMUNICATION ERROR) OVERRIDDEN (Always FALSE) OUT_OF_SERVICE (Always FALSE)
Event_State	BACnetEventState	R	R	Fixed at NORMAL
Reliability	BACnetReliability	O	R	NO_FAULT_DETECTED: NORMAL COMMUNICATION UNRELIABLE_OTHER: COMMUNICATION ERROR
Out_Of_Service	Boolean	R	R	
Number_Of_States	Unsigned	R	R	
State_Text	BACnetARRAY[N] of CharacterString	O	—	
Priority_Array	BACnetPriorityArray	R	R	
Relinquish_Default	Unsigned	R	R	
Time_Delay	Unsigned	O1	—	
Notification_Class	Unsigned	O1	—	
Feedback_Value	Unsigned	O1	—	
Event_Enable	BACnetEventTransitionBits	O1	—	
Acked_Transitions	BACnetEventTransitionBits	O1	—	
Notify_Type	BACnetNotifyType	O1	—	
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O1	—	
Profile_Name	CharacterString	O	—	

9. Report Function

9.1 COV Notification

A request for COV registration is accepted through the SubscribeCOV service.

(1) Settings of Confirmed or Unconfirmed COV
This item is supported according to the *BACnet Specifications*.

(2) Settings of the desired lifetime of the subscription
This item is supported according to the *BACnet Specifications*.
When COV notification is made at the time of status change, the difference between the registered time and present time will be calculated. If the difference is greater than the registered lifetime of the subscription, the subscription will be judged expired and deleted. Therefore, if a clock time change is made, the lifetime of the subscription may differ from the value that has been set.

(3) Memory after Interruption of Power Supply to System
This item is not supported.
Registration information is not stored in the memory, and will be lost when the power is turned off.
According to the *BACnet Specifications,* It is not required to guarantee preservation of subscriptions across power failure.

(4) Registration Information of Notification Destination
This item cannot be viewed from the BACnet. Network visibility is not guaranteed according to the BACnet Specifications.

(5) Number of Subscriptions
Up to 10 clients can be registered for each object.
The following error message will be returned if an attempt is made to subscribe more clients.
Error Class = RESOURCE; Error Code = OTHER

All objects of the air conditioner support COV notification.

9.2 Event Notification

Only Intrinsic Reporting is supported as Event notification.

9.2.1 Registration Information on Event Notification Destination

A single Notification Class object is generated, and all objects supporting Intrinsic notification refers to it. Therefore, if a notification destination is registered with the Notification Class object, Events from all objects will be notified.

(1) Notification Class Instance Number
This item is fixed at 3.
(2) Priority
This item is always fixed at 255.
(3) Ack_Required
This item is always fixed at FALSE. (No AcknowledgeAlarm service is expected for any Event.)

9.2.2 Registration of Event Notification Destination

It is possible to use the AddListElement service to register notification destination information on the Recipient_List property of the Notification Class object. Details of the BACnetDestination, notification destination information to be registered, are as per the following.

(1) Valid Date
This item conforms to the BACnet specifications. Event notification is enabled or disabled according to the specified day of the week.
(2) Valid Time
This item conforms to the BACnet specifications. Event notification is enabled or disabled according to the specified time range.
(3) Process ID
This item conforms to the BACnet specifications. Event notification is made with the process ID registered.
(4) Notification Destination Address Information
This item conforms to the BACnet specifications. It is possible to specify either Device object ID or BACnetAddress.
When the Device object ID is specified, it is necessary to know the relationship between the Device object ID and BACnetAddress before Event notification is made through a service such as the I-Am service. Information on the relationship will be stored in the Device_Address_Binding of the Device object.
When the system starts, the process to transmit the Who-Is service and receive the I-Am service will be performed. If the information is insufficient for some reason, no Event notification will be made.
If no BACnet packets are received from the counterpart for 10 minutes, the BACnet device will be deemed disconnected from the network. If the I-Am service is not received after that, the Device object ID will be indefinite, and Event notification will not be made to the notification destination where the Device object ID is specified.
(5) Issue Confirmed Notification
This item conforms to the BACnet specifications. Registration is possible with or without confirmation.
(6) Transitions
The value is kept on hold, but ignored at the time of processing.
(7) Maximum Number of Notification Destinations to be Registered
It is limited to a maximum of 10 clients. The following error message will be returned if an attempt is made to register more destinations.
Error Class = RESOURCE; Error Code = OTHER

9.2.3 Deletion of Event Notification Destination

The RemoveListElement service can be used to delete notification destination information from the Notification Class object. The existence of registration is judged by checking the coincidence of both process ID and notification destination address information. Unless the process ID coincides, the same notification destination address information will not be deleted.

9.2.4 Event Notification Destination Re-registration

If an Event with the same process ID and notification destination address information is re-registered, the existing registration destination information will be overwritten. Therefore, information items, such as the valid date, time and whether it is with or without confirmation, will be refreshed.

9.2.5 Event Notification Destination in Memory

The registered event notification destination is stored in the memory. When the system is turned on, the event notification destination will be initialized with the stored information. The Event notification destination will be stored five seconds after the registration or deletion.

9.2.6 Event Confirmation

Event conformation actions specified by the BACnet are not supported. Instead, the following specifications will apply.

(1) The AcknowledgeAlarm service is not supported.

(2) The Ack_Required items of the Notification Class object are all fixed at FALSE.

(3) The Ack_Transition items of the Event local object are all fixed at TRUE.

With consideration of Events that occur while the counterpart device is offline or disconnected from the network, the time stamp of the occurrence of each Event will be kept on hold. This will not be guaranteed in the event of a power interruption. The time of the detection of an Event will be stored as a time stamp if the Event has already occurred before the system starts.

10. Error Responses in BACnet Communication

The following PDUs will be returned if processing in response to the requests of BACnet client cannot be executed.

ErrorPDU

ErrorPDU	ErrorClass	ErrorCode
Reading of the object list during the initialization of the DIII-NET	DEVICE (0)	CONFIGURATION_IN_PROGRESS (2)
Request to access to an object not installed.	OBJECT (1)	UNKNOWN_OBJECT (31)
Request to access to a property not installed.	PROPERTY (2)	UNKNOWN_PROPERTY (32)
Request to write to a prohibited area.	PROPERTY (2)	WRITE_ACCESS_DENIED (40)
Request to write in a format different from the property.	PROPERTY (2)	INVALID_DATATYPE (9)
Request to access to a specified index outside the array index range.	PROPERTY (2)	INVALID_ARRAY_INDEX (42)
Request to write a value outside the permissible range.	PROPERTY (2)	VALUE_OUT_OF_RANGE (37)
A COV registration request of more than 10 registration items.	RESOURCES (3)	OTHER (0)
An Event registration request of more than 10 registration items.	RESOURCES (3)	NO_SPACE_TO_ADD_LIST_ELEMENT (19)
Request for the deletion of an element not existing in the list.	SERVICES (5)	OTHER (0)
Request for the execution of the AddListElement/ RemoveListElement for a property that is not of List type.	SERVICES (5)	PROPERTY_IS_NOT_A_LIST (22)

RejectPDU

RejectPDU	RejectReason
A propertyID or value overflow or underflow occurred during WritePropertyMultiple operation.	INCONSISTENT_PARAMETER (2)
The type of parameter for the execution of the service is different in type.	INVALID_PARAMETER_DATA_TYPE (3)
An error was detected during tag decoding.	INVALID_TAG (4)
A parameter shortage occurred during the execution of the service.	MISSING_REQUIRED_PARAMETER (5)
Too many arguments for the execution of the service.	TOO_MANY_ARGUMENTS (7)
An attempt to execute an unsupported service with confirmation.	UNRECOGNIZED_SERVICE (9)

AbortPDU

AbortPDU	AbortReason
Unable to process due to too many requests beyond the capacity.	BUFFER_OVERFLOW (1)
The processing of segments was aborted because an expected APDU was received.	INVALID_APDU_IN_THIS_STATE (2)
The response side does not support the segment.	SEGMENTATION_NOT_SUPPORTED (4)

11. Detailed Explanation of Objects

11.1 Common to All Objects

Objects related to the air conditioner in communication are treated on the BACnet as described below.

(1) Air Conditioner in Normal Communication
Other BACnet devices can access each object related to the air conditioner.

(2) Air Conditioner Unconnected
It seems to other BACnet devices that no objects related to the air conditioner exist.
Therefore, when the ReadProperty/WriteProperty service is received, the following ErrorPDU will be returned.
Error class: OBJECT; Error type: UNKNOWN_PROPERTY

(3) Air Conditioner Communication Error
Other BACnet device can access the objects related to the air conditioners, but the Present_Value Property will be read in a value immediately before the communication error.
The Reliability property value of each object is set to UNRELIABLE_OTHER. Whereas, the value will be set to NO_FAULT_DETECTED while in normal communication, and the FAULT flag of the Status_Flags property will be set to TRUE.
A command executed while the system has a communication error will be sent to the air conditioner.

(∗1) The system is designed to keep the memory of the set conditions even when the air conditioner stops due to a power failure. Each time when the setting of temperature, ON/OFF, heat/cool mode, air flow direction or air volume is changed, it is written into the non-volatile memory. The frequency of writing the setting into the non-volatile memory is limited and if the setting is frequently written into the memory after exceeding the limit, it may cause malfunction.
Therefore, **take caution so that the frequency of changing the setting of each indoor unit may not exceed 7000 times/year** when changing the setting of temperature, ON/OFF, heat/cool mode, air flow direction or air volume frequently by automatic control or the like from the central monitoring panel.

11.2 ON/OFF (Setting)

Point number: 1
Object name: StartStopCommand_XXX (XXX: A/C group number)
Object type: Binary Output
Meaning: This object is used to give ON/OFF commands to the air conditioner.
Present_Value property:
ACTIVE: ON command
INACTIVE: OFF command
Remarks:
(1) The command executed is transmitted to the air conditioner regardless of the status of the air conditioner.
(2) The Present_Value property will be INACTIVE as the default value if a property has never been set in the past.
(3) The Relinquish_Default property value is fixed at INACTIVE.

11.3 ON/OFF (Status)

Point number: 2
Object name: StartStopStatus_XXX (XXX: A/C group number)
Object type: Binary Input
Meaning: This object is used to monitor the ON/OFF status of the air conditioner.
Present_Value property:
ACTIVE: ON
INACTIVE: OFF
Remarks:
(1) If there is an operation error, the Present_Value property will be set to ACTIVE regardless of whether the air conditioner is in operation or not.
(2) The IN_ALARM flag of the Status_Flags property of the ON/OFF status object will not be set to TRUE if the air conditioner has an error. To detect the occurrence of errors, always refer to the value of the Alarm Sign object.

11.4 Alarm Sign

Point number: 3
Object name: Alarm_XXX (XXX: A/C group number)
Object type: Binary Input
Meaning: This object is used to monitor the Normal/Error status of the air conditioner.
Present_Value property:
ACTIVE: Error
INACTIVE: Normal
Remarks:
(1) This object supports the Intrinsic Reporting function. When the Present_Value property changes, the corresponding Event will be transmitted, provided that the Event has been registered.
(2) Detailed information is set for the following properties.
Time_Delay property: No delay for error notification is permitted (the time is fixed at 0) and nothing can be written.
Notify_Type property: Event notification is fixed at ALARM.
Event_Time_Stamps property: It represents the time of occurrence (To-OFFNORMAL)/restoration (To-NORMAL).
Indefinite time will be set if an Event has not occurred yet.
If an Event has occurred, the time of the Event being detected will be set at the rising edge.
If power supply to the system fails, the time will be fixed at the rising edge.
(3) An error is a state of the air conditioner not being operated due to trouble, but other troubles such as an alarm or warning are not considered an error.
(4) To stop the error sign of the air conditioner in which an error has occured, the STOP command should be executed. It does not mean the air conditioner has been returned to a normal state and an error will occur if the RUN command is executed again.
(5) A failure code is set using two ASCII characters specified by DAIKIN for the Description property.

11.5 Error Code

Point number: 4
Object name: MalfunctionCode_XXX (XXX: A/C group number)
Object type: Multistate Input
Meaning:This object is used to monitor the details of the error status when the air conditioner has an error.
Present_Value property:
1 to 512 (To read it is necessary to convert the value into a failure code.)
Remarks:
(1) A failure code is set using two ASCII characters specified by DAIKIN for the Description property.
(2) For the relationship between Present_Values and error codes, refer to the corresponding table at the end of this manual.

11.6 Operation Mode (Setting)

Point number: 5
Object name: AirConModeCommand_XXX (XXX: A/C group number)
Object type: Multistate Output
Meaning: This object is used to set the operation modes of the air conditioner.
Present_Value property:
1: Cooling mode
2: Heating mode
3: Ventilation mode
4: Auto mode
Remarks:
(1) The Present_Value property will be set to "1: Cooling Mode" as the default value if property has never been set in the past.
(2) The Relinquish_Default property is fixed at "1: Cooling Mode".
(3) The air conditioner will ignore the command to an object that does not have right to select operation mode. Therefore, the controlled/monitored system must not use this object for the air conditioner without the right to select operation mode.
(4) Even if the "4: Auto Mode" is set (with the Operation Mode Setting), the actual operation mode of the air conditioner is displayed as the Operation Mode Status, and the operation mode status object will not display 'Auto' mode.

11.7 Operation Mode (Status)

Point number: 6
Object name: AirConModeStatus_XXX (XXX: A/C group number)
Object type: Multistate Input
Meaning: This object is used to monitor the operation modes of the air conditioner.
Present_Value property:
1: Cooling mode
2: Heating mode
3: Ventilation mode
Remarks:
(1) Even if the Operation Mode (setting) object is set to 'Auto', the value for the present operation mode (Cooling, Heating, or Ventilation mode) of the air conditioner will be returned.
(2) When the Dry Mode is set on the handheld remote controller, the Preesent_Value will be set to "1: Cooling Mode".

11.8 Airflow Rate (Setting)

Point number: 7
Object name: AirFlowRateCommand_XXX (XXX: A/C group number)
Object type: Multistate Output
Meaning: This object is used to set the Airflow Rate of the air conditioner.
Present_Value property:
1: Weak
2: Strong
Remarks:
(1) The air conditioner features two airflow rate settings for both Cooling and Heating operations. The Airflow Rate is set for the mode in which the air conditioner is presently in operation.
(2) Some of the air conditioners have three airflow rate settings, but only the Weak and Strong settings are applicable.

11.9 Airflow Rate (Status)

Point number: 8
Object name: AirFlowRateStatus_XXX (XXX: A/C group number)
Object type: Multistate Input
Meaning: This object is used to monitor the Airflow Rate of the air conditioner.
Present_Value property:
1: Weak
2: Strong
Remarks:
(1) The air conditioner features two airflow rate settings for both Cooling and Heating operations.
(2) The notification of airflow rate is merely to return the set airflow rate at the time of notification and has no relationship with ON/OFF status of the air conditioner.
(3) Some of the air conditioners have three airflow rate settings, but the Present_Value property will be set to either Weak or Strong even if the actual airflow rate is set to Medium on the handheld remote controller.

11.10 Measured Room Temperature Value

Member number: 9
Object name: RoomTemp_XXX (XXX: A/C group number)
Object type: Analog Input
Meaning: This is used to monitor the room temperature detected by the air conditioner. The room temperature monitored by the air conditioner fluctuates to a certain extent according to the place where the sensor is installed.
Present_Value property:
Room temperature detected by the air conditioner.
Remarks:

(1) The unit will be °C and the valid range is between -10°C and +50°C.
(2) When COV registration is made, the COV_Increment property is fixed at 1.0 and no value can be written. The COV will be reported the moment a temperature change of at least 1°C is detected. When a temperature change of at least 1°C is detected after that, the next COV will be reported.
(3) This object supports the Intrinsic Reporting function, thus making higher and lower limit monitoring possible. When the room temperature exceeds the set higher and lower limits, the corresponding Event will be reported if the Event has been registered. The Event is reported in accordance with the BACnet rules.
(4) Higher and lower limit monitoring information is set for the following properties.
High_Limit property: The higher limit monitoring value. The default value is +80.0. The value can be overwritten. The new value will be saved 5 seconds after the value is written.
Low_Limit property: The lower limit monitoring value. The default value is -80.0. The value can be overwritten. The new value will be saved 5 seconds after the value is written.
Deadband property: The dead zone. The default value is +5.0. The value can be overwritten. The new value will be saved 5 seconds after the value is written.
Time_Delay property: No delay for error notification is permitted (the time is fixed at 0) and nothing can be written.
Notify_Type property: Event notification is fixed at ALARM.
Event_Time_Stamps property: It represents the time of occurrence (To-OFFNORMAL)/restoration (To-NORMAL).
At the rising edge:
Indefinite time will be set if an Event has not occurred yet.
If an Event has occurred, the time the Event was detected will be set at the rising edge.
If power supply to the system fails, the time will be fixed at the rising edge.
(5) If the air conditioner does not have a room temperature sensor, the Present_Value property will be set to 0.0°C.
(6) When the room temperature sensor is disconnected, the Reliability property will be set to NO_SENSOR and FAULT flag of the Status_Flags property will be set to TRUE. The Present_Value property will keep on hold the previous value
(7) As the indoor fan stops when the operation is in special operation mode such as thermostat off, at rest or defrosting, the “suction air temperature” is affected by the heat exchanger and the sensor may happen to detect the temperature different from that of the indoor and transmit the signal. Due to the above mentioned reason, consider the temperature as a rule of thumb. If the system control is to be based on this temperature (such as changeover of operation mode and changing the set temperature), the manufacturer of the building management system is kindly requested to carry out on its own responsibility.

11.11 Set Room Temperature Value

Set Room Temperature Value
Point number: 10
Object name: TempAdjust_XXX (XXX: A/C group number)
Object type: Analog Value
Meaning: This object is used to set the room temperature for the air conditioner.
Present_Value property:
The set temperature for the air conditioner
Remarks:

(1) The unit will be °C. The possible set range varies according to the type of indoor unit or outdoor unit.
If the air conditioner is a VRV model, the approximate set temperature range for cooling is between 20°C and 35°C and that for heating is between 15°C and 30°C.

(2) When COV registration is made, the COV_Increment property will be fixed at 1.0 and no value can be written.
The COV will be reported the moment a temperature change of at least 1°C is detected.
When a temperature change of at least 1°C is detected after that, the next COV will be reported.

(3) The possible higher and lower limits vary depending on the type of air conditioner and the mode in which the air conditioner is presently operating. If a value outside the limits is set, the value will be commanded to the air conditioner, but the air conditioner will limit the value within the predetermined higher and lower limit range.

(4) The air conditioner has set temperatures for both cooling and heating. When changing the operating mode as well as the set temperature, the operating mode should be changed first and the set temperature next. For example, in cases of changing from the current set temperature of 28°C in cooling mode to 20°C in heating mode, if the temperature is set to 20°C first and then operation mode is changed from cooling to heating, the set cooling temperature does change to 20°C for the moment but the heating temperature will be set to the temperature that the air conditioner has been kept internally, instead of the desired temperature (20°C).

11.12 Filter Limit Sign

Point number: 11
Object name: FilterSign_XXX (XXX: A/C group number)
Object type: Binary Input
Meaning: This object is used to monitor the used-up state of the filter of the air conditioner.
Present_Value property:
ACTIVE: Filter sign information is turned ON.
(Either normal filter, L/L filter, super L/L filter, or dust collection filter is turned ON.)
INACTIVE: Filter sign information is OFF.
Remarks:
(1) This object supports the Intrinsic Reporting function. When the Present_Value property changes, the corresponding Event will be reported if the Event has been registered.
(2) Detailed information is set for the following properties.
Time_Delay property: No delay for error notification is permitted (the time is fixed at 0) and nothing can be written.
Notify_Type property: Event notification is fixed at ALARM.
Event_Time_Stamps property: It represents the time of occurrence (To-OFFNORMAL)/ restoration (To-NORMAL).

At the rising edge:
Indefinite time will be set if an Event has not occurred yet.
If an Event has occurred, the time the Event was detected will be set at the rising edge.
If power supply to the system fails, the time will be fixed at the rising edge.

11.13 Filter Limit Sign Reset

Point number: 12
Object name: FilterSignReset_XXX (XXX: A/C group number)
Object type: Binary Value
Meaning: This object is used to reset the use limit sign of the filter of the air conditioner.
Present_Value property:
INACTIVE: Filter sign information is reset.
Remarks:
(1) During a read operation of the Present_Value property, the Fliter Limit Sign Reset will be always the same value as the Filter Limit Sign object.
(2) Only if INACTIVE is written to the Present_Value property during a write operation, the filter sign information resets ON signs and nothing will be executed even if ACTIVE is written.
(3) This object supports the Intrinsic Reporting function. When the Present_Value property changes, the corresponding Event will be transmitted if the Event has been registered.
(4) Detailed information is set for the following properties.
No delay for error notification is permitted (the time is fixed at 0) and nothing can be written.
Notify_Type property: Event notification is fixed at ALARM.
Event_Time_Stamps property: It represents the time of occurrence (To-OFFNORMAL)/restoration (To-NORMAL).

At the rising edge:
Indefinite time will be set if an Event has not occurred yet.
If an Event has occurred, the time the Event was detected will be set at the rising edge.
If power supply to the system fails, the time will be fixed at the rising edge.

11.14 Remote Control Operation (ON/OFF)

Point number: 13
Object name: RemoteControlStart_XXX (XXX: A/C group number)
Object type: Binary Value
Meaning: This object is used to prohibit or permit the ON/OFF operation of the air conditioner through the remote controller.
Present_Value property:
ACTIVE: The use of the remote controller for the ON/OFF control of the air conditioner is prohibited.
INACTIVE: The use of the remote controller for the ON/OFF control of the air conditioner is permitted.
Remarks:
When A/C system is installed based on a remote control group, air conditioners (sub/slave machines) other than the main machine cannot be monitored/controlled with a remote controller. Even though sub/slave machines do exist as an object when the A/C addresses are registered through the air conditioner line, be sure not to perform the mapping of the object through any other BACnet device.

11.15 Remote Control Operation (Operation Mode)

Point number: 14
Object name: RemoteContorlAirConModeSet_XXX (XXX: A/C group number)
Object type: Binary Value
Meaning: This object is used to prohibit or permit the operation mode change of the air conditioner through the remote controller.
Present_Value property:
ACTIVE: The use of the remote controller for temperature control mode change is prohibited.
INACTIVE: The use of the remote controller for temperature control mode change is permitted.
Remarks:
(1) When A/C system is installed based on a remote control group, air conditioners (sub/slave machines) other than the main machine cannot be monitored/controlled with a remote controller. Even though sub/slave machines do exist as an object when the A/C addresses are registered through the air conditioner line, be sure not to perform the mapping of the object through any other BACnet device.

11.16 Remote Control Operation (Set Temperature Value)

Point number: 16
Object name: RemoteControlTempAdjust_XXX (XXX: A/C group number)
Object type: Binary Value
Meaning: This object is used to prohibit or permit the set temperature change of the air conditioner through the remote controller.
Present_Value property:
ACTIVE: The use of the remote controller for temperature settings is prohibited.
INACTIVE: The use of the remote controller for temperature settings is permitted.
Remarks:
(1) When A/C system is installed based on a remote control group, air conditioners (sub/slave machines) other than the main machine cannot be monitored/controlled with a remote controller. Even though sub/slave machines do exist as an object when the A/C addresses are registered through the air conditioner line, be sure not to perform the mapping of the object through any other BACnet device.

11.17 Centralized Control (Sub Group Address Control Operation Rejection)

Point number: 17
Object name: CL_Rejection_XXX (XXX: Must be either 000, 064, 128, or 192 and correspond to the port number)
Object type: Binary Value
Meaning: This object is used to prohibit or permit the operation of all centralized devices connected to the corresponding port on the DIII-NET.
Present_Value property:
ACTIVE: Centralized control (sub group address control) is prohibited.
INACTIVE: Centralized control (sub group address control) is permitted.

11.18 Communication Status

Point number: 20
Object name: CommunicationStatus_XXX (XXX: A/C group number)
Object type: Binary Input
Meaning: This object is used to monitor the communication status of the air conditioner on the DIII-NET.
Present_Value property:
ACTIVE: A/C communication error
INACTIVE: Normal A/C communication
Remarks:
(1) This object supports the Intrinsic Reporting function. When the Present_Value property changes, the corresponding Event will be transmitted if the Event has been registered.
(2) Detailed information is set for the following properties.
Time_Delay property:No delay for error notification is permitted (the time is fixed at 0) and nothing can be written.
Notify_Type property:Event notification is fixed at ALARM.
Event_Time_Stamps property:It represents the time of occurrence (To-OFFNORMAL)/restoration (To-NORMAL).
At the rising edge:
Indefinite time will be set if an Event has not occurred yet.
If an Event has occurred, the time the Event was detected will be set at the rising edge.
If power supply to the system fails, the time will be fixed at the rising edge.
(3) If the air conditioner has a communication error, the Reliability property will not change the setting to UNRELIABLE_OTHER, but remain to be NO_FAULT_DETECTED. Therefore, the Fault flag of the Status_Flags property will be left as FALSE.

11.19 System Forced OFF

Point Number: 21
Object name: CL_Rejection_XXX (XXX: Must be either 000, 064, 128, or 192 and correspond to the port number)
Object type: Binary Value
Meaning: This object is used to stop the operation of all air conditioners connected to the corresponding port on the DIII-NET, or prohibit or permit the operation of the air conditioners through the remote controller.
Present_Value property:
ACTIVE: The operation of the system is stopped forcibly.
INACTIVE: The System Forced OFF setting is reset.
Remarks:
(1) When the System Forced OFF is set, the 'OFF' and 'Remote Control Operation Rejection (OFF is permitted)' commands will be given to the air conditioners.
(2) When the System Forced OFF is reset, the remote control operation setting will returns to the state before the Forced OFF Setting (i.e., Remote Control Operation Permission/Rejection) The air conditioner stays in OFF status and will not automatically resume operation. To resume operation, the host must give the command.
(3) Unless the stoppage of all the air conditioners is confirmed once the System Forced OFF is set, air conditioners may not start operation even if the System Forced OFF Reset commanded is executed (due to a time lag).

11.20 Air Direction (Setting)

Point Number: 22
Object name: AirDirectionCommand_XXX (XXX: A/C group number)
Object type: Analog Value
Meaning: This object is used to change the air direction setting of the air conditioner.
Present_Value property:
Possible set values are 0, 1, 2, 3, 4, and 7 (integers).
0 to 3: Horizontal direction
4: Vertical direction
7: Swing flap
Remarks:
(1) The air conditioner features two air direction settings for both Cooling and Heating operations. Therefore, when the operating mode of the air conditioner is changed, the set value may change as well.
(2) When in a reading operation, the value recognized as the set value in the air conditioner will be returned.

11.21 Air Direction (Status)

Point Number: 23
Object name: AirDirectionStatus_XXX (XXX: A/C group number)
Object type: Analog Input
Meaning: The object is used to monitor the air direction setting value of the air conditioner.
Present_Value property:
Possible set values are 0, 1, 2, 3, 4, and 7 (integers).
0 to 3: Horizontal direction
4: Vertical direction
7: Swing flap
Remarks:
(1) The set value will always be the same as the read Present_Value of the air direction (setting) object.
(2) The air conditioner features two air direction settings for both Cooling and Heating operations. Therefore, when the operating mode of the air conditioner is changed, the set value may change as well.

11.22 Forced Thermostat OFF (Settings)

Point Number: 24
Object name: ForcedThermoOFFCommand_XXX (XXX: A/C group number)
Object type: Binary Output
Meaning: This object is used to set or reset the forced thermostat operation of the air conditioner.
Present_Value property:
ACTIVE: The forced thermostat OFF mode is set.
INACTIVE: The forced thermostat OFF mode is reset.
Remarks:
(1) Regardless of the status of the air conditioner, the command executed will be transmitted to the air conditioner.
(2) The Present_Value property will be INACTIVE as the default value if a property has never been set in the past.
(3) The Relinquish_Default property value is fixed at INACTIVE.

11.23 Forced Thermostat OFF (Setting)

Point Number: 25
Object name: ForcedThermoOFFStatus_XXX (XXX: A/C group number)
Object type: Binary Input
Meaning: This object is used to monitor whether the air conditioner is set for forced thermostat operation.
Present_Value property:
ACTIVE: The forced thermostat OFF mode is set.
INACTIVE: The forced thermostat OFF mode is reset.

11.24 Energy Efficiency Command (Setting)

Point Number: 26
Object name: EnergyEfficiencyCommand_XXX (XXX: A/C group number)
Object type: Binary Output
Meaning: This object is used to operate the air conditioner in a condition where it will shift the set temperature by 2°C.
Present_Value property:
ACTIVE: The energy efficiency command is set.
INACTIVE: The energy efficiency command is reset.
Remarks:
(1) Regardless of the status of the air conditioner, the command executed will be transmitted to the air conditioner.
(2) The Present_Value property will be INACTIVE as the default value if a property has never been set in the past.
(3) The Relinquish_Default property value is fixed at INACTIVE.

11.25 Energy Efficiency Command (Status)

Point number: 27
Object name: EnergyEfficiencyCommand_XXX (XXX: A/C group number)
Object type: Binary Input
Meaning: This object is used to monitor whether proper settings are made so that the air conditioner will operate at a temperature 2°C higher/lower than the set temperature.
Present_Value property:
ACTIVE: The energy efficiency command is set.
INACTIVE: The energy efficiency command is reset.

11.26 Thermostat Status

Point number: 28
Object name: ThermoStatus_XXX (XXX: A/C group number)
Object type: Binary Input
Meaning: This object is used to monitor whether the air conditioner is in thermostat operation.
Present_Value property:
ACTIVE: The air conditioner is in thermostat operation (i.e., the thermostat function is ON).
INACTIVE: The air conditioner is not in thermostat operation (i.e., the thermostat function is OFF.)

11.27 Compressor Status

Point Number: 29
Object name: CompressorStatus_XXX (XXX: A/C group number)
Object type: Binary Input
Meaning: This object is used to monitor whether the compressor of the outdoor unit corresponding to the indoor unit is in operation or not.
Present_Value property:
ACTIVE: The compressor of the air conditioner is operating.
INACTIVE: The compressor of the air conditioner is not operating.

11.28 Indoor Fan Status

Point Number: 30
Object name: IndoorFanStatus_XXX (XXX: A/C group number)
Object type: Binary Input
Meaning: This object is used to monitor if the fan of the air conditioner is in operation or not.
Present_Value property:
ACTIVE: The indoor fan is operating.
INACTIVE: The indoor fan is not operating.

11.29 Heater Operating Status

Point number: 31
Object name: HeaterStatus_XXX (XXX: A/C group number)
Object type: Binary Input
Meaning: This object is used to monitor whether the built-in heater of the indoor unit is in operation or not.
Present_Value property:
ACTIVE: The built-in heater of the air conditioner is operating.
INACTIVE: The built-in heater of the air conditioner is not operating.

12. Others

12.1 Initialization at the Start UP

The system is designed to automatically recognize the connected air conditioners. Therefore, a period of approximately one minute will be required to recognize all the air conditioners after the system is turned on. During this period, the following error PDU may be returned when an object corresponding to an air conditioner is accessed.

ErrorClass = OBJECT; ErrorCode = UNKNOWN_OBJECT

If an attempt is made to read the ObjectList property of the Device object from an air conditioner during the above period of recognition, the following error PDU will be returned, unless the air conditioner has been recognized.

ErrorClass = DEVICE; ErrorCode = CONFIGATION_IN_PROGRESS

Then the System_Status property of the Device is CONFIGATION_IN_PROGRESS. Once recognition is completed, the property will change to OPERATIONAL.

12.2 BACnet Network Layer

The address designation of the BACnet network layers is supported, but the maximum number of communicable BACnet network addresses will be limited to 100.

12.3 Clock Setting

The TimeSynconization service allows clock settings by the local time.
Furthermore, the UTCTimeSynconization allows clock settings by UTC.
The test-run tool allows time difference settings.

[Reference]

The following table represents the correspondence between Present_Value properties of the Error Code Objects and Failure Codes

PV	Code	PV	Code	PV	Code	PV	Code	PV	Code	PV	Code	PV	Code	PV	Code	PV	Code	PV	Code
1	00	49	E0	97	J0	145	U0	193	70	241	40	289	10	337	M0	385	T0	433	X0
2	01	50	E1	98	J1	146	U1	194	71	242	41	290	11	338	M1	386	T1	434	X1
3	02	51	E2	99	J2	147	U2	195	72	243	42	291	12	339	M2	387	T2	435	X2
4	03	52	E3	100	J3	148	U3	196	73	244	43	292	13	340	M3	388	T3	436	X3
5	04	53	E4	101	J4	149	U4	197	74	245	44	293	14	341	M4	389	T4	437	X4
6	05	54	E5	102	J5	150	U5	198	75	246	45	294	15	342	M5	390	T5	438	X5
7	06	55	E6	103	J6	151	U6	199	76	247	46	295	16	343	M6	391	T6	439	X6
8	07	56	E7	104	J7	152	U7	200	77	248	47	296	17	344	M7	392	T7	440	X7
9	08	57	E8	105	J8	153	U8	201	78	249	48	297	18	345	M8	393	T8	441	X8
10	09	58	E9	106	J9	154	U9	202	79	250	49	298	19	346	M9	394	T9	442	X9
11	0A	59	EA	107	JA	155	UA	203	7A	251	4A	299	1A	347	MA	395	TA	443	XA
12	0H	60	EH	108	JH	156	UH	204	7H	252	4H	300	1H	348	MH	396	TH	444	XH
13	0C	61	EC	109	JC	157	UC	205	7C	253	4C	301	1C	349	MC	397	TC	445	XC
14	0J	62	EJ	110	JJ	158	UJ	206	7J	254	4J	302	1J	350	MJ	398	TJ	446	XJ
15	0E	63	EE	111	JE	159	UE	207	7E	255	4E	303	1E	351	ME	399	TE	447	XE
16	0F	64	EF	112	JF	160	UF	208	7F	256	4F	304	1F	352	MF	400	TF	448	XF
17	A0	65	H0	113	L0	161	90	209	60	257	30	305	G0	353	N0	401	V0	449	Y0
18	A1	66	H1	114	L1	162	91	210	61	258	31	306	G1	354	N1	402	V1	450	Y1
19	A2	67	H2	115	L2	163	92	211	62	259	32	307	G2	355	N2	403	V2	451	Y2
20	A3	68	H3	116	L3	164	93	212	63	260	33	308	G3	356	N3	404	V3	452	Y3
21	A4	69	H4	117	L4	165	94	213	64	261	34	309	G4	357	N4	405	V4	453	Y4
22	A5	70	H5	118	L5	166	95	214	65	262	35	310	G5	358	N5	406	V5	454	Y5
23	A6	71	H6	119	L6	167	96	215	66	263	36	311	G6	359	N6	407	V6	455	Y6
24	A7	72	H7	120	L7	168	97	216	67	264	37	312	G7	360	N7	408	V7	456	Y7
25	A8	73	H8	121	L8	169	98	217	68	265	38	313	G8	361	N8	409	V8	457	Y8
26	A9	74	H9	122	L9	170	99	218	69	266	39	314	G9	362	N9	410	V9	458	Y9
27	AA	75	HA	123	LA	171	9A	219	6A	267	3A	315	GA	363	NA	411	VA	459	YA
28	AH	76	HH	124	LH	172	9H	220	6H	268	3H	316	GH	364	NH	412	VH	460	YH
29	AC	77	HC	125	LC	173	9C	221	6C	269	3C	317	GC	365	NC	413	VC	461	YC
30	AJ	78	HJ	126	LJ	174	9J	222	6J	270	3J	318	GJ	366	NJ	414	VJ	462	YJ
31	AE	79	HE	127	LE	175	9E	223	6E	271	3E	319	GE	367	NE	415	VE	463	YE
32	AF	80	HF	128	LF	176	9F	224	6F	272	3F	320	GF	368	NF	416	VF	464	YF
33	C0	81	F0	129	P0	177	80	225	50	273	20	321	K0	369	R0	417	W0	465	Z0
34	C1	82	F1	130	P1	178	81	226	51	274	21	322	K1	370	R1	418	W1	466	Z1
35	C2	83	F2	131	P2	179	82	227	52	275	22	323	K2	371	R2	419	W2	467	Z2
36	C3	84	F3	132	P3	180	83	228	53	276	23	324	K3	372	R3	420	W3	468	Z3
37	C4	85	F4	133	P4	181	84	229	54	277	24	325	K4	373	R4	421	W4	469	Z4
38	C5	86	F5	134	P5	182	85	230	55	278	25	326	K5	374	R5	422	W5	470	Z5
39	C6	87	F6	135	P6	183	86	231	56	279	26	327	K6	375	R6	423	W6	471	Z6
40	C7	88	F7	136	P7	184	87	232	57	280	27	328	K7	376	R7	424	W7	472	Z7
41	C8	89	F8	137	P8	185	88	233	58	281	28	329	K8	377	R8	425	W8	473	Z8
42	C9	90	F9	138	P9	186	89	234	59	282	29	330	K9	378	R9	426	W9	474	Z9
43	CA	91	FA	139	PA	187	8A	235	5A	283	2A	331	KA	379	RA	427	WA	475	ZA
44	CH	92	FH	140	PH	188	8H	236	5H	284	2H	332	KH	380	RH	428	WH	476	ZH
45	CC	93	FC	141	PC	189	8C	237	5C	285	2C	333	KC	381	RC	429	WC	477	ZC
46	CJ	94	FJ	142	PJ	190	8J	238	5J	286	2J	334	KJ	382	RJ	430	WJ	478	ZJ
47	CE	95	FE	143	PE	191	8E	239	5E	287	2E	335	KE	383	RE	431	WE	479	ZE
48	CF	96	FF	144	PF	192	8F	240	5F	288	2F	336	KF	384	RF	432	WF	480	ZF

Present_Value properties between 481 and 512 are reserved.

Part 3
Point List

CB03A096

1. BACnet Point List

What is a point list

If connecting the AC to the central control board using the BACnet Gateway, it is necessary for the sales engineer in charge of objects to create a **"point list"** for each object and submit it to the central control board maker.
The point list includes BACnet object information required when monitoring/controlling the AC from the central control board via the BACnet Gateway. The central control board maker creates an AC monitoring/ control program for each object as per the items appearing in the point list.

The point list is determined as per the parameters below and created using a specially configured Excel file.

Parameter 1. DIII - NET address and ID name of AC connected to BACnet Gateway

Parameter 2. AC monitoring/control items executed by the central control board (documentation included in the table in Section 2 on P2 of CB03A098)

Below is a description of how to create a point list.
(For objects where multiple BACnet Gateways will be delivered, a point list should be created for each BACnet Gateway.)

How to create a point list

The point list creation methods for the following monitoring/control objects are provided as examples.

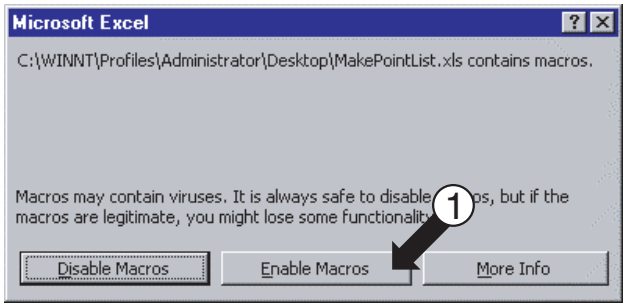
Parameter 1. D3-NET address and ID name of AC connected to the BACnet Gateway.
·Address of AC connected to DIII port 1: 1-01 (name: 1F_Lobby)
·Address of AC connected to DIII port 2: 4-15 (name: 4F_Tenant2)

Parameter 2. AC monitoring/control items executed by the central control board (documentation included in the table in Section 2 on P2 of CB03A098)

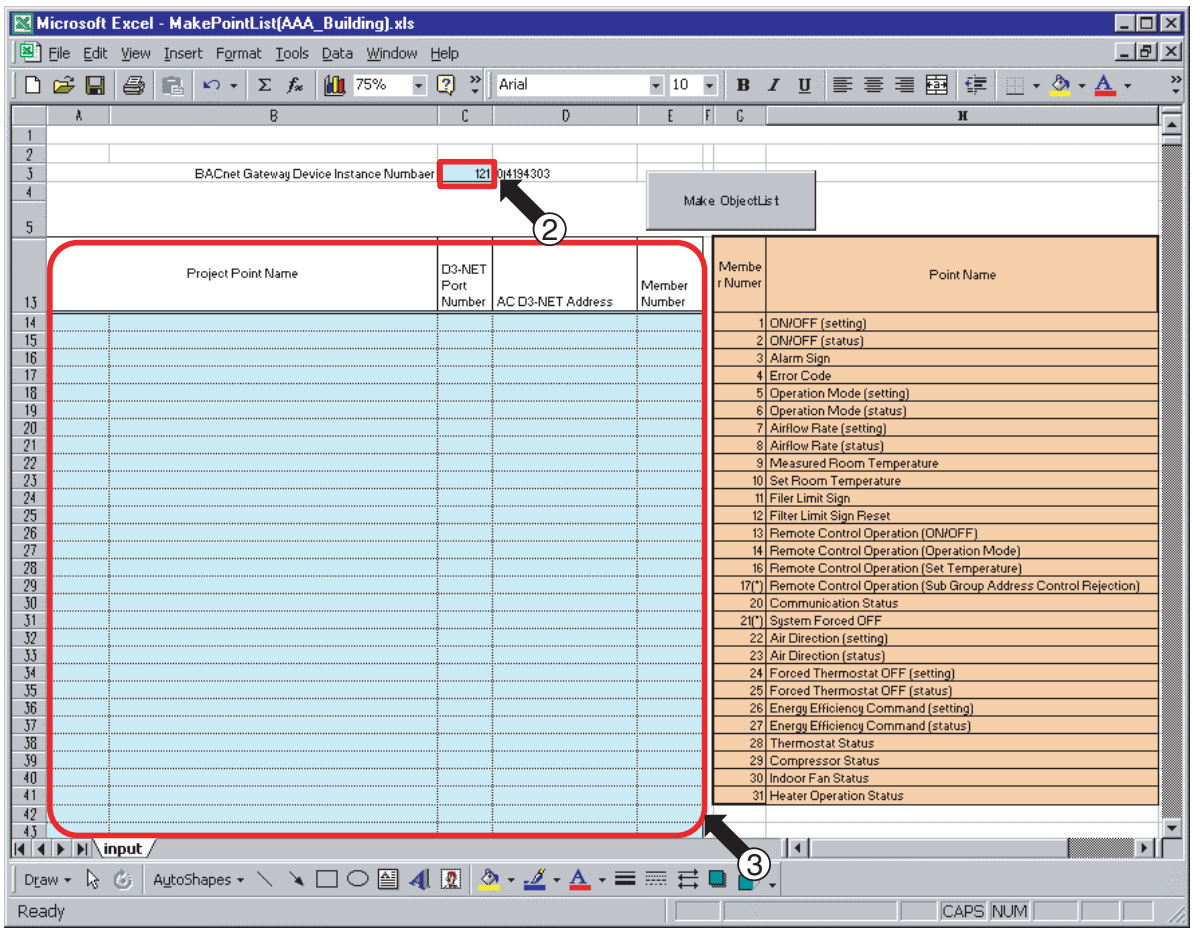
Member Number	Standard Name	Object Type	Activation of central supervisory board monitoring/ control (Yes/No)
1	ON/OFF (setting)	BO	Yes
2	ON/OFF (status)	BI	Yes
3	Alarm Sign	BI	Yes
4	Error Code	MI	Yes
5	Operation Mode (setting)	MO	Yes
6	Operation Mode (status)	MI	Yes
7	Airflow Rate (setting)	MO	Yes
8	Airflow Rate (status)	MI	Yes
9	Measured Room Temperature	AI	Yes
10	Set Room Temperature	AV	Yes
11	Filer Limit Sign	BI	Yes
12	Filter Limit Sign Reset	BV	Yes
13	Remote Control Operation (ON/OFF)	BV	Yes
14	Remote Control Operation (Operation Mode)	BV	Yes
16	Remote Control Operation (Set Temperature)	BV	Yes
17	Remote Control Operation (Sub Group Address Control Rejection)	BV	No
20	Communication Status	BI	No
21	System Forced OFF	BV	Yes
22	Air Direction (setting)	AV	No
23	Air Direction (status)	AI	No
24	Forced Thermostat OFF (setting)	BO	No
25	Forced Thermostat OFF (status)	BI	No
26	Energy Efficiency Command (setting)	BO	No
27	Energy Efficiency Command (status)	BI	No
28	Thermostat Status	BI	No
29	Compressor Status	BI	No
30	Indoor Fan Status	BI	No
31	Heater Operation Status	BI	No

1. Launch point list creation tool
   Filename: Copy MakePointList.xls and assign a unique name, such as the object name.
   (Store this file and the final created point list data. Do not discard this data, as it may be required for future use, as when adding AC units.)
   Double click on the file copied above will display the dialog box shown in Screen 1 below.
   Click on (1) "Enable Macros". Then when Screen 2 is displayed, enter the BACnet Gateway device instance number from Section 3 on P3 of CB03A098 in (2).
   The input method used for (3) (light blue cells) is described on the following pages.

Screen 1.

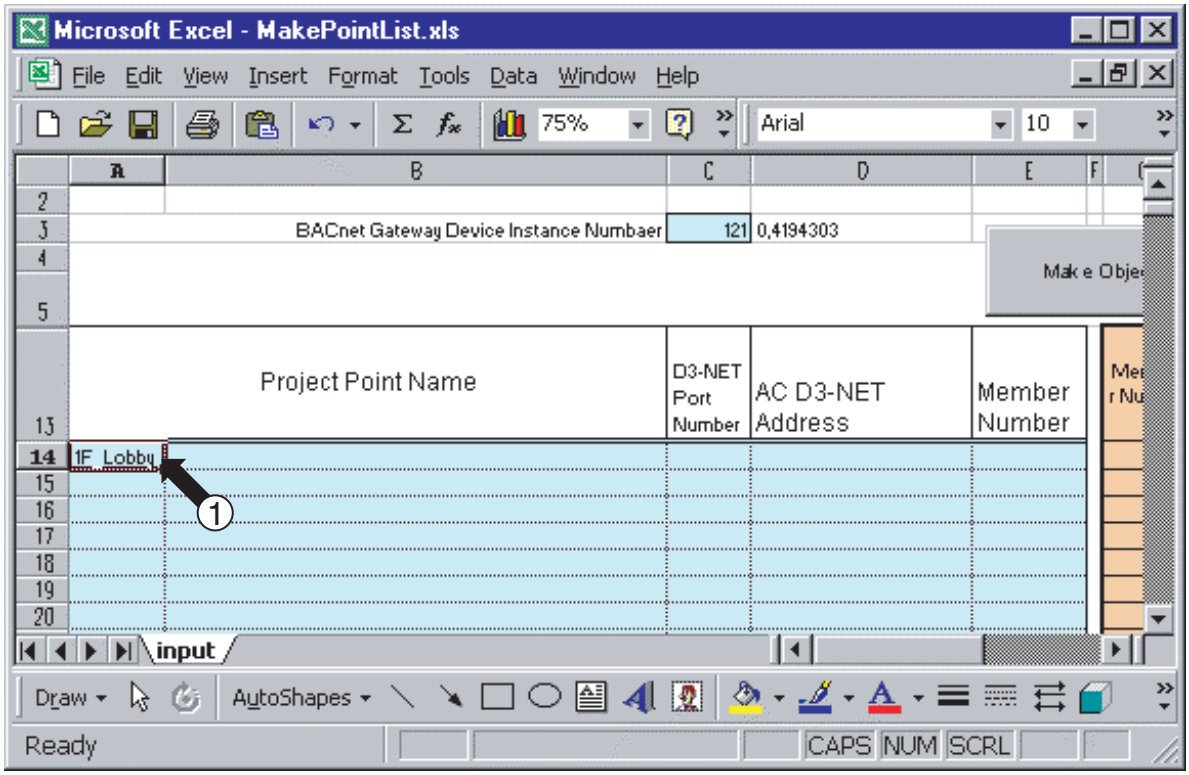


Screen 2. Point list creation tool default screen

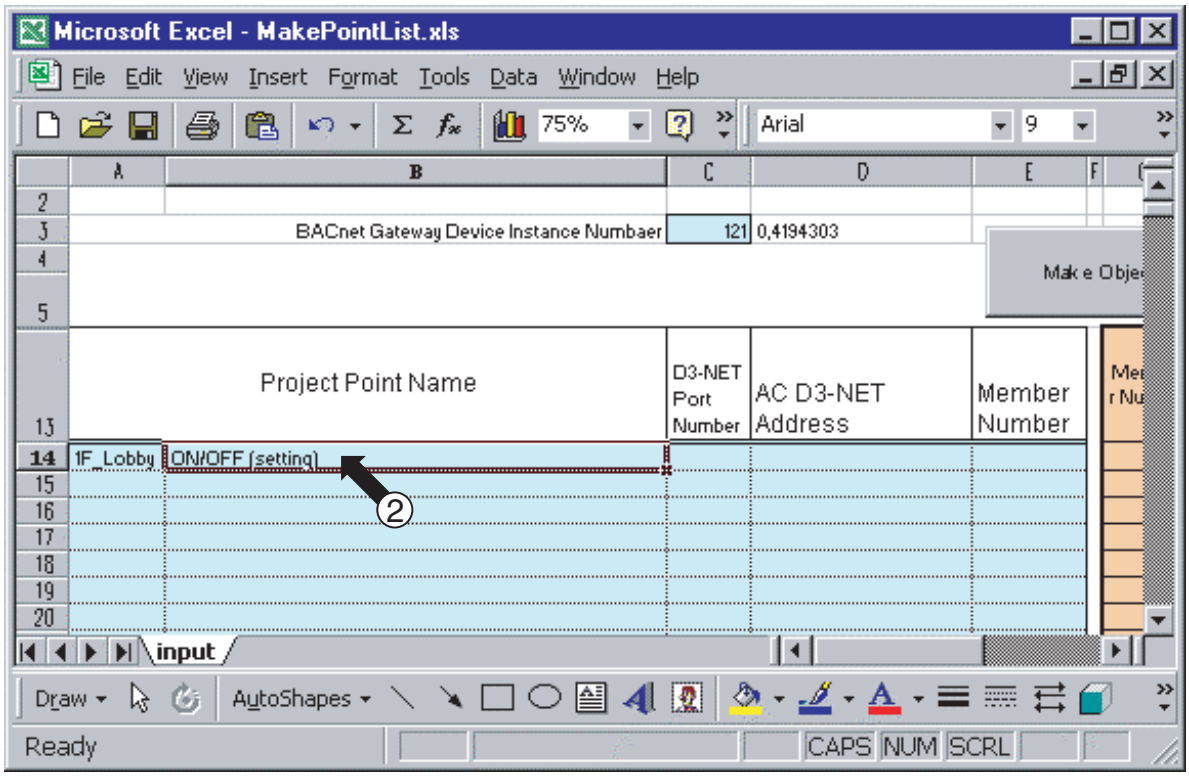


2. **For items in the Parameter 2 table “AC monitoring/control items executed by the central control board” on P3 where the “Activation of central control board monitoring/control” column is set to “Yes”, use the procedure described below to enter the “Project Point Name”, “ DIII-NET Port Number” , “ AC DIII-NET Address” , and “Member Number” in the order of AC addresses as they appear in the table.**

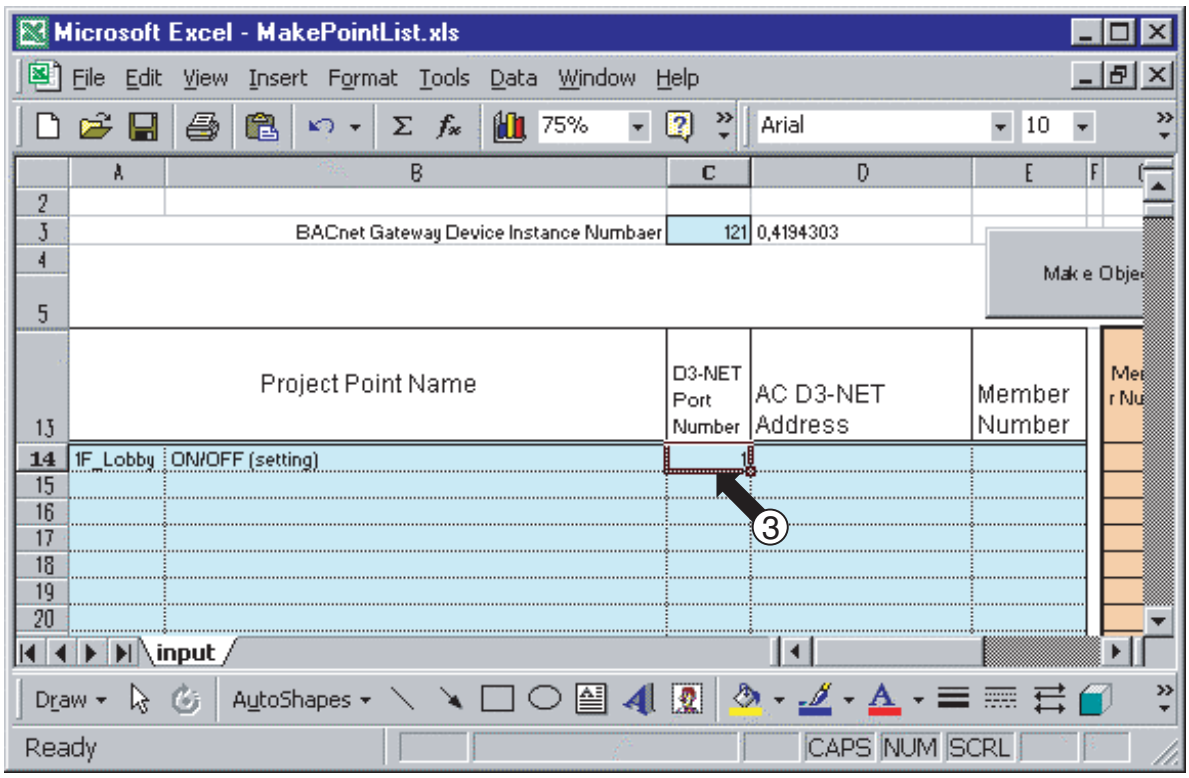
Screen 2-1. Enter the Parameter 1 AC ID Name from P3 into (1).



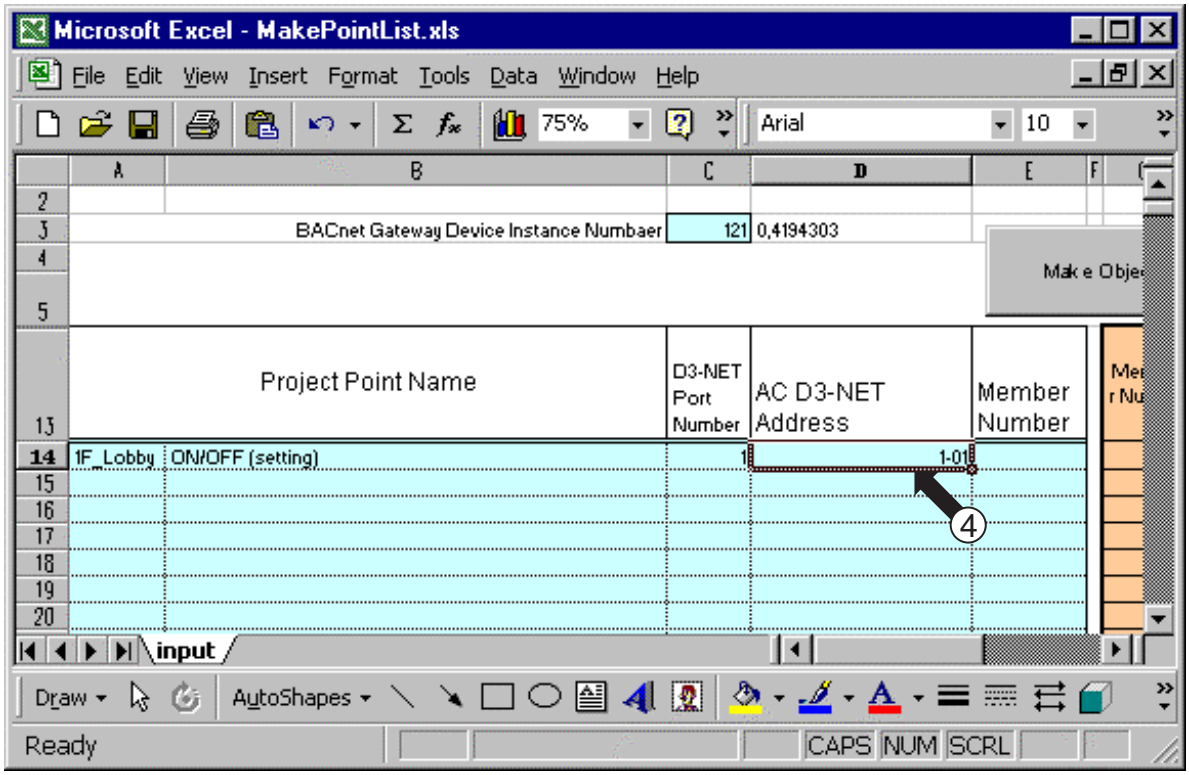
Screen 2-2. Enter the Parameter 2 Standard name from P3 into (2).



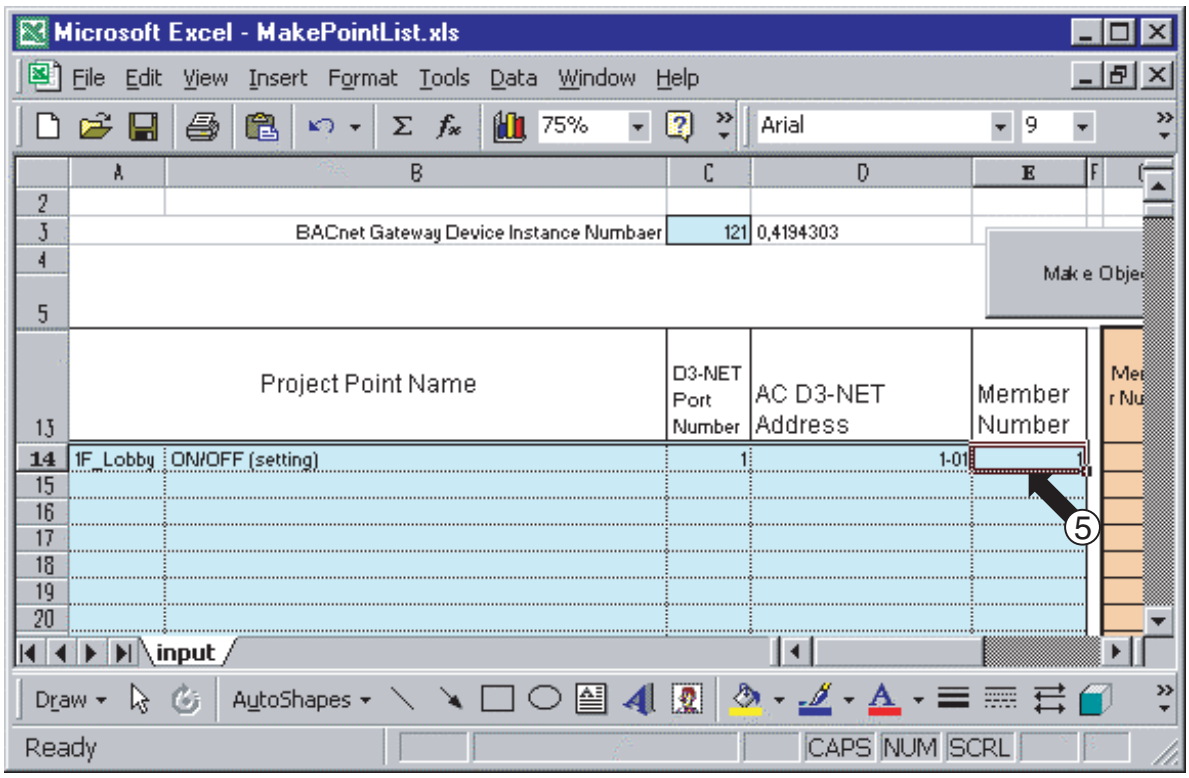
Screen 2-3. Enter the Parameter 1 D3-NET Port Number from P3 into (3).



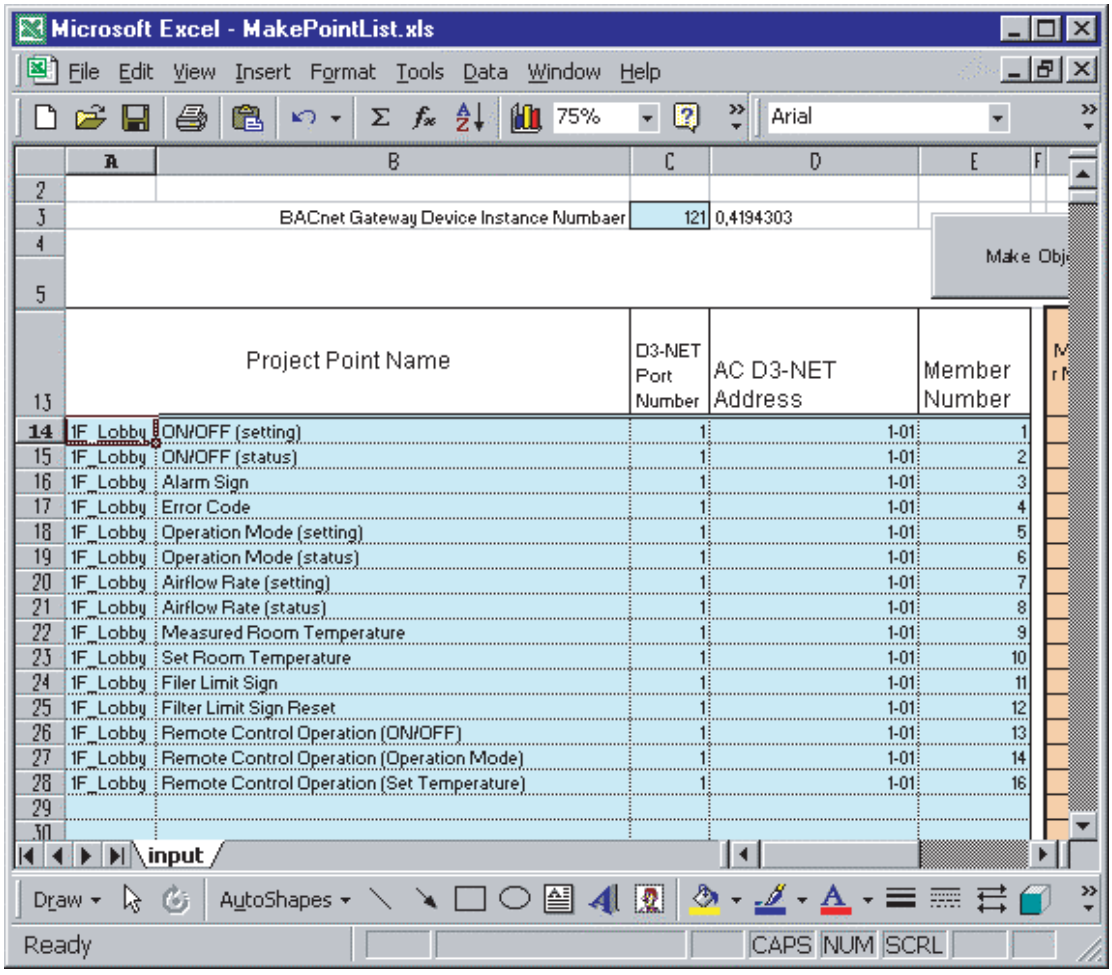
Screen 2-4. Enter the Parameter 1 AC D3-NET Address from P3 into (4).



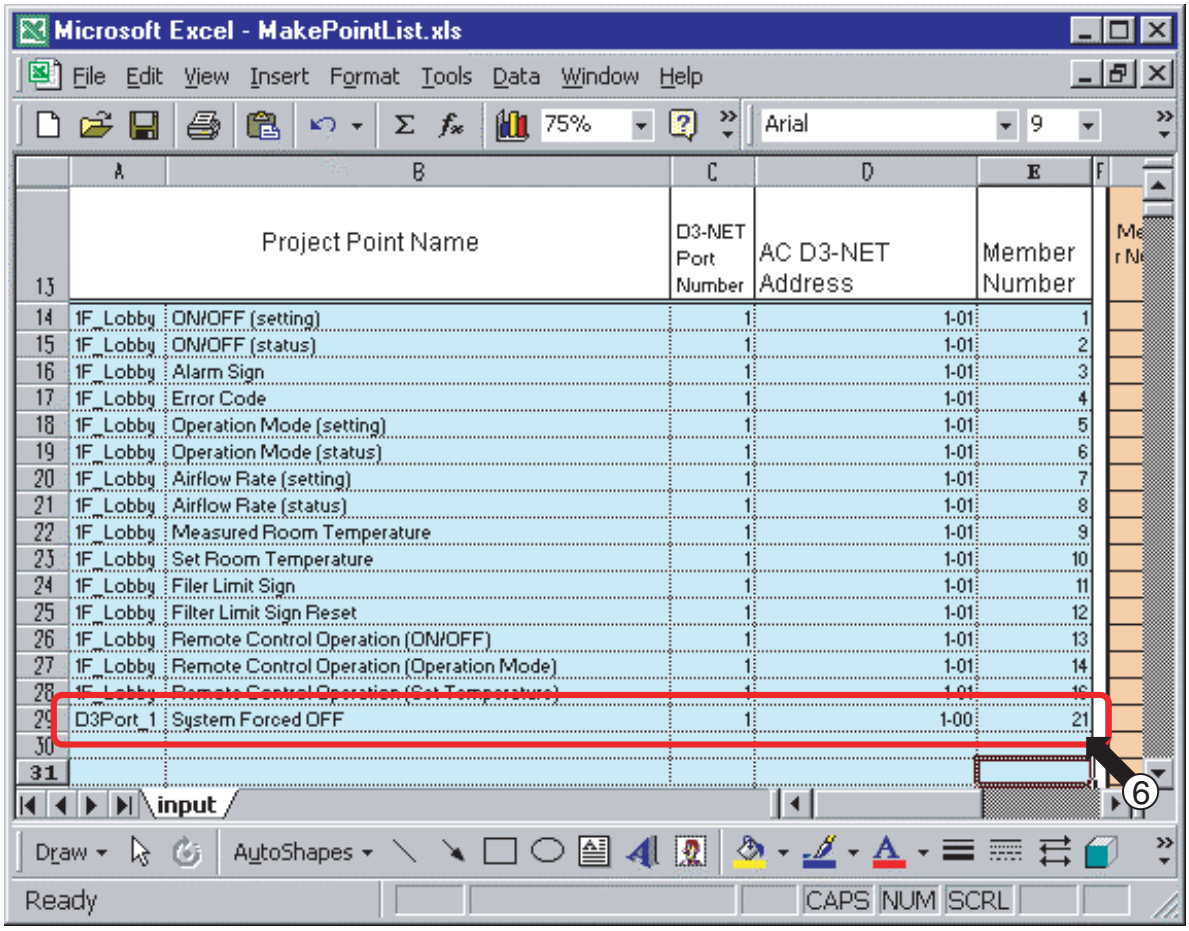
Screen 2-5. Enter the Parameter 2 Member Number from P3 into (5). This completes one row of input.



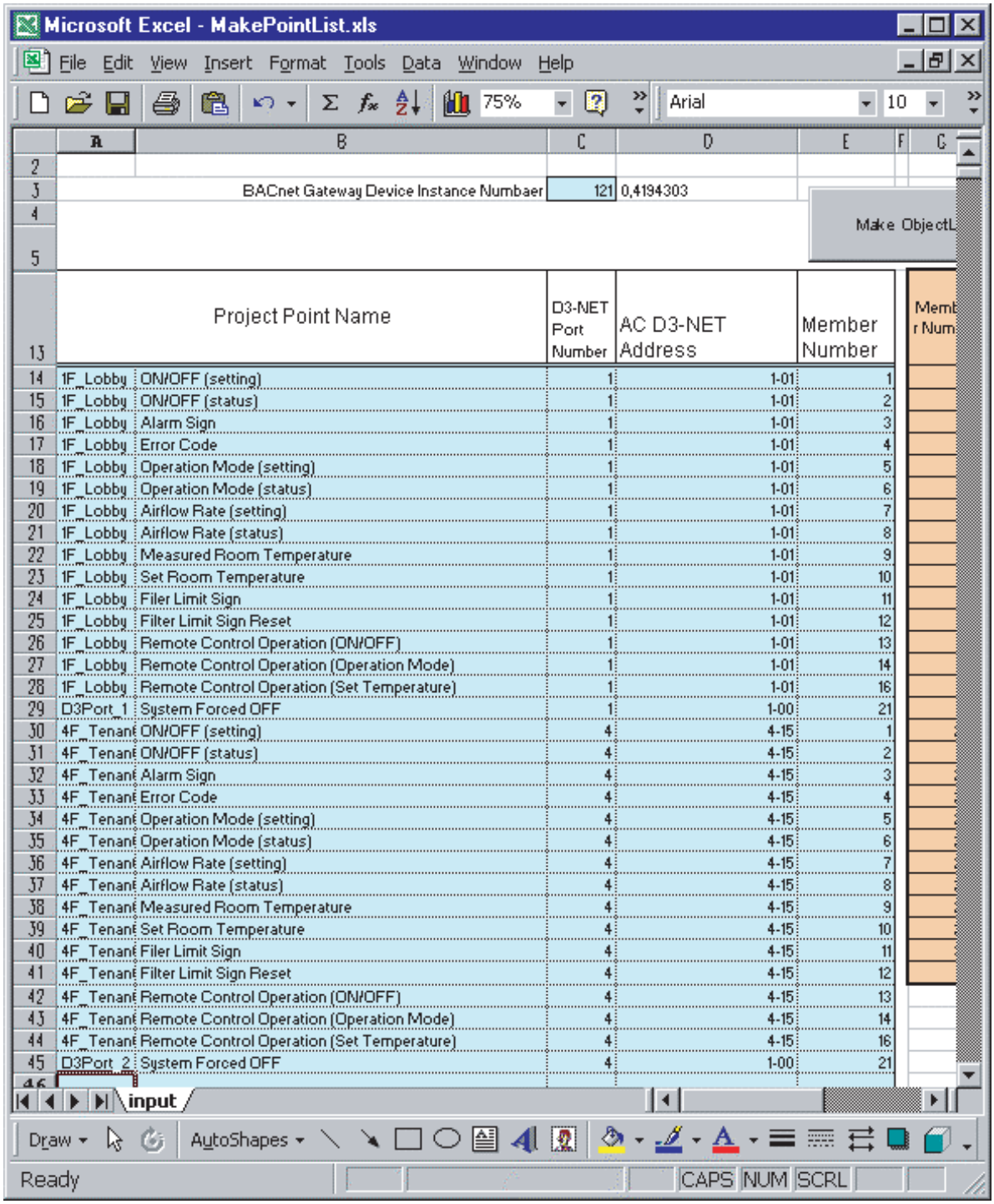
Screen 2-6. The screen will appear as illustrated below once steps 2-1 to 2-5 are repeated to enter all settings for the first AC unit.
(At this time, excel's copy feature can be used to enter settings more efficiently.)
Caution: Do not create any blank columns or lines while entering the settings.



Screen 2-7. Always enter “1-00” for the “AC D3-NET Address” field for the “Remote Control Operation (Sub Group Address Control Rejection)” used for member number 17 and the “System Forced OFF” used for member number 21, as illustrated in (6) in the figure below. Enter 1 line for each D3-NET port for member numbers 17 and 21.

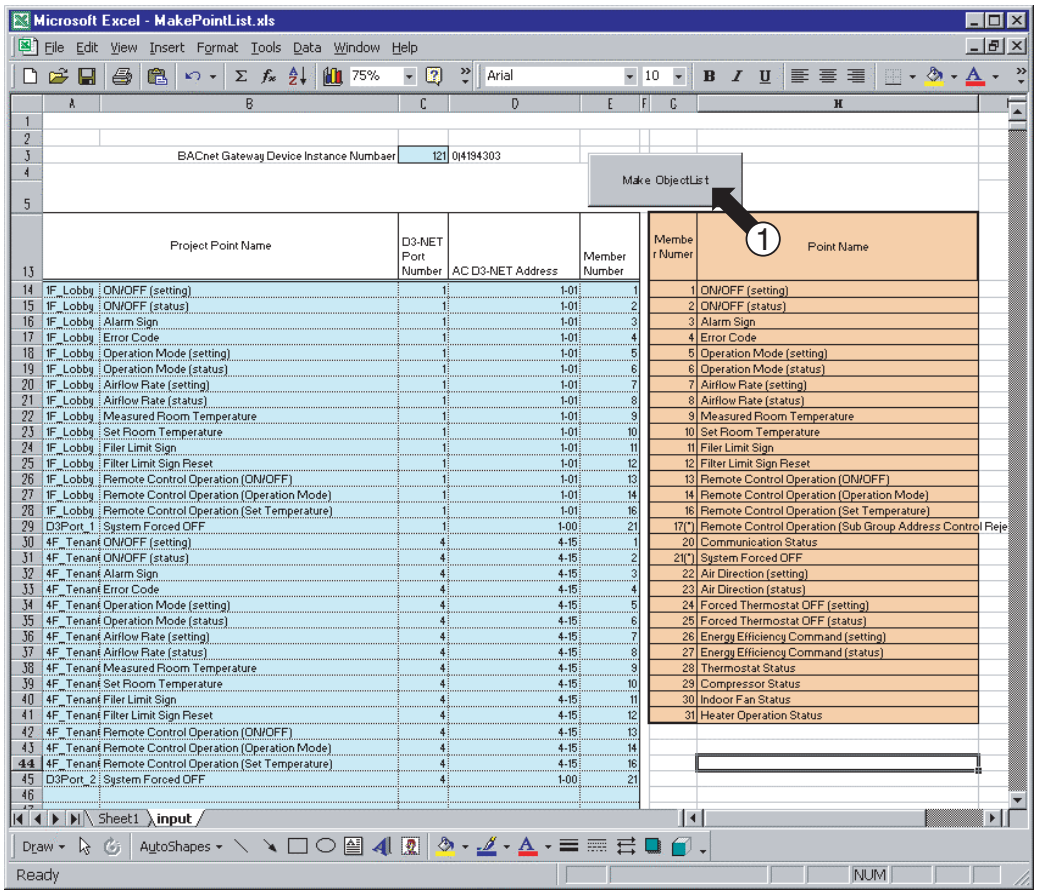


Screen 2-8. The screen will appear as illustrated below once all objects used in the P3 example have been entered.



3. Click on (1) “Make ObjectList” on Screen 1 once all information has been entered as illustrated on the previous page.
   The point list shown in Screen 2 below will be displayed.

Screen 1. Screen after all input is complete



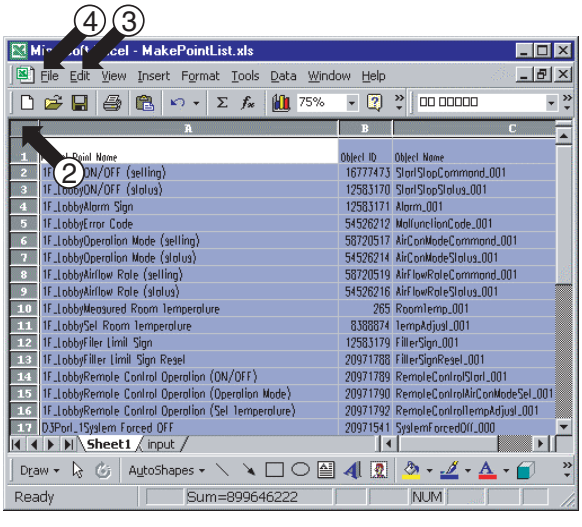
4. Use the following procedure to copy the point list and create and save a new CSV-format file.

4-1 Click on (2) in the upper left corner of screen 2 to select all the cells in the sheet.
Next, click on (3) “Edit” and select “Copy” from the pull-down menu to copy the selected cells.

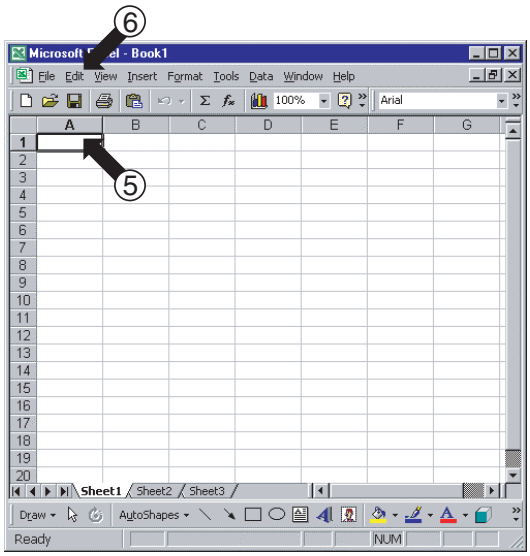
4-2 Click on (4) “File” and select “New…” from the pull-down menu to create a new file like the one shown in Screen 3.

4-3 Paste the data copied in step 4-2 into the newly created file.
Click on (5) to specify where the data is to be pasted. Next click on (6) “Edit” and select “Paste” from the pull-down menu to paste the copied data. Screen 1 on the following page shows the screen with the pasted data.

Screen 2. Screen Point List



Screen 3. Screen New file



5. Assign a name to the file created on the previous page and save it.

5-1. Screen 1 shows the screen resulting from following the steps on the previous page.
① Click on (1) “File” and select “Save As”from the pull-down menu to display the “Save As” dialog shown in Screen 2.

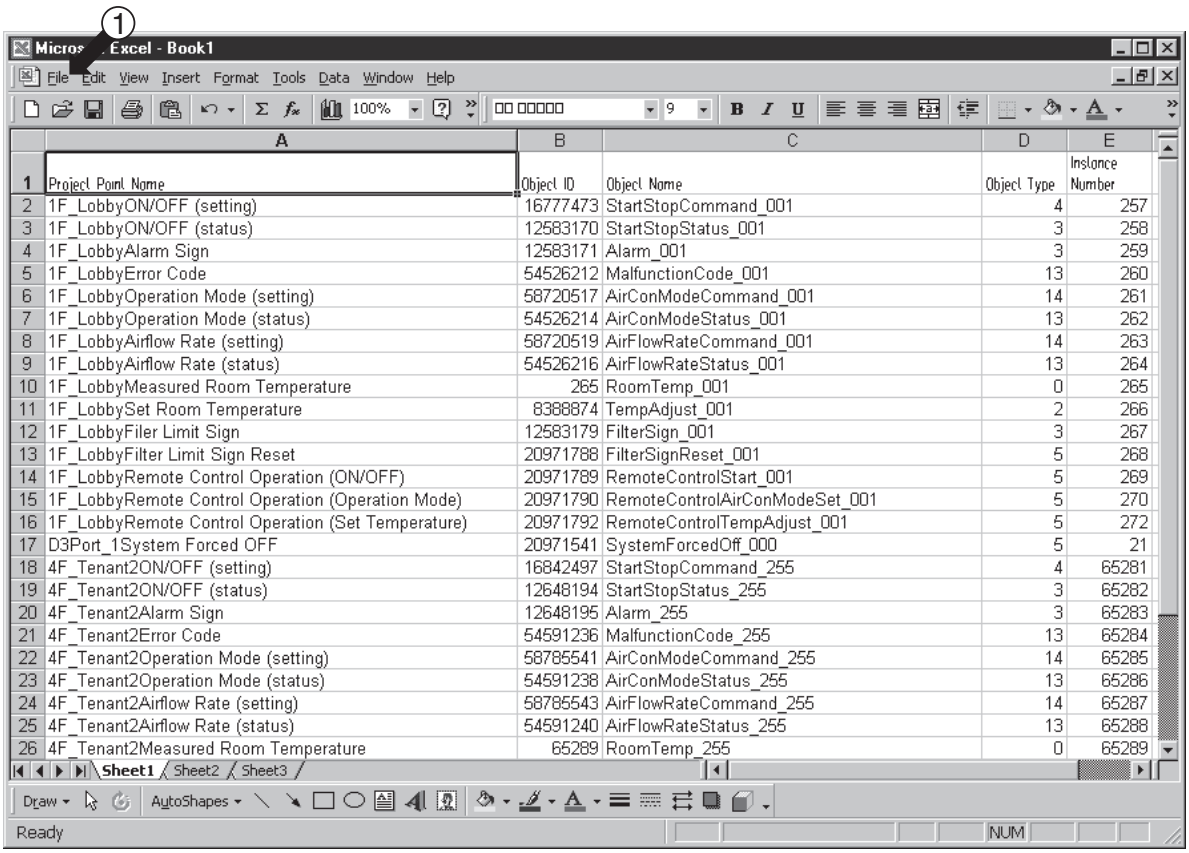
5-2. ② Select on “CSV(Comma delimited)(*.csv)” from the (2) pull-down menu.

5-3. ③ Enter a filename in (3). (Use a unique name that will not be easily mistaken.)

5-4. Finally, click on (4) “Save” to save the file.

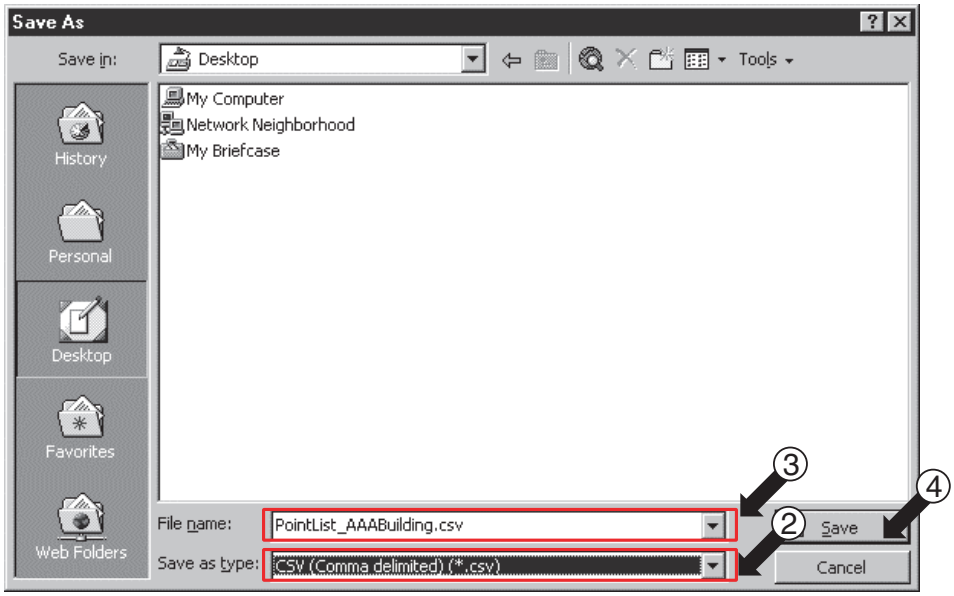
6. Send the file saved in step 5-4 to the central control board maker electronically to complete the point list creation procedure.
(Store this point list. Do not discard this data, as it may be required for future use, as when adding AC units.)

Screen 1. Newly created file after data has been copied



	A	B	C	D	E
1	Project Point Name	Object ID	Object Name	Object Type	Instance Number
2	1F_LobbyON/OFF (setting)	16777473	StartStopCommand_001	4	257
3	1F_LobbyON/OFF (status)	12583170	StartStopStatus_001	3	258
4	1F_LobbyAlarm Sign	12583171	Alarm_001	3	259
5	1F_LobbyError Code	54526212	MalfunctionCode_001	13	260
6	1F_LobbyOperation Mode (setting)	58720517	AirConModeCommand_001	14	261
7	1F_LobbyOperation Mode (status)	54526214	AirConModeStatus_001	13	262
8	1F_LobbyAirflow Rate (setting)	58720519	AirFlowRateCommand_001	14	263
9	1F_LobbyAirflow Rate (status)	54526216	AirFlowRateStatus_001	13	264
10	1F_LobbyMeasured Room Temperature	265	RoomTemp_001	0	265
11	1F_LobbySet Room Temperature	8388874	TempAdjust_001	2	266
12	1F_LobbyFiler Limit Sign	12583179	FilterSign_001	3	267
13	1F_LobbyFilter Limit Sign Reset	20971788	FilterSignReset_001	5	268
14	1F_LobbyRemote Control Operation (ON/OFF)	20971789	RemoteControlStart_001	5	269
15	1F_LobbyRemote Control Operation (Operation Mode)	20971790	RemoteControlAirConModeSet_001	5	270
16	1F_LobbyRemote Control Operation (Set Temperature)	20971792	RemoteControlTempAdjust_001	5	272
17	D3Port_1System Forced OFF	20971541	SystemForcedOff_000	5	21
18	4F_Tenant2ON/OFF (setting)	16842497	StartStopCommand_255	4	65281
19	4F_Tenant2ON/OFF (status)	12648194	StartStopStatus_255	3	65282
20	4F_Tenant2Alarm Sign	12648195	Alarm_255	3	65283
21	4F_Tenant2Error Code	54591236	MalfunctionCode_255	13	65284
22	4F_Tenant2Operation Mode (setting)	58785541	AirConModeCommand_255	14	65285
23	4F_Tenant2Operation Mode (status)	54591238	AirConModeStatus_255	13	65286
24	4F_Tenant2Airflow Rate (setting)	58785543	AirFlowRateCommand_255	14	65287
25	4F_Tenant2Airflow Rate (status)	54591240	AirFlowRateStatus_255	13	65288
26	4F_Tenant2Measured Room Temperature	65289	RoomTemp_255	0	65289

Screen 2. Screen Save As



Part 4
Daikin’s Agreement

1. Daikin's BACnet Gateway Agreement

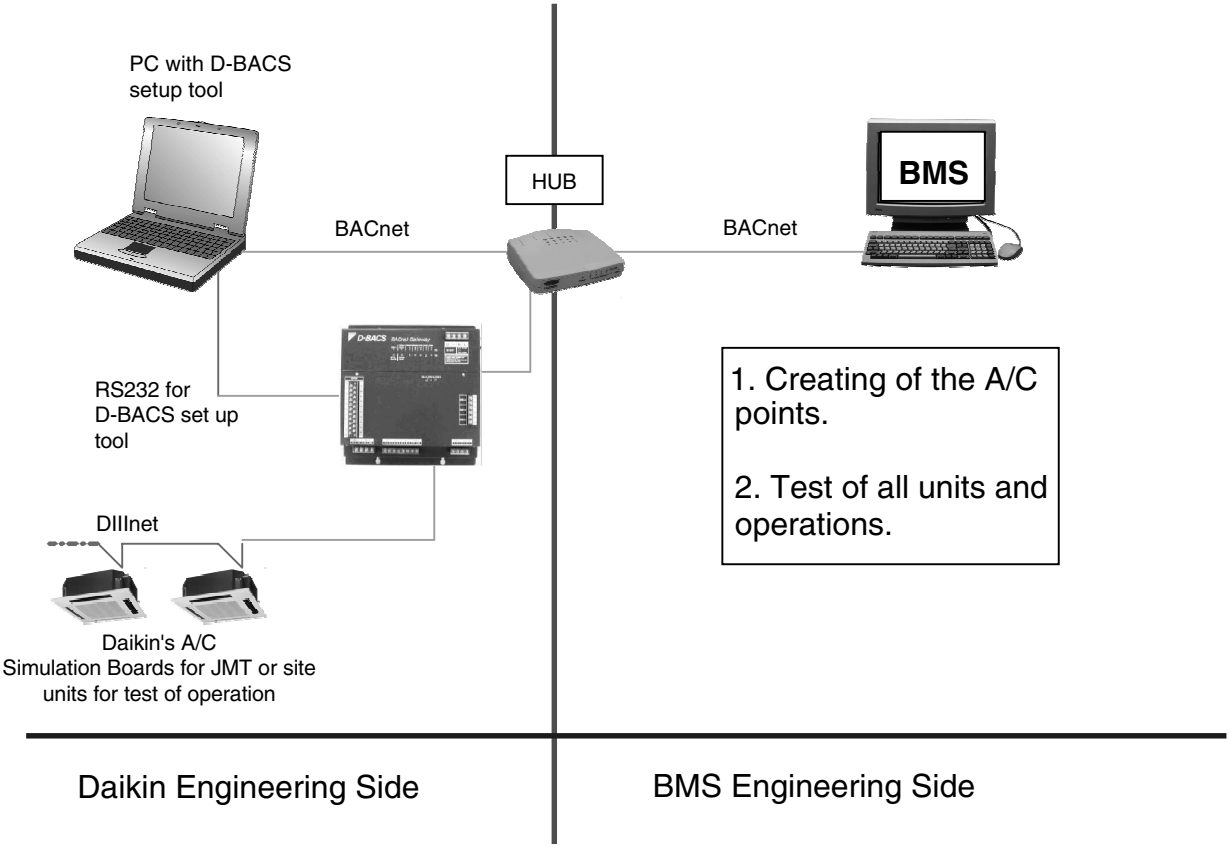
1. **JMT** — (Joint Matching Test) This is necessary for every independent BMS.
   The case where a JMT is not necessary is where previously a successful JMT has been carried out and the BMS system has not been updated by software or hardware changes. In the case that the BMS has updated their system by either changes, a following JMT will be required.

2. **D-BACS setup-tool** — Use of Daikin's D-BACS setup-tool is for confirming the operation/state of connected A/C units & address ID's, prior to connection with the BMS system.

3. **BMS Engineering** — Creating of the Points. This is NOT to be done by Daikin since it is directly related to the BMS side. The BMS engineer is to carry out the engineering of the Point, however Daikin is responsible for providing the method of how the Points are calculated.

4. **Commission** — First step, only using Daikin's BACnet Gateway, without connecting BMS. This is to be carried out by Daikin engineering staff with the use of the D-BACS set up tool.

5. **Discrepancy of operation of Gateway by BMS** — In the case that the BMS maker feels that the BACnet Gateway is not functioning correctly via the BACnet Protocol, a test with the use of Daikin's BACnet Client software can confirm this. (This test is generally not required)



Part 5
Test Operation Manual

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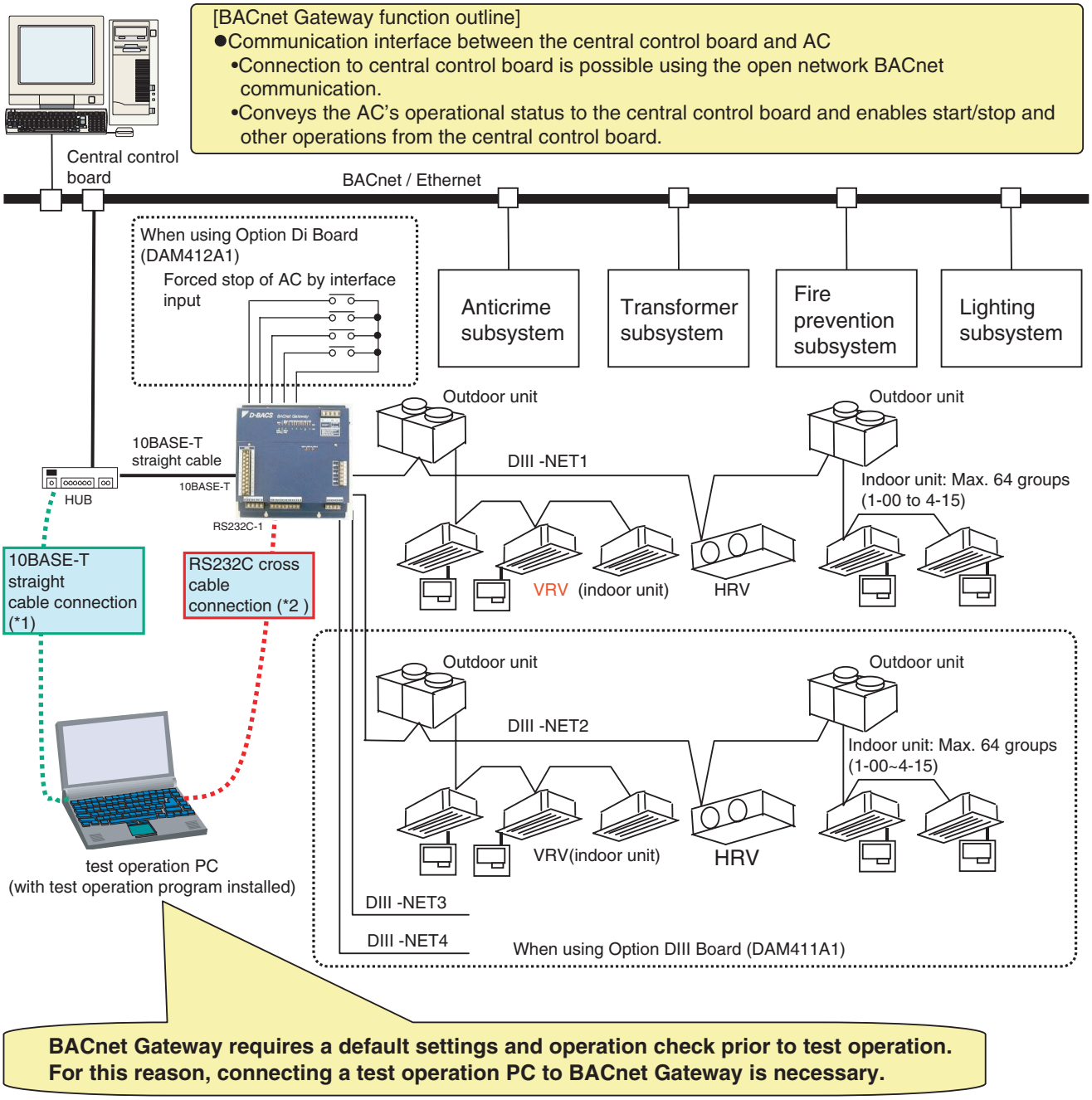
1. BACnet Gateway Object System Diagram



(There are two ways to connect the test operation PC to BACnet Gateway, *1 or *2 described below. Either method can be used.): See P18 for details.

***1: If connecting with a 10BASE-T straight cable, perform the following items.**

- Prepare a 10BASE-T straight cable (LAN straight cable).
  (Easily obtained at any electronic goods store.)
- Check if there is an open input port in HUB (parts to be arranged on site) shown above and an IP address that can be temporarily used only for the test operation on site (verify at sales or on site).
- Change the IP address of the test operation PC and change it back after the test operation.
  (See P19 for setting method)

*: The advantage of using a 10BASE-T straight cable for the test operation as opposed to using an RS232C is the very fast communication speed enabling quick setting.

***2: If connecting with an RS232C cross cable, set the test operation PC in advance as P12 to 15.**
(Perform [Set modem] and [Set dialup adapter] for test operation PC in advance.)

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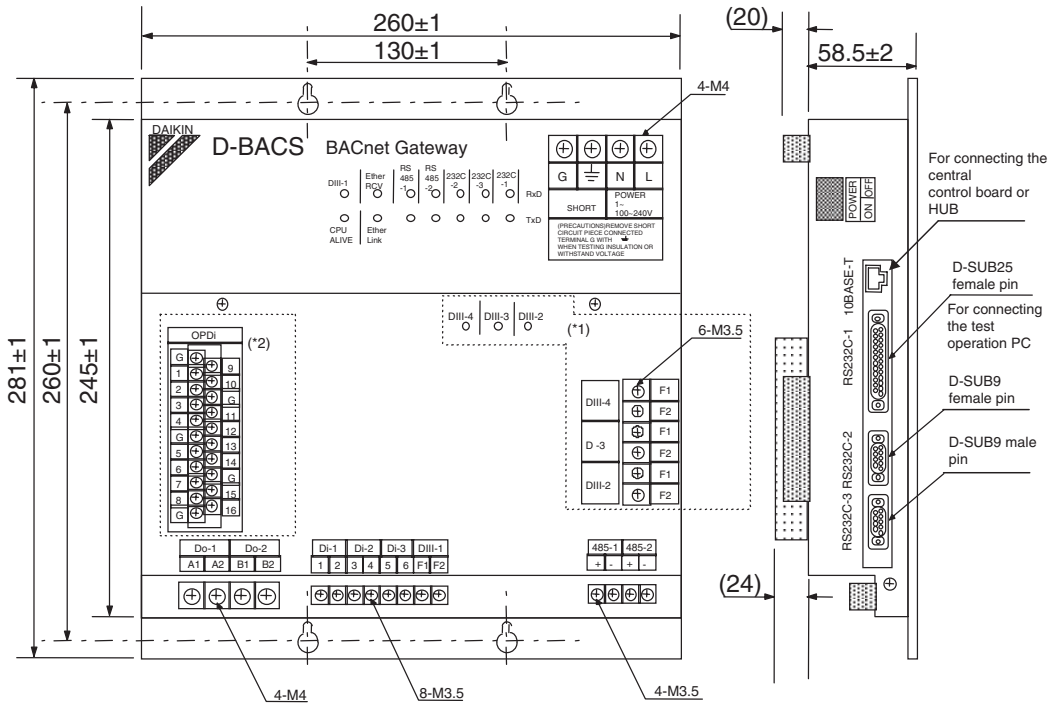
2. BACnet Gateway Specifications



(∗1) Dotted line diagram shows the optional (DAM411A1) installed.
(∗2) Dotted line diagram shows the optional (DAM412A1) installed.

1) Electric rating
   (1) Rated voltage: Single-phase 100 to 240VAC 5060 Hz
   (2) Power consumption: Max. 20W
2) Operating conditions
   (1) Power source voltage fluctuation: Rated value ±10%
   (2) Ambient temperature for use: -10 to 50°C
   (3) Ambient humidity for use: 0 to 98% (with no condensation)
   (4) Storage temperature: -20 to 60°C
3) Performance insulating resistance: 50MΩ or above with 500 VDC Megger
4) Weight 4.0 kg
5) Color
   Unit: PANTONE 533C Lettering: PANTONE 656C Lines: PANTONE 656C
6) Meaning of I/O interface
   Do-1: ON in the event of a trouble in the BACnet Gateway main unit
   Do-2: ON in the event of a malfunction in the AC connected
   Di-1 to 3: Not used
   OPDi-1 to 12: Not used
   OPDi-13: DIII port 1 AC forced stop input
   OPDi-14: DIII port 2 AC forced stop input
   OPDi-15: DIII port 3 AC forced stop input
   OPDi-16: DIII port 4 AC forced stop input

LED name	LED function
CPU ALIVE	Flashes when the main unit is operating normally
DIII-1	Flashes when data is received/sent from/to devices connected to the DIII-1 of the AC.
Ether RCV	Flashes when data is received from the BACnet Client.
Ether Link	Lights up when connecting the 10 BASE-T cable.
RS485-1(R×D)	Not used.
RS485-1(T×D)	Not used.
RS485-2(R×D)	Not used.
RS485-2(T×D)	Not used.

LED name	LED function
RS232C-1(RxD)	Flashes when data is received from the test run PC.
RS232C-1(T×D)	Flashes when data is sent to the test run PC.
RS232C-2(RxD)	Not used.
RS232C-2(T×D)	Not used.
RS232C-3(RxD)	Not used.
RS232C-3(T×D)	Not used.
DIII-2	Flashes when data is received/sent from/to devices connected to DIII-2 of the AC.
DIII-3	Flashes when data is received/sent from/to devices connected to DIII-3 of the AC.
DIII-4	Flashes when data is received/sent from/to devices connected to DIII-4 of the AC.

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3. Items Required Prior to Departing for the Site

3.1 Check the Test Operation PC, Communication Cable Specs, and Test Operation Program Version

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1. PC specs
   PC OS : **Windows98, Me, 2000 or XP**
   Communication port required for PC : **RS232C** communication port of the PC main unit: **1 port**
   (The test operation may not proceed well if a USB port was used to convert to the RS232C communication port. Make sure that the PC main unit has an RS232C communication port.)
   : **Ethernet (LAN communication) : 1 port**
2. Specs for communication cable required for test operation
   (Communication cable to connect BACnet Gateway to the test operation PC)
   RS232C communication cable : 9-pin (female) - 25-pin (male) cross cable
   Ethernet (10BASE-T) straight cable : LAN cable (straight cable)
   Ethernet (10BASE-T) cross cable : LAN cable (cross cable)
   (Used if there is no HUB on site or if it is damaged when upgrading the BACnet Gateway or during a test operation.)

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3.2 Download Latest Software

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Make sure to download the latest version of the test operation program and the BACnet Gateway main unit program from the Internet. Download as per the following procedures.

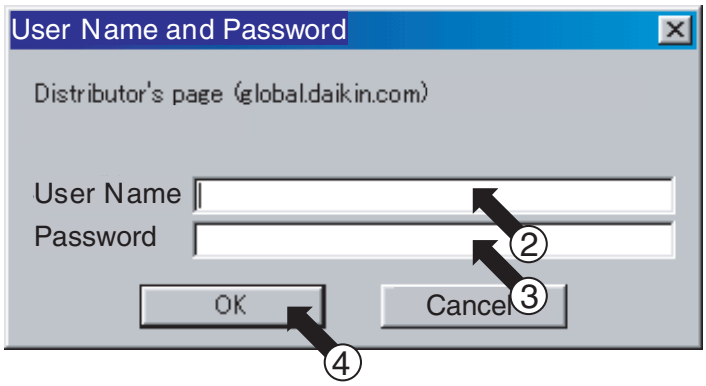
1. Access http://www.daikin.com/global/. Screen 1 will appear.
   Click on ① “Distributor’s Page” and screen 2 will appear.

Screen 1. Homepage of DAIKIN INDUSTRIES, LTD.

2. Enter the user name in ② and password in ③ on this screen.

   The user name entered in ② is “distributor”.
   Because the password entered in ③ is changed frequently, verify with the website manager.
   After inputting the user name and password, click on the ④ “OK” button. Screen 3 of the next page will appear.

Screen 2. Password Input Screen



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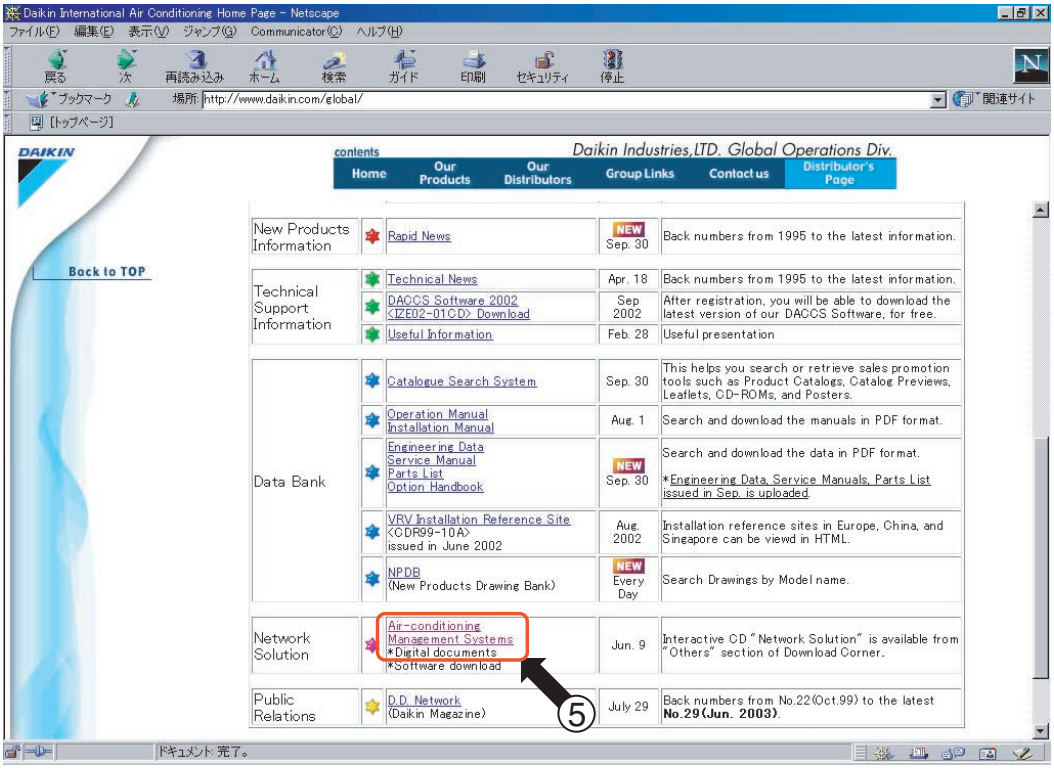
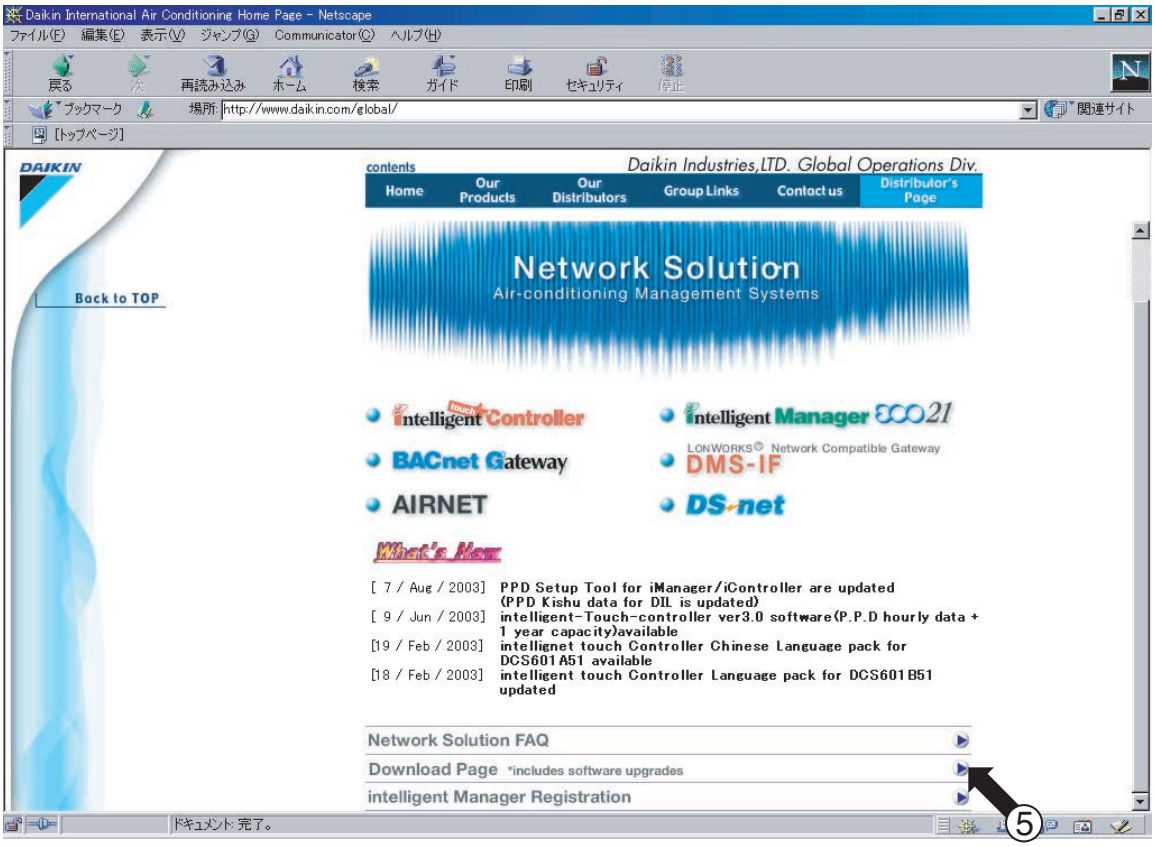
3. Click on ⑤ in screen 3 and screen 4 will appear.

Screen 3. Distributor's Homepage



4. Click on ⑥ "Download Page" and screen 5 of the next page will appear.

Screen 4. Network Solution



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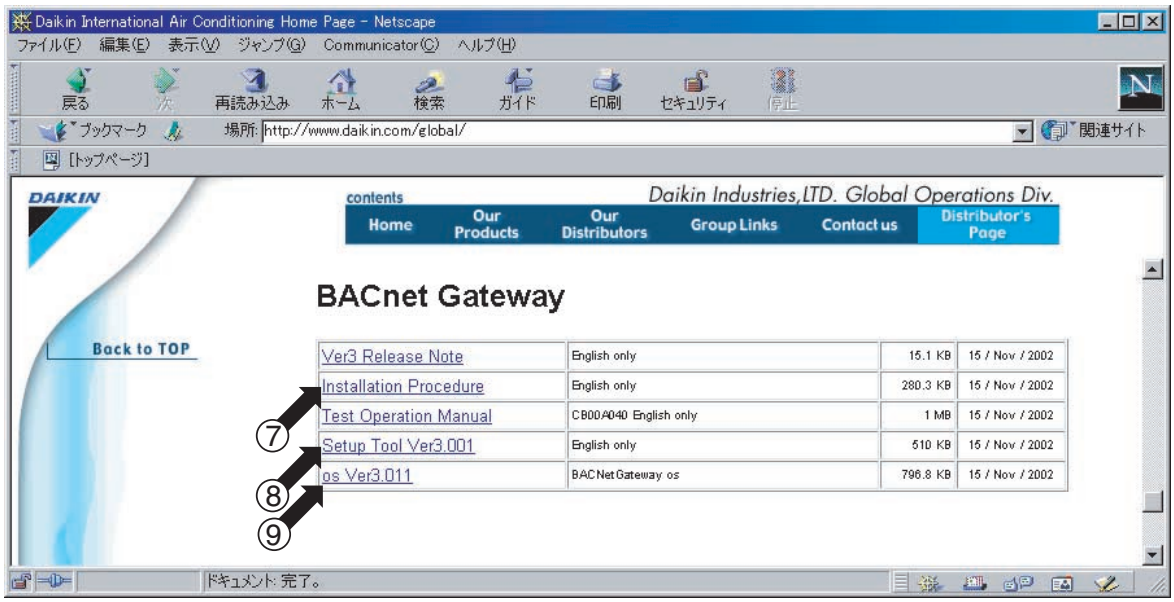
5. Click on ⑦ to ⑨ in screen 5 one at a time to download. Each software is described below.
   ⑦: BACnet Gateway main unit software upgrade procedure manual
   ⑧: Modem software for connecting the test operation PC to BACnet Gateway using the test operation program or an RS232C.
   ⑨: Software to be written in BACnet Gateway and upgrade tool when writing.
   ∗: The software mentioned above is downloaded in compressed form. Uncompress them for later use.
   ∗: Copy the uncompressed software into the test operation PC.

   This completes the download of the latest software.

Screen 5. Download



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3.3 Obtain Object Data

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Performing initial settings for BACnet Gateway prior to test operation is required. For this reason, obtain the data outlined in items ① to ⑤ below to be set in BACnet Gateway. The sales representative in charge of objects has this data.
(Reference material showing the settings specified for the objects is needed for the blank spaces in ① to ⑤.)

①. IP address set in BACnet Gateway
(Enter an IP address that can be used temporarily for service test operations as well. (Valid for test operation only.))

1. IP address set in BACnet Gateway

IP Address		Ex: 192.168.01.
Subnet Mask		Ex: 255.255.255.0
Default Gateway Address		Ex: 192.168.0.100

2.IP address temporarily used for service test operations (only valid for test operations)

IP Address		Ex: 192.168.0.2
Subnet Mask		Ex: 255.255.255.0
Default Gateway Address		Ex: 192.168.0.100

②. Instance number set in BACnet Gateway
∗:Setting range: 0 to 4194303, default settings “0”

BACnet Gateway device instance No.	

③. Communication protocol set in BACnet Gateway
∗:Setting protocol is “IEEE802.3” or “BACnet I/P”
Default setting is “IEEE802.3”

BACnet communication protocol	

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④. On-site installation drawing related material

- On-site wiring system diagram (materials with the following data)
  - BACnet Gateway (DMS502A51) quantity and installation position
  - Option DIII Board (DAM411A1) quantity and installation position
  - Option Di Board (DAM412A1) quantity and installation position
  - Materials that show the relationship between the number of AC units and their corresponding DIII-NET addresses and installation positions (drawings, etc.)

⑤. AC monitoring/control items executed by the central control board

Member Number	Standard Name	Object Type	Activation of central control board monitoring/control (Yes/No)
1	ON/OFF (setting)	BO	
2	ON/OFF (status)	BI	
3	Alarm Sign	BI	
4	Error Code	MI	
5	Operation Mode (setting)	MO	
6	Operation Mode (status)	MI	
7	Airflow Rate (setting)	MO	
8	Airflow Rate (status)	MI	
9	Measured Room Temperature	AI	
10	Set Room Temperature	AV	
11	Filer Limit Sign	BI	
12	Filter Limit Sign Reset	BV	
13	Remote Control Operation (ON/OFF)	BV	
14	Remote Control Operation (Operation Mode)	BV	
16	Remote Control Operation (Set Temperature)	BV	
(*)17	Remote Control Operation (Sub Group Address Control Rejection)	BV	
20	Communication Status	BI	
(*)21	System Forced OFF	BV	
22	Air Direction (setting)	AV	
23	Air Direction (status)	AI	
24	Forced Thermostat OFF (setting)	BO	
25	Forced Thermostat OFF (status)	BI	
26	Energy Efficiency Command (setting)	BO	
27	Energy Efficiency Command (status)	BI	
28	Thermostat Status	BI	
29	Compressor Status	BI	
30	Indoor Fan Status	BI	
31	Heater Operation Status	BI	

Centralized Control (Sub Group Address Control Rejection) and System Forced OFF are only applicable to A/Cs numbered ‘000’, ‘064’, ‘128’ and ‘192’.

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3.4 Setup Test Operation PC (only if connecting BACnet Gateway Using an RS232C Communication)

If connecting BACnet Gateway to the test operation PC using an RS232C communication, perform [Set modem] and [Set dialup adapter] in the test operation PC prior to departing for test operation.

* Once these settings are made in the test operation PC, they are saved and need not be reentered.

[Set modem]

1-1. Startup test operation PC.

1-2. Select [Settings]-[Control Panel] from the [Start] menu and double click on [Phone and Modem Options]. Screen 1 will appear.

1-3. Double click on ① “Modems” and click on ② “Add”. Screen 2 will appear.

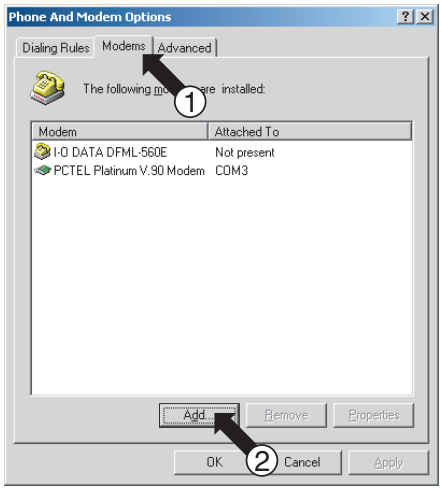
1-4. Enter a check in ③ “Don’t detect my modem ; II will select it from list” and click on ④ “Next”. Screen 3 will appear.

1-5. Click on ⑤ “Have Disk”. Screen 4 will appear.

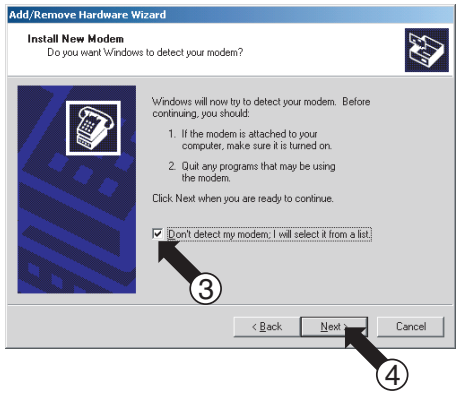
1-6. Click on ⑥ “Browse”. Screen 5 will appear. Select ⑧ “mdmcisc2.inf” located in ⑦ “GenericNULL modem ver2.0” folder downloaded from the Daikin website (see P7 to 9). Click on ⑨ “Open”. Screen 6 will appear.

1-7. Click on ⑩ “OK”. Screen 7 on the next page will appear.

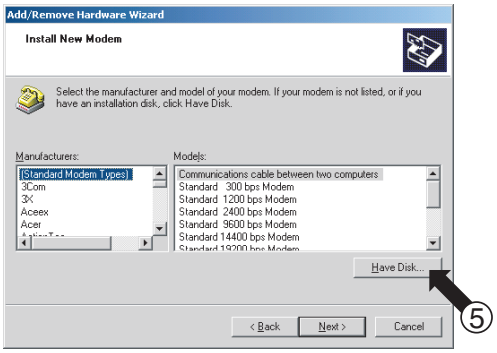
Screen 1. Phone and Modem Options



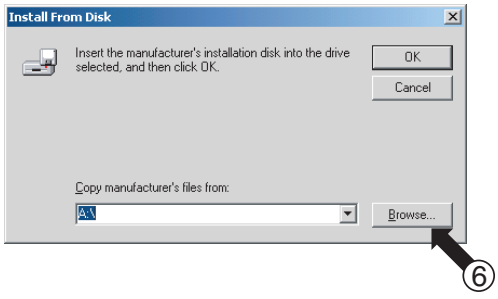
Screen 2. Add/Remove Hardware Wizard



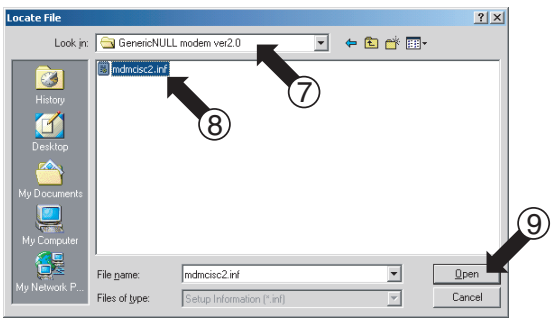
Screen 3. Add/Remove Hardware Wizard



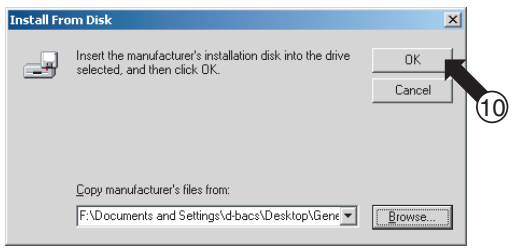
Screen 4. Install From Disk



Screen 5. Locate File



Screen 6. Install From Disk



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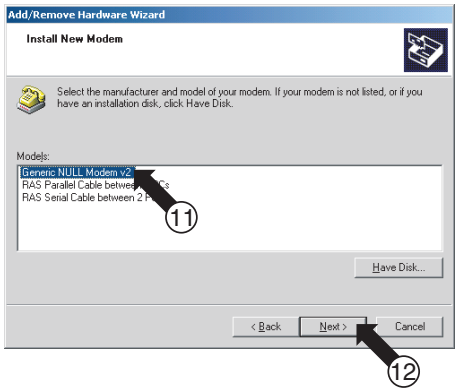
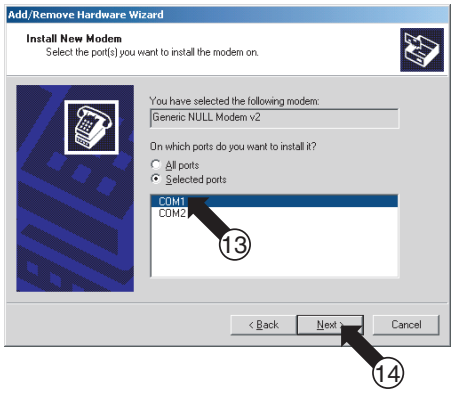
1-8. Select ⑪ “Generic NULL Modem v2” on Screen 7 and click on ⑫ “Next”. Screen 8 will appear.
1-9. Select the serial port to install “Generic NULL Modem v2” at ⑬ and click on ⑭ “Next”.
(Generally, the serial port is COM1) Screen 9 appears.
* Should the warning dialog “digital signature not found” appear, click on “Yes” to continue installation.
1-10. Click on ⑮ “Finish”. Screen 10 will appear. Click on ⑯ “OK”. This complete modem setting.
Next, perform [Set dialup adapter] as per the following pages.

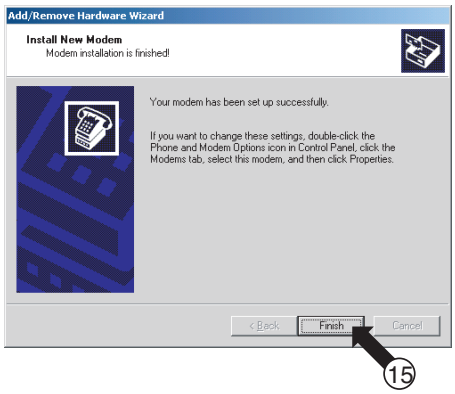
Screen 7. Add/Remove Hardware Wizard



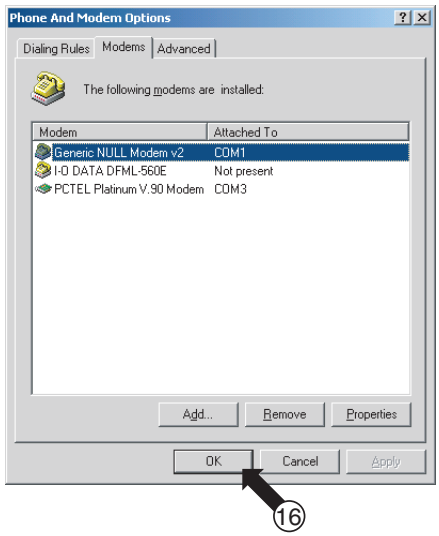
Screen 8. Add/Remove Hardware Wizard



Screen 9. Add/Remove Hardware Wizard



Screen 10. Phone and Modem Options



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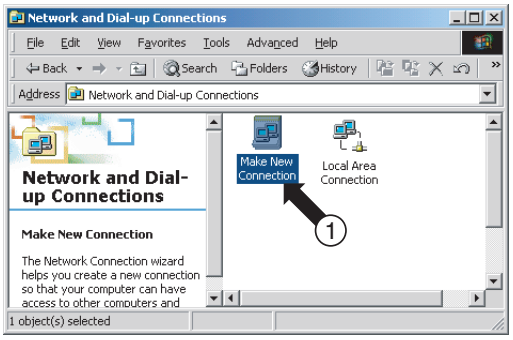
[Set dialup adapter]

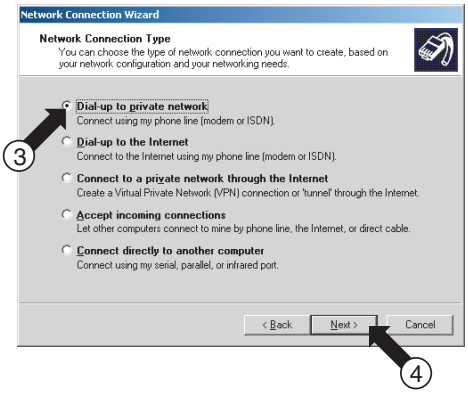
2-1. Startup test operation PC.
2-2. Select -[Settings]-[Control Panel] from the [Start] menu and double click on [Network and Dial-up Connections]. Screen 1 will appear.
2-3. Double click on ① “Make New Connection”. Screen 2 will appear. Click on ② “Next”. Screen 3 will appear.
2-4. Select ③ “Dial-up private network” and click on ④ “Next”. Screen 4 will appear.
2-5. Select ⑤ “Generic NULL Modem v2” and click on ⑥ “Next”. Screen 5 will appear.
* This screen will appear only if multiple modems are installed to the PC.
2-6. Input a random number in ⑦ “Phone number” (ex: 1) and click on ⑧ “Next”. Screen 6 will appear.
2-7. Select ⑨ “For all users” and click on ⑩ “Next”. Screen 7 on the next page will appear.

Screen 1. Network and Dialup Connections

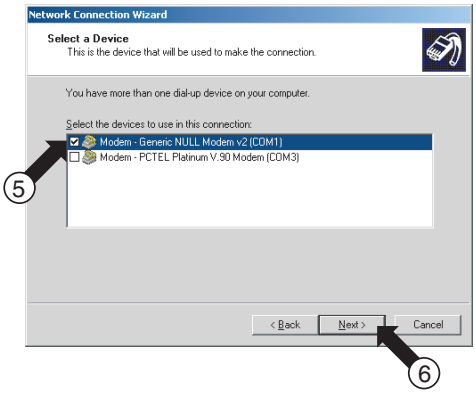


Screen 2. Network Connection Wizard

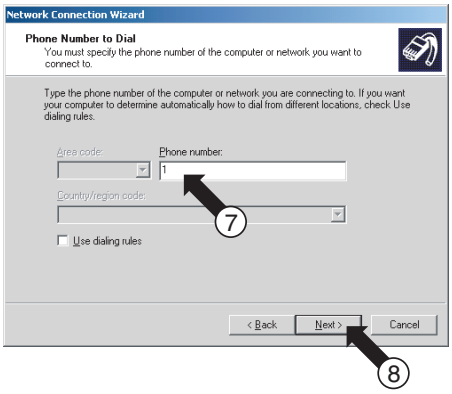
Screen 3. Network Connection Wizard



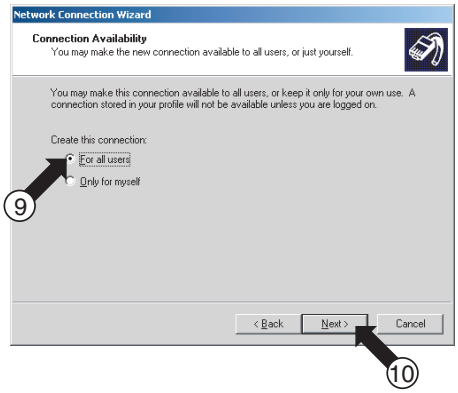
Screen 4. Network Connection Wizard



Screen 5. Network Connection Wizard



Screen 6. Network Connection Wizard



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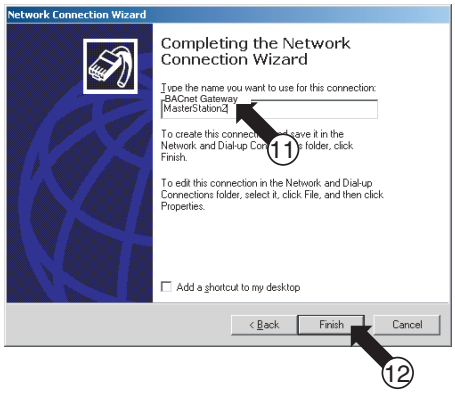
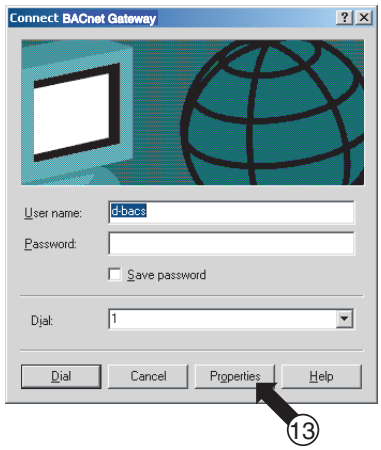
2-8. On screen 8, input “BACnet Gateway” and the connection name in ⑪ and click on ⑫ “Finish”. Screen 9 will appear.
2-9. Click on ⑬ “Properties”. Screen 10 will appear.
2-10. Select ⑭ “Generic NULL Modem v2” and click on ⑮ “Configure”. Screen 11 will appear.
2-11. Select “38400” for the Maximum speed in ⑯ and click on ⑰ “OK”. Screen 10 will return, click on ⑱ “OK”. This completes the dialup adapter setting and completes all prior settings for a connection using an RS232C.

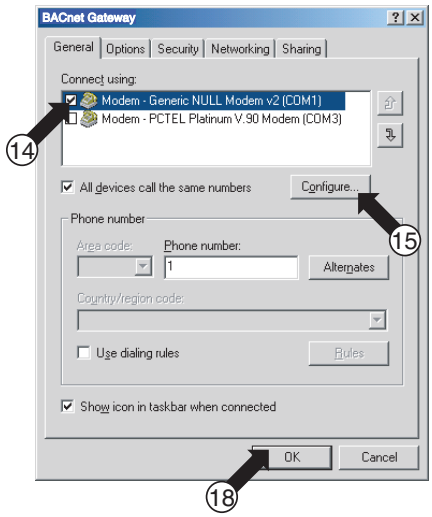
Screen 8. Network and Dialup Connections



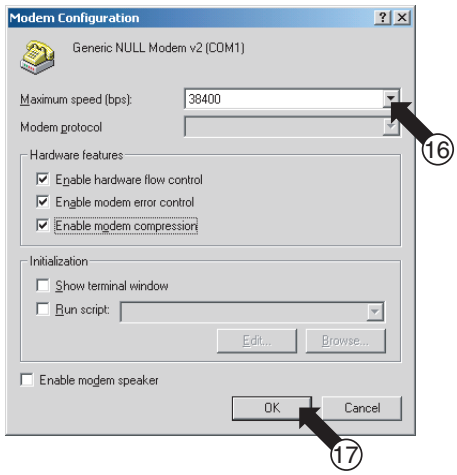
Screen 9. Connect BACnet Gateway



Screen 10. Network Connection Wizard



Screen 11. Network Connection Wizard



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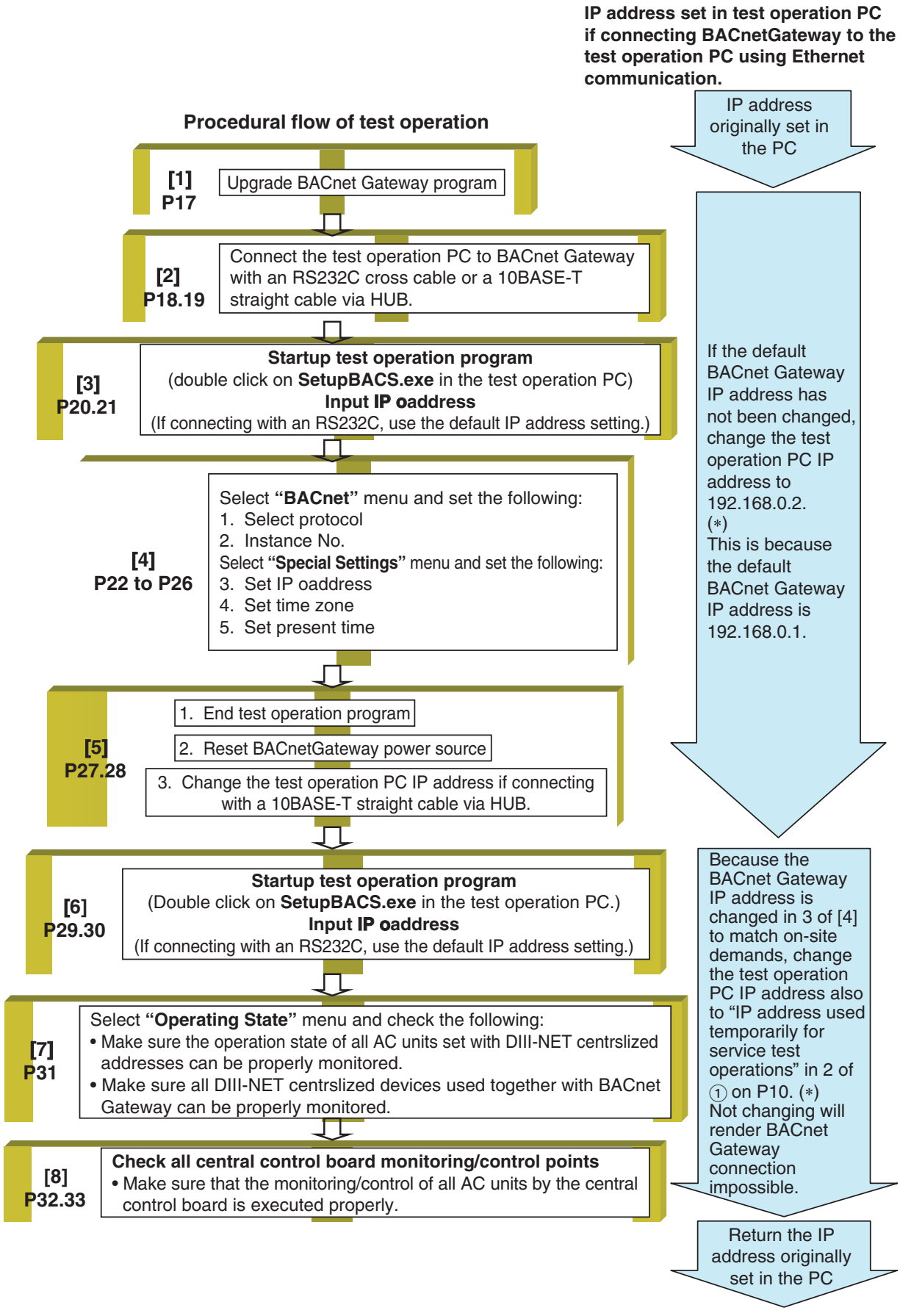
4. Actual Setup Work for BACnet Gateway



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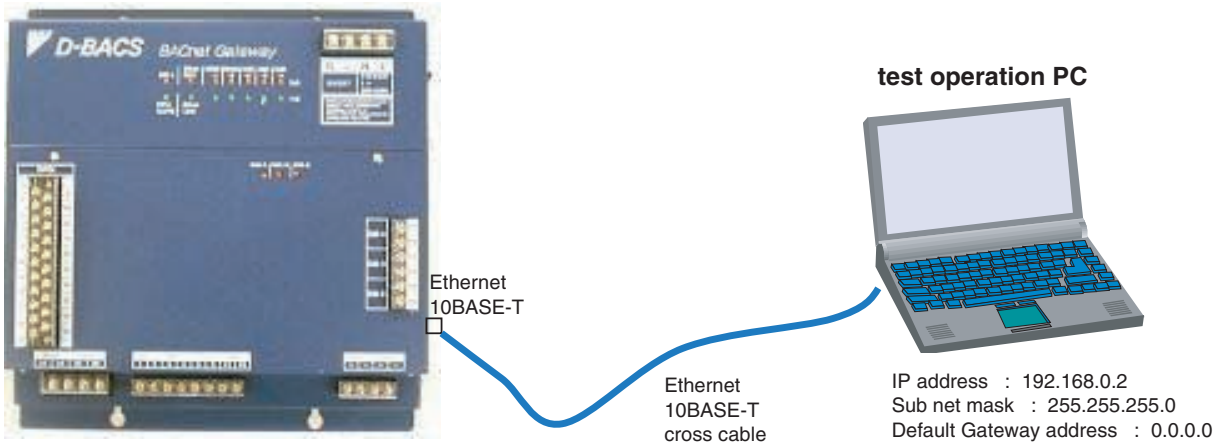
4.1 Upgrade BACnet Gateway Program

[1] **Upgrade BACnet Gateway program**

Make sure to upgrade the BACnet Gateway software to the software downloaded as per the steps on P7 to 9.
Refer to the upgrade procedure manual downloaded as per the steps on P7 to 9 for the actual work procedures.

[test operation PC and BACnet Gateway connection diagram for upgrading the BACnet Gateway software]



*: Default address
IP address : 192.168.0.1
Sub net mask : 255.255.255.0
Default Gateway address : 0.0.0.0

[IP address change method for test operation PC]
As per the steps on P19, change the test operation PC IP address for the address below.

(test operation PC IP address for upgrading BACnet Gateway program)
- **IP address: 192.168.0.2**
- **Sub net mask: 255.255.255.0**
- **Default Gateway address: 0.0.0.0**

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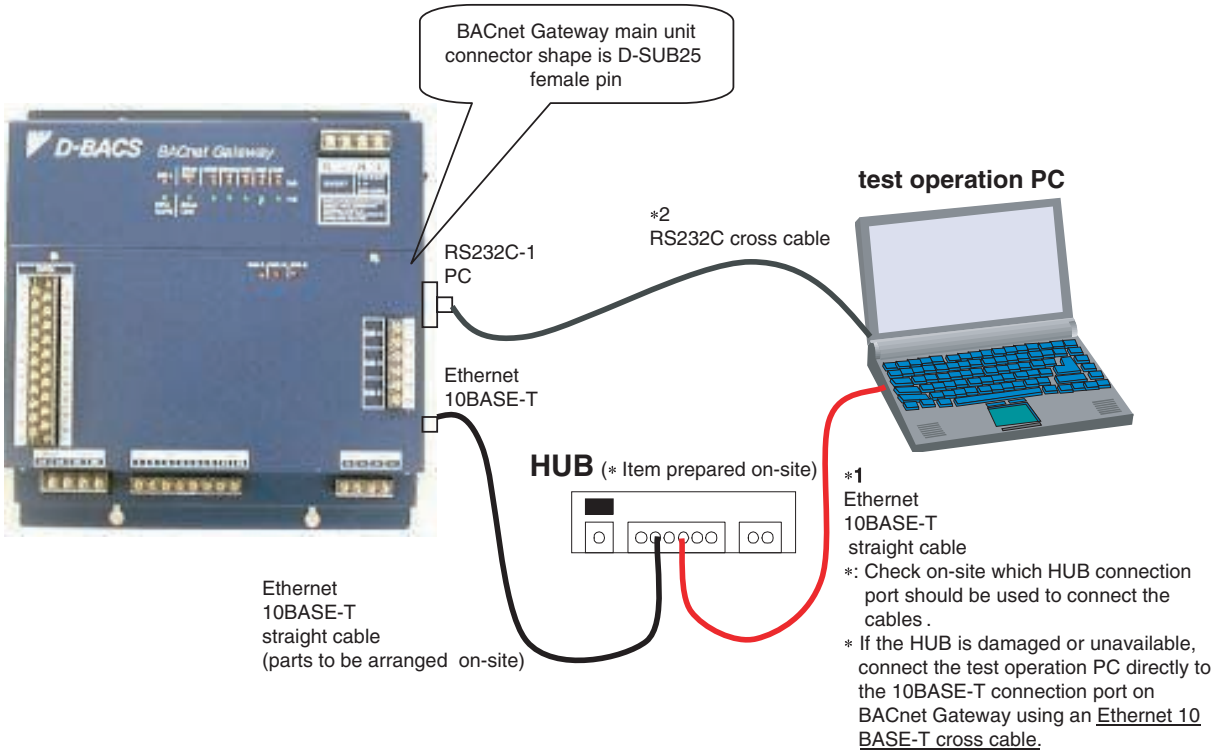
4.2 Connect the Test Operation PC to BACnet Gateway

[2] Connect the test operation PC to BACnet Gateway with an **RS232C cross cable or a 10OBASE-T straight cable via HUB.**

[test operation PC and BACnet Gateway connection diagram]
The figure below describes 2 test operation PC connection methods. Either one can be used.



(Below are 2 test operation PC connection methods. Either one can be used.)

∗1:The following items must be performed if connecting with a 10BASE-T straight cable.

- Prepare a 10BASE-T straight cable (LAN straight cable). (Obtained easily at any electronic goods store.) Having a 10BASE-T cross cable (LAN cross cable) is also recommended should the HUB be damaged or unavailable.

- Make sure there is an open input port on the HUB shown above and have an IP address available that can be used temporarily for a test operation on-site. (Check sales or on-site.)
- Change the test operation PC IP address and return it to its original address after the test operation. (An easy explanation appears on the next page.)
  (Note) If conducting test operations with multiple BACnet Gateway units for identical objects, make sure to either "turn the power supply OFF" or "disconnect the 10BASE-T cable" of the next BACnet Gateway until all settings described in [4] of this manual are complete. (All BACnet Gateway units are set with the same default IP address. Because the address is the same when connecting with a 10BASE-T cable via HUB, the test operation may not proceed well.)

∗: The advantages of using a 10BASE-T straight cable for a test operation as opposed to using an RS232C is the very fast connection speed enabling quick settings.

∗: If the BACnet Gateway IP address was already changed from the test operation PC and the address is unknown, the only option is to use an RS232C cross cable.
(If the BACnet Gateway IP address is found after connecting with an RS232C cable, the connection can be changed to a 10BASE-10 cable.)

∗2:If connecting with an RS232C cross cable, make sure to set the test operation PC as per the steps on P12 to 15.
(Perform [Set modem] and [Set dialup adapter] for the test operation PC in advance.)

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[PC IP address setting method for a BACnet Gateway connection using a 10BASE-T cable]

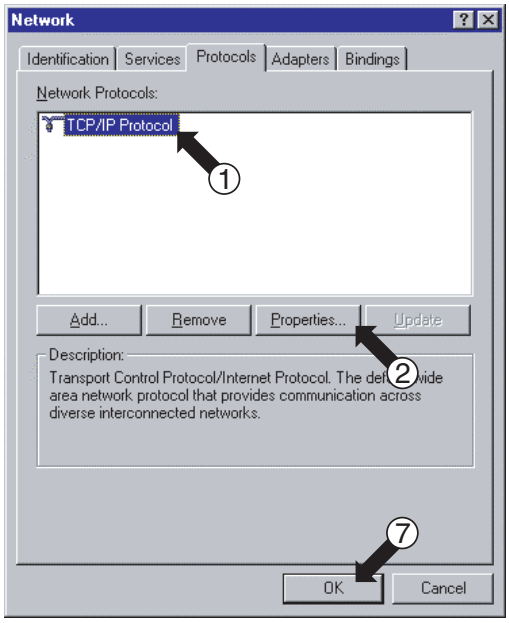
1. Record the present test operation PC IP address
   (Returning the original address is required after the test operation. Make sure to record it.)

1-1. Startup the test operation PC.
   The screens shown in the figure below are for Windows NT. Displays and operations vary depending on the OS.)

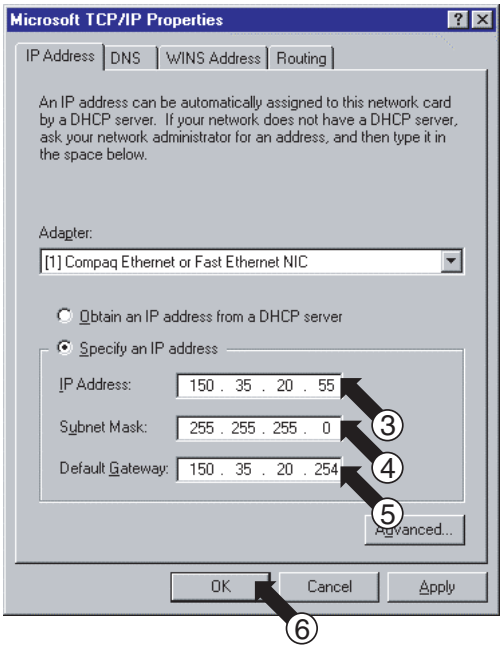
1-2. Click on the network located in the control panel folder. Screen 1 below will appear.

1-3. Next, select ① TCP/IP Protocol and click on ② Properties. Screen 2 will appear.
   On this screen, the present test operation PC settings for ③ IP Address, ④ Subnet Mask, and ⑤ Default Gateway will be displayed. Record these addresses in Table 1.

Screen 1. Network



Screen 2. TCP/IP Properties



[Table 1: Test operation PC IP address prior to change]

③ IP Address		Ex: 150.35.20.55
④ Subnet Mask		Ex: 255.255.255.0
⑤ Default Gateway		Ex: 150.35.20.254

2. Changing the test operation PC IP address

***: The test operation PC IP address changed here can be one of two types depending on the BACnet Gateway conditions. Please verify.**

(1): Set the following addresses if the BACnet Gateway IP address has **not been changed from the default setting.**

- **IP Address: 192.168.0.2**
- **Subnet Mask: 255.255.255.0**
- **Default Gateway: 0.0.0.0**

(2): Set the following address is the BACnet Gateway IP Address has **been changed from the default setting** according to on-site demands.

- Set as per addresses listed in the 2. **IP address temporarily used for service test operations** in ① on P10.

2-1. As the next step to 1-3, input the addresses confirmed in * above in ③ IP Address, ④ Subnet Mask and ⑤ Default Gateway in screen 2. Click on ⑥ OK after inputting. Screen 1 will return. Here, click on ⑦ OK.

2-2. Lastly, reboot the PC as per the screen displays.
(Rebooting the PC may not be necessary depending on the Windows OS. Follow the instructions on the screen.)

3. Return the original PC IP address after the test operation.
(Make sure to return the original test operation PC IP address after completing the test operation.)

3-1. Reset the original test operation PC IP address recorded in 1-3 above as per the operations described in 2-1 and 2-2.

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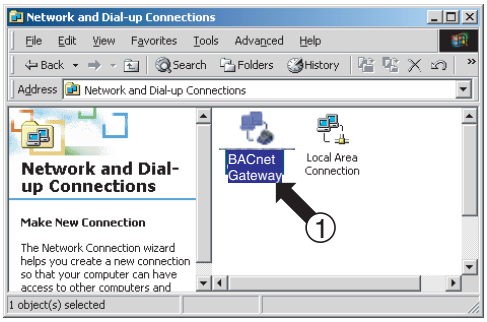
4.3 Startup Test Operation Program

[3] **Startup test operation program**
(Double click on **SetupBACS.exe** in the test operation PC)
Input the IP address
(If connecting with an RS232C, use the default IP address setting)

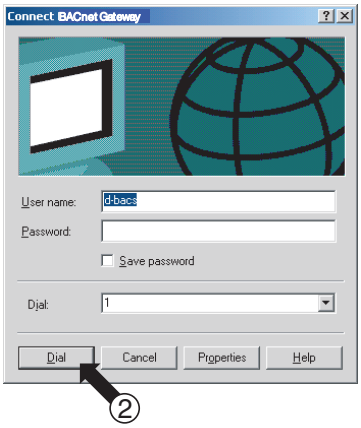
[Procedures for test operation PC connection to BACnet Gateway using an RS232C]

1. Connect the test operation PC to BACnet Gateway with an RS232C cross cable and startup the test operation PC.
2. Select “Settings” - “Control Panel” from the “Start” menu of the test operation PC.
3. Double click on “Network and Dial-up Connections” and screen 1 will appear.
4. Double click on ① “BACnet Gateway” dialup connection and screen 2 will appear.
5. Click on ② “Dial”, to initiate connection to BACnet Gateway.
   * No input is required for user name, password and dial.
6. In a moment, the dialup connection icon will appear as in ③ of screen 3 of the test operation PC. Connection is effectuated.
   *: If no icon appears, check the following:
   1. Is the RS232C communication cable properly connected?
   2. Is the RS232C communication cable a cross cable?
   3. Have the test operation PC modem and dialup adapter been set properly?

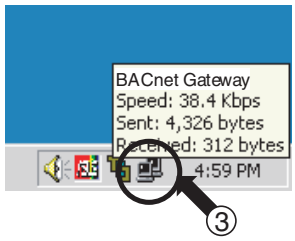
Screen 1. Network and Dial-up Connections



Screen 2. Connect BACnet Gateway



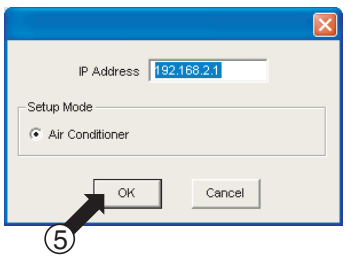
Screen 3. Task Bar Display



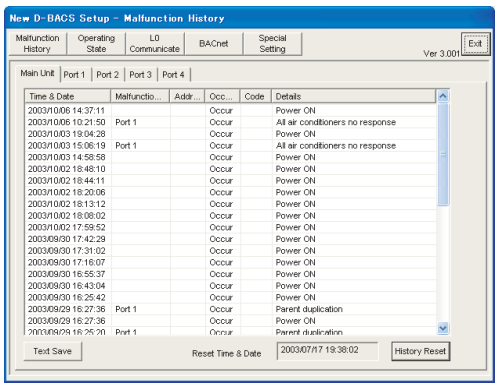
7. Next, double click on ④ “SetupBACS.exe” on screen 4 to startup the test operation program downloaded as per the steps on P7 to 9.
   The screen 5. IP address input screen will appear.
8. Click on ⑤ “OK”. (Do not change the IP address. “192.168.2.1” is OK.)
   Screen 6 will appear. This completes the test operation PC startup.

Screen 4. SetupBACS.exe

Screen 5. IP Address Input Screen



Screen 6. Trouble History



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[3]

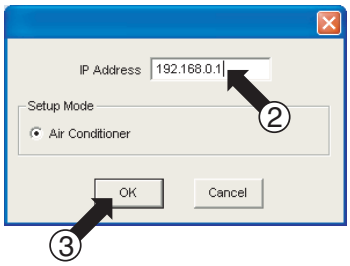
Startup test operation program
(Double click on **SetupBACS.exe** in the test operation PC)
Input the IP address
(If connecting with an RS232C, use the default IP address setting)

[Procedures for connecting the test operation PC to BACnet Gateway using a 1 OBASE-T]

1. Connect the test operation PC to BACnet Gateway using an Ethernet cable and startup the test operation PC.
2. As per screen 1, double click on ① test operation program (SetupBACS.exe) downloaded as per the steps on P7 to 9.
   Screen 2. IP address input screen will appear.
3. Next, input the IP address in ③ as per the following.
   - If the default setting for the BACnet Gateway IP address in the test operation PC has not been changed,
     → input 192.168.0.1
     * In such a case, the test operation PC IP address needs to be changed to 192.168.0.2. (See P19 for changing method.)
   - If the IP address has already been changed from the default setting as per on-site demands,
     → input the IP address as per 1 of ① on P10.
     * In such a case, the test operation PC IP address needs to be changed as per 2 of ① on P10. (See P19 for change method)
4. Click on ④ “OK” and screen 3 will appear.

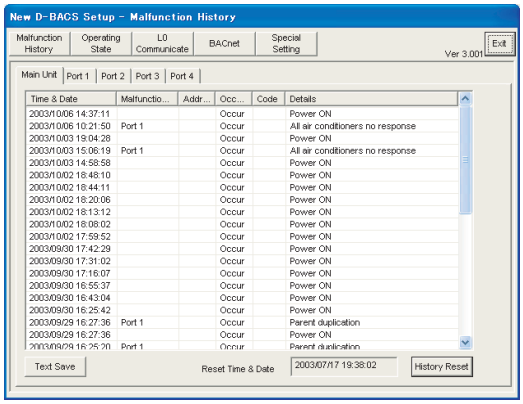
Screen 1. SetupBACS.exe

Screen 2. IP Address Input Screen

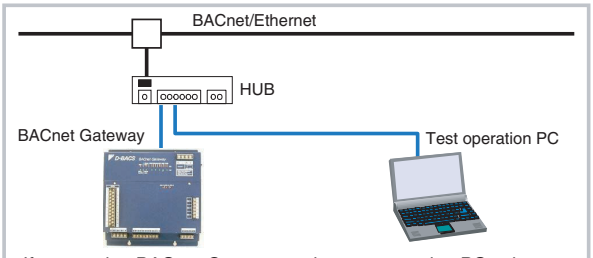


***For the IP address changing method, see P19.**

Screen 3. Trouble History



Reference: BACnet Gateway and test operation PC IP address relationship



If connecting BACnet Gateway to the test operation PC using an Ethernet, the following IP address relationship must be met for proper communication.

Condition	BACnet Gateway IP address	Test operation PC IP address
BACnet default setting	192.168.0.1	192.168.0.2
BACnet IP address changed as per on-site demands	IP address set in 1. BACnet Gateway in ① on P10	IP address temporarily used for 2 service test operation in ① on P10

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4.4 Setting

4.4.1 Select Protocol

[4]

Select **"BACnet"** menu and set the following:
1. Select protocol
2. Instance No.

Select **"Special settings"** menu and set the following:
3. Set IP address
4. Set time zone
5. Set present time

* BACnet communication protocols enabling the BACnet Gateway operation:
  BACnet/IP
  IEEE 802.3

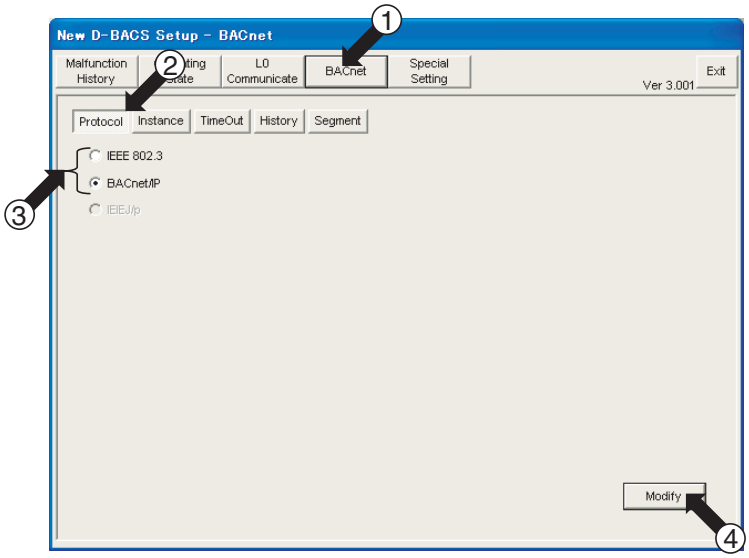
1. Select BACnet protocol

Check the ③ "Communication protocol set in BACnet Gateway" found in Obtain object data on P10 of this test operation manual.
In this item, these communication protocols are set in BACnet Gateway.

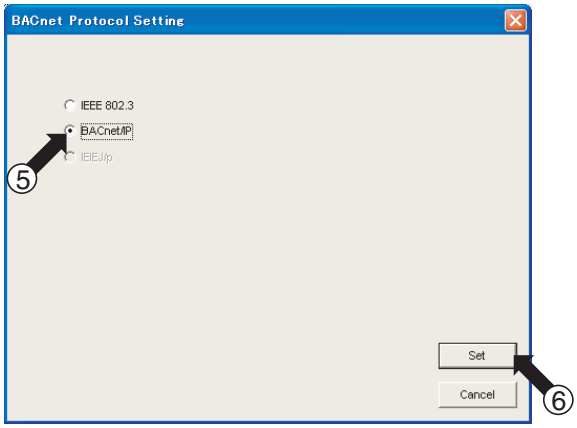
1-1. Click on ① "BACnet".
1-2. Click on ② "Protocol".
1-3. The present BACnet Gateway protocol will appear in ③.
1-4. If the displayed protocol differs from the protocol to be set, click on ④ "Modify".
1-5. Screen 2. BACnet Protocol Setting Screen will appear. Select from ⑤ the protocol to be set and click on ⑥ "Set".
1-6. Screen 3 power supply reset reminder screen will appear. Click on ⑦ "OK".

Reset the power supply after completing all settings.
***: This setting is enabled after resetting the BACnet Gateway power supply.**

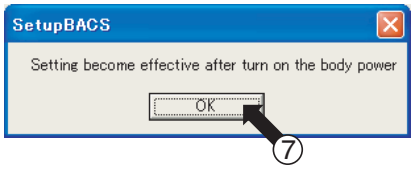
Screen 1. BACnet



Screen 2. BACnet Protocol Setting



Screen 3. Power Supply Reset Reminder



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4.4.2 Instance No.

[4]

Select **"BACnet"** menu and set the following:
1. Select protocol
2. **Instance No.**

Select **"Special settings"** menu and set the following:
3. Set IP address
4. Set time zone
5. Set present time

* The device instance number is mainly decided by the central control board maker during the object meeting. In this item, set that determined number in BACnet Gateway.

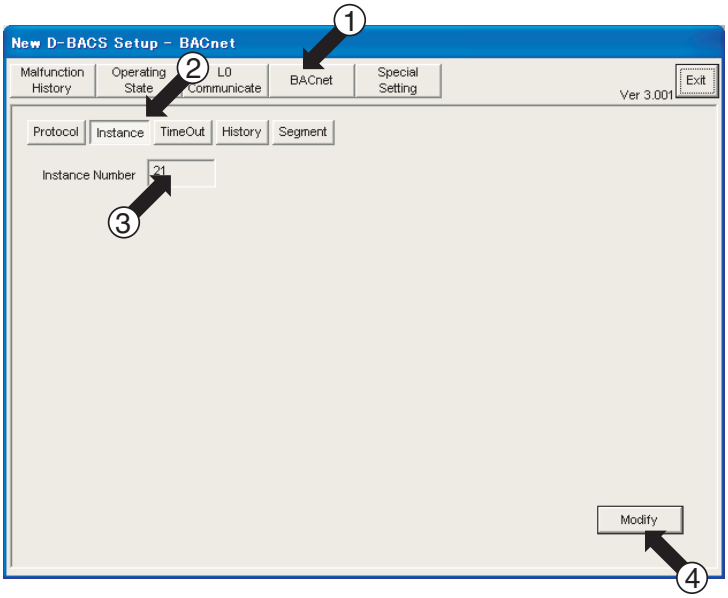
2. Set the BACnet Gateway instance number

Check ② "BACnet Gateway device instance No." found in Obtain object data on P10 of this test operation manual. In this item, set this instance number in the BACnet Gateway.

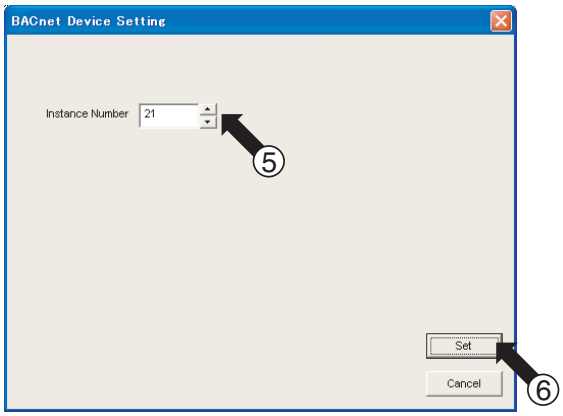
2-1. Click on ① "BACnet".
2-2. Click on ② "Instance".
2-3. The present BACnet Gateway Instance Number will appear in ③.
2-4. If the present BACnet Gateway Instance Number differs from the number to be set, click on ④ "Modify". (If a setting change is not needed, perform the settings on the next page.)
2-5. Screen 2 BACnet Device Setting Screen will appear. Use the ▲▼ buttons to set the desired number. When the number to be set appears, click on ⑥ "Set".
2-6. Screen 3 power supply reset reminder screen will appear. Click on ⑦ "OK".

Reset the power supply after completing all settings.
***: This setting is enabled after resetting the BACnet Gateway power supply.**

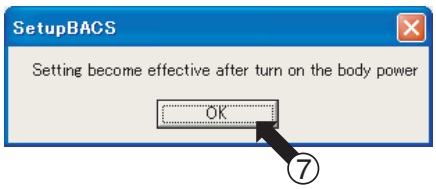
Screen 1. BACnet



Screen 2. BACnet Device Setting



Screen 3. Power Supply Reset Reminder



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4.4.3 Set IP Address

[4]

Select **"BACnet"** menu and set the following:
1. Select protocol
2. Instance No.

Select **"Special settings"** menu and set the following:
3. **Set IP address**
4. Set time zone
5. Set present time

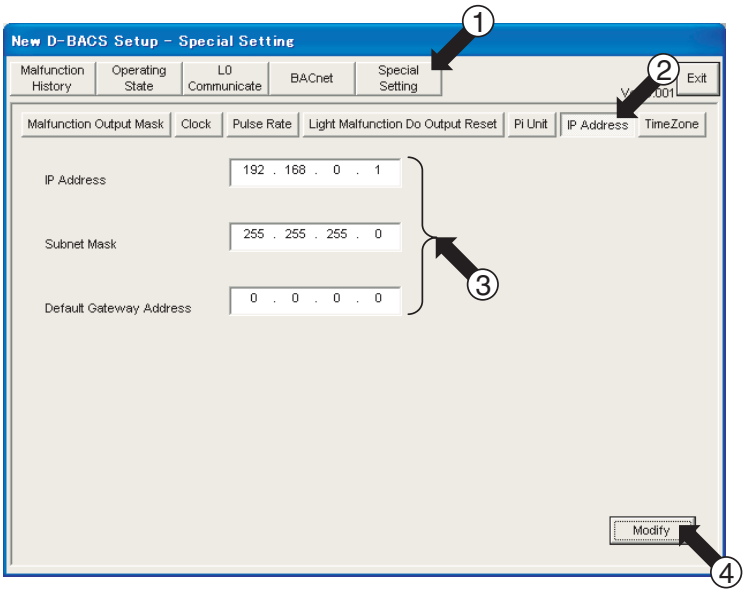
3. Set the BACnet Gateway IP Address, Subnet Mask and Default Gateway Address

Check ① "IP address set in BACnet Gateway" found in Obtain object data on P10 of this test operation manual. In this item, set the information related to this IP address in the BACnet Gateway.

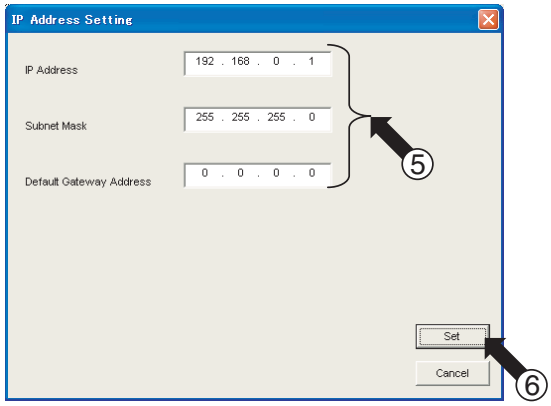
3-1. Click on ① "Special Setting".
3-2. Click on ② "IP Address".
3-3. The present IP Address, Subnet Mask and Default Gateway Address set in BACnet Gateway will appear in ③.
3-4. If the present IP Address, Subnet Mask and Default Gateway Address differ from the values desired, click on ④ "Modify". (If a setting change is not needed, perform the settings on the next page.)
3-5. Screen 2 IP Address Setting screen will appear. Use the PC's keyboard to input the desired settings in ⑤. After inputting the desired settings, click on ⑥ "Set".
3-6. Screen 3 power supply reset reminder screen will appear. Click on ⑦ "OK".

Reset the power supply after completing all settings.
***: This setting is enabled after resetting the BACnet Gateway power supply.**

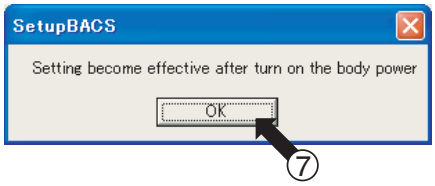
Screen 1. Special Setting



Screen 2. IP Address Setting



Screen 3. Power Supply Reset Reminder



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4.4.4 Set Time Zone

[4]

Select **"BACnet"** menu and set the following:
1. Select protocol
2. Instance No.

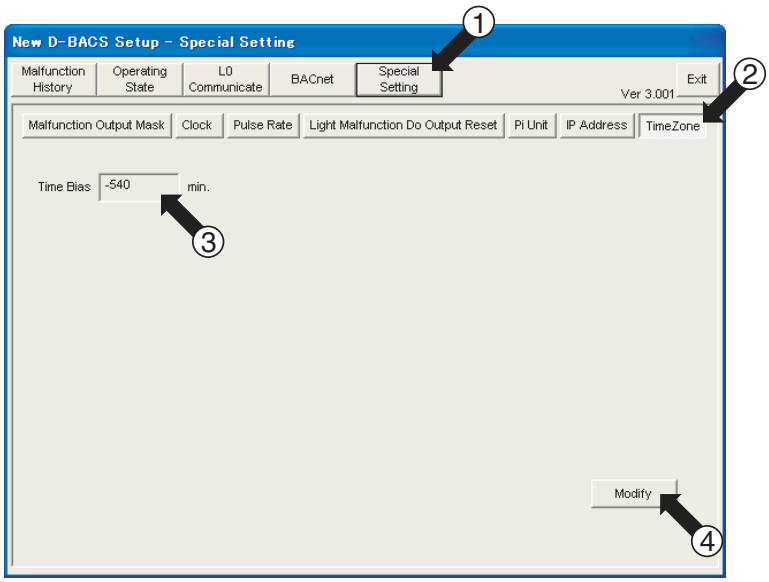
Select **"Special settings"** menu and set the following:
3. Set IP address
4. **Set time zone**
5. Set present time

[What is meant by the time zone]
BACnet Gateway aims to create the common software that cannot be changed depending on what country the BACnet Gateway was purchased.
The concept of time zones has widely penetrated the European market and is utilized even in PCs. Because of this, it is necessary to set the time zone of the country where the BACnet Gateway is used during a test operation.

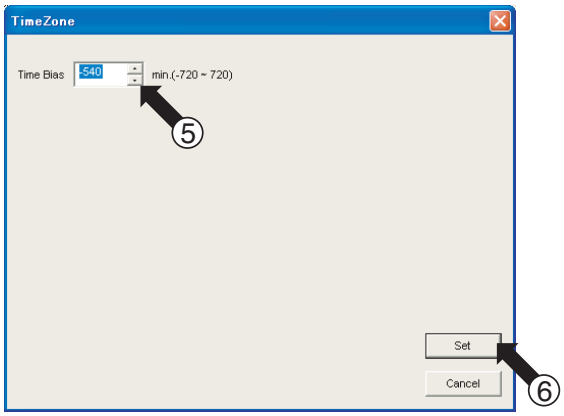
4. Set the BACnet Gateway Time Zone

4-1. Click on ① "Special Setting".
4-2. Click on ② "Time Zone".
4-3. The present Time Bias set in BACnet Gateway will appear in ③.
4-4. If the present Time Bias differs from the value desired, click on ④ "Modify".
(If a setting change is not needed, perform the settings on the next page.)
4-5. Screen 2 Time Zone screen will appear. Use the ▲▼ buttons to find the desired setting.
When the desired setting appears, click on ⑥ "Set".
4-6. Screen 3 power supply reset reminder screen will appear. Click on ⑦ "OK".
Reset the power supply after completing all settings.
***: This setting is enabled after resetting the BACnet Gateway power supply.**

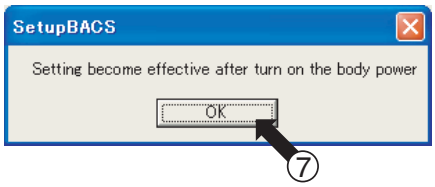
Screen 1. Special Setting



Screen 2. Time Zone



Screen 3. Power Supply Reset Reminder



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4.4.5 Set Present Time

[4]

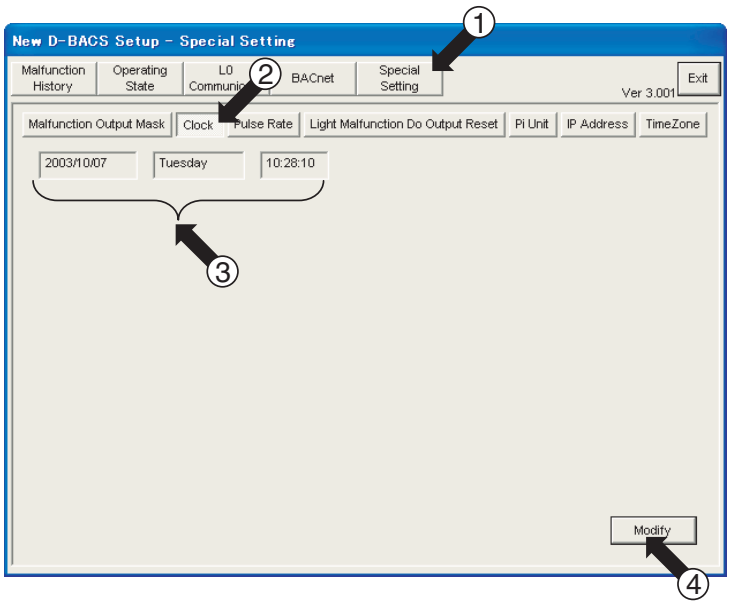
Select **"BACnet"** menu and set the following:
1. Select protocol
2. Instance No.

Select **"Special settings"** menu and set the following:
3. Set IP address
4. Set time zone
5. **Set present time**

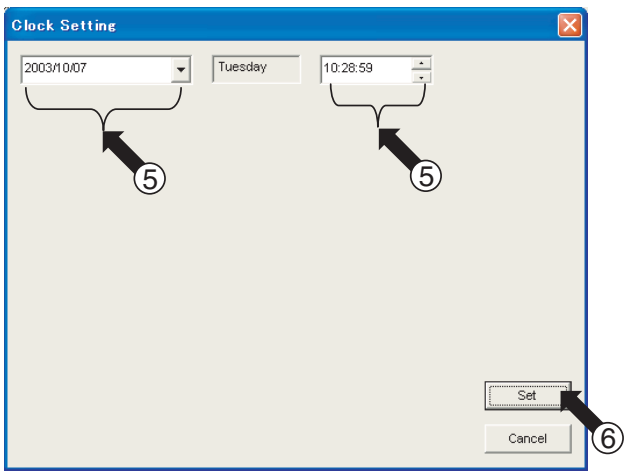
5. Set the present time in BACnet Gateway.

5-1. Click on ① "Special Setting".
5-2. Click on ② "Clock".
5-3. The present time recognized by BACnet Gateway will appear in ③.
5-4. If it differs from the actual present time, click on ④ "Modify".
(If a setting change is not needed, perform the settings on the next page.)
5-5. Screen 2 Clock Setting screen will appear. Set the present time in ⑤.
After setting, click on ⑥ "Set".
*: This time setting may be slightly off (about 10 seconds). This does not pose a problem.

Screen 1. Special Setting



Screen 2. Clock Setting



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4.5 Reset BACnet Gateway Power Supply

[5]

1. End test operation program
2. Reset BACnet Gateway power supply
3. Change the test operation PC IP address if connecting with a **10BASE-T straight cable** via HUB.

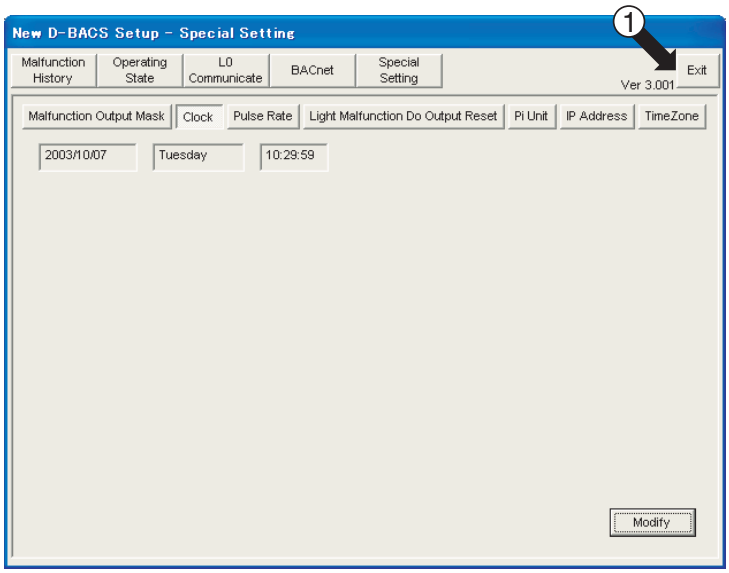
1. End test operation program

1-1. Click on ① "Exit".

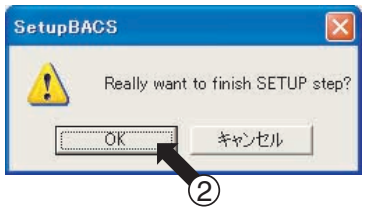
1-2. Screen 2 end confirmation screen will appear. Click on ② "OK" to end program.

1-3. If connecting BACnet Gateway using an RS232C, double click ③ on the task bar of the test operation PC (screen 3) and cut the connection with the test operation PC.

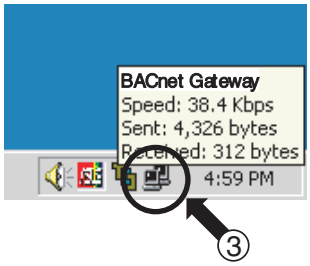
Screen 1. Test operation Program Options Screen



Screen 2. End Confirmation

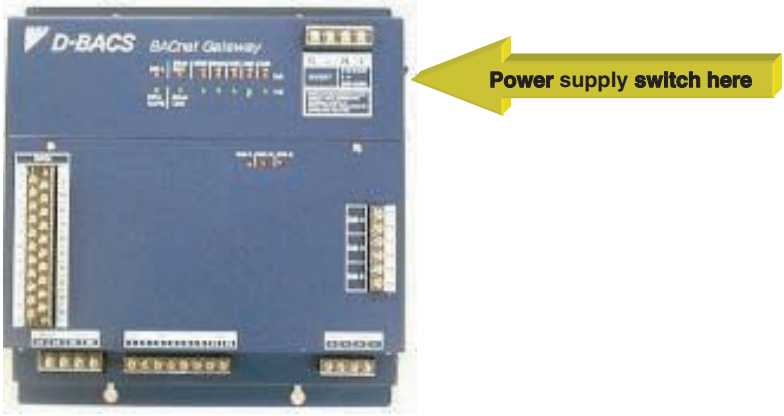


Screen 3. Task Bar Display



2. Reset the BACnet Gateway power supply

2-1. Turn the power supply switch located on the right surface of BACnet Gateway OFF and then ON. (See figure below.)



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[5]

1. End test operation program
2. Reset BACnet Gateway power supply
3. Change the test operation PC IP address if connecting with a 10BASE-T straight cable via HUB.

3. Change the test operation PC IP address if connecting with a 10BASE-T straight cable via HUB.
   *: This item is not necessary if connecting with an RS232C.

(The example screen displays in the figure below are for Windows NT. Displays and operations vary depending on the PC OS.)

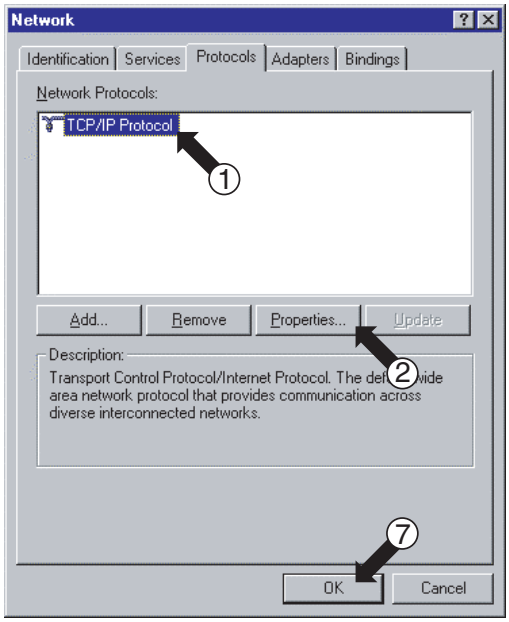
3-1. Click on the network located in the test operation PC's control panel folder. Screen 1 in the figure below will appear.

3-2. Next, select ① TCP/IP Protocol and click on ② Properties. Screen 2 will appear.

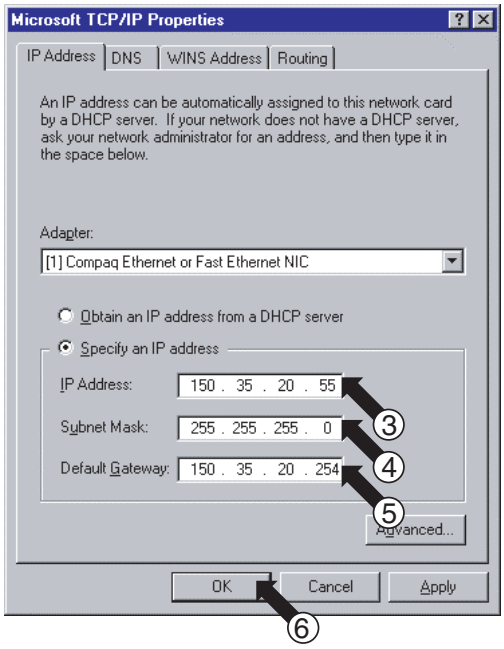
3-3. Input "③ IP Address", "④ Subnet Mask", and "⑤ Default Gateway"as per the address table listed in 2. **IP address temporarily used for service test operations** in ① of P10**.**
After inputting, click on ⑥ "OK".
Screen 1 display returns. Click on ⑦ "OK".

3-4. Lastly, reboot the PC as per the screen display.
(Rebooting the PC may not be necessary depending on the Windows OS.
Follow the instructions on the screen.)

Screen 1. Network



Screen 2. TCP/IP Properties



(Note) **After the test operation, make sure to return the original test operation PC IP address.**
Return the original test operation PC IP address recorded in Table 1 on P16 as per 3-1 to 3-4 above.

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4.6 Reboot Test Operation Program

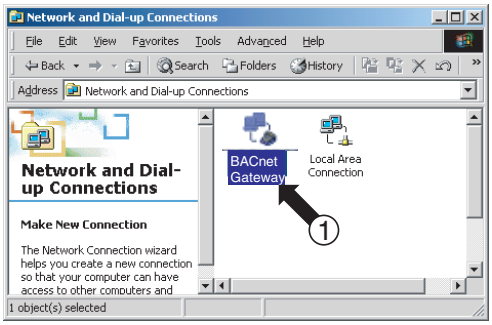
[6]

Startup test operation program
(Double click on **SetupBACS.exe** in the test operation PC)
Input IP address
(If connecting with an RS232C, use the default IP address setting.)

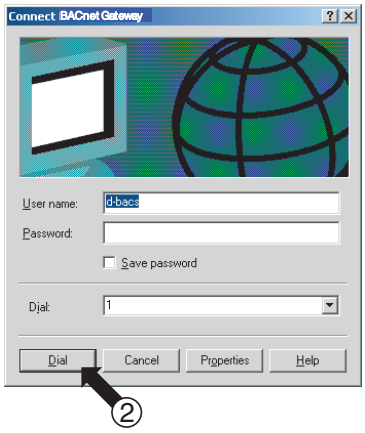
[Procedures for connecting the test operation PC to BACnet Gateway with an RS232C]

1. Connect the test operation PC and BACnet Gateway using an RS232C cross cable and startup the test operation PC.
2. Select “Settings” – “Control Panel” from the “Start” menu of the test operation PC.
3. Double click on “Network and Dial-up Connections”, screen 1 will appear.
4. Double click on ① “BACnet Gateway” dialup connection, screen 2 will appear.
5. Click on ② “Dial” to initiate connection to BACnet Gateway.
   * No input is required for user name, password and dial.
6. In a moment, the dialup connection icon will appear as in ③ of Screen 3 in the test operation PC. Connection is complete.
   *: If the icon does not appear, check the following:
   1. Is the RS232C communication cable connected properly?
   2. Is the RS232C communication cable a cross cable?
   3. Have the test operation PC modem and dialup adapter been set properly?

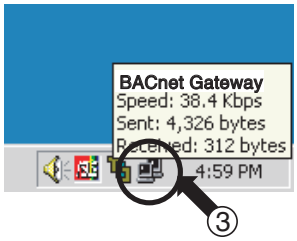
Screen 1. Network and Dial-up Connections



Screen 2. Connect BACnet Gateway



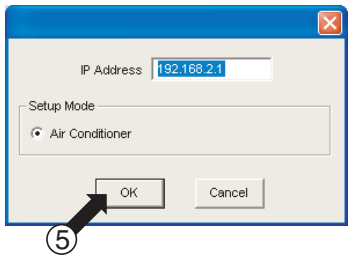
Screen 3. Task Bar Display



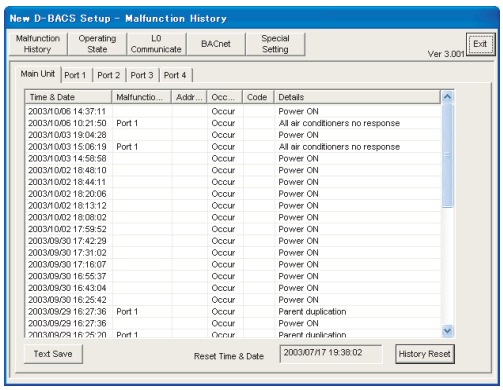
7. Next, double click on ④ “SetupBACS.exe” on Screen 4 to startup the test operation program. Screen 5 IP address input screen will appear.
8. Click on ⑤ “OK”. (Do not change the IP address. “192.168.2.1” is OK.) Screen 6 will appear. This completes test operation PC startup.

Screen 4. SetupBACS.exe

Screen 5. IP Address Input Screen



Screen 6. Trouble History



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[6]

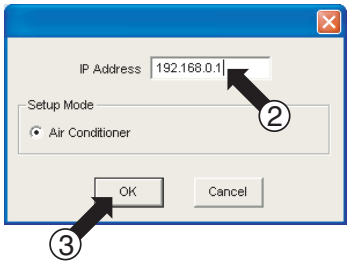
Startup test operation program
(Double click on **SetupBACS.exe** in the test operation PC)
Input IP address
(If connecting with an RS232C, use the default IP address setting.)

[Procedures for connecting the test operation PC to BACnet Gateway with a 10BASE-T]

1. Connect the test operation PC to BACnet Gateway with an Ethernet cable and startup the test operation PC.
2. Double click on ① test operation program (SetupBACS.exe) as in screen 1.
   Screen 2 IP address input screen will appear.
3. Select ② "AC" and input the IP address in ③ as per the following.
   → Input the IP address as per 1 of ① on P10.
   * In this case, the test operation PC IP address needs to be changed as per 2 of ① on P10.
   (See P28 for changing method)
4. Click on ④ "OK" and screen 3 on the bottom of this page will appear.

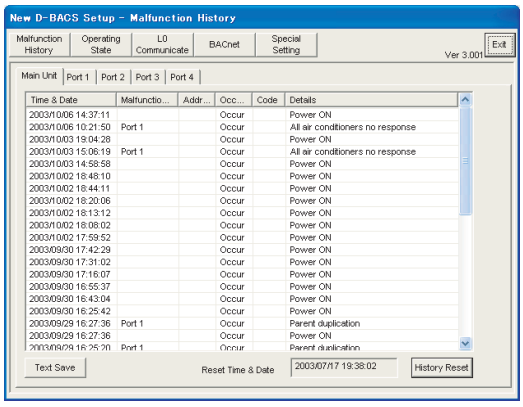
Screen 1. SetupBACS.exe

Screen 2. IP Address Input Screen

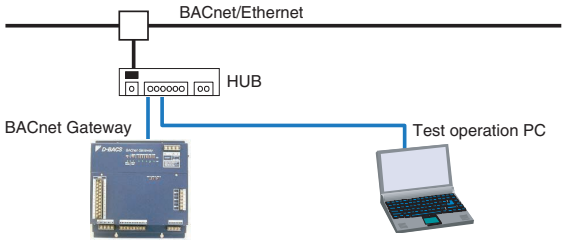


*For the IP address changing method, see P28.

Screen 3. Trouble History



Reference: BACnet Gateway and test operation PC IP address relationship



If connecting BACnet Gateway to the test operation PC using an Ethernet, the following IP address relationship must be met for proper communication.

Condition	BACnet Gateway IP address	Test operation PC IP address
BACnet default setting	192.168.0.1	192.168.0.2
BACnet IP address changed as per on-site demands	IP address set in 1. BACnet Gateway in ① on P10	IP address temporarily used for 2 service test operation in ① on P10

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4.7 AC Units Address, Wiring Check

[7]

Select "Operation State" menu and check the following:
- **Make sure the operation state of all AC units set with DIII-NET centrslized addressed can be properly monitored.**
- **Make sure all DIII-NET centrslized devices used together with BACnet Gateway can be properly monitored.**

Check whether the AC CDIII-NET communication wiring and address setting is correct.

1. Check whether the AC units operation state and other centralized devices connected can be properly monitored.

1-1. Click on ① "Operation State". Select the BACnet Gateway D3-NET communication port to be checked for proper operation at ②. Screen 1 Operation State Screen will appear.

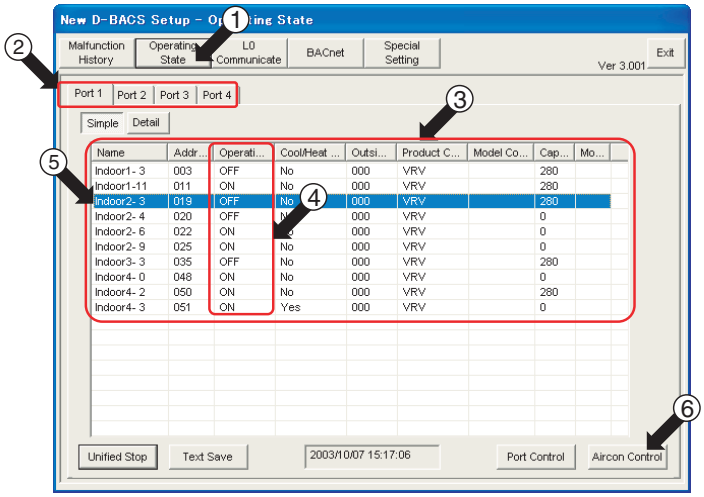
1-2. The state of the AC units and centralized devices connected to the port selected in 1-2 will appear like ③. Check that the other centralized devices connected can be monitored on this screen.

1-3. By switching the AC units ON/OFF, check that the wiring and address setting is correct.
This task is performed with 2 or more people: one person at the test operation PC and the other at the indoor unit to be checked for proper wiring and address setting. Turn each indoor unit ON/OFF to check that proper command and monitoring can be performed. Below are 2 types of checking methods:

1. Switch the indoor units ON/OFF with the remote controller and check whether their state can be properly monitored with the test operation PC.
   - Switch them ON/OFF with the remote controller and check whether the items in ④ of the table below are set.
2. If the remote controller is not connected, switch the indoor units ON/OFF with the test operation PC and check whether the AC units are actually turning ON/OFF by checking the operation of the indoor fans.
   - Select the indoor unit to be turned ON or OFF in ⑤ and click on ⑥ "Aircon Control", screen 2 Air Conditioner Control screen will appear. Next, select ON or OFF in ⑦ and select "No Change" for all items like ⑧.
   Lastly, click on ⑨ "Set". With this operation, check whether the indoor units are actually turning ON or OFF.

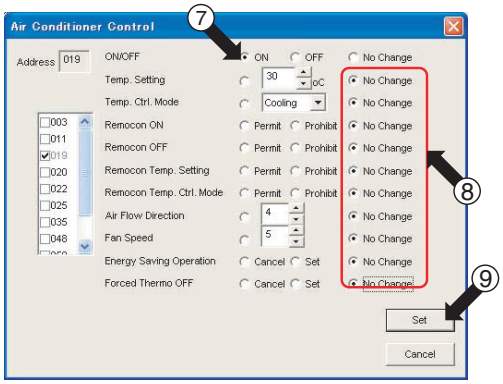
1-4. Check all AC units by repeating the steps in 1-1 to 1-3.

Screen 1. Operation State



If the units do not turn ON/OFF as per the set addresses, reset the addresses for those indoor units.

Screen 2. Air Conditioner Control



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4.8 Check All Central Control Board Monitoring/Control Points

[8] Check all central control board monitoring/control points
• Make sure that the monitoring/control of all AC units by the central control board is executed properly.

Check whether all AC units are operating as per the commands from the central control board.

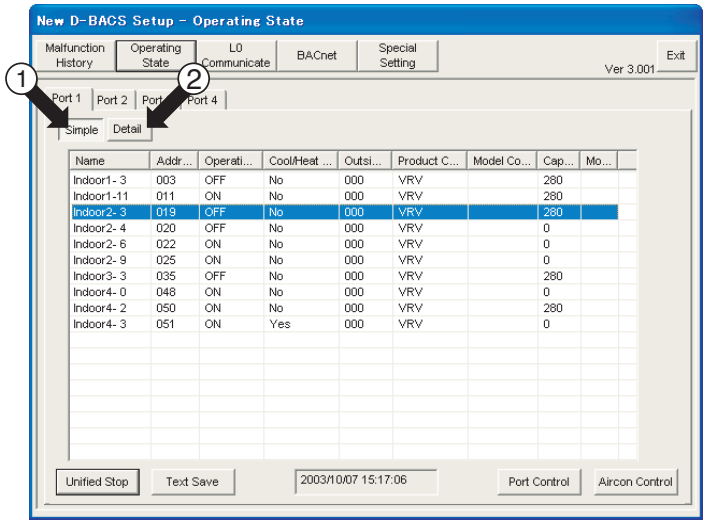
1. Check whether control commands from the central control board are executed properly.

1-1. Check the items that is set to “Yes” as per the instructions of the central control board maker in ⑤ Activation of central control board monitoring/control (Yes/No) in Obtain object data on P11. At this time, leave a record of what was checked. (This will be a reference material should a trouble occur after delivery.)

- Use any of the following methods to check whether the AC units are operating as per central control board.
  1. Check with the BACnet Gateway test operation PC (see below for operation method)
  2. Check with the AC remote controller
  3. Check using the other centralized devices (such as centralized controller)
     (If using in combination with other centralized devices)

Below are AC operation state checking methods using the BACnet Gateway test operation PC.
Perform the operation on the previous page for how to transfer to the AC operation state screen.
Click on either ① “Simple” or ② “Detail” to switch display types.
The following items can be displayed on each of the screens.

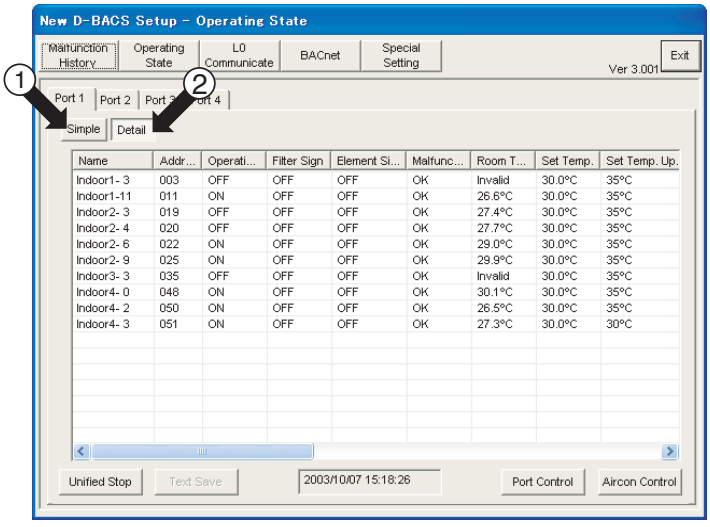
Screen 1. Simple



[Simple screen display items]
The following items are displayed for each indoor unit.
- ON/OFF
- Cool/heat options
- Outdoor unit system addresses
- Product codes (VRV/other)
- Model code*
- Capacity*
- Type*

Note: Items marked with * may not appear depending on the type of AC.

Screen 2. Detail



[Detailed screen display item]
The following items are displayed for each indoor unit.
- ON/OFF
- Filter sign
- Element sign
- Error codes (in case of an AC error)
- Room temperature (intake temperature)
- Set temperature
- Set temperature upper limit
- Set temperature lower limit
- Adjustable set temperature degree unit
- Thermostep
- Auto temperature controller
- Operation mode (temperature control mode)
- Remote controller ON Authorize/Prohibit
- Remote controller OFF Authorize/Prohibit
- Remote controller set temperature change Authorize/Prohibit
- Remote controller temperature control switch Authorize/Prohibit
- Airflow direction
- Airflow amount
- Remote controller Main/Sub
- Forced thermostat OFF
- Energy saving mode

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[8] Check all central control board monitoring/control points
• Make sure that the monitoring/control of all AC units by the central control board is executed properly.

Check whether AC operating state can be properly monitored from the central control board.

1. Check whether the AC operating state is being monitored properly from the central control board.

1-1. Check the items that is set to “Yes” as per the instructions of the central control board maker in ⑤ Activation of central control board monitoring/control (Yes/No) in Obtain object data on P11. At this time, leave a record of what was checked. (This will be a reference material should a trouble occur after delivery.)

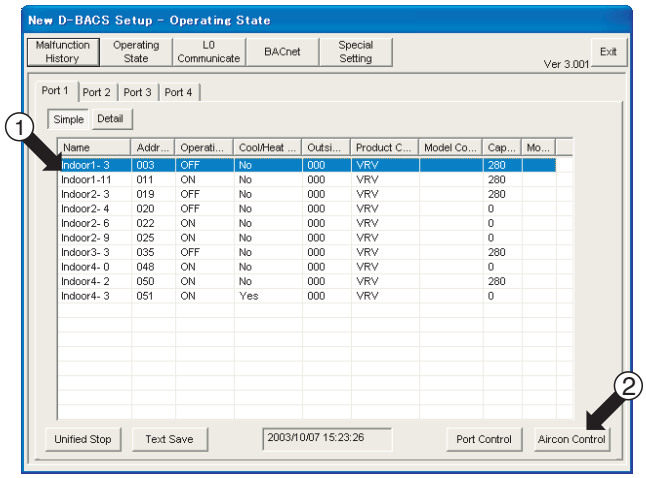
- Changing the AC operation state is necessary to perform this check. Change as per one of the methods below.
  1. Change using the BACnet Gateway test operation PC (see below for operating method)
  2. Change using the AC remote controller
  3. Change using other centralized devices (such as centralized controller) (if using in combination with other centralized devices)
  4. Because an error must be made by the AC in order to check errors, remove the outdoor unit sensor.
     *: Make sure not to forget to cancel the error. A check cannot be made for the filter sign or element sign.

Below are AC setting change methods using the BACnet Gateway test operation PC.

1-1-1. Select the indoor unit whose settings are to be changed in ① and click on ② “Aircon Control”.
Screen 2 “Air Conditioner Control ” will appear.

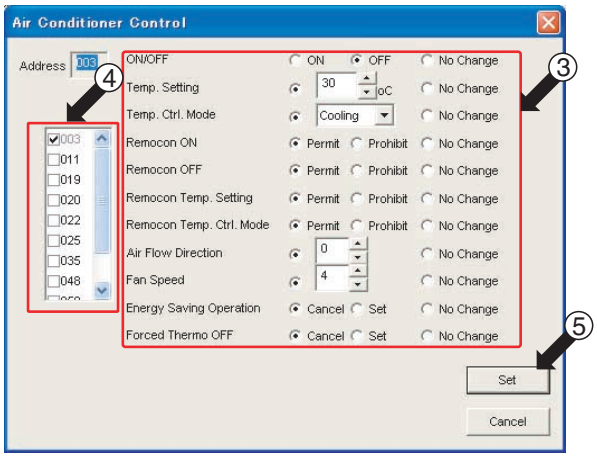
1-1-2. Select the item to be changed from the item list in ③ and click on ⑤ “Set”.
(Select “No Change” for any items not to be changed when selecting items to be set in ③.)
If wanting to change the same settings for multiple AC units simultaneously, place a check mark for all the AC units targeted for a setting change in ④. Items changeable from the test operation PC are shown on the bottom right.

Screen 1. Operating State



[Items changeable from the test operation PC]
- ON/OFF
- Temperature setting
- Temperature control mode
- Remote controller ON Authorized/Prohibited
- Remote controller OFF Authorized/Prohibited
- Remote controller temperature setting Authorized/Prohibited
- Remote controller temperature control setting Authorized/Prohibited
- Airflow direction
- Airflow amount
- Energy saving mode
- Forced thermostat OFF

Screen 2. Air Conditioner Control



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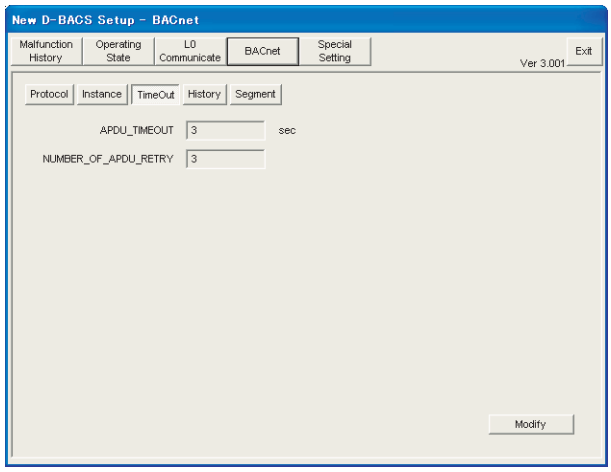
5. Reference: Items that Do not Require Changing from the Default Settings

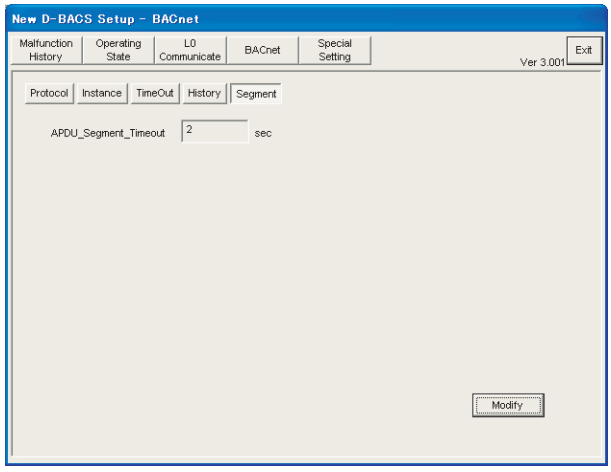
Of the items appearing on the test operation PC screen, the following basically do not require setting but are described below.

Time Out Setting Screen



[How to make the screen appear]
BACnet → Time Out
[Default settings]
• APDU_TIMEOUT: 3 Sec
• NUMBER_OF_APDU_RETRY: 3
[What is Time Out]
APDU_TIMEOUT refers to the time elapsed between the demand message transmission from BACnet Gateway to other BACnet devices and the reception of the answer message.
(Setting range: 1 to 120 seconds)
NUMBER_OF_APDU_RETRY refers to the number of times the demand **message** is **resent** after the time out.
(Setting range: 0 to 7 times)
*If the response time of the communication devices is slow, increasing the setting may be necessary. However, this setting is difficult to determine, change the setting only if the APDU_TIMEOUT / NUMBER_OF_APDU_RETRY is indicated by the maker.

Segment Setting Screen



[How to make the screen appear]
BACnet → segment
[Default settings]
• Segment time out time: 2 seconds
[What is segment]
BACnet Gateway supports the BACnet segmentation function which serves to separate messages exceeding 1 packet in length in multiple messages and transmit/receive them.
Segment time out time refers to the time it takes during the segmentation process for the other communication devices to answer.
(Setting range: 1 to 10 seconds.)
*Within the objects required for the segmentation function, depending on the reason for a slow response speed from the other communication BACnet devices, change the setting only if the segment time out time is specified by the other device's maker during the advance object meeting.

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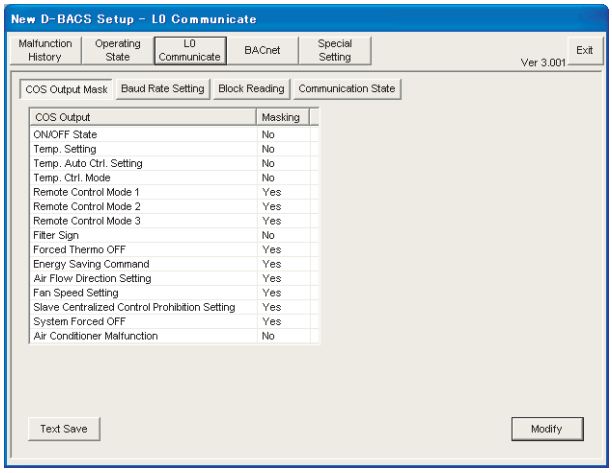
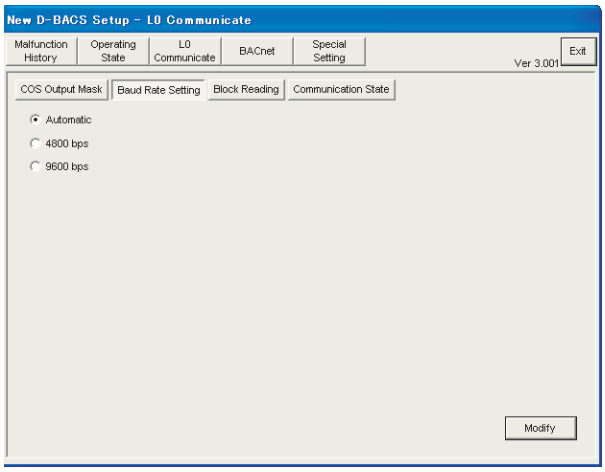
Of the items appearing on the test operation PC screen, the following basically do not require setting but are described below.

L0 Communication COS Output Mask Screen



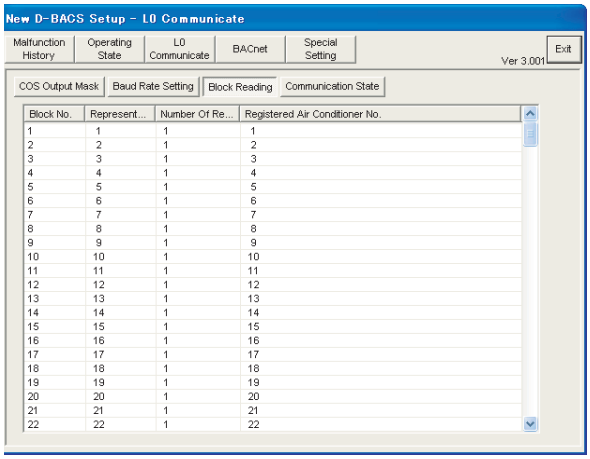
[How to make the screen appear]
L0 Communicate → COS Output Mask
[Default settings]
The items on the left screen are default settings.
[What is L0 communication COS output mask]
Setting if connected to the central control board using RS232C communication, not BACnet communication.
In case of variations in the AC operation state, the settings for each item can be changed to automatically “Notify” or “Not notify” the central control board accordingly.

L0 Communication Baud Rate Setting Screen



[How to make the screen appear]
L0 Communicate → Baud Rate Setting
[Default settings]
• Automatic
[What is L0 communication baud rate setting]
Setting if connected to the central control board using RS232C communication, not BACnet communication.
This screen sets the communication speed between the central control board and BACnet Gateway.
The default setting “auto” refers to the automatic communication speed determination by BACnet Gateway.
However, if considering communication reliability, a setting of either 4800 bps or 9600 bps rather than automatic enhances reliability.

L0 Communication Block Reading Screen



[How to make the screen appear]
L0 Communicate → Block Reading
[Default settings]
This is not a setting item but a monitor item.
[What is L0 communication block reading]
Make a check if the object not using BACnet communication but RS232C communication with the central control board has a problem.
If connected to the central control board with an RS232C, when the central control board monitors/ controls AC units, it operates in block units and not in address D3-NET units.
A maximum of 16 groups can be registered in 1 block (16 D3-NET addresses) and these registrations are communicated to BACnet Gateway by the central control board. If registration is not executed from the central control board, 1 block=1 group.

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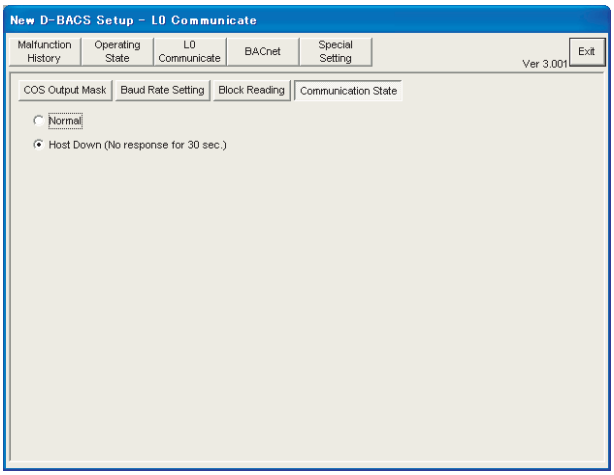
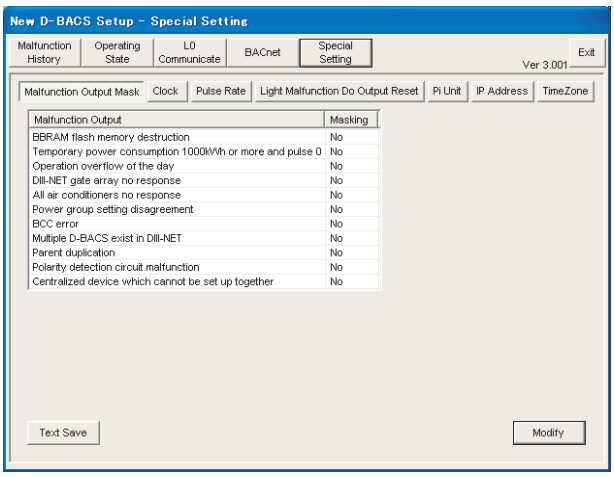
Of the items appearing on the test operation PC screen, the following basically do not require setting but are described below.

L0 Communication State Screen



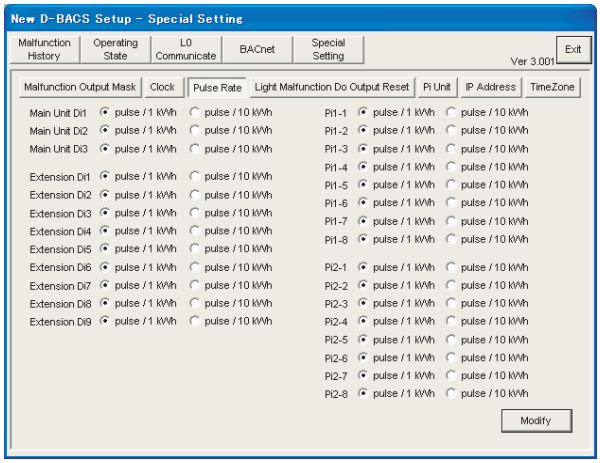
[How to make the screen appear]
L0 Communicate → Communication State
[Default setting]
This is not a setting item but a monitor item.
[What is L0 communication state]
Make a check if the object not using BACnet communication but RS232C communication with the central control board has a problem.
Displays “Normal” when the communication between BACnet Gateway and the central control board is functioning properly.
If communication fails for 30 seconds or more, “Host down” will be displayed.
When “Host down” is displayed, check the connection of the RS232C communication line and the baud rate setting.

Error Output Mask Screen



[How to make the screen appear]
Special Setting → Malfunction Output Mask
[Default settings]
The items on the left screen are default settings.
[What is error output mask]
The BACnet Gateway has a function of self-error detection that turns ON the relay output (Do-1) of the master station II.
The items on the left are errors each of which may be masked not to turn Do-1 ON even if they occur.
This screen serves to change the mask setting.
The setting is changed in the event of an object inherent error.

Pulse Rate Screen



[How to make the screen appear]
Special Setting → Pulse Rate
[Default settings]
The items on the left screen are default settings.
[What is pulse rate]
The BACnet Gateway (MASTER STATION II) version made for Japan enables power proportioning of the AC by purchasing power proportioning software (sold separately) and conducting a power proportioning test operation.
This screen serves to change the pulse rate of the watt-hour meter connected to each power pulse input terminal on BACnet Gateway.
*: Main unit Di: Power pulse input in BACnet Gateway main unit
Extension Di: Option Di Board input 1 to 9 power pulse input
Pi: Power pulse input into Pi unit to increase the power pulse count to be connected to the option DIII board port 4.
See below for a correlation between the Pi unit address and screen displays.
(Pi1-1 = Pi unit address 4-00, Pi1-8 = Pi unit address 4-07, Pi2-1= Pi unit address 4-08, Pi2-8 = Pi unit address 4-15)

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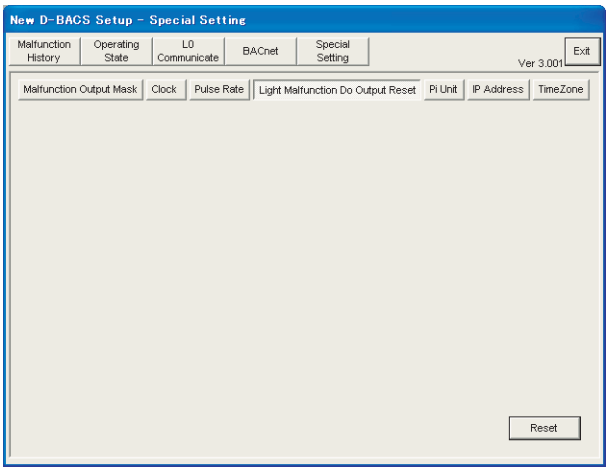
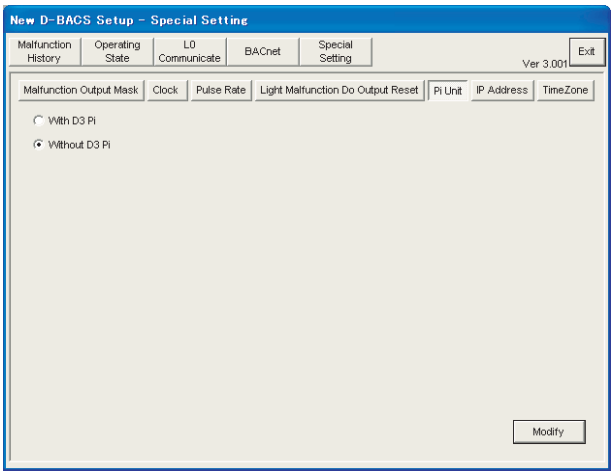
Of the items appearing on the test operation PC screen, the following basically do not require setting but are described below.

Nonfatal malfunction Do Output Reset Screen



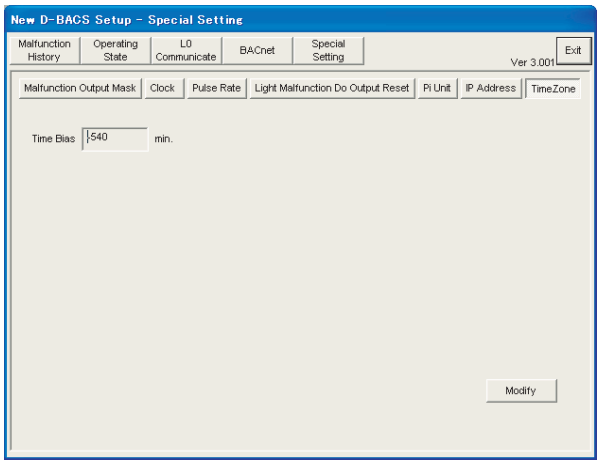
[How to make the screen appear]
Special Setting → Light Malfunction Do Output Reset
[Default settings]
Only for reset function, no default settings.
[What is nonfatal malfunction Do output reset]
The BACnet Gateway has a function of self-error detection that turns ON the relay output (Do-1) of the master station II. (See other pages as well for details)
This error has a serious effect on the system. Once Do-1 is turned ON, it will be kept ON hold. The non-fatal malfunction Do output reset is used to turn OFF this error output.
(Another way to reset the above is to turn the BACnet Gateway power supply so that the output will be turned OFF.)

Pi Unit Screen



[How to make the screen appear]
Special Setting → Pi Unit
[Default settings]
• Without D3 Pi
[What is Pi unit]
The BACnet Gateway (MASTER STATION II) version made for Japan enables power proportioning of the AC by purchasing power proportioning software (sold separately) and conducting a power proportioning test operation.
Make settings for this screen to use or not the Pi unit (DEC103A1). The Pi unit is used if the pulse input from the watt-hour meter connected to BACnet Gateway is insufficient.
[When using the Pi unit]
Pi unit outline: 1 unit accepts a maximum of 8 power pulses
Connection wiring: connected to BACnet Gateway Option DIII Board port 4 F1, F2 terminals (See the Pi unit installation manual for details.)
Address: The address set in the Pi unit has a range of 4-00 to 4-15.
Note: If using the Pi unit, the AC units connected to the BACnet Gateway DIII port 4 are set between 1-00 and 3-15, maximum of 48 groups.

Language Screen



[How to make the screen appear]
Special Setting → Malfunction Output Mask
[Default settings]
• Japanese
[What is language settings]
The BACnet Gateway test operation program has specifications common to Master Station II derived models. Some of these derived models, can monitor AC units through a Web site. (Supporting construction-oriented product)
This WebBACnet Gateway makes it possible to switch displayed characters “Japanese” or “English”.
This screen serves to switch the language.

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6. Q & A

<table>
<tr><th>Question</th><th>Answer</th></tr>
<tr><td>Absolutely AC unit operation / monitoring not possible from the central control board. What is the cause?</td><td>1. Is the BACnet Gateway power supply ON?
2. Is the Ethernet communication line connecting BACnet Gateway to the central control board severed? (See P4)
3. Is the HUB power supply ON?
4. Are the IP address, Subnet Mask and default Gateway address settings correct? (See P24)
5. Is the BACnet Gateway instance No. correct? (See P23)
6. Are the AC unit centralized address settings correct? (See P31)
7. Is the AC unit “point list” distributed to the central control board maker without error? (If not distributed, contact the sales engineer for that object.)
*:If connected to the central control board via BACnet connection, communication is performed as per the above mentioned point list.
This point list is created by the sales department for each object and must be submitted to the central control maker.

[Point list extract (Ex)]
<table><tr><th>Project Point Name</th><th>Object ID</th><th>Object Name</th><th>Object Type</th><th>Instance Number</th></tr><tr><td>1F Start/Stop(Setting)</td><td>16777217</td><td>StartStopCommand_000</td><td>4</td><td>1</td></tr><tr><td>1F Start/Stop(Monitaring)</td><td>12582914</td><td>StartStopStatus_000</td><td>3</td><td>2</td></tr><tr><td>1F Trip</td><td>12582915</td><td>Alarm_000</td><td>3</td><td>3</td></tr><tr><td>1F Malfunction Code</td><td>54525956</td><td>MalfunctionCode_000</td><td>13</td><td>4</td></tr><tr><td>1F Temperature Adjust</td><td>8388618</td><td>TempAdjust_000</td><td>2</td><td>10</td></tr><tr><td>1F R/C Mode Setting (Start/Stop)</td><td>20971533</td><td>RemoteControlStart_000</td><td>5</td><td>13</td></tr><tr><td>1F R/C Mode Setting (Air Conditioner Mode)</td><td>20971534</td><td>RemoteControlAirConModeSet_000</td><td>5</td><td>14</td></tr><tr><td>1F R/C Mode Setting(Temperature Adjust)</td><td>20971536</td><td>RemoteControlTempAdjust_000</td><td>5</td><td>16</td></tr><tr><td>1F Communication State</td><td>12582932</td><td>CommunicationStatus_000</td><td>3</td><td>20</td></tr><tr><td>2F Start/Stop(Setting)</td><td>16777473</td><td>StartStopCommand_001</td><td>4</td><td>257</td></tr><tr><td>2F Start/Stop(Monitaring)</td><td>12583170</td><td>StartStopStatus_001</td><td>3</td><td>258</td></tr><tr><td>2F Trip</td><td>12583171</td><td>Alarm_001</td><td>3</td><td>259</td></tr><tr><td>2F Malfunction Code</td><td>54526212</td><td>MalfunctionCode_001</td><td>13</td><td>260</td></tr></table></td></tr>
<tr><td>AC unit operation/monitoring not possible in part from the central control board. What is the cause?</td><td>1. Any point list registration errors for AC operation and monitoring items that cannot be performed by the central control board maker?
→ Check with the central control board maker.
2. Any errors in the operation/monitoring items of the point list submitted by the DAIKIN sales representative for that object?
→ Check with the sales department.
3. Is that AC unit a model equipped with the relevant operation/monitoring function?
→ See the AC unit equipment design guide and D-BACS design guide.</td></tr>
</table>

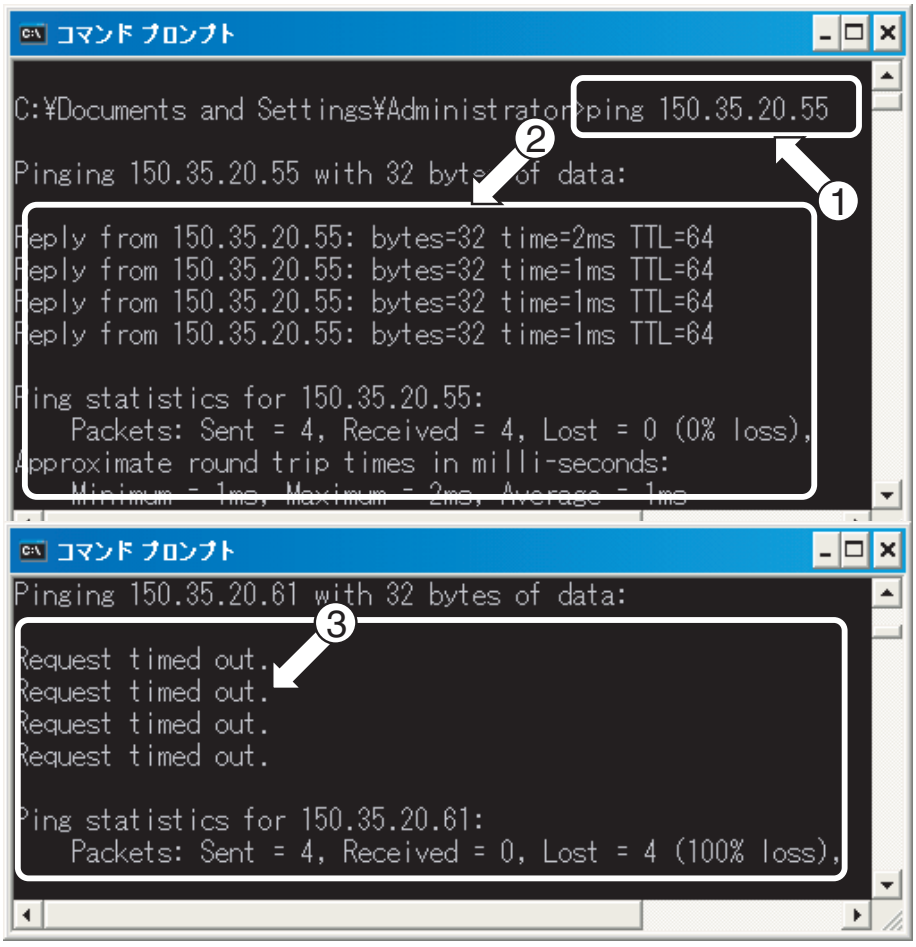
CB00A040A

Question	Answer
The BACnet Gateway cannot be connected properly to the test operation PC. What is the cause?	

1. Causes for connection failure when attempting to connect using an RS232C cross cable
   - Are the dialup and modem settings required for the PC properly set? (See P12 to 15)
   - Are the specifications for the RS232C cable correct? Are you using a cross cable?
   - Is there a malfunction in the PC's RS232C communication section?
2. Causes for connection failure when attempting to connect using an Ethernet communication (LAN communication)
   - Is the IP address set in the PC correct? (See P19 for the set IP addresses to be set and setting method)
   - Is the cable type correct?
     ① For connection via HUB: straight cable
     ② For direct connection of BACnet Gateway to the test operation PC: cross cable
   - Any malfunction in the PC's LAN communication section?
   - If connected via HUB, is the HUB power supply ON?
   - Is the PING transferred from the test operation PC? See below for the execution method.

[PING verification method]

1. Select the "Program" menu (or "Accessory") in the PC's "Start" menu and open "Command Prompt". The screen below will appear.
2. Next, use the PC's keyboard to input the BACnet Gateway IP address in ①.
   Ex: For a BACnet Gateway IP address of 150.35.20.55, input "ping 150.35.20.55" in lower case letters and hit Enter.
3. If a display such as shown in ② below appears, the LAN is connected. Reboot the test operation program and connect. If a display such as ③ appears, connection has failed for some reason. Recheck the PC settings.



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Question	Answer
An additional AC unit was installed after delivery. What should be done?	1. Create and submit a point list for the additional AC unit to the central control board maker (Sales engineer's job) 2. Check the on-site AC unit address setting along with the connection of the AC unit from the test operation PC of BACnet Gateway. (See P31 for details) 3. Check the connection of the additional AC unit to the central control board. (See P32 and 33 for details)
An AC unit was disconnected and moved after delivery. What should be done?	1. Contact the central control board maker for the AC unit removed from the point list. (The sales department's job) 2. Reset the BACnet Gateway power supply

CB00A040A

Question	Answer
A customer reported that an AC unit came to a stop automatically. What is the cause?	1. Was the AC unit turned OFF with the remote controller? 2. Was the AC unit turned OFF through a centralized device used in combination? 3. Was the AC unit turned OFF through the central control board? 4. Was there a failure in power supply to the AC unit? → In the event of a power failure in the AC unit, unless the power recovery reboot settings are effectuated from the indoor unit's remote controller in on-site setting mode, the unit will restart in OFF mode after power recovery.
A customer reported that an AC unit started operating automatically. What is the cause?	1. Was the AC unit turned ON with the remote control? 2. Was the AC unit turned ON through a centralized device used in combination? 3. Was the AC unit turned ON through the central control board?
The operation of an AC unit through the central control board was reportedly impossible. What is the cause?	1. Was the communication line between the central control board and BACnet Gateway properly connected? 2. Was there a malfunction in the central control board? 3. The BACnet Gateway Option Di Board (DAM412A1) has a forced stop contact input. Was this interface turned ON? 4. Was the communication between the inoperable AC unit and BACnet Gateway proper? (Is there a communication error?)

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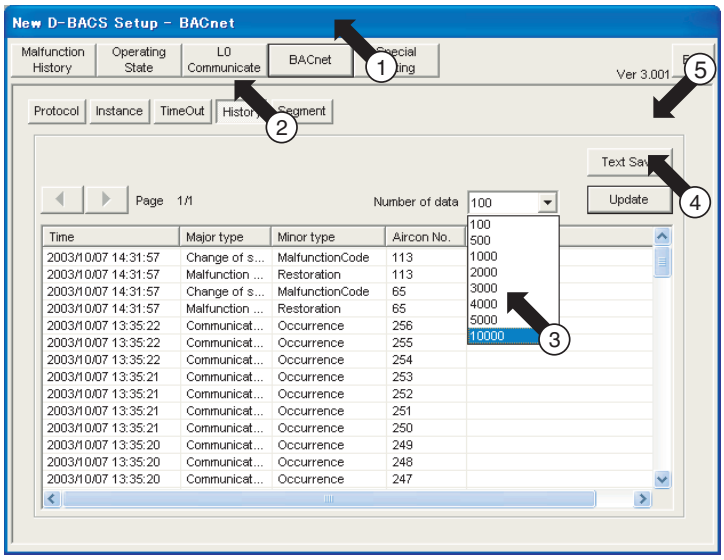
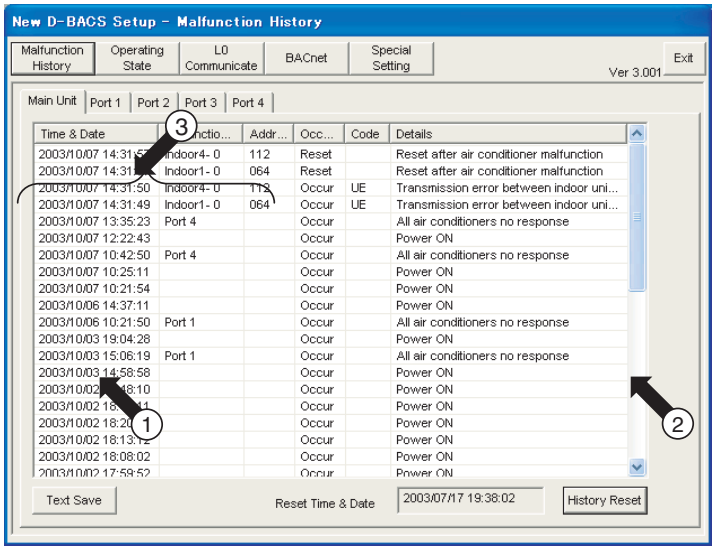
Question	Answer
BACnet communication was reportedly unsuccessful. What should be checked?	1. Obtain as much detailed information as possible about the product claim. • What phenomenon is occurring? (Ex: Monitoring impossible? Control impossible? Check the AC unit address. Check the AC unit model. What is the name or model of the central control board? etc) • When did the trouble occur? (Ex: Year, hour, minute) • How was the frequency of the occurrence? (Ex: About once a month) • Object name? When was the object delivered (test operation)? → The following tasks are unnecessary if the cause of the claim has been resolved and proper measures have been taken. 2. Check whether items were properly recorded during the test operation or not. (See P32, 33) 3. Check and save BACnet data stored in the BACnet Gateway using the test operation PC. 3-1. How to storing BACnet history to test operation PC 3-1-1. Connect the test operation PC to BACnet Gateway and startup the test operation program. Click on ① “BACnet”, and the screen below will appear. 3-1-2. Next, click on ② “History” and select ③ 10000. Click on ④ “Update”. 3-1-3. Click on ⑤ “Text Save” and save under an identifiable name. (If the malfunction is not solved on the site, use the above to remedy a malfunction by referring to the quality control design stored in the factory.) 

CB00A040A

Question	Answer
A product claim about the BACnet Gateway was received from the site after delivery. What kind of information or data should be collected?	1. Obtain as much detailed information as possible about the product claim. • What phenomenon is occurring? (Ex: Monitoring impossible? Control impossible? Check the AC unit address. Check the AC unit model. What is the name or model of the central control board? etc) • When did the trouble occur? (Ex: Year, hour, minute) • What was the frequency of the occurrence? (Ex: About once a month) • Object name? When was the object delivered (test operation)? → The following tasks are unnecessary if the cause of the claim has been resolved and proper measures have been taken. 2. Check and save BACnet data stored in the BACnet Gateway using the test operation PC. 2-1. How to verify history and storage method to test operation PC. 2-1-1. Connect the test operation PC to the BACnet Gateway and startup the test operation program. The screen below will appear. 2-1-2. A history of AC unit malfunctions, such as a power ON/OFF log recorded in BACnet Gateway, will appear on the screen. Check whether there are any items related to the product claim or not. 2-1-3. Next, save the error history in the test operation PC. Click on ① “Text Save”and store the history under an identifiable name. (If a malfunction is not solved on the site, use the history to remedy a malfunction by referring to the quality control and design departments in the factory.) ② “History Reset” is used to delete the error history stored in BACnet Gateway. Since there is no need to delete this data, do not click on this button. 2-1-4. ③ enables detailed error history verification and storage for each D3-NET communication port. (Note 1): For the error history data, the newest 40 entries are recorded for each item in ③ (main unit, port 1…, port 4, etc.). (Note 2): To save error history data, click on ① [Text Save] for each item in ③ (main unit, port 1…, port 4, etc.).  3. BACnet history is stored in the test operation PC using the operations in 3 on the previous page.

CB00A040A

Part 6
Installation Manual
(DMS502A51)

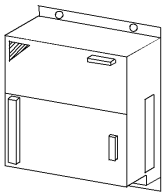
1. Installation Manual

1.1 DMS502A51

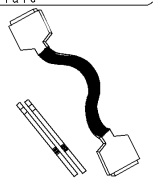
❶ Components

The following parts are attached to this unit.
Make sure to check them before installation.

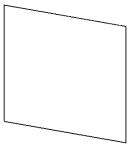
BACnet Gateway
DMS502A51



Adapter 232C for connection with the central monitoring board and wire clamp materials



INSTALLATION MANUAL



❷ Outline of functions

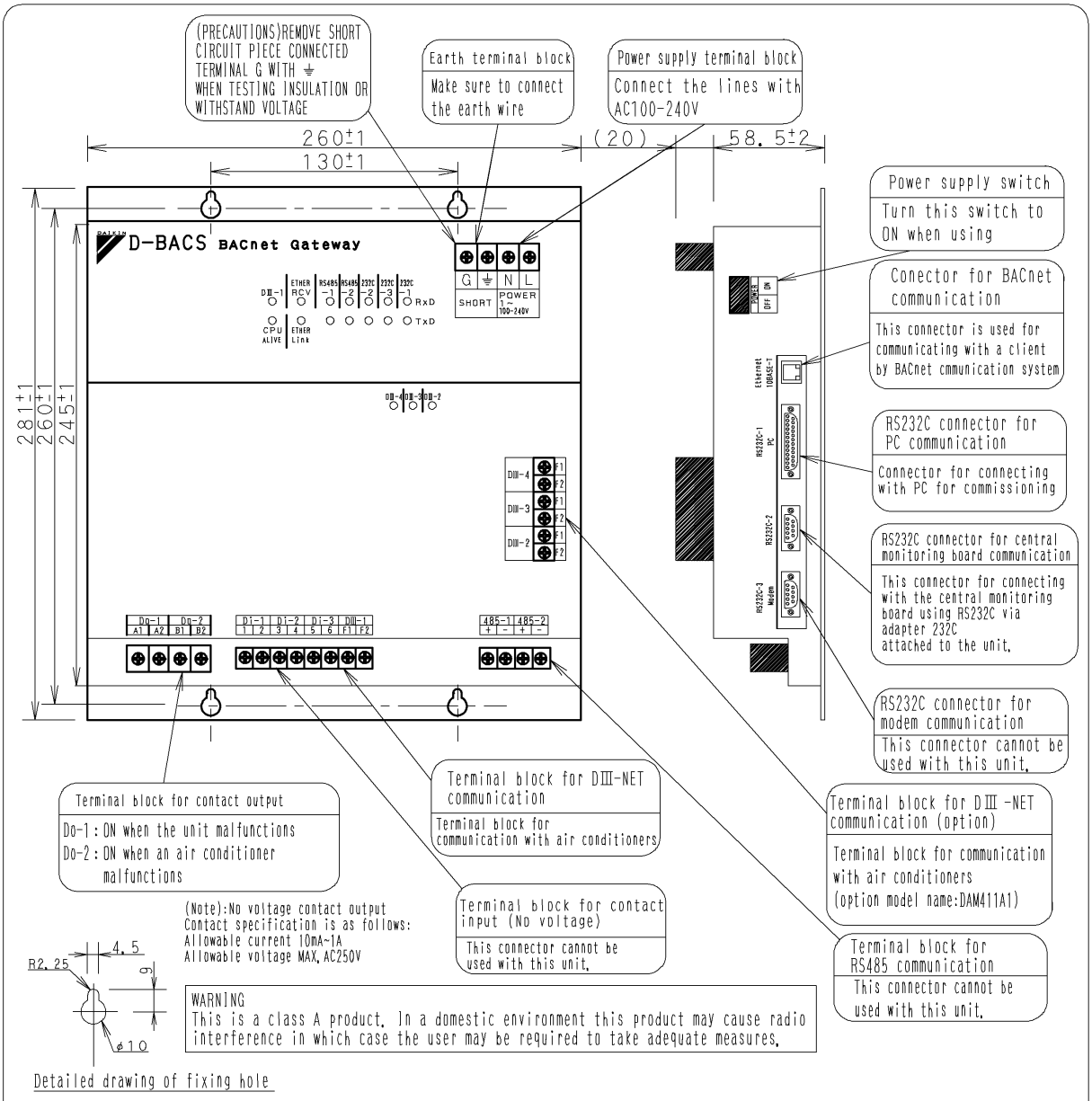
- This BACnet Gateway enables interfacing between the VRV system and central monitoring board.
- Data of up to 256 groups of air conditioner(when the option DⅢboard is used)are controllable by the BACnet Gateway.
- Air conditioners are operable and the state can be monitored from the central monitoring board by RS232C communication or BACnet communication.

❸ Main function

The BACnet Gateway can monitor and control air conditioners from a maximun of 256 groups, on a unit by unit basis. Major features are listed below.

1. Switches the ON/OFF operation and monitors operational state.
2. Monitors indoor units for malfunctions.
3. Monitors and changes temperature.
4. Monitors indoor unit temperature.
5. Monitors and resets filter clean sign.
6. Switches the operation mode.
7. Sets remote controller operation.

4 Names and functions of each part



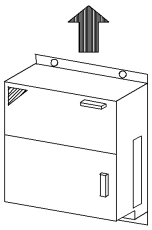
LED display

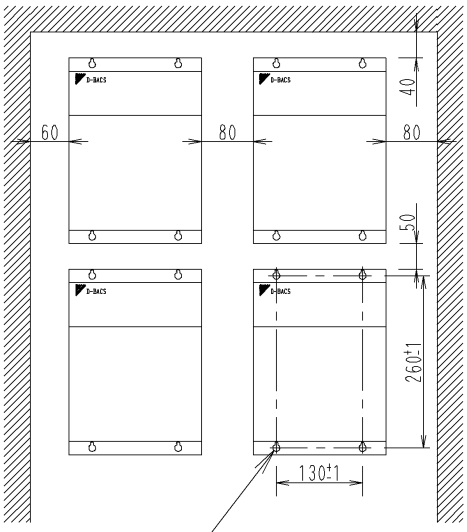
CPU ALIVE	It flashes when the unit is normal operation.
DⅢ－1	It flashes when it receives/transmits data from/to the equipment connected with DⅢ-1 such as air conditioners
Ether RCV	It flashes when it receives/transmits data from/to BACnet client
Ether Link	It lights when the 10BASE-T cable is connected
RS485-1(RxD)	This LED display cannot be used with this unit
RS485-1(TxD)	This LED display cannot be used with this unit
RS485-2(RxD)	This LED display cannot be used with this unit
RS485-2(TxD)	This LED display cannot be used with this unit

RS232C-1(RxD)	It flashes when it receives data to PC
RS232C-1(TxD)	It flashes when it transmits data to PC
RS232C-2(RxD)	It flashes when it receives data from the central monitoring board
RS232C-2(TxD)	It flashes when it transmits data to the central monitoring board
RS232C-3(RxD)	This LED display cannot be used with this unit
RS232C-3(TxD)	This LED display cannot be used with this unit
DⅢ－2	It flashes when it receives/transmits data from/to the equipment connected with DⅢ-2 such as air conditioners
DⅢ－3	It flashes when it receives/transmits data from/to the equipment connected with DⅢ-3 such as air conditioners
DⅢ－4	It flashes when it receives/transmits data from/to the equipment connected with DⅢ-4 such as air conditioners

⑤ Installation

- Make sure to install the unit on the inside of the inaccessible and lockable (or needed to use exclusive tools to open) electrical component box installed indoors where the effect of electromagnetic wave or dust can be avoided.
  The minimum depth required for installation is 100mm
- Keep the minimum amount of space indicated in the below drawing from walls, and between units when installed in series.
- For installation direction follow the drawing shown below.

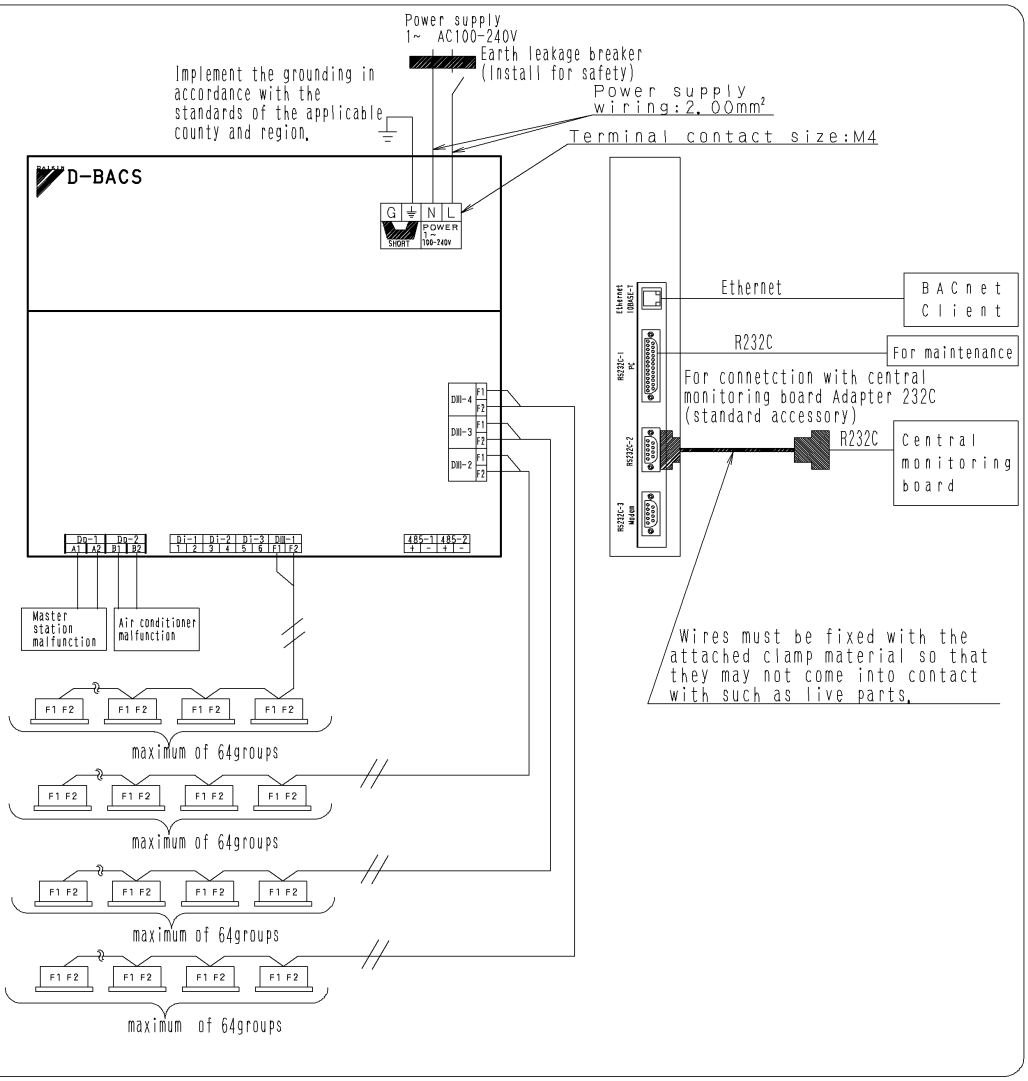




Make sure to install the unit vertically. Do not install the unit horizontally, because it may cause malfunction.

Fix the BACnet Gateway firmly with the installation screws(M4)

⑥ Malfunction of unit



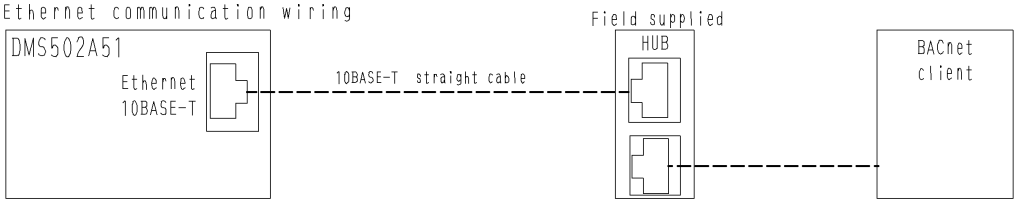
⑦「DⅢ-NET master」setting

Make sure to connect the unit with 「DⅢ-NET master」
Remove the master central setting connectors of the centralized management controllers or ON/OFF contorollers When using together with other centralized controllers such as centralized management controllers or ON/OFF controllers.

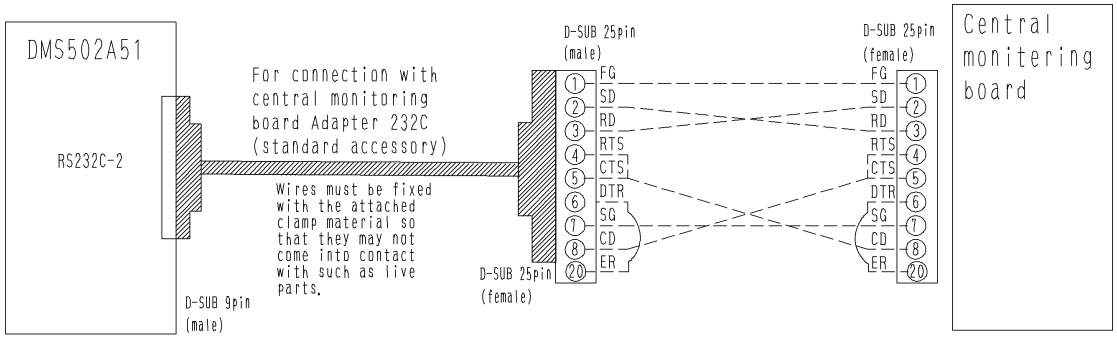
⑧For external wiring

■Everything relating with field wiring must be supplied in the field.

●Ethernet communication wiring

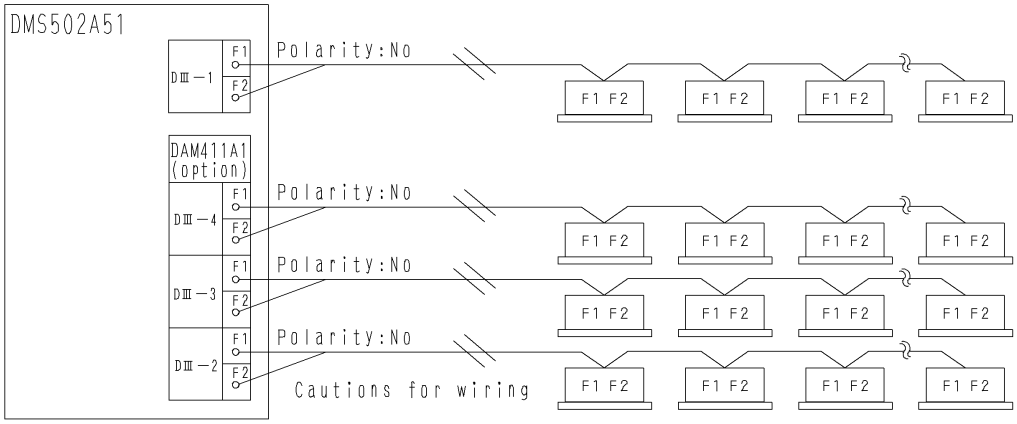


●Communication between central monitoring board



Transfer mode : Half-duplex operation
Interface : RS232C
Baud rate : 9600 or 4800 bps
(Changeover of transmission rate is carried out by serviceman's PC at cmmissioning)
Transmission method : Asynchronous;Start bit:1, Stop bit:1
Control protocol : Polling/Selecting(centralized);Comforms to JISX5002.
Control station :Central monitoring board
Substation :DMS502A51
Transfer code : JIS7 unit +1 parity bit
Error control : Vertical parity check(Even)
: Horizontal parity check(LRC)
: Timer-based montitoring
Wiring length : Max. 15m

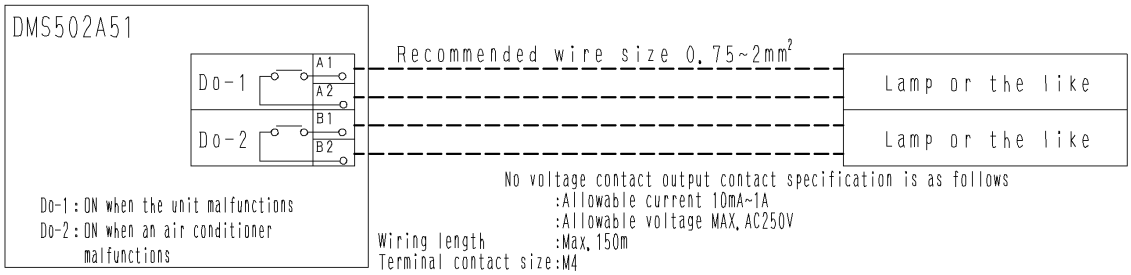
●DⅢ-NET wiring



Cautions for wiring

1. Do not use multicore cables with three or more cores.
2. Use wires of sizes between 0.75mm^2 and 1.25mm^2
3. Wire length:Max 1000m
4. Do not bind the wire for DⅢ-NET
5. Wirings for DⅢ-NET must be isolated from the power lines.
6. Terminal contact size:M3.5

● Do-1 and 2



Do-1 : ON when the unit malfunctions
Do-2 : ON when an air conditioner malfunctions

No voltage contact output contact specification is as follows
:Allowable current 10mA~1A
:Allowable voltage MAX. AC250V
Wiring length :Max. 150m
Terminal contact size:M4

Main specifcations

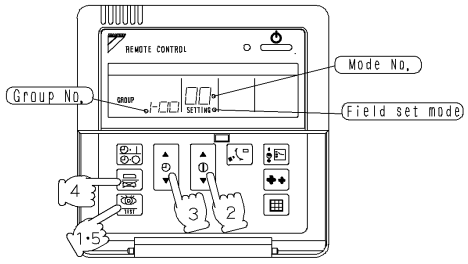
Temperture range	-10~50℃
Humidity range	0~98%(No frost formation)
Power supply	1~AC100-240V 50/60Hz
Power consumption	MAX. 20W
Weight	4.0Kg

Colours of the unit

Unit	PANTONE 533C
Letters	PANTONE 656C
Lines	PANTONE 656C

9 Setting group No. for centralized control

Turn ON the power to the BACnet Gateway Following the below procedure, set the group numbers for the indoor units connected to the DIII-NET. This group number is set for each indoor unit system.
(When not using the remote controller, the remote controller is to be connected just for making settings but must be disconnected when finished.)



Pre-paration	● Check no troubles exist with installation and wiring before turning ON the power. ● Turn ON the power to the indoor unit and BACnet Gateway Setting is not possible with the power OFF.

● Nothing is wrong with the equipment if "88" is displayed when power is turned ON. This may happen and the unit may not respond to operation, but the situation should last only a moment.

1	Hold down TEST for 4 seconds or more to enter the field set mode.
2	Press ▲▼ and set the mode NO. to "00"
3	Press ▲▼ and set the group No. Group No. increases in the order of 1-00, 1-01 ... 1-15, 2-00,... 4-15 Set the group No. when "GROUP" on the liquid crystal display is flashing. Press the ⊠ button to initiate flashing of "GROUP" on the liquid crystal display.
4	Press ⊠ to set the group No.
5	Press TEST . This will return the system to the normal mode.

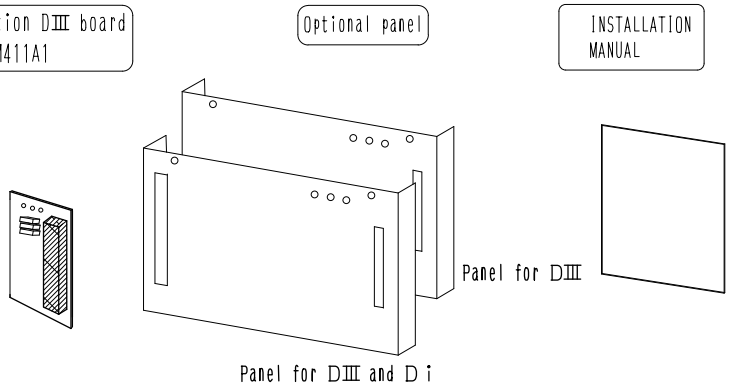
- For details on making settings from the simplified remote controller, refer to the instruction manual of the unit.
- For details on making settings of the group No. of the Ventiaire or adapters (wiring adapter for other air conditioners, etc.), refer to the instruction manual of the said unit.

1P056362-1A

1.2 DAM411A1 (Option DIII Board)

① Components

The following parts are attached to this unit.
Make sure to check them before installation

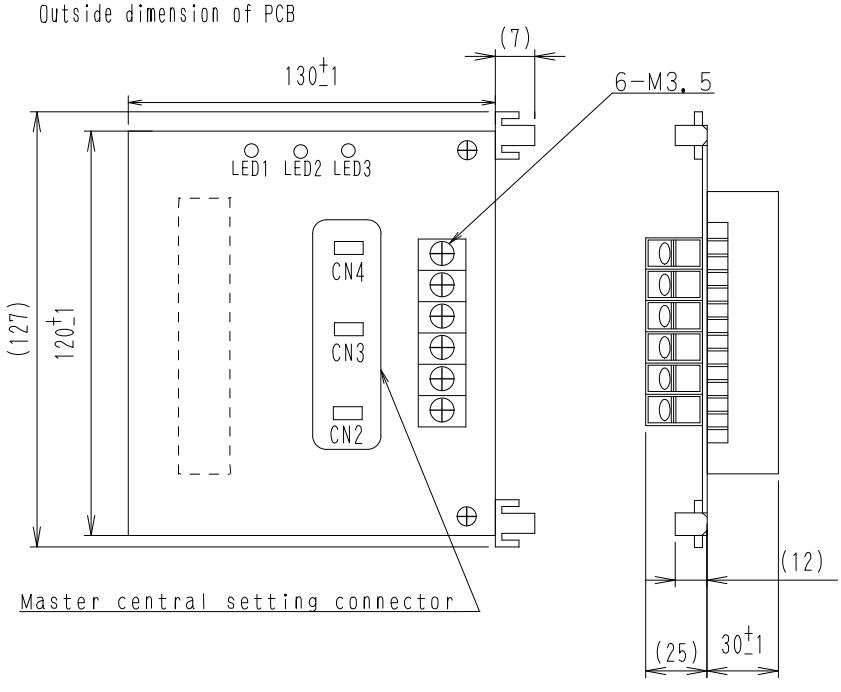


② Outline of functions

This unit is for adding 3 port to the DⅢ-NET communication port by installing it on the BACnet Gateway DMS502A51.

- Make sure to connect the unit with 「DⅢ-NET master」 (Do not remove the master central setting connector.)
  Remove the master central setting connectors of the centralized management controllers or ON/OFF contorollers When using togeter with other centralized cohtrollers such as centralized management controllers or ON/OFF controllers.

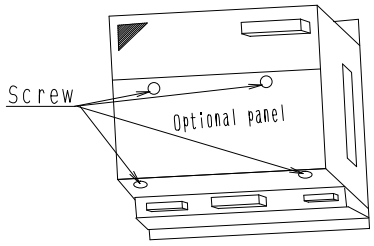
Outside dimension of PCB



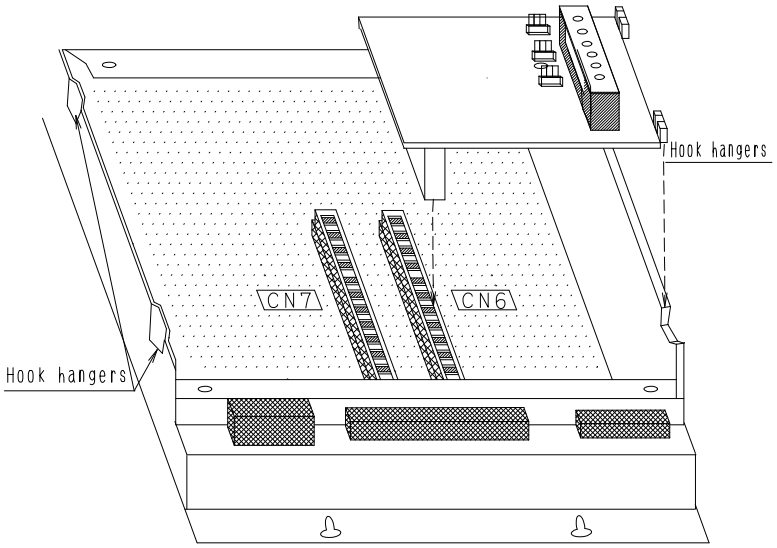
❸ Installation

Before installing the PCB, check that the power supply is turned OFF.
Since PCB's are weak to static electricity, make sure to remove the static electricity accumulated in the worker's body.
(The accumulated static electricity can be removed by touching the earthed controlboard and the like.)

① Remove the optional panel for the BACnet Gateway DMS502A51.
(Remove 4 screws)
Caution : Do not lose the remove 4 screws, because they are neccesary for reassembly the panel.



② Install the unit on CN6 and the hook hangers.

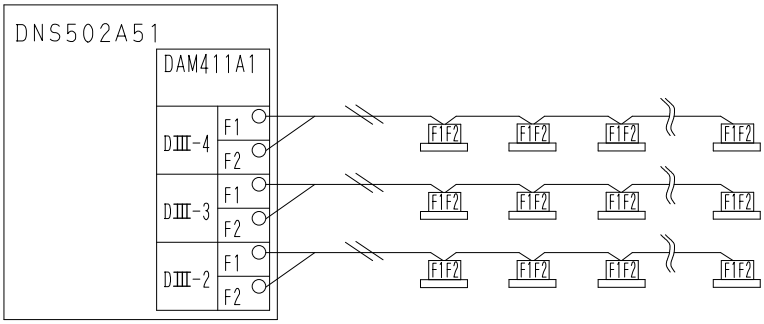


③ Screw the panel and fix it.
(Use only one of the two panels enclosed in this unit.)

Optional with / without	Panel to be used
Option DⅢ board ----With Option Di board ----Without	Panel for DⅢ
Option DⅢ board ----With Option Di board ----With	Panel for DⅢ and Di

(Warning)
This is class A product, in a domestic environment this product may cause radio interference
in which case the user may be required to take adequate measures.

4 For external wiring



LED display
This unit has the following LED display. When each corresponding port transmits or receives the data the LED flashes.

Cautions for wiring
1. Do not use multicore cables with three or more cores
2. Use wires of sizes between 0.75mm^2 and 1.25mm^2
3. Wire length:Max 1000m
4. Do not bind the wires for DⅢ-NET
5. Wirings for DⅢ-NET must be isolated from the power lines.
6. Terminal contact size :M3.5

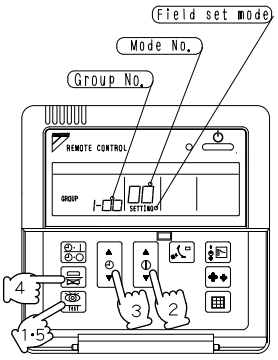
5 Setting group No. for centralized control

Turn ON the power to the BACnet Gateway Following the below procedure, set the group numbers for the indoor units connected to the DⅢ-NET. This group number is set for each indoor unit system.
(When not using the remote controller, the remote controller is to be connected just for making settings but must be disconnected when finished.)

Pre-paration	● Check no troubles exist with installation and wiring before turning ON the power. ● Turn ON the power to the indoor unit and BACnet Gateway Setting is not possible with the power OFF.

● Nothing is wrong with the equipment if "88" is displayed when power is turned ON. This may happen and the unit may not respond to operation, but the situation should last only a moment.

1	Hold down TEST for 4 seconds or more to enter the field set mode.
2	Press ⓘ and set the mode NO. to "00"
3	Press ⓘ and set the group No. Group No. increases in the order of 1-00, 1-01 ... 1-15, 2-00,... 4-15 Set the group No. when "GROUP" on the liquid crystal display is flashing. Press the ⊠ button to initiate flashing of "GROUP" on the liquid crystal display.
4	Press ⊠ to set the group No.
5	Press TEST . This will return the system to the normal mode.



・For details on making settings from the simplified remote controller, refer to the instruction manual of the unit.

・For details on making settings of the group No. of the Ventiaire or adapters (wiring adapter for other air conditioners, etc.), refer to the instruction manual of the said unit.

2P056452-1A

Part 7
Troubleshooting

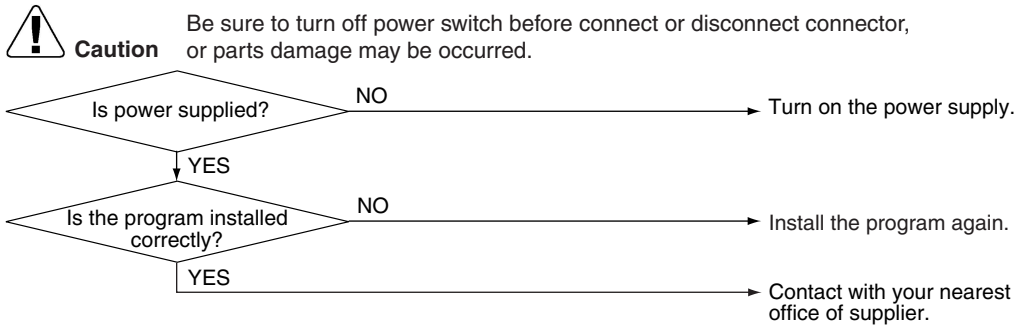
1. Troubleshooting

1.1 CPU Alive LED is Turned off or Lighting up

Trouble Contents CPU Alive LED is turned off or lighting up. (It will be blinking in normal condition.)

Supposed Causes
- Power is not supplied.
- Program is not installed correctly.

Troubleshooting



1.2 Ether Link LED is off

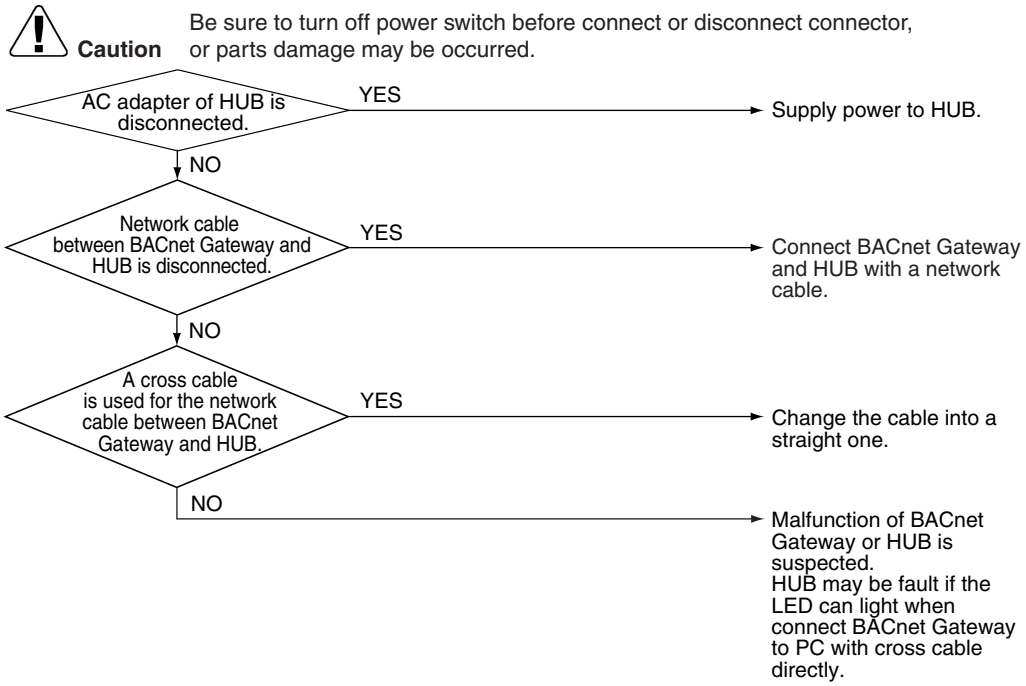
Trouble Contents

Ether link LED is off.
(It will light in normal condition.)

Supposed Causes

Power supply for HUB is turned off.
Communication cable between BACnet Gateway and HUB is disconnected.
Specification of the communication cable between BACnet Gateway and HUB is incorrect.

Troubleshooting



1.3 Ether RCV LED Does Not Light

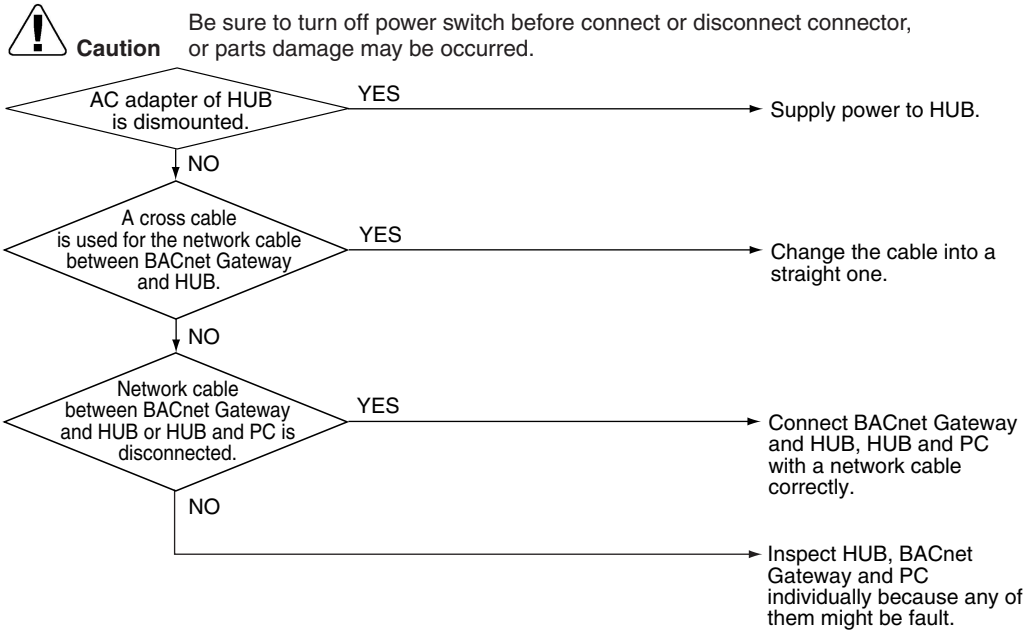
Trouble Contents

Ether RCV LED does not light.
(It will blink with an interval of several tens of seconds normally.)

Supposed Causes

Power supply for HUB is turned off.
Specification of the communication cable between BACnet Gateway and HUB is incorrect.
(If the trouble have been generated due to above two reasons, the ether link LED is also turned off.)
Any one of the communication cable between BACnet Gateway and HUB or HUB and PC is disconnected.

Troubleshooting



1.4 RS485-1 TxD,RxD, RS485-2 TxD,RxD LEDs are off

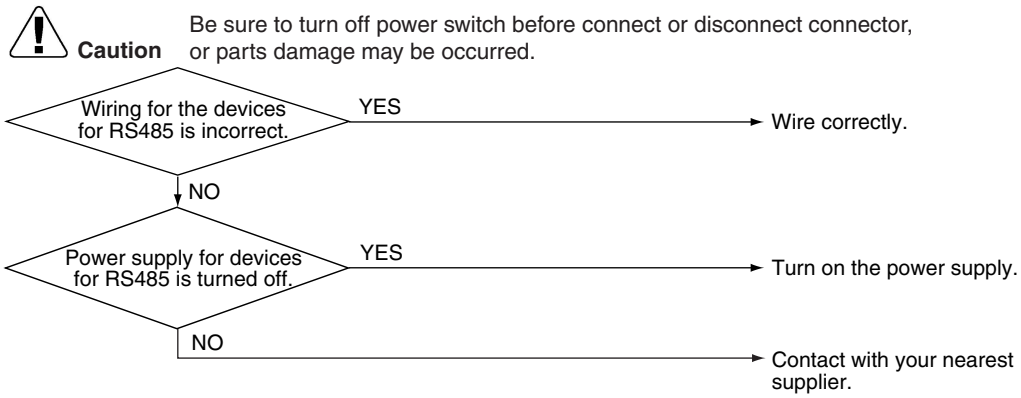
Trouble Contents

RS485-1 TxD,RxD, RS485-2 TxD,RxD LEDs are off.
(In the normal condition, they will blink when the devices for RS485 are connected, while they will be turned off if the devices are not connected.)
(There are two RS485 communication ports. LEDs mentioned above are for sending and receiving.)

Supposed Causes

Wiring to devices for RS485 is not correct.
Power supply to devices for RS485 is not turned on.

Troubleshooting



1.5 RS232C-2 TxD and RxD LED is off or Lights up

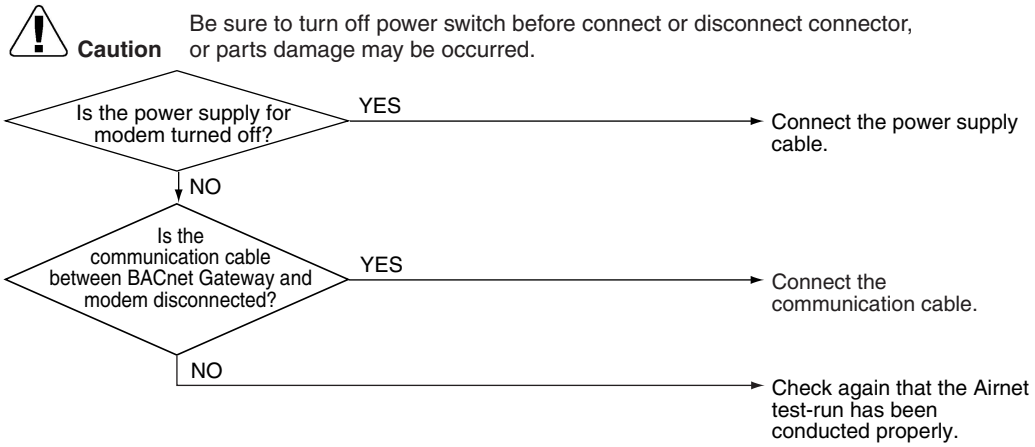
Trouble Contents

RS232C-2 TxD and RxD LED is off or lights up.
(The LED blinks with a certain interval when the device is connected with modem for Airnet and communicates normally.)
(Although the LED is connected with modem, since it does not perform communication continuously, it may sometimes be off.)
∗: Lighting /off of the LEDs of RS232C-1 and 3 are regardless of the operation of this device because the LEDs are not used.

Supposed Causes

Power supply for modem is turned off.
Communication cable between BACnet Gateway and modem is disconnected.

Troubleshooting



1.6 LEDs of DIII-1,2,3 and 4 is off or Lights

Trouble Contents

LEDs of DIII-1,2,3 and 4 is off or lights.
(When the device is communicating with air conditioner, the LED is blinking.)

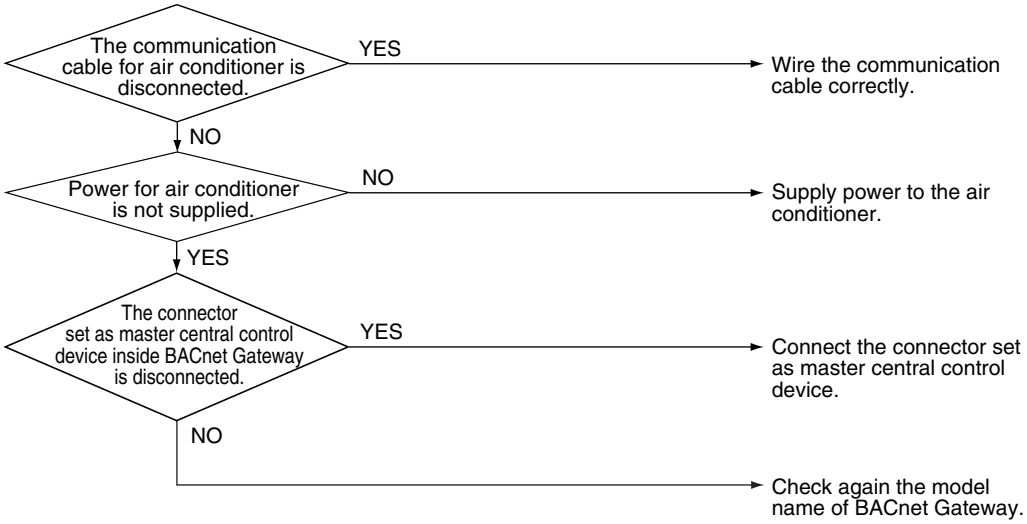
- When BACnet Gateway model name is DAM602A52, LED of DIII-3 and 4 is continuously off.
- When BACnet Gateway model name is DAM602A53, LED of DIII-4 is continuously off.

Supposed Causes

The communication cable for air conditioner connected to the communication port corresponding to DIII-NET is disconnected.
Power for air conditioner connected to the communication port corresponding to DIII-NET is not supplied.

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



1.7 Can not be Connected to BACnet Gateway (Software Setting)

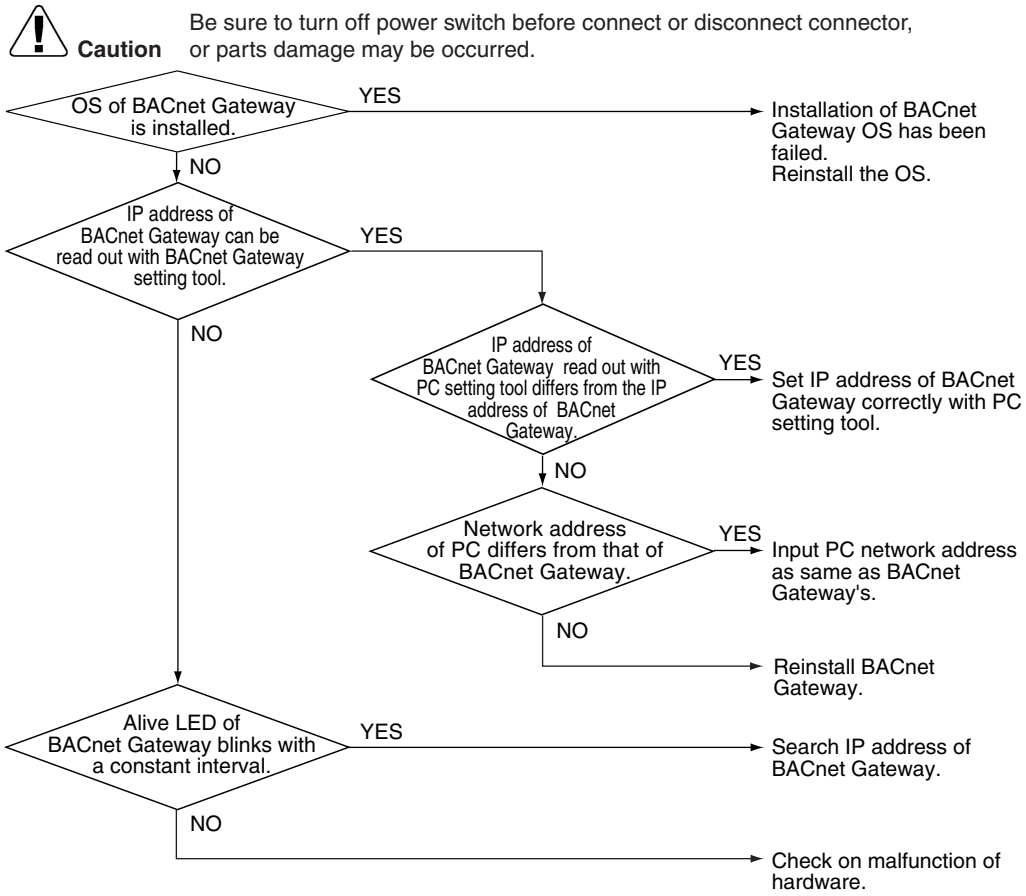
Trouble Contents

Can not be connected to BACnet Gateway.
(Software setting)

Supposed Causes

Incorrect setting for IP address of BACnet Gateway.
Incorrect setting for IP address of PC.
Incorrect updating of BACnet Gateway OS.

Troubleshooting



1.8 Can not be Connected to BACnet Gateway (Hardware Malfunction)

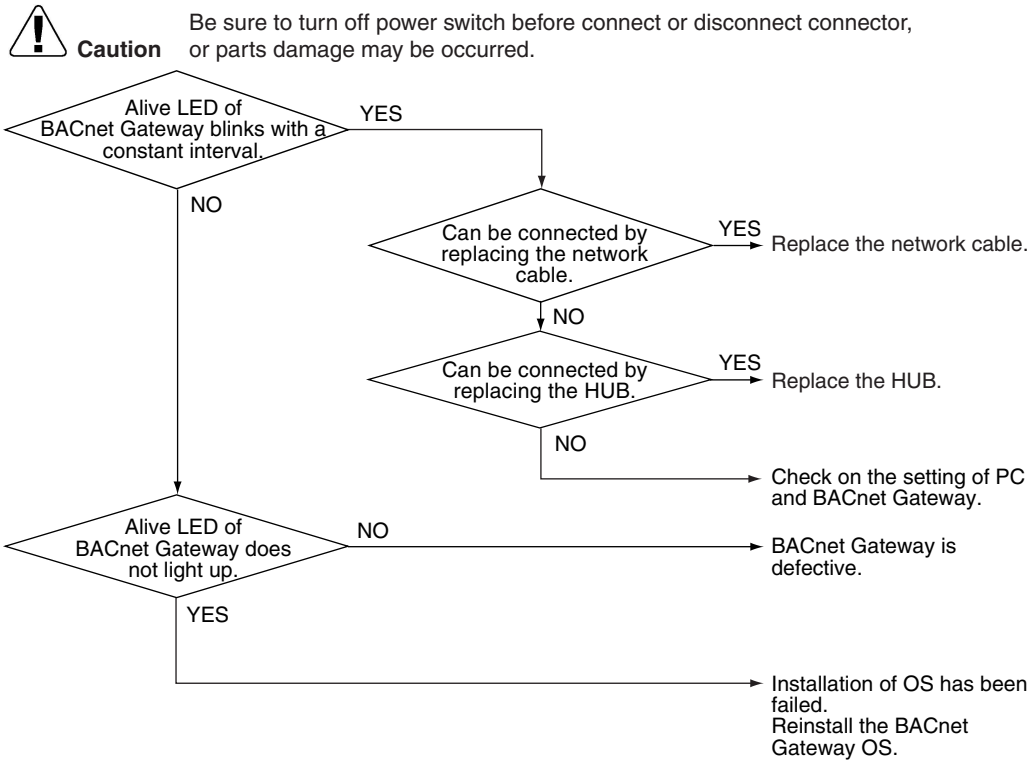
Trouble Contents

Can not be connected to BACnet Gateway.
(Hardware malfunction)

Supposed Causes

Disconnection of network cable.
Defective HUB
Defective BACnet Gateway

Troubleshooting

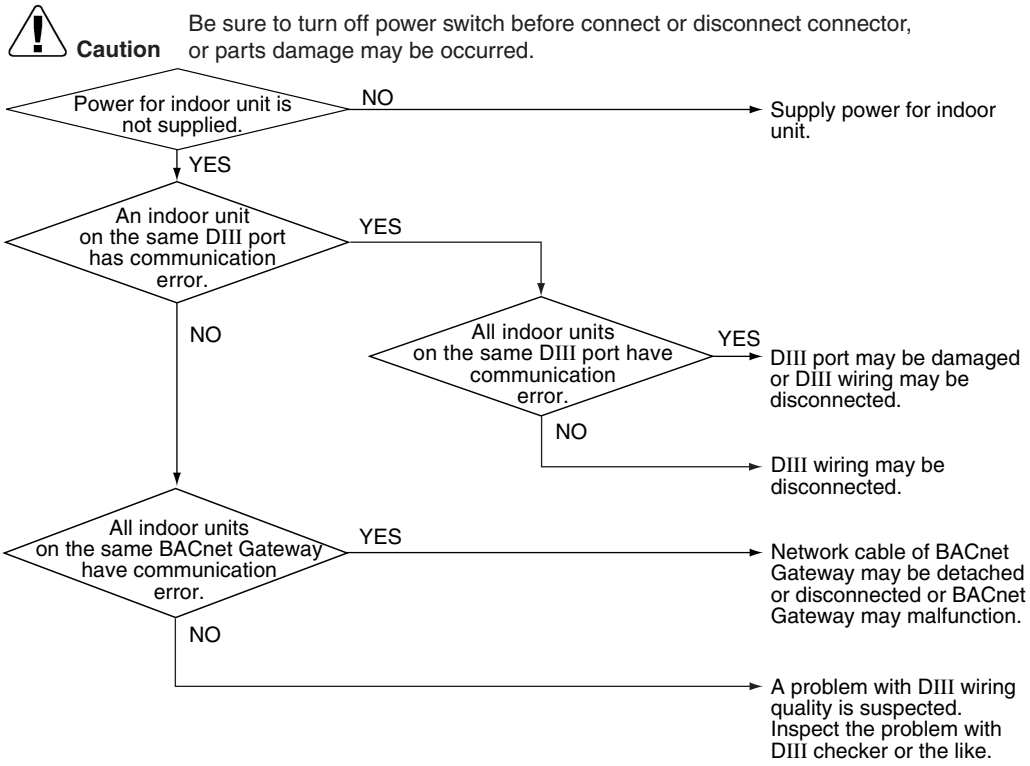


1.9 Some of the Air Conditioners Have Communication Error

Trouble Contents Some of the air conditioners have communication error.

Supposed Causes
Power for indoor unit is not supplied.
Disconnection of DIII wiring.
Disconnection of network cable of BACnet Gateway.
Faulty DIII port.

Troubleshooting



2. Appendix

1. Combination Table

	Central controller (DCS302A51 /B51,61)	Unified ON/OFF (DCS301A51 /B51,61)	Schedule Timer (DST301A51 /B51,61)	Parallel Interface (DPF201A51)	i-Touch Controller (DCS601A/ B51)	intelligent Manager (DMS602A51, 52,53)	BACnet Gateway (DMS502A51)	DMS-IF (DMS504B51)	LC 6 (Airnet)
Central controller	OK	OK	OK	OK	OK	OK	OK	OK	OK
Unified ON/OFF	OK	OK	OK	OK	OK	OK	OK	OK	OK
Schedule Timer	OK	OK	NG	NG	NG	NG	NG	NG	OK
Parallel Interface	OK	OK	NG	NG	OK	NG	NG	NG	OK
i-Touch Controller (DCS601A/B 51)	OK	OK	NG	OK	OK	OK	OK	OK	OK
intelligent Manager	OK	OK	NG	NG	OK	NG	NG	NG	OK
BACnet Gateway	OK	OK	NG	NG	OK	NG	NG	NG	OK
DMS-IF (DMS504B51)	OK	OK	NG	NG	OK	NG	NG	NG	OK
LC 6 (Airnet)	OK	OK	OK	OK	OK	OK	OK	OK	NG

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Drawings & Flow Charts

Warning

- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorized parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Read the User's Manual carefully before using this product. The User's Manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

For any inquiries, contact your local distributor.

Cautions on product corrosion

1. Air conditioners should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided and choose an outdoor unit with anti-corrosion treatment.

The air conditioners manufactured by Daikin Industries have received **ISO 9001** certification for quality assurance.

Certificate Number. JMI-0107
JQA-0495
JQA-1452

All Daikin Industries locations and subsidiaries in Japan have received environmental management system standard **ISO 14001** certification.

Daikin Industries, Ltd.
Domestic Group
Certificate Number. EC99J2044

About ISO 14001

ISO 14001 is the standard defined by the International Organization for Standardization (ISO) relating to environmental management systems. Our group has been acknowledged by an internationally accredited compliance organisation as having an appropriate programme of environmental protection procedures and activities to meet the requirements of ISO 14001.

Dealer

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This book is made of recycled paper.

ED72-549
Printed in Japan 09/2005 AK. FS