

BACnet™ SOFTWARE

Model:

BMS-STBN□□E

(for Intelligent Server model BMS-LSV4E only)

- Thank you very much for purchasing this TOSHIBA BACnet Software.
- Please read this manual carefully beforehand for proper installation of the software.

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Precautions for Safety

- Read these “Precautions for Safety” carefully before installation.
- The precautions described below include important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.

⚠ CAUTION

- **Ask an authorized dealer or qualified installation professional to install or reinstall the software.**
- **Perform installation work properly according to this Installation Manual.**
- **Do not modify the unit.**
- **Perform wiring correctly in accordance with specified the current capacity.**
Failure to do so may result in short-circuiting, overheating, or fire.
- **Connect the specified cables for the terminals securely to prevent external forces from affecting them.**
Failure to do so may result in disconnection, overheating, or fire.

Before Installation

NOTE

This CF (Compact Flash) card is the software for the Intelligent Server (Model: BMS-LSV4E) only. Prepare the Intelligent Server to use this card. This card is not applicable to BMS-LSV2E.

Check the following package contents.

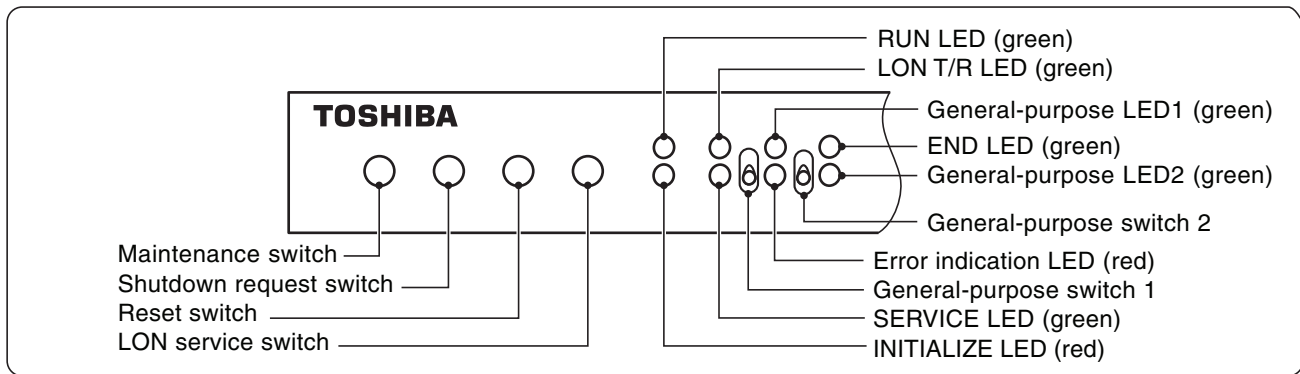
No.	Item	Quantity	Remarks
1	Intelligent Server Software	1	Compact Flash card
2	Cable	1	RS-485 cable for Intelligent Server
3	Closed end wire joint	2	
4	Installation Manual	1	

Use the following wiring materials to connect signal lines. (Procured on site)

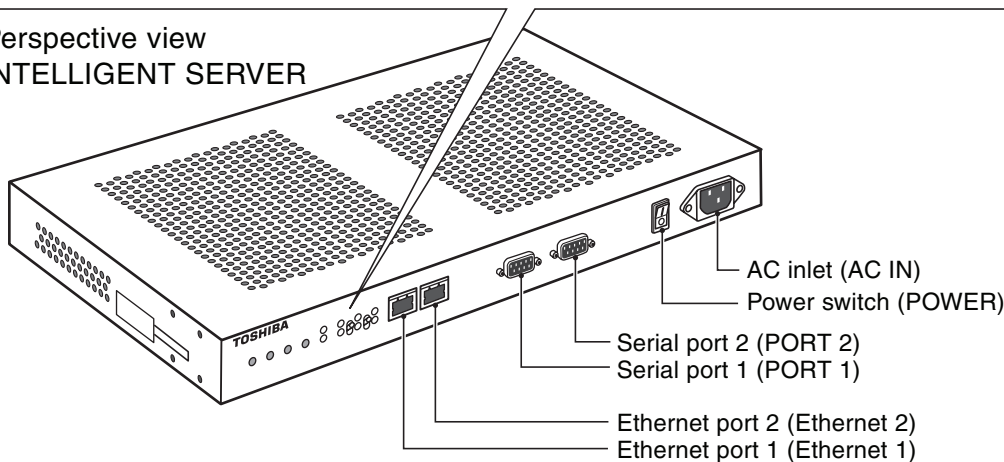
No.	Signal line	Description	
1	For RS-485	Type	2-core shield wire
		Wire size	1.25 mm ² , 500m max. (total length)
		Length	

Elements of the Intelligent Server

Front view INTELLIGENT SERVER



Perspective view INTELLIGENT SERVER



Specification of Installation Environment

(1) Ambient Conditions

The specification of ambient conditions is shown below.

■ Ambient Specification

Item	Operation	Storage
Temperature	0 to 40 °C	-20 to +60 °C
Temperature Change	15 °C/H	15 °C/H
Humidity	10 to 90 %RH (without condensation)	10 to 90 %RH (without condensation)
Vibration	2.45 m/s ² or the less	4.91 m/s ² or the less
Shock	24.5 m/s ² or the less	49.0 m/s ² or the less

(2) Power Supply Conditions

The specification of power supply conditions is shown below.

■ Power Supply Specification

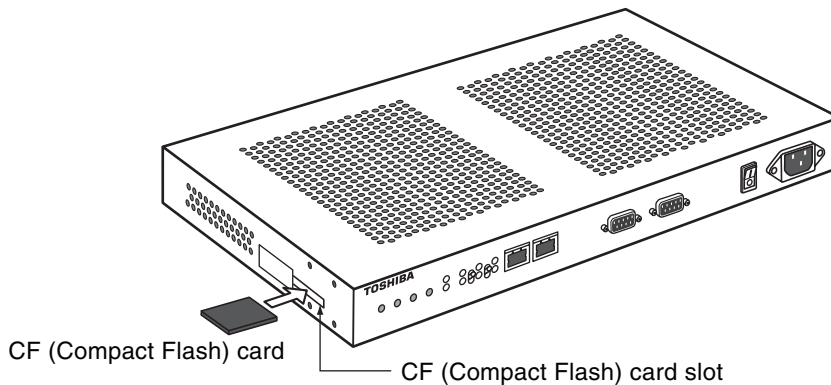
Item		Specification
Power Supply	Rated Voltage	100/240 V, AC Single phase with grounding
	Tolerable Range	85 - 132 V, AC / 180 - 264 V, AC
	Frequency	50/60 Hz ± 3 Hz, or the less
	Power Consumption	40 VA
	Tolerable Power Interruption	20 ms, or the less
Grounding		Exclusive grounding (Grounding resistance: 100 ohms, or the less)

1 CF (Compact Flash) card Installation

REQUIREMENT

- Do not insert or remove the CF (Compact Flash) card during power on of the Intelligent Server. Doing so may cause a failure.
- If the CF (Compact Flash) card is not inserted properly, the Intelligent Server will not work.

Insert the attached CF (Compact Flash) card fully into the CF (Compact Flash) card slot on the side of the Intelligent Server.

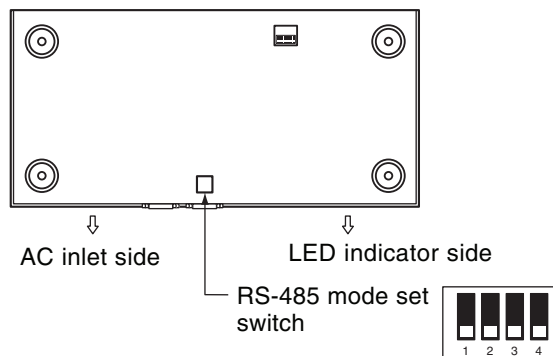


2 Setting

RS-485 operation mode setting

The RS-485 mode set switch is provided on the bottom board of the Intelligent Server. Set the switch as follows:

1	2	3	4
OFF	ON	ON	OFF



NOTE

If the RS-485 mode set switch is set incorrectly, the Intelligent Server will not work.

1	ON	A terminator resistor is connected between TX(+) and TX(-).
	OFF	No terminator resistor is connected between TX(+) and TX(-).
2	ON	A terminator resistor is connected between RX(+) and RX(-).
	OFF	No terminator resistor is connected between RX(+) and RX(-).
3	ON	Half-duplex mode (Note 1)
	OFF	Full-duplex mode (Note 2)
4	Not used	

(Note 1) Transmit data sent from the Intelligent Server is not received by the same server during transmission.

(Note 2) Transmit data sent from the Intelligent Server is also received by the same server during transmission.

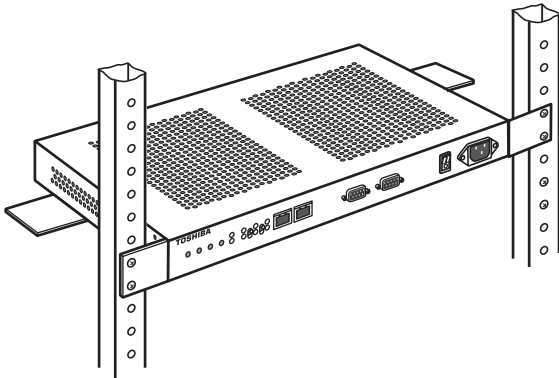
3 Installation

Intelligent Server Installation Method and Orientation

There are two ways to install the Intelligent Server as shown below: (1) rack mount (2) surface mount. The rack mount installation requires a support bracket for a 19-inch rack. Please contact us if you need the support bracket.

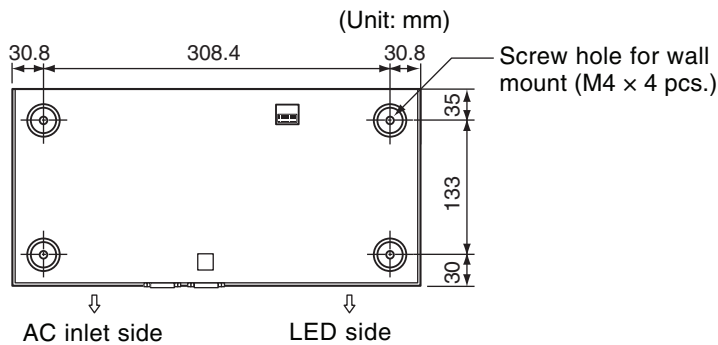
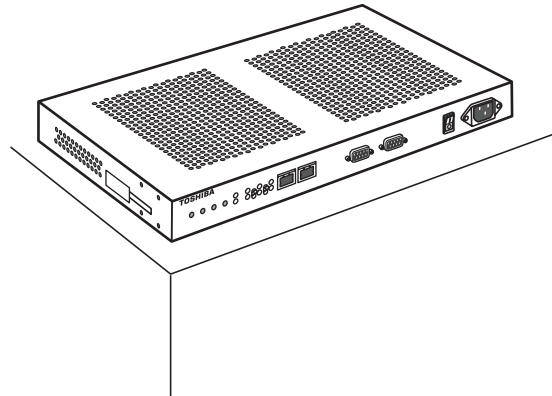
(1) Rack mount

A support bracket is required to be fixed to the bottom (rear side) of the unit.



(2) Surface mount

Standard installation



REQUIREMENT

Do not install the unit in any of the following places.

- Humid or wet place
- Dusty place
- Place exposed to direct sunlight
- Place where there is a TV set or radio within one meter
- Place exposed to rain (outdoors, under eaves, etc.)

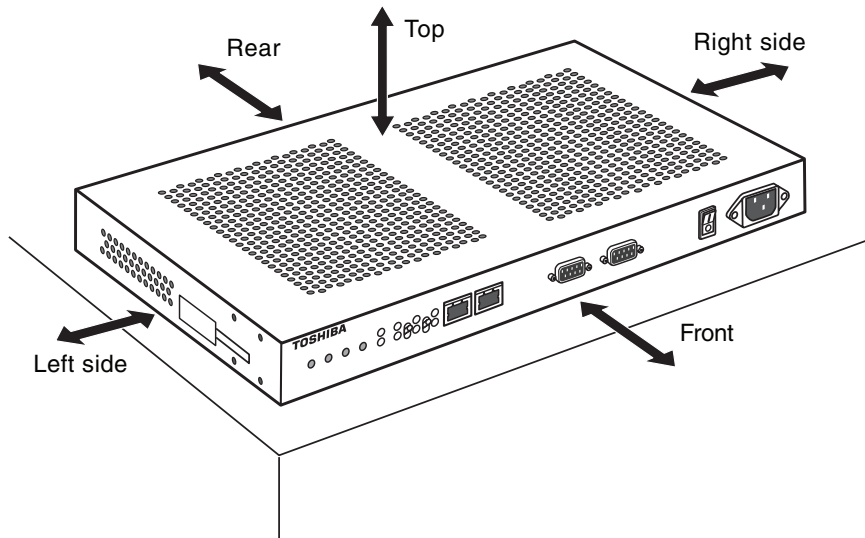
3 Installation (continued)

Installation Space and Maintenance Space

The installation space and the maintenance space must be determined before installation. These spaces depend on installation method.

Installation Space

The values in the following table are required for installation space in each direction. Select an installation place that allows good air ventilation.



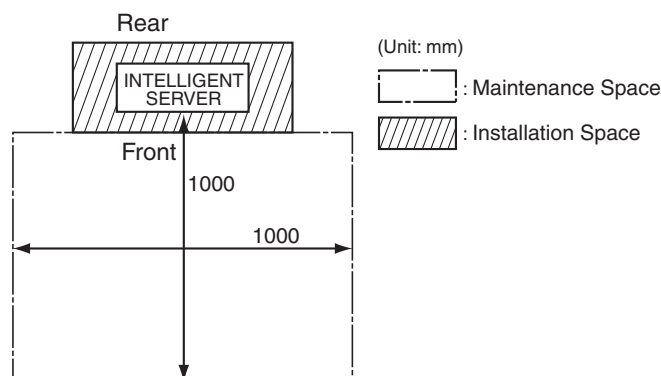
(Unit: mm)

Item	Direction	Rack mount	Surface mount
Installation space	Top	50	100
	Bottom	50	0
	Front	100	100
	Rear	100	Location adjacent to wall permitted (*1)
	Right side	Location adjacent to wall permitted (*1)	100
	Left side	Location adjacent to wall permitted (*1)	100

(*1) "Location adjacent to wall permitted" means that the unit can be installed close to the wall on that side.

Maintenance Space

Maintenance space is required for installation and maintenance of the unit.



4 Cable Connection

AC Power Cable Connection

REQUIREMENT

Power cable is not supplied for the Intelligent Server. Prepare a 3-core power cable conforming to applicable safety standards. Be sure to connect the earth line of the power cable securely.

- Insert an AC power cable into the AC inlet of the unit.
- Connect the power cord plug to an outlet (100V - 240 V, AC).

REQUIREMENT

- Install a breaker on the primary side of the outlet.
- Make sure that the outlet is earthed.

Ethernet wire Connection

NOTE

The Ethernet wires should be connected by professional service personnel.

Serial Port (RS-485) Connection

- Check that the power switch of the Intelligent Server is turned off.
- Connect the attached RS-485 wire to the serial port 1 (PORT 1). Secure the wire to the Intelligent Server using the two screws (right and left) attached to the RS-485 wire connector.

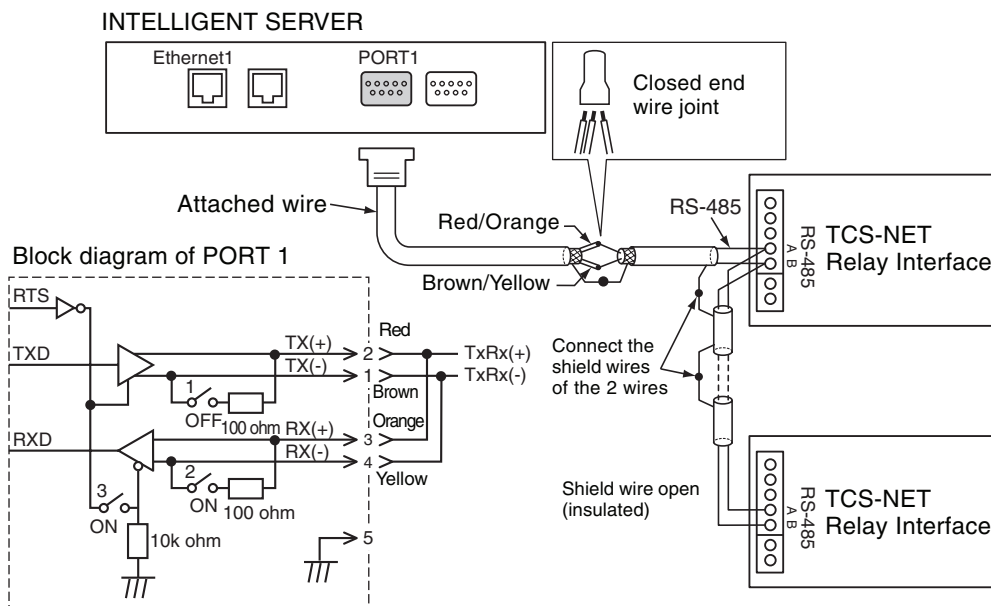
Connection to the TCS-NET Relay Interface

TxRx(+) Connection

Connect three of the four wires of RS-485 wire (red wire/orange wire/wire from the terminal board RS-485 A of the TCS-NET Relay Interface) together with the attached closed end wire joint. The red and orange wires can be connected directly to the terminal board RS-485 A of the Relay Interface.

TxRx(-) Connection

Connect three of the four wires of RS-485 wire (brown wire/yellow wire/wire from the terminal board RS-485 B of the TCS-NET Relay Interface) together with the attached closed end wire joint. The brown and yellow wires can be connected directly to the terminal board RS-485 B of the Relay Interface.

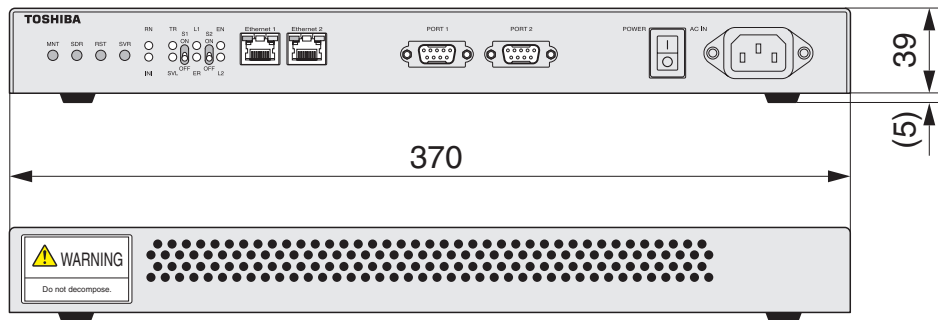
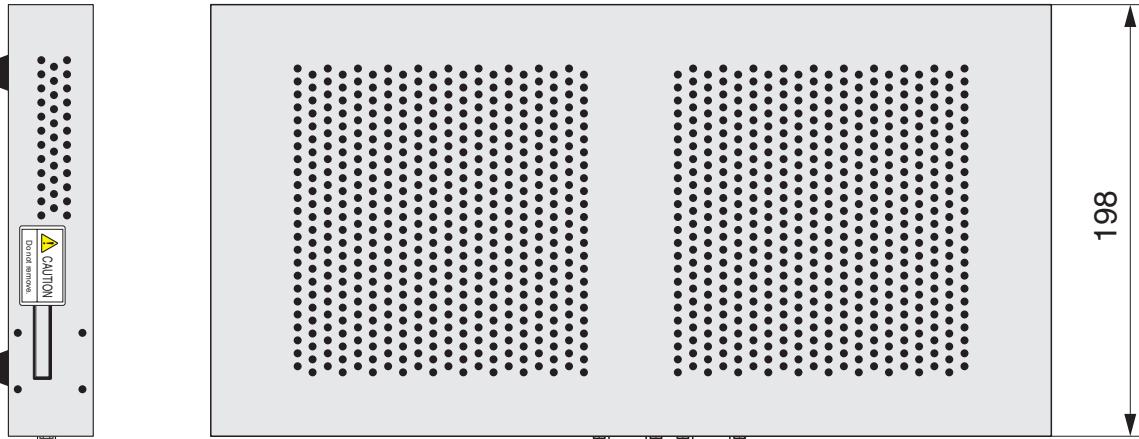


NOTE

The RS-485 signal wire has polarity. If connected with incorrect polarity, the unit will not work.

Do not connect or disconnect the wire during control operation. Doing so may cause a malfunction.

Appearance and Size



Unit in mm

NOTE

Trial operation should be checked by professional service personnel.

- ... Trademarks:
- BACnet is a registered trademark of ASHRAE(American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.).
 - Compact Flash and CF are trademarks of SanDisk Corporation.
 - Ethernet is a registered trademark of Xerox Corporation.
 - Lon Talk, LonWorks and Neuron are registered trademarks of Echelon Corporation in the United States and other countries.
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EH99852301

BACnet Interface

Network Object and Variables Specification

Model Name

BMS-STBN05E

BACnet are trademarks or registered trademarks of American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

1.Object List

Object Name	Object Type	Object Type (10bit)	Equipment category (4Bit)	Header/Follower ID Number (1Bit)	Equipment Number (1Byte)	Instance Number (1Byte)	Object ID (4Byte)	Value
Gateway Device	Device Object(8)	8	0000	0	0	IP address	0x020000C8	
ON/OFF Status	Binary Input Object(4)	4	0000	0/1	FCU(n) 1-128	0x82	0x0040xx83/ 0x0041xx83	Start/Stop
Operation Mode	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x83	0x0040xx84/ 0x0041xx84	Heat/Cool/Fan/Dry/Auto
Fan Speed	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x85	0x0040xx87/ 0x0041xx873	Stop / Auto / HH / H / L / LL
Louver	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x87	0x0000xx08/ 0x0001xx08	Stop /Swing / F1 / F2 / F3 / F4 / F5
Set Temperature	Analog Output Object(1)	1	0000	0/1	FCU(n) 1-128	0x84	0x0040xx85/ 0x0041xx85	From 18.0 to 29.0
Room Temperature	Analog Input Object(0)	0	0000	0/1	FCU(n) 1-128	0x08	0x0380xx89	From -39.0 To 150.0
Error status	Binary Input Object(3)	3	0000	0/1	FCU(n) 1-128	0x40	0x0000xx01/ 0x0001xx01	Error / No Error
Error Code	Analog Input Object(0)	0	0000	0/1	FCU(n) 1-128	0x01	0x0100xx82/ 0x0101xx82	From 0x00 to 0xFF
Permit / Prohibit of Local Control	Multi-state Output Object(14)	14	0000	0/1	FCU(n) 1-128	0x89	0x004000xx (0xB0-0xCF)	- Start/Stop - Operation Mode - Temperature Setting
All FCU Mode Change	Analog Output Object(1)	1	0000	0	0	0xB0		

2. Object Information

2.1 Gateway Device

Name	Data
Object Type	8
Equipment Category	0000
Equipment Number	0
Instance Number	IP Address
Object Type	Device Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R					Application Tag	object identifire (0xc4)		*** : Instance Number	
							Device object	0x020000**			
Object Name(77)	Character string	R					Application Tag	character string (0x7507)			
							String	"AC_CONTROLLER"			
Object Type(79)	BACnet Object Type	R					Application Tag	enumerated (0x91)		Device(8)	
							Device object	0x08			
System Status(112)	BACnet Device Status	R	*				Application Tag	enumerated (0x91)	Intrinsic reporting		
							value	OPERATIONAL			0x00
								NON_OPERATIONAL			0x04
Vender Name(121)	Character string	R					Application Tag	character string (0x750F)			
							value	Toshiba Carrier Corp.			
Vender Identifier(120)	Unsigned	R					Application Tag	Unsigned(0x21)			
							value	0x07D0			
Model Name(70)	Character string	R					Application Tag	character string			
							value	BMS-STBN03E			
Firmware Revision(44)	Character string	R					Application Tag	character string			
							value	AAC			
Application Software Version(12)	Character string	R					Application Tag	character string			
							value	*.*.*			
Protocol Version(98)	Unsigned	R					Application Tag	Bit string 4Byte			
							value	0x00000001			
Protocol Revision(139)	Unsigned	R					Application Tag	Bit string 4Byte			
							value	0x00000004			

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value	Notice of Status Change	Remarks	
Protocol Service Supported(97)	BACnet Supported	Service	R				Application Tag			
							Bit string 6Byte			
							First Byte			0x00
							After the second Byte			0x20CB802CA1
							Service Name			
							AcknowledgementAlarm			N/A
							confirmedCOVNotification			N/A
							confirmedEventNotification			✓
							getAlarmSummary			N/A
							getEnrollmentSummary			N/A
							subscribeCOV			N/A
							atomicReadFile			N/A
							atomicWriteFile			N/A
							addListElement			✓
							removeListElement			✓
							createObject			N/A
							deleteObject			N/A
							readProperty			✓
							readPropertyConditional			N/A
							readPropertyMultiple			✓
							writeProperty			✓
							writePropertyMultiple			✓
							deviceCommunicationControl			✓
							confirmedPrivateTransfer			N/A
							confirmedTextMessage			N/A
							reinitializeDevice			✓
							vtOpen			N/A
							vtClose			N/A
							vtData			N/A
							Aithenticate			N/A
							requestKey			N/A
							i-Am			✓
							i-Have			✓
							unconfirmedCOVnotification			✓
unconfirmedEventNotification	✓									
unconfirmedPrivateTransfer	N/A									
unconfirmedTextMessage	N/A									
timeSynchronization	✓									
Who-Has	✓									
Who-Is	✓									
ReadRange	N/A									
utcTimeSynchronization	N/A									
lifeSaftyOperation	N/A									
subscribeCOVProperty	N/A									
getEventInformation	N/A									

Property Identifier	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Protocol Object Types Supported(96)	Protocol Object Types Supported	R					Application Tag	Bit string 5Byte			
								First Byte			0x07
								After the second Byte			0xDE860000
								Object Type			
								Analog-input			✓
								Analog-output			✓
								Analog-value			N/A
								Binary-input			✓
								Binary-output			✓
								Binary-value			✓
								Calendar			✓
								Command			N/A
								Device			✓
								Event-enrollment			N/A
								file			N/A
								Group			N/A
								Loop			N/A
								Multi-state-input			✓
								Multi-state-output			✓
								Notification-class			✓
								Program			N/A
	Schedule	✓									
	Average	N/A									
	Multi-state-value	N/A									
	Trend-log	N/A									
	Life-safety-point	N/A									
	Life-safety-zone	N/A									
	Accumulator	N/A									
	Pulse-converter	N/A									
MAX_APDU length Supported(62)	Unsigned	R					Application Tag	Unsigned(0x22)			
							value	1024Byte(0x0400)			
Segmentation Supported(107)	BACnet Segmentation	R					Application Tag	Enumerated(0x91)			
							value	No-segmentation(0x03)			
Local Time(57)	Time	R	*				Application Tag	Time(0xB4)			
							value	Hour, Minute, Second, a hundredth of a second is "0"			
Local Date(56)	Date	R	*				Application Tag	Date(0xA4)			
							value	Year, Month, Day, a day of the week			
APDU Timeout(11)	Unsigned2	R					Application Tag	Unsigned1(0x22)			
							value	60000msec(0xEA60)			
Number of APDU Retries(73)	Unsigned	R					Application Tag	Unsigned1(0x21)			
							value	0x00			

2.2 ON / OFF status

Name	Data
Object Type	4
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x82
Object Type	Binary Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80	
							binary input object	0x0100**82			
Object Name(77)	character string	R					Application Tag	character string (0x7513)			
							String	“_“			
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		Binary Output(4)	
							analog input object	0x04			
Present value(85)	BACnetBinaryPV	W	*			0x91	Application Tag	enumerated (0x91)	COV		
							Value	INACTIVE			0x00
								ACTIVE			0x01

2.3 Operation mode

Name	Data
Object Type	1
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x83
Object Type	Analog Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80	
							binary input object	0x0040**83			
Object Name(77)	character string	R					Application Tag	character string (0x7511)			
							String	“_“			
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)			
							analog output object	0x01			
Present value(85)	Real	W	*			0x44	Application Tag	Real (0x44)	COV		
							Value	Heating			1.0
								Cooling			2.0
								Fan			3.0
								Dry			4.0
								Auto			5.0

2.4 Fan Speed

Name	Data
Object Type	14
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x85
Object Type	Analog Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80	
							binary input object	0x0040**85			
Object Name(77)	character string	R					Application Tag	character string (0x7506)			
							String	“_”			
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)			
							analog output object	0x01			
Present value(85)	Real	W	*			0x44	Application Tag	Real (0x44)	COV		
							Value	Stop			1.0
								Auto			2.0
								HH			3.0
								H			4.0
								L			5.0
								LL			6.0

2.5 Louver

Name	Data
Object Type	14
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x87
Object Type	Multi-state Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80	
							binary input object	0x0040**87			
Object Name(77)	character string	R					Application Tag	character string (0x7507)			
							String	“_“			
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)			
							analog output object	0x01			
Present value(85)	BACnetBinaryPV	W	*			0x44	Application Tag	Real (0x44)	COV		
							Value	SWING			1.0
								F1			2.0
								F2			3.0
								F3			4.0
								F4			5.0
								F5			6.0
								Stop			7.0

2.6 Set temperature

Name	Data
Object Type	1
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x84
Object Type	Analog Output Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80
							binary input object	0x0040**84		
Object Name(77)	character string	R					Application Tag	character string (0x750E)		
							String	“_“		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		
							analog output object	0x01		
Present value(85)	BACnetBinaryPV	W	*			0x44	Application Tag	Real (0x44)	COV	
							Value	From 18.0 to 29.0		

2.7 Room temperature

Name	Data
Object Type	0
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x08
Object Type	Analog Input Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80
							binary input object	0x0000**08		
Object Name(77)	character string	R					Application Tag	character string (0x7513)		
							String	“_“		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		ANALOG_INPUT(0)
							analog input object	0x00		
Present value(85)	BACnetBinaryPV	R	*			0x44	Application Tag	Real(0x44)		When is normal, the value is '0.0'.
							Value	From -39.0 to 150.0		

2.8 Permit / Prohibit of Local Operation

Name	Data
Object Type	3
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x40
Object Type	Binary Input Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value				Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)					*** : air conditioning number 0x01 – 0x80
							binary input object	0x00C0**40					
Object Name(77)	character string	R					Application Tag	character string (0x750f)					
							String	“_“					
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)					Binary Input(3)
							binary input object	0x03					
Present value(85)	BACnetBinaryPV	W	*			0x21	Application Tag	enumerated (0x91)				intrinsic reporting	
							Value	Prohibition					
								Mode	Temp	ON/OFF	Data		
								-	-	-	0x01		
								✓	-	-	0x02		
								-	✓	-	0x03		
								-	-	✓	0x04		
								✓	✓	-	0x05		
								✓	-	✓	0x06		
								-	✓	✓	0x07		
✓	✓	✓	0x08										

2.9 Error status

Name	Data
Object Type	3
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x40
Object Type	Binary Input Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks	
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80	
							binary input object	0x00C0**40			
Object Name(77)	character string	R					Application Tag	character string (0x750f)			
							String	“_“			
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		Binary Input(3)	
							binary input object	0x03			
Present value(85)	BACnetBinaryPV	R	*			0x91	Application Tag	enumerated (0x91)	intrinsic reporting	Error Code : please refer to ‘2.9 Indoor unit Error Code’.	
							Value	No Error			0x00
								Error			0x01

2.10 Error Code

Name	Data
Object Type	4
Equipment Category	0000
Equipment Number	From 1 to 128
Instance Number	0x01
Object Type	Analog Input Object

Property Identifire	Property Data Type	Read Write	Variable	Array	List	Tag	Value		Notice of Status Change	Remarks
Object Identifire(75)	BACnet Object ID	R				0xC4	Application Tag	object identifire (0xc4)		*** : air conditioning number 0x01 – 0x80
							binary input object	0x0000**01		
Object Name(77)	character string	R					Application Tag	character string (0x7514)		
							String	“_“		
Object Type(79)	BACnetObjectType	R				0x91	Application Tag	enumerated (0x91)		Analog Input(0)
							binary input object	0x00		
Present value(85)	BACnetBinaryPV	R	*			0x44	Application Tag	Real(0x44)		When is No Error, the value is '0x00'.
							Value	From 0x00 to 0xFF		