ENGLISH

IN485UNI001I100 UNIVERSAL GATEWAY

IR Air Conditioners to BACnet MS/TP and Modbus RTU

USER MANUAL
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Table of Contents

1. Description, Compatible AC systems, and Order Codes

BACnet MS/TP and Modbus RTU gateway for IR AC systems.

Compatible with IR AC units from most AC brands.

Use the compatibility tool to get a complete list of compatible units: https://compatibility.intesis.com/

ORDER CODE	LEGACY ORDER CODE
IN485UNI001I100	IN485UNI001I000

2. General Information

INTENDED USE OF THE USER MANUAL

This manual contains the main features of this gateway and the instructions for its appropriate installation, configuration, and operation. The contents of this manual should be brought to the attention of any person who installs, configures, or operates this gateway or any associated equipment. Keep this manual for future reference during the installation, configuration, and operation.

GENERAL SAFETY INFORMATION

IMPORTANT
Follow these instructions carefully. Improper work may seriously harm your health and damage the gateway and/or any other equipment connected to it.

Only technical personnel, following these instructions and the country legislation for installing electrical equipment, can install and manipulate this gateway.

Disconnect all systems from power before manipulating and connecting them to the gateway.

Install this gateway indoors, in a restricted access location, avoiding exposure to direct solar radiation, water, high relative humidity, or dust.

All wires (for communication and power supply, if needed) must only be connected to networks with indoor wiring. All communication ports are considered for indoor use and must only be connected to SELV circuits.

Use SELV-rated NEC class 2 or limited power source (LPS) power supply.

Supply the correct voltage to power the gateway. The admitted range is detailed in the technical specifications table.

Respect the expected polarity of power and communication cables when connecting them to the gateway.

ADMONITION MESSAGES

IMPORTANT
Instruction that must be followed to avoid a risk of reduced functionality and/or damage to the equipment or to avoid a network security risk.

NOTE
Additional information which may facilitate installation and/or operation.

TIP
Helpful advice and suggestions.

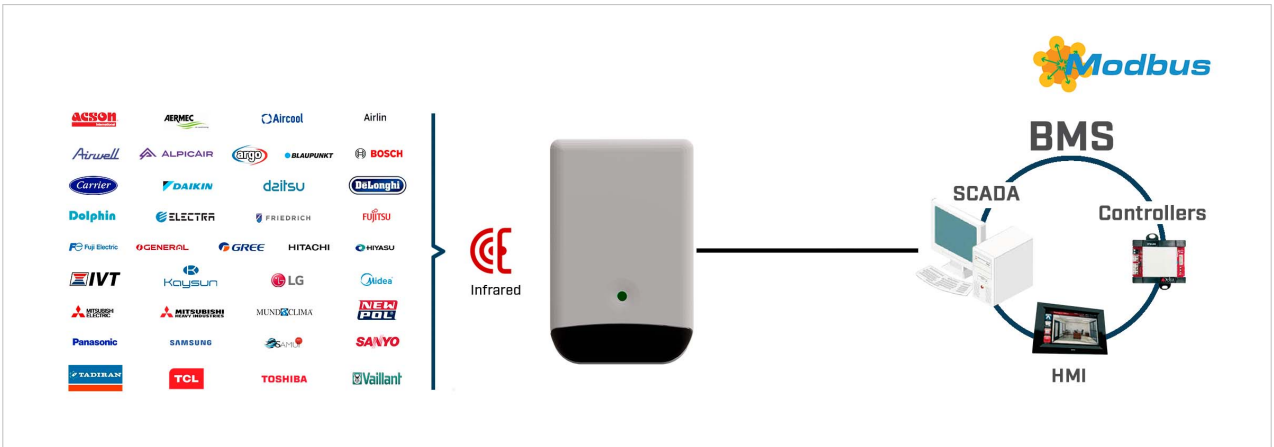
NOTICE
Remarkable Information.

3. Overview

NOTE
You can configure the IN485UNI001I100 gateway for BACnet MS/TP or Modbus RTU using the Intesis MAPS configuration tool. The configuration process is widely explained in the Configuration guide for IN485UNI001I100.

Figure 1. Integration of IR air conditioners into a BACnet installation using the Intesis IN485UNI001I100 gateway

Figure 2. Integration of IR air conditioners into a Modbus installation using the Intesis IN485UNI001I100 gateway



NOTE
This document assumes that the user is familiar with BACnet, Modbus, and IR air conditioning technologies and their technical terms.

3.1. Inside the Package

ITEMS INCLUDED

- Intesis IN485UNI001I100 gateway
- Power supply
- Adapter plugs for EU, UK, USA, and AU
- Extension cord
- Installation guide

3.2. Main Features

- Configurable for BACnet MS/TP or Modbus RTU
- Compatible with IR air conditioners from most brands
- Bidirectional communication between the AC unit and the building management system (BMS)
- Built-in room temperature and humidity sensors
- Auto-learn function for a quick and easy setup of the IR remote control
- Simultaneous control of the AC unit both from the BMS side and from the IR remote controller
- Reduced dimensions
- Wall or desktop (surface) mounting
- Direct connection to BACnet MS/TP or Modbus RTU through the EIA-485 port
- Up to 63 interfaces can be connected to the BACnet/Modbus network
- Mini USB port for connection to the configuration software
- Power supply and adapter plugs included (EU, UK, USA, and AU adapter plugs)

3.3. Gateway Capacity

This Intesis gateway can integrate one single IR AC unit and its associated elements.

3.4. General Functionality

With this Intesis IN485UNI001I100 gateway, you can easily integrate air conditioners having an IR receiver into a system based on BACnet MS/TP or Modbus RTU.

The gateway is connected to the BMS through the EIA-485 bus and to the AC unit via infrared light, acting as a link between both systems. This enables bidirectional control for the gateway: On the one hand, the gateway receives the status of the indoor unit from the AC system's IR remote controller and reports it to the BMS. On the other hand, any command from the BMS is sent to the gateway, which transmits those messages to the AC unit through IR signals.

The AC unit can be controlled simultaneously from both the AC system's IR remote controller (if present) and the BACnet/Modbus system.

4. Quickstart Guide

1. Connect the gateway to the PC through its mini USB port.
2. Configure your gateway using the Intesis MAPS configuration tool. For more information, please refer to the IN485UNI001I100 Configuration guide.
3. Connect the gateway to the power supply through the mini USB port using the cable delivered with it. See Connection to the Power Supply (Mini USB Port) (page 7).
4. Look for the gateway best emplacement. See Gateway Emplacement (page 7).
5. Connect the gateway to the BACnet MS/TP or Modbus RTU network though the EIA-485 port. See Connection to EIA-485 (page 9).
6. Mount the gateway. See Mounting (page 10).

5. Hardware

5.1. Gateway Layout

① LED
② IR emitter and receptor
③ EIA-485 connector
④ USB port
⑤ Temperature probe and humidity sensor
⑥ Push button

IMPORTANT
Open the enclosure only for setting the DIP switch, if needed.

If opened, the enclosure must be closed correctly, ensuring its frontal and rear parts fit perfectly. Two signs informing of a wrong closing are:

- The push button does not protrude from its hole and gets stuck inside the lid, which will cause a malfunction.
- The LED blinks in white.

5.2. Installation Instructions

Follow this order to install the gateway:

1. Connect the gateway to the power supply. See Connection to the Power Supply (Mini USB Port) (page 7).
2. Look for the proper emplacement for the gateway. See Gateway Emplacement (page 7).
3. Connect the gateway to BACnet/Modbus. See Connection to EIA-485 (page 9).
4. Mount the gateway. See Mounting (page 10).

5.2.1. Connection to the Power Supply (Mini USB Port)

1. Connect the delivered power supply to the gateway's mini USB port.
2. Plug the power supply into the grid[1]. Use one of the delivered adapters if needed.

IMPORTANT

[1] The delivered power supply transformer converts up to 240 V to the required 5 V. If using another power supply, be sure to respect the following requirements:

- Use a SELV-rated NEC class 2 or limited power source (LPS) power supply.
- Respect polarity.
- Apply the admitted voltage and power: 5 VDC, 250 mA.

NOTE

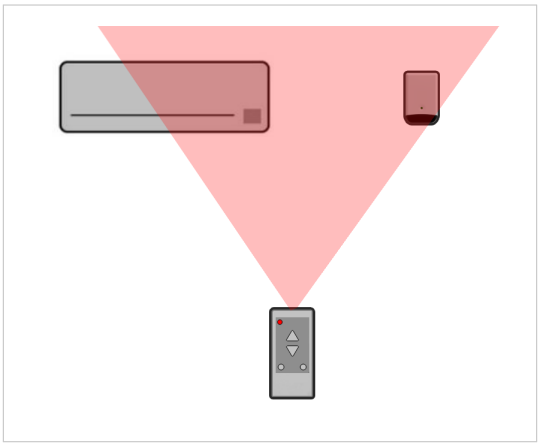
The mini USB port is also used to connect the gateway to a PC for configuration purposes.

5.2.2. Gateway Emplacement

The gateway sends data to the indoor unit through its four IR transmitters, while it receives feedback from the AC system's IR remote controller through its IR receiver. This means that the gateway emplacement is very important to grant proper communication between the gateway, the indoor unit, and the IR remote controller.

SIGNAL TRANSMISSION FROM THE IR REMOTE CONTROLLER TO THE GATEWAY

The remote controller's IR signal must be received simultaneously by both the indoor unit and the gateway. To ensure that, place the gateway near the indoor unit and within the IR remote controller's transmission range.



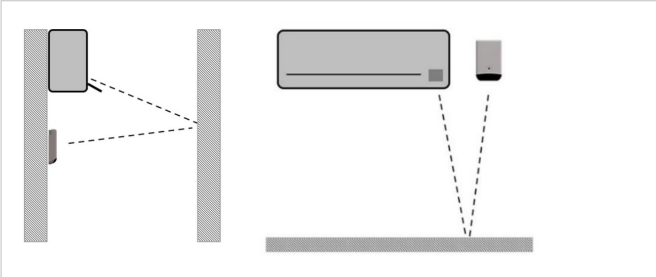
IMPORTANT

The range of the IR remote controller may vary depending on the AC system brand and model and the remote controller's battery's charge level.

SIGNAL TRANSMISSION FROM THE GATEWAY TO THE INDOOR UNIT

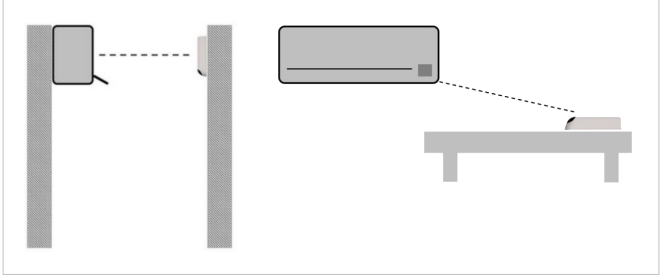
Also, the IR signal sent from the gateway must be clearly received by the indoor unit, so there must be a clear line of sight between both devices. Several emplacements are allowed:

Figure 3. Gateway placed below (left) or alongside the AC unit (right)



IMPORTANT
Consider that, in these two emplacement options shown above, the IR signal transmitted from the gateway to the indoor unit rebounds on a wall or the floor. Some furniture and materials (carpets, curtains, glass, metal…) may affect the signal.

Figure 4. Gateway placed in front of the AC unit (left) or over a desktop or any other horizontal surface (right)



You can use the Parrot mode to check that the IR signal sent from the gateway is indeed received by the indoor unit.

PARROT MODE

When enabling the Parrot mode, the gateway acts as a repeater, emitting every IR signal emitted by the IR remote controller.

To enable the Parrot mode, follow this procedure:

1. Press the push button and hold it for five seconds.
2. The LED will flicker* in white.
   **Flicker: 0.75 seconds on - 0.25 seconds off*
3. Release the button.

   NOTE
   At this point, the gateway is in Manual control mode.

4. Short press the button three times (three clicks).
5. The LED will blink** in white.
   ***Blink: 0.5 seconds on - 0.5 seconds off*

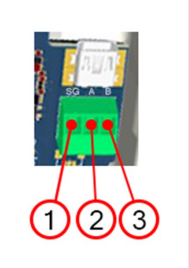
6. Point the AC system's IR remote controller at the gateway and turn the indoor unit on or off to ensure that the signal is also transmitted from the gateway to the indoor unit.
7. To exit the Parrot mode, press the button three times again (three clicks).

5.2.3. Connection to EIA-485

1. Find the EIA-485 connector (three poles) at the gateway's rear side.
2. Connect the EIA-485 bus to the corresponding terminal:
   - SG: signal ground
   - A: +
   - B: -

IMPORTANT
Respect the polarity.

Figure 5. 1: Signal ground; 2: Terminal A (+); 3 Terminal B (-)



EIA-485 BUS. TERMINATION RESISTORS AND FAIL-SAFE BIASING MECHANISM
The EIA-485 bus requires a 120Ω terminator resistor at each end of the bus to avoid signal reflections.

In order to prevent fail status detections by the receivers, which are "listening" to the bus, when all the transmitters' outputs are in three-state (high impedance), a fail-safe biasing mechanism is required. This mechanism provides a safe status (a correct voltage level) in the bus when all the transmitters' outputs are in three-state.

The IN485UNI001I100 gateway includes an on-board terminator resistor of 120Ω that can be connected to the EIA-485 bus by using the DIP switch.

- **Position 1:**
  ON: 120 Ω termination active.
  OFF: 120 Ω termination inactive (default position).

Some BACnet MS/TP EIA-485 Master devices can provide also internal 120Ω terminator resistor and/or fail-safe biasing. Consult the technical documentation of the Master device connected to the EIA-485 network in each case.

If the termination resistor is enabled and you install the gateway at one of the ends of the bus, do not install an additional termination resistor at that end.

5.2.4. Mounting

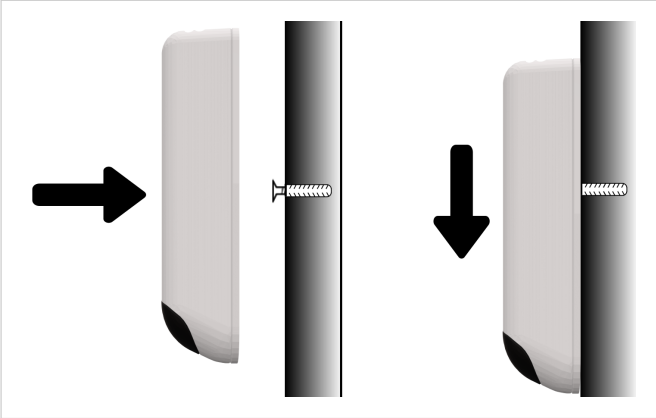
NOTE
These instructions refer to the wall mounting option.

The rear panel of the gateway has a blind hole for its mounting.

NOTE

- Use an M4 screw.
- Let the screw's head protrude 2 mm (0.08 in) from the wall.

1. Position the gateway close to the wall, aligning the screw’s head with the blind hole.
2. Pull the gateway down gently to fit it into the screw's shank.



5.3. LED Indicator

The gateway has one multicolor LED indicator visible from the front panel.

Table 1. LED patterns

Behavior	Pattern
Steady on	100% on
Long blink	1 sec on - 1 sec off
Flicker	0.75 sec on - 0.25 sec off
Blink	0.5 sec on - 0.5 sec off
Off	100% off

Table 2. LED behavior during regular operation

Color	Behavior	Description
Red	Steady on	Heat mode
Blue	Steady on	Cool mode
Blue	Steady on	Dry mode
Yellow	Steady on	Auto mode

Color	Behavior	Description
Green	Steady on	Fan mode
Red	Blink x 3	Command received or sent during Heat mode
Blue	Blink x 3	Command received or sent during Cool mode
Blue	Blink x 3	Command received or sent during Dry mode
Yellow	Blink x 3	Command received or sent during Auto mode
Green	Blink x 3	Command received or sent during Fan mode

NOTE
While holding the push button for five seconds to enable or disable the manual control mode the LED will flicker in white until the button release.

Table 3. LED behavior during Parrot mode

Color	Behavior	Description
White	Blink	Parrot mode is enabled

Table 4. LED behavior during Autolearn mode

Color	Behavior	Description
White	Steady on	The gateway is ready to get an IR frame

Table 5. LED behavior for error notification

Color	Behavior	Description
Red	Fast blink	Communication error

5.4. Push Button

The push button is accessible from the bottom side of the gateway. Use it to:

ENABLE/DISABLE THE MANUAL CONTROL MODE

- Hold the button pressed for five seconds to enable/disable the Manual control mode.
- During the Manual control mode, depending on the indoor unit's current status and the button action, you can turn the unit on in Cool or Heat modes, or turn it off. You can also enable/disable the gateway's Parrot mode:

AC current status	Button action	Behavior
Off	One click	AC unit turns on in Cool mode at 25°C
Off	Two clicks	AC unit turns on in Heat mode at 21°C
On	One or two clicks	AC unit turns off
On or Off	Three clicks	Enable/disable the gateway's Parrot mode[1]

NOTE
[1] When enabling the Parrot mode, the gateway acts as a repeater, emitting every IR signal emitted by the IR remote controller. This mode is used to find the gateway's best emplacement. See Installation Instructions (page 6).

IMPORTANT
When the gateway is in Parrot mode, the AC unit cannot be turned on or off using this button.

FACTORY RESET

1. Disconnect the gateway from power.
2. Press the push button, holding it pressed.
3. Reconnect power.
4. After ten seconds, the LED flashes five times in white.
5. Release the button.

5.5. DIP Switch

The gateway includes one DIP switch block (3 positions) mounted on its PCB.

NOTE
The gateway is connected to the BMS through its EIA-485 port. Since the EIA-485 bus needs a 120 ohms (Ω) termination resistor at each end, the gateway includes an internal bus biasing circuit already incorporating the termination resistor.

The terminal resistor can be enabled/disabled using the DIP switch block (position 1):

- **ON**: 120 Ω termination active
- **OFF**: 120 Ω termination inactive (default)

Use position 2 and position 3 of the DIP switch block to activate/deactivate the polarization:

- **ON**: Polarization active
- **OFF**: Polarization inactive (default)

NOTE
To access the DIP switch you have to open the enclosure. The frontal and the rear panels are assembled by snap-fitting tabs and can be easily disassembled using a small flat-tipped tool (size < 5mm). This procedure must be performed by qualified personnel only.

IMPORTANT

When closing the enclosure, ensure its frontal and rear parts fit perfectly. Two signs informing of a wrong closing are:

- The push button does not protrude from its hole and gets stuck inside the lid, which will cause a malfunction.
- The LED blinks in white.

5.6. Technical Specifications

Housing	Plastic, PC-Type (UL94 V-0) Net dimensions (HxWxD): 93 x 60 x 21 mm / 3.7” x 2.4” x 0.9” Color: Light Grey. NCS S 1002-B
Weight	55 g (1.94 oz)
Mounting	Wall On an horizontal surface (e.g. a desktop)
Terminal wiring	For terminal: solid wires or stranded wires (twisted or with ferrule) One core: 0.25 .. 1 mm^2 (24 .. 17 AWG) Two cores: 0.25 .. 0.75 mm^2 (24 .. 19 AWG) Three cores: 0.25 .. 0.75 mm^2 (24 .. 19 AWG)
EIA-485	1 x EIA-485 pluggable terminal block (3 poles: Signal ground, A, and B) with 120 Ω resistor termination and polarization configurable by DIP switch

DIP switch	• Position 1:
	  • On: 120 Ω termination active
	  • Off: 120 Ω termination inactive (default)
	• Positions 2 and 3:
	  • On: Polarization active
	  • Off: Polarization inactive (default)

USB port	1 x Standard USB (mini-B type), 5VDC Max Consumption: 400 mA
Temperature and humidity sensor	Humidity: 5 .. 100% HR (accuracy: ±10%) Temperature: 0 .. 60°C / 32 .. 140°F (accuracy: ±5%)
Buttons	1 x Push button
Power supply	SELV-rated NEC class 2 or limited power source (LPS) power supply 5 VDC, 250 mA
Operational temperature	0 .. 60°C / 32 .. 140°F
Operational humidity	5 .. 95% RH, non-condensing
Protection	IP20 (IEC60529)
LED Indicators	1 x external LED for operational status

5.7. Dimensions

Net dimensions (HxWxD): 93 x 60 x 21 mm / 3.7” x 2.3” x 0.83”

6. Available BMS Protocols: BACnet and Modbus

This IN485UNI001I100 gateway can be configured either for BACnet or for Modbus.

This configuration is carried out using the Intesis MAPS configuration tool by selecting the needed template:

- **IN-MBS-IR** for Modbus.
- **IN-BAC-IR** for BACnet.

To learn everything about the configuration procedure, consult the IN485UNI001I100 Configuration guide.

NOTE
The following sections list all the BACnet objects and Modbus registers available for this gateway.

7. BACnet Specifications

7.1. Supported Object Types

Object type	ID
Analog-Input	0
Analog-Output	1
Analog-Value	2
Binary-Input	3
Binary-Output	4
Binary-Value	5
Device	8
Multistate-Input	13
Multistate-Output	14
Multistate-Value	19

7.2. Type: Gateway

Object name	Description	Object type	Object instance
IN485UNI001I100	IR-enabled AC interface	8: Device	246000 (default)

7.3. Type: Indoor Unit

Object-name	Description	Object-type	Object-instance
OnOff_status		3:BI	0
OnOff_command		4:BO	0
Mode_status		13:MI	0
Mode_command		14:MO	0
SetPoint_status		0:AI	0
SetPoint_command		1:AO	0
FanSpeed_status		13:MI	1
FanSpeed_command		14:MO	1
AirDirectionUD_status		13:MI	2
AirDirectionUD_command		14:MO	2
AirDirectionLR_status		13:MI	3
AirDirectionLR_command		14:MO	3
RoomTemperature_status		0:AI	1
OnTimeCounter		2:AV	0
LockRemoteControl		5:BV	2
HumiditySensor_status		0:AI	13
ParrotMode		5:BV	3
ResetBehaviour		19:MV	4
OnOff_startup		5:BV	4
UserMode_startup		19:MV	5
SetPoint_startup		2:AV	6
FanSp_startup		19:MV	6
VanesUD_startup		19:MV	7
VanesLR_startup		19:MV	8
SerialNumber		0:AI	11
RGB_Led_Behaviour		19:MV	2
RGB_Led_Intensity		19:MV	3
IR_Remote_ID		0:AI	14
IR_Remote_FW_VERSION		0:AI	15
IR_Remote_FW_CRC		0:AI	16
ErrorCode		0:AI	2
ErrorCodeM		13:MI	4
ErrorActive		3:BI	1

7.4. Objects and Properties

7.4.1. Universal IR AC Gateway (Device Object Type)

Object_Identifier: Identifying the gateway in the BACnet network.

Object_name: In the **Device Object**, is configurable writing directly on this property.

Description: In the **Device Object**, is configurable writing directly on the property. Max. length: 63 characters.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	Device, 246000 (default value)	R	W
Object_Name	CharacterString	IN485UNI001I100	R	W
Object_Type	BACnetObjectType	DEVICE (8) (Device Object Type)	R	R
System_Status	BACnetDeviceStatus	OPERATIONAL (0)	R	R
Vendor_Name	CharacterString	HMS Industrial Networks SLU	R	R
Vendor_Identifier	Unsigned16	246	R	R
Model_Name	CharacterString	IN485UNI001I100	R	R
Firmware_Revision	CharacterString	1.0.0.0	R	R
Application_Software_Version	CharacterString	1.0.0.0	R	R
Location	CharacterString	""	O	-
Description	CharacterString	Universal IR AC interface	O	W
Protocol_Version	Unsigned	1	R	R
Protocol_Revision	Unsigned	12	R	R
Protocol_Services_Supported	BACnetServiceSupported	-	R	R
Protocol_Object_Types_Supported	BACnetObjectTypes Supported	Refer to section Supported Object Types (page 16)	R	R
Object_List	BACnetArray[N] of BACnetObjectIdentifier	BACnetARRAY[N]	R	R
Structured_Object_List	BACnetArray[N] of BACnetObjectIdentifier	-	O	-
Max_APDU_Length_Accepted	Unsigned	480	R	R
Segmentation_Supported	BACnetSegmentation	SEGMENTED-BOTH (0)	R	R
Max_Segments_accepted	Unsigned	16	O	R
VT_Classes_Supported	List of BACnetVTClass	-	O	-
Active_VT_Sessions	List of BACnetVTSession	-	O	-
Local_Date	Date	-	O	-
Local_Time	Time	-	O	-
UTC_Offset	INTEGER	-	O	-
Daylight_Savings_Status	BOOLEAN	-	O	-

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
APDU_Segment_Timeout	Unsigned	3000	R	R
APDU_Timeout	Unsigned	3000	R	R
Number_of_APDU_Retries	Unsigned	3	R	R
List_Of_Session_Keys	List of BACnetSessionKey	-	O	-
Time_Synchronization_Recipients	List of BACnetRecipient	-	O	-
Max_Master	Unsigned	32	R	W
Max_Info_Frames	Unsigned	1	O	R
Device_Address_Binding	List of BACnetAddressBinding	NULL (empty)	R	R
Database_Revision	Unsigned	0	R	R
Configuration_Files	BACnetArray[N] of BACnetObjectIdentifier	-	O	-
Last_Restore_Time	BACnetTimeStamp	-	O	-
Backup_Failure_Timeout	Unsigned16	-	O	-
Active_COV_Subscriptions	List of BACnetCOVSubscription	List of BACnetCOVSubscription	O	R
Slave_Proxy_Enable	BACnetArray[N] of BOOLEAN	-	O	-
Manual_Slave_Address_Binding	List of BACnetAddressBinding	-	O	-
Auto_Slave_Discovery	BACnetArray[N] of BOOLEAN	-	O	-
Slave_Address_Binding	BACnetAddressBinding	-	O	-
Last_Restart_Reason	BACnetRestartReason	-	O	-
Time_Of_Device_Restart	BACnetTimeStamp	-	O	-
Restart_Notification_Recipients	List of BACnetRecipient	-	O	-
UTC_Time_Synchronization_Recipients	List of BACnetRecipient	-	O	-
Time_Synchronization_Interval	Unsigned	-	O	-
Align_Intervals	BOOLEAN	-	O	-
Interval_Offset	Unsigned	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.2. OnOff_status (Binary Input Object Type)

It indicates if the indoor unit is turned on or off.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Binary Input, 0)	R	R
Object_Name	CharacterString	OnOff_status	R	R
Object_Type	BACnetObjectType	BINARY_INPUT (3)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Polarity	BACnetPolarity	NORMAL (0)	R	R
Inactive_Text	CharacterString	Off	O	R
Active_Text	CharacterString	On	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.3. OnOff_command (Binary Output Object Type)

It turns the indoor unit on or off.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Binary Output, 0)	R	R
Object_Name	CharacterString	OnOff_command	R	R
Object_Type	BACnetObjectType	BINARY_OUTPUT (4)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	W	W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Polarity	BACnetPolarity	NORMAL (0)	R	R
Inactive_Text	CharacterString	Off	O	R
Active_Text	CharacterString	On	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Minimum_Off_Time	Unsigned32	-	O	-
Minimum_On_Time	Unsigned32	-	O	-
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	BACnetBinaryPV	INACTIVE (0)	R	R
Time Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.4. Mode_status (Multistate Input Object Type)

It indicates the indoor unit's current mode.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Input, 0)	R	R
Object_Name	CharacterString	Mode_status	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT (13)	R	R
Present_Value	Unsigned	1 .. 5	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER(7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned	5	R	R
State_Text	BACnetArray[N] of CharacterString	Check the **Mode status table** below.	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Table 6. Mode status

Present_Value	State_Text
1	Heat
2	Cool
3	Fan
4	Dry
5	Auto

7.4.5. Mode_command (Multistate Output Object Type)

It sets the AC indoor unit's mode.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Output,0)	R	R
Object_Name	CharacterString	Mode_command	R	R
Object_Type	BACnetObjectType	MULTISTATE_OUTPUT (14)	R	R
Present_Value	Unsigned	1 .. 5	W	W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned	5	R	R
State_Text	BACnetArray[N] of CharacterString	Check the **Mode command table** below	O	R
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	Unsigned	1	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Table 7. Mode command

Present_Value	State_Text
1	Heat
2	Cool
3	Fan
4	Dry
5	Auto

7.4.6. Setpoint_status (Analog Input Object Type)

It reports the temperature setpoint requested to the indoor unit.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 0)	R	R
Object_Name	CharacterString	SetPoint_status	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value	REAL	16 .. 31°C / 61 .. 87.8°F	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units	BACnetEngineeringUnits	Celsius degrees (62) Fahrenheit degrees (64)	R	R
Min_Pres_Value	REAL	16°C / 61°F	O	R
Max_Pres_Value	REAL	31°C / 88°F	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.7. Setpoint_command (Analog Output Object Type)

It is used to request a temperature setpoint from the BACnet side.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Analog Output, 0)	R	R
Object_Name	CharacterString	SetPoint_command	R	R
Object_Type	BACnetObjectType	ANALOG_OUTPUT (1)	R	R
Present_Value	REAL	16 .. 31°C / 61 .. 87.8°F	R	W
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units	BACnetEngineeringUnits	Celsius degrees (62) Fahrenheit degrees (64)	R	R
Min_Pres_Value	REAL	16°C / 61°F	O	R
Max_Pres_Value	REAL	31°C / 88°F	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	Unsigned	22	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.8. FanSpeed_status (Multistate Input Object Type)

It indicates the indoor unit's fan speed.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Input, 1)	R	R
Object_Name	CharacterString	FanSpeed_status	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT (13)	R	R
Present_Value	Unsigned	1 .. 11	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	11	R	R
State_Text	BACnetArray[N] of CharacterString	Check the **Fan speed status table** below.	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Table 8. Fan speed status

Present_Value	State_Text	Present_Value	State_Text
1	Auto	7	Fan speed 6
2	Fan speed 1	8	Fan speed 7
3	Fan speed 2	9	Fan speed 8
4	Fan speed 3	10	Fan speed 9
5	Fan speed 4	11	Fan speed 10
6	Fan speed 5		

NOTE
The number of fan speeds varies depending on the AC unit.

7.4.9. FanSpeed_command (Multistate Output Object Type)

It sets the indoor unit's fan speed.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Output, 1)	R	R
Object_Name	CharacterString	FanSpeed_command	R	R
Object_Type	BACnetObjectType	MULTISTATE_OUTPUT (14)	R	R
Present_Value	Unsigned			W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned		R	R
State_Text	BACnetArray[N] of CharacterString	Check the **Fan speed command table** below	O	R
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	Unsigned	1	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Table 9. Fan speed command

Present_Value	State_Text	Present_Value	State_Text
1	Auto	7	Fan speed 6
2	Fan speed 1	8	Fan speed 7
3	Fan speed 2	9	Fan speed 8
4	Fan speed 3	10	Fan speed 9
5	Fan speed 4	11	Fan speed 10
6	Fan speed 5		

NOTE
The number of fan speeds varies depending on the AC unit.

7.4.10. AirDirectionUD_status (Multistate Input Object Type)

It indicates the indoor unit's vertical air direction (up-down) status.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Input, 2)	R	R
Object_Name	CharacterString	AirDirectionUD_status	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT(13)	R	R
Present_Value	Unsigned	1 .. 13	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	13	R	R
State_Text	BACnetArray[N] of CharacterString	Check the **Air direction status table** below.	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Table 10. Air direction up-down status

Present_Value	State_Text
1	Auto/Stop
2…10	POS 1 … 9
11	Swing
12	Swirl
13	Wide

7.4.11. AirDirectionUD_command (Multistate Output Object Type)

It sets the indoor unit's vertical air direction (up-down).

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Output, 2)	R	R
Object_Name	CharacterString	AirDirectionUD_command	R	R
Object_Type	BACnetObjectType	MULTISTATE_OUTPUT (14)	R	R
Present_Value	Unsigned			W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned		R	R
State_Text	BACnetArray[N] of CharacterString	Check the **Air direction command table** below	O	R
Priority_Array	BACnetPriorityArray	-	R	R
Relinquish_Default	Unsigned		R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Table 11. Air direction up-down command

Present_Value	State_Text
1	Auto/Stop
2…10	POS 1 … 9
11	Swing
12	Swirl
13	Wide

7.4.12. AirDirectionLR_status (Multistate Input Object Type)

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multi-state Input, 3)	R	R
Object_Name	CharacterString	AirDirectionLR_status	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT(13)	R	R
Present_Value	Unsigned	1 .. 13	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	13	R	R
State_Text	BACnetArray[N] of CharacterString	Check the **Air direction status table** below.	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Table 12. Air direction left-right status

Present_Value	Content displayed in State_Text
1	Auto/Stop
2…10	POS 1 … 9
11	Swing
12	Swirl
13	Wide

7.4.13. AirDirectionLR_command (Multi-state Output Object Type)

It allows control over the vertical air direction (left-right) for the indoor unit

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multi-state Output, 3)	R	R
Object_Name	CharacterString	AirDirectionLR_command	R	R
Object_Type	BACnetObjectType	MULTISTATE_OUTPUT (14)	R	R
Present_Value	Unsigned	1 .. 13	W	W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned	13	R	R
State_Text	BACnetArray[N] of CharacterString	Check the **Air direction command setting table** below	O	R
Priority_Array	BACnetPriorityArray	-	R	R
Relinquish_Default	Unsigned	-	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Table 13. Air direction left-right command

Present_Value	State_Text
1	Auto/Stop
2 ..10	POS 1 .. 9
11	Swing
12	Swirl
13	Wide

7.4.14. RoomTemperature_status (Analog Input Object Type)

It reports the ambient temperature perceived by the sensor from the AC system side.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 1)	R	R
Object_Name	CharacterString	RoomTemperature_status	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value	REAL	18 .. 30°C / 64 .. 86°F	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Update_Interval	Unsigned	-	O	-
Units	BACnetEngineeringUnits	Celsius degrees (62) Fahrenheit degrees (64)	R	R
Min_Pres_Value	REAL	18°C / 64°F	O	-
Max_Pres_Value	REAL	30°C / 86°F	O	-
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.15. OnTimeCounter (Analog Value Object Type)

It indicates the AC unit running time.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Analog Value, 0)	R	R
Object_Name	CharacterString	OnTimeCounter	R	R
Object_Type	BACnetObjectType	ANALOG_VALUE (2)	R	R
Present_Value	REAL	0 .. 65535	R	R
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units	BACnetEngineeringUnits	Hours (71)	R	R
Min_Pres_Value	REAL	0	O	-
Max_Pres_Value	REAL	65535	O	-
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.16. LockRemoteControl (Binary Value Object Type)

It is used to lock or unlock the AC remote controller.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Binary Value, 2)	R	R
Object_Name	CharacterString	LockRemoteControl	R	R
Object_Type	BACnetObjectType	BINARY_VALUE (5)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	R	R/W
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Inactive_Text	CharacterString	Unlocked	O	R
Active_Text	CharacterString	Locked	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Minimum_Off_Time	Unsigned32	-	O	-
Minimum_On_Time	Unsigned32	-	O	-
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	-
Relinquish_Default	BACnetBinaryPV	INACTIVE (0)	R	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.17. HumiditySensor_status (Analog Input Object Type)

It indicates the current relative humidity measured in the built-in humidity sensor of the IN485UNI001I100 gateway.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 13)	R	R
Object_Name	CharacterString	HumiditySensor_status	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value*	REAL	0 .. 100% RH	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0),	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units	BACnetEngineeringUnits	Percent (98)	R	R
Min_Pres_Value	REAL	0	O	R
Max_Pres_Value	REAL	100	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.18. ParrotMode (Binary Value Object Type)

It indicates if the parrot mode is active or inactive.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Binary Value, 3)	R	R
Object_Name	CharacterString	ParrotMode	R	R
Object_Type	BACnetObjectType	BINARY_VALUE (5)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	W	W
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Inactive_Text	CharacterString	Inactive	O	R
Active_Text	CharacterString	Active	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Minimum_Off_Time	Unsigned32	-	O	-
Minimum_On_Time	Unsigned32	-	O	-
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	-
Relinquish_Default	BACnetBinaryPV	INACTIVE (0)	R	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.19. ResetBehaviour (Multistate Value Object Type)

It indicates the Reset behavior of the gateway.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Value, 4)	R	R
Object_Name	CharacterString	ResetBehaviour	R	R
Object_Type	BACnetObjectType	MULTISTATE_Value (19)	R	R
Present_Value	Unsigned	1 .. 2	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	2	R	R
State_Text	BACnetArray[N] of CharacterString	Check the **ResetBehavior setting table** below.	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

ResetBehaviour interpretation is possible using the value in the following correspondence table.

Table 14. ResetBehavior setting table

Present_Value	State_Text	Description
1	Store AC status	Values for On/Off, Mode, Fan speed, Vanes position, and Setpoint are stored in the gateway's non-volatile memory. After a reset, the gateway restores these values.
2	Do not store AC status	Values for On/Off, Mode, Fan speed, Vanes position, and Setpoint are not stored. After a reset, the values for these signals will be the BACnet default ones.

7.4.20. OnOff_startup (Binary Value Object Type)

It sets the AC unit on or off after starting up or rebooting the gateway.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Binary Value, 4)	R	R
Object_Name	CharacterString	OnOff_startup	R	R
Object_Type	BACnetObjectType	BINARY_VALUE (5)	R	R
Present_Value	BACnetBinaryPV	OFF (0) / ON (1)	W	W
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Inactive_Text	CharacterString	"Disabled"	O	R
Active_Text	CharacterString	“Enabled"	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Minimum_Off_Time	Unsigned32	-	O	-
Minimum_On_Time	Unsigned32	-	O	-
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	-
Relinquish_Default	BACnetBinaryPV	INACTIVE (0)	R	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.21. UserMode_startup (Multistate Value Object Type)

It sets the indoor unit mode after starting up or resetting the gateway.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multi-state Value, 5)	R	R
Object_Name	CharacterString	UserMode_startup	R	R
Object_Type	BACnetObjectType	MULTISTATE_VALUE (19)	R	R
Present_Value	Unsigned	1 .. 5	W	W
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned	5	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **UserMode_startup table** below*	O	R
Priority_Array	BACnetPriorityArray	BACnetPriorityArray	R	R
Relinquish_Default	Unsigned	1	R	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Feedback_Value	Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Mode values can be set using the values in the following correspondence table.

Table 15. UserMode_startup

Present_Value	State_Text
1	Heat
2	Cool
3	Fan
4	Dry
5	Auto

7.4.22. Setpoint_startup (Analog Value Object Type)

It sets the setpoint temperature after starting up or resetting the gateway.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Analog Value, 6)	R	R
Object_Name	CharacterString	Setpoint_startup	R	R
Object_Type	BACnetObjectType	ANALOG_VALUE (2)	R	R
Present_Value*	REAL	16 .. 31 ºC / 61 .. 89 ºF	R	R
Description	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units	BACnetEngineeringUnits	Degrees Celsius (62), Degrees Fahrenheit (64)	R	R
Min_Pres_Value	REAL	16ºC / 61ºF	O	-
Max_Pres_Value	REAL	31ºC / 89ºF	O	-
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.23. FanSp_startup (Multistate Value Object Type)

It sets the fan speed after starting up or resetting the gateway.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Value, 6)	R	R
Object_Name	CharacterString	FanSp_startup	R	R
Object_Type	BACnetObjectType	MULTISTATE_Value (19)	R	R
Present_Value	Unsigned	1 .. 11	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	11	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **FanSp_startup table** below.*	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Fan speed interpretation is possible using the value in the following correspondence table.

Table 16. FanSp_startup

Present_Value	State_Text	Present_Value	State_Text
1	Auto	7	Fan speed 6
2	Fan speed 1	8	Fan speed 7
3	Fan speed 2	9	Fan speed 8
4	Fan speed 3	10	Fan speed 9
5	Fan speed 4	11	Fan speed 10
6	Fan speed 5		

7.4.24. VanesUD_startup (Multistate Value Object Type)

It sets the vanes up/down position after starting up or resetting the gateway.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Value, 7)	R	R
Object_Name	CharacterString	VanesUD_startup	R	R
Object_Type	BACnetObjectType	MULTISTATE_Value (19)	R	R
Present_Value	Unsigned	1 .. 13	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	13	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **VanesUD_startup table** below*.	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Vanes up/down position or mode interpretation is possible using the value in the following correspondence table.

Table 17. VanesUD_startup

Present_Value	State_Text
1	Auto/Stop
2 .. 10	POS 1 .. 9
11	Swing
12	Swirl
13	Wide

7.4.25. VanesLR_startup (Multistate Value Object Type)

It sets the vanes left/right position after starting up or resetting the gateway.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Value, 8)	R	R
Object_Name	CharacterString	VanesLR_startup	R	R
Object_Type	BACnetObjectType	MULTISTATE_Value (19)	R	R
Present_Value	Unsigned	1 .. 13	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	13	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **VanessLR_startup table** below*.	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Vanes left/right position or mode interpretation is possible using the value in the following correspondence table.

Table 18. VanesLR_startup

Present_Value	State_Text
1	Auto/Stop
2 .. 10	POS 1 .. 9
11	Swing
12	Swirl
13	Wide

7.4.26. SerialNumber (Analog Input Object Type)

It indicates the gateway's serial number: **000EXXXXX**

- 000E is a constant value and it's not included in the Present_Value property.
- XXXXX is a unique value for each gateway. This is the information the Present_Value provides.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 11)	R	R
Object_Name	CharacterString	SerialNumber	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units	BACnetEngineeringUnits	-	R	R
Min_Pres_Value	REAL	-	O	R
Max_Pres_Value	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.27. RGB_Led_Behaviour (Multistate Value Object Type)

It indicates the gateway's LED behavior.

Property Identifier	Property Datatype	Value	ASHRAE	GATEWAY
Object_Identifier	BACnetObjectIdentifier	(Multistate Value, 2)	R	R
Object_Name	CharacterString	RGB_Led_Behaviour	R	R
Object_Type	BACnetObjectType	MULTISTATE_Value (19)	R	R
Present_Value	Unsigned	1 .. 3	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	3	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **RGB_Led_Behaviour table** below*.	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

RGB LED behavior interpretation is possible using the value in the following correspondence table.

Table 19. RGB_Led_Behaviour

Present_Value	State_Text
1	Always OFF
2	Always ON
3	Reporting Changes

7.4.28. RGB_Led_Intensity (Multistate Value Object Type)

It indicates the gateway's LED intensity.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Value, 3)	R	R
Object_Name	CharacterString	RGB_Led_Intesity	R	R
Object_Type	BACnetObjectType	MULTISTATE_Value (19)	R	R
Present_Value	Unsigned	1 .. 5	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE/TRUE	R	R
Number_Of_States	Unsigned	5	R	R
State_Text	BACnetArray[N] of CharacterString	*Check **RGB_Led_Intensity table** below*.	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

RGB LED intensity interpretation is possible using the value in the following correspondence table.

Table 20. RGB_Led_Intensity

Present_Value	State_Text
1	Level 1
2	Level 2
3	Level 3
4	Level 4
5	Level 5

7.4.29. IR_Remote_ID (Analog Input Object Type)

It indicates the infrared remote controller ID.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 14)	R	R
Object_Name	CharacterString	IR_Remote_ID	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.30. IR_Remote_FW_VERSION (Analog Input Object Type)

It indicates the firmware version of the infrared remote controller.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 15)	R	R
Object_Name	CharacterString	IR_Remote_FW_VERSION	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.31. IR_Remote_FW_CRC (Analog Input Object Type)

It indicates the firmware cyclic redundancy check of the infrared remote controller to verify its firmware.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 16)	R	R
Object_Name	CharacterString	IR_Remote_FW_CRC	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value *	REAL	-	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE/TRUE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0), UNRELIABLE_OTHER (7)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	-	O	-
Units *	BACnetEngineeringUnits	-	R	R
Min_Pres_Value *	REAL	-	O	R
Max_Pres_Value *	REAL	-	O	R
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.32. ErrorCode (Analog Input Object Type)

It indicates the AC system's current error.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Analog Input, 2)	R	R
Object_Name	CharacterString	ErrorCode	R	R
Object_Type	BACnetObjectType	ANALOG_INPUT (0)	R	R
Present_Value	REAL	-1 .. 6846	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Update_Interval	Unsigned	300	O	-
Units	BACnetEngineeringUnits	NO_UNITS (95)	R	R
Min_Pres_Value	REAL	-1	O	-
Max_Pres_Value	REAL	6846	O	-
Resolution	REAL	-	O	-
COV_Increment	REAL	0	O	W
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
High_Limit	REAL	-	O	-
Low_Limit	REAL	-	O	-
Deadband	REAL	-	O	-
Limit_Enable	BACnetLimitEnable	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

7.4.33. ErrorCodeM (Multistate Input Object Type)

It indicates the AC system's current error.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Multistate Input, 4)	R	R
Object_Name	CharacterString	ErrorCodeM	R	R
Object_Type	BACnetObjectType	MULTISTATE_INPUT(13)	R	R
Present_Value	Unsigned	1 .. 4	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Number_Of_States	Unsigned	4	R	R
State_Text	BACnetArray[N] of CharacterString	Check the **Error codes table** below	O	R
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Values	List of Unsigned	-	O	-
Fault_Values	List of Unsigned	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

Table 21. Error codes

Present_Value	State_Text
1	Initializing
2	Internal Error
3	Wrong RCF
4	Unknown

7.4.34. ErrorActive (Binary Input Object Type)

It indicates if there is an active error in the AC system.

Property Identifier	Property Datatype	Value	ASHRAE	Gateway
Object_Identifier	BACnetObjectIdentifier	(Binary Input, 1)	R	R
Object_Name	CharacterString	ErrorActive	R	R
Object_Type	BACnetObjectType	BINARY_INPUT (3)	R	R
Present_Value	BACnetBinaryPV	INACTIVE (0) / ACTIVE (1)	R	R
Description	CharacterString	-	O	-
Device_Type	CharacterString	-	O	-
Status_Flags	BACnetStatusFlags	{FALSE, FALSE, FALSE, FALSE}	R	R
Event_State	BACnetEventState	STATE_NORMAL (0)	R	R
Reliability	BACnetReliability	NO_FAULT_DETECTED (0)	O	R
Out_Of_Service	BOOLEAN	FALSE	R	R
Polarity	BACnetPolarity	NORMAL (0)	R	R
Inactive_Text	CharacterString	No	O	R
Active_Text	CharacterString	Error	O	R
Change_Of_State_Time	BACnetDatetime	-	O	-
Change_Of_State_Count	Unsigned	-	O	-
Time_Of_State_Count_Reset	BACnetDatetime	-	O	-
Elapsed_Active_Time	Unsigned	-	O	-
Time_Of_Active_Time_Reset	BACnetDatetime	-	O	-
Time_Delay	Unsigned	-	O	-
Notification_Class	Unsigned	-	O	-
Alarm_Value	BACnetBinaryPV	-	O	-
Event_Enable	BACnetEventTransitionBits	-	O	-
Acked_Transitions	BACnetEventTransitionBits	-	O	-
Notify_Type	BACnetNotifyType	-	O	-
Event_Time_Stamps	BACnetArray[N] of BACnetTimeStamp	-	O	-
Profile_Name	CharacterString	-	O	-

8. Modbus Specifications

8.1. Modbus Physical Layer

This gateway implements a Modbus RTU server interface that connects to the EIA-485 bus. This interface performs an 8N2 communication (8 data bits, no parity, and 2 stop bit), even it also supports 8N1 communication (8 data bits, no parity, and 1 stop bit).

NOTE
The gateway automatically detects the communication type (8N2 or 8N1) and sets itself accordingly. No user action is needed.

The following baud rates are available: 2400, 4800, 9600, 19200, 38400, 57600, 76800, and 115200 bps.

NOTE
By default, the baudrate is set to 9600 bps.

8.2. Modbus Functions

The IN485UNI001I100 gateway implements the following Modbus functions:

- 3: Read holding registers
- 4: Read input registers
- 6: Write single registers
- 16: Write multiple registers

IMPORTANT
The gateway doesn't allow writing operations on more than one register with the same request. This means that the length field (i.e., the number of registers to write) should always be 1 when using Function Code 16 for writing.

NOTE

- All registers are 16-bit unsigned holding registers.
- All registers use the standard Modbus big-endian notation.

8.3. Control and Status Registers

Name	Possible values	Protocol address	PLC address	R/W
On/Off	0: Off 1: On	0	1	R/W
Operation mode **NOTE** The available modes may vary depending on the AC model.	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool	1	2	R/W
Fan speed **NOTE** The available fan speeds may vary depending on the AC model.	0: Auto 1 .. 5: Speed 1 .. Speed 5 10: Fan stop	2	3	R/W
Vane U/D position **NOTE** The available vane positions may vary depending on the AC model.	0: Auto 1 .. 9: Position 1 .. Position 9 10: Swing	3	4	R/W
Temperature setpoint **NOTE** The value range depend on the AC model.	x1; x10; °C; °F	4	5	R/W
Ambient temperature	x1; x10; °C; °F -35 .. 92.5°C / -31 .. 198.5°F	5	6	R
Control objects disablement **NOTE** It disables the control of the AC unit through the registers of the gateway. This value is stored in non-volatile memory. **TIP** Send a 0 to this register if, for an unknown reason, the gateway doesn't work.	0: Control objects enabled 1: Control objects disabled	7	8	R/W
Remote control disablement	0: RC enabled (default) 1: RC disabled	8	9	R/W

Name	Possible values	Protocol address	PLC address	R/W
NOTE It disables the control of the AC unit through any RC. This value is stored in non-volatile memory.				
Operation time **NOTE** This value is stored in non-volatile memory.	0 .. 65535 hours	9	10	R/W
Vane L/R position **NOTE** The available vane positions may vary depending on the AC model.	0: Auto 1 .. 9: Position 1 .. Position 9 10: Swing	26	27	R/W
U/D vane pulse	1: Pulse	27	28	Trigger
U/L vane pulse	1: Pulse	34	35	Trigger
Relative humidity	0 .. 100%	70	71	R
Max. num. of fan speeds	Max. number of fan speeds configured.	21	22	R
Actual AC max setpoint	x1; x10; °C; °F	24	25	R
Actual AC min setpoint	x1; x10; °C; °F	25	26	R
Parrot mode	0: Disabled 1: Enabled	200	201	R/W

8.4. Startup Registers

These registers determine the status of the AC unit after starting up or rebooting the gateway.

Name	Possible values	Protocol address	PLC address	R/W
Reset operation at startup	0: Do not send default settings to AC after reset 1: Send default settings to AC after reset	1100	1001	R/W
On/Off at startup	0: Off 1: On	1101	1102	R/W
Operation mode at startup	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool	1102	1103	R/W
Fan speed at startup	0: Auto 1 .. 5: Speed 1 .. Speed 5 10: Fan stop	1103	1104	R/W
Setpoint temperature at startup	x1; x10; °C; °F	1104	1105	R/W
Vane U/D position at startup	0: Auto 1 .. 9: Position 1 .. Position 9 10: Swing	1105	1106	R/W
Vane L/R position at startup	0: Auto 1 .. 9: Position 1 .. Position 9 10: Swing	1106	1107	R/W

8.5. Device Registers

Name	Possible values	Protocol address	PLC address	R/W
Baudrate	2400 bps 4800 bps 9600 bps (Default) 19200 bps 38400 bps 57600 bps 76800 bps 115200 bps	14	15	R
Modbus slave address	1 .. 63	15	16	R
Device definition	Device ID	49	50	R
Software version	Software version	50	51	R
Block periodic sendings	0: Don't block 1: Block	97	98	R/W
Reset device	1: Reset	99	100	R/W
RGB LED criteria	0: Off 1: On 2: Report only changes	202	203	R/W
IR Remote FW version	MSB: High version number LSB: Low version number	203	204	R
IR Remote ID	2-byte integer identifying Remote Controller type	204	205	R
RGB LED intensity	1 (Low) .. 5 (High)	206	207	R/W
Alarm status	0: No alarm condition 1: Alarm condition	10	11	R
Error code	0: No error Any other value: AC unit error code **NOTE** Read the AC unit documentation to know the meaning of each error code.	11	12	R

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