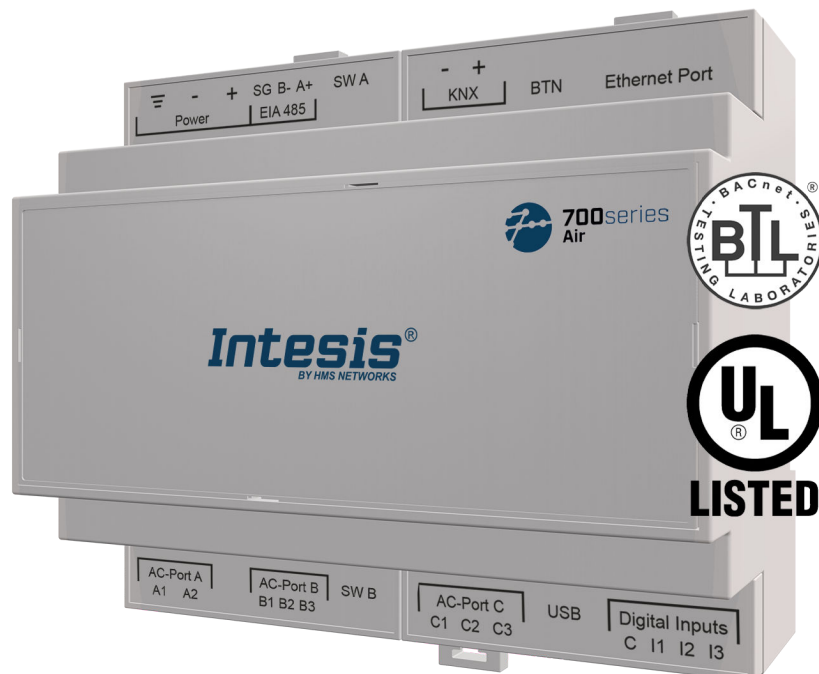


Hitachi VRF with KNX, Serial and IP support IN770AIR00XO000 GATEWAY

USER MANUAL
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1. Description and Order Codes

IN770AIR00xO000 Gateway

Modbus®, KNX®, BACnet®, and Home Automation® gateway for Hitachi® air conditioning systems

ORDER CODE	LEGACY ORDER CODE
IN770AIR00xO000 ¹	INBACHIT016O000 INBACHIT064O000 INKNXHIT016O000 INKNXHIT064O000 INMBSHIT016O000 INMBSHIT064O000
¹ The x stands for S, M, or L, depending on the license you have purchased. (See the next section).	

 **NOTICE** The order code may vary depending on the product seller and the buyer's location.

2. Licensing

Distribution license(s) for the IN770AIR00xO000 gateway:

Order Code	License	Maximum AC units	
		Indoor units	Outdoor units
IN770AIR00SO000	Small	16	64
IN770AIR00MO000	Medium	64	64

**NOTE**

The order code may vary depending on the product seller and the buyer's location.

3. General Information

3.1. Intended Use of the User Manual

This manual contains the main features of this Intesis 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.

3.2. 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.

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.

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

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

Supply always a correct voltage to power the gateway. See [Technical Specifications \(page 23\)](#).

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

3.3. Admonition Messages and Symbols



DANGER

Instructions that must be followed to avoid an imminently hazardous situation that, if not avoided, will result in death or severe injury.



WARNING

Instructions that must be followed to avoid a potentially hazardous situation that, if not avoided, could result in death or severe injury.



CAUTION

Instruction that must be followed to avoid a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.



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.

4. Overview

This document describes the available applications for this IN770AIR00xO000 gateway.



IMPORTANT

This document assumes that the user is familiar with these technologies.

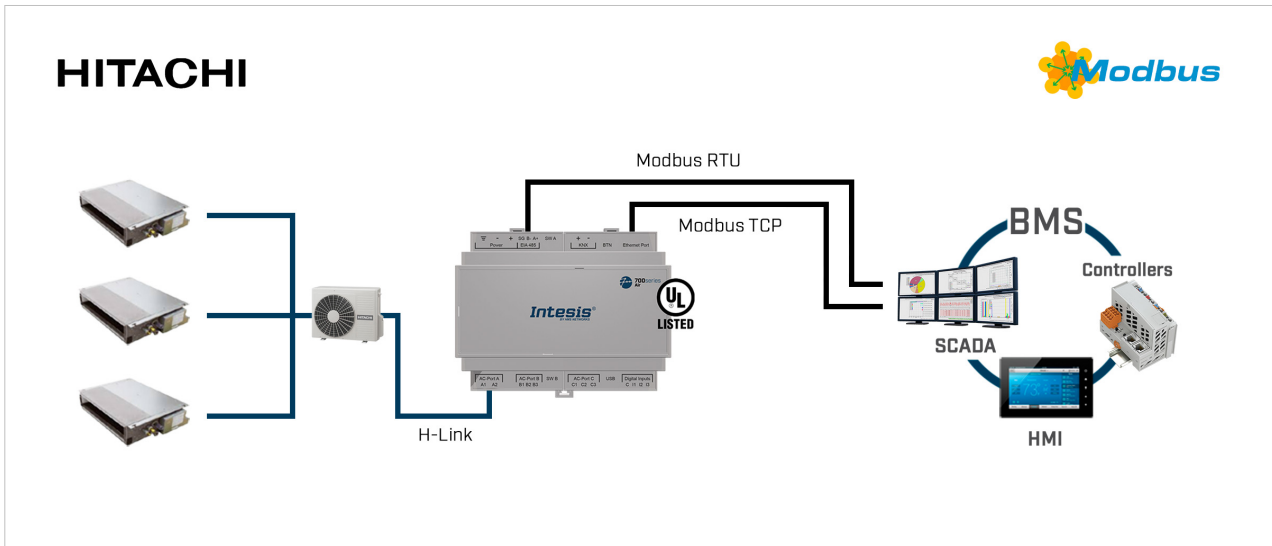


Figure 1. Integration of Hitachi AC systems into Modbus installations

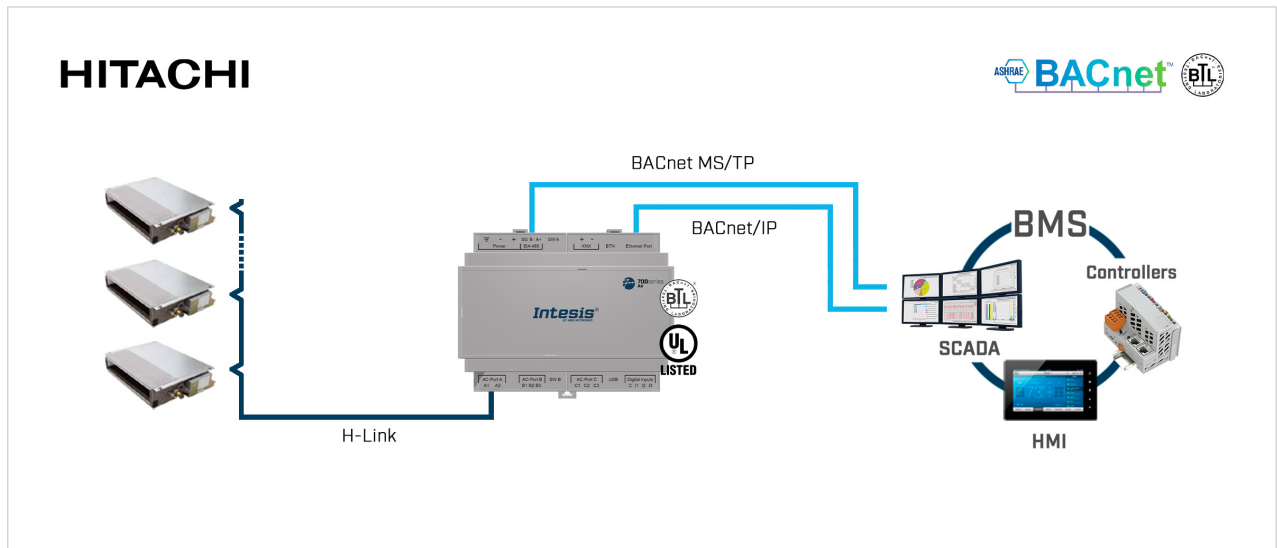


Figure 2. Integration of Hitachi AC systems into BACnet installations

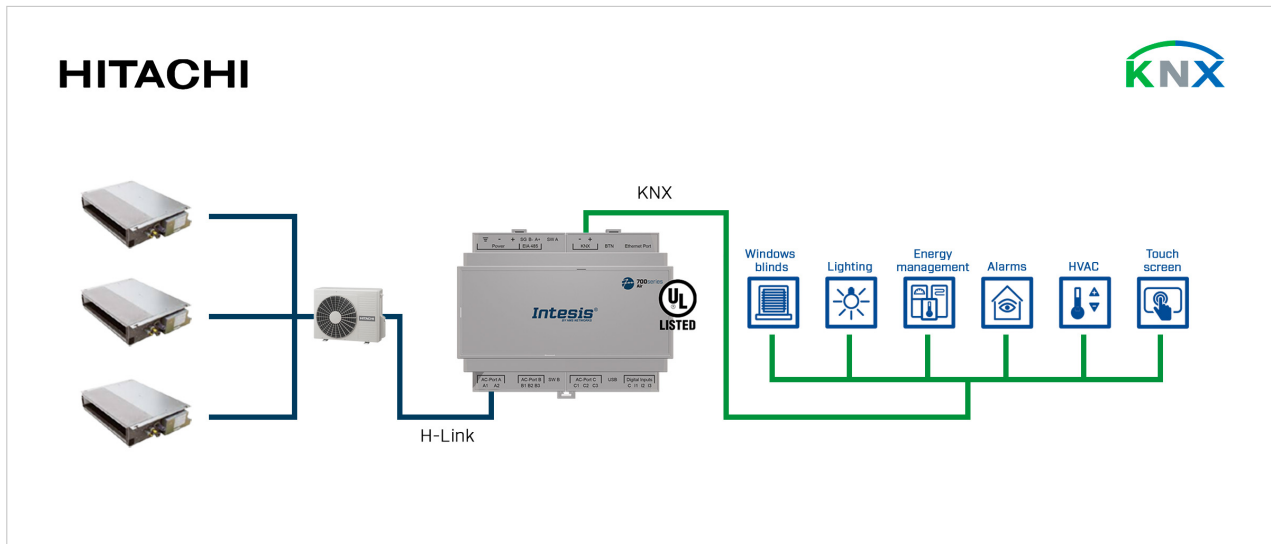


Figure 3. Integration of Hitachi AC systems into KNX installations

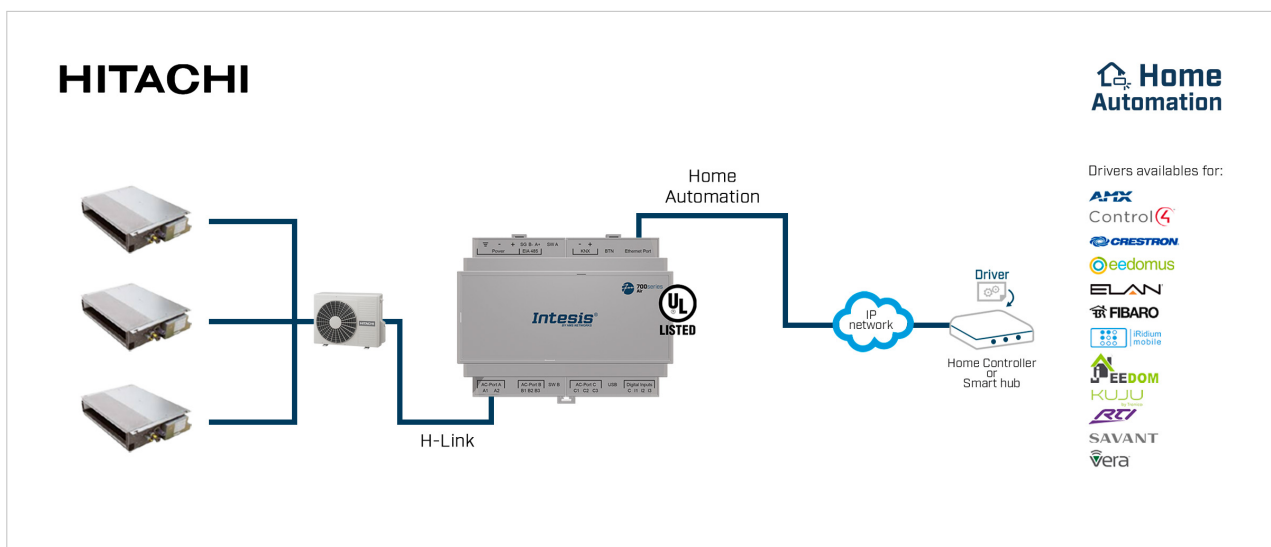


Figure 4. Integration of Hitachi AC systems into Home Automation installations

4.1. Inside the Package

Items included:

- Intesis IN770AIR00xO000 gateway
- USB Mini-B type to USB A type cable
- Installation sheet

4.2. Gateway Main Features

- Several applications available: Configurable for BACnet/IP and MS/TP, Modbus TCP and RTU, KNX, and Home Automation communication protocols.
- Late configuration: Change between applications easily.
- Scan function: Find the devices connected to the air conditioning bus.
- Specific signals to monitor outdoor units.
- 2 x DIP switches for the EIA-485 connector termination and polarization configuration.
- 14 LEDs indicate the operating status for both the gateway and the communication bus.

- DIN rail and wall mounting case.
- Accredited with the main certifications for electronic equipment.
- Multiple ports for serial and TCP/IP communication:
 - Green pluggable terminal block for EIA-485 (3 poles)
 - Orange pluggable terminal block for KNX (2 poles)
 - Ethernet
 - Green pluggable terminal block for binary inputs (4 poles)
 - USB Mini-B type 2.0 port for connection to the PC
 - Green pluggable terminal block for AC connection (2 poles)
 - Green pluggable terminal block for AC connection (3 poles)
 - Green pluggable terminal block for AC connection (3 poles)

**NOTE**

Depending on the AC bus, some of these AC connection ports are not used.

4.3. Gateway General Functionality

With this Intesis IN770AIR00xO000 gateway, you can easily integrate Hitachi air conditioning (AC) systems into an installation based on Modbus TCP, Modbus RTU, KNX, BACnet/IP, BACnet MS/TP, or Home Automation. To do so, the gateway acts as a server device of the installation itself, accessing all signals from each air conditioner unit and controlling the whole AC network.

The gateway is continuously polling the AC network, storing in its memory the current status of every signal you want to track and serving this data to the installation when requested. Also, when a signal status changes, the gateway sends a write telegram to the installation, waits for the response, and performs the corresponding action.

A lack of response from a signal activates a communication error, allowing you to know which signal from which AC unit is not correctly working.

5. Hardware

5.1. Mounting



IMPORTANT

Before mounting, please ensure that the chosen installation place preserves the gateway from direct solar radiation, water, high relative humidity, or dust.



IMPORTANT

Maximum mounting height: below 2 meters (6.5 feet).



NOTE

Mount the gateway on a wall or over a DIN rail. We recommend the DIN rail mounting option, preferably inside a grounded metallic industrial cabinet.

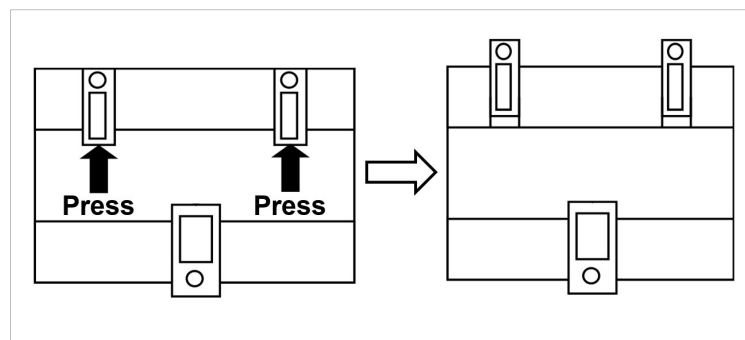


IMPORTANT

Ensure the gateway has sufficient clearances for all connections when mounted. See [Dimensions \(page 24\)](#).

Wall mounting

1. Press the top side mobile clips in the rear panel until you hear a *click*.



2. Use the clip holes to fix the gateway on the wall using screws.



NOTE

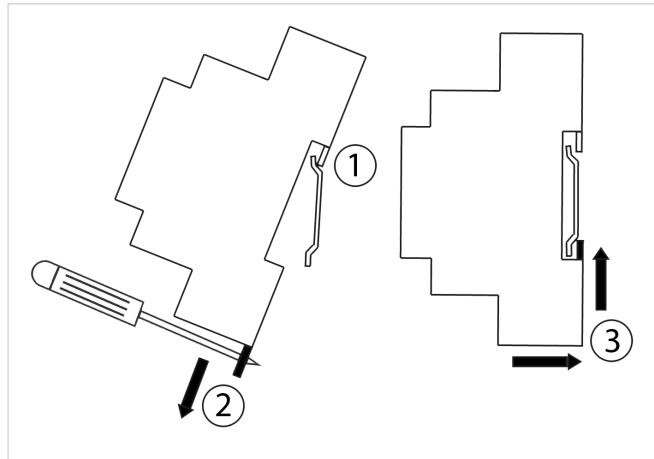
Use M3 screws, 25 mm (1") length.

3. Make sure the gateway is firmly fixed.

DIN rail mounting

Keep the clips down in their original position.

1. Fit the gateway's top side clips in the upper edge of the DIN rail.
2. Use a screwdriver or similar to pull the bottom clip down.
3. Fit the low side of the gateway in the DIN rail and let the clip switch back to its original position, locking the gateway to the rail.
4. Make sure the gateway is firmly fixed.



5.2. Connection



CAUTION

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

5.2.1. Gateway Connectors

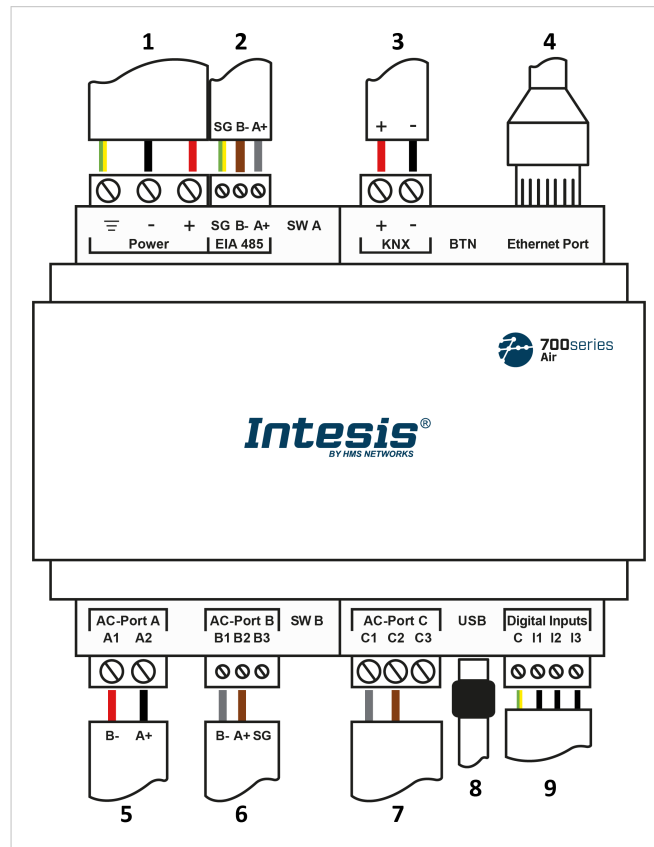


Figure 5. General view of all gateway connectors

- | | |
|--|--|
| 1. Power supply: 12 to 36 VDC / 24 VAC | 6. AC-Port B: Not used |
| 2. Port EIA 485: For RS 485 serial bus connection | 7. AC-Port C: Not used |
| 3. Port KNX: Exclusive to the KNX bus | 8. USB: Connection with the PC for configuration purposes |
| 4. Ethernet Port: For TCP/IP and Home Automation connection | 9. Binary inputs: Dry contact (optional) |
| 5. AC-Port A: Hitachi bus (H-Link) | |



NOTE

You can also use the **Ethernet Port** to connect the gateway and the PC for configuration purposes.



NOTICE

The common connectors (those used for all applications), specific connectors (those used for each application), and the connection procedures are deeply explained in the following sections.



NOTE

Mount the gateway in the desired installation site before wiring.



IMPORTANT

Use solid or stranded wires (twisted or with ferrule).

Wire cross-section/gauge for all wire connectors:

- 1 core: 0.5 to 2.5 mm² (24 to 11 AWG).
- 2 cores: 0.5 to 1.5mm² (24 to 15 AWG).
- 3 cores: not permitted.

Summary tables

BMS Protocol	Port EIA 485	Port KNX	Ethernet
BACnet	BACnet MS/TP	(Not used)	BACnet/IP and Console
Modbus	Modbus RTU	(Not used)	Modbus TCP and Console
KNX	(Not used)	KNX	Console
Home Automation	(Not used)	(Not used)	Home Automation and Console

AC Manufacturer	Port A	Port B	Port C	Ethernet
Hitachi	H-Link	(Not used)	(Not used)	(Not used)

Bus connectors pinout			
EIA 485	Port A	Port B	Port C
B- (NEG pole)	A1 (NEG pole)	B1 (NEG pole)	C1 (NEG pole)
A+ (POS pole)	A2 (POS pole)	B2 (POS pole)	C2 (POS pole)
SG (Ground)		B3 (Ground)	



NOTE

To know more about each port's specifications, see [Technical Specifications \(page 23\)](#).

5.2.2. Common Connections

5.2.2.1. Connecting the Gateway to the Power Supply

The power supply connector is a green pluggable terminal block (3 poles) labeled as **Power**.



IMPORTANT

- Use SELV-rated NEC class 2 or limited power source (LPS) power supply.
- Connect the gateway's ground terminal to the installation grounding.
- A wrong connection may cause earth loops that can damage the Intesis gateway and/or any other system equipment.

Apply the voltage within the admitted range and of enough power:

- **For DC:** 12 .. 36 VDC (+/-10%), Max: 250 mA
- **For AC:** 24 VAC (+/-10 %), 50-60 Hz, Max: 127 mA

Recommended voltage: 24 VDC, Max: 127 mA



IMPORTANT

- **When using a DC power supply:** Respect the polarity labeled on the power connector for the positive and negative wires.
- **When using an AC power supply:** Ensure the same power supply is not powering any other device.

5.2.2.2. Connecting the Gateway to the Air Conditioning System

Connect the Hitachi air conditioning network bus (H-Link) to the gateway using the **A1** and **A2** poles of the **AC-Port A**.



NOTE

There is no polarity to be respected.



NOTICE

See the wiring diagram in the gateway connectors figure: [General view of all gateway connectors \(page 10\)](#).

5.2.3. Connection Procedure for Modbus

**NOTE**

Remember to check the [Common Connections \(page 12\)](#).

For Modbus TCP:

1. Connect the Modbus TCP Ethernet cable to the gateway's **Ethernet Port**.

**IMPORTANT**

Use a straight Ethernet UTP/FTP CAT5 or higher cable.

**IMPORTANT**

If communicating through the LAN of the building, contact the network administrator and make sure traffic on the used port is allowed through all LAN paths.

**NOTE**

When commissioning the gateway for the first time, DHCP will be enabled for 30 seconds. After that time, the default IP address 192.168.100.246 will be set.

For Modbus RTU:

1. Connect the Modbus RTU communication cable to the gateway's **EIA-485** port.

**IMPORTANT**

Observe polarity.

**IMPORTANT**

Remember the characteristics of the standard EIA-485 bus:

- Maximum distance of 1200 meters (0.75 miles).
- Maximum of 32 devices connected to the bus.
- A termination resistor of 120 ohms (Ω) is needed at each end of the bus. The gateway has an internal bus biasing circuit already incorporating the termination resistor. It can be enabled using the DIP switch block (**SW A**) dedicated to the **EIA-485** port:

Position 1

- ON: 120 Ω termination active.
- OFF: 120 Ω termination inactive.

Position 2 and 3

- ON: Polarization active.
- OFF: Polarization inactive.

For further details, see [DIP Switches \(page 21\)](#).

**IMPORTANT**

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

2. Use the supplied USB Mini-B type to A type cable to connect the gateway, through its **USB** port, to a PC to configure it with Intesis MAPS.

**NOTE**

For Modbus RTU only, you can use the **Ethernet Port** to connect the gateway and the PC instead.

**NOTICE**

Find all you need to know about the gateway configuration and Intesis MAPS in the IN770AIR00xO000 Gateway configuration guide.

**NOTICE**

See the wiring diagram in the gateway connectors figure: [General view of all gateway connectors \(page 10\)](#)

5.2.4. Connection Procedure for KNX

**NOTE**

Remember to check the [Common Connections \(page 12\)](#).

1. Connect the KNX TP communication cable to the gateway's **KNX** port.

**IMPORTANT**

Observe polarity.

2. Use the supplied USB Mini-B type to A type cable to connect the gateway, through its **USB** port, to a PC to configure it with Intesis MAPS.

**NOTE**

You can use the **Ethernet Port** to connect the gateway and the PC instead.

**NOTICE**

Find all you need to know about the gateway configuration and Intesis MAPS in the IN770AIR00xO000 Gateway configuration guide.

**NOTICE**

See the wiring diagram in the gateway connectors figure: [General view of all gateway connectors \(page 10\)](#)

5.2.5. Connection Procedure for BACnet



NOTE

Remember to check the [Common Connections \(page 12\)](#).

For BACnet/IP:

1. Connect the BACnet/IP Ethernet cable to the gateway's **Ethernet Port**. The correct cable to use depends on where the gateway is connected:
 - **Connecting directly to a BACnet/IP device:** use a crossover Ethernet UTP/FTP CAT5 or higher cable.
 - **Connecting to a hub or switch of the LAN of the building:** use a straight Ethernet UTP/FTP CAT5 or higher cable.



IMPORTANT

When commissioning the gateway for the first time, DHCP will be enabled for 30 seconds. After that time, the default IP address 192.168.100.246 will be set.



IMPORTANT

If communicating through the LAN of the building, contact the network administrator and make sure traffic on the used port is allowed through all LAN paths.

For BACnet MS/TP:

1. Connect the BACnet MS/TP communication cable to the gateway's **EIA-485** port.



IMPORTANT

Observe polarity.



IMPORTANT

Remember the characteristics of the standard EIA-485 bus:

- Maximum distance of 1200 meters (0.75 miles).
- Maximum of 32 devices connected to the bus.
- A termination resistor of 120 ohms (Ω) is needed at each end of the bus. The gateway has an internal bus biasing circuit already incorporating the termination resistor. It can be enabled using the DIP switch block dedicated to the EIA-485 port:

Position 1

- ON: 120 Ω termination active.
- OFF: 120 Ω termination inactive.

Position 2 and 3

- ON: Polarization active.
- OFF: Polarization inactive.

For further details, see [DIP Switches \(page 21\)](#).



IMPORTANT

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

2. Use the supplied USB Mini-B type to A type cable to connect the gateway, through its **USB** port, to a PC to configure it with Intesis MAPS.

**NOTE**

For BACnet MS/TP only, you can use the **Ethernet Port** to connect the gateway and the PC instead.

**NOTICE**

Find all you need to know about the gateway configuration and Intesis MAPS in the IN770AIR00xO000 Gateway configuration guide.

**NOTICE**

See the wiring diagram in the gateway connectors figure: [General view of all gateway connectors \(page 10\)](#)

5.2.6. Connection Procedure for Home Automation

**NOTE**

Remember to check the [Common Connections \(page 12\)](#).

1. Connect the Home Automation Ethernet cable to the gateway's **Ethernet Port**.

**IMPORTANT**

Use a straight Ethernet UTP/FTP CAT5 or higher cable.

**IMPORTANT**

If communicating through the LAN of the building, contact the network administrator and make sure traffic on the used port is allowed through all LAN paths.

**NOTE**

When commissioning the gateway for the first time, DHCP will be enabled for 30 seconds. After that time, the default IP address 192.168.100.246 will be set.

2. Use the supplied USB Mini-B type to A type cable to connect the gateway, through its **USB** port, to a PC to configure it with Intesis MAPS.

**NOTICE**

Find all you need to know about the gateway configuration and Intesis MAPS in the IN770AIR00x0000 Gateway configuration guide.

**NOTICE**

See the wiring diagram in the gateway connectors figure: [General view of all gateway connectors \(page 10\)](#)

5.3. LED Indicators

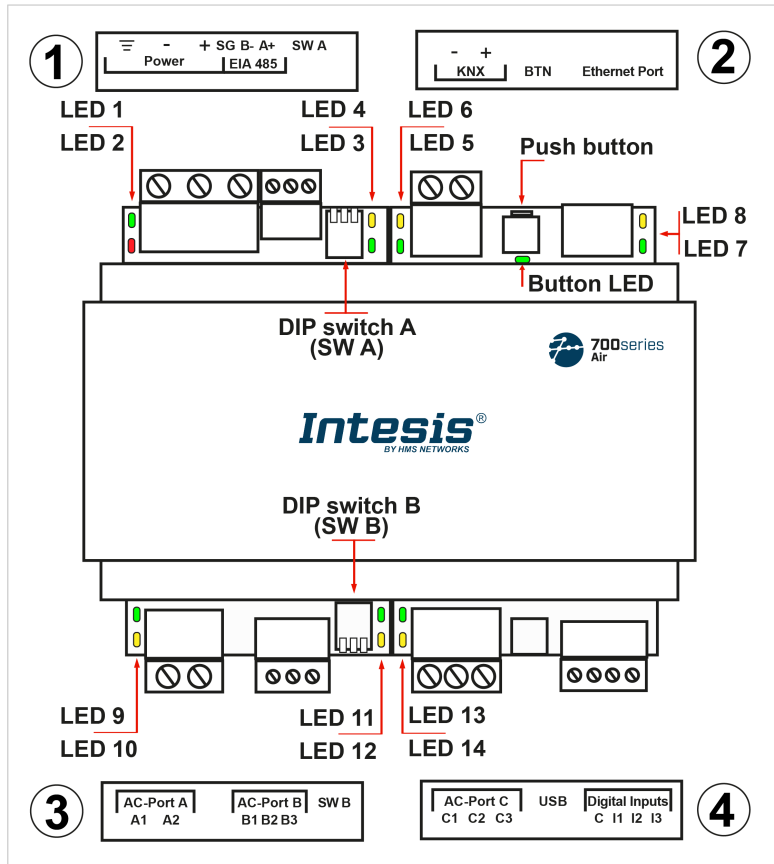


Figure 6. Gateway layout

LED	Color	Description
Top side		
LED 1 (PWR)	Green	Power on (not programmable)
LED 2 (ERR)	Red	Blinking: Hardware error
LED 3	Green	485 Tx (RS485 for BACnet or Modbus)
LED 4	Yellow	485 Rx (RS485 for BACnet or Modbus)
LED 5	Green	KNX Port Tx
LED 6	Yellow	KNX Port Rx
BUTTON LED	Green	KNX: Programming mode on BACnet: BACnet link established Modbus and Home Automation: Not used
LED 7	Green	Ethernet link established
LED 8	Yellow	Ethernet speed
Bottom side		
LED 9	Green	AC-Port A Tx (HBS)
LED 10	Yellow	AC-Port A Rx (HBS)
LED 11	Green	AC-Port B Tx (RS485)
LED 12	Yellow	AC-Port B Rx (RS485)
LED 13	Green	AC-Port C Tx (UFO-SLQ)
LED 14	Yellow	AC-Port C Rx (UFO-SLQ)

**NOTE**

LEDs are hidden behind the four frontal labeled covers. These covers are assembled by pressure, so you just need to pull them to remove them.

5.4. DIP Switches

See figure: [Gateway layout \(page 19\)](#)

1: DIP switch A (SW A).

2: DIP switch B (SW B).

Each DIP switch is dedicated to a 485 port, and its function is to activate or deactivate the termination resistor and the polarization of each port:

Position			Description
1	2	3	
↑	X	X	120 Ω termination active
↓	X	X	120 Ω termination inactive (default position)
X	↑	↑	Polarization active (default position)
X	↓	↓	Polarization inactive

5.5. Push Button

Find the push button at the top side, between the KNX and the Ethernet connectors.

See Figure [Gateway layout \(page 19\)](#)



NOTE

The button is hidden and only accessible using a thin object like a paper clip.

Common functionality:

Reset factory settings

1. Push the button.
2. Power on the gateway.
3. Wait four seconds.
4. Release the button.

Functionalities depending on the current project:

BACnet

- Push the button to send an I-Am message to all BACnet ports.

KNX

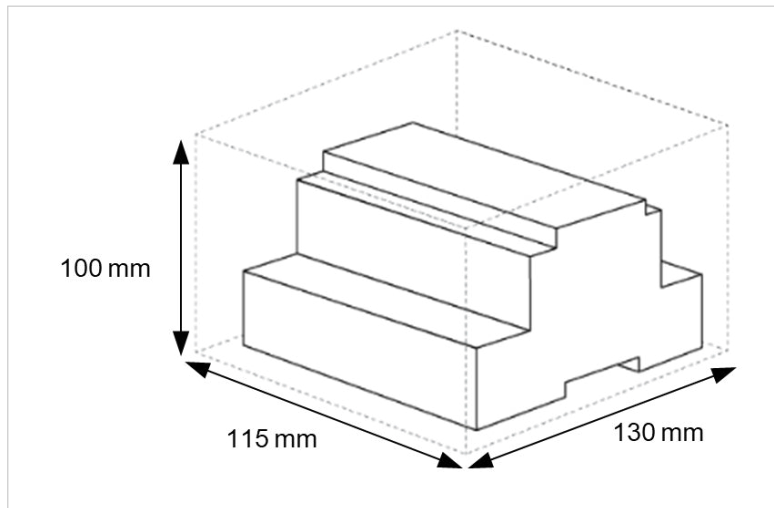
- Push the button to switch between normal mode and programming mode.

5.6. Technical Specifications

Case	Plastic, type PC (UL 94 V-0). Color: Light Grey. RAL 7035 Net dimensions (dxwxh): 90x106x58 mm / 3.5x4.2x2.3" Recommended space for installation (dxwxh): 130x115x100 mm / 5.1x4.5x3.9"	
Mounting	Wall: M3 25mm (1") length screws. Secure mounting: below 2 meters (6 feet) DIN rail (recommended mounting) EN60715 TH35	
Wires (for power supply and low-voltage signals)	Solid wires or stranded wires (twisted or with ferrule) Per terminal: 1 core: 0.5 to 2.5mm ² (24 to 11 AWG) 2 cores: 0.5 to 1.5mm ² (24 to 15 AWG) 3 cores: not permitted For distances longer than 3.05 meters (10 feet), use class 2 cables	
Power	1 x Green pluggable terminal block (3 poles) 12 to 36 VDC +/-10%, Max.: 250 mA 24 VAC +/-10% 50-60 Hz, Max.: 127 mA Recommended: 24 VDC	
Ethernet	1 x Ethernet 10/100 Mbps RJ45	
Port EIA 485	1 x Green pluggable terminal block (3 poles) SGND (Reference ground or shield) 1500VDC isolation from other ports	
Port KNX	1 x Orange pluggable terminal block (2 poles): A, B	
AC Ports	AC-Port A (serial, 2 poles): AC bus connection (H-Link) AC-Port B (serial, 3 poles): Not used AC-Port C: (serial, 3 poles): Not used	
LEDs	2 x Run (Power/Error) 2 x Port EIA-485 TX/RX 2 x Port KNX TX/TR 1 x Button indicator	2 x Ethernet Link/Speed 2 x AC-Port A TX/RX 2 x AC-Port B TX/RX 2 x AC-Port C TX/RX
Binary inputs	1 x Green pluggable terminal block (4 poles) I1, I2, I3, and Common 1500 VDC isolation from other ports	
Console port	USB Mini-B type 2.0 compliant 1500 VDC isolation	
SW A SW B	2 x DIP switch blocks for EIA-485 serial port configuration: Position 1: On: 120 Ω termination active Off: 120 Ω termination inactive Position 2 and 3: On: Polarization active Off: Polarization inactive	
Push button	Refer to the user manual	
Operational temperature	Celsius: 0 .. 60°C Fahrenheit: 32 .. 140°F	
Operational humidity	5 to 95%. No condensation	
Protection	IP20 (IEC60529)	

5.7. Dimensions

- **Net dimensions (DxWxH)**
Millimeters: 90 x 106 x 58 mm
Inches: 3.5 x 4.2 x 2.3"
- **Clear space for installation (DxWxH)**
Millimeters: 130 x 115 x 100 mm
Inches: 5.1 x 4.5 x 3.9"



6. Available Applications

6.1. Integration into Modbus Systems

6.1.1. Modbus Registers



NOTICE

This part is common for Modbus RTU and TCP.

Functions to read Modbus registers:

- 03 Read Holding Registers.
- 04 Read Input Registers.

Function to write Modbus registers

- 06 Single Multiple Holding Registers.

Modbus register contents are expressed in most significant bit (MSB) .. less significant bit (LSB).

The following tables list all available Modbus registers for the gateway.



NOTICE

Read/write parameter terminology:

- **R**: Read-only register.
- **W**: Write-only register.
- **RW**: Read and write register.

Table 1. Global registers

Register name	Possible values	R/W
On (all units)	1-Set the units On	Trigger
Off (all units)	1-Set the units Off	Trigger
Operation Mode Auto (all the units)	1-Set Auto Mode	Trigger
Operation Mode Heat (all the units)	1-Set Heat Mode	Trigger
Operation Mode Dry (all the units)	1-Set Dry Mode	Trigger
Operation Mode Fan (all the units)	1-Set Fan Mode	Trigger
Operation Mode Cool (all the units)	1-Set Cool Mode	Trigger
Fan Speed Auto (all the units)	1-Set Fan Speed Auto	Trigger
Fan Speed Low (all the units)	1-Set Fan Speed Low	Trigger
Fan Speed Mid (all the units)	1-Set Fan Speed Mid	Trigger
Fan Speed High (all the units)	1-Set Fan Speed High	Trigger
Fan Speed High+ (all the units)	1-Set Fan Speed High+	Trigger
Air louver Auto (all the units)	1-Set Air louver Position Auto	Trigger
Air louver 1 (all the units)	1-Set Air louver Position 1	Trigger
Air louver 2 (all the units)	1-Set Air louver Position 2	Trigger
Air louver 3 (all the units)	1-Set Air louver Position 3	Trigger

Register name	Possible values	R/W
Air louver 4 (all the units)	1-Set Air louver Position 4	Trigger
Air louver 5 (all the units)	1-Set Air louver Position 5	Trigger
Air louver 6 (all the units)	1-Set Air louver Position 6	Trigger
Air louver 7 (all the units)	1-Set Air louver Position 7	Trigger
Temperature Setpoint (x10°C) (all units)	Cool: 19 .. 30°C / 66 .. 86°F Heat: 17 .. 30°C / 63 .. 86°F	Trigger

Table 2. Outdoor unit registers

Register name	Possible values	Modbus address formula	R/W
Communication Error OU	0-No error, 1-Error	(OU address × 25) + 10000 + 0	R
Outdoor Air Temp.	-50 .. 99°C / -58 .. 210°F	(OU address × 25) + 10000 + 1	R
Comp.Top Temp.	0 .. 200°C / 32 .. 392°F	(OU address × 25) + 10000 + 2	R
Total Real Comp. Freq.	0 .. 255 Hz	(OU address × 25) + 10000 + 3	R
Total Comp. Current	0 .. 255 A	(OU address × 25) + 10000 + 4	R
Out Exp. Valve 1 Open	0 .. 100%	(OU address × 25) + 10000 + 5	R
Discharge Pressure (x10)	-5.0 .. 9.9 MPa	(OU address × 25) + 10000 + 6	R
Suction Pressure (x10)	-5.0 .. 9.9 MPa	(OU address × 25) + 10000 + 7	R

Table 3. Indoor unit registers

Register name	Possible values	Modbus address formula	R/W
On/Off	0-Off,1-On	(IU address × 100) + 0	RW
Operation Mode	0-Auto, 1-Heat, 2-Dry, 3-Fan, 4-Cool	(IU address × 100) + 1	RW
Fan Speed	0-Auto, 1-Low, 2-Mid, 3-High, 4-High+	(IU address × 100) + 2	RW
Air louver	0-Auto, 1-Pos1..7-Pos7	(IU address × 100) + 3	RW
Temperature Setpoint (x10°C)	Cool: 19 .. 30°C / 66 .. 86°F Heat: 17 .. 30°C / 63 .. 86°F	(IU address × 100) + 4	RW
Remote Sensor Temp. (x10°C)	-63 .. 63°C / -81 .. 145°F	(IU address × 100) + 5	R
Inlet Temp. (x10°C)	-63 .. 63°C / -81 .. 145°F	(IU address × 100) + 6	R
Outlet Temp. (x10°C)	-63 .. 63°C / -81 .. 145°F	(IU address × 100) + 7	R
GasPipe Temp. (x10°C)	-63 .. 63°C / -81 .. 145°F	(IU address × 100) + 8	R
LiquidPipe Temp. (x10°C)	-63 .. 63°C / -81 .. 145°F	(IU address × 100) + 9	R
Unit Error code	Error code	(IU address × 100) + 10	R
Filter Alarm	0-Normal, 1-Alarm	(IU address × 100) + 11	R
Filter Alarm Reset	1-Reset	(IU address × 100) + 12	W
Communication Status	0-Not Exist, 1-Exist	(IU address × 100) + 13	R
Allow On/Off from RC	0-Allow, 1-Not allow	(IU address × 100) + 14	RW
Allow Mode from RC	0-Allow, 1-Not allow	(IU address × 100) + 15	RW
Allow Setpoint from RC	0-Allow, 1-Not allow	(IU address × 100) + 16	RW
Allow Fan from RC	0-Allow, 1-Not allow	(IU address × 100) + 17	RW
Unit type	0-Not Defined, 1-SS, 2-FC, 3-VRF, 4-IU, 5-ES	(IU address × 100) + 18	R
Unit Address	0 .. 63	(IU address × 100) + 19	R
System Address	0 .. 63	(IU address × 100) + 20	R

Register name	Possible values	Modbus address formula	R/W
Dehumidification	0-Disabled, 1-Enabled	(IU address × 100) + 21	R
Dehumidification Correction	0-0, 1-(-1), 2-(-2)	(IU address × 100) + 22	RW
Compressor Stop Cause	255-Operation Off, Other-Refer to the AC user manual	(IU address × 100) + 23	R
IDU expansion valve	0 .. 100%	(IU address × 100) + 24	R
Operation Condition	0-Off, 1-Thermo Off, 2-Thermo On, 3-Alarm	(IU address × 100) + 25	R
RC SW Temperature	-63 .. 63°C / -81 .. 145°F	(IU address × 100) + 26	R
RC SW Config	0-Without RCS, 1-With RCS	(IU address × 100) + 27	R
Consumption Yesterday	n Wh / n kWh	(IU address × 100) + 28	R
Consumption Today	n Wh / n kWh	(IU address × 100) + 29	R
Consumption Total	n Wh / n kWh	(IU address × 100) + 30	R
Consumption Yesterday Heat	n Wh / n kWh	(IU address × 100) + 31	R
Consumption Today Heat	n Wh / n kWh	(IU address × 100) + 32	R
Consumption Total Heat	n Wh / n kWh	(IU address × 100) + 33	R
Consumption Yesterday Cool	n Wh / n kWh	(IU address × 100) + 34	R
Consumption Today Cool	n Wh / n kWh	(IU address × 100) + 35	R
Consumption Total Cool	n Wh / n kWh	(IU address × 100) + 36	R

6.2. Integration into KNX Systems

6.2.1. KNX Signals

The following tables list all available KNX signals for this gateway.



NOTE

Physical Address: The gateway supports (P/S) and (P/I/S) format levels.



NOTICE

Communication object flags:

- **Ri (Read on initialization):** The gateway requests this signal's updated data after an initialization instead of waiting for a change in the signal.
- **R:** The KNX system can read this signal.
- **W:** The KNX system can write this signal.
- **T:** The KNX system receives a telegram when this signal changes its value.
- **U:** This signal's data is updated after a reboot of either the gateway or the bus.

Table 4. Global signals

Object name	Possible values	DPT	Flags
On/Off (all units)	0-Off, 1-On	1.001-DPT_Switch (1bit)	W
Operating Mode (all units)	0-Auto, 1-Heat, 3-Cool, 9-Fan, 14-Dry	20.105-DPT_HVACContrMode (1byte)	W
Operating Mode (all units)	0-Auto, 1-Heat, 2-Dry, 3-Fan, 4-Cool	5.x (1byte)	W
Fan Speed (all units)	1-Low, 2-Mid, 3-High, 4-High+	5.x (1byte)	W
Fan Speed AUTO (all units)	1-Set auto fan; 0-Stop auto fan	1.001-DPT_Switch (1bit)	W
Air louver position (all units)	1-Position 1 .. 7-Position 7	5.x (1byte)	W
Air louver position AUTO (all units)	1-Set auto vane; 0-Stop auto vane	1.001-DPT_Switch (1bit)	W
Temperature Setpoint (°C) (all units)	Cool: 19 .. 30°C / 66 .. 86°F Heat: 17 .. 30°C / 62 .. 86°F	9.001-DPT_Value_Temp (2byte)	W

Table 5. Outdoor units signals

Object name	Possible values	DPT	Flags
Status_Communication Error OU	0-No error, 1-Error	1.005-DPT_Alarm (1bit)	R, T
Status_Outdoor Air Temperature (°C)	-50 .. 99 °C / -58 .. 210°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_Compressor Top Temperature (°C)	0 .. 200 °C / 32 .. 392°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_Total Real Compressor Freq.	0 .. 255 Hz	14.033-DPT_Value_Frequency (4byte)	R, T
Status_Total Compressor Current	0 .. 255 A	14.019-DPT_Value_Electric_Current (4byte)	R, T
Status_Out Exp. Valve 1 Open	0 .. 100%	5.001: percentage (0..100%) (1 byte)	R, T
Status_Discharge Pressure	-5.0 .. 9.9 Mpa	14.058: pressure (Pa) (4byte)	R, T
Status_Suction Pressure	-5.0 .. 9.9 Mpa	14.058: pressure (Pa) (4byte)	R, T

Table 6. Indoor units signals

Object name	Possible values	DPT	Flags
Control_On/Off	0-Off,1-On	1.001-DPT_Switch (1bit)	Ri, W, U
Status_On/Off	0-Off,1-On	1.001-DPT_Switch (1bit)	R, T
Control_Operation mode	0-Auto, 1-Heat, 3-Cool, 9-Fan, 14-Dry	20.105-DPT_HVACContrMode (1byte)	Ri, W, U
Status_Operation mode	0-Auto, 1-Heat, 3-Cool, 9-Fan, 14-Dry	20.105-DPT_HVACContrMode (1byte)	R, T
Control_Operation mode	0-Auto, 1-Heat, 2-Dry, 3-Fan, 4-Cool	5.x (1byte)	Ri, W, U

Object name	Possible values	DPT	Flags
Status_Operation mode	0-Auto, 1-Heat, 2-Dry, 3-Fan, 4-Cool	5.x (1byte)	R, T
Control_Mode Cool/Heat	0-Cool, 1-Heat	1.100-DPT_Heat/Cool (1bit)	Ri, W, U
Status_Mode Cool/Heat	0-Cool, 1-Heat	1.100-DPT_Heat/Cool (1bit)	R, T
Control_Heat mode&ON	0%-Off, 1 .. 100%-On+Heat	5.001-DPT_Scaling (1byte)	Ri, W, U
Control_Cool mode&ON	0%-Off, 1 .. 100%-On+Cool	5.001-DPT_Scaling (1byte)	Ri, W, U
Control_Auto mode	1-Set auto mode	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Auto mode	1-Auto mode active, 0-Auto mode not active	1.001-DPT_Switch (1bit)	R, T
Control_Heat mode	1-Set heat mode	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Heat mode	1-Heat mode active, 0-Heat mode not active	1.001-DPT_Switch (1bit)	R, T
Control_Cool mode	1-Set cool mode	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Cool mode	1-Cool mode active, 0-Cool mode not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan mode	1-Set fan mode	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Fan mode	1-Fan mode active, 0-Fan mode not active	1.001-DPT_Switch (1bit)	R, T
Control_Dry mode	1-Set dry mode	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Dry mode	1-Dry mode active, 0-Dry mode not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan speed enumerated	1-Low, 2-Mid, 3-High, 4-High+	5.010 (DPT_Value_1_Ucount)	Ri, W, U
Status_Fan speed enumerated	1-Low, 2-Mid, 3-High, 4-High+	5.010 (DPT_Value_1_Ucount)	R, T
Control_Fan speed scaling	Thersholds (0%..37%; 38%..62%; 63%..87%; 88%..100%)	5.001-DPT_Scaling (1byte)	Ri, W, U
Status_Fan speed scaling	Thersholds (25%; 50%; 75%; 100%)	5.001-DPT_Scaling (1byte)	R, T
Control_Fan speed low	1-Set fan speed low	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Fan speed low	1-Speed low active, 0-Speed low not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan speed mid	1-Set fan speed mid	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Fan speed mid	1-Speed mid active, 0-Speed mid not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan speed high	1-Set fan speed high	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Fan speed high	1-Speed high active, 0-Speed high not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan speed high+	1-Set fan speed high+	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Fan speed high+	1-Speed high+ active, 0-Speed high+ not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan speed Man/Auto	0-Manual; 1-Auto	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Fan speed Man/Auto	0-Manual; 1-Auto	1.001-DPT_Switch (1bit)	R, T
Control_Vane position enumerated	1-Position 1 .. 7-Position 7	5.010 (DPT_Value_1_Ucount)	Ri, W, U
Status_Vane position enumerated	1-Position 1 .. 7-Position 7	5.010 (DPT_Value_1_Ucount)	R, T
Control_Vane position scaling	Thersholds (0..21%; 22..36%; 37..50%; 51..64%; 65..79%; 80..93%; 94..100%)	5.001-DPT_Scaling (1byte)	Ri, W, U
Status_Vane position scaling	Thersholds (0..14%; 15..29%; 30..43%; 44..57%; 58..71%; 72..86%; 87..100%)	5.001-DPT_Scaling (1byte)	R, T
Control_Vane position auto	1-Set auto vane, 0-Stop auto vane	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vane position auto	1-Vane auto active, 0-Vane auto not active	1.001-DPT_Switch (1bit)	R, T
Control_Vane position-1	1-Set position-1 vane	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vane position-1	1-Vane position-1 active, 0-Vane position-1 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vane position-2	1-Set position-2 vane	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vane position-2	1-Vane position-2 active, 0-Vane position-2 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vane position-3	1-Set position-3 vane	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vane position-3	1-Vane position-3 active, 0-Vane position-3 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vane position-4	1-Set position-4 vane	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vane position-4	1-Vane position-4 active, 0-Vane position-4 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vane position-5	1-Set position-5 vane	1.001-DPT_Switch (1bit)	Ri, W, U

Object name	Possible values	DPT	Flags
Status_Vane position-5	1-Vane position-5 active, 0-Vane position-5 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vane position-6	1-Set position-6 vane	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vane position-6	1-Vane position-6 active, 0-Vane position-6 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vane position-7	1-Set position-7 vane	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vane position-7	1-Vane position-7 active, 0-Vane position-7 not active	1.001-DPT_Switch (1bit)	R, T
Control_Temperature Setpoint (°C)	Cool: 19 .. 30°C / 66 .. 86°F Heat: 17 .. 30°C / 62 .. 86°F	9.001-DPT_Value_Temp (2byte)	Ri, W, U
Status_Temperature Setpoint (°C)	Cool: 19 .. 30°C / 66 .. 86°F Heat: 17 .. 30°C / 62 .. 86°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_AC Ambient Temperature (°C)	-63 .. 63 °C / -81 .. 145°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_Remote Sensor Temperature (°C)	-63 .. 63 °C / -81 .. 145°F	9.001-DPT_Value_Temp (2byte)	R, T
Control_KNX ambient Temperature (°C)	°C	9.001-DPT_Value_Temp (2byte)	Ri, W, U
Status_Outlet Temperature (°C)	-63 .. 63 °C / -81 .. 145°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_GasPipe Temperature (°C)	-63 .. 63 °C / -81 .. 145°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_LiquidPipe Temperature (°C)	-63 .. 63 °C / -81 .. 145°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_Unit error	0-No error, 1-Error	1.005-DPT_Alarm (1bit)	R, T
Status_Unit error code	0-No Error, X-Error (100..999)	8.x (2 byte)	R, T
Status_FilterSign	0-Normal, 1-Alarm	1.005-DPT_Alarm (1bit)	R, T
Control_FilterReset	0-No reset, 1-Reset	1.015-DPT_Reset (1bit)	Ri, W, U
Status_Communication status	0-Not exist, 1-Exist	1.001-DPT_Switch (1bit)	R, T
Control_Allow On/Off from RC	0-Allowed, 1-Not allowed	1.002 DPT_Bool (1bit)	Ri, W, U
Status_Allow On/Off from RC	0-Allowed, 1-Not allowed	1.002 DPT_Bool (1bit)	R, T
Control_Allow Mode from RC	0-Allowed, 1-Not allowed	1.002 DPT_Bool (1bit)	Ri, W, U
Status_Allow Mode from RC	0-Allowed, 1-Not allowed	1.002 DPT_Bool (1bit)	R, T
Control_Allow Setpoint from RC	0-Allowed, 1-Not allowed	1.002 DPT_Bool (1bit)	Ri, W, U
Status_Allow Setpoint from RC	0-Allowed, 1-Not allowed	1.002 DPT_Bool (1bit)	R, T
Control_Allow Fan Speed from RC	0-Allowed, 1-Not allowed	1.002 DPT_Bool (1bit)	Ri, W, U
Status_Allow Fan Speed from RC	0-Allowed, 1-Not allowed	1.002 DPT_Bool (1bit)	R, T
Status_Unit type	1-SS, 2-FC, 3-VRF, 4-IU, 5-ES, 13:Not Defined	5.x (1byte)	R, T
Status_Unit adress	0 .. 63	5.010 (DPT_Value_1_Ucount)	R, T
Status_System adress	0 .. 63	5.010 (DPT_Value_1_Ucount)	R, T
Status_Dehumidification	0-Off, 1-On	1.001-DPT_Switch (1bit)	R, T
Control_Dehumidification correction	0 .. 2	5.010 (DPT_Value_1_Ucount)	Ri, W, U
Status_Dehumidification correction	0 .. 2	5.010 (DPT_Value_1_Ucount)	R, T
Status_Compressor stop cause	n (0 .. 254)-Cause, 255-Operation Off	8.x (2 byte)	R, T
Status_Expansion valve open	0 .. 100%	5.001-DPT_Scaling (1byte)	R, T
Status_Operation condition	0-Off, 1-Thermo Off, 2-Thermo On, 3-Alarm	5.x (1byte)	R, T
Status_RC SW Temperature (°C)	-63 .. 63 °C / -81 .. 145°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_RC SW Configuration	0-Without RCS, 1-With RCS	1.001-DPT_Switch (1bit)	R, T
Status_Consumption Yesterday	n Wh / n kWh	13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Today	n Wh / n kWh	13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Total	n Wh / n kWh	13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Yesterday Heat	n Wh / n kWh	13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Today Heat	n Wh / n kWh	13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Total Heat	n Wh / n kWh	13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Yesterday Cool	n Wh / n kWh	13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Today Cool	n Wh / n kWh	13.010 active energy (Wh) (4byte)	R, T

Object name	Possible values	DPT	Flags
Status_Consumption Total Cool	n Wh / n kWh	13.010 active energy (Wh) (4byte)	R, T

**NOTE**

The default unit for the consumption signals is Wh, but you can set it in kWh instead. If so, the DPT number changes from 13.010 to 13.013.

6.3. Integration into BACnet Systems



NOTICE

You can see the Protocol Implementation Conformance Statement (PICS) document on <https://www.intesis.com/docs/bacnet-client-pic-statement-770>

6.3.1. BACnet Objects



NOTICE

This part is common for BACnet MS/TP and BACnet/IP.

Input object types:

- Binary input.

Output object types:

- Binary output.
- Multistate output.
- Analog output.

The following tables list all available BACnet objects for this gateway.

Table 7. Global signals

Object name	Possible values	Object type	Object instance
On/Off (all units)	0-Off, 1-On	4-Binary Output	0+0
Mode (all units)	1-Heat, 2-Cool, 3-Fan, 4-Dry, 5-Auto	14-Multistate Output	0+0
FanSpeed (all units)	1-Auto, 2-Low, 3-Mid, 4-High, 5-High+ (For H-Link only)	14-Multistate Output	0+1
FanSpeed (all units)	1-Low, 2-Mid, 3-High (For CSNET only)	14-Multistate Output	0+1
Air louver Position (all units)	1-Auto, 2-Pos1 .. 8-Pos7	14-Multistate Output	0+2
Temperature Setpoint (all units)	Cool: 19 .. 30°C / 66 .. 86°F Heat: 17 .. 30°C / 63 .. 86°F	1-Analog Output	0+0

Table 8. Outdoor units signals

Object name	Possible values	Object type	Object instance
OUXX_Outdoor Air Temp.	-50 .. 99°C / -58 .. 210°F	0-Analog Input	(OU address × 25) + 20000 + 0
OUXX_Comp.Top Temp.	0 .. 200°C / 32 .. 392°F	0-Analog Input	(OU address × 25) + 20000 + 1
OUXX_Total Real Comp. Freq.	0 .. 255 Hz	0-Analog Input	(OU address × 25) + 20000 + 2
OUXX_Total Comp. Current	0 .. 255 A	0-Analog Input	(OU address × 25) + 20000 + 3
OUXX_Out Exp. Valve 1 Open	0 ..100%	0-Analog Input	(OU address × 25) + 20000 + 4
OUXX_Discharge Pressure	-5.0 .. 9.9 MPa	0-Analog Input	(OU address × 25) + 20000 + 5
OUXX_Suction Pressure	-5.0 .. 9.9 MPa	0-Analog Input	(OU address × 25) + 20000 + 6
OUXX_Communication Status	0-Not Exit, 1-Exist	3-Binary Input	(OU address × 25) + 20000 + 0

Table 9. Indoor units signals

Object name	Possible values	Object type	Object instance
OXXUXX_On/Off_S	0-Off, 1-On	3-Binary Input	(IU address × 100) + 0
OXXUXX_On/Off_C	0-Off, 1-On	4-Binary Output	(IU address × 100) + 0
OXXUXX_Mode_S	1-Heat, 2-Cool, 3-Fan, 4-Dry, 5-Auto	13-Multistate Input	(IU address × 100) + 0
OXXUXX_Mode_C	1-Heat, 2-Cool, 3-Fan, 4-Dry, 5-Auto	14-Multistate Output	(IU address × 100) + 0

Object name	Possible values	Object type	Object instance
OXXUXX_Setpoint_S	Cool: 19 .. 30°C / 66 .. 86°F Heat: 17 .. 30°C / 63 .. 86°F	0-Analog Input	(IU address × 100) + 0
OXXUXX_Setpoint_C	Cool: 19 .. 30°C / 66 .. 86°F Heat: 17 .. 30°C / 63 .. 86°F	1-Analog Output	(IU address × 100) + 0
OXXUXX_FanSpeed_S	1-Auto, 2-Low, 3-Mid, 4-High, 5-High+ (For H-Link only)	13-Multistate Input	(IU address × 100) + 1
OXXUXX_FanSpeed_C	1-Auto, 2-Low, 3-Mid, 4-High, 5-High+ (For H-Link only)	14-Multistate Output	(IU address × 100) + 1
OXXUXX_Air louver Position_S	1-Auto, 2-Pos1 .. 8-Pos7	13-Multistate Input	(IU address × 100) + 2
OXXUXX_Air louver Position_C	1-Auto, 2-Pos1 .. 8-Pos7	14-Multistate Output	(IU address × 100) + 2
OXXUXX_Remote Sensor Temp.	-63 .. 63°C / -81 .. 145°F	0-Analog Input	(IU address × 100) + 1
OXXUXX_Inlet Temp.	-63 .. 63°C / -81 .. 145°F	0-Analog Input	(IU address × 100) + 2
OXXUXX_Outlet Temp.	-63 .. 63°C / -81 .. 145°F	0-Analog Input	(IU address × 100) + 3
OXXUXX_GasPipe Temp.	-63 .. 63°C / -81 .. 145°F	0-Analog Input	(IU address × 100) + 4
OXXUXX_LiquidPipe Temp.	-63 .. 63°C / -81 .. 145°F	0-Analog Input	(IU address × 100) + 5
OXXUXX_Unit Error code	Error code	0-Analog Input	(IU address × 100) + 6
OXXUXX_FilterSign	0-Normal, 1-Alarm	3-Binary Input	(IU address × 100) + 1
OXXUXX_FilterReset	1-Reset	4-Binary Output	(IU address × 100) + 1
OXXUXX_Communication Status	0-Not Exist, 1-Exist	3-Binary Input	(IU address × 100) + 2
OXXUXX_Allow On/Off from RC_S	0-Allowed, 1-Not allowed	3-Binary Input	(IU address × 100) + 3
OXXUXX_Allow On/Off from RC_C	0-Allowed, 1-Not allowed	4-Binary Output	(IU address × 100) + 2
OXXUXX_Allow Mode from RC_S	0-Allowed, 1-Not allowed	3-Binary Input	(IU address × 100) + 4
OXXUXX_Allow Mode from RC_C	0-Allowed, 1-Not allowed	4-Binary Output	(IU address × 100) + 3
OXXUXX_Allow Setpoint from RC_S	0-Allowed, 1-Not allowed	3-Binary Input	(IU address × 100) + 5
OXXUXX_Allow Setpoint from RC_C	0-Allowed, 1-Not allowed	4-Binary Output	(IU address × 100) + 4
OXXUXX_Allow Fan from RC_S	0-Allowed, 1-Not allowed	3-Binary Input	(IU address × 100) + 6
OXXUXX_Allow Fan from RC_C	0-Allowed, 1-Not allowed	4-Binary Output	(IU address × 100) + 5
OXXUXX_Unit type	1-Not Defined, 2-SS, 3-FC, 4-VRF, 5-IU, 6-ES	13-Multistate Input	(IU address × 100) + 3
OXXUXX_Unit Address	0 .. 63	0-Analog Input	(IU address × 100) + 7
OXXUXX_System Address	0 .. 63	0-Analog Input	(IU address × 100) + 8
OXXUXX_Dehumidification	0-Disabled, 1-Enabled	3-Binary Input	(IU address × 100) + 7
OXXUXX_Dehum. Correction_S	1-0, 2-(-1), 3-(-2)	13-Multistate Input	(IU address × 100) + 4
OXXUXX_Dehum. Correction_C	1-0, 2-(-1), 3-(-2)	14-Multistate Output	(IU address × 100) + 3
OXXUXX_Comp. Stop Cause	255-Operation Off, Other-See the AC user manual	0-Analog Input	(IU address × 100) + 9
OXXUXX_IDU expansion valve	0 .. 100	0-Analog Input	(IU address × 100) + 10
OXXUXX_Operat. Condition	1-Off, 2-Thermo Off, 3-Thermo On, 4-Alarm	13-Multistate Input	(IU address × 100) + 5
OXXUXX_RC SW Temp.	-63 .. 63°C / -81 .. 145°F	0-Analog Input	(IU address × 100) + 11
OXXUXX_RC SW Config	0-Without RCS, 1-With RCS	3-Binary Input	(IU address × 100) + 8
OXXUXX_Consumption Yesterday_S	n Wh / n kWh	0-Analog Input	(IU address × 100) + 12
OXXUXX_Consumption Today_S	n Wh / n kWh	0-Analog Input	(IU address × 100) + 13
OXXUXX_Consumption Total_S	n Wh / n kWh	0-Analog Input	(IU address × 100) + 14
OXXUXX_Consumption Yesterday_S Heat	n Wh / n kWh	0-Analog Input	(IU address × 100) + 15
OXXUXX_Consumption Today_S Heat	n Wh / n kWh	0-Analog Input	(IU address × 100) + 16
OXXUXX_Consumption Total_S Heat	n Wh / n kWh	0-Analog Input	(IU address × 100) + 17
OXXUXX_Consumption Yesterday_S Cool	n Wh / n kWh	0-Analog Input	(IU address × 100) + 18
OXXUXX_Consumption Today_S Cool	n Wh / n kWh	0-Analog Input	(IU address × 100) + 19
OXXUXX_Consumption Total_S Cool	n Wh / n kWh	0-Analog Input	(IU address × 100) + 20

6.4. Integration into Home Automation Systems

6.4.1. Home Automation Signals

The following tables list all available Home Automation signals for this gateway.



NOTE

- **SET:** Command used to control the indoor unit. It is sent by the client.
- **CHN:** Command used to get notifications of changes in the status of a specific function of the gateway. It is sent spontaneously by the gateway itself.
- **GET:** Command used to get the status of a specific function. It is sent by the client.

To know more about the Home Automation protocol, see the [Protocol specifications manual](#).

Table 10. Indoor units signals

Name	Possible values	acNum ¹	Commands supported
On/Off	ON/OFF	See the note below	SET/CHN/GET
Operation Mode	HEAT/COOL/FAN/DRY/AUTO		SET/CHN/GET
Fan Speed	1/2/3/4/AUTO		SET/CHN/GET
Vane Position	1/2/3/4/5/6/7/AUTO		SET/CHN/GET
Temperature Setpoint (x10)	°C / °F		SET/CHN/GET
AC Ambient Temperature (x10)	°C / °F		CHN/GET
Unit Error code	0-No Error, X-Error		CHN/GET
Error IU	OK/ERR		CHN/GET



NOTE

¹ This index must be set accordingly to the Unit ID Index.

For outdoor units, the acNum value must be the same than the minimum indoor unit associated in the CONFIGURATION section.

7. Late Configuration: Change the Gateway's Protocol

Reconfiguring the gateway with a different protocol is very easy:

1. Connect the gateway to the PC and open the configuration tool Intesis MAPS.
2. Select the new template you need.
3. Click **Next** or double-click the template in the list.
4. A message will pop up, asking if you want to save the project currently loaded in the gateway.
5. Click **Yes** or **No**, depending on your needs.
6. Configure the needed parameters and signals for your new project.
7. Send the configuration to the gateway.



NOTE

For a complete gateway configuration guide, please refer to the [Intesis MAPS User manual for IN770AIR00x0000](#).

8. Error Codes



NOTE

These error codes are the same for all applications.

Error Code	Category	Description	Cause
1	Indoor unit	Device protection Activation of the float switch	Drain clogging
2	Outdoor unit	Device protection Activation of the high pressure switch	Pipe clogging Excessive refrigerant Inert gas mixing
3	Transmission	Abnormality between indoor and outdoor units	Wrong wiring Loose terminals Wire disconnection Fuse blowout
4		Inverter PCB-outdoor PCBs transmission failure	Loose connector Breaking of wire Fuse blowout
4.		Fan controller PCB-outdoor PCB transmission failure	Loose connector Breaking of wire Fuse blowout
5	Supply phase	Abnormality in the power source phases	Wrong power source Connection to reversed phase Open-phase
6	Voltage	Abnormal inverter voltage	Drop in the outdoor voltage Insufficient power capacity
6.		Abnormal fan controller voltage	Drop in the outdoor voltage Insufficient power capacity
7	Cycle	Decrease in the discharge gas superheat	Excessive refrigerant charge Thermistor failure Wrong wiring Wrong piping connection Expansion valve stuck in the closed position
8		Increase in the discharge gas temperature	Insufficient refrigerant charge Pipe clogging Thermistor failure Wrong wiring Wrong piping connection Expansion valve stuck in the open position
0A	Transmission	Transmission error between the indoor and the outdoor unit	Wrong wiring Breaking of wire Loose terminals
0b	Outdoor unit	Wrong outdoor unit address setting	2+ outdoor units share the same address
0c		Wrong outdoor unit main unit setting	2+ outdoor units are set as main unit
11	Indoor unit's sensor	Inlet air thermistor	Wrong wiring
12		Outlet air thermistor	Wire disconnection
13		Freeze protection thermistor	Breaking of wire
14		Gas piping thermistor	Short circuit

Error Code	Category	Description	Cause
19	Fan motor	Protection device activation for the indoor fan	Fan's motor overheating Fan's motor is blocked
21	Outdoor unit's sensor	High Pressure Sensor	Wrong wiring Wire disconnection Breaking of wire Short circuit
22		Outdoor Air Thermistor	
23		Discharge gas thermistor on top of the compressor	
24		Heat exchanger liquid pipe thermistor	
25		Heat exchanger gas pipe thermistor	
29		Low pressure sensor	
31	System	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit	Incorrect Capacity Code Setting of Combination Excessive or Insufficient Indoor Unit Total Capacity Code
35		Incorrect Setting of Indoor Unit No.	Duplication of Indoor Unit No. in same Ref. Gr.
36		Incorrect of Indoor Unit Combination	Indoor Unit is Designed for R22
38		Abnormality of Picking up Circuit for Protection in Outdoor Unit	Failure of Protection Detecting Device (Incorrect Wiring of Outdoor PCB)
39	Compressor	Abnormality Running Current at Constant! Speed Compressor	Overcurrent, Blowout Fuse, Current Sensor Failure, instantaneous Power Failure, Voltage Drop, Abnormal Power Supply
3A	Outdoor Unit	Abnormality of Outdoor Unit Capacity	Outdoor Unit Capacity > 510kBtu/h
3b		Incorrect Setting of Outdoor Unit Models Combination or Voltage	Incorrect Setting of Main and Sub Unit(s) Combination or Voltage
3d		Abnormality Transmission between Main Unit and Sub Unit(s)	Incorrect Wiring, Disconnect Wire, Breaking Wire, PCB Failure
43	Protection Device	Activation of Low Compression Ratio Protection Device	Defective Compression (Failure of Compressor of Inverter, Loose Power Supply Connection)
44		Activation of Low Pressure Increase Protection Device	Overload at Cooling, High Temperature at Heating, Expansion Valve Locking (Loose Connector)
45		Activation of High Pressure Increase Protection Device	Overload Operation (Clogging, Short-Pass), Pipe Clogging, Excessive Refrigerant!, Inert Gas Mixing
47		Activation of Low Pressure Decrease Protection Device (Vacuum Operation Protection)	Insufficient Refrigerant!, Refrigerant! Piping, Clogging, Expansion Valve Locking at Open Position (Loose Connector)
48		Activation of Inverter Overcurrent Protection Device	Overload Operation, Compressor Failure
51	Sensor	Abnormal Inverter Current! Sensor	Current! Sensor Failure
53	Inverter	Inverter Error Signal Detection	Driver IC Error Signal Detection (Protection for Overcurrent, Low Voltage, Short Circuit)
54		Abnormality of Inverter Fin Temperature	Abnormal Inverter Fin Thermistor, Heat Exchanger Clogging, Fan Motor Failure
55		Inverter Failure	Inverter PCB Failure
57	Fan Controller	Activation of Fan Controller Protection	Driver IC Error Signal Detection (Protection for Overcurrent, Low Voltage, Short Circuit), Instantaneous Overcurrent
5A		Abnormality of Fan Controller Fin Temperature	Fin Thermistor Failure, Heat Exchanger Clogging, Fan Motor Failure
5b		Activation of Overcurrent Protection	Fan Motor Failure
5C		Abnormality of Fan Controller Sensor	Failure of Current! Sensor (Instantaneous Overcurrent, Increase of Fin Temperature, Low Voltage, Earth Fault, Step-Out)
EE	Compressor	Compressor Protection Alarm (It is cannot be reset from remote Controller)	This alarm code appears when the following alarms• occurs three times within 6 hours. *02, 07, 08, 39, 43 to 45, 47
b1	Outdoor Unit No. Setting	Incorrect Setting of Unit and Refrigerant! Cycle No.	Over 64 Number is Set for Address or Refrigerant! Cycle.
b5	Indoor Unit No. Setting	Incorrect Indoor Unit Connection Number Setting	More than 17 Non-Corresponding to HI-NET Units are Connected to One System.

Error Code	Category	Description	Cause
C1	Switch Box Unit	Incorrect Indoor Unit Connection	2 or more Switch Box Units are connected between outdoor unit and indoor unit.
C2		Incorrect Indoor Unit Connection No. Setting	9 or More Indoor Units Connected to Switch Box Unit
C3		Incorrect Indoor Unit Connection	The indoor units of different refrigerant! cycle is connected to Switch Box unit.

**NOTE**

If you detect a non-listed error code, please contact Hitachi technical support.