ENGLISH

Panasonic domestic and commercial with KNX, Serial and IP support

IN771AIR00LO000 GATEWAY

USER MANUAL
Version 1.0.3
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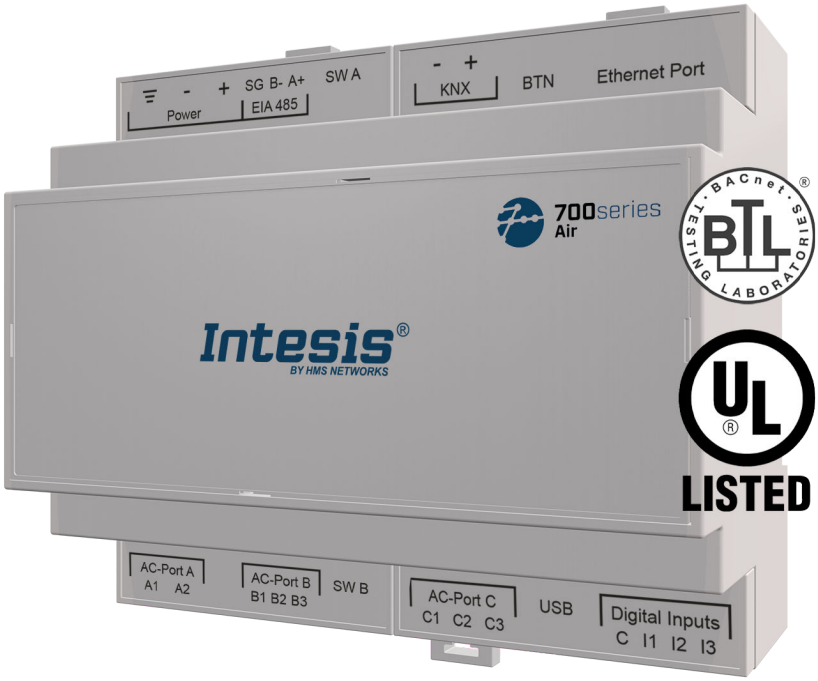

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Table of Contents

1. Description and Order Codes

IN771AIR00LO000 Gateway.
Modbus®, KNX®, BACnet®, and Home Automation® gateway for Panasonic® air conditioning systems.

ORDER CODE	LEGACY ORDER CODE
IN771AIR00LO000	INBACPAN128O000 INMBSPAN128O000

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

2. Licensing

Distribution license(s) for the IN771AIR00LO000 gateway:

Order Code	License	Maximum AC units	
		Indoor units	Outdoor units
IN771AIR00LO000	Large	128	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 22).

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 IN771AIR00LO000 gateway.

Panasonic domestic and commercial HVAC systems to:

- Modbus TCP and RTU
- KNX TP
- BACnet/IP or MS/TP
- Home Automation

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

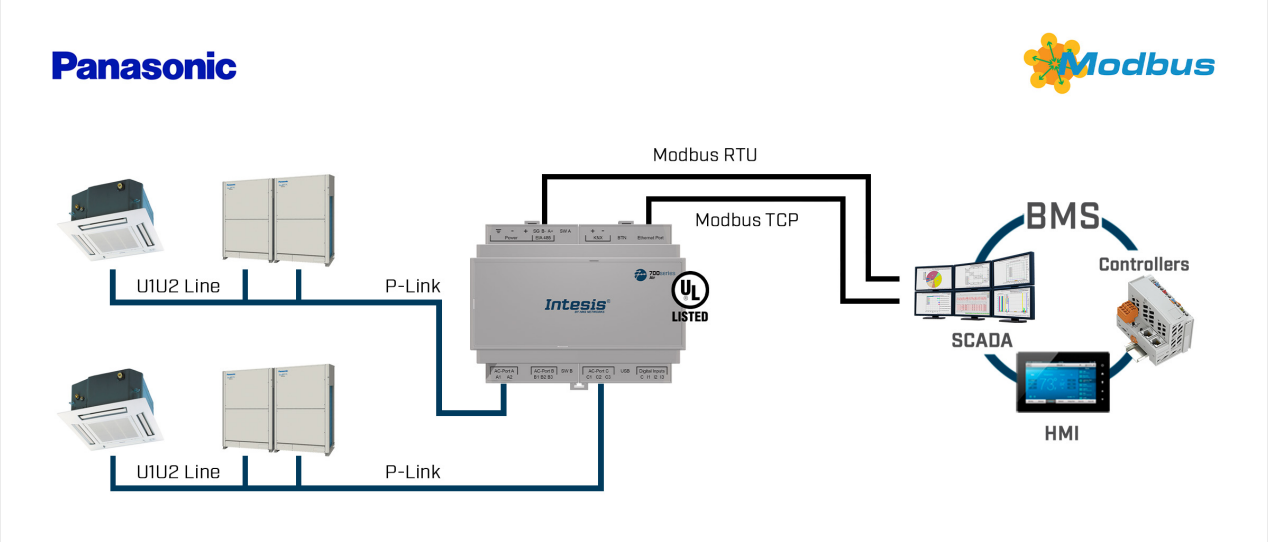


Figure 1. Integration of Panasonic AC systems into Modbus installations

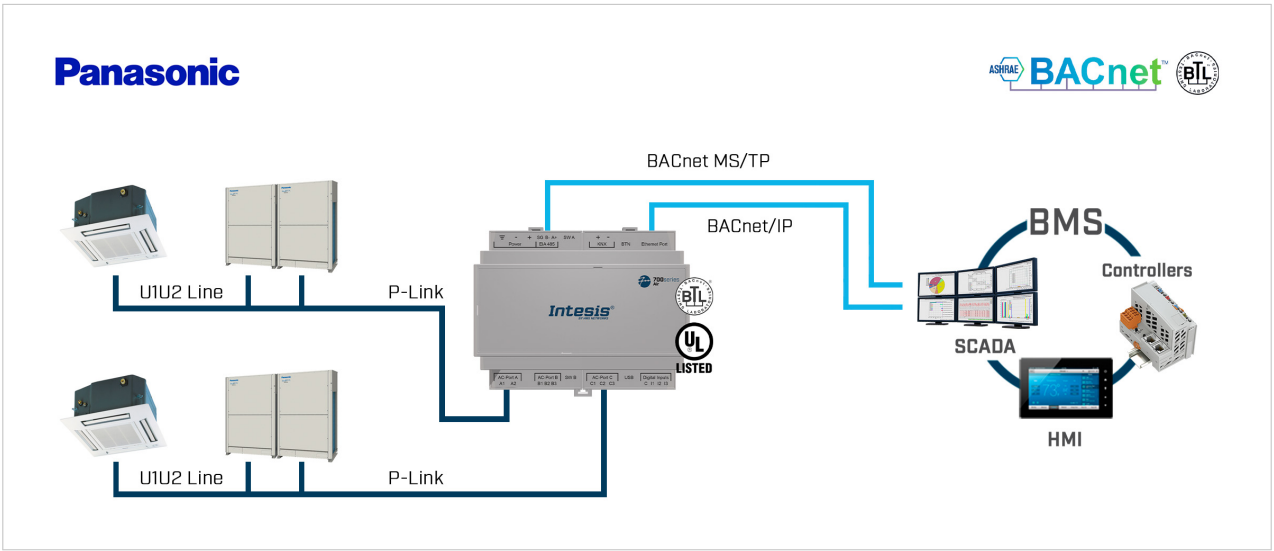


Figure 2. Integration of Panasonic AC systems into BACnet installations

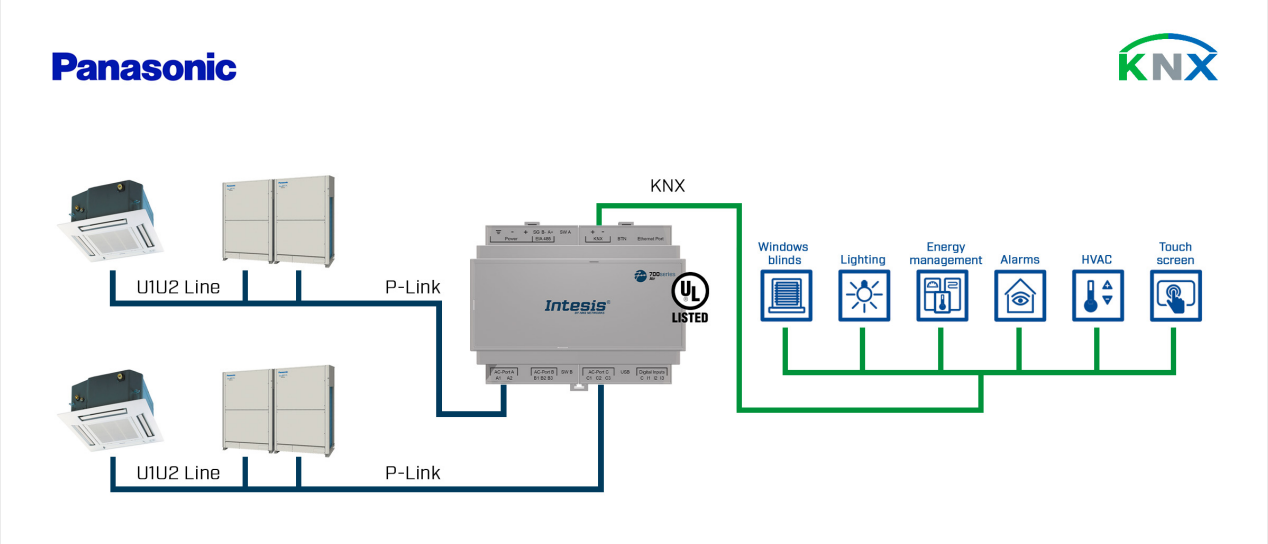


Figure 3. Integration of Panasonic AC systems into KNX installations

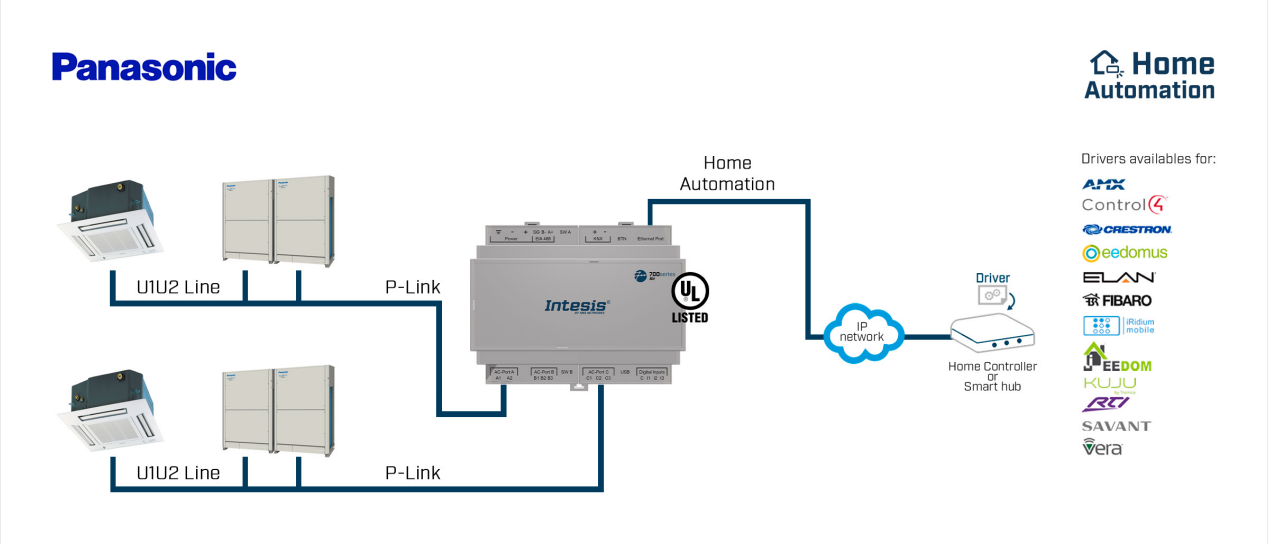


Figure 4. Integration of Panasonic AC systems into Home Automation installations

4.1. Inside the Package

Items included:

- Intesis IN771AIR00LO000 Gateway
- USB Mini-B type to USB A type cable
- Installation sheet

4.2. 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 IN771AIR00LO000 gateway, you can easily integrate Panasonic 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.

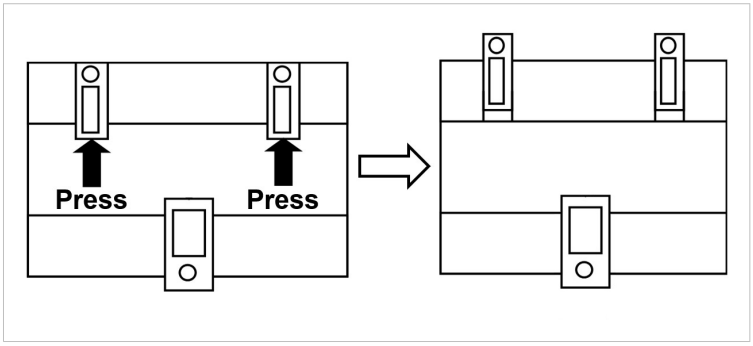
IMPORTANT
Maximum mounting height: below 2 meters (6.5 feet).

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 23).

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.

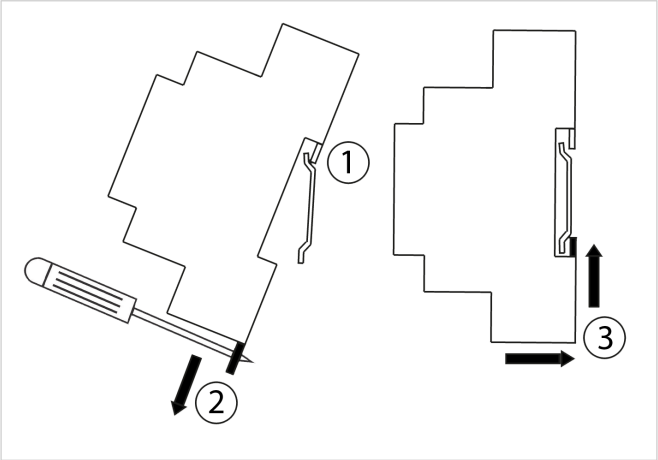
NOTE
Use M3 screws, 25 mm (1") length.

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.

IMPORTANT
Keep communication cables away from power and ground wires.

5.2.1. Gateway Connectors

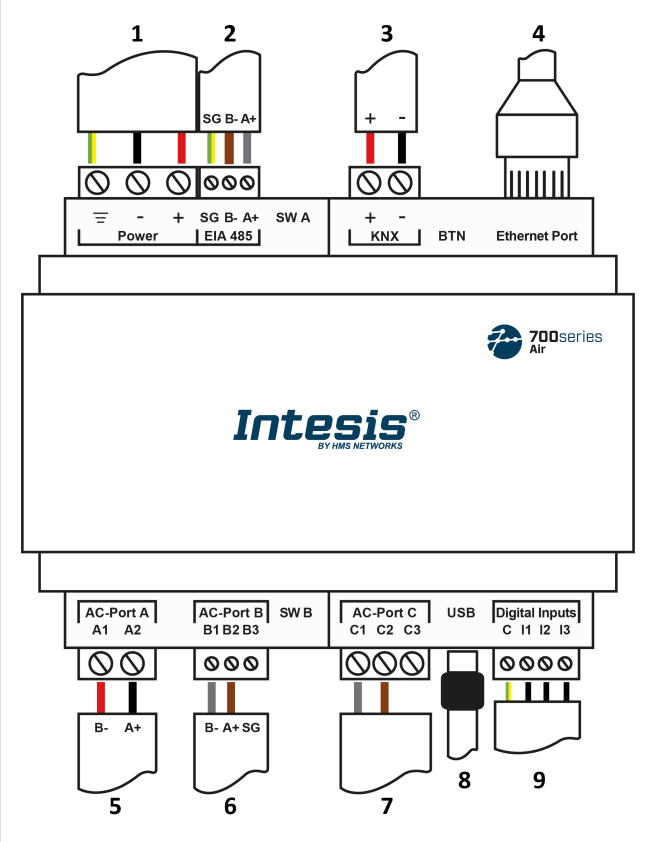


Figure 5. General view of all gateway connectors

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

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

NOTE
To know more about each port's specifications, see Technical Specifications (page 22).

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:

- One core: 0.2 .. 2.5 mm^2 (24 .. 14 AWG).
- Two cores: 0.2 .. 1.5 mm^2 (24 .. 16 AWG).
- Three 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
Panasonic	P-Link 1	(Not used)	P-Link 2	(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)	

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.

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 Panasonic air conditioning network bus (P-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 consult 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 20).

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 Intesis MAPS User manual for IN771AIR00LO000.

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 consult 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 Intesis MAPS User manual for IN771AIR00LO000.

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 consult 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 20).

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 Intesis MAPS User manual for IN771AIR00LO000.

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 consult 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 Intesis MAPS User manual for IN771AIR00LO000.

NOTICE
See the wiring diagram in the gateway connectors figure: General view of all gateway connectors (page 10)

5.3. Gateway Layout

Find in this image below the disposition of various hardware elements in the gateway.

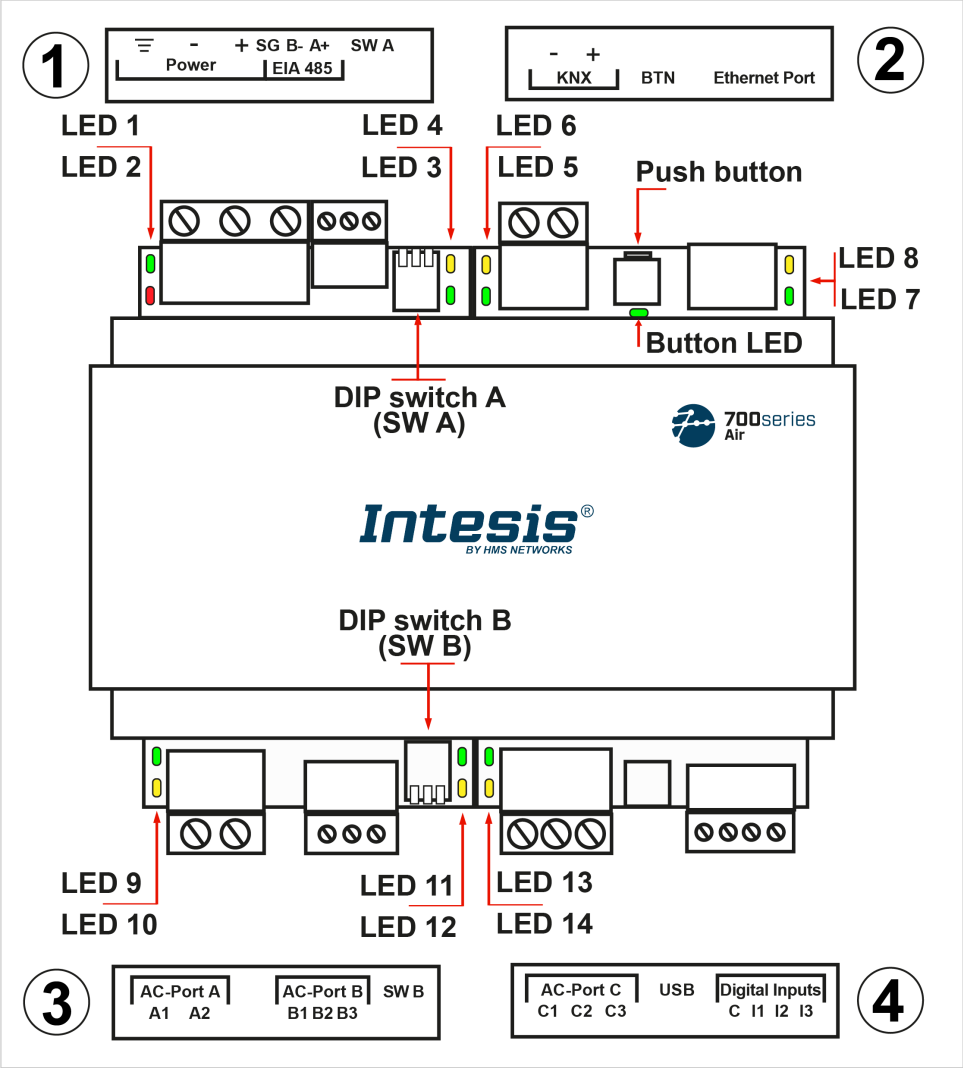


Figure 6. Gateway layout

The following sections explain in more detail each element: LEDs, DIP switches, and the push button.

5.4. LED Indicators

Table 1. LEDs location and behavior

Cover	LED	Color	Description
Top side			
Under frontal cover ①	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)
Under frontal cover ②	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			
Under frontal cover ③	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)
Under frontal cover ④	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 (figure Gateway layout (page 19)). These covers are assembled by pressure, so you just need to pull them to remove them.

5.5. DIP Switches

The gateway has two DIP switches (figure Gateway layout (page 19)):

- DIP switch A (SW A)
- 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

5.6. Push Button

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

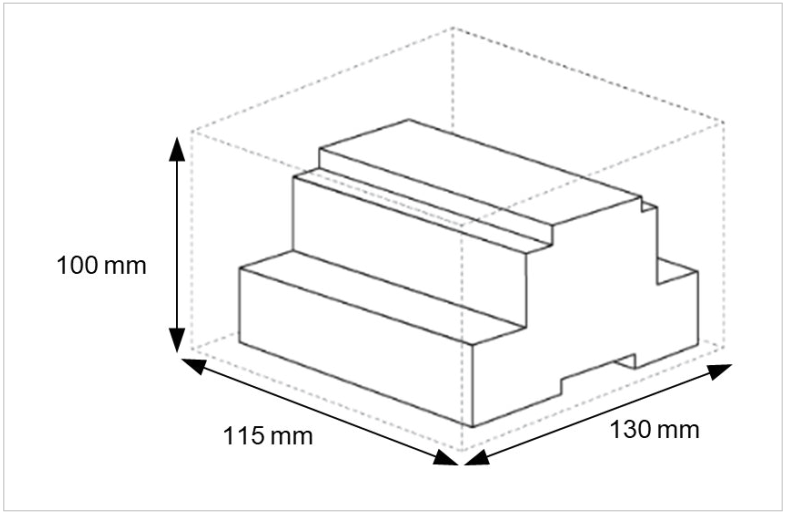
- Push the button to switch between normal mode and programming mode.

5.7. Technical Specifications

Case	Plastic, type PC (UL 94 V-0). Color: Light Grey. RAL 7035 Net dimensions (dxwxh): Millimeters: 90 x 106 x 58 mm / Inches: 3.5 x 4.2 x 2.3" Recommended space for installation (dxwxh): Millimeters: 130 x 115 x 100 mm / Inches: 5.1 x 4.5 x3.9"	
Mounting	Wall: M3 25 mm (1") length screws. Secure mounting: below 2 meters (6 feet) DIN rail (recommended mounting) EN60715 TH35	
Wires (for power supply and low-voltage signals)	Per terminal: solid wires or stranded wires (twisted or with ferrule) Wire cross-section/gauge: One core: 0.2 .. 2.5 mm^2 (24 .. 14 AWG) Two cores: 0.2 to 1.5 mm^2 (24 .. 16 AWG) Three 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 (P-Link 1) AC-Port B (serial, 3 poles): Not used AC-Port C: (serial, 3 poles): AC bus connection (P-Link 2)	
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	1 x Push button Factory reset I-Am message (for BACnet only) Normal mode/programming mode switch (for KNX only)	
Operational temperature	Celsius: 0 .. 60°C Fahrenheit: 32 .. 140ºF	
Operational humidity	5 to 95%. No condensation	
Protection	IP20 (IEC60529)	

5.8. 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 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 2. Occupancy registers

Register name	Possible values	R/W
Occupancy Cool Setpoint (x10)	Celsius: -15 .. 60°C Fahrenheit: 4 .. 140°F	R, W
Occupancy Heat Setpoint (x10)	Celsius: -15 .. 60°C Fahrenheit: 4 .. 140°F	R, W
Unoccupancy Cool Setpoint (x10)	Celsius: -15 .. 60°C Fahrenheit: 4 .. 140°F	R, W
Unoccupancy Heat Setpoint (x10)	Celsius: -15 .. 60°C Fahrenheit: 4 .. 140°F	R, W
Occupancy Continuous Check	0: Disabled 1: Enabled	R, W
Unoccupancy Deadband Action	0: Off 1: Current mode	R, W

Table 3. Global signals

Register name	Possible values	R/W
On (all the units)	1: Set the units On	W
Off (all the units)	1: Set the units Off	W
Operation Mode Auto (all the units)	1: Set Auto Mode	W

Register name	Possible values	R/W
Operation Mode Heat (all the units)	1: Set Heat Mode	W
Operation Mode Dry (all the units)	1: Set Dry Mode	W
Operation Mode Fan (all the units)	1: Set Fan Mode	W
Operation Mode Cool (all the units)	1: Set Cool Mode	W
Fan Speed Auto (all the units)	1: Set Fan Speed Auto	W
Fan Speed Low (all the units)	1: Set Fan Speed Low	W
Fan Speed Med (all the units)	1: Set Fan Speed Med	W
Fan Speed High (all the units)	1: Set Fan Speed High	W
Vanes Stop (all the units)	1: Set Vanes Stop	W
Vanes Position 1 (all the units)	1: Set Vanes Pos1	W
Vanes Position 2 (all the units)	1: Set Vanes Pos2	W
Vanes Position 3 (all the units)	1: Set Vanes Pos3	W
Vanes Position 4 (all the units)	1: Set Vanes Pos4	W
Vanes Position 5 (all the units)	1: Set Vanes Pos5	W
Vanes Swing (all the units)	1: Set Vanes Swing	W
Temperature Setpoint (all units) (x10)	°C / °F	W

Table 4. Outdoor units signals

Register name	Possible values	Modbus address formula	R/W
Communication Error OU	0: No error 1: Error	(OU address×25)+((L-1)×10000)+7000)+0	R
Demand Limit. Ratio	0 .. 200% (255: No limit)	(OU address×25)+((L-1)×10000)+7000)+1	R, W
High Pressure Sensor (x10)	bar	(OU address×25)+((L-1)×10000)+7000)+2	R
Low Pressure Sensor (x10)	bar	(OU address×25)+((L-1)×10000)+7000)+3	R
Compressor 1 Operation Time	0 .. 16777215 hours	(OU address×25)+((L-1)×10000)+7000)+4	R
Compressor 2 Operation Time	0 .. 16777215 hours	(OU address×25)+((L-1)×10000)+7000)+5	R
Compressor 3 Operation Time	0 .. 16777215 hours	(OU address×25)+((L-1)×10000)+7000)+6	R

Table 5. Indoor units signals

Register name	Possible values	Modbus address formula	R/W
On/Off	0: Off 1: On	(IU address×100)+((L-1)×10000)+0	R, W
Operation Mode	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool 5: AutoHeat 6: AutoCool	(IU address×100)+((L-1)×10000)+1	R, W
Fan Speed	0: Auto 1: Low 2: Low+ 3: Medium 4-Medium+ 5-High	(IU address×100)+((L-1)×10000)+2	R, W

Register name	Possible values	Modbus address formula	R/W
Vane Position	0: Stop 1: Position 1 2: Position 2 3: Position 3 4: Position 4 5: Position 5 10-Swing	(IU address×100)+((L-1)×10000)+3	R, W
Temperature Setpoint (x10)	°C / °F	(IU address×100)+((L-1)×10000)+4	R, W
AC Ambient Temperature (x10)	Celsius: -35 .. 92,5°C Fahrenheit: -31 .. 198,5°F	(IU address×100)+((L-1)×10000)+5	R
Modbus ambient temperature (x10)	°C / °F	(IU address×100)+((L-1)×10000)+28	R, W
AC Real Temperature Setpoint (x10)	°C / °F	(IU address×100)+((L-1)×10000)+29	R
Wired Remote Controller	0: Body sensor 1: Remote control sensor	(IU address×100)+((L-1)×10000)+6	R, W
Discharge Setpoint Temp. Cool (x10)	Celsius: -10 .. 10°C Fahrenheit: 13 .. 50°F	(IU address×100)+((L-1)×10000)+7	R, W
Discharge Setpoint Temp. Heat (x10)	Celsius: -10 .. 10°C Fahrenheit: 13 .. 50°F	(IU address×100)+((L-1)×10000)+8	R, W
Discharge Current Temp. (x10)	Celsius: -35 .. 92,5°C Fahrenheit: -31 .. 198,5°F	(IU address×100)+((L-1)×10000)+9	R
Heat Exchanger Temp. (x10)	Celsius: -1 .. 26°C Fahrenheit: 30 .. 79°F	(IU address×100)+((L-1)×10000)+10	R
Heat Setpoint Up Limit (x10)	Celsius: -35 .. 92,5°C Fahrenheit: -31 .. 198,5°F	(IU address×100)+((L-1)×10000)+11	R
Heat Setpoint Low Limit (x10)	Celsius: -35 .. 92,5°C Fahrenheit: -31 .. 198,5°F	(IU address×100)+((L-1)×10000)+12	R
Cool Setpoint Up Limit (x10)	Celsius: -35 .. 92,5°C Fahrenheit: -31 .. 198,5°F	(IU address×100)+((L-1)×10000)+13	R
Cool Setpoint Low Limit (x10)	Celsius: -35 .. 92,5°C Fahrenheit: -31 .. 198,5°F	(IU address×100)+((L-1)×10000)+14	R
Dry Setpoint Up Limit (x10)	Celsius: -35 .. 92,5°C Fahrenheit: -31 .. 198,5°F	(IU address×100)+((L-1)×10000)+15	R
Dry Setpoint Low Limit (x10)	Celsius: -35 .. 92,5°C Fahrenheit: -31 .. 198,5°F	(IU address×100)+((L-1)×10000)+16	R
Auto Setpoint Up Limit (x10)	Celsius: -35 .. 92,5°C Fahrenheit: -31 .. 198,5°F	(IU address×100)+((L-1)×10000)+17	R
Auto Setpoint Low Limit (x10)	Celsius: -35 .. 92,5°C Fahrenheit: -31 .. 198,5°F	(IU address×100)+((L-1)×10000)+18	R
Unit Error code	0: No Error X (1 .. 255): Error	(IU address×100)+((L-1)×10000)+19	R
Filter Alarm	0: Normal 1: Alarm	(IU address×100)+((L-1)×10000)+20	R
Filter Alarm Reset	1: Reset	(IU address×100)+((L-1)×10000)+21	W
Communication Error IU	0: No error 1: Error	(IU address×100)+((L-1)×10000)+22	R
Allow On/Off from RC	0: Allow 1: Not allow	(IU address×100)+((L-1)×10000)+23	R, W
Allow Mode from RC	0: Allow 1: Not allow	(IU address×100)+((L-1)×10000)+24	R, W

Register name	Possible values	Modbus address formula	R/W
Allow Setpoint from RC	0: Allow 1: Not allow	(IU address×100)+((L-1)×10000)+25	R, W
Unit Type	0: Not Defined 1: TBD 2: GHP 3: PAC 4: VRF	(IU address×100)+((L-1)×10000)+26	R
Occupancy	1: Occupied 2: Unoccupied 3: Disable	(IU address×100)+((L-1)×10000)+27	R, W
Consumption Yesterday	Wh/KWh	(IU address×100)+((L-1)×10000)+30	R
Consumption Today	Wh/KWh	(IU address×100)+((L-1)×10000)+32	R
Consumption Total	Wh/KWh	(IU address×100)+((L-1)×10000)+34	R
Consumption Yesterday Heat	Wh/KWh	(IU address×100)+((L-1)×10000)+36	R
Consumption Today Heat	Wh/KWh	(IU address×100)+((L-1)×10000)+38	R
Consumption Total Heat	Wh/KWh	(IU address×100)+((L-1)×10000)+40	R
Consumption Yesterday Cool	Wh/KWh	(IU address×100)+((L-1)×10000)+42	R
Consumption Today Cool	Wh/KWh	(IU address×100)+((L-1)×10000)+44	R
Consumption Total Cool	Wh/KWh	(IU address×100)+((L-1)×10000)+46	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 6. 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
Operating Mode (all units)	0: Cool, 1: Heat, 2: Fan, 3: Dry, 4: Auto 0: Cool 1: Dry 2: Fan 3: Heat 4: Auto	5.x (1byte)	W
Fan Speed (all units)	1: Low 2: Med 3: High	5.x (1byte)	W
Fan Speed AUTO (all units)	1: Set auto fan 0: Stop auto fan	1.001-DPT_Switch (1bit)	W
Vanes position (all units)	1 .. 5: Position 1 .. Position 5	5.x (1byte)	W
Vanes position Swing (all units)	1: Set swing vanes 0: Stop swing vanes	1.001-DPT_Switch (1bit)	W
Temperature Setpoint (°C) (all units)	°C	9.001-DPT_Value_Temp (2byte)	W

Table 7. 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
Control_Demand Limit. Ratio	0 .. 200 % (255: No limit)	5.004-DPT_Percent_U8 (1byte)	R, T
Status_Demand Limit. Ratio	0 .. 200 % (255: No limit)	5.004-DPT_Percent_U8 (1byte)	R, T
Status_High Pressure Sensor	Pa	14.058_DPT_Value_Pressure	R, T
Status_Low Pressure Sensor	Pa	14.058_DPT_Value_Pressure	R, T
Status_Compressor 1 operation time	0 .. 16777215 hours	7.007-DPT_TimePeriodHrs (2byte)	R, T
Status_Compressor 2 operation time	0 .. 16777215 hours	7.007-DPT_TimePeriodHrs (2byte)	R, T
Status_Compressor 3 operation time	0 .. 16777215 hours	7.007-DPT_TimePeriodHrs (2byte)	R, T

Table 8. Indoor units signals

Object name	Possible values	DPT	Flags
Control_On/Off	0: Off 1: On	1.001-DPT_Switch (1bit)	W
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)	W
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)	W
Status_Operation mode	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool 5: AutoHeat 6: AutoCool	5.x (1byte)	R, T
Control_Operation mode	0: Cool 1: Dry 2: Fan 3: Heat 4: Auto	5.x (1byte)	W

Object name	Possible values	DPT	Flags
Status_Operation mode	0: Cool 1: Dry 2: Fan 3: Heat 4: Auto 5: AutoHeat 6: AutoCool	5.x (1byte)	R, T
Control_Mode Cool/Heat	0: Cool, 1: Heat	1.100-DPT_Heat/Cool (1bit)	W
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)	W
Control_Cool mode&ON	0 %: Off 1 .. 100 %: On+Heat	5.001-DPT_Scaling (1byte)	W
Control_Auto mode	1: Set auto mode	1.001-DPT_Switch (1bit)	W
Status_Auto mode	1: Auto mode active 0: Auto mode not active	1.001-DPT_Switch (1bit)	R, T
Status_AutoHeat mode	1: AutoHeat mode active 0: AutoHeat mode not active	1.001-DPT_Switch (1bit)	R, T
Status_AutoCool mode	1: AutoCool mode active 0: AutoCool mode not active	1.001-DPT_Switch (1bit)	R, T
Control_Heat mode	1: Set heat mode	1.001-DPT_Switch (1bit)	W
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)	W
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)	W
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)	W
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: Med 3: High	5.x (1byte)	W
Status_Fan speed enumerated	1: Low, 2: Low+, 3: Med 4: Med+ 5: High	5.x (1byte)	R, T
Control_Fan speed scaling	Thersholds: 0 .. 49 % 50 .. 82 % 83 .. 100 %	5.001-DPT_Scaling (1byte)	W

Object name	Possible values	DPT	Flags
Status_Fan speed scaling	Thersholds: 20 %; 40 % 60 % 80 % 100 %	5.001-DPT_Scaling (1byte)	R, T
Control_Fan speed low	1: Set fan speed low	1.001-DPT_Switch (1bit)	W
Status_Fan speed low	1: Speed low active 0: Speed low not active	1.001-DPT_Switch (1bit)	R, T
Status_Fan speed low+	1: Speed low+ active 0: Speed low+ not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan speed med	1: Set fan speed med	1.001-DPT_Switch (1bit)	W
Status_Fan speed med	1: Speed med active 0: Speed med not active	1.001-DPT_Switch (1bit)	R, T
Status_Fan speed med+	1: Speed med+ active 0: Speed med+ not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan speed high	1: Set fan speed high	1.001-DPT_Switch (1bit)	W
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)	W
Status_Fan speed Man/Auto	0: Manual 1: Auto	1.001-DPT_Switch (1bit)	R, T
Control_Vanes position enumerated	1.. 5: Position 1 .. Position 5	5.x (1byte)	W
Status_Vanes position enumerated	1.. 5: Position 1 .. Position 5	5.x (1byte)	R, T
Control_Vanes position scaling	Thersholds: 0 .. 29 % 30 .. 49 % 50 .. 69 % 70 .. 89 % 90 .. 100 %	5.001-DPT_Scaling (1byte)	W
Status_Vanes position scaling	Thersholds: 20 %; 40 % 60 % 80 % 100 %	5.001-DPT_Scaling (1byte)	R, T
Control_Vanes position-1	1: Set position-1 vanes	1.001-DPT_Switch (1bit)	W
Status_Vanes position-1	1: Vanes position-1 active 0: Vanes position-1 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vanes position-2	1: Set position-2 vanes	1.001-DPT_Switch (1bit)	W
Status_Vanes position-2	1: Vanes position-2 active 0: Vanes position-2 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vanes position-3	1: Set position-3 vanes	1.001-DPT_Switch (1bit)	W
Status_Vanes position-3	1: Vanes position-3 active 0: Vanes position-3 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vanes position-4	1: Set position-4 vanes	1.001-DPT_Switch (1bit)	W
Status_Vanes position-4	1: Vanes position-4 active 0: Vanes position-4 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vanes position-5	1: Set position-5 vanes	1.001-DPT_Switch (1bit)	W

Object name	Possible values	DPT	Flags
Status_Vanes position-5	1: Vanes position-5 active 0: Vanes position-5 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vanes position stop	1: Set stop vanes	1.001-DPT_Switch (1bit)	W
Status_Vanes position stop	1: Vanes stop active 0: Vanes stop not active	1.001-DPT_Switch (1bit)	R, T
Control_Vanes position swing	0: Swing off 1: Swing on	1.001-DPT_Switch (1bit)	W
Status_Vanes position swing	0: Swing off 1: Swing on	1.001-DPT_Switch (1bit)	R, T
Control_Temperature setpoint (°C)	°C / °F	9.001-DPT_Value_Temp (2byte)	W
Status_Temperature setpoint (°C)	°C / °F	9.001-DPT_Value_Temp (2byte)	R, T
Status_AC ambient temperature (°C)	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198°F	9.001-DPT_Value_Temp (2byte)	R, T
Control_KNX ambient temperature (°C)	°C / °F	9.001-DPT_Value_Temp (2byte)	W
Control_Wired remote controller	0: Body sensor 1: Remote control sensor	1.001-DPT_Switch (1bit)	W
Status_Wired remote controller	0: Body sensor 1: Remote control sensor	1.001-DPT_Switch (1bit)	R, T
Control_Disch. setpoint cool (°C)	Celsius: -10 .. 10°C Fahrenheit: 14 .. 50°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_Disch. setpoint cool (°C)	Celsius: -10 .. 10°C Fahrenheit: 14 .. 50°F	9.001-DPT_Value_Temp (2byte)	R, T
Control_Disch. setpoint heat (°C)	Celsius: -10 .. 10°C Fahrenheit: 14 .. 50°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_Disch. setpoint heat (°C)	Celsius: -10 .. 10°C Fahrenheit: 14 .. 50°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_Disch. current temperature (°C)	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_Heat exchanger temperature (°C)	Celsius: -1 .. 26°C Fahrenheit: 30 .. 79°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 1 .. 255: Error	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)	W
Status_Communication status with IU	0: Not exist 1: Exist	1.001-DPT_Switch (1bit)	R, T
Control_On/Off Remote controll disablement	0: No disabled 1: Disabled	1.002 DPT_Bool (1bit)	W
Status_On/Off Remote controll disablement	0: No disabled 1: Disabled	1.002 DPT_Bool (1bit)	R, T
Control_Mode Remote controll disablement	0: No disabled 1: Disabled	1.002 DPT_Bool (1bit)	W
Status_Mode Remote controll disablement	0: No disabled 1: Disabled	1.002 DPT_Bool (1bit)	R, T
Control_Setpoint Remote controll disablement	0: No disabled 1: Disabled	1.002 DPT_Bool (1bit)	W

Object name	Possible values	DPT	Flags
Status_Setpoint Remote controll disablement	0: No disabled 1: Disabled	1.002 DPT_Bool (1bit)	R, T
Status_Unit type	1: Not Defined 2: TBD 3: GHP 4: PAC 5: VRF	5.x (1byte)	R, T
Status_Consumption Yesterday	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Today	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Total	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Yesterday_Heat	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Today_Heat	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Total_Heat	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Yesterday_Cool	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Today_Cool	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Total_Cool	Wh/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-server-pic-statement-771

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 9. Occupancy signals

Object name	Possible values	Object type	Object instance
Occupancy Cool Setpoint	Celsius: -15 .. 60°C Fahrenheit: 4 .. 140°F	2-Analog value	0+0
Occupancy Heat Setpoint	Celsius: -15 .. 60°C Fahrenheit: 4 .. 140°F	2-Analog value	0+1
Unoccupancy Cool Setpoint	Celsius: -15 .. 60°C Fahrenheit: 4 .. 140°F	2-Analog value	0+2
Unoccupancy Heat Setpoint	Celsius: -15 .. 60°C Fahrenheit: 4 .. 140°F	2-Analog value	0+3
Occupancy Continuous Check	0: Disabled 1: Enabled	5-Binary value	0+0
Unoccupancy Deadband Action	0: Off 1: Current mode	5-Binary value	0+1

Table 10. 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: Med 4: High	14-Multistate Output	0+1

Object name	Possible values	Object type	Object instance
Vane Position (all units)	1: Stop 2: Pos1 3: Pos2 4: Pos3 5: Pos4 6: Pos5 7: Swing	14-Multistate Output	0+2
Temperature Setpoint (all units)	°C / °F	1-Analog Output	0+0

Table 11. Outdoor unit signals

Object name	Possible values	Object type	Object instance
LXOUXX_Communication Error OU	0: No error 1: Error	3-Binary Input	(OU[1..30]×25)+((L-1)×1000)+10000)+0
LXOUXX_Demand Limit. Ratio_S	0 .. 200% (255: No limit)	0-Analog Input	(OU[1..30]×25)+((L-1)×1000)+10000)+0
LXOUXX_Demand Limit. Ratio_C	0 .. 200% (255: No limit)	0-Analog Output	(OU[1..30]×25)+((L-1)×1000)+10000)+0
LXOUXX_High Pressure Sensor	bar	0-Analog Input	(OU[1..30]×25)+((L-1)×1000)+10000)+1
LXOUXX_Low Pressure Sensor	bar	0-Analog Input	(OU[1..30]×25)+((L-1)×1000)+10000)+2
LXOUXX_Compressor_1_Working Time	0 .. 16777215 hours	0-Analog Input	(OU[1..30]×25)+((L-1)×1000)+10000)+3
LXOUXX_Compressor_2_Working Time	0 .. 16777215 hours	0-Analog Input	(OU[1..30]×25)+((L-1)×1000)+10000)+4
LXOUXX_Compressor_3_Working Time	0 .. 16777215 hours	0-Analog Input	(OU[1..30]×25)+((L-1)×1000)+10000)+5

Table 12. Indoor unit signals

Object name	Possible values	Object type	Object instance
LXOXXUXX_On/Off_S	0: Off 1: On	3-Binary Input	(U[1..64]×100)+((L-1)×20000)+0
LXOXXUXX_On/Off_C	0: Off 1: On	4-Binary Output	(U[1..64]×100)+((L-1)×20000)+0
LXOXXUXX_Mode_S	1: Heat 2: Cool 3: Fan 4: Dry 5: Auto 6: AutoHeat 7: AutoCool	13-Multistate Input	(U[1..64]×100)+((L-1)×20000)+0
LXOXXUXX_Mode_C	1: Heat 2: Cool 3: Fan 4: Dry 5: Auto	14-Multistate Output	(U[1..64]×100)+((L-1)×20000)+0
LXOXXUXX_Setpoint_S	°C / °F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+0
LXOXXUXX_Setpoint_C	°C / °F	1-Analog Output	(U[1..64]×100)+((L-1)×20000)+0
LXOXXUXX_FanSpeed_S	1: Auto 2: Low 3: Low+ 4: Med 5: Med+ 6: High	13-Multistate Input	(U[1..64]×100)+((L-1)×20000)+1

Object name	Possible values	Object type	Object instance
LXOXXUXX_FanSpeed_C	1: Auto 2: Low 3: Med 4: High	14-Multistate Output	(U[1..64]×100)+((L-1)×20000)+1
LXOXXUXX_Vane Position_S	1: Stop 2: Pos1 3: Pos2 4: Pos3 5: Pos4 6: Pos5 7: Swing	13-Multistate Input	(U[1..64]×100)+((L-1)×20000)+2
LXOXXUXX_Vane Position_C	1: Stop 2: Pos1 3: Pos2 4: Pos3 5: Pos4 6: Pos5 7: Swing	14-Multistate Output	(U[1..64]×100)+((L-1)×20000)+2
LXOXXUXX_Room Temperature	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198.5°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+1
LXOXXUXX_Bacnet ambient temperature	°C / °F	1-Analog Output	(U[1..64]×100)+((L-1)×20000)+3
LXOXXUXX_Wired Remote Controller_S	0: Body sensor 1: Remote control sensor	3-Binary Input	(U[1..64]×100)+((L-1)×20000)+1
LXOXXUXX_Wired Remote Controller_C	0: Body sensor 1: Remote control sensor	4-Binary Output	(U[1..64]×100)+((L-1)×20000)+1
LXOXXUXX_Disch.Setpoint Cool_S	Celsius: -10 .. 10°C Fahrenheit: 13 .. 50°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+2
LXOXXUXX_Disch.Setpoint Cool_C	Celsius: -10 .. 10°C Fahrenheit: 13 .. 50°F	1-Analog Output	(U[1..64]×100)+((L-1)×20000)+1
LXOXXUXX_Disch.Setpoint Heat_S	Celsius: -10 .. 10°C Fahrenheit: 13 .. 50°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+3
LXOXXUXX_Disch.Setpoint Heat_C	Celsius: -10 .. 10°C Fahrenheit: 13 .. 50°F	1-Analog Output	(U[1..64]×100)+((L-1)×20000)+2
LXOXXUXX_Disch.Current Temp.	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198.5°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+4
LXOXXUXX_Heat Exchanger Temp.	Celsius: -1 .. 26°C Fahrenheit: 30 .. 79°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+5
LXOXXUXX_Heat Setpoint Up Limit	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198.5°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+6
LXOXXUXX_Heat Setpoint Low Limit	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198.5°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+7
LXOXXUXX_Cool Setpoint Up Limit	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198.5°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+8
LXOXXUXX_Cool Setpoint Low Limit	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198.5°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+9
LXOXXUXX_Dry Setpoint Up Limit	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198.5°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+10
LXOXXUXX_Dry Setpoint Low Limit	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198.5°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+11
LXOXXUXX_Auto Setpoint Up Limit	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198.5°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+12

Object name	Possible values	Object type	Object instance
LXOXXUXX_Auto Setpoint Low Limit	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198.5°F	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+13
LXOXXUXX_Unit Error Code	0: No Error 1 .. 255: Error	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+14
LXOXXUXX_Filter Sign	0: Normal 1: Alarm	3-Binary Input	(U[1..64]×100)+((L-1)×20000)+2
LXOXXUXX_Filter Reset	0: No reset 1: Reset	4-Binary Output	(U[1..64]×100)+((L-1)×20000)+2
LXOXXUXX_Communication Error IU	0: No error 1: Error	3-Binary Input	(U[1..64]×100)+((L-1)×20000)+3
LXOXXUXX_Allow On/Off from RC_S	0: Allow 1: Not allow	3-Binary Input	(U[1..64]×100)+((L-1)×20000)+4
LXOXXUXX_Allow On/Off from RC_C	0: Allow 1: Not allow	4-Binary Output	(U[1..64]×100)+((L-1)×20000)+3
LXOXXUXX_Allow Mode from RC_S	0: Allow 1: Not allow	3-Binary Input	(U[1..64]×100)+((L-1)×20000)+5
LXOXXUXX_Allow Mode from RC_C	0: Allow 1: Not allow	4-Binary Output	(U[1..64]×100)+((L-1)×20000)+4
LXOXXUXX_Allow Setpoint from RC_S	0: Allow 1: Not allow	3-Binary Input	(U[1..64]×100)+((L-1)×20000)+6
LXOXXUXX_Allow Setpoint from RC_C	0: Allow 1: Not allow	4-Binary Output	(U[1..64]×100)+((L-1)×20000)+5
LXOXXUXX_Unit Type	1: Not Defined 2: TBD 3: GHP 4: PAC 5: VRF	13-Multistate Input	(U[1..64]×100)+((L-1)×20000)+3
LXOXXUXX_Occupancy_S	1: Occupied 2: Unoccupied 3: Disable	13-Multistate Input	(U[1..64]×100)+((L-1)×20000)+4
LXOXXUXX_Occupancy_C	1: Occupied 2: Unoccupied 3: Disable	14-Multistate Output	(U[1..64]×100)+((L-1)×20000)+3
LXOXXUXX_Consumption Yesterday	Wh/KWh	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+15
LXOXXUXX_Consumption Today	Wh/KWh	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+16
LXOXXUXX_Consumption Total	Wh/KWh	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+17
LXOXXUXX_Consumption Yesterday Heat	Wh/KWh	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+18
LXOXXUXX_Consumption Today Heat	Wh/KWh	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+19
LXOXXUXX_Consumption Total Heat	Wh/KWh	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+20
LXOXXUXX_Consumption Yesterday Cool	Wh/KWh	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+21
LXOXXUXX_Consumption Today Cool	Wh/KWh	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+22
LXOXXUXX_Consumption Total Cool	Wh/KWh	0-Analog Input	(U[1..64]×100)+((L-1)×20000)+23

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 13. 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 5 AUTO		SET/CHN/GET
Vane Position	1 2 3 4 5 AUTO		SET/CHN/GET
Temperature Setpoint (x10)	°C / °F		SET/CHN/GET
AC Ambient Temperature (x10)	Celsius: -35 .. 92.5°C Fahrenheit: -31 .. 198.5°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 IN771AIR00LO000.

8. Error Codes

NOTE
These error codes are the same for all applications.

Error Code	Error in Control Panel	Error Description	Error category
0	N/A	No active error	N/A
1	A01	GHP - Engine oil pressure fault	GHP Engine Issues
2	A02	GHP - Engine oil level fault	
3	A03	GHP - Engine over speed	
4	A04	GHP - Engine under speed	
5	A05	GHP - Ignition power supply failure	
6	A06	GHP - Engine start up failure	
7	A07	GHP - Fuel gas valve failure	
8	A08	GHP - Engine stalled	
9	A09	GHP - Engine overload	
10	A10	GHP - High exhaust gas temp	
11	A11	GHP - Engine oil level failure	
12	A12	GHP - Throttle actuator fault	
13	A13	GHP - Fuel gas valve adjustment failure	
14	A14	GHP - Engine oil pressure sensor fault	
15	A15	GHP - Starter power output short circuit	
16	A16	GHP - Starter motor locked	
17	A17	GHP - Starter current (CT) coil failed	
19	A19	GHP - Wax Valve (3 Way) fault	
20	A20	GHP - Cooling water temp high	
21	A21	GHP - Cooling water level fault	
22	A22	GHP - Cooling water pump fault	
23	A23	GHP - Engine crank angle sensor failure	
24	A24	GHP - Engine cam angle sensor failure	
25	A25	GHP - Clutch fault	
26	A26	GHP - Misfire	
27	A27	GHP - Catalyst temperature fault	
28	A28	GHP - Generator fault	
29	A29	GHP - Converter fault	
30	A30	GHP - Fuel gas pressure low	
33	C01	Duplicated setting of control address	Central Controller Issues
34	C02	Central control number of units mis-matched	
35	C03	Incorrect wiring of central control	
36	C04	Incorrect connection of central control	
37	C05	System Controller fault, error in transmitting comms signal, i/door or o/door unit not working, wiring fault	
38	C06	System Controller fault, error in receiving comms signal, i/door or o/door unit not working, wiring fault, CN1 not connected correctly	
44	C12	Batch alarm by local controller	
48	C16	Transmission error from adaptor to unit	
49	C17	Reception error to adaptor from unit	
50	C18	Duplicate central address in adaptor	

Error Code	Error in Control Panel	Error Description	Error category
51	C19	Duplicate adaptor address	
52	C20	Mix of PAC & GHP type units on adaptor	
53	C21	Memory fault in adaptor	
54	C22	Incorrect address setting in adaptor	
55	C23	Host terminal software failure	
56	C24	Host terminal hardware failure	
57	C25	Host terminal processing failure	
58	C26	Host terminal communication failure	
60	C28	Reception error of S-DDC from host terminal	
61	C29	Initialization failure of S-DDC	
63	C31	Configuration change detected by adaptor	
65	E01	Remote control detecting error from indoor unit, Address not set/Auto address failed. Check interconnecting wiring etc. Re-address system.	
66	E02	Remote detecting error from indoor unit,	
67	E03	Indoor unit detecting error from remote,	
68	E04	Indoor seeing error from outdoor. Qty of i/d units connected areless than qty set. Check; all i/d units are ON, reset turn off all units wait 5min power up	
69	E05	Indoor unit detecting error from outdoor unit, Error in sending comms signal	
70	E06	Outdoor unit detecting error from indoor unit, Error in receiving comms signal	
71	E07	Outdoor unit detecting error from indoor unit, Error in sending comms signal	
72	E08	Incorrect setting indoor/controller, Indoor address duplicated	
73	E09	Incorrect setting indoor/controller, Remote address duplicated or IR wireless controller not disabled	
74	E10	Indoor unit detecting error from 'option' plug, Error in sending comms signal	
75	E11	Indoor unit detecting error from 'option' plug, Error in receiving comms signal	
76	E12	Auto addressing failed, Auto address connector CN100 shorted during auto addressing	Addressing and Communication Problems
77	E13	Indoor unit failed to send signal to remote controller	
78	E14	Setting Failure, Duplication of master indoor units	
79	E15	Auto addressing failed, Number of indoor units connected are less than number set	
80	E16	Auto addressing failed, Number of indoor units connected are more than number set	
81	E17	Group control wiring error, Main indoor unit not sending signal for sub indoor units	
82	E18	Group control wiring error, Main indoor unit not receiving signal for sub indoor units	
84	E20	Auto addressing failed, No indoor units connected	
88	E24	Auto addressing failed, Error on sub outdoor unit	
89	E25	Auto addressing failed, Error on outdoor unit address setting	
90	E26	Auto addressing failed, Quantity of main and sub outdoor units do not correspond to the number set on main outdoor unit P.C.B.	
93	E29	Auto addressing failed, Sub outdoor unit not receiving comms for main outdoor unit	
95	E31	Between units, Comms failure with MDC, does E31 remain after power is re-instated? If so replace PCB. & power PCB	
97	F01	Indoor Heat Exch inlet temp sensor failure (E1)	Sensor Faults
98	F02	Indoor Heat Exch freeze temp sensor failure (E2)	

Error Code	Error in Control Panel	Error Description	Error category
99	F03	Indoor Heat Exch outlet temp sensor failure (E3)	
100	F04	Outdoor Discharge temp sensor failure (TD) or (DISCH1)	
101	F05	Outdoor Discharge temp sensor failure (DISCH2)	
102	F06	Outdoor Heat Exch temp sensor failure (C1) or (EXG1)	
103	F07	Outdoor Heat Exch temp sensor failure (C2) or (EXL1)	
104	F08	Outdoor Air temp sensor failure (TO)	
106	F10	Indoor inlet temp sensor failure	
107	F11	Indoor outlet temp sensor failure	
108	F12	Outdoor Intake sensor failure (TS)	
109	F13	GHP - Cooling water temperature sensor failure	
112	F16	Outdoor High pressure sensor failure	
113	F17	GHP - Cooling water temperature sensor fault	
114	F18	GHP - Exhaust gas temperature sensor fault	
116	F20	GHP Clutch coil temperature fault	
119	F23	Outdoor Heat Exch temp sensor failure (EXG2)	
120	F24	Outdoor Heat Exch temp sensor failure (EXL2)	
125	F29	Indoor EEPROM error	
126	F30	Clock Function (RTC) fault	
127	F31	Outdoor EEPROM error	
129	H01	Compressor Fault, Over current (Comp1)	
130	H02	Compressor Fault, Locked rota current detected (Comp1)	
131	H03	Compressor Fault, No current detected (Comp1)	
133	H05	Compressor Fault, Discharge temp not detected (Comp1)	
134	H06	Compressor Fault, Low Pressure trip	
135	H07	Compressor Fault, Low oil level	
136	H08	Compressor Fault, Oil sensor Fault (Comp1)	
139	H11	Compressor Fault, Over current (Comp2)	
140	H12	Compressor Fault, Locked rota current detected (Comp2)	
141	H13	Compressor Fault, No current detected (Comp2)	
143	H15	Compressor Fault, Discharge temp not detected (Comp2)	
149	H21	Compressor Fault, Over current (Comp3)	
150	H22	Compressor Fault, Locked rota current detected (Comp3)	
151	H23	Compressor Fault, No current detected (Comp3)	
153	H25	Compressor Fault, Discharge temp not detected (Comp3)	
155	H27	Compressor Fault, Oil sensor fault (Comp2)	
156	H28	Compressor Fault. Oil sensor (connection failure)	
159	H31	Compressor Fault. IPM trip (IMP current on temperature)	
193	L01	Setting Error, Indoor unit group setting error	
194	L02	Setting Error, Indoor/outdoor unit type/model miss-matched	
195	L03	Duplication of main indoor unit address in group control	
196	L04	Duplication of outdoor unit system address	
197	L05	2 or more controllers have been set as 'priority' in one system - shown on controllers set as 'priority'	
198	L06	2 or more controllers have been set as 'priority' in one system - shown on controllers not set as 'priority'	
199	L07	Group wiring connected on and individual indoor unit	
200	L08	Indoor unit address/group not set	
201	L09	Indoor unit capacity code not set	
202	L10	Outdoor unit capacity code not set	

Error Code	Error in Control Panel	Error Description	Error category
203	L11	Group control wiring incorrect	
205	L13	Indoor unit type setting error, capacity	
207	L15	Indoor unit paring fault	
208	L16	Water heat exch unit setting failure	
209	L17	Miss-match of outdoor unit with different refrigerant	
210	L18	4-way valve failure	
211	L19	Water heat exch unit duplicated address	
213	L21	Gas type setup failure	
225	P01	Indoor unit fault, Fan motor thermal overload	Indoor Unit Problems
226	P02	Outdoor unit fault, Compressor motor thermal overload, over or under voltage	
227	P03	Outdoor unit fault, Compressor discharge temperature too high (Comp1) over 111 ºC. Low on ref gas, exp valve, pipework damage.	
228	P04	Outdoor unit fault, High pressure trip	
229	P05	Outdoor unit fault, Open phase on power supply. Check power on each phase, inverter pcb, control pcb	
233	P09	Indoor unit fault, Ceiling panel incorrectly wired	
234	P10	Indoor unit fault, Condensate float switch opened	
235	P11	GHP - Water Heat exch low temp (frost protection) fault	
236	P12	Indoor unit fault, Fan DC motor fault	
238	P14	Input from leak detector (If fitted)	
239	P15	Refrigerant loss, high discharge temp and EEV wide open and low compressor current draw.	
240	P16	Outdoor unit fault, Open phase on compressor power supply	
241	P17	Outdoor unit fault, Compressor discharge temperature too high (Comp2) over 111 degC. Low on ref gas, exp valve, pipework damage.	
242	P18	Outdoor unit fault, By-pass valve failure	
243	P19	Outdoor unit fault, 4 way valve failure, i/door temp rises in cooling or fills in heating. Check wiring, coil, pcb output, valve operation.	
244	P20	Ref gas, high temp/pressure fault, heat exch temp high C2, 55-60 degC, cooling over-load, sensor fault.	
246	P22	Outdoor unit fan motor fault, fan blade jammed, check connections, does fan turn freely, motor resistance 30-40ohm on each pair, no fan fault, yes pcb fault.	
250	P26	Outdoor unit fault, Compressor overcurrent - check winding resistance, Inverter failure - check internal resistance term HIC + & - to UVW 200-300Kohm or more	
252	P29	Outdoor unit fault, Inverter circuit fault - Motor-current Detection Circuit (MDC) fault, check comp windings, sensors C1 & TS, if ok possible pcb failure.	
253	P30	Indoor unit fault, System controller detected fault on sub indoor unit	
255	P31	Simultaneous operation multi control fault, Group controller fault	

IMPORTANT
These error codes may differ depending on the specific AC unit model.

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