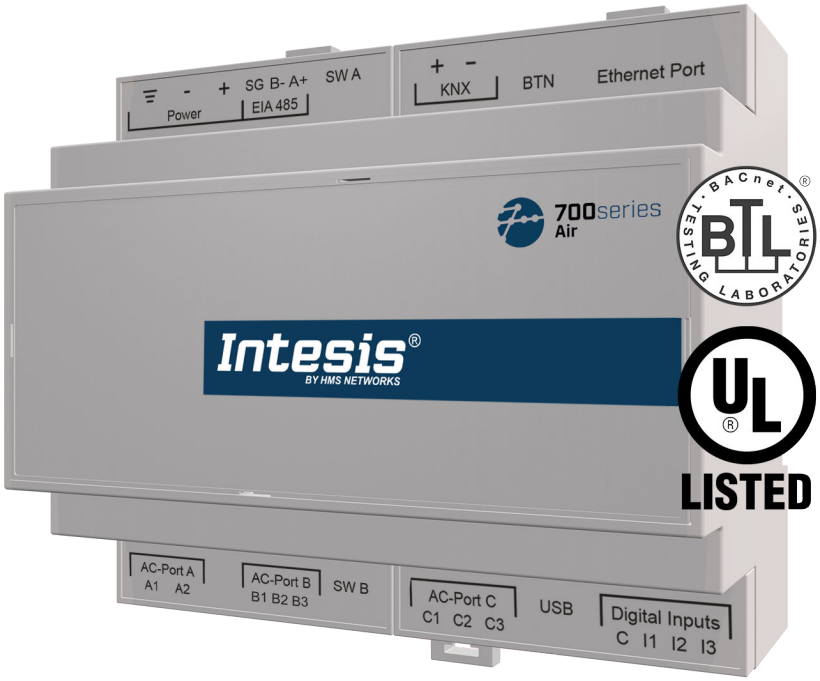
ENGLISH

700 Series Air Gateway - IN770AIR***O000

MITSUBISHI ELECTRIC CITY MULTI SYSTEMS to Modbus, KNX, BACnet, MQTT, and Home Automation

USER MANUAL
Version 1.0.19
Publication date 2026-03-16



Copyright © 2026 Intesis

Disclaimer

The information in this document is for informational purposes only. Please inform HMS Networks of any inaccuracies or omissions found in this document. HMS Networks disclaims any responsibility or liability for any errors that may appear in this document.

HMS Networks reserves the right to modify its products in line with its policy of continuous product development. The information in this document shall therefore not be construed as a commitment on the part of HMS Networks and is subject to change without notice. HMS Networks makes no commitment to update or keep current the information in this document.

The data, examples and illustrations found in this document are included for illustrative purposes and are only intended to help improve understanding of the functionality and handling of the product. In view of the wide range of possible applications of the product, and because of the many variables and requirements associated with any particular implementation, HMS Networks cannot assume responsibility or liability for actual use based on the data, examples or illustrations included in this document nor for any damages incurred during installation of the product. Those responsible for the use of the product must acquire sufficient knowledge in order to ensure that the product is used correctly in their specific application and that the application meets all performance and safety requirements including any applicable laws, regulations, codes and standards. Further, HMS Networks will under no circumstances assume liability or responsibility for any problems that may arise as a result from the use of undocumented features or functional side effects found outside the documented scope of the product. The effects caused by any direct or indirect use of such aspects of the product are undefined and may include e.g. compatibility issues and stability issues.

Table of Contents

1. Description, Compatible AC systems, and Order Codes 1

2. Licensing 2

3. General Information 3
3.1. Intended Use of the User Manual 3
3.2. General Safety Information 3
3.3. Admonition Messages and Symbols 4

4. Overview 5
4.1. Inside the Package 7
4.2. Main Features 7
4.3. Gateway General Functionality 7

5. Quick Start Guide 8

6. About Mitsubishi Electric Centralized Controller for M-Net 9

7. Hardware 10
7.1. Mounting 10
7.2. Connection 12
7.2.1. Gateway Connectors 12
7.2.2. Connection to the Power Supply 14
7.2.3. Connection to the Centralized Controller 15
7.2.4. Connection to Modbus 15
7.2.5. Connection to KNX 16
7.2.6. Connection to BACnet 17
7.2.7. Connection to MQTT 18
7.2.8. Connection to Home Automation 18
7.2.9. Connection to a Computer for Configuration 19
7.2.10. Connection to Energy Meters (Digital Inputs) 19
7.3. Gateway Layout 20
7.4. LED Indicators 21
7.5. DIP Switches 22
7.6. Push Button 22
7.7. Technical Specifications 23
7.8. Dimensions 24

8. Available Protocol Combinations 25
8.1. Integration into Modbus Systems 25
8.1.1. Modbus Registers 25
8.2. Integration into KNX Systems 30
8.2.1. KNX signals 30
8.3. Integration into BACnet Systems 37
8.3.1. BACnet Objects 37
8.4. Integration into MQTT Systems 44
8.4.1. MQTT Topics 44
8.5. Integration into Home Automation Systems 49
8.5.1. Home Automation Signals 49

9. Field Configuration: Change the Gateway's Protocol 50

10. Error Codes 51

1. Description, Compatible AC systems, and Order Codes

IN770AIR*O000 Gateway**.

Modbus®, KNX®, BACnet®, MQTT, and Home Automation gateway for Mitsubishi Electric® HVAC systems.

This gateway is compatible with City Multi units commercialized by Mitsubishi Electric.

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

You can set up this Intesis gateway for Modbus TCP, Modbus RTU, KNX TP, BACnet/IP, BACnet MS/TP, MQTT, or Home Automation.

ORDER CODE	LEGACY ORDER CODE
IN770AIR***O000 [1]	INMBSMIT050C000 INMBSMIT100C000 INKNXMIT015C000 INKNXMIT100C000
[1] *** stands for XXS, 00S, or 00M, depending on the license you have purchased. To know more, see Licensing (page 2).	

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

2. Licensing

Distribution license(s) for the IN770AIR∗∗∗O000 gateway:

Order Code	License	Maximum groups	Maximum centralized controllers
IN770AIRXXSO000	XXS	15	1
IN770AIR00SO000	Small	50	1
IN770AIR00MO000	Medium	100	2

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.

Any person who installs, configures, or operates this gateway or any associated equipment should be aware of this manual's contents.

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.

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

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

Preferably, mount this gateway on a DIN rail inside a grounded metallic cabinet, following the instructions in this manual.

If mounting on a wall, firmly fix this gateway on a non-vibrating surface, following the instructions in this manual.

Connect this gateway only to networks without routing to the outside plant.

All communication ports are considered for indoor use and must only be connected to SELV circuits.

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

CAUTION
To avoid earth loops that can damage the gateway and/or any other equipment connected to it, we strongly recommend:

- The use of DC power supplies, floating or with the negative terminal connected to earth. **Never use a DC power supply with a positive terminal connected to earth**.
- The use of AC power supplies only if they are floating and not powering any other device.

Use a circuit breaker between the gateway and the power supply. Rating: 250 V, 6 A.

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

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

This Intesis gateway is designed for installation in an enclosure. When the device is mounted outside an enclosure, precautions should be taken to avoid electrostatic discharges to the unit in environments with static levels above 4 kV. When working in an enclosure (e.g., making adjustments, setting switches, etc.), typical anti-static precautions should be observed before touching the unit.

Binary inputs are potential-free contacts. Do not connect any voltage.

These safety instructions in other languages can be found here.

3.3. Admonition Messages and Symbols



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

Protocol combinations supported by the IN770AIR***O000 gateway:

Gateway's client interface	↔	Gateway's server interface
Mitsubishi Electric City Multi systems	to	Modbus TCP and RTU
		KNX TP
		BACnet/IP or MS/TP
		MQTT
		Home Automation

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

Figure 1. Integration of Mitsubishi Electric units into Modbus systems

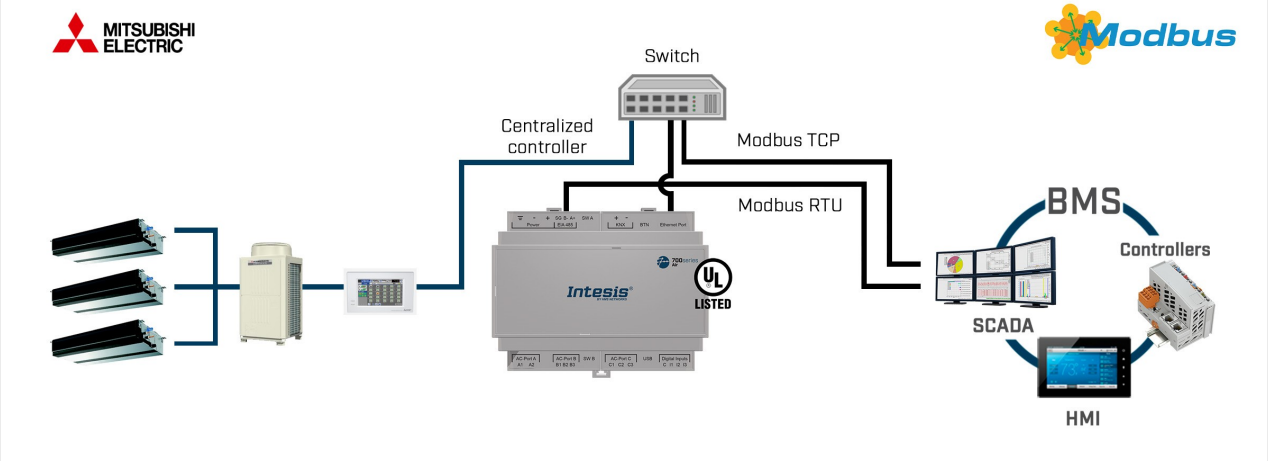


Figure 2. Integration of Mitsubishi Electric units into KNX TP systems

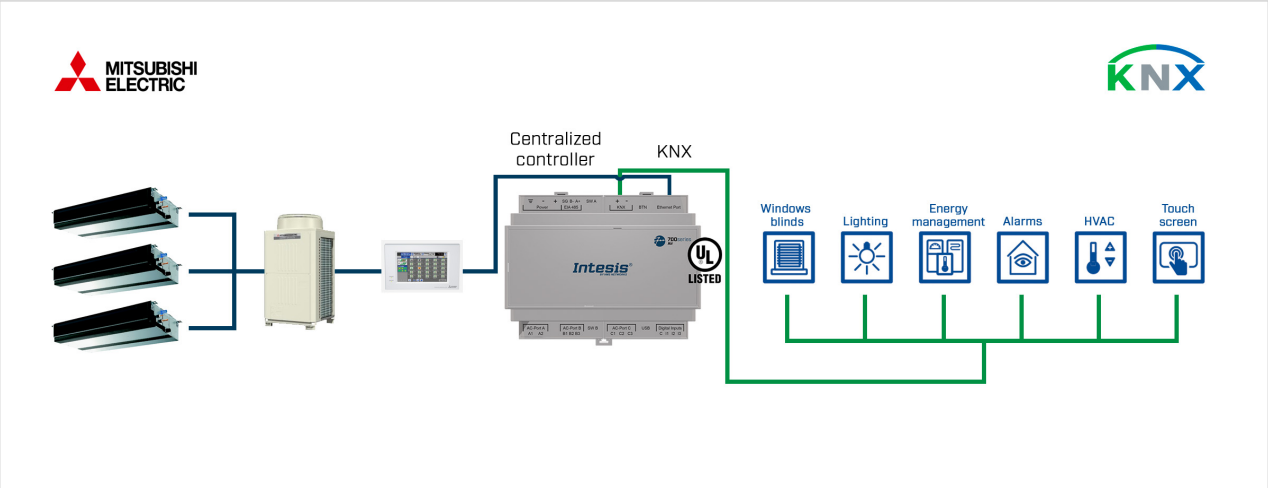


Figure 3. Integration of Mitsubishi Electric units into BACnet systems

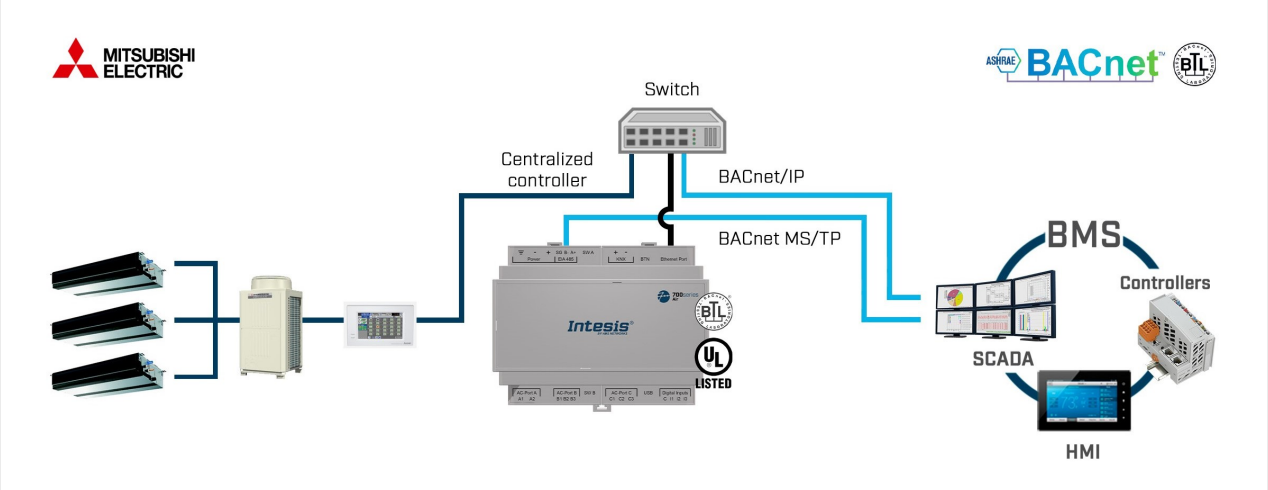


Figure 4. Integration of Mitsubishi Electric units into MQTT systems

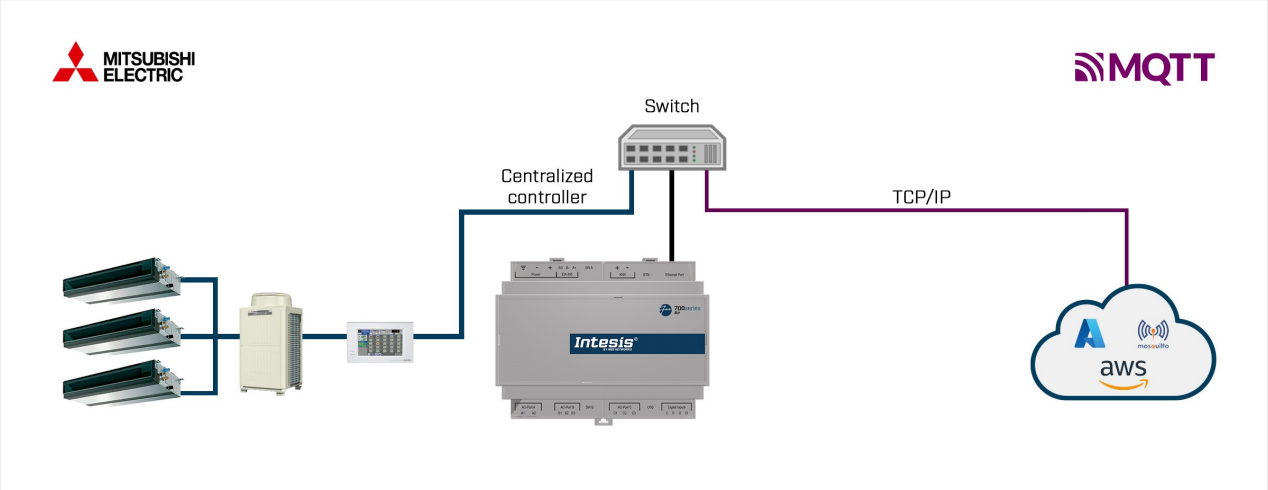
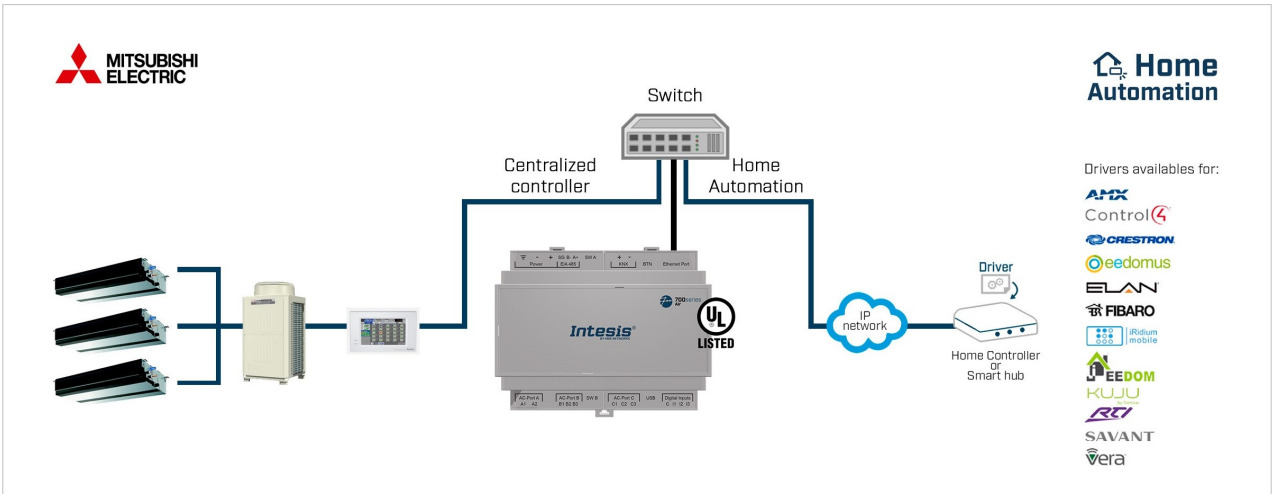


Figure 5. Integration of Mitsubishi Electric units into Home Automation systems



4.1. Inside the Package

ITEMS INCLUDED

- Intesis IN770AIR∗∗∗O000 Gateway
- Installation Guide

4.2. Main Features

- Several protocol combinations available: Configurable for Modbus TCP and RTU, KNX TP, BACnet/IP and MS/TP, MQTT, and Home Automation communication protocols.
- Late configuration: Change between protocol combinations easily.
- Three licenses with different capacities.
- Scan function: Find the AC units 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.
- Three binary inputs to integrate energy meters.
- 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 Type-C 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)

4.3. Gateway General Functionality

With this Intesis IN770AIR∗∗∗O000 gateway, you can easily integrate Mitsubishi Electric City Multi systems into an installation based on Modbus TCP, Modbus RTU, KNX TP, BACnet/IP, BACnet MS/TP, MQTT, or Home Automation. To do so, the gateway acts as a server device of the installation itself, accessing all signals from each unit and allowing control of the whole HVAC network.

The gateway continuously polls the HVAC network, storing in its memory the current status of every signal you want to track and serving this data to the installation when requested. When a signal status changes, the gateway communicates it to the installation, waits for the response, and performs the corresponding action.

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

5. Quick Start Guide

IMPORTANT
While the following procedure outlines the fundamental steps for installing, wiring, and configuring the gateway, it is crucial to thoroughly review all documentation to prevent errors.

1. Install Intesis MAPS on your computer. Use the setup program supplied and follow the instructions given by the installation wizard.
2. Mount the gateway at the desired installation site. The gateway can be mounted on a DIN rail or on a wall. Mounting the gateway on a DIN rail inside a metallic industrial cabinet grounded to earth is recommended. See Mounting (page 10).
3. Disconnect all systems from power before wiring the gateway.
4. Connect the BMS communication wires to the gateway. See Gateway Connectors (page 12).
   a. If using Modbus TCP, BACnet/IP, MQTT, or Home Automation, connect the communication cable coming from the Modbus/BACnet/MQTT/Home Automation network to the port marked as **Ethernet** on the gateway.
   b. If using Modbus RTU or BACnet MS/TP, connect the communication cables coming from the Modbus/BACnet network to the port marked as **EIA 485** on the gateway.
   c. If using KNX TP, connect the communication cables coming from the KNX network to the port marked as **KNX** on the gateway.
5. Connect the communication cable from the Mitsubishi Electric centralized controller to the Ethernet port of the gateway.

   NOTICE
   Use a switch to connect the Ethernet-based BMS (Building Management System) and the centralized controller simultaneously, along with any Modbus TCP energy meters, if available.

6. Power the gateway. The supply voltage can be from 12 to 36 VDC or just 24 VAC. Observe the polarity. See Connection to the Power Supply (page 14).
7. Connect the gateway to your computer to configure it with Intesis MAPS. See Connection to a Computer for Configuration (page 19).
   a. If you want to connect via USB, connect a USB cable from the laptop to the port marked as **USB** on the gateway.
   b. If you want to connect via IP, connect the Ethernet cable from the laptop to the port marked as **Ethernet Port** on the gateway.
8. Open Intesis MAPS and create a new project by selecting the needed project template.
9. Modify the configuration as needed, save it, and send the configuration file to the gateway.
   Consult the Intesis MAPS Guide for Mitsubishi Electric.
10. Go to the **Diagnostic** tab and check the communication activity between the gateway, the BMS, and the Mitsubishi Electric systems. If there is no communication activity, check that all systems are operative, the wiring of all devices is right, and the configuration of the gateway is correct.

6. About Mitsubishi Electric Centralized Controller for M-Net

This integration requires the Mitsubishi Electric City Multi AC system to be equipped with a Mitsubishi Electric Centralized Controller for M-Net. This Centralized Controller offers the signals of the City Multi AC system through XML protocol to its Ethernet port, which is accessed by the Intesis IN770AIR∗∗∗O000 gateway.

IMPORTANT
The number of Mitsubishi Electric Centralized Controllers supported by the gateway depends on the license purchased:

Order code	License	Number of Centralized Controllers allowed
IN770AIRXXSO000	XXS	1
IN770AIR00SO000	Small	1
IN770AIR00MO000	Medium	2

IMPORTANT
Most Mitsubishi Electric Centralized Controllers require a PC-Monitoring (SW-Mon) software license, which must be purchased together with the centralized controller for the XML interface to be active and used by the Intesis gateway.

IMPORTANT
List of compatible centralized controllers:

- AB-150
- AE-50
- AE-200
- AE-200E
- AE-C400E
- AG-150A
- EB-50GU
- EW-50
- EW-C50E
- G-50
- GB-50ADA

IMPORTANT
This gateway is only compatible with centralized controllers that have an Ethernet port.

7. Hardware

7.1. Mounting

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

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.

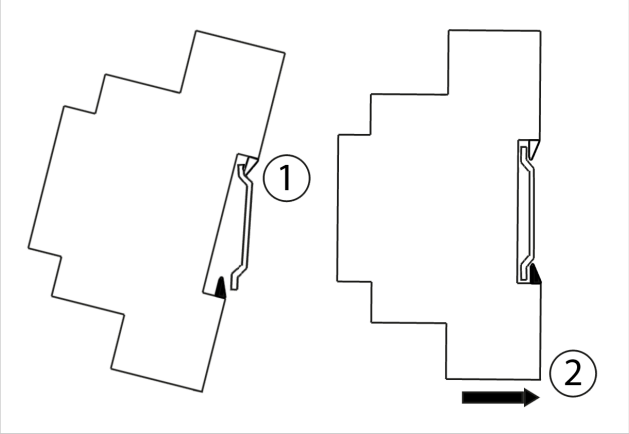
IMPORTANT
Ensure the gateway has sufficient clearances for all connections when mounted. See Dimensions (page 24).

DIN RAIL MOUNTING

Keep the clips in their original position.

1. Fit the gateway's top-side clips in the upper edge of the DIN rail.
2. Press the low side of the gateway gently to lock it in the DIN rail.
3. Make sure the gateway is firmly fixed.

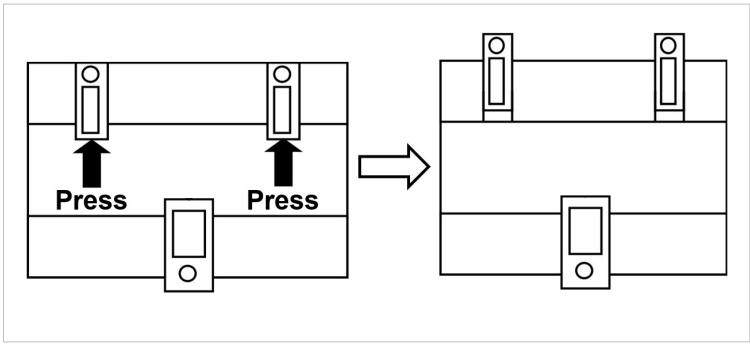
NOTE
For some DIN rails, to complete step 2, you may need a small screwdriver or similar to pull the bottom clip down.



WALL MOUNTING

IMPORTANT
For reasons of security, the maximum height for wall mounting is two meters (6.5 feet).

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.

7.2. Connection

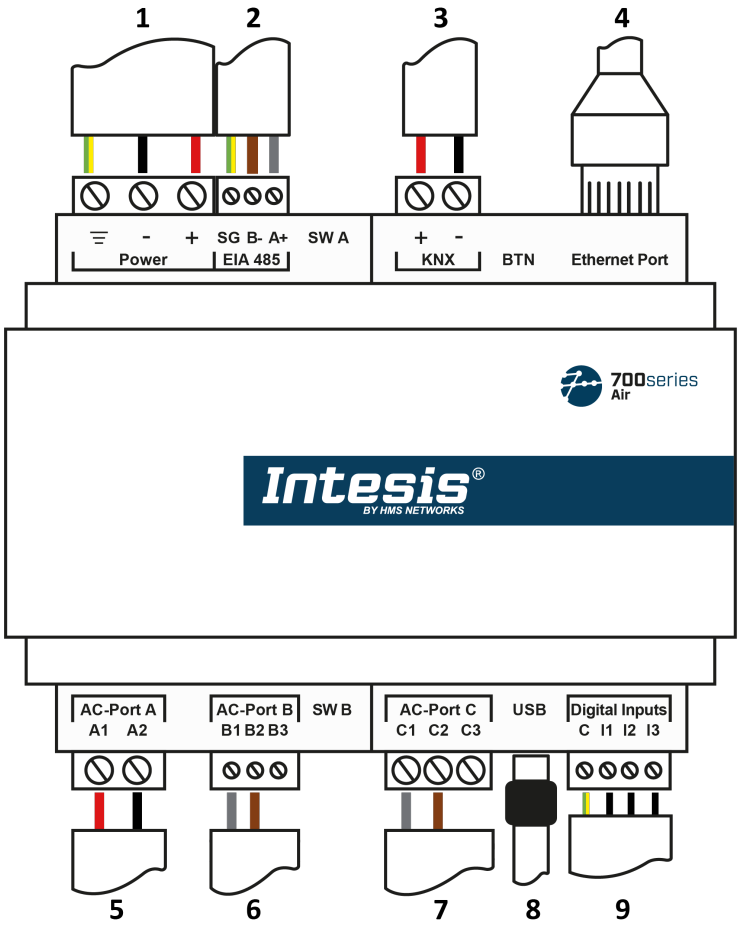
CAUTION
Disconnect all systems from power before manipulating and connecting them to the gateway.

IMPORTANT
Keep communication cables away from power and ground wires.

NOTE
Mount the gateway in the desired place before wiring it.

7.2.1. Gateway Connectors

Figure 6. Wiring diagram



1. **Power Supply** (12-36 VDC / 24 VAC)
2. **Port EIA-485**
3. **Port KNX**
4. **Ethernet/**
   Mitsubishi Electric
   (Centralized Controller)
5. **Not used**
6. **Not used**
7. **Not used**
8. **Console**
9. **Binary inputs**
   (dry contact) optional

WIRING THE CONNECTORS

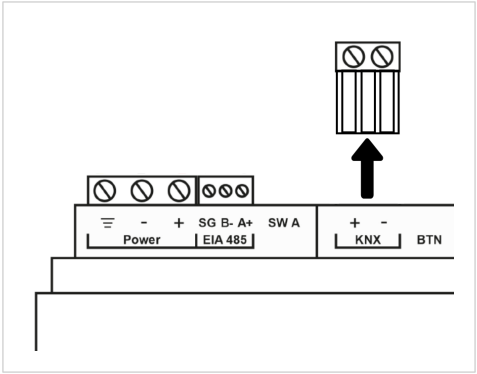
IMPORTANT
For all connectors, use solid or stranded wires (twisted or with ferrule).

Cross-section/gauge per terminal:

- One core: 0.2 .. 2.5 mm^2 / 24 .. 11 AWG
- Two cores: 0.2 .. 1.5 mm^2 / 24 .. 15 AWG
- Three cores: Not permitted

NOTE
To know more about each port's specifications, see Technical Specifications (page 23).

TIP
Terminal block connectors can be unplugged to facilitate the wiring process.



COMMUNICATION PORTS

PORT	USAGE	WIRING			
EIA-485	BACnet MS/TP and Modbus RTU	**SG**: Signal ground	**B-**	**A+**	
KNX	KNX bus	**+**		**-**	
Ethernet	**As a TCP/IP Port**: Connection to the Centralized Controller and TCP/IP-based protocols **As a console port**: Connection to a computer for configuration purposes	Ethernet cable (CAT5 or higher) When using the building LAN, contact the network administrator and make sure traffic is allowed. When starting up the gateway for the first time, DHCP will be enabled for 30 seconds. After that time, the default IP 192.168.100.246 will be set.			
AC-Port A	*Not used*				
AC-Port B	*Not used*				
AC-Port C	*Not used*				
USB	Connection to a computer for configuration purposes	USB Type-C			
Digital Inputs	Dry contact for metering devices	**C**: Common	**I1**: Input 1	**I2**: Input 2	**I3**:Input3

7.2.2. Connection to the Power Supply

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

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

NOTE
Recommended voltage: 24 VDC, Max: 127 mA

IMPORTANT
Use a circuit breaker between the gateway and the power supply. Rating: 250 V, 6 A.

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.

IMPORTANT
- Use SELV-rated NEC class 2 or limited power source (LPS) power supply.
- Respect the polarity.
- Connect the gateway's ground terminal ⏚ to the installation grounding.

IMPORTANT
To avoid earth loops that can damage the gateway and/or any other equipment connected to it, we strongly recommend:

- The use of DC power supplies, floating or with the negative terminal connected to earth.
- The use of AC power supplies only if they are floating and not powering any other device.

CAUTION
Never use a DC power supply with a positive terminal connected to earth.

7.2.3. Connection to the Centralized Controller

Connect the Mitsubishi Electric central control network to the gateway using the **Ethernet Port**.

IMPORTANT
Use an Ethernet 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. During that time, if there is a DHCP server, an IP address will be automatically assigned to the gateway. If there is no DHCP, you can type an IP address of your choice. After that time, the default IP address 192.168.100.246 will be automatically set.

NOTE
See the Wiring diagram (page 12).

7.2.4. Connection to Modbus

FOR MODBUS TCP

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

NOTE
The gateway features a temporary DHCP mode that is enabled for 30 seconds when an Ethernet link is detected, provided the gateway still has its factory settings or has been factory reset. During this time, if the gateway is connected to a DHCP-enabled network, the server will assign it a dynamic IP address. If no DHCP server is available, the default IP address 192.168.100.246 will be automatically assigned after 30 seconds.

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 MODBUS RTU

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

The connector for the EIA-485 bus is a green pluggable terminal block labeled **SG** (signal ground), **B-**, and **A+**.

IMPORTANT
Observe polarity.

IMPORTANT
Observe the standard restrictions of the EIA-485 bus:

- Maximum distance of 1200 meters (0.75 miles).
- Maximum of 32 devices connected to the bus.
- A 120 ohms (Ω) termination resistor is needed at each end of the bus. The gateway has an internal bus biasing circuit 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.

  Positions 2 and 3
  - ON: Polarization active.
  - OFF: Polarization inactive.

  For further details, see DIP Switches (page 22).

To know more, refer to the document Polarity Issues in RS485 Networks.

IMPORTANT
When installing the gateway at the end of the bus with the termination resistor enabled, do not install an additional termination resistor at that end.

NOTE
See the Wiring diagram (page 12).

7.2.5. Connection to KNX

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

IMPORTANT
Observe polarity.

NOTE
See the Wiring diagram (page 12).

7.2.6. Connection to BACnet

FOR BACNET/IP

Connect the BACnet/IP Ethernet cable to the gateway's **Ethernet Port**.

NOTE
The gateway features a temporary DHCP mode that is enabled for 30 seconds when an Ethernet link is detected, provided the gateway still has its factory settings or has been factory reset. During this time, if the gateway is connected to a DHCP-enabled network, the server will assign it a dynamic IP address. If no DHCP server is available, the default IP address **192.168.100.246** will be automatically assigned after 30 seconds.

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

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

The connector for the EIA-485 bus is a green pluggable terminal block labeled **SG** (signal ground), **B-**, and **A+**.

IMPORTANT
Observe polarity.

IMPORTANT
Observe the standard restrictions of the EIA-485 bus:

- Maximum distance of 1200 meters (0.75 miles).
- Maximum of 32 devices connected to the bus.
- A 120 ohms (Ω) termination resistor is needed at each end of the bus. The gateway has an internal bus biasing circuit 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.

  Positions 2 and 3
  - ON: Polarization active.
  - OFF: Polarization inactive.

  For further details, see DIP Switches (page 22).

To know more, refer to the document Polarity Issues in RS485 Networks.

IMPORTANT
When installing the gateway at the end of the bus with the termination resistor enabled, do not install an additional termination resistor at that end.

NOTE
See the Wiring diagram (page 12).

7.2.7. Connection to MQTT

Connect the Ethernet cable from your network to the gateway's **Ethernet Port**.

NOTE
When commissioning the gateway for the first time, DHCP will be enabled for 30 seconds. During that time, if there is a DHCP server, an IP address will be automatically assigned to the gateway. After that time, the default IP address 192.168.100.246 will be automatically 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.

NOTE
See the Wiring diagram (page 12).

7.2.8. Connection to Home Automation

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

NOTE
When commissioning the gateway for the first time, DHCP will be enabled for 30 seconds. During that time, if there is a DHCP server, an IP address will be automatically assigned to the gateway. After that time, the default IP address 192.168.100.246 will be automatically 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.

NOTE
See the Wiring diagram (page 12).

7.2.9. Connection to a Computer for Configuration

Use a USB Type-C cable (not supplied) to connect the gateway through its **USB** port to a computer to configure it with Intesis MAPS.

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

NOTE
To know more about the gateway configuration, consult the Intesis MAPS Guide for Mitsubishi Electric.

NOTE
See the Wiring diagram (page 12).

7.2.10. Connection to Energy Meters (Digital Inputs)

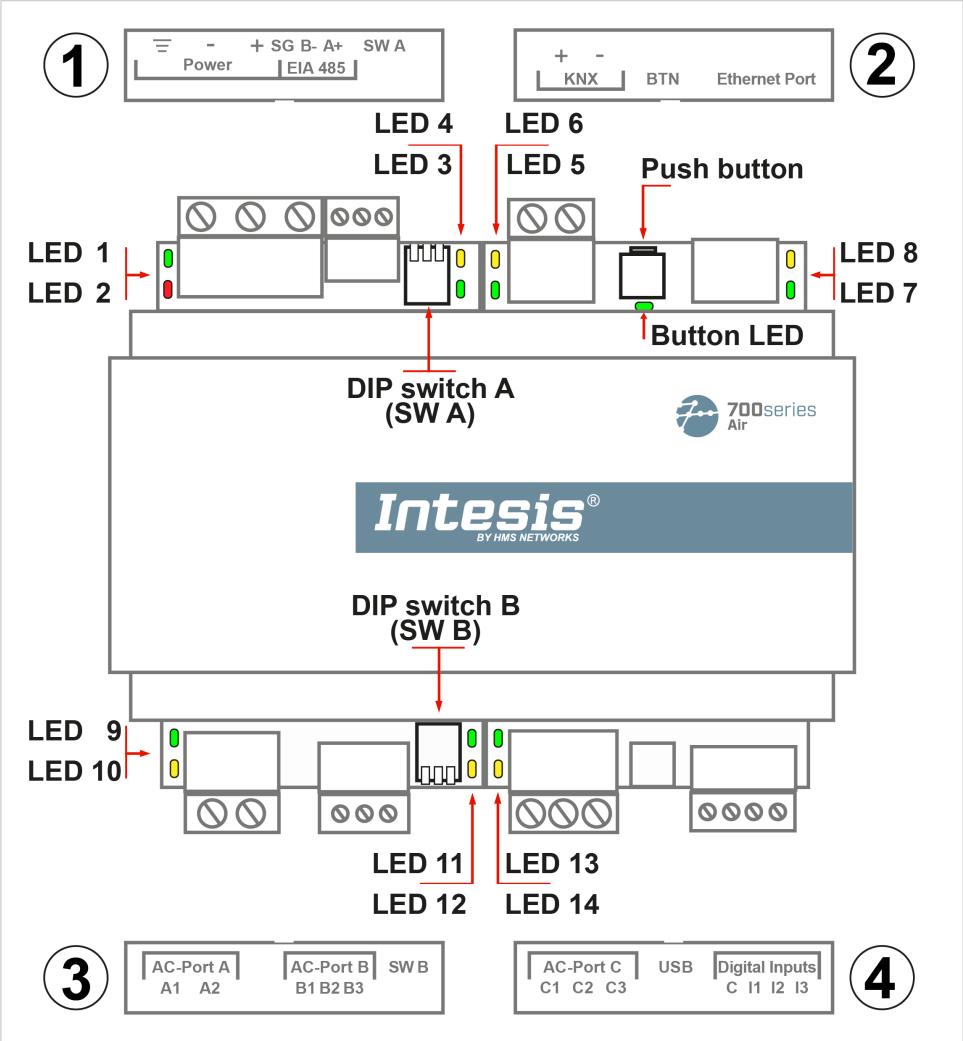
The **Digital Inputs** connector is a green pluggable terminal block (four poles) placed at the bottom right side of the gateway.

IMPORTANT
The **Digital Inputs** connector is a potential-free contact for energy metering only. It does not support any other kind of third-party elements.

NOTE
See the Wiring diagram (page 12).

7.3. Gateway Layout

Figure 7. Disposition of hardware elements in the gateway



NOTICE
Plastic covers numbered in the image as ①, ②, ③, and ④ can be easily disassembled by inserting a small flat-head screwdriver into the designated notch, located on the edge closest to the gateway's main body, and gently prying to disengage them.

NOTE
LEDs and DIP switches are hidden behind the removable plastic covers and can only be accessed by disassembling the covers.

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

7.4. 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**, **MQTT**, 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 (see the figure Disposition of hardware elements in the gateway (page 20)). These covers are pressure-fitted, so they can be removed simply by pulling. The recommended method is to insert a small flat-head screwdriver into the designated notch—located on the edge closest to the gateway's main body—and gently pry to disengage the cover.

7.5. DIP Switches

The gateway has two DIP switches (see the figure Disposition of hardware elements in the gateway (page 20)):

- 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 (position 1) and the polarization (positions 2 and 3) of each port.

Position			Description
1	2	3	
OFF	X	X	120 Ω termination inactive
ON	X	X	120 Ω Termination active
X	OFF	OFF	Polarization inactive
X	ON	ON	Polarization active

IMPORTANT
Observe the **ON** indicator on the DIP switch as a reference.

NOTE
Default positions are:

- DIP switch A (SW A): **OFF, OFF, OFF** (120 Ω termination and polarization inactive)
- DIP switch B (SW B): **OFF, OFF, OFF** (120 Ω termination and polarization inactive)

7.6. Push Button

Find the push button on the top side, between the KNX and the Ethernet connectors (see the figure Disposition of hardware elements in the gateway (page 20)).

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

Common functionality:

RESET FACTORY SETTINGS

IMPORTANT
This action will restore the gateway to its original state, erasing all project data and 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.

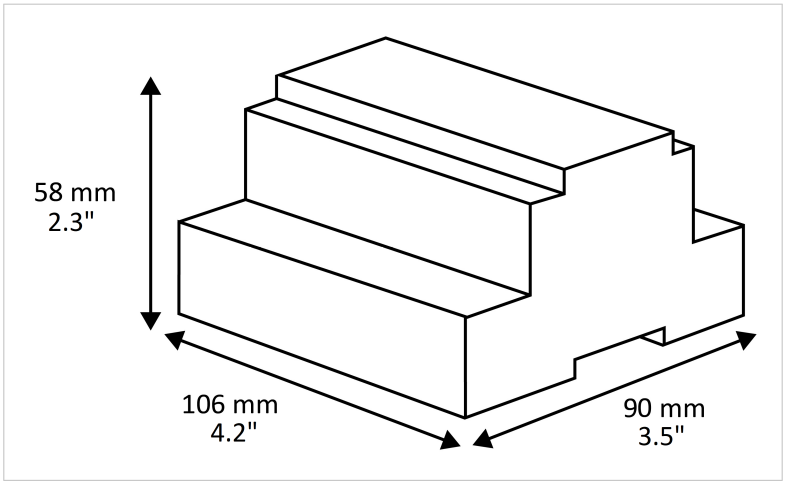
7.7. Technical Specifications

Housing	Plastic, type PC (UL 94 V-0). Color: Light Grey. RAL 7035 Net dimensions (HxWxD): Millimeters: 90 x 106 x 58 mm / Inches: 3.5 x 4.2 x 2.3" Protection: IP20	
Mounting	Wall: Use 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)	Wire cross-section/gauge per terminal: 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 Use solid or stranded wires (twisted or with ferrule). 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, Max.: 127 mA	
Ethernet	Use this connector for the AC central control network to the gateway connection 1 x Ethernet 10/100 Mbps RJ45	
Port EIA 485	1 x Green pluggable terminal block (3 poles) SGND (Reference ground or shield)	
Port KNX	1 x Orange pluggable terminal block (2 poles): A, B	
AC Ports	AC-Port A (serial, 2 poles): Not used 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	
Console port	USB Type-C compliant	
DIP switches	**SW A** Position 1: On: 120 Ω termination active Off: 120 Ω termination inactive (default) Position 2 and 3: On: Polarization active Off: Polarization inactive (default)	**SW B** Position 1: On: 120 Ω termination active Off: 120 Ω termination inactive (default) Position 2 and 3: On: Polarization active Off: Polarization inactive (default)
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..140°F	
Operational humidity	5..95%. No condensation	
Isolation between comm. ports	1000 VDC	

7.8. Dimensions

NET DIMENSIONS (HxWxD)
Millimeters: 90 x 106 x 58 mm
Inches: 3.5 x 4.2 x 2.3"

IMPORTANT
Leave enough clear space to wire the gateway easily and for the subsequent manipulation of elements, such as connectors, DIP switches, etc.



8. Available Protocol Combinations

8.1. Integration into Modbus Systems

8.1.1. 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.

IMPORTANT
The signals available depend on the gateway configuration and/or the unit type (AC indoor unit, Air-to-water booster unit, heat pump, etc.)

To know more, refer to the Intesis MAPS Configuration Guide.

NOTICE
Read/write parameter terminology:

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

NOTICE
In the following table, CC# stands for the Centralized Controller number (1 or 2).

For the first signal, for example, the Modbus address will be **0** for centralized controller 1:

((1 - 1) × 30) + 0 = 0

and **30** for centralized controller 2:

((2 - 1) × 30) + 0 = 30

For more information, check the Signals Tab section in the Intesis MAPS Configuration Guide for IN770AIR∗∗∗O000.

Table 2. Global signals

Register name	Possible values	Modbus address formula	R/W
Centralized controller communication error	0: Ok 1: Communication error	((CC# - 1) × 30) + 0	R
Reset errors for all the groups	1: Reset errors	((CC# - 1) × 30) + 1	W
On (all the groups)	1: Set the groups On	((CC# - 1) × 30) + 2	W
Off (all the groups)	1: Set the groups Off	((CC# - 1) × 30) + 3	W
Operation Mode Auto (all the IC groups)	1: Set Auto Mode	((CC# - 1) × 30) + 4	W
Operation Mode Heat (all the IC groups)	1: Set Heat Mode	((CC# - 1) × 30) + 5	W
Operation Mode Dry (all the IC groups)	1: Set Dry Mode	((CC# - 1) × 30) + 6	W
Operation Mode Fan (all the IC groups)	1: Set Fan Mode	((CC# - 1) × 30) + 7	W
Operation Mode Cool (all the IC groups)	1: Set Cool Mode	((CC# - 1) × 30) + 8	W
Operation Mode Setback (all the IC groups)	1: Set Setback Mode	((CC# - 1) × 30) + 9	W
Operation Mode LC_Auto (all the LOSSNAY groups)	1: Set LC_Auto Mode	((CC# - 1) × 30) + 10	W
Operation Mode Heat Recovery (all the LOSSNAY groups)	1: Set Heat Recovery Mode	((CC# - 1) × 30) + 11	W
Operation Mode Bypass (all the LOSSNAY groups)	1: Set Bypass Mode	((CC# - 1) × 30) + 12	W
Fan Speed (all the IC groups)	1: Set Fan Speed Auto	((CC# - 1) × 30) + 13	W
Fan Speed (all the IC groups)	1: Set Fan Speed Low	((CC# - 1) × 30) + 14	W
Fan Speed (all the IC groups)	1: Set Fan Speed Mid-1	((CC# - 1) × 30) + 15	W
Fan Speed (all the IC groups)	1: Set Fan Speed Mid-2	((CC# - 1) × 30) + 16	W
Fan Speed (all the IC groups)	1: Set Fan Speed High	((CC# - 1) × 30) + 17	W
Fan Speed (all the LOSSNAY groups)	1: Set Fan Speed Low	((CC# - 1) × 30) + 18	W
Fan Speed (all the LOSSNAY groups)	1: Set Fan Speed Mid-1	((CC# - 1) × 30) + 28	W
Fan Speed (all the LOSSNAY groups)	1: Set Fan Speed Mid-2	((CC# - 1) × 30) + 29	W
Fan Speed (all the LOSSNAY groups)	1: Set Fan Speed High	((CC# - 1) × 30) + 19	W
Vane position (all the IC groups)	1: Set Vanes Auto	((CC# - 1) × 30) + 20	W
Vane position (all the IC groups)	1: Set Vanes Horizontal	((CC# - 1) × 30) + 21	W
Vane position (all the IC groups)	1: Set Vanes Position-2	((CC# - 1) × 30) + 22	W
Vane position (all the IC groups)	1: Set Vanes Position-3	((CC# - 1) × 30) + 23	W
Vane position (all the IC groups)	1: Set Vanes Position-4	((CC# - 1) × 30) + 24	W
Vane position (all the IC groups)	1: Set Vanes Vertical	((CC# - 1) × 30) + 25	W
Vane position (all the IC groups)	1: Set Vanes Swing	((CC# - 1) × 30) + 26	W
Individual Temperature Setpoint (x10) (all the groups)	5..90°C / 41..194°F	((CC# - 1) × 30) + 27	W

NOTICE

For individual group signals, the Modbus address formula also takes into account the group number, shown in the following table as Group#.

For the first signal, for example, the Modbus address for group 1 of centralized controller 1 will be **100**:

(((1 - 1) × 50) + 1) × 100 + 0 = 100

For group 6 of centralized controller 2, the Modbus address will be **5600**.

(((2 - 1) × 50) + 6) × 100 + 0 = 5600

Table 3. Individual group signals

Register name	Possible values	Modbus address formula	R/W
On/Off	0: Off 1: On	(((CC# - 1) × 50) + Group#) × 100 + 0	RW
Operation Mode IC	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool 5: Auto Heat 6: Auto Cool 7: Setback 8: Setbackheat 9: Setbackcool	(((CC# - 1) × 50) + Group#) × 100 + 1	RW
Operation Mode LOSSNAY	0: LC_Auto 1: Heat Recovery 2: Bypass	(((CC# - 1) × 50) + Group#) × 100 + 1	RW
Operation Mode ATW & HWHP	0: Hot_Water 1: Heating 2: Heating_Eco 3: Anti_Freeze 4: Cooling	(((CC# - 1) × 50) + Group#) × 100 + 1	RW
Fan Speed IC	0: Auto 1: Low 2: Middle 2 3: Middle 1 4: High	(((CC# - 1) × 50) + Group#) × 100 + 2	RW
Fan Speed LOSSNAY	1: Low 2: Middle 2 3: Middle 1 4: High	(((CC# - 1) × 50) + Group#) × 100 + 2	RW
Vane position	0: Auto 1: Horizontal 2: Pos. 2 3: Pos. 3 4: Pos. 4 5: Vertical 6: Swing	(((CC# - 1) × 50) + Group#) × 100 + 3	RW
Temperature Setpoint (x10)	**Cool or dry:** 19..30°C / 66.2..86°F **Heat or Auto:** 17..28°C / 62.6..82.4°F	(((CC# - 1) × 50) + Group#) × 100 + 4	RW
Temperature Setpoint (x10)	5..90°C / 41..194°F	(((CC# - 1) × 50) + Group#) × 100 + 4	RW
Ambient Temperature (x10)	0.0..99.9°C / 32..211.82°F	(((CC# - 1) × 50) + Group#) × 100 + 5	R
Operational Status for Lossnay or OA	0: Off 1: Low 2: High	(((CC# - 1) × 50) + Group#) × 100 + 6	RW
Group operation time (x100 hours)	0..9999	(((CC# - 1) × 50) + Group#) × 100 + 7	R
Group operation time (%100 hours)	0..99	(((CC# - 1) × 50) + Group#) × 100 + 8	R

Register name	Possible values	Modbus address formula	R/W
Group error status	0: No error 1: Group error	(((CC# - 1) × 50) + Group#) × 100 + 9	R
Group error code	Number of the error code (XXXX)	(((CC# - 1) × 50) + Group#) × 100 + 10	R
Group error reset	1: Reset the error	(((CC#-1) × 50) + Group#) × 100 + 11	W
Group model	Model of units connected to the group	(((CC# - 1) × 50) + Group#) × 100 + 12	R
Allow ON/OFF control from the local panel	0: Allow 1: Not allowed	(((CC# - 1) × 50) + Group#) × 100 + 13	RW
Allow operation mode control from the local panel		(((CC# - 1) × 50) + Group#) × 100 + 14	RW
Allow set point control from the local panel		(((CC# - 1) × 50) + Group#) × 100 + 15	RW
Allow filter reset control from the local panel		(((CC# - 1) × 50) + Group#) × 100 + 16	RW
Allow air direction control from the local panel		(((CC# - 1) × 50) + Group#) × 100 + 17	RW
Allow fan speed control from the local panel		(((CC# - 1) × 50) + Group#) × 100 + 18	RW
Allow timer control from the local panel		(((CC# - 1) × 50) + Group#) × 100 + 19	RW
Setback control	0: Disable 1: Enable	(((CC# - 1) × 50) + Group#) × 100 + 20	RW
Minimum cool setpoint restriction	4.5..35°C / 40.1..95°F	(((CC# - 1) × 50) + Group#) × 100 + 21	RW
Maximum cool setpoint restriction		(((CC# - 1) × 50) + Group#) × 100 + 22	RW
Minimum heat setpoint restriction		(((CC# - 1) × 50) + Group#) × 100 + 23	RW
Maximum heat setpoint restriction		(((CC# - 1) × 50) + Group#) × 100 + 24	RW
Minimum auto setpoint restriction		(((CC# - 1) × 50) + Group#) × 100 + 25	RW
Maximum auto setpoint restriction		(((CC# - 1) × 50) + Group#) × 100 + 26	RW
Cool/dry/auto(upper) dual temperature setpoint (x10°C)		(((CC# - 1) × 50) + Group#) × 100 + 27	RW
Heating ATW & HWHP temperature setpoint (x10°C)	4.5..90°C / 40.1..194°F	(((CC# - 1) × 50) + Group#) × 100 + 27	RW
Heat/auto(lower) dual temperature setpoint (x10°C)		(((CC# - 1) × 50) + Group#) × 100 + 28	RW
Heating ECO ATW temperature setpoint (x10°C)		(((CC# - 1) × 50) + Group#) × 100 + 28	RW
Auto single temperature setpoint (x10°C)		(((CC# - 1) × 50) + Group#) × 100 + 29	RW
Hot water ATW & HWHP temperature setpoint (x10°C)		(((CC# - 1) × 50) + Group#) × 100 + 29	RW
Setback upper temperature setpoint (x10°C)		(((CC# - 1) × 50) + Group#) × 100 + 30	RW

Register name	Possible values	Modbus address formula	R/W
Anti-Freeze ATW temperature setpoint (x10°C)	4.5..90°C / 40.1..194°F	(((CC# - 1) × 50) + Group#) × 100 + 30	RW
Setback lower temperature setpoint (x10°C)		(((CC# - 1) × 50) + Group#) × 100 + 31	RW
Cooling ATW temperature setpoint (x10°C)		(((CC# - 1) × 50) + Group#) × 100 + 31	RW
Room Humidity	0..100%	(((CC# - 1) × 50) + Group#) × 100 + 32	R
Brightness status	0: Dark 1: Bright	(((CC# - 1) × 50) + Group#) × 100 + 33	R
Occupancy	0: Absence 1: Occupancy	(((CC# - 1) × 50) + Group#) × 100 + 34	R
Outdoor temperature	0.0..99.9°C / 32..211.82°F	(((CC# - 1) × 50) + Group#) × 100 + 35	R
Filter status	0: Ok 1: Dirty	(((CC#- 1) × 50) + Group#) × 100 + 36	R
Dirty filter indication reset	1: Reset the filter	(((CC# - 1) × 50) + Group#) × 100 + 37	W
Consumption Yesterday	Wh/KWh	(((CC# - 1) × 50) + Group#) × 100 + 38	R
Consumption Today		(((CC# - 1) × 50) + Group#) × 100 + 40	R
Consumption Total		(((CC# - 1) × 50) + Group#) × 100 + 42	R
Consumption Yesterday Heat		(((CC# - 1) × 50) + Group#) × 100 + 44	R
Consumption Today Heat		(((CC# - 1) × 50) + Group#) × 100 + 46	R
Consumption Total Heat		(((CC# - 1) × 50) + Group#) × 100 + 48	R
Consumption Yesterday Cool		(((CC# - 1) × 50) + Group#) × 100 + 50	R
Consumption Today Cool		(((CC# - 1) × 50) + Group#) × 100 + 52	R
Consumption Total Cool		(((CC# - 1) × 50) + Group#) × 100 + 54	R

Table 4. Individual unit error code signals

Register name	Possible values	Modbus address formula	R/W
AlarmCode Indoor Unit n	0: No alarm 1..9999: Error code	(CC# × 1,000) + 20,000 + M-NET Address + 1..50	R
AlarmCode Outdoor Unit n		(CC# × 1,000) + 20,050 + M-NET Address + 1..50	R

IMPORTANT

Individual unit signals are exclusively related to error codes and are disabled by default. They can be enabled at the centralized controller level in the **Controllers Configuration** section of the Intesis MAPS configuration tool. For more information, refer to the Intesis MAPS Configuration Guide.

8.2. Integration into KNX Systems

8.2.1. KNX signals

IMPORTANT
The signals available depend on the gateway configuration and/or the unit type (AC indoor unit, Air-to-water booster unit, heat pump, etc.)

To know more, refer to the Intesis MAPS Configuration Guide.

Table 5. Global group signals

Description	Object function	DPT	Flags
Centralized controller communication error	0: Ok 1: Communication error	DPT_Alarm (1bit)	R, T
Reset errors for all the groups	1: Reset the errors	DPT_Reset (1bit)	W
On/Off (all the groups)	0: Off 1: On	DPT_Switch (1bit)	W
Operation Mode (all the IC groups)	0: Auto 1: Heat 3: Cool 9: Fan 14: Dry	DPT_HVACContrMode (1byte)	W
Operation Mode (all the IC groups)	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool 5: Setback	DPT_Enumerated (1byte)	W
Operation Mode (all the IC groups)	0: Cool 1: Dry 2: Fan 3: Heat 4: Auto 5: Setback	DPT_Enumerated (1byte)	W
Operation Mode (all the LOSSNAY groups)	0: LC_Auto 1: Heat Recovery 2: Bypass	DPT_Enumerated (1byte)	W
Operation Mode (all the ATW & HWHP groups)	0: Hot Water 1: Heating 2: Heating_Eco 3: Anti_Freeze 4: Cooling	DPT_Enumerated (1byte)	W
Fan Speed (all the IC groups)	1: Speed 1 2: Speed 2 3: Speed 3 4: Speed 4	DPT_Enumerated (1byte)	W
Fan Speed (all the LOSSNAY groups)		DPT_Enumerated (1byte)	W
Fan Speed AUTO (all the IC groups)	1: Set auto fan 0: Stop auto fan	DPT_Switch (1bit)	W
Vane position (all the groups)	1: Horizontal 2: Pos. 2 3: Pos. 3 4: Pos. 4 5: Vertical	DPT_Enumerated (1byte)	W
Vane position AUTO (all the groups)	1: Set auto vane 0: Stop auto vane	DPT_Switch (1bit)	W
Vane position Swing (all the groups)	1: Set swing vane 0: Stop swing vane	DPT_Switch (1bit)	W
Individual Temperature Setpoint (all the groups)	5..90°C / 41..194°F	DPT_Value_Temp (2byte)	W

Table 6. Individual group signals

Description	Object function	DPT	Flags
Control_On/Off	0: Off 1: On	DPT_Switch (1bit)	W
Status_On/Off		DPT_Switch (1bit)	R, T
Control_Operation mode IC	0: Auto 9: Fan 1: Heat 14: Dry 3: Cool	DPT_HVACContrMode (1byte)	W
Status_Operation mode IC		DPT_HVACContrMode (1byte)	R, T
Control_Operation mode IC	0: Auto 3: Fan 1: Heat 4: Cool 2: Dry 5: Setback	DPT_Enumerated (1byte)	W
Status_Operation mode IC		DPT_Enumerated (1byte)	R, T
Control_Operation mode IC	0: Cool 3: Heat 1: Dry 4: Auto 2: Fan 5: Setback	DPT_Enumerated (1byte)	W
Status_Operation mode IC		DPT_Enumerated (1byte)	R, T
Control_Mode Cool/Heat IC	0: Cool 1: Heat	DPT_Heat/Cool (1bit)	W
Status_Mode Cool/Heat IC		DPT_Heat/Cool (1bit)	R, T
Control_Heat mode&ON IC	0 %: Off 1..100 %: On+Heat	DPT_Scaling (1byte)	W
Control_Cool mode&ON IC	0 %: Off 1..100 %: On+Cool	DPT_Scaling (1byte)	W
Control_Auto mode IC	1: Set auto mode	DPT_Switch (1bit)	W
Status_Auto mode IC	1: Auto mode active 0: Auto mode not active	DPT_Switch (1bit)	R, T
Control_Heat mode IC	1: Set heat mode	DPT_Switch (1bit)	W
Status_Heat mode IC	1: Heat mode active 0: Heat mode not active	DPT_Switch (1bit)	R, T
Control_Cool mode IC	1: Set cool mode	DPT_Switch (1bit)	W
Status_Cool mode IC	1: Cool mode active 0: Cool mode not active	DPT_Switch (1bit)	R, T
Control_Fan mode IC	1: Set fan mode	DPT_Switch (1bit)	W
Status_Fan mode IC	1: Fan mode active 0: Fan mode not active	DPT_Switch (1bit)	R, T
Control_Dry mode IC	1: Set dry mode	DPT_Switch (1bit)	W
Status_Dry mode IC	1: Dry mode active 0: Dry mode not active	DPT_Switch (1bit)	R, T
Status_Auto heat mode IC	1: Auto heat mode active 0: Auto heat mode not active	DPT_Switch (1bit)	R, T
Status_Auto cool mode IC	1: Auto cool mode active 0: Auto cool mode not active	DPT_Switch (1bit)	R, T
Control_Setback mode IC	1: Set setback mode	DPT_Switch (1bit)	W
Status_Setback mode IC	1: Setback mode active, 0: Setback mode not active	DPT_Switch (1bit)	R, T
Status_Setbackheat mode IC	1: Setbackheat mode active 0: Setbackheat mode not active	DPT_Switch (1bit)	R, T
Status_Setbackcool mode IC	1: Setbackcool mode active 0: Setbackcool mode not active	DPT_Switch (1bit)	R, T

Description	Object function	DPT	Flags
Control_Operation mode LOSSNAY	0: LC_Auto 1: Heat Recovery 2: Bypass	DPT_Enumerated (1byte)	W
Status_Operation mode LOSSNAY		DPT_Enumerated (1byte)	R, T
Control_LC_auto mode LOSSNAY	1: Set LC_auto mode	DPT_Switch (1bit)	W
Status_LC_auto mode LOSSNAY	1: LC_auto mode active 0: LC_auto mode not active	DPT_Switch (1bit)	R, T
Control_Heat recovery mode LOSSNAY	1: Set heat recovery mode	DPT_Switch (1bit)	W
Status_Heat recovery mode LOSSNAY	1: Heat recovery mode active 0: Heat recovery mode not active	DPT_Switch (1bit)	R, T
Control_Bypass mode LOSSNAY	1: Set bypass mode	DPT_Switch (1bit)	W
Status_Bypass mode LOSSNAY	1: Bypass mode active 0: Bypass mode not active	DPT_Switch (1bit)	R, T
Control_Operation mode ATW & HWHP	0: Hot Water 3: Anti_Freeze 1: Heating 4: Cooling 2: Heating_Eco	DPT_Enumerated (1byte)	W
Status_Operation mode ATW & HWHP		DPT_Enumerated (1byte)	R, T
Control_Hot water mode ATW & HWHP	1: Set hot water mode	DPT_Switch (1bit)	W
Status_Hot water mode ATW & HWHP	1: Hot water mode active 0: Hot water mode not active	DPT_Switch (1bit)	R, T
Control_Heating mode ATW & HWHP	1: Set heating mode	DPT_Switch (1bit)	W
Status_Heating mode ATW & HWHP	1: Heating mode active 0: Heating mode not active	DPT_Switch (1bit)	R, T
Control_Cooling mode ATW & HWHP	1: Set cooling mode	DPT_Switch (1bit)	W
Status_Cooling mode ATW & HWHP	1: Cooling mode active 0: Cooling mode not active	DPT_Switch (1bit)	R, T
Control_Heating_Eco mode ATW & HWHP	1: Set heating_eco mode	DPT_Switch (1bit)	W
Status_Heating_Eco mode ATW & HWHP	1: Heating_Eco mode active 0: Heating_Eco mode not active	DPT_Switch (1bit)	R, T
Control_Anti_Freeze mode ATW & HWHP	1: Set anti_freeze mode	DPT_Switch (1bit)	W
Status_Anti_Freeze mode ATW & HWHP	1: Anti_Freeze mode active 0: Anti_Freeze mode not active	DPT_Switch (1bit)	R, T
Control_Fan Speed enumerated (4stages)	1: Speed 1 3: Speed 3 2: Speed 2 4: Speed 4	DPT_Enumerated (1byte)	W
Status_Fan Speed enumerated (4stages)		DPT_Enumerated (1byte)	R, T
Control_Fan Speed enumerated (3stages)	1: Speed 1 2: Speed 2 3: Speed 3	DPT_Enumerated (1byte)	W
Status_Fan Speed enumerated (3stages)		DPT_Enumerated (1byte)	R, T
Control_Fan Speed enumerated (2stages)	1: Speed 1 2: Speed 2	DPT_Enumerated (1byte)	W
Status_Fan Speed enumerated (2stages)		DPT_Enumerated (1byte)	R, T

Description	Object function	DPT	Flags
Control_Fan Speed scaling (4stages)	Thresholds: 0..37% 38..62% 63..87% 88..100%	DPT_Scaling (1byte)	W
Status_Fan Speed scaling (4stages)	Thresholds: 25 % 50 % 75 % 100%	DPT_Scaling (1byte)	R, T
Control_Fan Speed scaling (3stages)	Thresholds: 0..49% 50..82% 83..100%	DPT_Scaling (1byte)	W
Status_Fan Speed scaling (3stages)	Thresholds: 33% 67% 100%	DPT_Scaling (1byte)	R, T
Control_Fan Speed scaling (2stages)	Thresholds: 0..74% 75..100%	DPT_Scaling (1byte)	W
Status_Fan Speed scaling (2stages)	Thresholds: 50% 100%	DPT_Scaling (1byte)	R, T
Control_Fan speed 1	1: Set fan speed 1	DPT_Switch (1bit)	W
Status_Fan speed 1	1: Speed 1 active 0: Speed 1 not active	DPT_Switch (1bit)	R, T
Control_Fan speed 2	1: Set fan speed 2	DPT_Switch (1bit)	W
Status_Fan speed 2	1: Speed 2 active 0: Speed 2 not active	DPT_Switch (1bit)	R, T
Control_Fan speed 3	1: Set fan speed 3	DPT_Switch (1bit)	W
Status_Fan speed 3	1: Speed 3 active 0: Speed 3 not active	DPT_Switch (1bit)	R, T
Control_Fan speed 4	1: Set fan speed 4	DPT_Switch (1bit)	W
Status_Fan speed 4	1: Speed 4 active 0: Speed 4 not active	DPT_Switch (1bit)	R, T
Control_Fan speed Man/Auto	0: Manual 1: Auto	DPT_Bool (1bit)	W
Status_Fan speed Man/Auto		DPT_Bool (1bit)	R, T
Control_Vane position enumerated	1: Horizontal 4: Pos. 4 2: Pos. 2 5: Vertical 3: Pos. 3	DPT_Enumerated (1byte)	W
Status_Vane position enumerated		DPT_Enumerated (1byte)	R, T

Description	Object function	DPT	Flags
Control_Vane position scaling	Thresholds: 0..30% 31..50% 51..70% 71..90% 91..100%	DPT_Scaling (1byte)	W
Status_Vane position scaling	Thresholds: 20% 40% 60% 80% 100%	DPT_Scaling (1byte)	R, T
Control_Vane position auto	1: Set auto vane 0: Stop auto vane	DPT_Switch (1bit)	W
Status_Vane position auto	1: Vane auto active 0: Vane auto not active	DPT_Switch (1bit)	R, T
Control_Vane position horizontal	1: Set horizontal vane	DPT_Switch (1bit)	W
Status_Vane position horizontal	1: Vane horizontal active 0: Vane horizontal not active	DPT_Switch (1bit)	R, T
Control_Vane position-2	1: Set position-2 vane	DPT_Switch (1bit)	W
Status_Vane position-2	1: Vane position-2 active 0: Vane position-2 not active	DPT_Switch (1bit)	R, T
Control_Vane position-3	1: Set position-3 vane	DPT_Switch (1bit)	W
Status_Vane position-3	1: Vane position-3 active 0: Vane position-3 not active	DPT_Switch (1bit)	R, T
Control_Vane position-4	1: Set position-4 vane	DPT_Switch (1bit)	W
Status_Vane position-4	1: Vane position-4 active 0: Vane position-4 not active	DPT_Switch (1bit)	R, T
Control_Vane position vertical	1: Set vertical vane	DPT_Switch (1bit)	W
Status_Vane position vertical	1: Vane vertical active 0: Vane vertical not active	DPT_Switch (1bit)	R, T
Control_Vane position swing	1: Set swing vane 0: Stop swing vane	DPT_Switch (1bit)	W
Status_Vane position swing	1: Vane swing active 0: Vane swing not active	DPT_Switch (1bit)	R, T
Control_Temperature Setpoint	**Cool or dry:** 19..30°C / 66.2..86°F **Heat or Auto:** 17..28°C / 62.6..82,4°F	DPT_Value_Temp (2byte)	W
Status_Temperature Setpoint		DPT_Value_Temp (2byte)	R, T
Control_Temperature Setpoint	5..90°C / 41..194°F	DPT_Value_Temp (2byte)	W
Status_Temperature Setpoint		DPT_Value_Temp (2byte)	R, T
Status_AC Ambient Temperature	0.0..99.9°C / 32..211.82°F	DPT_Value_Temp (2byte)	R, T
Control_KNX ambient Temperature		DPT_Value_Temp (2byte)	W

Description	Object function	DPT	Flags
Control_Operational Status for LOSSNAY or OA	0: Off 1: Low 2: High	DPT_Enumerated (1byte)	W
Status_Operational Status for LOSSNAY or OA		DPT_Enumerated (1byte)	R, T
Control_On/Off control disablement	0: Enabled 1: Disabled	DPT_Enable (1bit)	W
Status_On/Off control disablement		DPT_Enable (1bit)	R, T
Control_operating mode control disablement		DPT_Enable (1bit)	W
Status_operating mode control disablement		DPT_Enable (1bit)	R, T
Control_set point control disablement		DPT_Enable (1bit)	W
Status_set point control disablement		DPT_Enable (1bit)	R, T
Control_filter reset control disablement		DPT_Enable (1bit)	W
Status_filter reset control disablement		DPT_Enable (1bit)	R, T
Status_Group operation time (secs)	0..9999999999	DPT_LongDeltaTimeSec (4bytes)	R, T
Status_group error	0: No error 1: Group error	DPT_Alarm (1bit)	R, T
Status_group error code	Number of the error code (XXXX)	8.x: (2byte, Signed Value)	R, T
Control_group error reset	1: Reset the error	DPT_Switch (1bit)	W
Status_group model	0: IC 4: FU 1: KIC 5: BU 2: AIC 6: WH 3: LC 7CEh	DPT_String_ASCII (14 bytes)	R, T
Control_Setback	1: Enable 0: Disable	DPT_Enable (1bit)	W
Status_Setback		DPT_Enable (1bit)	R, T
Control_Cool/dry/auto(upper) dual temperature setpoint (°C)	4.5..90°C / 40..194°F	DPT_Value_Temp (2byte)	W
Status_Cool/dry/auto(upper) dual temperature setpoint		DPT_Value_Temp (2byte)	R, T
Control_Heating ATW temperature setpoint		DPT_Value_Temp (2byte)	W
Status_Heating ATW temperature setpoint		DPT_Value_Temp (2byte)	R, T
Control_Heat/auto(lower) dual temperature setpoint		DPT_Value_Temp (2byte)	W
Status_Heat/auto(lower) dual temperature setpoint		DPT_Value_Temp (2byte)	R, T
Control_Heating ECO ATW temperature setpoint		DPT_Value_Temp (2byte)	W
Status_Heating ECO ATW temperature setpoint		DPT_Value_Temp (2byte)	R, T
Control_Auto single temperature setpoint		DPT_Value_Temp (2byte)	W

Description	Object function	DPT	Flags
Status_Auto single temperature setpoint	4.5..90°C / 40..194°F	DPT_Value_Temp (2byte)	R, T
Control_Hot water ATW temperature setpoint		DPT_Value_Temp (2byte)	W
Status_Hot water ATW temperature setpoint		DPT_Value_Temp (2byte)	R, T
Control_Setback upper temperature setpoint		DPT_Value_Temp (2byte)	W
Status_Setback upper temperature setpoint		DPT_Value_Temp (2byte)	R, T
Control_Anti-Freeze ATW temperature setpoint		DPT_Value_Temp (2byte)	W
Status_Anti-Freeze ATW temperature setpoint		DPT_Value_Temp (2byte)	R, T
Control_Setback lower temperature setpoint		DPT_Value_Temp (2byte)	W
Status_Setback lower temperature setpoint		DPT_Value_Temp (2byte)	R, T
Control_Cooling ATW temperature setpoint		DPT_Value_Temp (2byte)	W
Status_Cooling ATW temperature setpoint		DPT_Value_Temp (2byte)	R, T
Status_Outdoor temperature	0.0..99.9°C / 32..211.82°F	DPT_Value_Temp (2byte)	R, T
Status_Filter	0: Ok 1: Dirty	DPT_Alarm (1bit)	R, T
Control_Dirty filter indication reset	1: Reset the filter	DPT_Reset (1bit)	W
Status_Consumption Yesterday	Wh/KWh	13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Today		13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Total		13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Yesterday Heat		13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Today Heat		13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Total Heat		13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Yesterday Cool		13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Today Cool		13.010 active energy (Wh) (4byte)	R, T
Status_Consumption Total Cool		13.010 active energy (Wh) (4byte)	R, T

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

Table 7. Individual unit error code signals

Controller	Unit	Description	Value	DPT	Flags
Controller 1..2	Indoor Unit 1..50	Status_Indoor Unit n error code	Number of the error code (XXXX)	DPT_7.N (2byte)	R, T
Controller 1..2	Outdoor Unit 1..50	Status_Outdoor Unit n error code		DPT_7.N (2byte)	R, T

IMPORTANT
Individual unit signals are exclusively related to error codes and are disabled by default. They can be enabled at the centralized controller level in the **Controllers Configuration** section of the Intesis MAPS configuration tool. For more information, refer to the Intesis MAPS Configuration Guide.

8.3. Integration into BACnet Systems

NOTICE
You can consult the Protocol Implementation Conformance Statement (PICS) document here.

8.3.1. BACnet Objects

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

Input object types:

- Analog input
- Binary input
- Multistate input

Output object types:

- Analog output
- Binary output
- Multistate output

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

IMPORTANT
The signals available depend on the gateway configuration and/or the unit type (AC indoor unit, Air-to-water booster unit, heat pump, etc.)

To know more, refer to the Intesis MAPS Configuration Guide.

NOTICE

In the following table, CC# stands for the Centralized Controller number (1 or 2).

For the first global signal, for example, the BACnet object instance for centralized controller 1 is **0**:

((1 - 1) × 8000) + 0 = 0

For controller 2, the BACnet object instance for its first global signal is **8000**:

((2 - 1) × 8000) + 0 = 8000

For more information, check the Signals Tab section in the Intesis MAPS Configuration Guide for IN770AIR∗∗∗O000.

Table 8. Global signals

Object name	Possible values	Object type	Object instance
Centralized controller communication error	0: Ok 1: Communication error	3-Binary Input	(((CC# - 1) × 8000) + 0
Reset errors (all groups)	0: No Reset 1: Reset errors	4-Binary Output	((CC# - 1) × 8000) + 0
On/Off (all groups)	0: Off 1: On	4-Binary Output	((CC# - 1) × 8000) + 1
Mode (all IC groups)	1: Heat 2: Cool 3: Fan 4: Dry 5: Auto 6: Setback	14-Multistate Output	((CC# - 1) × 8000) + 0
Mode (all Lossnay groups)	1: LC_Auto 2: HeatRecovery 3: Bypass	14-Multistate Output	((CC# - 1) × 8000) + 1
Fan Speed (all IC groups)	1: Auto 2: Low 3: Mid1 4: Mid2 5: High	14-Multistate Output	((CC# - 1) × 8000) + 2
Fan Speed (all Lossnay groups)	1: Low 2: Mid1 3: Mid2 4: High	14-Multistate Output	((CC# - 1) × 8000) + 3
Vane Position (all IC groups)	1: Auto 2: Horizontal 3: Pos. 2 4: Pos. 3 5: Pos4 6: Vertical 7: Swing	14-Multistate Output	((CC# - 1) × 8000) + 4
Setpoint (all the groups)	5..90°C / 41..194°F	1-Analog Output	((CC# - 1) × 8000) + 0

NOTICE

For individual group signals, the BACnet object instance formula also takes into account the group number, shown in the following table as **G**.

For the first signal, for example, the BACnet object instance for group 1 of centralized controller 1 is **100**:

((1 - 1) × 8000) + (1 × 100) = 100

For group controller 2, the BACnet object instance for its first signal is **8100**:

((2 - 1) × 8000) + (1 × 100) = 8100

For more information, check the Signals Tab section in the Intesis MAPS Configuration Guide for IN770AIR∗∗∗O000.

Table 9. Individual group signals

Object name	Possible values	Object type	Object instance
CXGX_On/Off_S	0: Off 1: On	3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 0
CXGX_On/Off_C		4-Binary Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 0
CXGX_Mode_S	1: Auto 2: Heat 3: Dry 4: Fan 5: Cool 6: AutoHeat 7: AutoCool 8: Setback 9: Setbackheat 10: Setbackcool	13-Multistate Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 0
CXGX_Mode_S	1: LC_Auto 2: Heat Recovery 3: Bypass	13-Multistate Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 1
CXGX_Mode_S	1: Hot_Water 2: Heating 3: Heating_Eco 4: Anti_Freeze 5: Cooling	13-Multistate Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 2
CXGX_Mode_C	1: Auto 2: Heat 3: Dry 4: Fan 5: Cool 6: Setback	14-Multistate Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 0
CXGX_Mode_C	1: LC_Auto 2: Heat Recovery 3: Bypass	14-Multistate Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 1
CXGX_Mode_C	1: Hot_Water 2: Heating 3: Heating_Eco 4: Anti_Freeze 5: Cooling	14-Multistate Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 2

Object name	Possible values	Object type	Object instance
CXGX_FanSpeed_S	The values depend on the number of fan speeds selected in the configuration tool: **2 fan speeds:** 1: Auto 2: Low 3: High **3 fan speeds:** 1: Auto 3: Mid1 2: Low 4: High **4 fan speeds:** 1: Auto 4: Mid1 2: Low 5: High 3: Mid2	13-Multistate Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 3
CXGX_FanSpeed_S		13-Multistate Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 4
CXGX_FanSpeed_C		14-Multistate Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 3
CXGX_FanSpeed_C		14-Multistate Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 4
CXGX_Vanes_S	1: Auto 5: Pos. 4 2: Horizontal 6: Vertical 3: Pos. 2 7: Swing 4: Pos. 3	13-Multistate Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 5
CXGX_Vanes_C		14-Multistate Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 5
CXGX_Setpoint_S	**Cool or dry:** 19..30°C / 66.2..86°F **Heat or Auto:** 17..28°C / 62.6..82.4°F	0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 0
CXGX_Setpoint_S	5..90°C / 41..194°F	0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 1
CXGX_Setpoint_C	**Cool or dry:** 19..30°C / 66.2..86°F **Heat or Auto:** 17..28°C / 62.6..82.4°F	1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 0
CXGX_Setpoint_C	5..90°C / 41..194°F	1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 1
CXGX_AmbientTemp_S	0.0..99.9°C / 32..211.82°F	0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 2
CXGX_OperationalStatus_LS_OA_S	1: Off 2: Low 3: High	13-Multistate Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 6
CXGX_OperationalStatus_LS_OA_C		14-Multistate Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 6
CXGX_OperationTimex100_S	0..9999	0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 3
CXGX_OperationTime%100_S	0..99	0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 4
CXGX_ErrorStatus_S	0: No error 1: Group error	3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 1
CXGX_ErrorCode_S	0: No Error 1..255: Error	0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 5
CXGX_ErrorReset_C	0: No Reset 1: Reset	4-Binary Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 1

Object name	Possible values	Object type	Object instance
CXGX_Model_S	1: IC 9: DC 17: AN 2: KIC 10: AHC 18: GR 3: AIC 11: RC 19: SR 4: LC 12: ME 20: ST 5: FU 13: RC 21: SC 6: BU 14: URC 22: ?? 7: WH 15: GW 23: NONE 8: CEh 16: TR	13-Multistate Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 7
CXGX_Allow_ONOFF_Panel_S	0: Allow 1: Not allowed	3-Binary Input	((CC# - 1) × 8000) + G[1..50] × 100) + 2
CXGX_Allow_ONOFF_Panel_C		4-Binary Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 2
CXGX_Allow_MODE_Panel_S		3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 3
CXGX_Allow_MODE_Panel_C		4-Binary Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 3
CXGX_Allow_SETPOINT_Panel_S		3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 4
CXGX_Allow_SETPOINT_Panel_c		4-Binary Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 4
CXGX_Allow_FILTERRESET_Panel_S		3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 5
CXGX_Allow_FILTERRESET_Panel_C		4-Binary Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 5
CXGX_Allow_FANSPEED_Panel_S		3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 6
CXGX_Allow_FANSPEED_Panel_C		4-Binary Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 6
CXGX_Allow_VANES_Panel_S		3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 7
CXGX_Allow_VANES_Panel_C		4-Binary Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 7
CXGX_Allow_TIMER_Panel_S		3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 8
CXGX_Allow_TIMER_Panel_C		4-Binary Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 8
CXGX_SetbackControl_S	0: Disable 1: Enable	3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 9
CXGX_SetbackControl_C		4-Binary Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 9
CXGX_Min_Cool_Setpoint_S	4.5..35°C / 40.1..95°F	0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 6
CXGX_Min_Cool_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 2
CXGX_Max_Cool_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 7
CXGX_Max_Cool_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 3
CXGX_Min_Heat_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 8
CXGX_Min_Heat_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 4

Object name	Possible values	Object type	Object instance
CXGX_Max_Heat_Setpoint_S	4.5..35°C / 40.1..95°F	0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 9
CXGX_Max_Heat_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 5
CXGX_Min_Auto_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 10
CXGX_Min_Auto_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 6
CXGX_Max_Auto_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 11
CXGX_Max_Auto_Setpoint_C	4.5..90°C / 40.1..194°F	1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 7
CXGX_CoolDryAuto_Upper_DualSetpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 12
CXGX_CoolDryAuto_Upper_DualSetpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 8
CXGX_Heating_ATW_HWHP_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 13
CXGX_Heating_ATW_HWHP_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 9
CXGX_AutoHeat_Lower_DualSetpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 14
CXGX_AutoHeat_Lower_DualSetpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 10
CXGX_HeatingECO_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 15
CXGX_HeatingECO_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 11
CXGX_AutoSingle_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 16
CXGX_AutoSingle_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 12
CXGX_HotWater_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 17
CXGX_HotWater_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 13
CXGX_Setback_Upper_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 18
CXGX_Setback_Upper_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 14
CXGX_Setback_Lower_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 19
CXGX_Setback_Lower_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 15
CXGX_Antifreeze_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 20
CXGX_Antifreeze_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 16
CXGX_Cooling_Setpoint_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 21
CXGX_Cooling_Setpoint_C		1-Analog Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 17

Object name	Possible values	Object type	Object instance
CXGX_Room_Humidity_S	0..100%	0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 22
CXGX_Brightness_S	0: Dark 1: Bright	3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 10
CXGX_Occupancy_S	0: Absence 1: Occupancy	3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 11
CXGX_Outdoor_Temperature_S	0..99.9°C / 32..211.82°F	0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 23
CXGX_FilterStatus_S	0: Ok 1: Dirty	3-Binary Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 12
CXGX_DirtyFilter_Reset_C	0: No Reset 1: Reset	4-Binary Output	((CC# - 1) × 8000) + (G[1..50] × 100) + 10
CXGX_Consumption Yesterday_S	Wh/KWh	0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 24
CXGX_Consumption Today_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 25
CXGX_Consumption Total_S		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 26
CXGX_Consumption Yesterday_S_Heat		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 27
CXGX_Consumption Today_S_Heat		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 28
CXGX_Consumption Total_S_Heat		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 29
CXGX_Consumption Yesterday_S_Cool		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 30
CXGX_Consumption Today_S_Cool		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 31
CXGX_Consumption Total_S_Cool		0-Analog Input	((CC# - 1) × 8000) + (G[1..50] × 100) + 32

Table 10. Individual unit error code signals

Object name	Possible values	Object type	Object instance
CXIndoorUnitX_ErrorCode_S	0: No alarm 1..9999: Error code	0-Analog Input	((CC# - 1) × 8000) + IUAddress[1..50] + 15000
CXOutdoorUnitX_ErrorCode_S		0-Analog Input	((CC# - 1) × 8000) + OUAddress[1..50] + 15050

IMPORTANT

Individual unit signals are exclusively related to error codes and are disabled by default. They can be enabled at the centralized controller level in the **Controllers Configuration** section of the Intesis MAPS configuration tool. For more information, refer to the Intesis MAPS Configuration Guide.

8.4. Integration into MQTT Systems

8.4.1. MQTT Topics

When using the MQTT protocol, the gateway publishes topics to share its status information and subscribes to topics to receive commands. Both actions are performed through an external MQTT broker, which manages communication between the gateway and other MQTT clients, such as the BMS.

In MQTT, a topic is a string identifier used to route messages between clients via the broker. A topic follows a hierarchical structure with different levels, which vary depending on the MQTT broker:

- **AWS IoT Core / Generic**:
  - **For Publishing**: <macGW>/<Lxx>/<IUxx>/status/<metricName>
  - **For Subscribing**: <macGW>/<Lxx>/<IUxx>/cmd/<metricName>
- **Azure IoT Hub**:
  - **For Publishing**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=<metricName>
  - **For Subscribing**: devices/<macGW>/messages/devicebound/&line=<Lxx>&IU=<IUxx>&metricName=<metricName>

NOTICE
The **<Lxx>** parameter refers to the line associated with each centralized controller.

Consult the Intesis MAPS Configuration Guide for more information.

The following tables list all available topics.

IMPORTANT
The topics available depend on the gateway configuration and/or the unit type (AC indoor unit, Air-to-water booster unit, heat pump, etc.)

To know more, refer to the Intesis MAPS Configuration Guide.

Table 11. Publishing topics

MQTT topics	Description	Possible values
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/onOffSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=onOffSts	On/Off Status	0: Off 1: On
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/modeSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=modeSts	IC Operation Mode Status	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool 5: Auto Heat 6: Auto Cool 7: Setback 8: Setback Heat 9: Setback Cool

MQTT topics	Description	Possible values
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/modeSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=modeSts	LOSSNAY Operation Mode Status	0: LC_Auto 1: Heat Recovery 2: Bypass
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/modeSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=modeSts	ATW & HWHP Operation Mode Status	0: Hot Water 1: Heating 2: Heating Eco 3: Anti Freeze 4: Cooling
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/fanSpeedSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=fanSpeedSts	IC Fan Speed Status	0: Auto 1: Low 2: Mid2 3: Mid1 4: High

NOTICE
The number of values available varies depending on the number of FanSpeeds selected in the Intesis MAPS configuration tool:

- 0: No signals available
- 2: Auto, Mid2, and High
- 3: Auto, Mid2, Mid1, and High
- 4: Auto, Low, Mid2, Mid1, High

Refer to the Intesis MAPS Guide for Mitsubishi Electric for more information.

AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/fanSpeedSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=fanSpeedSts	LOSSNAY Fan Speed Status	0: Auto 1: Low 2: Mid2 3: Mid1 4: High

NOTICE
The number of values available varies depending on the number of FanSpeeds selected in the Intesis MAPS configuration tool:

- 0: No signals available
- 2: Mid2 and High
- 3: Mid2, Mid1, and High
- 4: Low, Mid2, Mid1, and High

AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/vanesSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=vanesSts	Vane Position Status	0: Auto 1: Horizontal 2: Pos. 2 3: Pos. 3 4: Pos. 4 5: Vertical 6: Swing
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/setTempSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=setTempSts	Temperature Setpoint Status	**Cool/Dry:** 19..30°C /66.2..86°F **Heat/Auto:** 17..28°C /62.6..84°F

MQTT topics	Description	Possible values
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/setTempSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=setTempSts	Temperature Setpoint Status	5..90°C /41..194°F
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/tempAmbientSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=tempAmbientSts	Ambient Temperature	-0..99.9°C /32..211.82°F
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/errorSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=errorSts	Group Error Status	0: No error 1: Error
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/status/errorCodeSts **Azure IoT Hub**: devices/<macGW>/messages/events/&line=<Lxx>&IU=<IUxx>&metricName=errorCodeSts	Group Error Code	Error code number (XXXX)

Table 12. Subscribing topics

MQTT topics	Description	Possible values
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/cmd/onOffCmd **Azure IoT Hub**: devices/<macGW>/messages/devicebound/&line=<Lxx>&IU=<IUxx>&metricName=onOffCmd	On/Off Control	0: Off 1: On
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/cmd/modeCmd **Azure IoT Hub**: devices/<macGW>/messages/devicebound/&line=<Lxx>&IU=<IUxx>&metricName=modeCmd	IC Operation Mode Control	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool 5: Auto Heat 6: Auto Cool 7: Setback 8: Setback Heat 9: Setback Cool
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/cmd/modeCmd **Azure IoT Hub**: devices/<macGW>/messages/devicebound/&line=<Lxx>&IU=<IUxx>&metricName=modeCmd	LOSSNAY Operation Mode Control	0: LC_Auto 1: Heat Recovery 2: Bypass
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/cmd/modeCmd **Azure IoT Hub**: devices/<macGW>/messages/devicebound/&line=<Lxx>&IU=<IUxx>&metricName=modeCmd	ATW & HWHP Operation Mode Control	0: Hot Water 1: Heating 2: Heating Eco 3: Anti Freeze 4: Cooling

MQTT topics	Description	Possible values
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/cmd/modeCmd **Azure IoT Hub**: devices/<macGW>/messages/devicebound/&line=<Lxx>&IU=<IUxx>&metricName=modeCmd	IC Fan Speed Control	0: Auto 1: Low 2: Mid2 3: Mid1 4: High
NOTICE The number of values available varies depending on the number of FanSpeeds selected in the Intesis MAPS configuration tool: • 0: No signals available • 2: Auto, Mid2, and High • 3: Auto, Mid2, Mid1, and High • 4: Auto, Low, Mid2, Mid1, High Refer to the Intesis MAPS Guide for Mitsubishi Electric for more information.		
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/cmd/modeCmd **Azure IoT Hub**: devices/<macGW>/messages/devicebound/&line=<Lxx>&IU=<IUxx>&metricName=modeCmd	LOSSNAY Fan Speed Control	0: Auto 1: Low 2: Mid2 3: Mid1 4: High
NOTICE The number of values available varies depending on the number of FanSpeeds selected in the Intesis MAPS configuration tool: • 0: No signals available • 2: Mid2 and High • 3: Mid2, Mid1, and High • 4: Low, Mid2, Mid1, and High		
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/cmd/vanesCmd **Azure IoT Hub**: devices/<macGW>/messages/devicebound/&line=<Lxx>&IU=<IUxx>&metricName=vanesCmd	Vane Position Control	0: Auto 1: Horizontal 2: Pos. 2 3: Pos. 3 4: Pos. 4 5: Vertical 6: Swing
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/cmd/setTempCmd **Azure IoT Hub**: devices/<macGW>/messages/devicebound/&line=<Lxx>&IU=<IUxx>&metricName=setTempCmd	Temperature Setpoint Control	**Cool/Dry:** 19..30°C /66.2..86°F **Heat/Auto:** 17..28°C /62.6..82.4°F
AWS IoT Core / Generic: <macGW>/<Lxx>/<IUxx>/cmd/setTempCmd **Azure IoT Hub**: devices/<macGW>/messages/devicebound/&line=<Lxx>&IU=<IUxx>&metricName=setTempCmd	Temperature Setpoint Control	5..90°C /41..194°F

The content of the transmitted topics is handled in a JSON format.

Example 1. Payload example:

```
Topic:
<macGW>/<Lxx>/<IUxx>/cmd/setTempCmd

Payload:
{
"name": "setTempCmd",
"timestamp": "<timestamp>",
"dataType": "float",
"isValid": "true",
"value": "0.0,"
"unit": "ºC"
}
```

NOTICE
To know more about the gateway configuration, consult the Intesis MAPS guide for Mitsubishi Electric.

8.5. Integration into Home Automation Systems

8.5.1. Home Automation Signals

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

IMPORTANT
The signals available depend on the gateway configuration and/or the unit type (AC indoor unit, Air-to-water booster unit, heat pump, etc.)

To know more, refer to the Intesis MAPS Configuration Guide.

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 WMP protocol specifications manual.

Table 13. Indoor unit signals

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

NOTE
[1] This index must be set according to the Unit ID Index.

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

9. Field Configuration: Change the Gateway's Protocol

Reconfiguring the gateway with a different protocol is very easy:

1. Connect the gateway to the computer 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
To know more about the gateway configuration, consult the Intesis MAPS Guide for Mitsubishi Electric.

10. Error Codes

NOTE
These error codes are the same for all applications.

Error Code	Description
65535 (-1)	Communication error between the gateway and the AC unit
0	No active error
1102	Discharge temperature high
1108	Internal thermostat detector working (49C)
1110	Outdoor unit failure
1300	Low pressure
1302	High pressure (High pressure probe working 63H)
1503	Protection against freeze or battery high temperature
1504	Protection against freeze or battery high temperature
1504	Overheating protection
1509	High pressure error (ball valve closed)
1520	Super heating anomaly due to low temp. of discharge (TH4)
2500	Erroneous operation of the drain pump
2502	Erroneous operation of the drain pump
2503	Drain sensor anomaly (DS)
4030	Serial transmission error
4100	Compressor pause due to excess of current (initial block)
4101	Compressor pause due to excess of current (overload)
4102	Phase detection opened
4103	Anti-phase detection
4108	Phase opened in phase L2 or connector 51CM opened
4118	Error in the anti-phase detector (electronic board)
4124	Connector 49L opened
4210	Cut due to over-current of compressor
4220	Voltage anomaly
4230	Radiator panel temperature anomaly (TH8)
5101	Ambient temperature probe anomaly (TH1), indoor unit
5102	Liquid probe anomaly (TH2)
5102	Condensation/Evaporation probe anomaly (TH5)
5104	Error detection in discharge temperature
5105	Outdoor probe error TH3
5106	Outdoor probe error TH7
5107	Outdoor probe error TH6
5110	Outdoor probe error TH8
5202	Connector 63L opened
5300	Current probe error
6600	M-NET duplicated address definition
6602	M-NET line transmission hardware error

6603	M-NET bus busy
6606	M-NET line transmission error
6607	M-NET transmission error
6607	M-NET without ack
6608	M-NET transmission error
6608	M-NET without response
6831	Remote controller transmission error (reception error)
6832	Remote controller transmission error (transmission error)
6840	Transmission error with the indoor/outdoor unit (reception error)
6841	Transmission error with the indoor/outdoor unit (transmission error)
6844	Error in the inter-connection cable in the indoor/outdoor unit, indoor unit number deactivated (5 min or more)
6845	Error in the inter-connection cable in the indoor/outdoor unit (cabling error, disconnection)
6846	Initial timer deactivated

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

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