ENGLISH

700series Air Gateway - IN770AIR***O000

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

USER MANUAL
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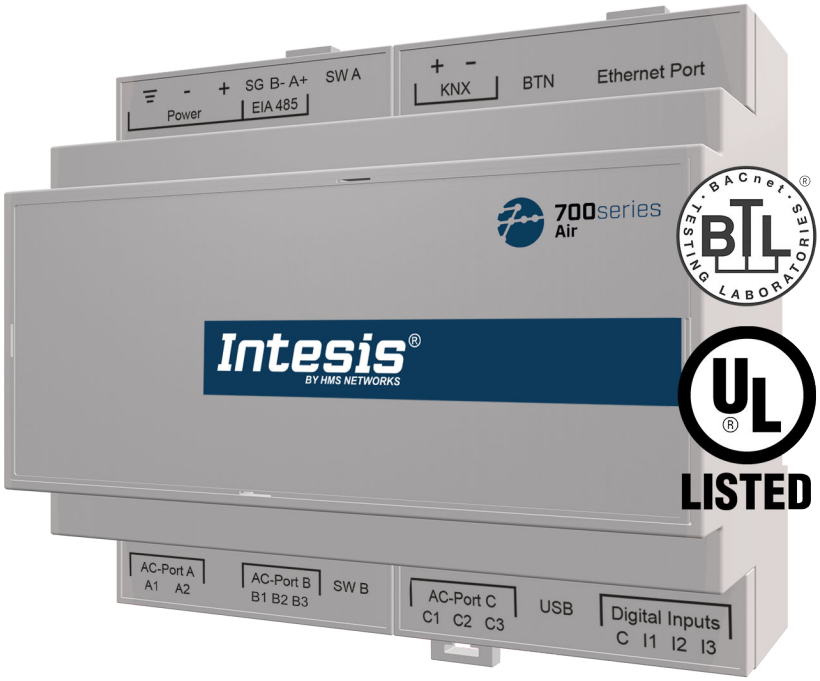

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Table of Contents

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 6
4.2. Main Features 6
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 14
7.2.4. Connection to Modbus 15
7.2.5. Connection to KNX 16
7.2.6. Connection to BACnet 16
7.2.7. Connection to Home Automation 17
7.2.8. Connection to a PC for Configuration 18
7.2.9. Connection to Energy Meters (Digital Inputs) 18
7.3. Gateway Layout 19
7.4. LED Indicators 20
7.5. DIP Switches 21
7.6. Push Button 21
7.7. Technical Specifications 22
7.8. Dimensions 23

8. Available Protocol Combinations 24

8.1. Integration into Modbus Systems 24
8.1.1. Modbus Registers 24
8.2. Integration into KNX Systems 29
8.2.1. KNX signals 29
8.3. Integration into BACnet Systems 37
8.3.1. BACnet Objects 37
8.4. Integration into Home Automation Systems 45
8.4.1. Home Automation Signals 45

9. Late Configuration: Change the Gateway's Protocol 46

10. Error Codes 47

1. Description, Compatible AC systems, and Order Codes

IN770AIR*O000 Gateway.**

Modbus®, KNX®, BACnet®, 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, 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.

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.

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 power before manipulating and connecting them to the gateway.

Use 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, if present, are potential-free contact. 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

This IN770AIR***O000 gateway supports four combinations.

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
		Home Automation

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

Figure 1. Integration of Mitsubishi Electric units into Modbus systems

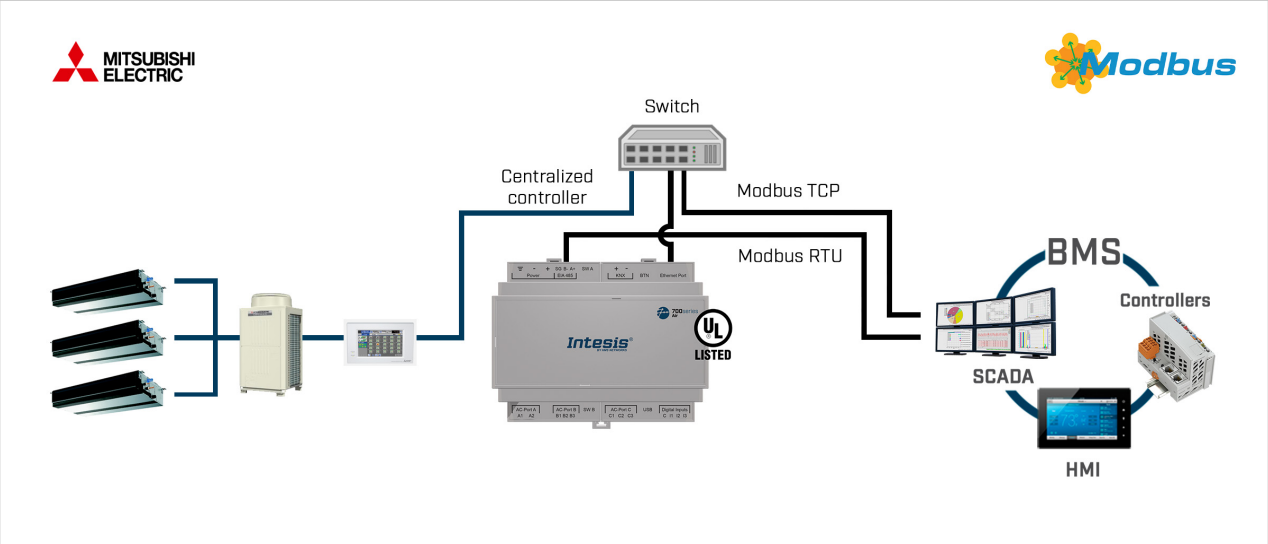


Figure 2. Integration of Mitsubishi Electric units into KNX TP systems

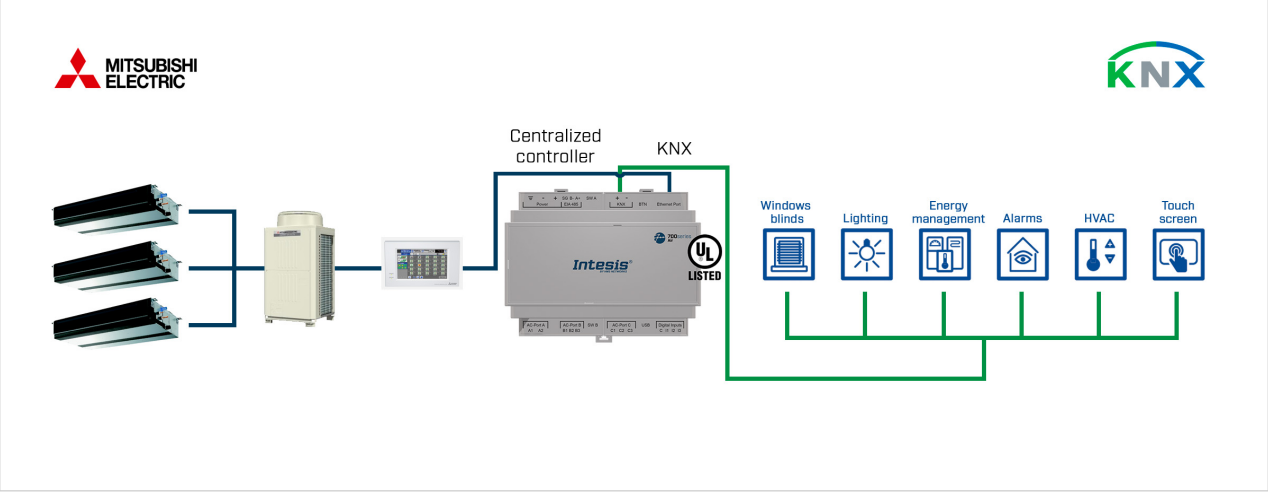


Figure 3. Integration of Mitsubishi Electric units into BACnet systems

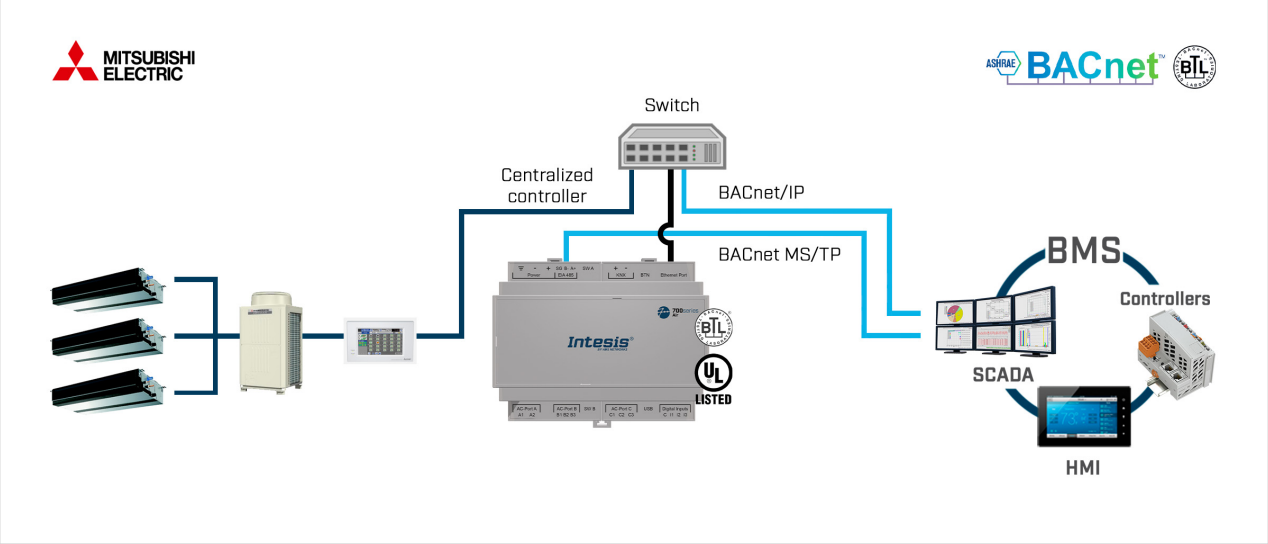
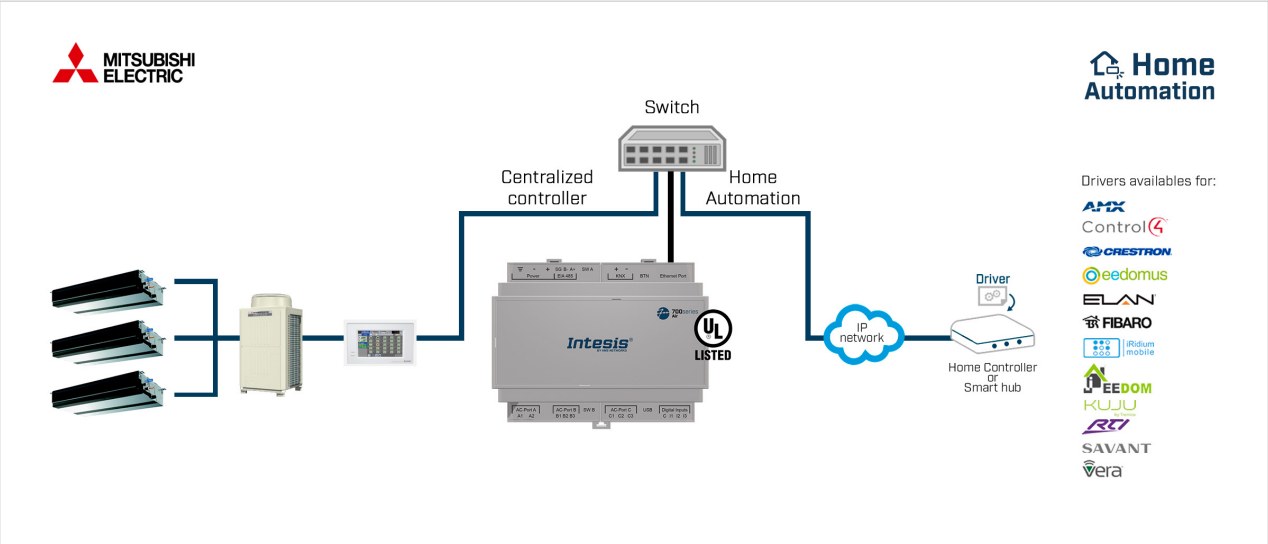


Figure 4. Integration of Mitsubishi Electric units into Home Automation systems



4.1. Inside the Package

ITEMS INCLUDED

- Intesis IN770AIR***O000 Gateway
- USB Mini-B type to USB Type-A cable
- Installation guide

4.2. Main Features

- Several protocol combinations available: Configurable for Modbus TCP and RTU, KNX TP, BACnet/IP and MS/TP, 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 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)

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, 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 laptop. 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, or Home Automation, connect the communication cable coming from the Modbus/BACnet/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.
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 laptop to configure it with Intesis MAPS. Use the port marked as **Console**.
8. Open Intesis MAPS and create a new project 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
XXS and small licenses support one Mitsubishi Electric Centralized Controller. To use two centralized controllers, a medium license is required.

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:

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

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.

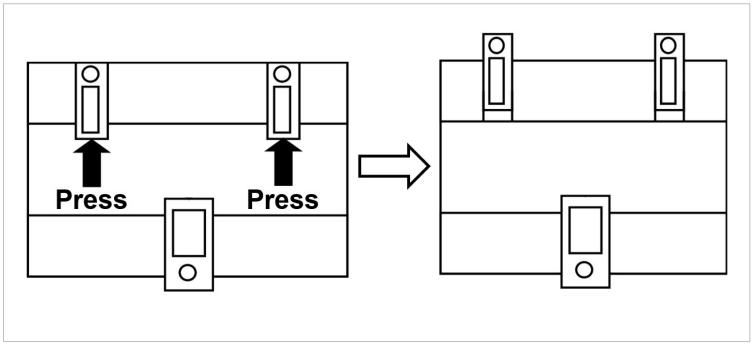
NOTE
Mount the gateway on a wall or over a DIN rail. We recommend the DIN rail mounting option, preferably inside a grounded metallic industrial cabinet.

IMPORTANT
Ensure the gateway has sufficient clearances for all connections when mounted. See Dimensions (page 23).

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.

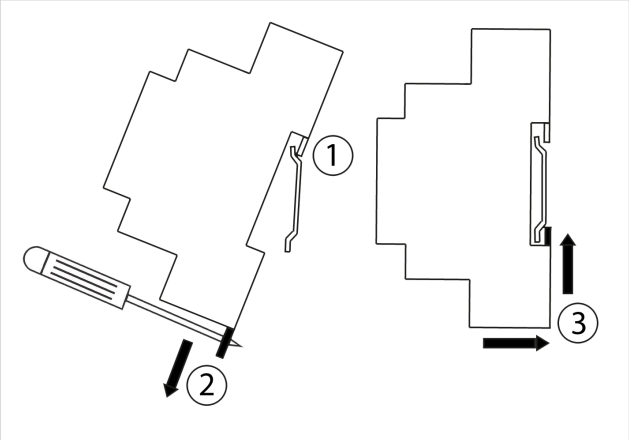
3. Make sure the gateway is firmly fixed.

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.



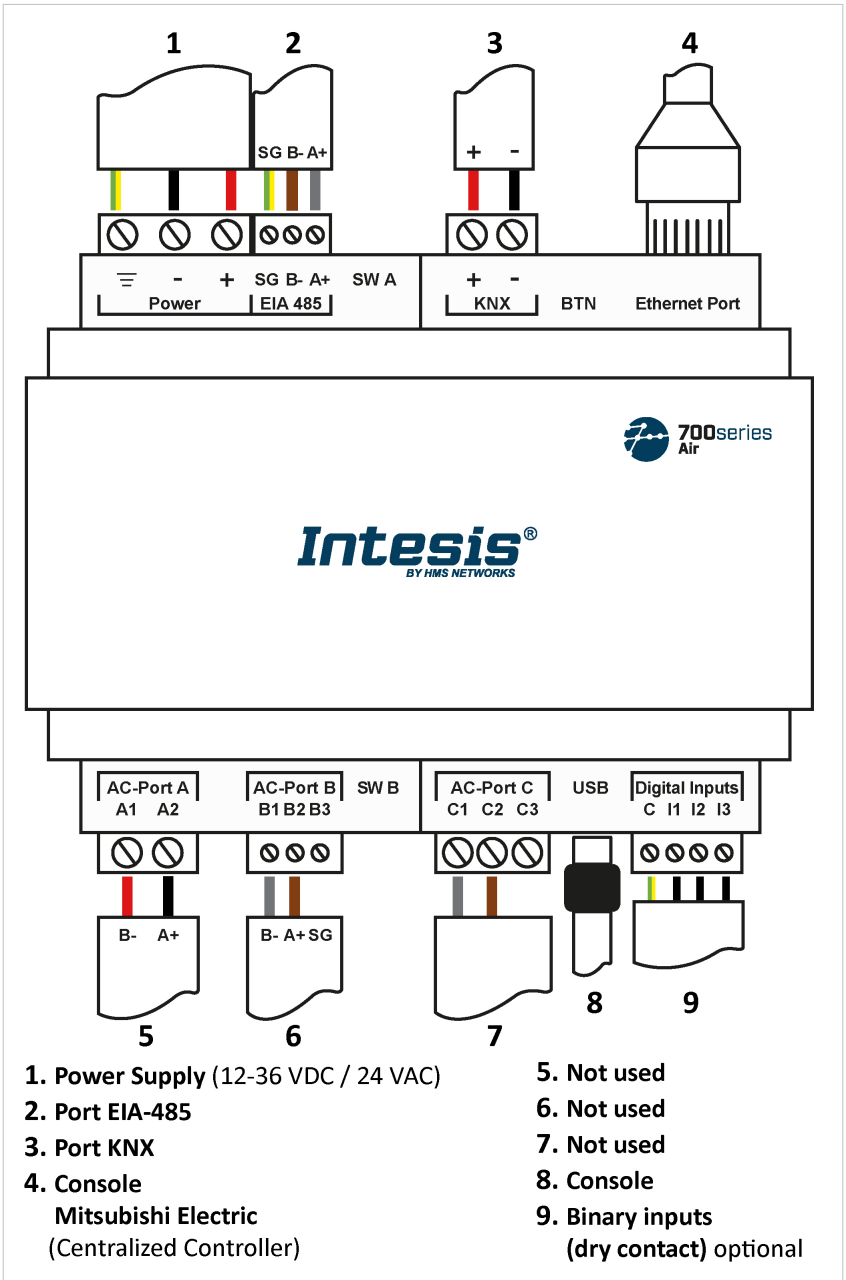
7.2. Connection

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

IMPORTANT
Keep communication cables away from power and ground wires.

7.2.1. Gateway Connectors

Figure 5. Wiring diagram



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

WIRING THE CONNECTORS

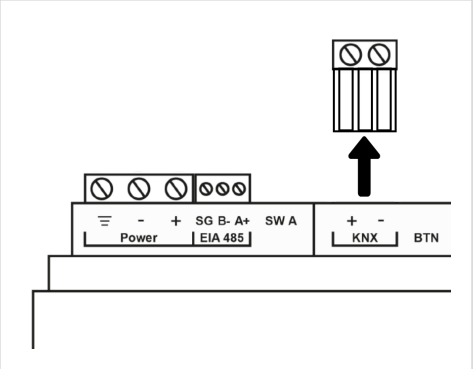
IMPORTANT
For all connectors, use solid or stranded wires (twisted or with ferrule).

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 22).

TIP
- Mount the gateway in the desired place before wiring it.
- 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	Connection to the Centralized Controller	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 PC for configuration purposes	USB Mini-B type			
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**. The correct cable to use depends on where the gateway is connected:

- **Connecting directly to a Modbus TCP 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.

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.

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 21).

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**. 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.

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.

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 termination resistor of 120 ohms (Ω) 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 dedicated to the EIA-485 port:
  Position 1
  - ON: 120 Ω termination active.
  - OFF: 120 Ω termination inactive.

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

  For further details, see DIP Switches (page 21).

IMPORTANT
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 Home Automation

Connect the Home Automation Ethernet cable to the gateway's **Ethernet Port**. The correct cable to use depends on where the gateway is connected:

- **Connecting directly to a Home Automation 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.

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 a PC for Configuration

Use the supplied USB Mini-B type to USB Type-A cable to connect the gateway through its **Console** 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.

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

NOTE
See the Wiring diagram (page 12).

7.2.9. Connection to Energy Meters (Digital Inputs)

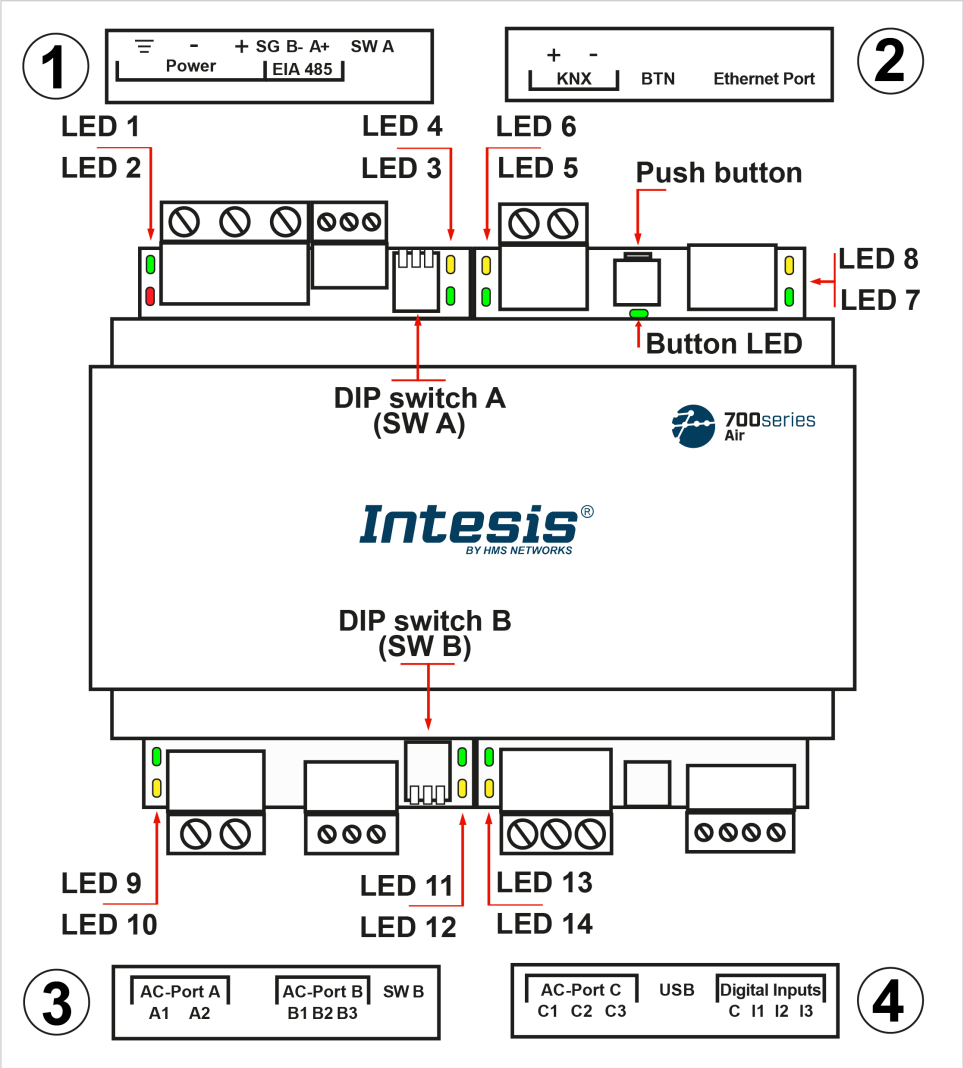
The **Digital Inputs** connector is a green pluggable terminal block (four poles) placed at the bottom right side of the gateway.

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 6. Disposition of hardware elements in the gateway



Plastic covers numbered in the image as ①, ②, ③, and ④ can be easily disassembled.

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** 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 19)). These covers are assembled by pressure, so you just need to pull to remove them.

7.5. DIP Switches

The gateway has two DIP switches (see the figure Disposition of hardware elements in the gateway (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 (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

NOTE
Default positions are:

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

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

7.6. Push Button

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

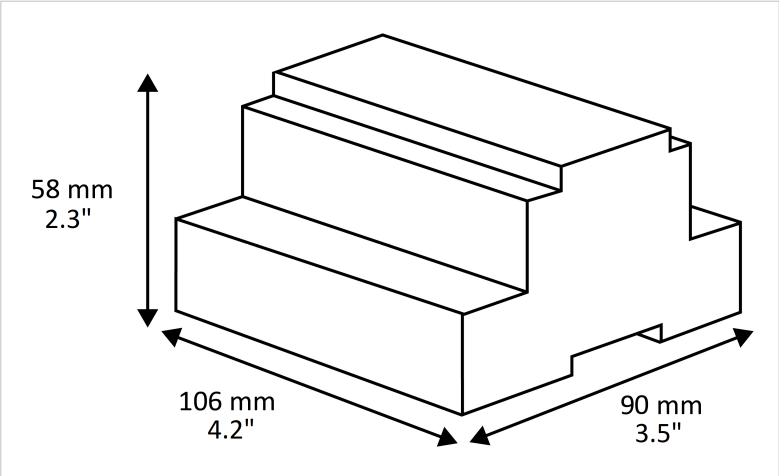
7.7. Technical Specifications

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"	
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 to 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) 1500 VDC isolation from other ports	
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 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 (default) Position 2 and 3: On: Polarization active (default) 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 .. 140°F	
Operational humidity	5 to 95%. No condensation	
Protection	IP20 (IEC60529)	

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.



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.

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	W/R
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

Register name	Possible values	Modbus address formula	W/R
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 (°C) (all the groups)	Celsius: 5 .. 90°C Fahrenheit: 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	R, W
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	R, W
Operation Mode LOSSNAY	0: LC_Auto 1: Heat Recovery 2: Bypass	(((CC# - 1) × 50) + Group#) × 100 + 1	R, W
Operation Mode ATW & HWHP	0: Hot_Water 1: Heating 2: Heating_Eco 3: Anti_Freeze 4: Cooling	(((CC# - 1) × 50) + Group#) × 100 + 1	R, W
Fan Speed IC	0: Auto 1: Low 2: Middle 2 3: Middle 1 4: High	(((CC# - 1) × 50) + Group#) × 100 + 2	R, W
Fan Speed LOSSNAY	1: Low 2: Middle 2 3: Middle 1 4: High	(((CC# - 1) × 50) + Group#) × 100 + 2	R, W

Register name	Possible values	Modbus address formula	R/W
Vane position	0: Auto 1: Horizontal 2: Position 2 3: Position 3 4: Position 4 5: Vertical 6: Swing	(((CC# - 1) × 50) + Group#) × 100 + 3	R, W
Temperature Setpoint (°C)	Cool or dry: 19 .. 30°C / 66 .. 86°F Heat or Auto: 17 .. 28°C / 63 .. 82°F	(((CC# - 1) × 50) + Group#) × 100 + 4	R, W
Temperature Setpoint (°C)	Celsius: 5 .. 90°C Fahrenheit: 41 .. 194°F	(((CC# - 1) × 50) + Group#) × 100 + 4	R, W
Ambient Temperature (°C/x10°C)	0.0 .. 99.9	(((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	R, W
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
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 allow	(((CC# - 1) × 50) + Group#) × 100 + 13	R, W
Allow operation mode control from the local panel	0: Allow 1: Not allow	(((CC# - 1) × 50) + Group#) × 100 + 14	R, W
Allow set point control from the local panel	0: Allow 1: Not allow	(((CC# - 1) × 50) + Group#) × 100 + 15	R, W
Allow filter reset control from the local panel	0: Allow 1: Not allow	(((CC# - 1) × 50) + Group#) × 100 + 16	R, W
Allow air direction control from the local panel	0: Allow 1: Not allow	(((CC# - 1) × 50) + Group#) × 100 + 17	R, W
Allow fan speed control from the local panel	0: Allow 1: Not allow	(((CC# - 1) × 50) + Group#) × 100 + 18	R, W
Allow timer control from the local panel	0: Allow 1: Not allow	(((CC# - 1) × 50) + Group#) × 100 + 19	R, W
Setback control	0: Disable 1: Enable	(((CC# - 1) × 50) + Group#) × 100 + 20	R, W
Minimum cool setpoint restriction	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	(((CC# - 1) × 50) + Group#) × 100 + 21	R, W
Maximum cool setpoint restriction	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	(((CC# - 1) × 50) + Group#) × 100 + 22	R, W
Minimum heat setpoint restriction	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	(((CC# - 1) × 50) + Group#) × 100 + 23	R, W
Maximum heat setpoint restriction	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	(((CC# - 1) × 50) + Group#) × 100 + 24	R, W

Register name	Possible values	Modbus address formula	R/W
Minimum auto setpoint restriction	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	(((CC# - 1) × 50) + Group#) × 100 + 25	R, W
Maximum auto setpoint restriction	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	(((CC# - 1) × 50) + Group#) × 100 + 26	R, W
Cool/dry/auto(upper) dual temperature setpoint (x10°C)	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	(((CC# - 1) × 50) + Group#) × 100 + 27	R, W
Heating ATW & HWHP temperature setpoint (x10°C)	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	(((CC# - 1) × 50) + Group#) × 100 + 27	R, W
Heat/auto(lower) dual temperature setpoint (x10°C)	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	(((CC# - 1) × 50) + Group#) × 100 + 28	R, W
Heating ECO ATW temperature setpoint (x10°C)	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	(((CC# - 1) × 50) + Group#) × 100 + 28	R, W
Auto single temperature setpoint (x10°C)	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	(((CC# - 1) × 50) + Group#) × 100 + 29	R, W
Hot water ATW & HWHP temperature setpoint (x10°C)	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	(((CC# - 1) × 50) + Group#) × 100 + 29	R, W
Setback upper temperature setpoint (x10°C)	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	(((CC# - 1) × 50) + Group#) × 100 + 30	R, W
Anti-Freeze ATW temperature setpoint (x10°C)	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	(((CC# - 1) × 50) + Group#) × 100 + 30	R, W
Setback lower temperature setpoint (x10°C)	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	(((CC# - 1) × 50) + Group#) × 100 + 31	R, W
Cooling ATW temperature setpoint (x10°C)	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	(((CC# - 1) × 50) + Group#) × 100 + 31	R, W
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	(((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	Wh/KWh	(((CC# - 1) × 50) + Group#) × 100 + 40	R
Consumption Total	Wh/KWh	(((CC# - 1) × 50) + Group#) × 100 + 42	R
Consumption Yesterday Heat	Wh/KWh	(((CC# - 1) × 50) + Group#) × 100 + 44	R
Consumption Today Heat	Wh/KWh	(((CC# - 1) × 50) + Group#) × 100 + 46	R
Consumption Total Heat	Wh/KWh	(((CC# - 1) × 50) + Group#) × 100 + 48	R
Consumption Yesterday Cool	Wh/KWh	(((CC# - 1) × 50) + Group#) × 100 + 50	R
Consumption Today Cool	Wh/KWh	(((CC# - 1) × 50) + Group#) × 100 + 52	R
Consumption Total Cool	Wh/KWh	(((CC# - 1) × 50) + Group#) × 100 + 54	R

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 4. 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

Description	Object function	DPT	Flags
Fan Speed (all the LOSSNAY groups)	1: Speed 1 2: Speed 2 3: Speed 3 4: Speed 4	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: Position-2 3: Position-3 4: Position-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 (°C) (all the groups)	Celsius: 5 .. 90°C Fahrenheit: 41 .. 194°F	DPT_Value_Temp (2byte)	W

Table 5. Individual group signals

Description	Object function	DPT	Flags
Control_On/Off	0: Off 1: On	DPT_Switch (1bit)	W
Status_On/Off	0: Off 1: On	DPT_Switch (1bit)	R, T
Control_Operation mode IC	0: Auto 1: Heat 3: Cool 9: Fan 14: Dry	DPT_HVACContrMode (1byte)	W
Status_Operation mode IC	0: Auto 1: Heat 3: Cool 9: Fan 14: Dry	DPT_HVACContrMode (1byte)	R, T
Control_Operation mode IC	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool 5: Setback	DPT_Enumerated (1byte)	W
Status_Operation mode IC	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool 5: Setback	DPT_Enumerated (1byte)	R, T

Description	Object function	DPT	Flags
Control_Operation mode IC	0: Cool 1: Dry 2: Fan 3: Heat, 4: Auto 5: Setback	DPT_Enumerated (1byte)	W
Status_Operation mode IC	0: Cool 1: Dry 2: Fan 3: Heat, 4: Auto 5: Setback	DPT_Enumerated (1byte)	R, T
Control_Mode Cool/Heat IC	0: Cool 1: Heat	DPT_Heat/Cool (1bit)	W
Status_Mode Cool/Heat IC	0: Cool 1: Heat	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	0: LC_Auto 1: Heat Recovery 2: Bypass	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 1: Heating 2: Heating_Eco 3: Anti_Freeze 4: Cooling	DPT_Enumerated (1byte)	W
Status_Operation mode ATW & HWHP	0: Hot Water 1: Heating 2: Heating_Eco 3: Anti_Freeze 4: Cooling	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 2: Speed 2 3: Speed 3 4: Speed 4	DPT_Enumerated (1byte)	W
Status_Fan Speed enumerated (4stages)	1: Speed 1 2: Speed 2 3: Speed 3 4: Speed 4	DPT_Enumerated (1byte)	R, T

Description	Object function	DPT	Flags
Control_Fan Speed enumerated (3stages)	1: Speed 1 2: Speed 2 3: Speed 3	DPT_Enumerated (1byte)	W
Status_Fan Speed enumerated (3stages)	1: Speed 1, 2: Speed 2 3: Speed 3	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)	1: Speed 1 2: Speed 2	DPT_Enumerated (1byte)	R, T
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 activ 0: Speed 4 not active	DPT_Switch (1bit)	R, T
Control_Fan speed Man/Auto	0: Manual 1: Auto	DPT_Bool (1bit)	W

Description	Object function	DPT	Flags
Status_Fan speed Man/Auto	0: Manual 1: Auto	DPT_Bool (1bit)	R, T
Control_Vane position enumerated	1: Horizontal 2: Position-2 3: Position-3 4: Position-4 5: Vertical	DPT_Enumerated (1byte)	W
Status_Vane position enumerated	1: Horizontal 2: Position-2, 3: Position-3 4: Position-4, 5: Vertical	DPT_Enumerated (1byte)	R, T
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

Description	Object function	DPT	Flags
Control_Temperature Setpoint	Cool or dry: 19 .. 30°C / 66 .. 86°F Heat or Auto: 17 .. 28°C / 63 .. 82°F	DPT_Value_Temp (2byte)	W
Status_Temperature Setpoint	Cool or dry: 19 .. 30°C / 66 .. 86°F Heat or Auto: 17 .. 28°C / 63 .. 82°F	DPT_Value_Temp (2byte)	R, T
Control_Temperature Setpoint	Celsius: 5 .. 90°C Fahrenheit: 41 .. 194°F	DPT_Value_Temp (2byte)	W
Status_Temperature Setpoint	Celsius: 5 .. 90°C Fahrenheit: 41 .. 194°F	DPT_Value_Temp (2byte)	R, T
Status_AC Ambient Temperature	Celsius: 0.0 .. 99.9°C Fahrenheit: 32 .. 212°F	DPT_Value_Temp (2byte)	R, T
Control_KNX ambient Temperature	Celsius: 0.0 .. 99.9°C Fahrenheit: 32 .. 212°F	DPT_Value_Temp (2byte)	W
Control_Operational Status for Lossnay or OA	0: Off 1: Low 2: High	DPT_Enumerated (1byte)	W
Status_Operational Status for Lossnay or OA	0: Off 1: Low 2: High	DPT_Enumerated (1byte)	R, T
Control_On/Off control disablement	0: Enabled 1: Disabled	DPT_Enable (1bit)	W
Status_On/Off control disablement	0: Enabled 1: Disabled	DPT_Enable (1bit)	R, T
Control_operating mode control disablement	0: Enabled 1: Disabled	DPT_Enable (1bit)	W
Status_operating mode control disablement	0: Enabled 1: Disabled	DPT_Enable (1bit)	R, T
Control_set point control disablement	0: Enabled 1: Disabled	DPT_Enable (1bit)	W
Status_set point control disablement	0: Enabled 1: Disabled	DPT_Enable (1bit)	R, T
Control_filter reset control disablement	0: Enabled 1: Disabled	DPT_Enable (1bit)	W
Status_filter reset control disablement	0: Enabled 1: Disabled	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 1: KIC 2: AIC 3: LC 4: FU 5: BU 6: WH 7: CEh	DPT_String_ASCII (14 bytes)	R, T

Description	Object function	DPT	Flags
Control_Setback	1: Enable 0: Disable	DPT_Enable (1bit)	W
Status_Setback	1: Enable 0: Disable	DPT_Enable (1bit)	R, T
Control_Cool/dry/auto(upper) dual temperature setpoint (°C)	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	W
Status_Cool/dry/auto(upper) dual temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	R, T
Control_Heating ATW temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	W
Status_Heating ATW temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	R, T
Control_Heat/auto(lower) dual temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	W
Status_Heat/auto(lower) dual temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	R, T
Control_Heating ECO ATW temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	W
Status_Heating ECO ATW temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	R, T
Control_Auto single temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	W
Status_Auto single temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	R, T
Control_Hot water ATW temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	W
Status_Hot water ATW temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	R, T
Control_Setback upper temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	W
Status_Setback upper temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	R, T
Control_Anti-Freeze ATW temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	W
Status_Anti-Freeze ATW temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	R, T
Control_Setback lower temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	W
Status_Setback lower temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	R, T
Control_Cooling ATW temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	W
Status_Cooling ATW temperature setpoint	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	DPT_Value_Temp (2byte)	R, T
Status_Outdoor temperature	Celsius: 0.0 .. 99.9°C Fahrenheit: 32 .. 212°F	DPT_Value_Temp (2byte)	R, T
Status_Filter	0: Ok 1: Dirty	DPT_Alarm (1bit)	R, T

Description	Object function	DPT	Flags
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	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 ID changes from 13.010 to 13.013.

Table 6. Individual error code signals for indoor and outdoor units

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	Number of the error code (XXXX)	DPT_7.N (2byte)	R, T

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:

- Binary input

Output object types:

- Binary output
- Multistate output
- Analog output

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

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 7. 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

Object name	Possible values	Object type	Object instance
Vane Position (all IC groups)	1: Auto 2: Horizontal 3: Pos2 4: Pos3 5: Pos4 6: Vertical 7: Swing	14-Multistate Output	(CC# - 1) × 8000) + 4
Setpoint (all the groups)	Celsius: 5 .. 90°C Fahrenheit: 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 8. Individual groups 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	0: Off 1: On	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

Object name	Possible values	Object type	Object instance
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
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 2: Low 3: Mid1 4: High **4 fan speeds:** 1: Auto 2: Low 3: Mid2 4: Mid1 5: High	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 2: Horizontal 3: Pos2 4: Pos3 5: Pos4 6: Vertical 7: Swing	13-Multistate Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 5
CXGX_Vanes_C	1: Auto 2: Horizontal 3: Pos2 4: Pos3 5: Pos4 6: Vertical 7: Swing	14-Multistate Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 5
CXGX_Setpoint_S	Cool or dry: 19 .. 30°C / 66 .. 86°F Heat or Auto: 17 .. 28°C / 62 .. 82°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 0
CXGX_Setpoint_S	Celsius: 5 .. 90°C Fahrenheit: 41 .. 194°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 1

Object name	Possible values	Object type	Object instance
CXGX_Setpoint_C	Cool or dry: 19 .. 30°C / 66 .. 86°F Heat or Auto: 17 .. 28°C / 62 .. 82°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 0
CXGX_Setpoint_C	Celsius: 5 .. 90°C Fahrenheit: 41 .. 194°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 1
CXGX_AmbientTemp_S	Celsius: 0.0 .. 99.9°C Fahrenheit: 32 .. 212°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	1: Off 2: Low 3: High	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
CXGX_Model_S	1: IC 7: WH 13: RC 19: SR 2: KIC 8: CEh 14: URC 20: ST 3: AIC 9: DC 15: GW 21: SC 4: LC 10: AHC 16: TR 22: ?? 5: FU 11: RC 17: AN 23: NONE 6: BU 12: ME 18: GR	13-Multistate Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 7
CXGX_Allow_ONOFF_Panel_S	0: Allow 1: Not allow	3-Binary Input	(CC# - 1) × 8000) + G[1..50] × 100) + 2
CXGX_Allow_ONOFF_Panel_C	0: Allow 1: Not allow	4-Binary Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 2
CXGX_Allow_MODE_Panel_S	0: Allow 1: Not allow	3-Binary Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 3
CXGX_Allow_MODE_Panel_C	0: Allow 1: Not allow	4-Binary Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 3
CXGX_Allow_SETPOINT_Panel_S	0: Allow 1: Not allow	3-Binary Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 4
CXGX_Allow_SETPOINT_Panel_c	0: Allow 1: Not allow	4-Binary Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 4
CXGX_Allow_FILTERRESET_Panel_S	0: Allow 1: Not allow	3-Binary Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 5
CXGX_Allow_FILTERRESET_Panel_C	0: Allow 1: Not allow	4-Binary Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 5
CXGX_Allow_FANSPEED_Panel_S	0: Allow 1: Not allow	3-Binary Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 6
CXGX_Allow_FANSPEED_Panel_C	0: Allow 1: Not allow	4-Binary Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 6

Object name	Possible values	Object type	Object instance
CXGX_Allow_VANES_Panel_S	0: Allow 1: Not allow	3-Binary Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 7
CXGX_Allow_VANES_Panel_C	0: Allow 1: Not allow	4-Binary Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 7
CXGX_Allow_TIMER_Panel_S	0: Allow 1: Not allow	3-Binary Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 8
CXGX_Allow_TIMER_Panel_C	0: Allow 1: Not allow	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	0: Disable 1: Enable	4-Binary Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 9
CXGX_Min_Cool_Setpoint_S	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 6
CXGX_Min_Cool_Setpoint_C	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 2
CXGX_Max_Cool_Setpoint_S	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 7
CXGX_Max_Cool_Setpoint_C	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 3
CXGX_Min_Heat_Setpoint_S	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 8
CXGX_Min_Heat_Setpoint_C	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 4
CXGX_Max_Heat_Setpoint_S	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 9
CXGX_Max_Heat_Setpoint_C	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 5
CXGX_Min_Auto_Setpoint_S	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 10
CXGX_Min_Auto_Setpoint_C	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 6
CXGX_Max_Auto_Setpoint_S	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 11
CXGX_Max_Auto_Setpoint_C	Celsius: 4.5 .. 35°C Fahrenheit: 40 .. 95°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 7
CXGX_CoolDryAuto_Upper_DualSetpoint_S	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 12
CXGX_CoolDryAuto_Upper_DualSetpoint_C	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 8
CXGX_Heating_ATW_HWHP_Setpoint_S	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 13
CXGX_Heating_ATW_HWHP_Setpoint_C	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 9
CXGX_AutoHeat_Lower_DualSetpoint_S	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 14
CXGX_AutoHeat_Lower_DualSetpoint_C	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 10

Object name	Possible values	Object type	Object instance
CXGX_HeatingECO_Setpoint_S	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 15
CXGX_HeatingECO_Setpoint_C	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 11
CXGX_AutoSingle_Setpoint_S	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 16
CXGX_AutoSingle_Setpoint_C	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 12
CXGX_HotWater_Setpoint_S	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 17
CXGX_HotWater_Setpoint_C	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 13
CXGX_Setback_Upper_Setpoint_S	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 18
CXGX_Setback_Upper_Setpoint_C	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 14
CXGX_Setback_Lower_Setpoint_S	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 19
CXGX_Setback_Lower_Setpoint_C	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 15
CXGX_Antifreeze_Setpoint_S	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 20
CXGX_Antifreeze_Setpoint_C	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 16
CXGX_Cooling_Setpoint_S	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 21
CXGX_Cooling_Setpoint_C	Celsius: 4.5 .. 90°C Fahrenheit: 40 .. 194°F	1-Analog Output	(CC# - 1) × 8000) + (G[1..50] × 100) + 17
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	Celsius: 0 .. 99.9°C Fahrenheit: 32 .. 212°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	Wh/KWh	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 25
CXGX_Consumption Total_S	Wh/KWh	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 26
CXGX_Consumption Yesterday_S_Heat	Wh/KWh	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 27

Object name	Possible values	Object type	Object instance
CXGX_Consumption Today_S_Heat	Wh/KWh	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 28
CXGX_Consumption Total_S_Heat	Wh/KWh	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 29
CXGX_Consumption Yesterday_S_Cool	Wh/KWh	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 30
CXGX_Consumption Today_S_Cool	Wh/KWh	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 31
CXGX_Consumption Total_S_Cool	Wh/KWh	0-Analog Input	(CC# - 1) × 8000) + (G[1..50] × 100) + 32

Table 9. Individual units error code signals

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

8.4. Integration into Home Automation Systems

8.4.1. 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 WMP protocol specifications manual.

Table 10. Indoor units signals

Name	Possible values	acNum[1]	Commands supported
On/Off	ON OFF	See the note below	SET/CHN/GET
Operation Mode	HEAT COOL FAN DRY AUTO		SET/CHN/GET
Fan Speed	1 2 3 4 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)	°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. 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
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.