ENGLISH

700series Air Gateway - IN776MHI***O000

MITSUBISHI HEAVY INDUSTRIES VRF SYSTEMS to Modbus, KNX, BACnet, and Home Automation

USER MANUAL
Version 1.2.14
Publication date 2025-02-14

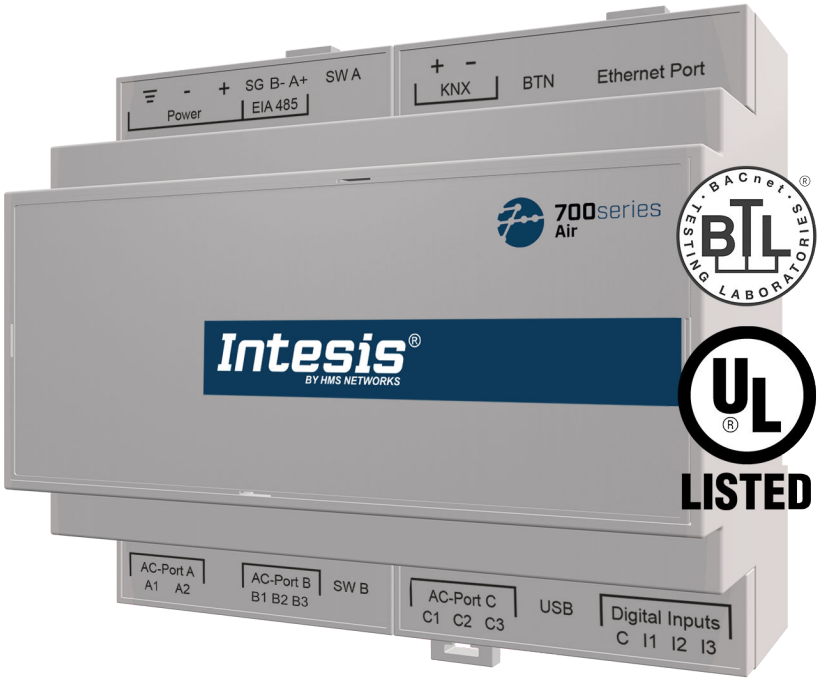

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Table of Contents

1. Description, Compatible AC systems, and Order Codes

IN776MHI∗∗∗O000 Gateway.

Modbus®, KNX®, BACnet®, and Home Automation gateway for Mitsubishi Heavy Industries® HVAC systems.

This gateway is compatible with VRF units commercialized by Mitsubishi Heavy Industries.

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
IN776MHI∗∗∗O000 [1]	INMBSMHI048O000 INMBSMHI128O000 INKNXMHI048O000 INKNXMHI128O000
[1] ∗∗∗ stands for XXS, 00S, 00M, or 00L, 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 IN776MHI∗∗∗O000 gateway:

Order Code	License	Maximum AC units	
		Indoor units	Outdoor units
IN776MHIXXSO000	XXS	4	4
IN776MHI00SO000	Small	16	12
IN776MHI00MO000	Medium	64	12
IN776MHI00LO000	Large	See note	See note

NOTE
For IN776MHI00LO000, the maximum number of indoor units you can integrate depends on the number of integrated outdoor units. You can integrate up to 128 indoor units if you don't integrate any outdoor units. If you need to integrate outdoor units (up to 12), then the maximum number of indoor units you can integrate is 80. See the table below.

Max. indoor units	Max. outdoor units
128	0
80	12

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 IN776MHI***O000 gateway supports four combinations.

Gateway's client interface	↔	Gateway's server interface
Mitsubishi Heavy Industries VRF 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 Heavy Industries units into Modbus systems

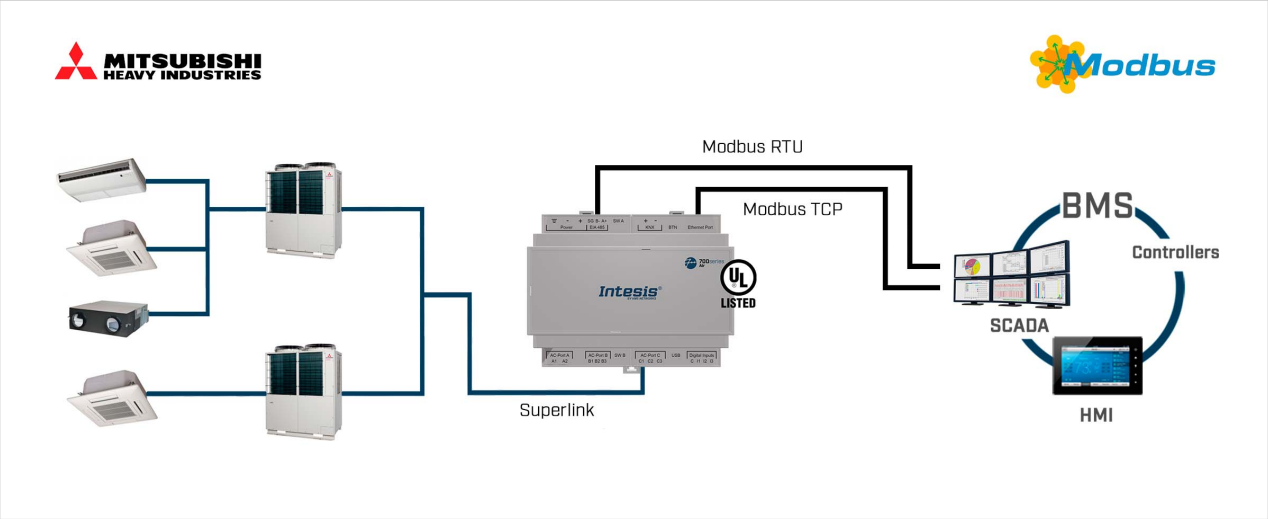


Figure 2. Integration of Mitsubishi Heavy Industries units into KNX TP systems

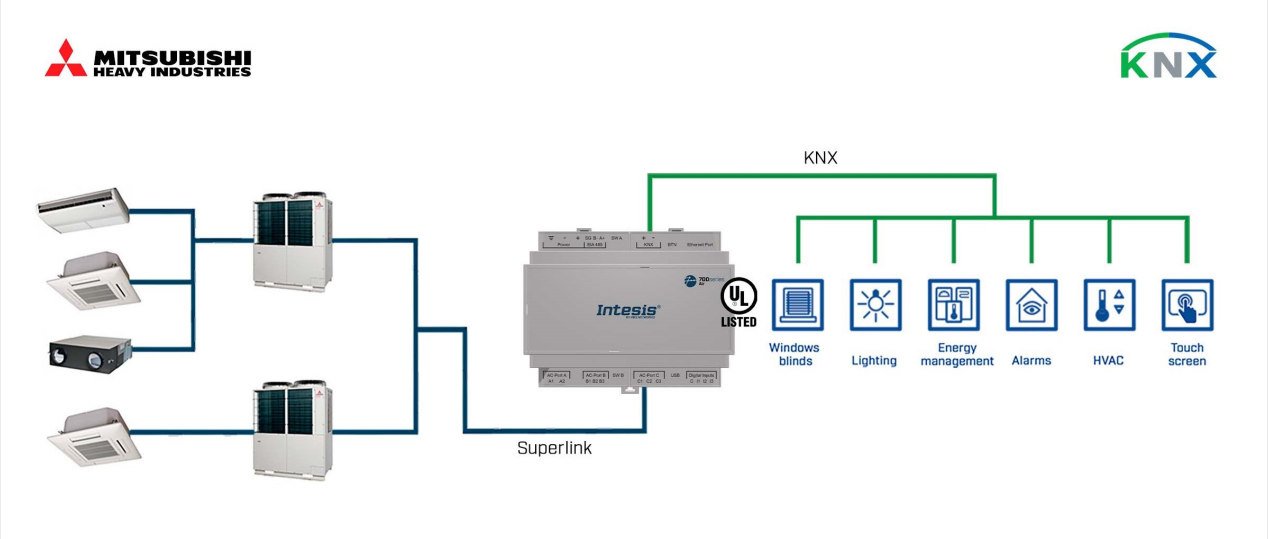


Figure 3. Integration of Mitsubishi Heavy Industries units into BACnet systems

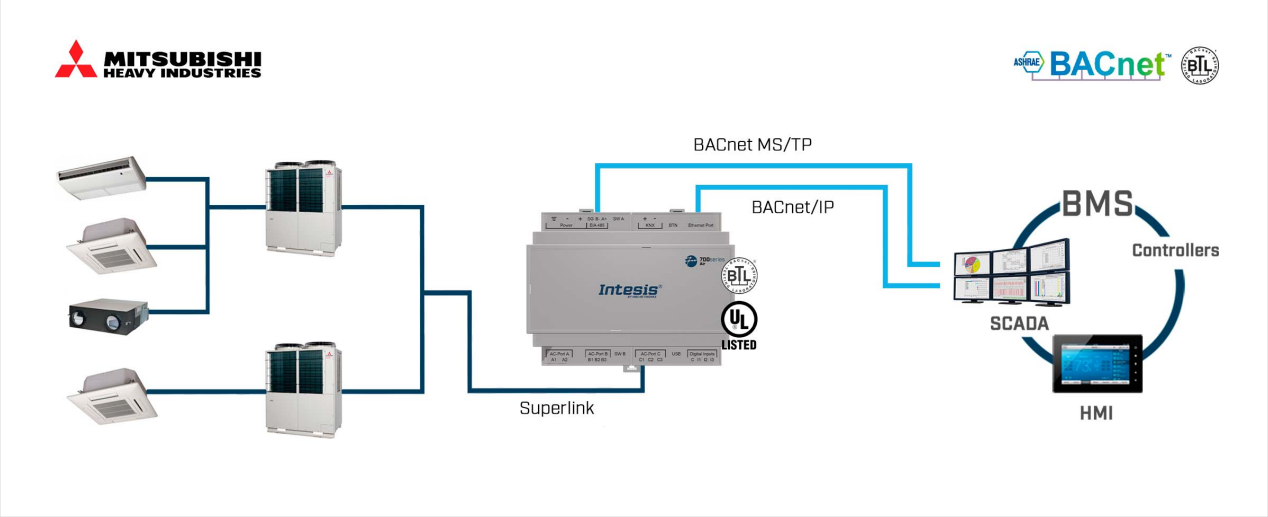
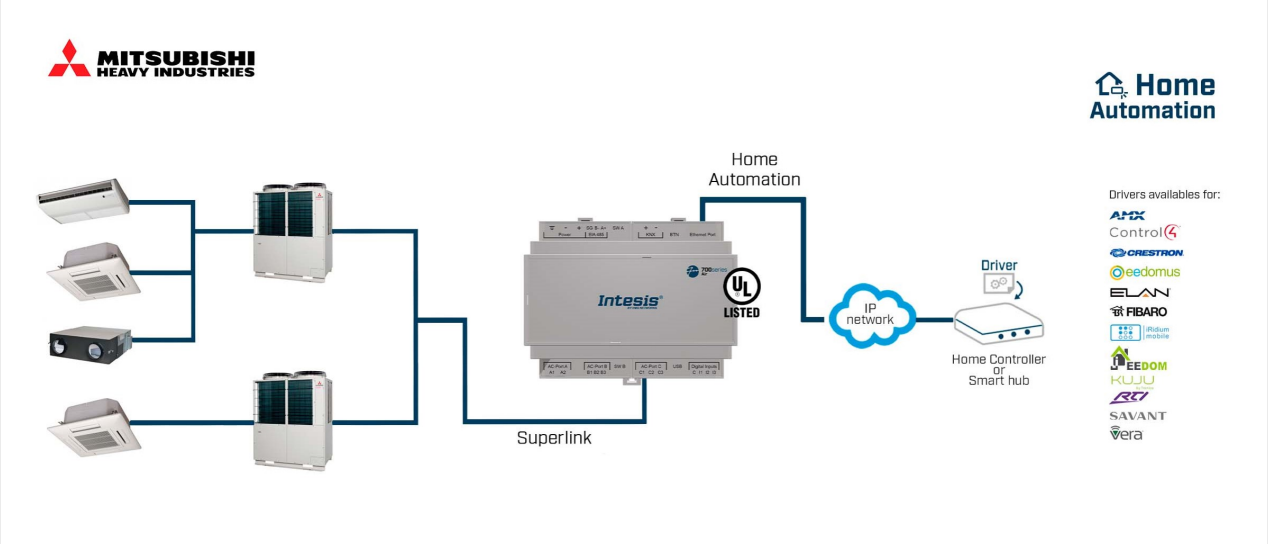


Figure 4. Integration of Mitsubishi Heavy Industries units into Home Automation systems



4.1. Inside the Package

ITEMS INCLUDED

- Intesis IN776MHI***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.
- Four 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 IN776MHI∗∗∗O000 gateway, you can easily integrate Mitsubishi Heavy Industries 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 9).
3. Disconnect all systems from power before wiring the gateway.
4. Connect the BMS communication wires to the gateway. See Gateway Connectors (page 11).
   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 Heavy Industries system to the port marked as **AC-Port C** on 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 13).
7. Connect the gateway to your laptop to configure it with Intesis MAPS. See Connection to a PC for Configuration (page 17).
   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 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 Heavy Industries.
10. Go to the **Diagnostic** tab and check the communication activity between the gateway, the BMS, and the Mitsubishi Heavy Industries 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. Hardware

6.1. Mounting

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

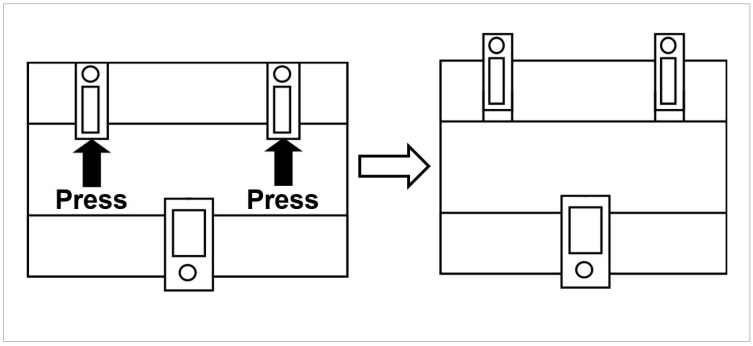
NOTE
Mount the gateway on a wall or over a DIN rail. We recommend the DIN rail mounting option, preferably inside a grounded metallic industrial cabinet.

IMPORTANT
Ensure the gateway has sufficient clearances for all connections when mounted. See Dimensions (page 22).

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.

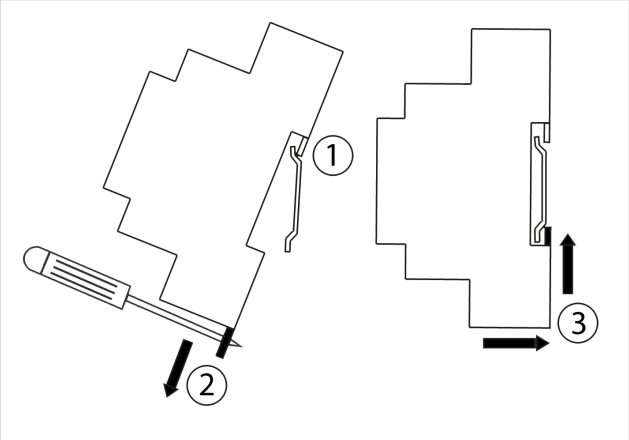
3. Make sure the gateway is firmly fixed.

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.



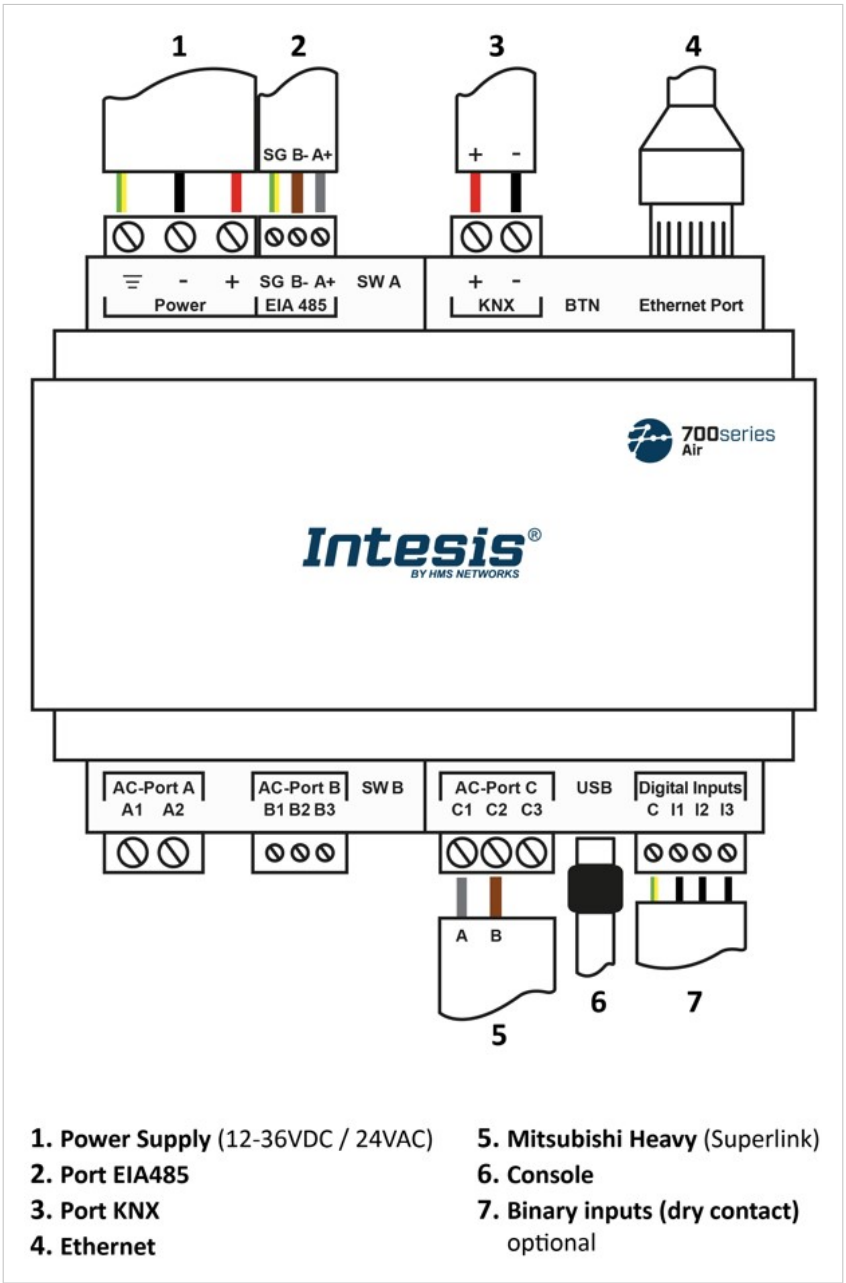
6.2. Connection

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

IMPORTANT
Keep communication cables away from power and ground wires.

6.2.1. Gateway Connectors

Figure 5. Wiring diagram



1. **Power Supply** (12-36VDC / 24VAC)
2. **Port EIA485**
3. **Port KNX**
4. **Ethernet**
5. **Mitsubishi Heavy** (Superlink)
6. **Console**
7. **Binary inputs (dry contact)** optional

WIRING THE CONNECTORS

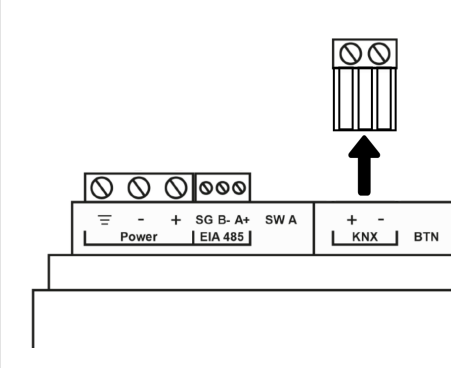
IMPORTANT
For all connectors, use solid or stranded wires (twisted or with ferrule).

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 21).

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	**As an IP/TCP port**: BACnet/IP, Modbus TCP, and Home Automation **As a console port**: Connection to a PC 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 No polarity to observe	Mitsubishi Heavy Industries Superlink	**C1**: Superlink	**C2**: Superlink	C3: *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**: Input 3

6.2.2. 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.

6.2.3. Connection to the AC Unit

Connect the Mitsubishi Heavy Industries air conditioning network bus (Superlink) to the gateway using the **C1** and **C2** poles of the **AC-Port C**.

NOTE
There is no polarity to observe.

IMPORTANT
This Intesis gateway supports VRF units with the Superlink-II version.[1]

WIRING CONSIDERATIONS

- Maximum wiring length: 1000 meters (0.75 miles).
- Loop wiring is not allowed.

NOTE

For the Mitsubishi Heavy Industries domestic series with an SC-BIKN-E connector, you need an SC-ADNA-E adapter (not included).

NOTE

See the Wiring diagram (page 11).

6.2.4. 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.

IMPORTANT

Observe polarity.

[1]Superlink-II is also called New Superlink.

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 20).

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 11).

6.2.5. Connection to KNX

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

IMPORTANT
Observe polarity.

NOTE
See the Wiring diagram (page 11).

6.2.6. 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.

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 20).

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 11).

6.2.7. 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 11).

6.2.8. Connection to a PC for Configuration

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

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

NOTE
See the Wiring diagram (page 11).

6.2.9. Connection to Energy Meters (Digital Inputs)

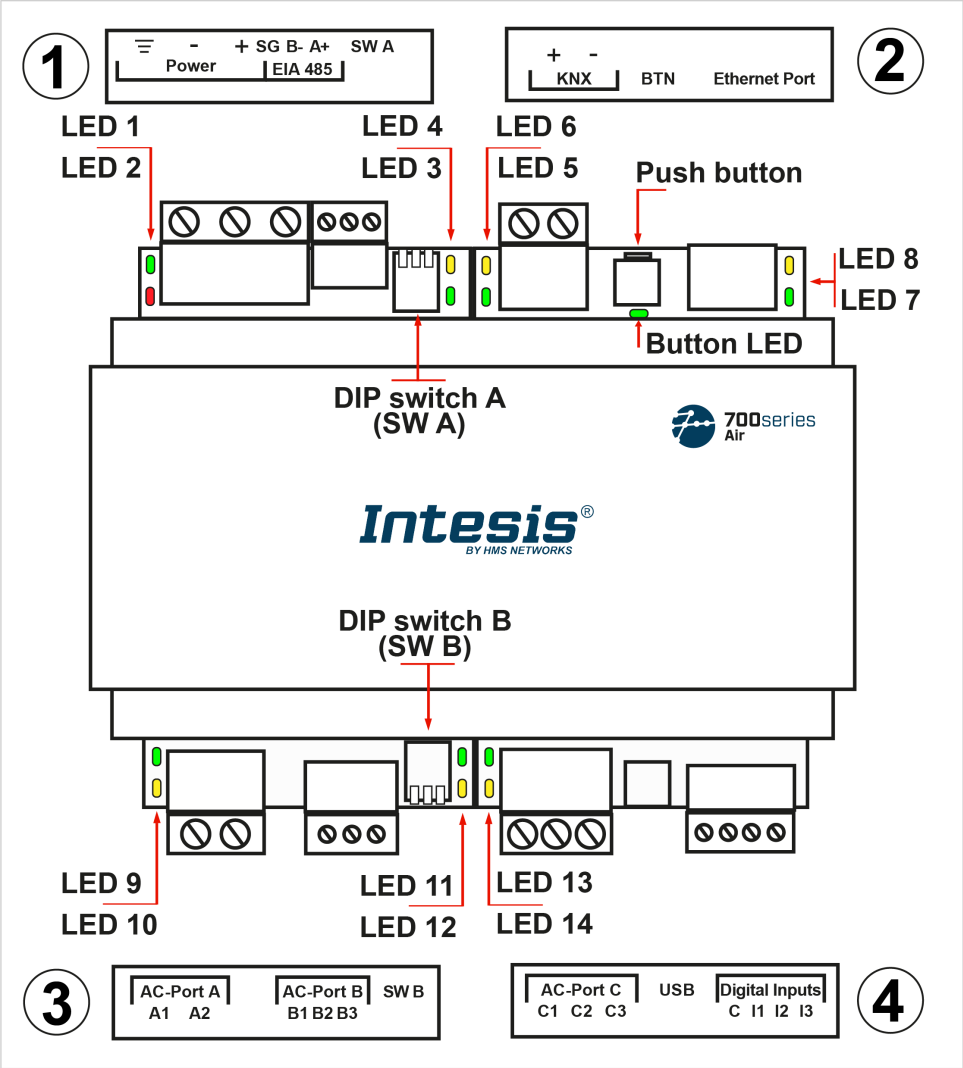
The **Digital Inputs** connector is a green pluggable terminal block (four poles) placed at the bottom right side of the gateway.

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 11).

6.3. 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.

6.4. 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): It shows Superlink activity
	LED 14	Yellow	AC-Port C Rx (UFO-SLQ): It show Superlink activity

NOTE
LEDs are hidden behind the four frontal labeled covers (see the figure Disposition of hardware elements in the gateway (page 18)). These covers are assembled by pressure, so you just need to pull to remove them.

6.5. DIP Switches

The gateway has two DIP switches (see the figure Disposition of hardware elements in the gateway (page 18)):

- 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, OFF, OFF** (120 Ω termination and polarization inactive)
- 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.

6.6. 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 18)).

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.

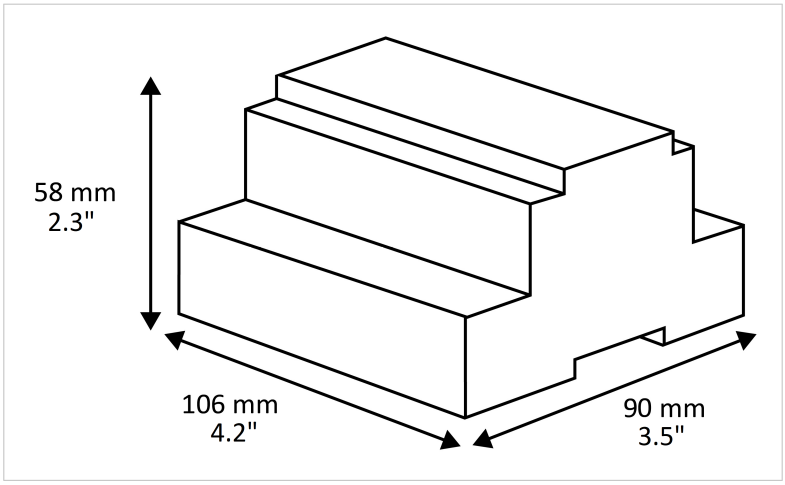
6.7. Technical Specifications

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	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): AC bus connection (Superlink)	
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	
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 to 95%. No condensation	
Protection	IP20 (IEC60529)	

6.8. 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.



7. Available Protocol Combinations

7.1. Integration into Modbus Systems

7.1.1. 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
- **RW**: Read and write register
- **W**: Write-only register
- **T**: Trigger-only register

Table 2. Global registers

Register name	Possible values	Modbus address	R/W
Gateway Communication Status	0: No Error 1: Failure	2995	R
On/Off (all the units)	0: Off 1: On	2996	R, W
Operation Mode (all the units)	0: Cool 1: Heat 2: Fan 3: Auto 4: Dry	2997	R, W
Setpoint (all the units) (x10)	Celsius: 16 .. 30°C Fahrenheit: 60 .. 86°F	2998	R, W
Fan Speed (all the units)	0: Low 1: Medium 2: High 3: Powerful	2999	R, W
Remote Lock (all the units)	1: Lock 0-Unlock	3000	R, W

Table 3. Outdoor unit registers

Register name	Possible values	Modbus address	R/W
OU Compressor 1 Frequency	0 .. 255 Hz	(OU address[0..127] × 20) + 4000 + 1	R
OU Compressor 2 Frequency	0 .. 255 Hz	(OU address[0..127] × 20) + 4000 + 2	R
OU Heat Exchange low 1 temperature (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 3	R
OU Heat Exchange low 2 temperature (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 4	R
OU Heat Exchange low 3 temperature (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 5	R
OU Heat Exchange low 4 temperature (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 6	R
OU Heat exchange high 1 temperature (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 7	R
OU Heat exchange high 2 temperature (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 8	R
OU Heat exchange high 3 temperature (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 9	R
OU Heat exchange high 4 temperature (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 10	R
OU Unit temperature (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 11	R
OU Discharge pipe temperature 1 (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 12	R
OU Discharge pipe temperature 2 (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 13	R
OU Crankcase 1 temperature (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 14	R
OU Crankcase 2 temperature (x10)	°C / °F	(OU address[0..127] × 20) + 4000 + 15	R
OU Compressor current 1 (x10)	Amperes	(OU address[0..127] × 20) + 4000 + 16	R
OU Compressor current 2 (x10)	Amperes	(OU address[0..127] × 20) + 4000 + 17	R
OU High pressure (x100)	MPa	(OU address[0..127] × 20) + 4000 + 18	R
OU Low pressure (x100)	MPa	(OU address[0..127] × 20) + 4000 + 19	R

Table 4. Indoor unit registers

Register name	Possible values	Modbus address	R/W
Communication Status	0: No Error 1: Error	(IU address[0..127] × 20) + 1	R
On/Off	0: Off 1: On	(IU address[0..127] × 20) + 2	R, W
Operation Mode	0: Cool 1: Heat 2: Fan 3: Auto 4: Dry	(IU address[0..127] × 20) + 3	R, W
Temperature Setpoint (x10)	Celsius: 16 .. 30°C Fahrenheit: 60 .. 86°F	(IU address[0..127] × 20) + 4	R, W
Fan Speed	0: Low 1: Medium 2: High 3: Powerful	(IU address[0..127] × 20) + 5	R, W
Remote Lock	0: Unlock 1-Lock	(IU address[0..127] × 20) + 6	R, W

Louver / Vane Position	0: Swing 1: Position 1 2: Position 2 3: Position 3 4: Position 4	(IU address[0..127] × 20) + 7	R, W
Room Temperature (x10)	Celsius: 0 .. 30°C Fahrenheit: 32 .. 86°F	(IU address[0..127] × 20) + 8	R
Filter Sign Status	0: Off 1: On	(IU address[0..127] × 20) + 9	R
Unit Error code	0: No Error X (1.. 255): Error	(IU address[0..127] × 20) + 10	R
Compressor Status	0: Off 1: On	(IU address[0..127] × 20) + 11	R
Filter Sign Reset	1: Reset	(IU address[0..127] × 20) + 12	W
RC Error Reset	1-Reset	(IU address[0..127] × 20) + 13	W
Thermo On/Off	0: Off 1: On	(IU address[0..127] × 20) + 14	R
Expansion valve opening pulse status	000 .. 999	(IU address[0..127] × 20) + 15	R
Decision frequency status	0 .. 255 Hz	(IU address[0..127] × 20) + 16	R
Demand frequency status	0 .. 255 Hz	(IU address[0..127] × 20) + 17	R
Heat Exchange low 1 temperature (x10)	°C / °F	(IU address[0..127] × 20) + 18	R
Heat Exchange low 2 temperature (x10)	°C / °F	(IU address[0..127] × 20) + 19	R
Heat Exchange low 3 temperature (x10)	°C / °F	(IU address[0..127] × 20) + 20	R
Consumption Yesterday (Wh)	Wh/KWh	(IU address[0..127] × 20) + 6001	R
Consumption Today (Wh)	Wh/KWh	(IU address[0..127] × 20) + 6003	R
Consumption Total (Wh)	Wh/KWh	(IU address[0..127] × 20) + 6005	R
Consumption Yesterday Heat (Wh)	Wh/KWh	(IU address[0..127] × 20) + 6007	R
Consumption Today Heat (Wh)	Wh/KWh	(IU address[0..127] × 20) + 6009	R
Consumption Total Heat (Wh)	Wh/KWh	(IU address[0..127] × 20) + 6011	R
Consumption Yesterday Cool (Wh)	Wh/KWh	(IU address[0..127] × 20) + 6013	R
Consumption Today Cool (Wh)	Wh/KWh	(IU address[0..127] × 20) + 6015	R
Consumption Total Cool (Wh)	Wh/KWh	(IU address[0..127] × 20) + 6017	R

7.2. Integration into KNX Systems

7.2.1. KNX

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

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

NOTICE
Communication object flags:

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

Table 5. Global signals

Description	Function	DPT	Flags
Status_Gateway Communication Status	0: No Error 1: Failure	1.005-DPT_Alarm (1bit)	R, T
Control_On/Off (all units)	0: Off 1: On	1.001-DPT_Switch (1bit)	W
Control_Operating Mode (all units)	0: Auto 1: Heat 3: Cool 9: Fan 14: Dry	20.105-DPT_HVACContrMode (1byte)	W
Control_Operating Mode (all units)	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool	5.x (1byte)	W
Control_Operating Mode (all units)	0: Cool 1: Heat 2: Fan 3: Dry 4: Auto	5.x (1byte)	W
Control_Fan Speed (all units)	0: Low 1: Medium 2: High 3: Powerful	5.x (1byte)	W
Control_Setpoint (all the units)	Celsius: 16 .. 30°C Fahrenheit: 60 .. 86°F	9.001/9.027-DPT_Value_Temp (2byte)	W
Control_Remote Lock/Unlock (all the units)	0: Unlock 1: Lock	1.002 DPT_Bool (1bit)	W

Table 6. Outdoor units

Description	Function	DPT	Flags
Status_OU Compressor 1 Frequency	Hz	14.033-DPT_Value_Frequency (4byte)	R, T
Status_OU Compressor 2 Frequency	Hz	14.033-DPT_Value_Frequency (4byte)	R, T
Status_OU Heat Exchange low 1 temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Heat Exchange low 2 temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Heat Exchange low 3 temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Heat Exchange low 4 temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Heat Exchange high 1 temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Heat Exchange high 2 temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Heat Exchange high 3 temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Heat Exchange high 4 temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Unit temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Discharge pipe temperature 1	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Discharge pipe temperature 2	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Crankcase temperature 1	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Crankcase temperature 2	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_OU Compressor current 1	Amperes	14.019-DPT_Value_Electric_Current (4byte)	R, T
Status_OU Compressor current 2	Amperes	14.019-DPT_Value_Electric_Current (4byte)	R, T
Status_OU High pressure	MPa	14.058-DPT_Value_Pressure (4byte)	R, T
Status_OU Low pressure	MPa	14.058-DPT_Value_Pressure (4byte)	R, T

Table 7. Indoor units

Description	Function	DPT	Flags
Status_CommError	0: No error 1: Error	1.005-DPT_Alarm (1bit)	R, T
Control_On/Off	0: Off 1: On	1.001-DPT_Switch (1bit)	Ri, W, U
Status_On/Off	0: Off 1: On	1.001-DPT_Switch (1bit)	R, T
Control_Operation mode	0: Auto 1: Heat 3: Cool 9: Fan 14: Dry	20.105-DPT_HVACContrMode (1byte)	Ri, W, U
Status_Operation mode	0: Auto 1: Heat 3: Cool 9: Fan 14: Dry	20.105-DPT_HVACContrMode (1byte)	R, T

Description	Function	DPT	Flags
Control_Operation mode	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool	5.x (1byte)	Ri, W, U
Status_Operation mode	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool	5.x (1byte)	R, T
Control_Mode Cool/Heat	0: Cool 1: Heat	1.100-DPT_Heat/Cool (1bit)	Ri, W, U
Status_Mode Cool/Heat	0: Cool 1: Heat	1.100-DPT_Heat/Cool (1bit)	R, T
Control_Auto mode	1: Set auto mode	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Auto mode	1: Auto mode active 0: Auto mode not active	1.001-DPT_Switch (1bit)	R, T
Control_Heat mode	1: Set heat mode	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Heat mode	1: Heat mode active 0: Heat mode not active	1.001-DPT_Switch (1bit)	R, T
Control_Cool mode	1: Set cool mode	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Cool mode	1: Cool mode active 0: Cool mode not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan mode	1: Set fan mode	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Fan mode	1: Fan mode active 0: Fan mode not active	1.001-DPT_Switch (1bit)	R, T
Control_Dry mode	1: Set dry mode	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Dry mode	1: Dry mode active 0: Dry mode not active	1.001-DPT_Switch (1bit)	R, T
Control_Temperature setpoint	Celsius: 16 .. 30°C Fahrenheit: 60 .. 86°F	9.001/9.027-DPT_Value_Temp (2byte)	Ri, W, U
Status_Temperature setpoint	Celsius: 16 .. 30°C Fahrenheit: 60 .. 86°F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Control_Fan speed enumerated	0: Low 1: Medium 2: High 3: Powerful	5.x (1byte)	Ri, W, U
Status_Fan speed enumerated	0: Low 1: Medium 2: High 3: Powerful	5.x (1byte)	R, T
Control_Fan speed scaling	Thresholds: 0 .. 24% 25 .. 49% 50 .. 74% 75 .. 100%	5.001-DPT_Scaling (1byte)	Ri, W, U

Description	Function	DPT	Flags
Status_Fan speed scaling	Thresholds: 25% 50% 75% 100%	5.001-DPT_Scaling (1byte)	R, T
Control_Fan speed low	1: Set fan speed low	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Fan speed low	1: Speed low active 0: Speed low not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan speed medium	1: Set fan speed medium	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Fan speed medium	1: Speed medium active 0: Speed medium not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan speed high	1: Set fan speed high	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Fan speed high	1: Speed high active 0: Speed high not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan speed powerful	1: Set fan speed powerful	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Fan speed powerful	1: Speed powerful active 0: Speed powerful not active	1.001-DPT_Switch (1bit)	R, T
Control_Louver / Vane Position enumerated	1 .. 4: Position1.. Position4	5.x (1byte)	Ri, W, U
Status_Louver / Vane Position enumerated	1.. 4: Position1.. Position4	5.x (1byte)	R, T
Control_Louver / Vane Position scaling	Thresholds: 0 .. 24% 25 .. 49% 50 .. 74% 75 .. 100%	5.001-DPT_Scaling (1byte)	Ri, W, U
Status_Louver / Vane Position scaling	Thresholds: 25% 50% 75% 100%	5.001-DPT_Scaling (1byte)	R, T
Control_Vanes position-1	1: Set position-1 vanes	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vanes position-1	1: Vanes position-1 active 0: Vanes position-1 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vanes position-2	1: Set position-2 vanes	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vanes position-2	1: Vanes position-2 active 0: Vanes position-2 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vanes position-3	1: Set position-3 vanes	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vanes position-3	1: Vanes position-3 active 0: Vanes position-3 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vanes position-4	1: Set position-4 vanes	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vanes position-4	1: Vanes position-4 active 0: Vanes position-4 not active	1.001-DPT_Switch (1bit)	R, T
Control_Vanes position swing	0: Swing off 1: Swing on	1.001-DPT_Switch (1bit)	Ri, W, U
Status_Vanes position swing	0: Swing off 1: Swing on	1.001-DPT_Switch (1bit)	R, T

Description	Function	DPT	Flags
Status_AC ambient temperature	Celsius: 0 .. 30 °C Fahrenheit: 32 .. 86°F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Control_KNX ambient temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	Ri, W, U
Status_FilterSign	0: Normal 1: Alarm	1.005-DPT_Alarm (1bit)	R, T
Control_FilterReset	0: No reset 1: Reset	1.015-DPT_Reset (1bit)	Ri, W, U
Status_Unit error code	0: No Error 1 .. 255: Error	8.x (2 byte)	R, T
Status_Compressor status	0: Off 1: On	1.001-DPT_Switch (1bit)	R, T
Control_RC Error Reset	0: No reset 1: Reset	1.015-DPT_Reset (1bit)	Ri, W, U
Status_Thermo On/Off	0: Off 1: On	1.001-DPT_Switch (1bit)	R, T
Status_Expansion valve opening pulse status	000 .. 999	8.x (2 byte)	R, T
Status_Decision frequency status	0 .. 255 Hz	14.033-DPT_Value_Frequency (4byte)	R, T
Status_Demand frequency status	0 .. 255 Hz	14.033-DPT_Value_Frequency (4byte)	R, T
Status_Heat Exchange low 1 temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_Heat Exchange low 2 temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_Heat Exchange low 3 temperature	°C / °F	9.001/9.027-DPT_Value_Temp (2byte)	R, T
Status_Consumption Yesterday Heat	Wh/KWh	13.010: active energy (Wh)	R, T
Status_Consumption Today Heat	Wh/KWh	13.010: active energy (Wh)	R, T
Status_Consumption Total Heat	Wh/KWh	13.010: active energy (Wh)	R, T
Status_Consumption Yesterday Cool	Wh/KWh	13.010: active energy (Wh)	R, T
Status_Consumption Today Cool	Wh/KWh	13.010: active energy (Wh)	R, T
Status_Consumption Total Cool	Wh/KWh	13.010: active energy (Wh)	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.

7.3. Integration into BACnet Systems

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

7.3.1. BACnet Objects

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

Input object types:

- Binary input

Output object types:

- Binary output
- Multistate output
- Analog output

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

Table 8. Global signals

Object name	Possible values	Type	Object instance
Gateway Communication Status	0: No error 1: Error	3-Binary Input	15000 + 0
On/Off (all units)	0: Off 1: On	4-Binary Output	15000 + 0
Mode (all units)	1: Heat 2: Cool 3: Fan 4: Dry 5: Auto	14-Multistate Output	15000 + 0
Setpoint	°C / °F	1-Analog Output	15000 + 0
FanSpeed (all units)	1: Low 2: Medium 3: High 4: Powerful	14-Multistate Output	15000 + 1
Remote Lock	0: Unlock 1: Lock	4-Binary Output	15000 + 1

Table 9. Outdoor units

Object name	Possible values	Type	Object instance
OUXX_Compressor 1 Frequency	Hz	0-Analog Input	(OU[1..12] × 20) + 10000 + 0
OUXX_Compressor 2 Frequency	Hz	0-Analog Input	(OU[1..12] × 20) + 10000 + 1
OUXX_Heat Exchange low 1 temperature	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 2
OUXX_Heat Exchange low 2 temperature	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 3
OUXX_Heat Exchange low 3 temperature	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 4
OUXX_Heat Exchange low 4 temperature	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 5
OUXX_Heat exchange high 1 temperature	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 6
OUXX_Heat exchange high 2 temperature	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 7
OUXX_Heat exchange high 3 temperature	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 8
OUXX_Heat exchange high 4 temperature	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 9
OUXX_Unit temperature	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 10
OUXX_Discharge pipe 1 temperature	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 11
OUXX_Discharge pipe 2 temperature	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 12
OUXX_Crankcase temperature 1	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 13
OUXX_Crankcase temperature 2	°C / °F	0-Analog Input	(OU[1..12] × 20) + 10000 + 14
OUXX_Compressor current 1	Amperes	0-Analog Input	(OU[1..12] × 20) + 10000 + 15
OUXX_Compressor current 2	Amperes	0-Analog Input	(OU[1..12] × 20) + 10000 + 16

Object name	Possible values	Type	Object instance
OUXX_High pressure	MPa	0-Analog Input	(OU[1..12] × 20) + 10000 + 17
OUXX_Low pressure	MPa	0-Analog Input	(OU[1..12] × 20) + 10000 + 18

Table 10. Indoor units

Object name	Possible values	Type	Object instance
IUXX_Communication Status_S	0: No Error 1: Error	3-Binary Input	(IU[1..128] × 25) + 0
IUXX_On/Off_S	0: Off 1: On	3-Binary Input	(IU[1..128] × 25) + 1
IUXX_On/Off_C	0: Off 1: On	4-Binary Output	(IU[1..128] × 25) + 0
IUXX_Operation Mode_S	1: Heat 2: Cool 3: Fan 4: Dry 5: Auto	13-Multistate Input	(IU[1..128] × 25) + 0
IUXX_Operation Mode_C	1: Heat 2: Cool 3: Fan 4: Dry 5: Auto	14-Multistate Output	(IU[1..128] × 25) + 0
IUXX_Temperature Setpoint_S	°C / °F	0-Analog Input	(IU[1..128] × 25) + 0
IUXX_Temperature Setpoint_C	°C / °F	1-Analog Output	(IU[1..128] × 25) + 0
IUXX_FanSpeed_S	1: Low 2: Medium 3: High 4: Powerful	13-Multistate Input	(IU[1..128] × 25) + 1
IUXX_FanSpeed_C	1: Low 2: Medium 3: High 4: Powerful	14-Multistate Output	(IU[1..128] × 25) + 1
IUXX_Remote Lock_S	0: Unlock 1: Lock	3-Binary Input	(IU[1..128] × 25) + 2
IUXX_Remote Lock_C	0: Unlock 1: Lock	4-Binary Output	(IU[1..128] × 25) + 1
IUXX_Louver / Vane Position_S	1: Swing 2: Pos1 3: Pos2 4: Pos3 5: Pos4	13-Multistate Input	(IU[1..128] × 25) + 2
IUXX_Louver / Vane Position_C	1: Swing 2: Pos1 3: Pos2 4: Pos3 5: Pos4	14-Multistate Output	(IU[1..128] × 25) + 2
IUXX_Room Temperature_S	°C / °F	0-Analog Input	(IU[1..128] × 25) + 1
IUXX_Filter Sign_S	0: Off 1: On	3-Binary Input	(IU[1..128] × 25) + 3

IUXX_Unit Error code_S	0: No Error 1 .. 255: Error	0-Analog Input	(IU[1..128] × 25) + 2
IUXX_Compressor_S	0: Off 1: On	3-Binary Input	(IU[1..128] × 25) + 4
IUXX_Filter Sign Reset_C	0: No reset 1: Reset	4-Binary Output	(IU[1..128] × 25) + 2
IUXX_RC Error Reset_C	0: No reset 1: Reset	4-Binary Output	(IU[1..128] × 25) + 3
IUXX_Thermo On/Off_S	0: Off 1: On	3-Binary Input	(IU[1..128] × 25) + 5
IUXX_Expansion valve opening pulse_S	000 .. 999	0-Analog Input	(IU[1..128] × 25) + 3
IUXX_Decision frequency_S	0 .. 255 Hz	0-Analog Input	(IU[1..128] × 25) + 4
IUXX_Demand frequency_S	0 .. 255 Hz	0-Analog Input	(IU[1..128] × 25) + 5
IUXX_Heat Exchange low 1 temperature_S	°C / °F	0-Analog Input	(IU[1..128] × 25) + 6
IUXX_Heat Exchange low 2 temperature_S	°C / °F	0-Analog Input	(IU[1..128] × 25) + 7
IUXX_Heat Exchange low 3 temperature_S	°C / °F	0-Analog Input	(IU[1..128] × 25) + 8
IUXX_Consumption Yesterday_S	Wh/KWh	0-Analog Input	(IU[1..128] × 25) + 9
IUXX_Consumption Today_S	Wh/KWh	0-Analog Input	(IU[1..128] × 25) + 10
IUXX_Consumption Total_S	Wh/KWh	0-Analog Input	(IU[1..128] × 25) + 11
IUXX_Consumption Yesterday Heat_S	Wh/KWh	0-Analog Input	(IU[1..128] × 25) + 12
IUXX_Consumption Today Heat_S	Wh/KWh	0-Analog Input	(IU[1..128] × 25) + 13
IUXX_Consumption Total Heat_S	Wh/KWh	0-Analog Input	(IU[1..128] × 25) + 14
IUXX_Consumption Yesterday Cool_S	Wh/KWh	0-Analog Input	(IU[1..128] × 25) + 15
IUXX_Consumption Today Cool_S	Wh/KWh	0-Analog Input	(IU[1..128] × 25) + 16
IUXX_Consumption Today Cool_S	Wh/KWh	0-Analog Input	(IU[1..128] × 25) + 17

7.4. Integration into Home Automation Systems

7.4.1. 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 11. 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		SET/CHN/GET
Vane Position	1 2 3 4 SWING		SET/CHN/GET
Temperature Setpoint (x10)	Celsius: 16 .. 30°C Fahrenheit: 61 .. 86°F		SET/CHN/GET
AC Ambient Temperature (x10)	Celsius: 0 .. 30°C Fahrenheit: 32 .. 86°F		CHN/GET
Unit Error code	0: No Error X: Error		CHN/GET
Error IU	OK ERR		CHN/GET

NOTE

[1] This index must be set 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.

8. 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 Heavy Industries.

9. Error Codes

NOTE
These error codes are the same for all applications.

Error code	Code in the wired RC	Description
0	N/A	No active error
1	E1	Remote controller communication error
2	E2	Duplicated indoor unit address
3	E3	Outdoor unit signal line error
5	E5	Communication error during operation
6	E6	Indoor heat exchanger temperature thermistor anomaly
7	E7	Indoor return air temperature thermistor anomaly
8	E8	Heating overload operation
9	E9	Drain trouble
10	E10	Excessive number of indoor units (more than 17) by controlling one remote controller
12	E12	Address setting error by mixed setting method
14	E14	Communication error between master and slave indoor units
15	E15	I/U Supply Air sensor disconnection
16	E16	Indoor fan motor anomaly
19	E19	Indoor unit operation check, drain motor check setting error
28	E28	Remote controller temperature thermistor anomaly
30	E30	Unmatched connection of indoor and outdoor unit
31	E31	Duplicated outdoor unit address No.
32	E32	Open L3 Phase on power supply at primary side
33	E33	Inverter primary current error
35	E35	Cooling overload operation
36	E36	Discharge pipe temperature error
37	E37	Outdoor heat exchanger temperature thermistor anomaly
38	E38	Outdoor/Ambient air temperature thermistor anomaly
39	E39	Discharge pipe temperature thermistor anomaly
40	E40	High pressure error
41	E41	Power transistor overheat
42	E42	Current cut
43	E43	Excessive number of indoor units connected, excessive total capacity of connection
45	E45	Communication error between inverter PCB and outdoor control PCB
46	E46	Mixed address setting methods coexistent in same network
47	E47	Inverter overcurrent error
48	E48	Outdoor DC fan motor anomaly
49	E49	Low pressure anomaly
51	E51	Inverter anomaly

Error code	Code in the wired RC	Description
53	E53	Suction pipe temperature thermistor anomaly
54	E54	High/Low pressure sensor anomaly
55	E55	Underneath temperature thermistor anomaly
56	E56	Power transistor temperature thermistor anomaly
57	E57	Insufficient in refrigerant amount or detection of service valve closure
58	E58	Anomalous compressor by loss of synchronism
59	E59	Compressor startup failure
60	E60	Rotor position detection failure / Anomalous compressor rotor lock
61	E61	Communication error between the master unit and slave units
63	E63	Emergency stop

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 Heavy Industries technical support.