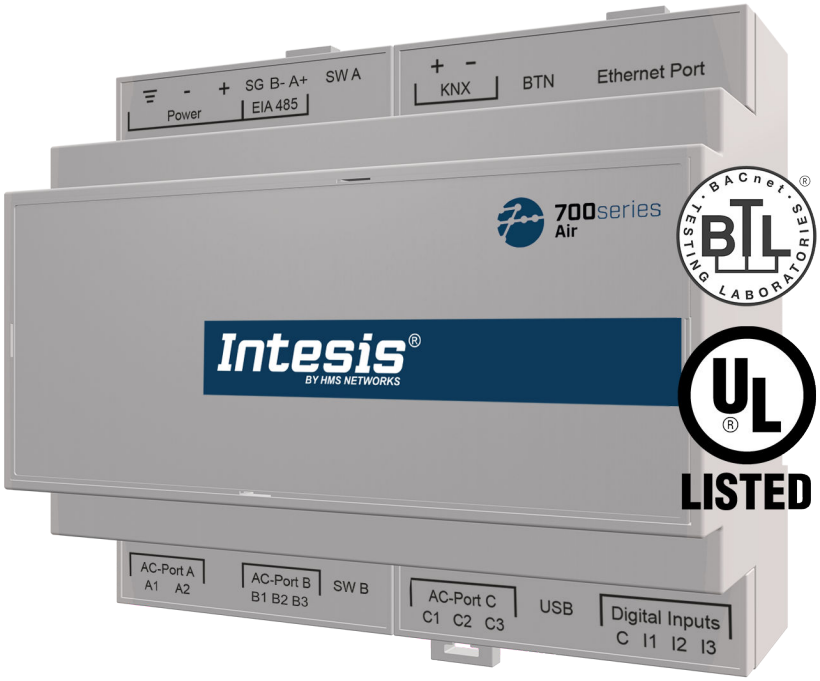
ENGLISH

700 Series Air Gateway - IN770AIR***O000

SAMSUNG NASA VRF SYSTEMS
to Modbus, KNX, BACnet, MQTT, and Home Automation

USER MANUAL
Version 1.0.19
Publication date 2025-12-09



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1. Description, Compatible AC systems, and Order Codes

IN770AIR*O000 Gateway**.

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

This gateway is compatible with NASA VRF units commercialized by Samsung.

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

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

ORDER CODE	LEGACY ORDER CODE
IN770AIR***O000 [1]	INBACSAM004O000 INBACSAM008O000 INBACSAM016O000 INBACSAM064O000 INKNXSAM004O000 INKNXSAM008O000 INKNXSAM016O000 INKNXSAM064O000 INMBSSAM004O000 INMBSSAM008O000 INMBSSAM016O000 INMBSSAM064O000
[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 AC units	
		Indoor units	Outdoor units
IN770AIRXXSO000	XXS	4	4
IN770AIR00SO000	Small	16	16
IN770AIR00MO000	Medium	64	16

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.

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

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

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

These safety instructions in other languages can be found here.

3.3. Admonition Messages and Symbols



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



IMPORTANT
Instruction that must be followed to avoid a risk of reduced functionality and/or damage to the equipment or to avoid a network security risk.



NOTE
Additional information which may facilitate installation and/or operation.



TIP
Helpful advice and suggestions.



NOTICE
Remarkable Information.

4. Overview

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

Gateway's client interface	↔	Gateway's server interface
Samsung NASA systems	to	Modbus TCP and RTU
		KNX TP
		BACnet/IP or MS/TP
		MQTT
		Home Automation

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

Figure 1. Integration of Samsung units into Modbus systems

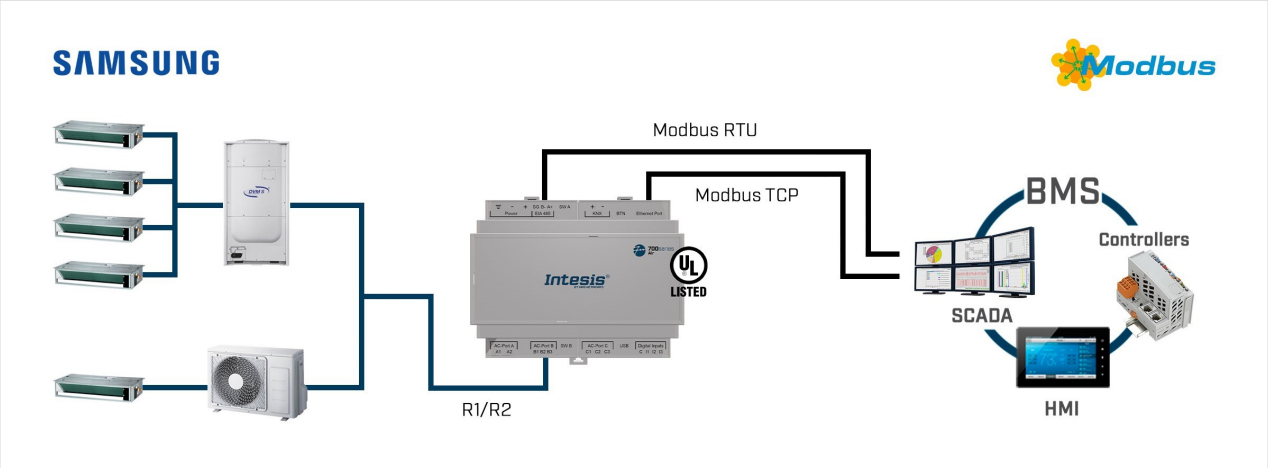


Figure 2. Integration of Samsung units into KNX TP systems

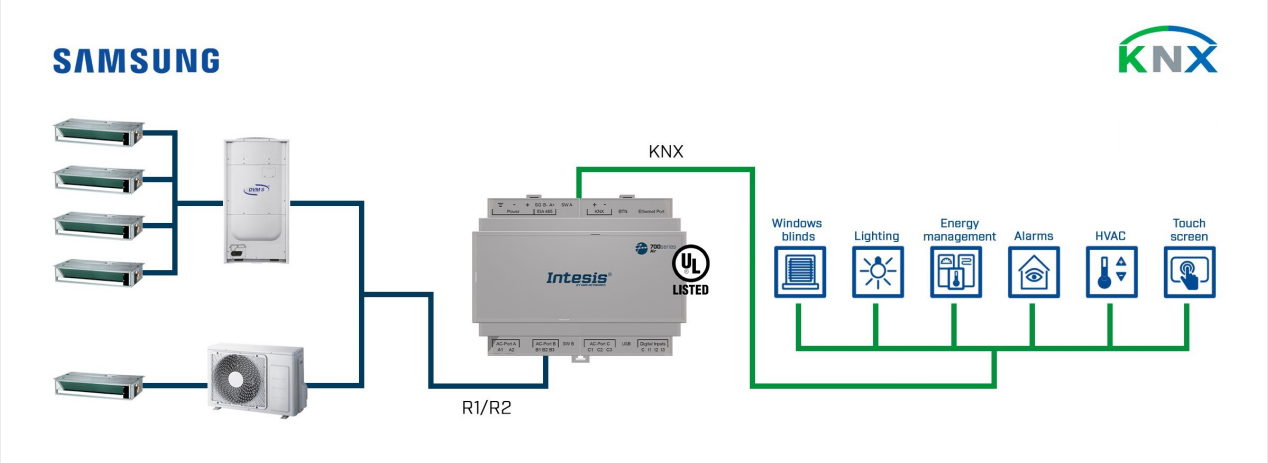


Figure 3. Integration of Samsung units into BACnet systems

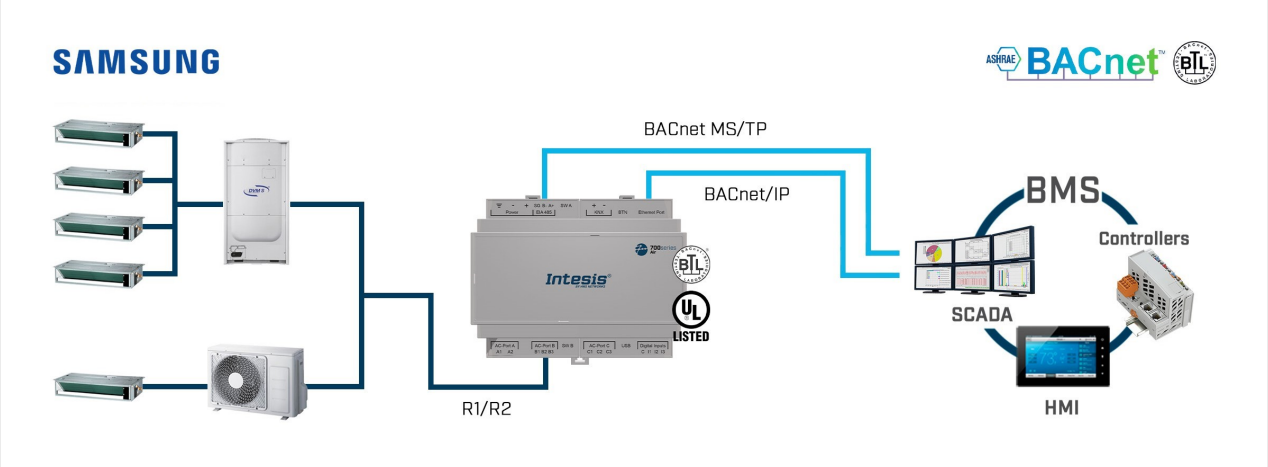


Figure 4. Integration of Samsung units into MQTT systems

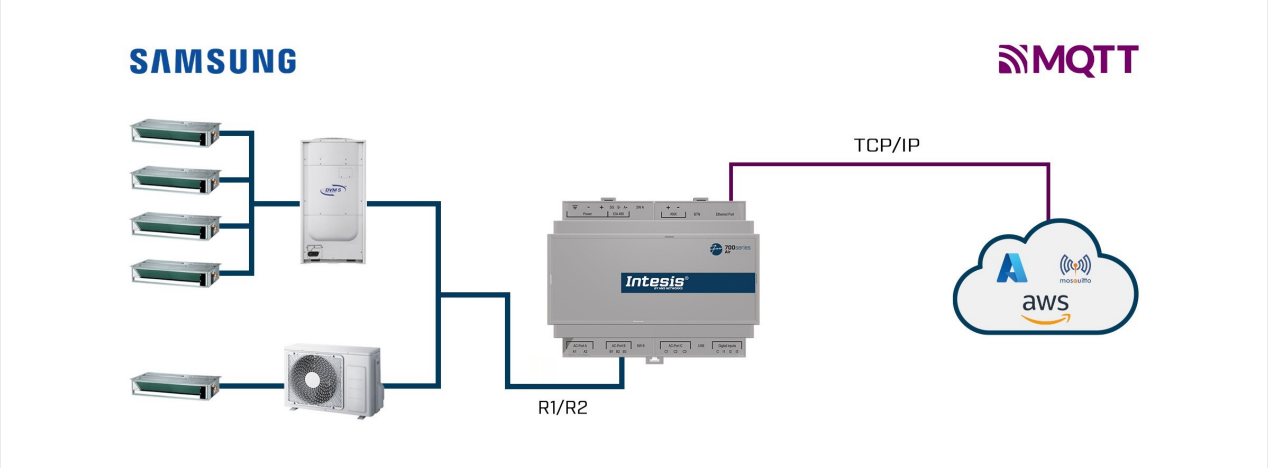
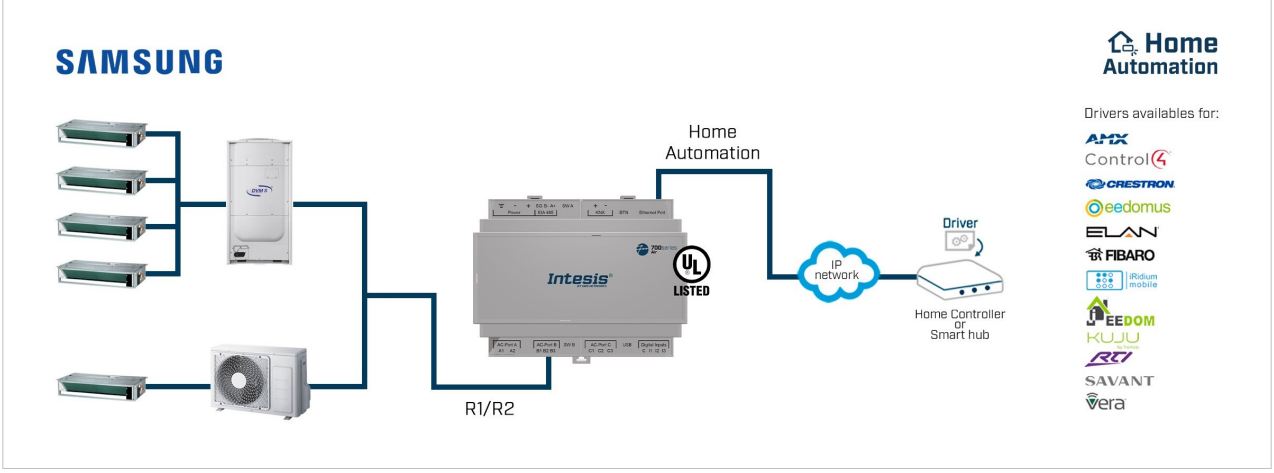


Figure 5. Integration of Samsung units into Home Automation systems



4.1. Inside the Package

ITEMS INCLUDED

- Intesis IN770AIR∗∗∗O000 Gateway
- Installation guide

4.2. Main Features

- Several protocol combinations available: Configurable for Modbus TCP and RTU, KNX TP, BACnet/IP and MS/TP, MQTT, and Home Automation communication protocols.
- Late configuration: Change between protocol combinations easily.
- Three licenses with different capacities.
- Scan function: Find the AC units connected to the air conditioning bus.
- Specific signals to monitor outdoor units.
- 2 x DIP switches for the EIA-485 connector termination and polarization configuration.
- 14 LEDs indicate the operating status for both the gateway and the communication bus.
- DIN rail and wall mounting case.
- Accredited with the main certifications for electronic equipment.
- Three binary inputs to integrate energy meters.
- Multiple ports for serial and TCP/IP communication:
  - Green pluggable terminal block for EIA-485 (3 poles)
  - Orange pluggable terminal block for KNX (2 poles)
  - Ethernet
  - Green pluggable terminal block for binary inputs (4 poles)
  - USB Type-C port for connection to the PC
  - Green pluggable terminal block for AC connection (2 poles)
  - Green pluggable terminal block for AC connection (3 poles)
  - Green pluggable terminal block for AC connection (3 poles)

4.3. Gateway General Functionality

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

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

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

5. Quick Start Guide

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

1. Install Intesis MAPS on your 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 12).
3. Disconnect all systems from power before wiring the gateway.
4. Connect the BMS communication wires to the gateway. See Gateway Connectors (page 14).
   a. If using Modbus TCP, BACnet/IP, MQTT, or Home Automation, connect the communication cable coming from the Modbus/BACnet/MQTT/Home Automation network to the port marked as **Ethernet** on the gateway.
   b. If using Modbus RTU or BACnet MS/TP, connect the communication cables coming from the Modbus/BACnet network to the port marked as **EIA 485** on the gateway.
   c. If using KNX TP, connect the communication cables coming from the KNX network to the port marked as **KNX** on the gateway.
5. Connect the communication cable from the Samsung system to the port marked as **AC-Port B** 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.
7. Connect the gateway to your laptop to configure it with Intesis MAPS. See Connection to a Computer for Configuration (page 20).
   a. If you want to connect via USB, connect a USB cable from the laptop to the port marked as **USB** on the gateway.
   b. If you want to connect via IP, connect the Ethernet cable from the laptop to the port marked as **Ethernet Port** on the gateway.
8. Open Intesis MAPS and create a new project by selecting the needed project template.
9. Modify the configuration as needed, save it, and send the configuration file to the gateway.
   Consult the Intesis MAPS guide for Samsung.
10. Go to the **Diagnostic** tab and check the communication activity between the gateway, the BMS, and the Samsung 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. Incompatibility with Centralized Controllers

IMPORTANT

This IN770AIR***O000 gateway cannot coexist with a centralized controller in the Samsung installation. This limitation applies to all possible configurations of the gateway (Modbus, KNX, BACnet, MQTT, and Home Automation).

7. Samsung Network Setup

Before integrating the IN770AIR***O000 gateway into the HVAC system, you must first perform some actions to properly set up the Samsung NASA VRF network.

IMPORTANT
Read the documentation provided with the Samsung NASA system to learn the specific procedures needed for this setup and seek guidance from your Samsung provider.

HOW TO SET UP THE SAMSUNG NETWORK

1. Connect the Samsung bus (R1/R2) to the connectors **B1** and **B2** of the gateway's **AC-Port B**.

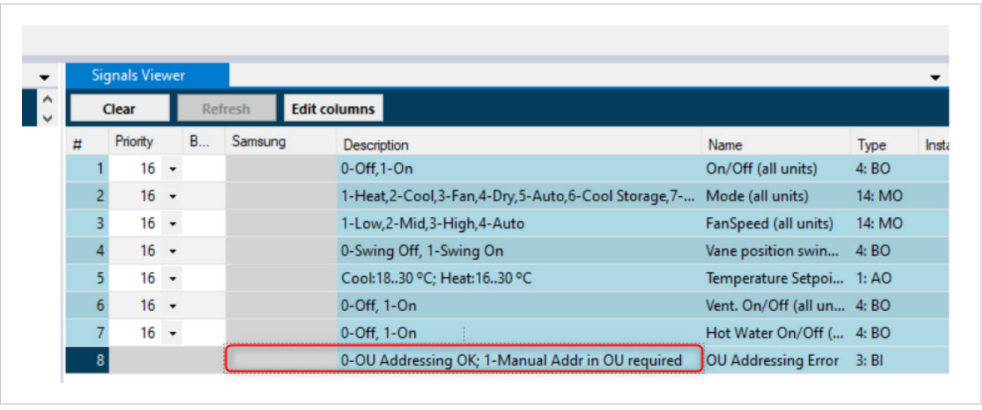
   IMPORTANT
   Observe polarity:

   - **B1**: R1
   - **B2**: R2
   - ***B3**: Not used*

   For more information on the gateway's connections, see Connection (page 14).
2. Use the Samsung system's wired remote controller (RC) to configure all the network's indoor units to accept central control.
   To do so, once you access the indoor unit's settings, set the fifth segment of the installation option code from 0 to 1.
3. Set outdoor and indoor units to manual addressing.
   Samsung NASA systems allow both automatic and manual addressing. To allow the IN770AIR***O000 gateway to communicate with the Samsung NASA system, outdoor and indoor units must be set to manual addressing.
   For outdoor units, this procedure is performed via a DIP switch mounted on its PCB. For indoor units, the procedure varies depending on the model, usually involving DIP switches and/or the remote controller.

HOW TO CHECK IF THE SYSTEM IS SET UP CORRECTLY

1. Connect the IN770AIR***O000 gateway to the laptop and open Intesis MAPS.
2. Enter the **Diagnostic** tab.
3. Look for the signal **OU Addressing Error**.



4. This signal must report a value of **0**, indicating that the outdoor units are already in manual addressing.
   A value of **1** in this signal indicates that the outdoor units are still in automatic addressing.

5. Also, the Console viewer shows the output **Samsung initialized** after booting up the gateway, as shown in the picture below:

> **NOTE**
> This console output may take a few minutes to display.



8. Hardware

8.1. 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.

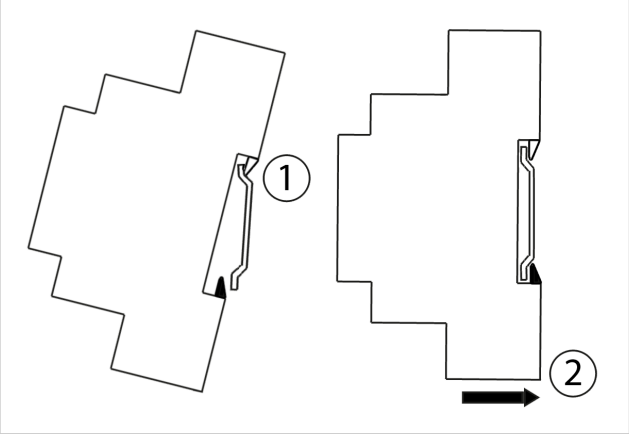
IMPORTANT
Ensure the gateway has sufficient clearances for all connections when mounted. See Dimensions (page 25).

DIN RAIL MOUNTING

Keep the clips in their original position.

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

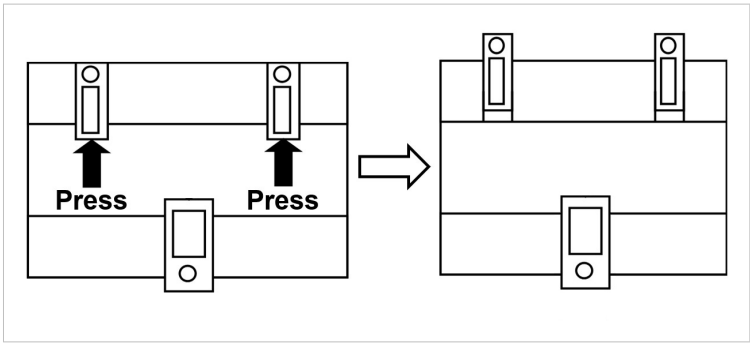
NOTE
For some DIN rails, to complete step 2, you may need a small screwdriver or similar to pull the bottom clip down.



WALL MOUNTING

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

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



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

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

3. Make sure the gateway is firmly fixed.

8.2. Connection

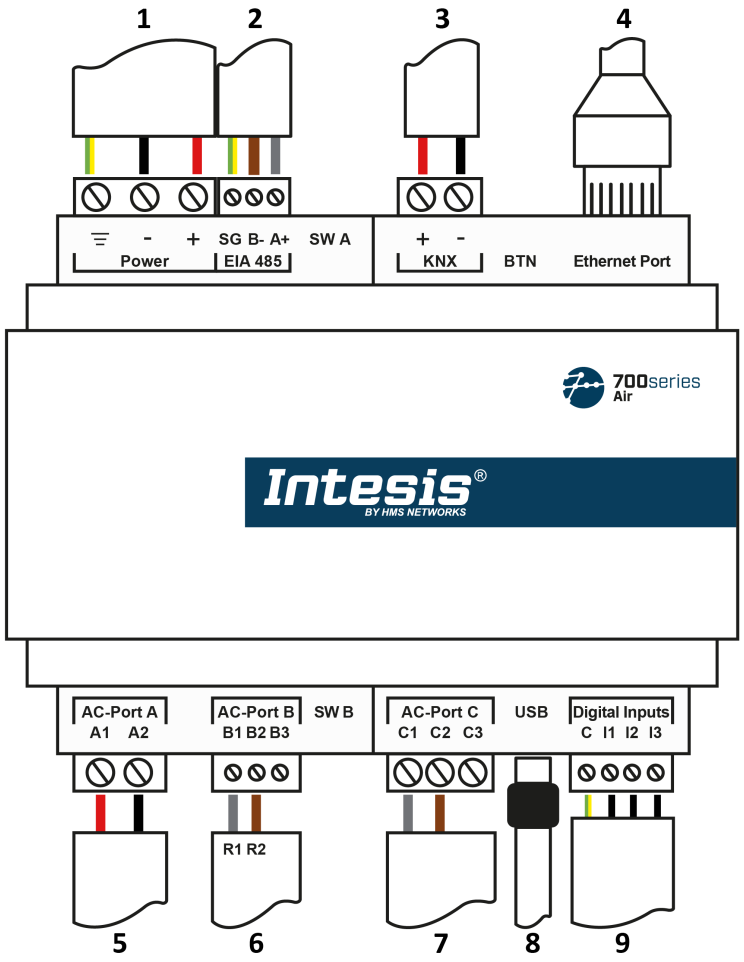
CAUTION
Disconnect all systems from power before manipulating and connecting them to the gateway.

IMPORTANT
Keep communication cables away from power and ground wires.

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

8.2.1. Gateway Connectors

Figure 6. Wiring diagram



1. **Power Supply** (12-36 VDC / 24 VAC)
2. **Port EIA-485**
3. **Port KNX**
4. **Ethernet**
5. **Not used**
6. **Samsung** (R1/R2)
7. **Not used**
8. **Console**
9. **Binary inputs (dry contact)** optional

WIRING THE CONNECTORS

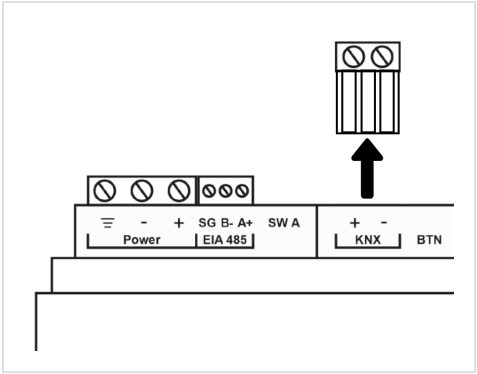
IMPORTANT
For all connectors, use solid or stranded wires (twisted or with ferrule).

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 24).

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



COMMUNICATION PORTS

PORT	USAGE	WIRING			
EIA-485	BACnet MS/TP and Modbus RTU	**SG**: Signal ground	**B-**	**A+**	
KNX	KNX bus	**+**		**-**	
Ethernet	**As a TCP/IP port**: BACnet/IP, Modbus TCP, MQTT, and Home Automation **As a console port**: Connection to a computer for configuration purposes	Ethernet cable (CAT5 or higher) When using the building LAN, contact the network administrator and make sure traffic is allowed. When starting up the gateway for the first time, DHCP will be enabled for 30 seconds. After that time, the default IP 192.168.100.246 will be set.			
AC-Port A	*Not used*				
AC-Port B Observe polarity	Samsung bus	**B1**: R1	**B2**: R2	B3: *Not used*	
AC Port-C	*Not used*				
USB	Connection to a computer for configuration purposes	USB Type-C			
Digital Inputs	Dry contact for metering devices	**C**: Common	**I1**: Input 1	**I2**: Input 2	**I3**: Input 3

8.2.2. Connection to the AC Unit

Connect the Samsung air conditioning network bus (R1/R2) to the gateway using the **B1** and **B2** poles of the **AC-Port B**.

IMPORTANT
Observe polarity:

- **B1**: R1
- **B2**: R2
- ***B3**: Not used*

IMPORTANT
Samsung NASA AC network allows automatic and manual addressing. For the proper communication of this Intesis gateway, a Samsung installer must set up the indoor and outdoor units' manual addressing through the remote controller or DIP switches (for indoor units) and through DIP switches (for outdoor units).

Samsung NASA indoor units must be configured to accept **central control**. To do so, segment 5 of the **installation option code** must be set to **1**.

To know more, see Samsung Network Setup (page 10).

NOTE
See the Wiring diagram (page 14).

8.2.3. Connection to Modbus

FOR MODBUS TCP

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

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

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

FOR MODBUS RTU

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

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

IMPORTANT
Observe polarity.

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

- Maximum distance of 1200 meters (0.75 miles).
- Maximum of 32 devices connected to the bus.
- A 120 ohms (Ω) termination resistor is needed at each end of the bus. The gateway has an internal bus biasing circuit incorporating the termination resistor. It can be enabled using the DIP switch block (**SW A**) dedicated to the **EIA-485** port:
  Position 1
  - ON: 120 Ω termination active.
  - OFF: 120 Ω termination inactive.

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

  For further details, see DIP Switches (page 23).

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

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

NOTE
See the Wiring diagram (page 14).

8.2.4. Connection to KNX

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

IMPORTANT
Observe polarity.

NOTE
See the Wiring diagram (page 14).

8.2.5. Connection to BACnet

FOR BACNET/IP

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

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

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

FOR BACNET MS/TP

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

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

IMPORTANT
Observe polarity.

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

- Maximum distance of 1200 meters (0.75 miles).
- Maximum of 32 devices connected to the bus.
- A 120 ohms (Ω) termination resistor is needed at each end of the bus. The gateway has an internal bus biasing circuit incorporating the termination resistor. It can be enabled using the DIP switch block (**SW A**) dedicated to the **EIA-485** port:
  Position 1
  - ON: 120 Ω termination active.
  - OFF: 120 Ω termination inactive.

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

  For further details, see DIP Switches (page 23).

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

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

NOTE
See the Wiring diagram (page 14).

8.2.6. Connection to MQTT

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

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

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

NOTE
See the Wiring diagram (page 14).

8.2.7. Connection to Home Automation

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

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

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

NOTE
See the Wiring diagram (page 14).

8.2.8. Connection to a Computer for Configuration

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

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

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

NOTE
See the Wiring diagram (page 14).

8.2.9. Connection to Energy Meters (Digital Inputs)

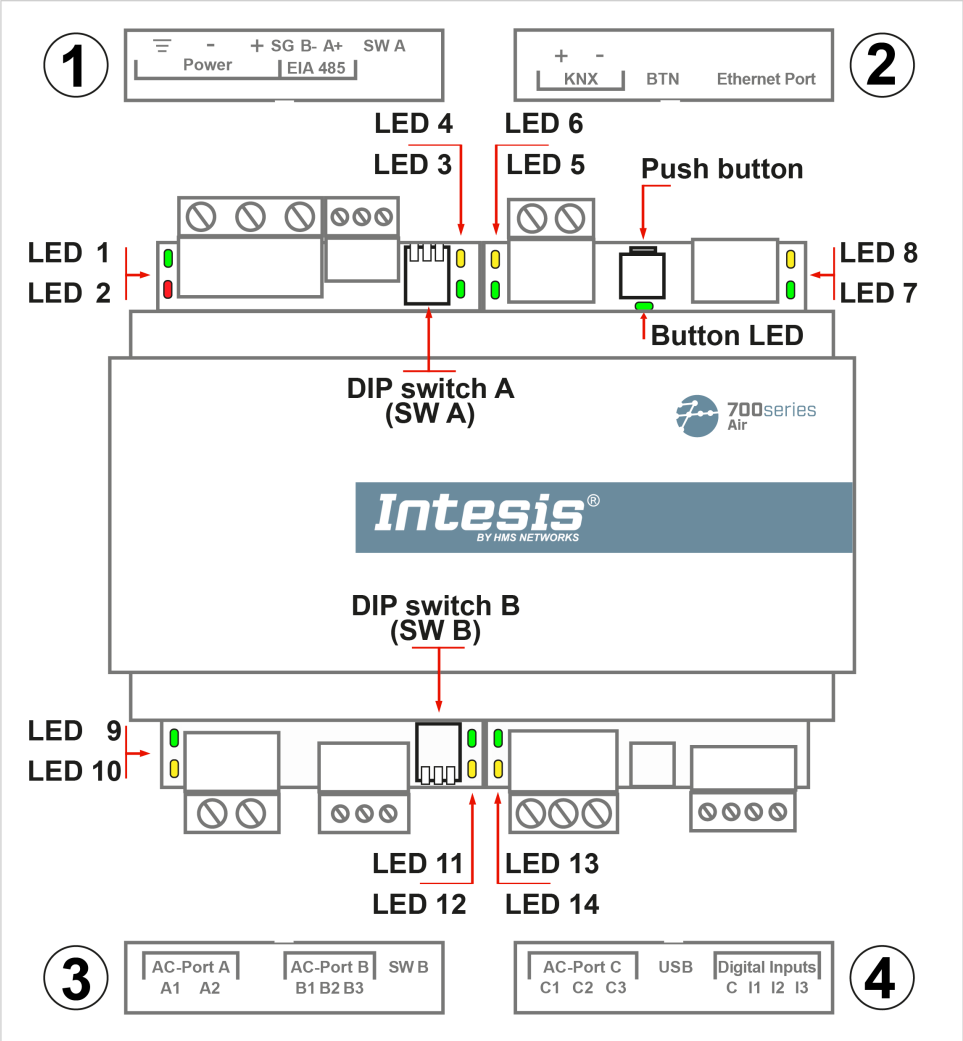
The **Digital Inputs** connector is a green pluggable terminal block (four poles) placed at the bottom right side of the gateway.

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 14).

8.3. Gateway Layout

Figure 7. Disposition of hardware elements in the gateway



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

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

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

8.4. LED Indicators

Table 1. LEDs location and behavior

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

NOTE

LEDs are hidden behind the four frontal labeled covers (see the figure Disposition of hardware elements in the gateway (page 21)). These covers are pressure-fitted, so they can be removed simply by pulling. The recommended method is to insert a small flat-head screwdriver into the designated notch—located on the edge closest to the gateway's main body—and gently pry to disengage the cover.

8.5. DIP Switches

The gateway has two DIP switches (see the figure Disposition of hardware elements in the gateway (page 21)):

- DIP switch A (SW A)
- DIP switch B (SW B)

Each DIP switch is dedicated to a 485 port, and its function is to activate or deactivate the termination resistor (position 1) and the polarization (positions 2 and 3) of each port.

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

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

NOTE
Default positions are:

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

8.6. Push Button

Find the push button on the top side, between the KNX and the Ethernet connectors (see the figure Disposition of hardware elements in the gateway (page 21)).

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

Common functionality:

RESET FACTORY SETTINGS

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

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

Functionalities depending on the current project:

- **BACnet**: Push the button to send an I-Am message to all BACnet ports.
- **KNX**: Push the button to switch between normal mode and programming mode.

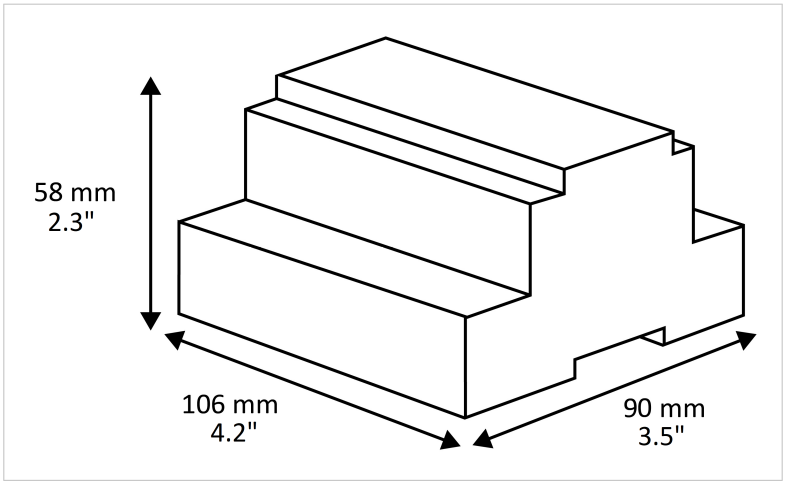
8.7. Technical Specifications

Housing	Plastic, type PC (UL 94 V-0). Color: Light Grey. RAL 7035 Net dimensions (HxWxD): Millimeters: 90 x 106 x 58 mm / Inches: 3.5 x 4.2 x 2.3" Protection: IP20	
Mounting	Wall: Use M3 25 mm (1") length screws. Secure mounting: below 2 meters (6 feet) DIN rail (recommended mounting) EN60715 TH35	
Wires (for power supply and low-voltage signals)	Wire cross-section/gauge per terminal: One core: 0.2..2.5 mm^2 (24..14 AWG) Two cores: 0.2..1.5 mm^2 (24..16 AWG) Three cores: Not permitted Use solid or stranded wires (twisted or with ferrule). For distances longer than 3.05 meters (10 feet), use class 2 cables	
Power	1 x Green pluggable terminal block (3 poles) 12 to 36 VDC +/-10%, Max.: 250 mA 24 VAC +/-10% 50-60 Hz, Max.: 127 mA Recommended: 24 VDC, Max.: 127 mA	
Ethernet	1 x Ethernet 10/100 Mbps RJ45	
Port EIA 485	1 x Green pluggable terminal block (3 poles) SGND (Reference ground or shield)	
Port KNX	1 x Orange pluggable terminal block (2 poles): A, B	
AC Ports	AC-Port A (serial, 2 poles): Not used AC-Port B (serial, 3 poles): AC bus connection (R1/R2) AC-Port C: (serial, 3 poles): Not used	
LEDs	2 x Run (Power/Error) 2 x Port EIA-485 TX/RX 2 x Port KNX TX/TR 1 x Button indicator	2 x Ethernet Link/Speed 2 x AC-Port A TX/RX 2 x AC-Port B TX/RX 2 x AC-Port C TX/RX
Binary inputs	1 x Green pluggable terminal block (4 poles) I1, I2, I3, and Common	
Console port	USB Type-C compliant	
DIP switches	**SW A** Position 1: On: 120 Ω termination active Off: 120 Ω termination inactive (default) Position 2 and 3: On: Polarization active Off: Polarization inactive (default)	**SW B** Position 1: On: 120 Ω termination active Off: 120 Ω termination inactive (default) Position 2 and 3: On: Polarization active Off: Polarization inactive (default)
Push button	1 x Push button Factory reset I-Am message (for BACnet only) Normal mode/programming mode switch (for KNX only)	
Operational temperature	Celsius: 0..60°C Fahrenheit: 32..140°F	
Operational humidity	5..95%. No condensation	
Isolation between comm. ports	1000 VDC	

8.8. Dimensions

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

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



9. Available Protocol Combinations

9.1. Integration into Modbus Systems

9.1.1. Modbus Registers

NOTICE
This part is common for Modbus RTU and TCP.

Functions to read Modbus registers:

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

Function to write Modbus registers:

- 06 Single Holding Registers.

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

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

NOTICE
Read/write parameter terminology:

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

Table 2. Global signals

Register name	Possible values	Modbus address	R/W
On (all the units)	1: Set the units On	20	W
Off (all the units)	1: Set the units Off	21	W
Operation Mode Auto (all the units)	1: Set Auto Mode	22	W
Operation Mode Heat (all the units)	1: Set Heat Mode	23	W
Operation Mode Dry (all the units)	1: Set Dry Mode	24	W
Operation Mode Fan (all the units)	1: Set Fan Mode	25	W
Operation Mode Cool (all the units)	1: Set Cool Mode	26	W
Operation Mode Cool Storage (all the units)	1: Set Cool Storage Mode	27	W
Operation Mode Heat Storage (all the units)	1: Set Heat Storage Mode	28	W
Fan Speed Auto (all the units)	1: Set Fan Speed Auto	29	W
Fan Speed Low (all the units)	1: Set Fan Speed Low	30	W
Fan Speed Mid (all the units)	1: Set Fan Speed Mid	31	W
Fan Speed High (all the units)	1: Set Fan Speed High	32	W
Vane Position Swing On (all the units)	1: Set Swing On	33	W
Vane Position Swing Off (all the units)	1: Set Swing Off	34	W

Register name	Possible values	Modbus address	R/W
Temperature Setpoint (all the units) (x10°C)	**Cool:** 18..30 °C / 64..86°F **Heat:** 16..30 °C / 61..86°F	35	W
Vent. On (all the units)	1: Set Vent. On	36	W
Vent. Off (all the units)	1: Set Vent. Off	37	W
Hot Water On (all the units)	1: Set Hot Water On	38	W
Hot Water Off (all the units)	1: Set Hot Water Off	39	W
OU Addressing Error	0: OU Addressing OK 1: Manual Addr in OU required	16	R

Table 3. Outdoor units signals

Register name	Possible values	R/W
Oxx_Communication Error	0: No error 1: Error	R
OU_xx_IU Master of mode	0xFF: OU XX: IU	R

Table 4. Indoor units signals

Register name	Possible values	Modbus address formula	R/W
On/Off	0: Off 1: On	(IU address[1..64] × 100) + 0	RW
Operation Mode IU/AHU	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool	(IU address[1..64] × 100) + 1	RW
Operation Mode HE	1: Heat 4: Cool	(IU address[1..64] × 100) + 1	RW
Operation Mode EHS/ERV+	0: Auto 1: Heat 4: Cool	(IU address[1..64] × 100) + 1	RW
Operation Mode CHILLER	1: Heat 4: Cool 5: Cool Storage 6: Heat Storage	(IU address[1..64] × 100) + 1	RW
Fan Speed	0: Auto 1: Low 3: Middle 3-High	(IU address[1..64] × 100) + 2	RW
Vane Position Swing	0: Swing Off 1: Swing On	(IU address[1..64] × 100) + 3	RW
Temperature Setpoint (x10) (For Samsung EHS, an external sensor is needed)	**Cool:** 18..30°C / 64..86°F **Heat:** 16..30°C / 61..86°F	(IU address[1..64] × 100) + 4	RW
Ambient Temperature (x10) (For Samsung EHS, an external sensor is needed)	-41..100°C / -42..212°F	(IU address[1..64] × 100) + 5	R
Discharge Setpoint Temp. Cool IU (x10)	8..18°C / 46..64°F	(IU address[1..64] × 100) + 6	RW
Discharge Setpoint Temp.. Cool AHU (x10)	8..25°C / 46..77°F	(IU address[1..64] × 100) + 7	RW
Discharge Setpoint Temp. Heat IU (x10)	30..43°C / 86..109°F	(IU address[1..64] × 100) + 8	RW

Register name	Possible values	Modbus address formula	R/W
Discharge Setpoint Temp. Heat AHU (x10)	18..43°C / 64..109°F	(IU address[1..64] × 100) + 9	RW
Discharge Current Temp. (x10)	°C / °F	(IU address[1..64] × 100) + 10	R
Unit Error code	0: No Error X: Error (100..999)	(IU address[1..64] × 100) + 11	R
Error of Slave Chiller Unit	0: No error X: Error (100..999)	(IU address[1..64] × 100) + 12	R
Slave Chiller Unit in Error	b0..b15: 1-Error in Unit 0..15	(IU address[1..64] × 100) + 13	R
Filter Alarm	0: Normal 1: Alarm	(IU address[1..64] × 100) + 14	R
Filter Alarm Reset	1: Reset	(IU address[1..64] × 100) + 15	W
Communication Status	b0: Exist b1: Ready b2:Data updated b3: Type OK	(IU address[1..64] × 100) + 16	R
Remote control disablement	0: No disabled 1: Disabled	(IU address[1..64] × 100) + 17	RW
Buzzer Sound On	1: Set buzzer sound On	(IU address[1..64] × 100) + 18	W
Buzzer Sound Off	1: Set buzzer sound Off	(IU address[1..64] × 100) + 19	W
Unit type	0: Not Defined 1: IU 2: HE 3: HT 4: AHU 5: ERV 6: ERV+ 7: EHS 8: MASTER CHILLER	(IU address[1..64] × 100) + 20	R
Hot Water On/Off	0: Off 1: On	(IU address[1..64] × 100) + 21	RW
Hot Water Mode HE/HT	0: Eco 1: Standby 2: Power	(IU address[1..64] × 100) + 22	RW
Hot Water Mode EHS	0: Eco 1: Standby 2: Power 3: Force	(IU address[1..64] × 100) + 23	RW
Hot Water Setpoint Temp. HE (x10)	30..75°C / 86..167°F	(IU address[1..64] × 100) + 24	RW
Hot Water Setpoint Temp. HT (x10)	25..75°C / 95..167°F	(IU address[1..64] × 100) + 25	RW
Hot Water Setpoint Temp. EHS (x10)	30..70°C / 86..158°F	(IU address[1..64] × 100) + 26	RW
Hot Water Current Temp. (x10)	°C / °F	(IU address[1..64] × 100) + 27	R
Water In Temp (x10)	°C / °F	(IU address[1..64] × 100) + 28	R
Water Out Temp (x10)	°C / °F	(IU address[1..64] × 100) + 29	R
Water Out Setpoint Temp. HE (x10)	**Cool:** 5..25°C / 41..77°F **Heat:** 15..50°C / 59..122°F	(IU address[1..64] × 100) + 30	RW
Water Out Setpoint Temp. HT (x10)	25..80°C / 77..176°F	(IU address[1..64] × 100) + 31	RW
Water Out Setpoint Temp. EHS (x10)	**Cool:** 5..25°C / 41..77°F **Heat:** 15..55°C / 59..131°F	(IU address[1..64] × 100) + 32	RW

Register name	Possible values	Modbus address formula	R/W
Water Out Setpoint Temp. CHILLER (x10)	**CHILLER-Cool/Cool Storage:** -10..25°C / 14..77°F **CHILLER-Heat/Hot Water:** 25 .. 55°C / 77..131°F	(IU address[1..64] × 100) + 33	RW
Water Out Average Temp. (x10)	°C / °F	(IU address[1..64] × 100) + 34	R
Vent. On/Off	0: Off 1: On	(IU address[1..64] × 100) + 35	RW
Vent. Operating Mode	0: Bypass 1: HeatEx 2: Sleep 3: Auto	(IU address[1..64] × 100) + 36	RW
Vent. Fan Speed	0: Low 1: High 2: Turbo	(IU address[1..64] × 100) + 37	RW
WindFree	0: Disable 1: Enable	(IU address[1..64] × 100) + 38	RW
Air Clean	0: Disable 1: Enable	(IU address[1..64] × 100) + 39	RW
360 CST Air Flow Direction	0: Spot 1: Mid 2: Wide 3: Swing	(IU address[1..64] × 100) + 40	RW
Dualsetpoint Heat temperature	16..30°C / 61..86°F	(IU address[1..64] × 100) + 41	RW
Dualsetpoint Cool temperature	18..30°C / 64..86°F	(IU address[1..64] × 100) + 42	RW
Quiet	0: Off 1: On	(IU address[1..64] × 100) + 43	RW
Discharge temperature control On/Off	0: Off 1: On	(IU address[1..64] × 100) + 44	RW
Consumption Yesterday	Wh/KWh	(IU address[1..64] × 100) + 45	RW
Consumption Today	Wh/KWh	(IU address[1..64] × 100) + 47	RW
Consumption Total	Wh/KWh	(IU address[1..64] × 100) + 49	RW
Consumption Yesterday Heat	Wh/KWh	(IU address[1..64] × 100) + 51	RW
Consumption Today Heat	Wh/KWh	(IU address[1..64] × 100) + 53	RW
Consumption Total Heat	Wh/KWh	(IU address[1..64] × 100) + 55	RW
Consumption Yesterday Cool	Wh/KWh	(IU address[1..64] × 100) + 57	RW
Consumption Today Cool	Wh/KWh	(IU address[1..64] × 100) + 59	RW
Consumption Total Cool	Wh/KWh	(IU address[1..64] × 100) + 61	RW

9.2. Integration into KNX Systems

9.2.1. KNX Signals

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

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

NOTICE
Communication object flags:

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

Table 5. Alarm signals

Object name	Possible values	DPT	Flags
Status_OUXX_Communication Error OU	0: No error 1: Error	1.005-DPT_Alarm (1bit)	R, T
Status_OU Addressing Error	0: OU Addressing OK 1: Manual Addr in OU required	1.005-DPT_Alarm (1bit)	R, T

Table 6. Global signals

Object name	Possible values	DPT	Flags
On/Off (all units)	0: Off 1: On	1.001-DPT_Switch (1bit)	W
Operating Mode (all units)	0: Auto 1: Heat 3: Cool 9: Fan 14: Dry	20.105-DPT_HVACContrMode (1byte)	W
Operating Mode (all units)	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool 5: Cool Storage 6: Heat Storage	5.x (1byte)	W

Object name	Possible values	DPT	Flags
Operating Mode (all units)	0: Cool 1: Heat 2: Dry 3: Fan 4: Auto 5: Cool Storage 6: Heat Storage	5.x (1byte)	W
Fan Speed (all units)	1: Low 2: Mid 3: High	5.x (1byte)	W
Fan Speed AUTO (all units)	1: Set auto fan 0: Stop auto fan	1.001-DPT_Switch (1bit)	W
Vane position swing (all units)	0: Swing Off 1: Swing On	1.001-DPT_Switch (1bit)	W
Temperature Setpoint (all units)	**Cool:** 18..30°C / 64..86°F **Heat:** 16..30°C / 61..86°F	9.001-DPT_Value_Temp (2byte)	W
Vent. On/Off (all units)	0: Off 1: On	1.001-DPT_Switch (1bit)	W
Hot Water On/Off (all units)	0: Off 1: On	1.001-DPT_Switch (1bit)	W

Table 7. Individual units signals

Object name	Possible values	DPT	Flags
Control_On/Off	0: Off 1: On	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_On/Off	0: Off 1: On	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Operation mode	0: Auto 1: Heat 3: Cool 9: Fan 14: Dry	20.105-DPT_HVACContrMode (1byte)	W
Status_OXXUXX_Operation mode	0: Auto 1: Heat 3: Cool 9: Fan 14: Dry	20.105-DPT_HVACContrMode (1byte)	R, T
Control_OXXUXX_Operation mode	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool 5: Cool Storage 6: Heat Storage	5.x (1byte)	W

Object name	Possible values	DPT	Flags
Status_OXXUXX_Operation mode	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool 5: Cool Storage 6: Heat Storage	5.x (1byte)	R, T
Control_OXXUXX_Operation mode	0: Cool 1: Heat 2: Dry 3: Fan 4: Auto 5: Cool Storage 6: Heat Storage	5.x (1byte)	W
Status_OXXUXX_Operation mode	0: Cool 1: Heat 2: Dry 3: Fan 4: Auto 5: Cool Storage 6: Heat Storage	5.x (1byte)	R, T
Control_OXXUXX_Mode Cool/Heat	0: Cool 1: Heat	1.100-DPT_Heat/Cool (1bit)	W
Status_OXXUXX_Mode Cool/Heat	0: Cool 1: Heat	1.100-DPT_Heat/Cool (1bit)	R, T
Control_OXXUXX_Heat mode&ON	0%: Off 1..100%: On+Heat	5.001-DPT_Scaling (1byte)	W
Control_OXXUXX_Cool mode&ON	0%: Off 1..100%: On+Cool	5.001-DPT_Scaling (1byte)	W
Control_OXXUXX_Auto mode	1: Set auto mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Auto mode	1: Auto mode active 0: Auto mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Heat mode	1: Set heat mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Heat mode	1: Heat mode active 0: Heat mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Cool mode	1: Set cool mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Cool mode	1: Cool mode active 0: Cool mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Fan mode	1: Set fan mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Fan mode	1: Fan mode active 0: Fan mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Dry mode	1: Set dry mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Dry mode	1: Dry mode active 0: Dry mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Cool storage mode	1: Set cool storage mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Cool storage mode	1: Cool storage mode active 0: Cool storage mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Heat storage mode	1: Set heat storage mode	1.001-DPT_Switch (1bit)	W

Object name	Possible values	DPT	Flags
Status_OXXUXX_Heat storage mode	1: Heat storage mode active 0: Heat storage mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Fan speed enumerated	1: Low 2: Mid 3: High	5.010 (DPT_Value_1_Ucount)	W
Status_OXXUXX_Fan speed enumerated	1: Low 2: Mid 3: High	5.010 (DPT_Value_1_Ucount)	R, T
Control_OXXUXX_Fan speed scaling	Thresholds: 0..49% 50..82% 83..100%	5.001-DPT_Scaling (1byte)	W
Status_OXXUXX_Fan speed scaling	Thresholds: 33% 67% 100%	5.001-DPT_Scaling (1byte)	R, T
Control_OXXUXX_Fan speed low	1: Set fan speed low	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Fan speed low	1: Speed low active 0: Speed low not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Fan speed mid	1: Set fan speed mid	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Fan speed mid	1: Speed mid active 0: Speed mid not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Fan speed high	1: Set fan speed high	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Fan speed high	1: Speed high active 0: Speed high not active	1.001-DPT_Switch (1bit)	R, T
Control_Fan speed Man/Auto	0: Manual 1: Auto	1.001-DPT_Switch (1bit)	W
Status_Fan speed Man/Auto	0: Manual 1: Auto	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Vane position swing	0: Swing Off 1: Swing On	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Vane position swing	0: Swing Off 1: Swing On	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Temperature Setpoint (For Samsung EHS, an external sensor is needed)	**Cool:** 18..30°C / 64..86°F **Heat:** 16..30°C / 61..86°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_Temperature Setpoint (For Samsung EHS, an external sensor is needed)	**Cool:** 18..30°C / 64..86°F **Heat:** 16..30°C / 61..86°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_OXXUXX_AC Ambient Temperature (For Samsung EHS, an external sensor is needed)	-41..100°C / -42..212°F	9.001-DPT_Value_Temp (2byte)	R, T
Control_OXXUXX_KNX ambient Temperature (For Samsung EHS, an external sensor is needed)	-41..100°C / -42..212°F	9.001-DPT_Value_Temp (2byte)	W
Control_OXXUXX_Disch.Setpoint Cool IU	8..18°C / 46..64°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_Disch.Setpoint Cool IU	8..18°C / 46..64°F	9.001-DPT_Value_Temp (2byte)	R, T
Control_OXXUXX_Disch.Setpoint Cool AHU	8..25°C / 46..77°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_Disch.Setpoint Cool AHU	8..25°C / 46..77°F	9.001-DPT_Value_Temp (2byte)	R, T

Object name	Possible values	DPT	Flags
Control_OXXUXX_Disch.Setpoint Heat IU	30..43°C / 86..109°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_Disch.Setpoint Heat IU	30..43°C / 86..109°F	9.001-DPT_Value_Temp (2byte)	R, T
Control_OXXUXX_Disch.Setpoint Heat AHU	18..43°C / 64..109°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_Disch.Setpoint Heat AHU	18..43°C / 64..109°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_OXXUXX_Disch. Current Temp.	°C / °F	9.001-DPT_Value_Temp (2byte)	R, T
Status_OXXUXX_Unit error code	0: No error 100..999: Error	8.x (2 byte)	R, T
Status_OXXUXX_Error slave chiller unit	0: No error 100..999: Error	8.x (2 byte)	R, T
Status_OXXUXX_Slave chiller in error	b0..b15: 1-Error in unit b0..b15	8.x (2 byte)	R, T
Status_OXXUXX_FilterSign	0: Normal 1: Alarm	1.005-DPT_Alarm (1bit)	R, T
Control_OXXUXX_FilterReset	0: No reset 1: Reset	1.015-DPT_Reset (1bit)	W
Status_OXXUXX_Communication status	b0: Exist b1: Ready b2: Data updated b3: Type OK	5.x (1byte)	R, T
Control_OXXUXX_Remote control disablement	0: Not disabled 1: Disabled	1.002 DPT_Bool (1bit)	W
Status_OXXUXX_Remote control disablement	0: Not disabled 1: Disabled	1.002 DPT_Bool (1bit)	R, T
Control_OXXUXX_Buzzer Sound	0: Buzzer On 1: Buzzer Off	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Unit type	1: IU 2: HE 3: HT 4: AHU 5: ERV 6: ERV+ 7: EHS 8: CHILLER 13: Not Defined	5.x (1byte)	R, T
Control_OXXUXX_HotWater On/Off	0: Off 1: On	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_HotWater On/Off	0: Off 1: On	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_HotWater Mode HE/HT	0: Eco 1: Standby 2: Power	5.x (1byte)	W
Status_OXXUXX_HotWater Mode HE/HT	0: Eco 1: Standby 2: Power	5.x (1byte)	R, T
Control_OXXUXX_HotWater Mode EHS	0: Eco 1: Standby 2: Power 3: Force	5.x (1byte)	W

Object name	Possible values	DPT	Flags
Status_OXXUXX_HotWater Mode EHS	0: Eco 1: Standby 2: Power 3: Force	5.x (1byte)	R, T
Control_OXXUXX_HotWater Eco Mode	1: Set eco mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_HotWater Eco Mode	1: Eco mode active 0: Eco mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_HotWater Standby Mode	1: Set standby mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_HotWater Standby Mode	1: Standby mode active 0: Standby mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_HotWater Power Mode	1: Set power mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_HotWater Power Mode	1: Power mode active 0: Power mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_HotWater Force Mode	1: Set force mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_HotWater Force Mode	1: Force mode active 0: Force mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_HotWater Setpoint HE	30..75°C / 86..167°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_HotWater Setpoint HE	30..75°C / 86..167°F	9.001-DPT_Value_Temp (2byte)	R, T
Control_OXXUXX_HotWater Setpoint HT	35..75°C / 95..167°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_HotWater Setpoint HT	35..75°C / 95..167°F	9.001-DPT_Value_Temp (2byte)	R, T
Control_OXXUXX_HotWater Setpoint EHS	30..70°C / 86..158°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_HotWater Setpoint EHS	30..70°C / 86..158°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_OXXUXX_HotWater Current Temperature	°C / °F	9.001-DPT_Value_Temp (2byte)	R, T
Status_OXXUXX_WaterIn Temperature	°C / °F	9.001-DPT_Value_Temp (2byte)	R, T
Status_OXXUXX_WaterOut Temperature	°C / °F	9.001-DPT_Value_Temp (2byte)	R, T
Control_OXXUXX_WaterOut Setpoint HE	**Cool:** 5..25°C / 41..77°F **Heat:** 15..50°C / 59..122°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_WaterOut Setpoint HE	**Cool:** 5..25°C / 41..77°F **Heat:** 15..50°C / 59..122°F	9.001-DPT_Value_Temp (2byte)	R, T
Control_OXXUXX_WaterOut Setpoint HT	25..80°C / 77..176°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_WaterOut Setpoint HT	25..80°C / 77..176°F	9.001-DPT_Value_Temp (2byte)	R, T
Control_OXXUXX_WaterOut Setpoint EHS	**Cool:** 5..25°C / 41..77°F **Heat:** 15..55°C / 59..131°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_WaterOut Setpoint EHS	**Cool:** 5..25°C / 41..77°F **Heat:** 15..55°C / 59..131°F	9.001-DPT_Value_Temp (2byte)	R, T
Control_OXXUXX_WaterOut Setpoint CHILLER	**CHILLER-Cool/Cool Storage:** -10..25°C / 55..77°F **CHILLER-Heat/Hot Water:** 25..55°C / 77..131°F	9.001-DPT_Value_Temp (2byte)	W
Status_OXXUXX_WaterOut Setpoint CHILLER	**CHILLER-Cool/Cool Storage:** -10..25°C / 55..77°F **CHILLER-Heat/Hot Water:** 25..55°C / 77..131°F	9.001-DPT_Value_Temp (2byte)	R, T
Status_OXXUXX_Water Out Average Temp.	°C / °F	9.001-DPT_Value_Temp (2byte)	R, T
Control_OXXUXX_Vent. On/Off	0: Off 1: On	1.001-DPT_Switch (1bit)	W

Object name	Possible values	DPT	Flags
Status_OXXUXX_Vent. On/Off	0: Off 1: On	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Vent. Operation mode	1: Bypass 2: HeatEx 3: Sleep 4: Auto	5.x (1byte)	W
Status_OXXUXX_Vent. Operation mode	1: Bypass 2: HeatEx 3: Sleep 4: Auto	5.x (1byte)	R, T
Control_OXXUXX_Vent. Bypass mode	1: Set Vent. Bypass mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Vent. Bypass mode	1: Vent. Bypass mode active 0: Vent. Bypass mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Vent. HeatEx mode	1: Set Vent. HeatEx mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Vent. HeatEx mode	1: Vent. HeatEx mode active 0: Vent. HeatEx mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Vent. Sleep mode	1: Set Vent. Sleep mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Vent. Sleep mode	1: Vent. Sleep mode active 0: Vent. Sleep mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Vent. Auto mode	1: Set Vent. Auto mode	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Vent. Auto mode	1: Vent. Auto mode active 0: Vent. Auto mode not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Vent. Fan speed enumerated	1: Low 2: High 3: Turbo	5.x (1byte)	W
Status_OXXUXX_Vent. Fan speed enumerated	0: Low 2: High 3: Turbo	5.x (1byte)	R, T
Control_OXXUXX_Vent. Fan speed scaling	Thresholds: 0..49% 50..82% 83..100%	5.001-DPT_Scaling (1byte)	W
Status_OXXUXX_Vent. Fan speed scaling	Thresholds: 33% 67% 100%	5.001-DPT_Scaling (1byte)	R, T
Control_OXXUXX_Vent. fan speed low	1: Set Vent. Fan speed low	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Vent. fan speed low	1: Vent. Fan speed low active 0: Vent. Fan speed low not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Vent. fan speed high	1: Set Vent. Fan speed high	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Vent. fan speed high	1: Vent. Fan speed high active 0: Vent. Fan speed high not active	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Vent. fan speed turbo	1: Set Vent. Fan speed turbo	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Vent. fan speed turbo	1: Vent. Fan speed turbo active 0: Vent. Fan speed turbo not active	1.001-DPT_Switch (1bit)	R, T

Object name	Possible values	DPT	Flags
Control_OXXUXX_WindFree	0: Off 1: On	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_WindFree	0: Off 1: On	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_Air clean	0: Off 1: On	1.001-DPT_Switch (1bit)	W
Status_OXXUXX_Air clean	0: Off 1: On	1.001-DPT_Switch (1bit)	R, T
Control_OXXUXX_360 CST air flow direction	0: Spot 1: Mid 2: Wide 3: Swing	5.x (1byte)	W
Status_OXXUXX_360 CST air flow direction	0: Spot 1: Mid 2: Wide 3: Swing	5.x (1byte)	R, T
Status_Consumption Yesterday	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Today	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Total	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Yesterday Heat	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Today Heat	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Total Heat	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Yesterday Cool	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Today Cool	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T
Status_Consumption Total Cool	Wh/KWh	13.010: active energy (Wh) (4byte)	R, T

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

9.3. Integration into BACnet Systems

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

9.3.1. BACnet Objects

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

Available input object types	Available output object types
Analog input	Analog output
Binary input	Binary output
Multistate input	Multistate output

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

Table 8. Error signals

Object name	Possible values	Object type	Object instance
OUXX_Communication Error OU	0: No error 1: Error	3-Binary Input	OU[0..15] + 1
OU Addressing Error	0: OU Addressing OK 1: Manual Addr in OU required	3-Binary Input	0 + 16

Table 9. Global signals

Object name	Possible values	Object type	Object instance
On/Off (all units)	0: Off 1: On	4-Binary Output	0 + 0
Mode (all units)	1: Heat 2: Cool 3: Fan 4: Dry 5: Auto 6: Cool Storage 7: Heat Storage	14-Multistate Output	0 + 0
FanSpeed (all units)	1: Low 2: Mid 3: High 4: Auto	14-Multistate Output	0 + 1
Vane position swing (all units)	0: Swing Off 1: Swing On	4-Binary Output	0 + 1
Temperature Setpoint (all units)	**Cool:** 18..30°C / 64..86°F **Heat:** 16..30°C / 61..86°F	1-Analog Output	0 + 0
Vent. On/Off (all units)	0: Off 1: On	4-Binary Output	0 + 2
Hot Water On/Off (all units)	0: Off 1: On	4-Binary Output	0 + 3

Table 10. Individual unit signals

Object name	Possible values	Object type	Object instance
OXXUXX_On/Off_S	0: Off 1: On	3-Binary Input	(IU[1..64] × 100) + 0
OXXUXX_On/Off_C	0: Off 1: On	4-Binary Output	(IU[1..64] × 100) + 0
OXXUXX_Mode IU/AHU_S	1: Heat 2: Cool 3: Fan 4: Dry 5: Auto	13-Multistate Input	(IU[1..64] × 100) + 0
OXXUXX_Mode HE_S	1: Heat 2: Cool	13-Multistate Input	(IU[1..64] × 100) + 0
OXXUXX_Mode EHS/ERV+_S	1: Heat 2: Cool 5: Auto	13-Multistate Input	(IU[1..64] × 100) + 0
OXXUXX_Mode CHILLER_S	1: Heat 2: Cool 6: Cool Storage 7: Heat Storage	13-Multistate Input	(IU[1..64] × 100) + 0
OXXUXX_Mode IU/AHU_C	1: Heat 2: Cool 3: Fan 4: Dry 5: Auto	14-Multistate Output	(IU[1..64] × 100) + 0
OXXUXX_Mode HE_C	1: Heat 2: Cool	14-Multistate Output	(IU[1..64] × 100) + 0
OXXUXX_Mode EHS/ERV+_C	1: Heat 2: Cool 5: Auto	14-Multistate Output	(IU[1..64] × 100) + 0
OXXUXX_Mode CHILLER_C	1: Heat 2: Cool 6: Cool Storage 7: Heat Storage	14-Multistate Output	(IU[1..64] × 100) + 0
OXXUXX_Setpoint_S (For Samsung EHS, an external sensor is needed)	**Cool:** 18..30°C / 64..86°F **Heat:** 16..30°C / 61..86°F	0-Analog Input	(IU[1..64] × 100) + 0
OXXUXX_Setpoint_C (For Samsung EHS, an external sensor is needed)	**Cool:** 18..30°C / 64..86°F **Heat:** 16..30°C / 61..86°F	1-Analog Output	(IU[1..64] × 100) + 0
OXXUXX_FanSpeed_S	1: Low 2: Mid 3: High 4: Auto	13-Multistate Input	(IU[1..64] × 100) + 1
OXXUXX_FanSpeed_C	1: Low 2: Mid 3: High 4: Auto	14-Multistate Output	(IU[1..64] × 100) + 1
OXXUXX_Vane position swing_S	0: Swing Off 1: Swing On	3-Binary Input	(IU[1..64] × 100) + 1

Object name	Possible values	Object type	Object instance
OXXUXX_Vane position swing_C	0: Swing Off 1: Swing On	4-Binary Output	(IU[1..64] × 100) + 1
OXXUXX_Room_Temperature (For Samsung EHS, an external sensor is needed)	-41..100°C / -42..212°F	0-Analog Input	(IU[1..64] × 100) + 1
OXXUXX_Disch.Setpoint Cool IU_S	8..18°C / 46..64°F	0-Analog Input	(IU[1..64] × 100) + 2
OXXUXX_Disch.Setpoint Cool IU_C	8..18°C / 46..64°F	1-Analog Output	(IU[1..64] × 100) + 1
OXXUXX_Disch.Setpoint Cool AHU_S	8..25°C / 46..79°F	0-Analog Input	(IU[1..64] × 100) + 2
OXXUXX_Disch.Setpoint Cool AHU_C	8..25°C / 46..79°F	1-Analog Output	(IU[1..64] × 100) + 1
OXXUXX_Disch.Setpoint Heat IU_S	30..43°C / 86..109°F	0-Analog Input	(IU[1..64] × 100) + 3
OXXUXX_Disch.Setpoint Heat IU_C	30..43°C / 86..109°F	1-Analog Output	(IU[1..64] × 100) + 2
OXXUXX_Disch.Setpoint Heat AHU_S	18..43°C / 64..109°F	0-Analog Input	(IU[1..64] × 100) + 3
OXXUXX_Disch.Setpoint Heat AHU_C	18..43°C / 64..109°F	1-Analog Output	(IU[1..64] × 100) + 2
OXXUXX_Disch. Current Temp.	°C / °F	0-Analog Input	(IU[1..64] × 100) + 4
OXXUXX_Unit Error code	0: No Error 100 .. 999: Error	0-Analog Input	(IU[1..64] × 100) + 5
OXXUXX_Error Slave Chiller Unit	0: No error 100 .. 999: Error	0-Analog Input	(IU[1..64] × 100) + 6
OXXUXX_Slave Chiller in Error	b0..b15: 1-Error in unit b0..b15	0-Analog Input	(IU[1..64] × 100) + 7
OXXUXX_FilterSign	0: Normal 1: Alarm	3-Binary Input	(IU[1..64] × 100) + 2
OXXUXX_FilterReset	0: No reset 1: Reset	4-Binary Output	(IU[1..64] × 100) + 2
OXXUXX_Communication Status	b0: Exist b1: Ready b2: Data updated b3: Type OK	13-Multistate Input	(IU[1..64] × 100) + 2
OXXUXX_RC Restriction_S	0: No restriction 1: Restriction	3-Binary Input	(IU[1..64] × 100) + 3
OXXUXX_RC Restriction_C	0: No restriction 1: Restriction	4-Binary Output	(IU[1..64] × 100) + 3
OXXUXX_Buzzer Sound	0: Buzzer On 1: Buzzer Off	4-Binary Output	(IU[1..64] × 100) + 4
OXXUXX_Unit type	1: Not Defined 2: IU 3: HE 4: HT 5: AHU 6: ERV 7: ERV+ 8: EHS 9: CHILLER	13-Multistate Input	(IU[1..64] × 100) + 3
OXXUXX_HotWater On/Off_S	0: Off 1: On	3-Binary Input	(IU[1..64] × 100) + 4
OXXUXX_HotWater On/Off_C	0: Off 1: On	4-Binary Output	(IU[1..64] × 100) + 5

Object name	Possible values	Object type	Object instance
OXXUXX_HotWater Mode HE/HT_S	1: Eco 2: Standb. 3: Power	13-Multistate Input	(IU[1..64] × 100) + 4
OXXUXX_HotWater Mode EHS_S	1: Eco 2: Standb. 3: Power 4: Force	13-Multistate Input	(IU[1..64] × 100) + 4
OXXUXX_HotWater Mode HE/HT_C	1: Eco 2: Standb. 3: Power	14-Multistate Output	(IU[1..64] × 100) + 2
OXXUXX_HotWater Mode EHS_C	1: Eco 2: Standb. 3: Power 4: Force	14-Multistate Output	(IU[1..64] × 100) + 2
OXXUXX_HotWater Setpoint HE_S	30..75°C / 86..167°F	0-Analog Input	(IU[1..64] × 100) + 8
OXXUXX_HotWater Setpoint HT_S	35..75°C / 95..167°F	0-Analog Input	(IU[1..64] × 100) + 8
OXXUXX_HotWater Setpoint EHS_S	30..70°C / 86..158°F	0-Analog Input	(IU[1..64] × 100) + 8
OXXUXX_HotWater Setpoint HE_C	30..75°C / 86..167°F	1-Analog Output	(IU[1..64] × 100) + 3
OXXUXX_HotWater Setpoint HT_C	35..75°C / 95..167°F	1-Analog Output	(IU[1..64] × 100) + 3
OXXUXX_HotWater Setpoint EHS_C	30..70°C / 86..158°F	1-Analog Output	(IU[1..64] × 100) + 3
OXXUXX_HotWater Current Temp.	°C / °F	0-Analog Input	(IU[1..64] × 100) + 9
OXXUXX_WaterIn Temperature	°C / °F	0-Analog Input	(IU[1..64] × 100) + 10
OXXUXX_WaterOut Temperature	°C / °F	0-Analog Input	(IU[1..64] × 100) + 11
OXXUXX_WaterOut Setpoint HE_S	-10..80°C / 14..176°F	0-Analog Input	(IU[1..64] × 100) + 12
OXXUXX_WaterOut Setpoint HT_S	-10..80°C / 14..176°F	0-Analog Input	(IU[1..64] × 100) + 12
OXXUXX_WaterOut Setpoint EHS_S	-10..80°C / 14..176°F	0-Analog Input	(IU[1..64] × 100) + 12
OXXUXX_WaterOut Setpoint CHILL_S	**CHILLER-Cool/Cool Storage:** 10..25°C / 14..77°F **CHILLER-Heat/Hot Water:** 25..55°C / 77..131°F	0-Analog Input	(IU[1..64] × 100) + 12
OXXUXX_WaterOut Setpoint HE_C	-10..80°C / 14..176°F	1-Analog Output	(IU[1..64] × 100) + 4
OXXUXX_WaterOut Setpoint HT_C	-10..80°C / 14..176°F	1-Analog Output	(IU[1..64] × 100) + 4
OXXUXX_WaterOut Setpoint EHS_C	-10..80°C / 14..176°F	1-Analog Output	(IU[1..64] × 100) + 4
OXXUXX_WaterOut Setpoint CHILL_C	**CHILLER-Cool/Cool Storage:** 10..25°C / 14..77°F **CHILLER-Heat/Hot Water:** 25..55°C / 77..131°F	1-Analog Output	(IU[1..64] × 100) + 4
OXXUXX_WaterOut Average Temp.	°C / °F	0-Analog Input	(IU[1..64] × 100) + 13
OXXUXX_Vent. On/Off_S	0: Off 1: On	3-Binary Input	(IU[1..64] × 100) + 5
OXXUXX_Vent. On/Off_C	0: Off 1: On	4-Binary Output	(IU[1..64] × 100) + 6
OXXUXX_Vent. Mode_S	1: Bypass 2: HeatEx 3: Sleep 4: Auto	13-Multistate Input	(IU[1..64] × 100) + 5

Object name	Possible values	Object type	Object instance
OXXUXX_Vent. Mode_C	1: Bypass 2: HeatEx 3: Sleep 4: Auto	14-Multistate Output	(IU[1..64] × 100) + 3
OXXUXX_Vent. FanSpeed_S	1: Low 2: High 3: Turbo	13-Multistate Input	(IU[1..64] × 100) + 6
OXXUXX_Vent. FanSpeed_C	1: Low 2: High 3: Turbo	14-Multistate Output	(IU[1..64] × 100) + 4
OXXUXX_WindFree_S	0: Disable 1: Enable	3-Binary Input	(IU[1..64] × 100) + 6
OXXUXX_WindFree_C	0: Disable 1: Enable	4-Binary Output	(IU[1..64] × 100) + 7
OXXUXX_Air Clean_S	0: Disable 1: Enable	3-Binary Input	(IU[1..64] × 100) + 7
OXXUXX_Air Clean_C	0: Disable 1: Enable	4-Binary Output	(IU[1..64] × 100) +
OXXUXX_360 CST Air Flow_S	1: Spot 2: Mid 3: Wide 4: Swing	13-Multistate Input	(IU[1..64] × 100) + 7
OXXUXX_360 CST Air Flow_C	1: Spot 2: Mid 3: Wide 4: Swing	14-Multistate Output	(IU[1..64] × 100) + 5
OXXUXX_Consumption Yesterday_S	Wh/kWh	0-Analog Input	(IU[1..64] × 100) + 9
OXXUXX_Consumption Today_S	Wh/kWh	0-Analog Input	(IU[1..64] × 100) + 10
OXXUXX_Consumption Total_S	Wh/kWh	0-Analog Input	(IU[1..64] × 100) + 11
OXXUXX_Consumption Yesterday Heat_S	Wh/kWh	0-Analog Input	(IU[1..64] × 100) + 12
OXXUXX_Consumption Today Heat_S	Wh/kWh	0-Analog Input	(IU[1..64] × 100) + 13
OXXUXX_Consumption Total Heat_S	Wh/kWh	0-Analog Input	(IU[1..64] × 100) + 14
OXXUXX_Consumption Yesterday Cool_S	Wh/kWh	0-Analog Input	(IU[1..64] × 100) + 15
OXXUXX_Consumption Today Cool_S	Wh/kWh	0-Analog Input	(IU[1..64] × 100) + 16
OXXUXX_Consumption Total Cool_S	Wh/kWh	0-Analog Input	(IU[1..64] × 100) + 17

9.4. Integration into MQTT Systems

9.4.1. MQTT Topics

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

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

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

The following tables list all available topics.

Table 11. Publishing topics

MQTT topics	Description	Possible values
AWS IoT Core / Generic: <macGW>/<IUxx>/status/onOffSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=onOffSts	On/Off Status	0: Off 1: On
AWS IoT Core / Generic: <macGW>/<IUxx>/status/modeSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=modeSts	IU/AHU Operation Mode Status	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool
AWS IoT Core / Generic: <macGW>/<IUxx>/status/modeSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=modeSts	HE Operation Mode Status	1: Heat 4: Cool
AWS IoT Core / Generic: <macGW>/<IUxx>/status/modeSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=modeSts	EHS/ERV+ Operation Mode Status	0: Auto 1: Heat 4: Cool
AWS IoT Core / Generic: <macGW>/<IUxx>/status/fanSpeedSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=fanSpeedSts	Fan Speed Status	0: Auto 1: Low 2: Mid 3: High
AWS IoT Core / Generic: <macGW>/<IUxx>/status/VanesSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=VanesSts	Vane Swing Status	0: Swing Off 1: Swing On

MQTT topics	Description	Possible values
AWS IoT Core / Generic: <macGW>/<IUxx>/status/setTempSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=setTempSts (For Samsung EHS, an external sensor is needed)	Temperature Setpoint Status	**Cool:** 18..30°C /64.4..86°F **Heat:** 16..30°C /60.8..86°F
AWS IoT Core / Generic: <macGW>/<IUxx>/status/tempAmbientSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=tempAmbientSts (For Samsung EHS, an external sensor is needed)	Ambient Temperature Status	-41..100°C /-41.8..212°F
AWS IoT Core / Generic: <macGW>/<IUxx>/status/errorCodeSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=errorCodeSts	Unit Error Code Status	0: No error 100..999: Error
AWS IoT Core / Generic: <macGW>/<IUxx>/status/comErrorSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=comErrorSts	Communication Status	b0: Exists b1: Ready b2: Data updated b3: Type OK
AWS IoT Core / Generic: <macGW>/<IUxx>/status/onOffDHWSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=onOffDHWSts	Hot Water On/Off Status	0: Off 1: On
AWS IoT Core / Generic: <macGW>/<IUxx>/status/modeDHWSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=modeDHWSts	HE/HT Hot Water Mode status	0: Eco 1: Stand. 2: Power
AWS IoT Core / Generic: <macGW>/<IUxx>/status/modeDHWSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=modeDHWSts	EHS Hot Water Mode Status	0: Eco 1: Standby 2: Power 3: Force
AWS IoT Core / Generic: <macGW>/<IUxx>/status/setTempDHWSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=setTempDHWSts	HE Hot Water Setpoint Temp. Status	30..75°C /86..167°F
AWS IoT Core / Generic: <macGW>/<IUxx>/status/setTempDHWSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=setTempDHWSts	HT Hot Water Setpoint Temp. Status	35..75°C /14..167°F
AWS IoT Core / Generic: <macGW>/<IUxx>/status/setTempDHWSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=setTempDHWSts	EHS Hot Water Setpoint Temp. Status	30..70°C /86..158°F
AWS IoT Core / Generic: <macGW>/<IUxx>/status/tempWCurrentSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=tempWCurrentSts	Hot Water Current Temp. Status	°C

MQTT topics	Description	Possible values
AWS IoT Core / Generic: <macGW>/<IUxx>/status/tempWInSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=tempWInSts	Water In Temp Status	°C
AWS IoT Core / Generic: <macGW>/<IUxx>/status/tempWOutSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=tempWOutSts	Water Out Temp Status	°C
AWS IoT Core / Generic: <macGW>/<IUxx>/status/setTempWOutSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=setTempWOutSts	HE Water Out Setpoint Temp. Status	-10..80°C /14..176°F
AWS IoT Core / Generic: <macGW>/<IUxx>/status/setTempWOutSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=setTempWOutSts	HT Water Out Setpoint Temp. Status	-10..80°C /14..176°F
AWS IoT Core / Generic: <macGW>/<IUxx>/status/setTempWOutSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=setTempWOutSts	EHS Water Out Setpoint Temp. Status	-10..80°C /14..176°F
AWS IoT Core / Generic: <macGW>/<IUxx>/status/ventOnOffSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=ventOnOffSts	Vent. On/Off Status	0: Off 1: On
AWS IoT Core / Generic: <macGW>/<IUxx>/status/ventModeSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=ventModeSts	Vent. Operating Mode Status	0: Bypass 1: HeatEx 2: Sleep 3: Auto
AWS IoT Core / Generic: <macGW>/<IUxx>/status/ventFanSpeedSts **Azure IoT Hub:** devices/<macGW>/messages/events/&IU=<IUxx>&metricName=ventFanSpeedSts	Vent. Fan Speed Status	0: Low 1: High 2: Turbo

Table 12. Subscribing topics

MQTT topics	Description	Possible values
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/onOffCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=onOffCmd	On/Off Control	0: Off 1: On
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/modeCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=modeCmd	IU/AHU Operation Mode Control	0: Auto 1: Heat 2: Dry 3: Fan 4: Cool
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/modeCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=modeCmd	HE Operation Mode Control	1: Heat 4: Cool
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/modeCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=modeCmd	EHS/ERV+ Operation Mode Control	0: Auto 1: Heat 4: Cool
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/fanSpeedCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=fanSpeedCmd	Fan Speed Control	0: Auto 1: Low 2: Mid 3: High
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/vanesCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=vanesCmd	Vane Swing Control	0: Swing Off 1: Swing On
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/setTempCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=setTempCmd (For Samsung EHS, an external sensor is needed)	Temperature Setpoint Control	**Cool:** 18..30°C /64.4..86°F **Heat:** 16..30°C /60.8..86°F
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/OnOffDHWCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=OnOffDHWCmd	Hot Water On/Off Control	0: Off 1: On
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/modeDHWCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=modeDHWCmd	HE/HT Hot Water Mode Control	0: Eco 1: Stand. 2: Power
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/modeDHWCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=modeDHWCmd	EHS Hot Water Mode Control	0: Eco 1: Standby 2: Power 3: Force
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/setTempDHWCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=setTempDHWCmd	HE Hot Water Setpoint Temp. Control	30..75°C /86..167°F

MQTT topics	Description	Possible values
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/setTempDHWCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=setTempDHWCmd	HT Hot Water Setpoint Temp. Control	35..75°C /14..167°F
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/setTempDHWCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=setTempDHWCmd	EHS Hot Water Setpoint Temp. Control	30..70°C /86..158°F
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/setTempWOutCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=setTempWOutCmd	HE Water Out Setpoint Temp. Control	-10..80°C /14..176°F
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/setTempWOutCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=setTempWOutCmd	HT Water Out Setpoint Temp. Control	-10..80°C /14..176°F
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/setTempWOutCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=setTempWOutCmd	EHS Water Out Setpoint Temp. Control	-10..80°C /14..176°F
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/ventOnOffCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=ventOnOffCmd	Vent. On/Off Control	0: Off 1: On
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/ventModeCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=ventModeCmd	Vent. Operating Mode Control	0: Bypass 1: HeatEx 2: Sleep 3: Auto
AWS IoT Core / Generic: <macGW>/<IUxx>/cmd/ventFanSpeedCmd **Azure IoT Hub:** devices/<macGW>/messages/devicebound/&IU=<IUxx>&metricName=ventFanSpeedCmd	Vent. Fan Speed Control	0: Low 1: High 2: Turbo

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

Example 1. Payload example:

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

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

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

9.5. Integration into Home Automation Systems

9.5.1. 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 13. Indoor unit signals

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

NOTE

[1] This index must be set 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.

10. Late Configuration: Change the Gateway's Protocol

Reconfiguring the gateway with a different protocol is very easy:

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

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

11. Error Codes

NOTE
These error codes are the same for all applications.

ERROR CODE	DESCRIPTION
101	Indoor unit communication error. Indoor unit can not receive any data from outdoor unit
102	Communication error between indoor unit and outdoor unit. Displayed in indoor unit
108	Error due to repeated address setting (When 2 or more devices has same address within the network)
110	Communication error between Hydro unit HT (Main PBA) and Control kit PBA (Detection from the Control kit)
121	Error on indoor temperature sensor of indoor unit (Short or Open)
122	Error on EVA IN sensor of indoor unit (Short or Open)
123	Error on EVA OUT sensor of indoor unit (Short or Open)
128	EVA IN temperature sensor of indoor unit is detached from EVA IN pipe
129	EVA OUT temperature sensor of indoor unit is detached from EVA OUT pipe
130	Heat exchanger in/out sensors of indoor unit are detached
135	RPM feedback error of indoor unit's cleaning fan
151	Error due to opened EEV of indoor unit (2nd detection)
152	Error due to closed EEV of indoor unit (2nd detection)
153	Error on floating switch of indoor unit (2nd detection)
154	RPM feedback error of indoor unit
161	Mixed operation mode error of indoor unit; When outdoor unit is getting ready to operate in cooling (or heating) and some of the indoor unit is trying to operate in heating (or cooling) mode
162	EEPROM error of MICOM (Physical problem of parts/circuit)
163	Indoor unit's remote controller option input is Incorrect or missing. Outdoor unit EEPROM data error
180	Simultaneous opening of cooling/heating MCU SOL V/V (1st detection)
181	Simultaneous opening of cooling/heating MCU SOL V/V (2nd detection)
185	Cross wiring error between communication and power cable of indoor unit
186	Connection error or problem on SPi
190	No temperature changes in EVA IN during pipe inspection or changes in temperature indoor unit with wrong address
191	No temperature changes in EVA OUT during pipe inspection or changes in temperature is seen in indoor unit with wrong address
198	Error due to disconnected thermal fuse of indoor unit
201	Communication error between indoor and outdoor units (installation number setting error, repeated indoor unit address, indoor unit communication cable error)
202	Communication error between indoor and outdoor units (Communication error on all indoor unit, outdoor unit communication cable error)
203	Communication error between main and sub outdoor units
205	Communication error on all PBA within the outdoor unit C-Box, communication cable error
206	E206-C001: HUB PBA communication error / E206-C002: FAN PBA communication errorE206-C003: INV1 PBA communication error / E206-C004: INV2 PBA communication error
211	When single indoor unit uses 2 MCU ports that are not in series
212	If the rotary switch (on the MCU) for address setting of the indoor unit has 3 or more of the same address
213	When total number of indoor units assigned to MCU is same as actual number of installed indoor units but there is indoor unit that is not installed even though it is assigned on MCU

ERROR CODE	DESCRIPTION
214	When number of MCU is not set correctly on the outdoor unit or when two or more MCU was installed some of them have the same address
215	When two different MCU's have same address value on the rotary switch
216	When indoor unit is not installed to a MCU port but the switch on the port is set to On
217	When indoor unit is connected to a MCU port but indoor unit is assigned to a MCU and the switch on the port is set to Off
218	When there's at least one or more actual number of indoor unit connection compared to number of indoor units assigned to MCU
219	Error on temperature sensor located on MCU intercooler inlet (Short or Open)
220	Error on temperature sensor located on MCU intercooler outlet (Short or Open)
221	Error on outdoor temperature sensor of outdoor unit (Short or open)
231	Error on COND OUT temperature sensor of main outdoor unit (Short or Open)
241	COND OUT sensor is detached
251	Error on discharge temperature sensor of compressor 1 (Short or Open)
257	Error on discharge temperature sensor of compressor 2 (Short or Open)
262	Discharge temperature sensor of compressor 1 is detached from the sensor holder on the pipe
263	Discharge temperature sensor of compressor 2 is detached from the sensor holder on the pipe
266	Top sensor of compressor 1 is detached
267	Top sensor of compressor 2 is detached
269	Suction temperature sensor is detached from the sensor holder on the pipe
276	Error on top sensor of compressor 1 (Short or Open)
277	Error on top sensor of compressor 2 (Short or Open)
291	Refrigerant leakage or error on high pressure sensor (Short or Open)
296	Refrigerant leakage or error on low pressure sensor (Short or Open)
308	Error on suction temperature sensor (Short or Open)
311	Error on temperature sensor of double layer pipe/liquid pipe (sub heat exchanger) (Short or Open)
321	Error on EVI (ESC) IN temperature sensor (Short or Open)
322	Error on EVI (ESC) OUT temperature sensor (Short or Open)
323	Error on suction sensor 2 (Short or Open)
346	Error due to operation failure of Fan2
347	Motor wire of Fan2 is not connected
348	Lock error on Fan2 of outdoor unit
353	Error due to overheated motor of outdoor unit's Fan2
355	Error due to overheated IPM of Fan2
361	Error due to operation failure of inverter compressor 2
364	Error due to over-current of inverter compressor 2
365	V-limit error of inverter compressor 2
366	Error due to over voltage /low voltage of inverter PBA2
367	Error due to unconnected wire of compressor 2
368	Output current sensor error of inverter PBA2
369	DC voltage sensor error of inverter PBA2
374	Heat sink temperature sensor error of inverter PBA2
378	Error due to overcurrent of Fan2
385	Error due to input current of inverter 2
386	Over-voltage/low-voltage error of Fan2
387	Hall IC connection error of Fan2

ERROR CODE	DESCRIPTION
389	V-limit error on Fan2 of compressor
393	Output current sensor error of Fan2
396	DC voltage sensor error of Fan2
399	Heat sink temperature sensor error of Fan2
400	Error due to overheat caused by contact failure on IPM of Inverter PBA2
407	Compressor operation stop due to high pressure protection control
410	Compressor operation stop due to low pressure protection control or refrigerant leakage
416	Compressor operation stop due to discharge temperature protection control
425	Phase reversal or phase failure (3Ø outdoor unit wiring, R-S-T-N), connection error on 3 phase input
428	Compressor operation stop due abnormal compression ratio
438	EVI (ESC) EEV leakage or internal leakage of intercooler or incorrect connector insertion of EVI (ESC) EEV
439	Error due to refrigerant leakage
440	Heating mode restriction due to high air temperature
441	Cooling mode restriction due to low air temperature
442	Refrigerant charing restriction in heating mode when air temperature is over 15°C
443	Operation prohibited due to the pressure drop
445	CCH is deatched
446	Error due to operation failure of Fan1
447	Motor wire of Fan1 is not connected
448	Lock error on Fan1
452	Error due to ZPC detection circuit problem or power failure
453	Error due to overheated motor of outdoor unit's Fan1
455	Error due to overheated IPM of Fan1
461	Error due to operation failure of inverter compressor 1
462	Compressor stop due to full current control or error due to low current on CT2
464	Error due to overcurrent of inverter compressor 1
465	V-limit error of inverter compressor 1
466	Error due to over voltage /low voltage of inveter PBA1
467	Error due to unconnected wire of compressor 1
468	Output current sensor error of inverter PBA1
469	DC voltage sensor error of inver PBA1
474	Heat sink temperature sensor error of inverter PBA1
478	Error due to overcurrent of Fan1
485	Error due to input current of inverter 1
486	Error due to over voltage/low voltage of Fan
487	Hall IC error of Fan1
489	V-limit error on Fan1 of compressor
493	Output current sensor error of Fan1
496	DC voltage sensor error of Fan1
499	Heat sink temperature sensor error of Fan1
500	Error due to overheat caused by contact failure on IPM of Inverter PBA1
503	Error due to alert the user to check if the service valve is closed
504	Error due to self diagnosis of compressor operation
505	Error due to self diagnosis of high pressure sensor
506	Error due to self diagnosis of low pressure sensor

ERROR CODE	DESCRIPTION
560	Outdoor unit's option switch setting error (when iinappropriate option switch is on)
563	Error due to module installation of indoor unit with old version (Micom version needs to be checked)
573	Error due to using single type outdoor unit in a module installation
601	Communication error between remote controller and the DVM Hydro unit / Hydro unit HT
602	Communication error between master and slave remote controller
604	Tracking error between remote controller and the DVM Hydro unit / Hydro unit HT
618	Error due to exceeding maximum numbers of Hydro unit installation (16 units)
627	Error due to exceeding maximum numbers of wired remote controller installation (2 units)
633	Error caused by installing mixed models
653	Remote controller's temperature sensor is disconnected or has problem
654	Data error on remote controller (Memory read/write error)
702	Error due to closed EEV of indoor unit (1st detection)
703	Error due to opened EEV of indoor unit (1st detection)
901	Error on the sensor of water inlet pipe (Short or Open)
902	Error on the sensor of water outlet pipe (Short or Open)
904	Error on water tank (Short or open)
907	Error due to pipe rupture protection
908	Error due to freeze prevention (Re-operation is possible)
909	Error due to freeze prevention (Re-operation is impossible)
910	Water temperature sensor on water outlet pipe is detached
911	Flow switch off error, When the switch is turned off within 10 seconds after a pump starts its operation (Re-operation is possible)
913	Six times detection for Flow Switch Error (Re-operation is not possible)
914	Error due to incorrect thermostat connection
915	Error on DC fan (Non-operating)
573	Error due to using single type outdoor unit in a module installation
601	Communication error between remote controller and the DVM Hydro unit / Hydro unit HT
602	Communication error between master and slave remote controller
604	Tracking error between remote controller and the DVM Hydro unit / Hydro unit HT
618	Error due to exceeding maximum numbers of Hydro unit installation (16 units)
627	Error due to exceeding maximum numbers of wired remote controller installation (2 units)
633	Error caused by installing mixed models
653	Remote controller's temperature sensor is disconnected or has problem
654	Data error on remote controller (Memory read/write error)
702	Error due to closed EEV of indoor unit (1st detection)
703	Error due to opened EEV of indoor unit (1st detection)
901	Error on the sensor of water inlet pipe (Short or Open)
902	Error on the sensor of water outlet pipe (Short or Open)
904	Error on water tank (Short or open)
907	Error due to pipe rupture protection
908	Error due to freeze prevention (Re-operation is possible)
909	Error due to freeze prevention (Re-operation is impossible)
910	Water temperature sensor on water outlet pipe is detached
911	Flow switch off error, When the switch is turned off within 10 seconds after a pump starts its operation (Re-operation is possible)
913	Six times detection for Flow Switch Error (Re-operation is not possible)

ERROR CODE	DESCRIPTION
914	Error due to incorrect thermostat connection
915	Error on DC fan (Non-operating)

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

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