

Modbus to KNX Gateway

USER MANUAL

SCM-1202-050 1.2 en-US ENGLISH



Important User Information

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1 Preface

1.1 About This Document

This document describes how to configure and use the Modbus to KNX Gateway.

The instructions in this document require a basic knowledge of KNX and Modbus technologies and terminology.

For additional related documentation and file downloads, please visit www.anybus.com/support.

1.2 Document Conventions

Numbered lists indicate tasks that should be carried out in sequence:

1. First do this
2. Then do this

Bulleted lists are used for:

- Tasks that can be carried out in any order
- Itemized information
- An action
 - and a result

User interaction elements (buttons etc.) are indicated with bold text.

Program code and script examples

Cross-reference within this document: [Document Conventions, p. 3](#)

External link (URL): www.hms-networks.com



WARNING

Instruction that must be followed to avoid a risk of death or serious injury.



Caution

Instruction that must be followed to avoid a risk of personal injury.



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.



Additional information which may facilitate installation and/or operation.

1.3 Trademarks

Anybus® is a registered trademark of HMS Industrial Networks. All other trademarks mentioned in this document are the property of their respective holders.

2 Safety



Connecting power with reverse polarity or using the wrong type of power supply may damage the equipment. Make sure that the power supply is connected correctly and of the recommended type.



This product contains parts that can be damaged by electrostatic discharge (ESD). Use ESD prevention measures to avoid damage.

The Modbus to KNX Gateway should only be installed by adequately trained personnel and according to applicable safety regulations.

The unit should be mounted on a standard DIN rail or screw-mounted onto a flat surface inside a properly grounded metallic enclosure. The unit should not be mounted outdoors or exposed to direct sunlight, water, high humidity or dust.

Make sure that you have all the necessary information about the capabilities and restrictions of your local network environment before installation.

3 Product Description

3.1 General

The Anybus Modbus to KNX Gateway is intended for integration of Modbus RTU and Modbus TCP installations into KNX monitoring and control systems.

On the KNX side the gateway acts as a KNX device, and on the Modbus side it emulates a Modbus RTU Master device and/or a Modbus TCP Client device. The Modbus slave device(s) are read by the gateway using automatic continuous polling.

Configuration is carried out using Anybus Configuration Manager (MAPS) which can be downloaded from www.anybus.com/support..

3.2 Operation

After the startup process has completed, the gateway will continuously read data points from the connected Modbus TCP Server and/or Modbus RTU Slave devices and update these values in its memory.

From the KNX system point of view, the whole Modbus system is seen as a single KNX device with the same configuration and operation characteristics as other KNX devices. Every register in the Modbus slave devices will be associated with a specific KNX *group address*. When a new value is read from Modbus for a given register, a write telegram is sent to the associated KNX group. When a telegram is received from the KNX bus, a message is sent to the associated Modbus device to perform the corresponding action.

If a device is not responding during the continuous polling of Modbus devices, a virtual signal inside the gateway will be activated indicating a communication error with the device. These virtual signals indicating real-time communication status are accessible from KNX in the same way as the other data points.

3.3 KNX Interface

The gateway connects directly to the KNX TP-1 (EIB) bus and behaves as one more device in the KNX system, with the same configuration and operational characteristics as other KNX devices.

Internally, the circuit part connected to the KNX bus is opto-isolated from the rest of the electronics.

The gateway receives, manages and sends all the telegrams related to its configuration to the KNX bus.

On receiving telegrams of KNX groups associated to internal datapoints, the corresponding messages are sent to Modbus to maintain both systems synchronised in every moment.

When a change in a signal of the external system is detected, a telegram is sent to the KNX bus (of the associated KNX group) to maintain both systems synchronised in every moment.

The status of the KNX bus is checked continuously. If a bus drop down is detected (e.g. due to a failure in the bus power supply), when the KNX bus is restored again, the gateway will retransmit the status of all the KNX groups marked as *“T” Transmit*. Also the *Updates* of the groups marked as *“U” Update* will be performed. The behaviour of each individual point into the gateway is determined by the flags configured for the point.

3.3.1 KNX Points Definition

Every internal datapoint to define has the following KNX properties:

Property	Description
Description	Descriptive information about the Communication Object or Signal.
Signal	Signal's Description. Only for informative purposes, allows identifying the signal comfortably.
DPT	It is the KNX data type used to code the signal's value. It will depend on the type of signal associated in the external system in every case. In some integrations, it is selectable, in others it is fixed due to the intrinsic characteristics of the signal.
Group	It is the KNX group to which the point is associated. It is also the group to which the read (R), write (W), transmit (T) and update (U) flags are applied. Is the sending group.
Listening addresses	They are the addresses that will actuate on the point, apart of the main Group address.
R	Read. If this flag is activated, read telegrams of this group address will be accepted.
Ri	Read. If this flag is activated, the object will be read on initialization.
W	Write. If this flag is activated, write telegrams of this group address will be accepted.
T	Transmit. If this flag is activated, when the point's value changes, due to a change in the external system, a write telegram of the group address will be sent to the KNX bus.
U	Update. If this flag is activated, on gateway start-up or after a KNX bus reset detection, objects will be updated from KNX.
Active	If activated, the point will be active in the gateway, if not, the behaviour will be as if the point is not defined. This allows deactivating points without the need of delete them for possible future use.

3.4 Modbus Interface

Modbus TCP basically embeds the Modbus RTU protocol in TCP/IP frames. TCP/IP allows faster communication and a longer distance between the master and slave devices than RTU communication over serial line. Modbus TCP allows communication over an existing TCP/IP infrastructure such as a LAN, WAN or the Internet. It also allows multiple Modbus masters to exist in the same network.

The Modbus to KNX Gateway will act as a master in a Modbus TCP network or as a Modbus RTU Master, or both. All other Modbus devices connected to the same network must be slave/server devices.

Each Modbus TCP slave device has an IP address and a predefined *register address map*. The address map defines the address, type and characteristics of each internal point (register) of the device and makes this data accessible through the Modbus TCP protocol.

Each defined point can be configured with a slave address from 0 to 255. This allows for great flexibility, for example to integrate Modbus RTU slave devices connected in a serial line with an RTU/TCP converter enabling access to their data points through TCP/IP. The converter, communicating in TCP, will then identify the destination of the point (slave address in the RTU network) by the contents of the slave address field.

The Modbus TCP protocol defines different types of function codes to read/write different type of registers in Modbus devices, and also different data encoding formats. Implementation can vary between different slave device types and manufacturers. The data encoding and byte order for 16-bit registers can be configured in the gateway.

The communication parameters (IP address, netmask, default router address and TCP port) of the Modbus TCP interface are also fully configurable.

See also [Modbus Points Definition, p. 8](#).

3.4.1 Modbus Points Definition

Each point defined in the gateway has the following Modbus features associated to it:

Feature	Description
Modbus Device	Modbus TCP device to which belongs the point, from a list of Modbus TCP slave devices that can be defined in the gateway (up to 5). For every Modbus TCP slave device defined, a virtual signal is created automatically in the gateway to inform about the communication with the device, this signal is available also from the KNX interface like the rest of the points.
Function code Read Func Write Func	One of the following Modbus function codes can be used: <ul style="list-style-type: none"> • 1- Read Coils. • 2- Read Discrete Inputs. • 3- Read Holding Registers. • 4- Read Input Registers. • 5- Write Single Coil. • 6- Write Single Register. • 15- Write Multiple Coils. • 16- Write Multiple Registers.
#Bits	Number of bits to be used by this signal.
Data Coding Format	One of the following Modbus data coding formats can be used: <ul style="list-style-type: none"> • 16/32/48/64 bits unsigned. • 16/32/48/64 bits signed (one's complement – C1). • 16/32/48/64 bits signed (two's complement – C2). • 16/32/48/64 bits Float. • 16/32/48/64 bits Bitfields. • Error comm
Byte Order	<ul style="list-style-type: none"> • Big Endian • Little Endian • Word Inverted Big Endian • Word Inverted Little Endian
Register Address	The Modbus register address inside the slave device for the point.
Bit inside the register	Bit inside the Modbus register (optional). The gateway allows bit decoding from generic 16 bits input/holding Modbus registers. <i>Bit coding into 16 bit input/holding Modbus registers is used for some devices to encode digital values into this type of registers, being these registers normally accessible using Modbus function codes 3 and 4 (read holding/input registers).</i>

4 Installation

4.1 Overview

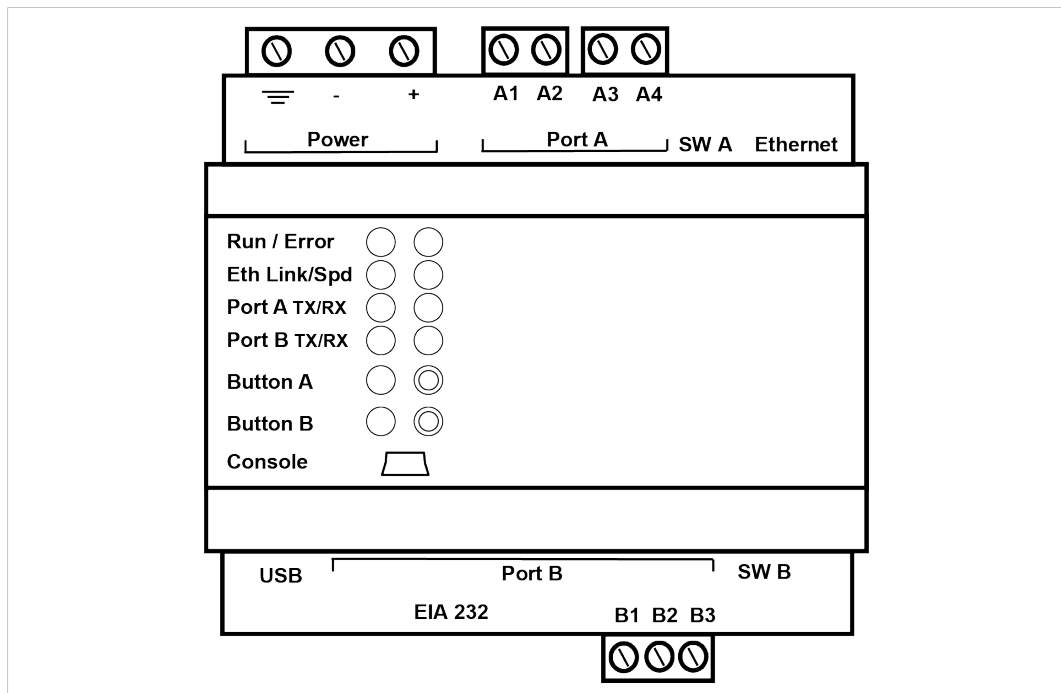


Fig. 1 Front panel



Read the [Safety](#) before starting installation.

Installation Procedure


These are the main steps when installing and setting up the Modbus to KNX Gateway. Each step will be described in the following sections of this document.

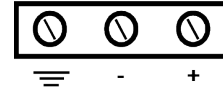
1. Mount the gateway on a DIN rail or using the screw mounting clips.
2. Connect the KNX and Modbus serial and/or Ethernet interfaces.
3. Connect a computer for configuration to the Console USB port or to the Ethernet network.
4. Connect the power supply and power on the unit.
5. Configure the unit using Anybus Configuration Manager (MAPS).

Connectors

See [Technical Data, p. 31](#) regarding terminal wiring and power supply requirements.

Power Connector (3-pole terminal block)

Pin	Function
	Protective Earth
-	Power Ground
+	24 VAC or +9 to +36 VDC



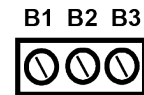
Port A / KNX (2-pole terminal block)

Pin	Function
A1, A2	Not used
A3	KNX +
A4	KNX -



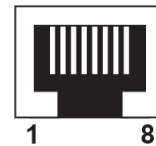
Port B / Modbus RTU EIA-485 (3-pole terminal block)

Pin	Function
B1	EIA-485 Line B (-)
B2	EIA-485 Line A (+)
B3	Signal Ground



Ethernet Port (RJ-45)

Pin	Function
1	TD+
2	TD-
3	RD+
6	RD-
4, 5, 7, 8	(reserved)



USB Port (USB Type A)

Can be used to connect a USB flash storage device for storing logfiles.
HDD drives are **not** supported (max. 150 mA load).

Console Port (USB Type Mini-B)

Used to connect the gateway to a computer for configuration.

LED Indicators

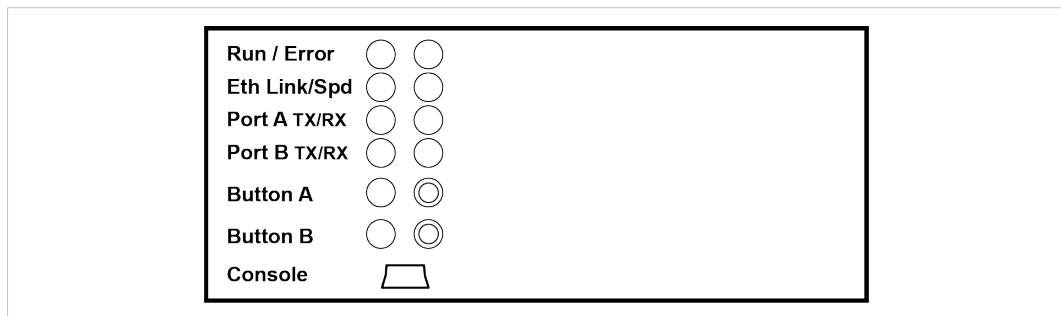


Fig. 2 Overview

LED	Indication	Meaning
Run	Green	Normal operation
Error	Red	Operating error
Eth Link	Green Yellow Flashing	100 Mbit/s Ethernet 10 Mbit/s Ethernet Ethernet traffic
Eth Spd	Green Off Flashing	Full-duplex Ethernet mode Half-duplex Ethernet mode Packet collision
Port A Tx	Green	Transmitting on Port A
Port A Rx	Green	Receiving on Port A
Port B Tx	Green	Transmitting on Port B
Port B Rx	Green	Receiving on Port B
Button A/B	(reserved for future use)	

DIP Switches

DIP switches

SW A is reserved for future use.

SW B toggles internal termination and polarization for Port B.

Switch	Function
1	ON = 120 Ω termination enabled
2, 3	ON = line polarization enabled



4.2 Mechanical Installation

The unit should be mounted on a standard DIN rail or screw-mounted onto a flat surface inside a properly grounded metallic enclosure. The unit should not be mounted outdoors or exposed to direct sunlight, water, high humidity or dust.

Make sure that there is enough space for the connectors and that the LED indicators and configuration switches are accessible after the unit is mounted.

DIN Rail Mount

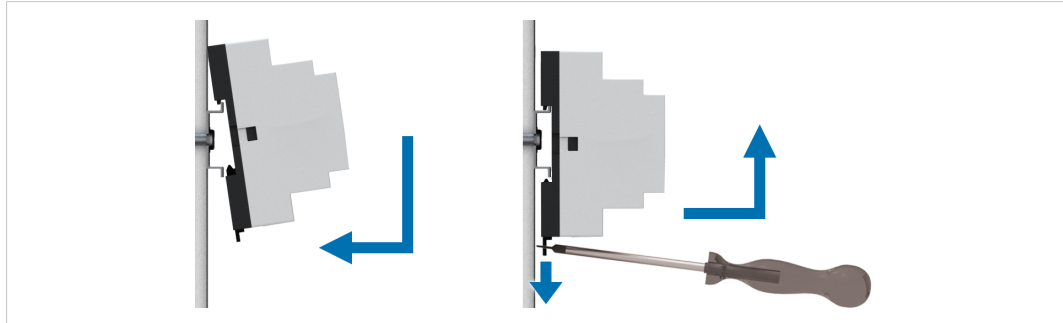


Fig. 3 DIN rail mounting option

Mounting

1. Hook the unit onto the upper lip of the rail.
2. Press the unit gently towards the rail until it snaps into place.

Removing

1. Pull the tab at the bottom of the unit gently downwards.
2. Pull the bottom end free and lift the unit from the rail.

Wall Mount

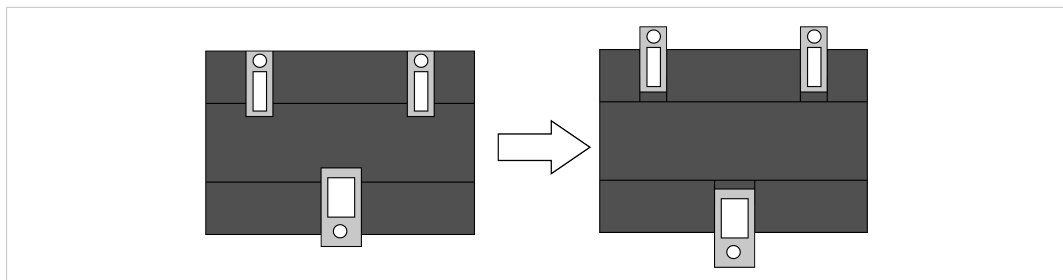


Fig. 4 Wall mounting option

Push the three mounting clips on the back of the unit from the original position to the outer position. A click indicates when the clip is locked in the outer position.

The holes in the mounting clips can now be used for screw mounting.

4.3 Connecting the KNX interface

Connect the KNX TP1 bus to **Port A** on the gateway.



Observe the correct polarity of the connections, see [Connectors, p. 10](#).

If there is no response on the KNX interface, check that the devices on the bus are connected and operating correctly, and that traffic to/from the gateway is not restricted.

If using a KNX line coupler, make sure that the coupler is not filtering the telegrams to/from the Modbus to KNX Gateway.

4.4 Connecting the Modbus interface

Modbus TCP

Connect the network to the **Ethernet** port on the gateway using a straight UTP/FTP CAT5e or CAT6 Ethernet cable.

If there is no response from the network, check that the devices on the network are connected and operating correctly, and that traffic to/from the gateway is not restricted. Contact your network administrator if in doubt.

Modbus RTU

Connect the EIA-485 bus to **Port B** on the gateway.



Observe the correct polarity of the connections, see [Connectors, p. 10](#).

If the gateway is installed at one of the ends of the Modbus serial bus, the internal termination switch for the port (DIP switch 1) should be switched on. See [DIP Switches, p. 11](#).

Do not use an external termination resistor when internal termination is enabled.

4.5 Connecting the Power Supply

Connect a suitable power supply to the **Power** terminal. See [Technical Data, p. 31](#) regarding the power supply requirements.



Observe the correct polarity of the connections, see [Connectors, p. 10](#).

4.6 Configuration Connections

Connect the computer to be used for configuration to the **Console** port on the front panel of the gateway using a standard USB type B cable.

The gateway can also communicate with the computer over Ethernet if they are connected to the same Ethernet network subnet. The gateway uses DHCP as default.



*The **USB** port next to the EIA-232 serial port is only intended for making file backups to a USB flash drive and cannot be used for configuration.*

5 Anybus Configuration Manager (MAPS)

Anybus Configuration Manager (MAPS) is a free Windows®-based software tool which is used to monitor and configure the AnybusModbus to KNX Gateway.

5.1 Installation

Make sure that you have all the necessary information about the capabilities and restrictions of your local network environment before installing and using this software.

1. Download Anybus Configuration Manager (MAPS) from www.anybus.com/support.
2. Double-click on the self-extracting archive to extract the installation files to your computer.
3. Double-click on the installer executable and follow the instructions in the installation wizard. You will be prompted for a location for the installation on your hard disk. Use the default location if unsure.

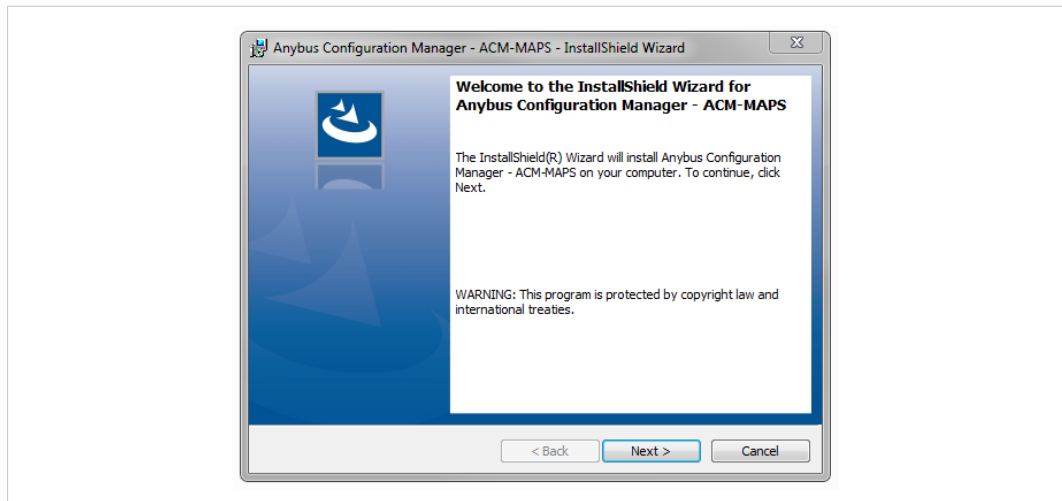


Fig. 5 Installation wizard

4. Open Anybus Configuration Manager (MAPS) from the Start menu or by double-clicking on the icon on your desktop.

5.2 Connection Tab

Anybus Configuration Manager (MAPS) can communicate with the gateway either over an Ethernet network or directly via the **Console** USB port. Projects can be created when the gateway is offline and then downloaded to the unit once a connection has been established.

5.2.1 Connection Mode

IP

When this option is selected the computer used for configuration must be connected to the same Ethernet network subnet as the gateway. DHCP addressing is used as default.

A password is required for IP connection. The default password is “admin”.

See [Configuration Tab, p. 18](#) on how to change the password and the IP addressing mode.

Connection Mode

Connection Mode

Discovered Devices

Description	Value
Gateway Name	ANYBUS-BAC-MBM
Serial Number	000K2372 / 00060161120046
Application Name	IBOX-BAC-MBM
License	3000
License comment	-
Version	0.0.0.2
Configuration Date	01/06/2017 16:22:37
MAC Address	CC:3F:1D:01:06:68
IP Address	10.10.13.144
Net Mask	255.255.255.0
Gateway	10.10.13.1
DHCP	ON
Date Time	26/02/1970 08:26:41
Up Time	0000d 00:28:45


Selected Device: 10.10.13.144

Pw: *****

Disconnect Connect

Fig. 6 IP connection

The software will scan the local Ethernet network for devices that match the current configuration. Compatible devices will be listed in black, incompatible devices in red.

Select the gateway and click on the **Connect** button or on the  symbol in the footer bar. If the connection is successful the footer bar will change color and indicate that the gateway is connected.

If the gateway does not appear in the list:

- ▶ Check the network connections on the gateway and the computer.
- ▶ Check that the gateway is powered on.
- ▶ Check that the firewall settings allow communication with the gateway. Contact your network administrator if necessary.

USB Port

Select this option if the computer used for configuration is connected directly to the gateway via the Console USB port. All the available serial (COM) ports on the computer will be listed.

Connection Mode

Connection Mode

Discovered Devices


Refresh

Selected Device

Description	Value
Gateway Name	IBOX-BAC-MBM
Serial Number	000K2372 / 00060161120046
Application Name	IBOX-BAC-MBM
License	3000
License comment	-
Version	0.0.0.2
Configuration Date	17/02/2017 11:29:12
MAC Address	CC:3F:1D:01:06:68
IP Address	0.0.0.0
Net Mask	0.0.0.0
Gateway	0.0.0.0
DHCP	ON
Date Time	25/02/1970 06:18:49
Up Time	0000d 00:09:04

Disconnect Connect

Fig. 7 USB port connection (COM port numbers may be different on your computer)

Select the COM port used by the USB interface and click on the **Connect** button or on the  symbol in the footer bar. If the connection is successful the footer bar will change color and indicate that the gateway is connected.

Connected to: Serial Port COM7 BMS Protocol: BACnet Server Device Protocol: ModBus Master 5/31/2017 2:46:25 PM

Fig. 8 Footer bar

If the gateway does not appear in the list:

- ▶ Check the USB connections on the gateway and computer.
- ▶ Check that the gateway is powered on.
- ▶ Open the Windows Device Manager to check for issues with the COM ports.

5.3 Configuration Tab

Connection

Configuration

Signals

Receive / Send

Diagnostic

General

KNX

ModBus Master

General Configuration

Gateway Name

IBOX-KNX-MBM

Project Description

IntesisBox KNX to ModBus Master Gateway

Connection

☒ Enable DHCP

IP Address

192.168.100.246

Netmask

255.255.255.0

Default Gateway

Password

Conversions

Edit Conversions

Edit

Fig. 9 Configuration tab

5.3.1 General

General Configuration	
Gateway Name	Used for easy identification of the unit in the project. This entry is only informational and can be edited freely.
Project Description	A brief description of the project. This entry is only informational and can be edited freely.
Connection	
Enable DHCP	Enables/disables dynamic IP addressing. DHCP is enabled as default.
IP	Static IP address for the unit when not using DHCP.
Netmask	Subnet mask when using static IP
Gateway	Default gateway when using static IP
Password	The password when connecting to the gateway via Ethernet. The default password is "admin". To change the password, enter a new password in the text box and download the configuration to the gateway.

Conversions

Edit Conversions Allows you to define customized unit conversions and value filters to be used in the integration project.

See also .

Conversions Manager

Filters

Limit to 0-100

Limit to 0-255

Is not 0

Is higher than 100

Only positive values

Description

Limit to 0-100

Type

Limited Filter

Comp. type

InRange

0 ≤ X ≤ 100

+

-

Operations

Celsius to Fahrenheit

Fahrenheit to Celsius

/10

x100

/100

x1000

/1000

0-100 to 0-255

0-255 to 0-100

Description

Celsius to Fahrenheit

Type

Scale

Arithmetic

Definition

$y = x * B * (10 ^ A) + C$

Values

A

-1

B

18

C

32

+

-

Save

Cancel

Fig. 10 Conversions Manager

5.3.2 KNX

This section contains settings related to KNX communication.

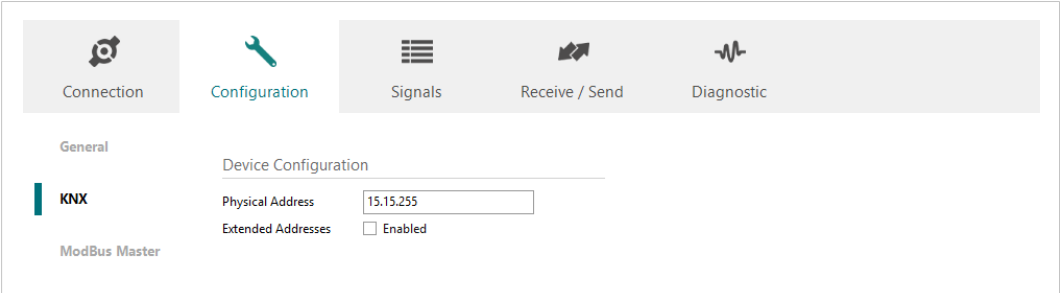


Fig. 11 KNX configuration

Device Configuration	
Physical Address	Sets the KNX Physical Address (Individual Address) of the gateway. This is a unique identifier for the gateway inside a single KNX TP-1 segment. The maximum value is 15.15.255.
Extended Address	Enables the use of KNX Extended Addresses. By enabling this setting, the range of KNX group addresses available increases from the standard 15/7/255 to 31/7/255. Do not enable this function unless required by the integrator.

5.3.3 Modbus Master

This section contains all settings related to Modbus communication.

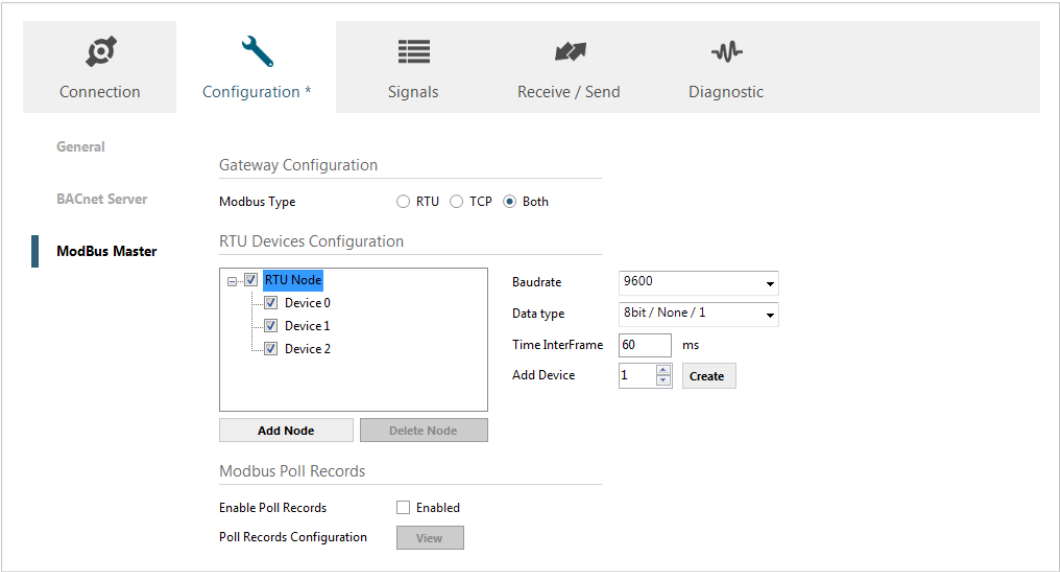


Fig. 12 Modbus master configuration

Gateway Configuration

Select the type of Modbus communication required for the Modbus slave devices:

Modbus RTU	Modbus connection over the EIA-485 serial port.
Modbus TCP	Modbus connection over Ethernet.
	More than one Modbus master device can be active in this mode.
Both	Modbus RTU and Modbus TCP connections allowed simultaneously.

RTU Devices Configuration

Different device and node configuration options are available depending on if Modbus TCP or Modbus RTU communication is selected.

Modbus RTU

The following parameters must be configured for each RTU node:

Baudrate	The communication speed for RTU communication. Allowed values: 2400 to 115200 bps
Data type	Data bits (8 only) / Parity (Odd/Even/None) / Stop bits (1 or 2)
Time InterFrame	Minimum time between the received frame and sent frame. Allowed values: 0 to 2000 ms
Add Device(s)	Creates new devices to be included in the configuration.

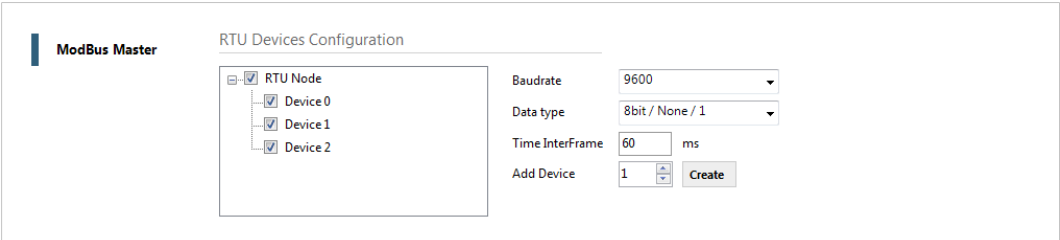


Fig. 13 Modbus RTU device configuration

For each slave device, the user can configure the following parameters:

Device Name	Descriptive name for the Modbus RTU slave device
Slave Number	Modbus slave address
Delete Device	Click on Delete to delete the selected device.
Device Timeout	Time to wait before sending a timeout message if there is no response from the slave device.

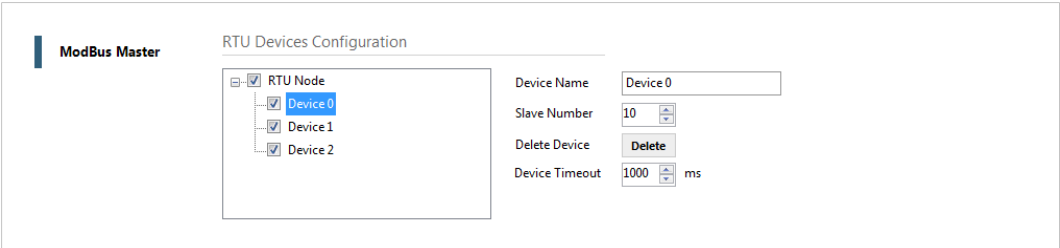


Fig. 14 Modbus RTU node configuration

Modbus TCP

For Modbus TCP the following standard parameters must be configured:

ModBus Master

RTU Devices Configuration

☒ RTU Node

Node 0 (192.168.100.10:502)

Add Node

Delete Node

TCP Node Name

Node 0

TCP Node IP

192.168.100.10

TCP Node Port

502

Add Device(s)

1

Create

☒ Advanced Configuration

Time InterFrame

10

ms

Retry Timeout

5000

ms

Conn. Timeout

10000

ms

Rx Timeout

5000

ms

Time Slave Chg

100

ms

Fig. 15 Modbus TCP node configuration

TCP Node Name	Descriptive device name
TCP Node IP	IP address for the Modbus server to connect
TCP Node Port	Port for the Modbus server to connect (default = 502)
Add Device(s)	Adds the selected number of devices

Advanced Configuration

Additional settings are available when the **Advanced Configuration** checkbox is checked.

!

Do not change these settings unless you have a good knowledge of the Modbus TCP communication protocol.

Time Interframe	Minimum time between received frame and sent frame. Allowed values: 0 to 10000 ms.
Retry Timeout	Minimum time before launching a retry frame after no response on the TCP connection. Allowed values: 0 to 30000 ms
Conn. Timeout	Minimum time before launching an error message after no TCP connection. Allowed values: 0 to 30000 ms
Rx Timeout	Minimum time before launching an error message after no TCP frames received, but TCP connection is OK. Allowed values: 0 to 30000 ms
Time Slave Chg	Minimum time of silence when changing from one slave device to another. Allowed values: 0 to 10000 ms

Modbus Poll Records

The gateway allows the use of Modbus Poll Records.

Modbus Poll Records

Enable Poll Records ☒ Enabled

Poll Records Configuration

Poll Records Configuration

Allow using Poll Records with missing registers ☐ Enabled

Maximum registers in a Poll Record 100

Poll Records Preview

Fill the table with generated Poll Records

Poll Record	Device	Function	Reg.Start	Reg.Stop	Idx. First	Idx. Last
0	0	3	0	0	0	0
1	0	3	2	2	1	1
2	1	1	0	0	2	2
3	1	1	2	2	3	3
4	2	3	0	0	4	4
5	2	3	4	4	5	5

Fig. 16 Modbus poll records

Allow using Poll Records with missing registers

If enabled, it allows nonconsecutive registers to be grouped in the same Poll Record.

Maximum registers in a Poll Record

Sets the maximum number of registers to be grouped in a single Poll Record.

Poll Records Preview

Summary of the Poll Records to be used according to the current configuration present in the Signals table.

Allow using Poll Records with missing registers

If enabled, it allows nonconsecutive registers to be grouped in the same Poll Record.

Maximum registers in a Poll Record

Sets the maximum number of registers to be grouped in a single Poll Record.

Poll Records Preview

Summary of the Poll Records to be used according to the current configuration present in the Signals table.

5.4 Signals Tab

This section contains settings for the signals on both protocols.

Connection

Configuration

Signals

Receive / Send

Diagnostic

			KNX										Modbus Master									
#	Active	Description	DPT	Sending	Listening	U	T	Ri	W	R	Device	Read Func	Write Func	# Bits	Format	ByteOrder	Address	Bit				
1	<input checked="" type="checkbox"/>	Comm Error De...	1.005: alarm	0/0/100			T			R	RTU_Device 0	-	-	1	99: Error comm	-	-	-				
2	<input checked="" type="checkbox"/>	Comm Error De...	1.005: alarm	0/0/101			T			R	RTU_Device 1	-	-	1	99: Error comm	-	-	-				
3	<input checked="" type="checkbox"/>	Comm Error De...	1.005: alarm	0/0/102			T			R	RTU_Device 2	-	-	1	99: Error comm	-	-	-				
4	<input checked="" type="checkbox"/>	On_Off_R	1.001: switch	0/0/1						R	RTU_Device 0	1: Read Coils	-	1	-	-	0	-				
5	<input checked="" type="checkbox"/>	On_Off_W	1.001: switch	0/0/2			U		W		RTU_Device 0	-	5: Write Single Coil	1	-	-	1	-				
6	<input checked="" type="checkbox"/>	On_Off_RW	1.001: switch	0/0/3			U		W		RTU_Device 0	1: Read Coils	5: Write Single Coil	1	-	-	2	-				
7	<input checked="" type="checkbox"/>	Temp_R	9.001: temperature (C)	0/0/4			T			R	RTU_Device 1	3: Read Holding Registers	-	16	0: Unsigned	0: Big End...	0	-				
8	<input checked="" type="checkbox"/>	Temp_W	9.001: temperature (C)	0/0/5			U		W		RTU_Device 1	-	6: Write Single Register	16	0: Unsigned	0: Big End...	1	-				
9	<input checked="" type="checkbox"/>	Temp_RW	9.001: temperature (C)	0/0/6			U		W		RTU_Device 1	3: Read Holding Registers	6: Write Single Register	16	0: Unsigned	0: Big End...	2	-				
10	<input checked="" type="checkbox"/>	Counter_R	5.010: counter pulses (0..255)	0/0/7			T			R	RTU_Device 2	3: Read Holding Registers	-	32	0: Unsigned	0: Big End...	0	-				
11	<input checked="" type="checkbox"/>	Counter_W	5.010: counter pulses (0..255)	0/0/8			U		W		RTU_Device 2	-	16: Write Multiple Regist...	32	0: Unsigned	0: Big End...	2	-				
12	<input checked="" type="checkbox"/>	Counter_RW	5.010: counter pulses (0..255)	0/0/9			U		W		RTU_Device 2	3: Read Holding Registers	16: Write Multiple Regist...	32	0: Unsigned	0: Big End...	4	-				

Active signals: 12 / -

Edit Columns

Import

Export

AA

1

2

3

4

5

6

7

8

9

10

11

12

Check table

Fig. 17 Signals tab

5.4.1 Common and KNX Signal Parameters

The following common and KNX specific parameters can be configured for each signal.

Active	If checked, the signal will be considered in the configuration and will be downloaded to the Gateway as active.
Description	A short description of the signal.
Data Type	EIS data type corresponding to the selected DPT column. Not editable, just for information.
DPT	Select the KNX Data Point Type (DPT) to be used for each signal or KNX communication object.
Sending	KNX sending group address associated to the communication object. 2 (P/S) and 3 (P/I/S) level format is supported.
Listening	5. KNX listening group address associated to the communication object. 2 (P/S) and 3 (P/I/S) level format is supported. More than one group address can be used, comma separated.
U	If selected, the KNX Communication Object will be updated after a KNX bus failure.
T	If selected, the KNX Communication Object will be updated when a transmit telegrams are sent from KNX.
Ri	If selected, the KNX Communication Object will be updated on initialization.
W	If selected, the KNX Communication Object is ready to be written from KNX.
R	If selected, the KNX Communication Object is ready to be read from KNX.
Priority	Define the KNX priority for each KNX Communication Object. Values from 0 to 3, where 0 is the highest priority.

5.4.2 Signals View Settings

The controls at the bottom of the Signals view can be used to customize the column layout and when importing and exporting configurations.



Fig. 18 Signals view settings

Edit Columns	Allows you to select which columns to display in the list. At least one column must be enabled for each protocol.
Import	Imports previously exported Excel files back into the project. See the Export function below. <ul style="list-style-type: none">Replace: The current signals table will be completely replaced with the imported table.Add Signals: The imported rows will be added to the current table.
Export	<ul style="list-style-type: none">Excel: Exports the signal table in Excel format. The file can then be modified in Excel (or another compatible spreadsheet application) and imported back into Modbus to KNX Gateway.
AA	Toggles the font size used in the signals table.
	Moves the currently selected row(s) up/down in the table.
	Adds the selected number of signals to the table.
	Deletes the currently selected row(s) from the table.
Check table	Verifies that the current configuration in the signals table is technically valid. This check will not include integration issues related to bad addresses or other mistakes by the integrator. It will only check that the standard defined conditions and properties are fulfilled.

5.5 Receive/Send Tab

5.5.1 Send

Send the current project configuration to the gateway. If the project has not been saved you will be prompted to save it before sending.

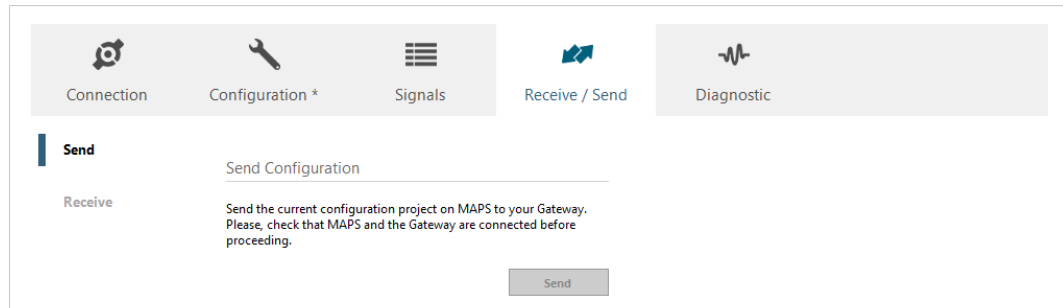


Fig. 19 Send configuration

5.5.2 Receive

Downloads the active configuration from the connected gateway to the Anybus Configuration Manager (MAPS).

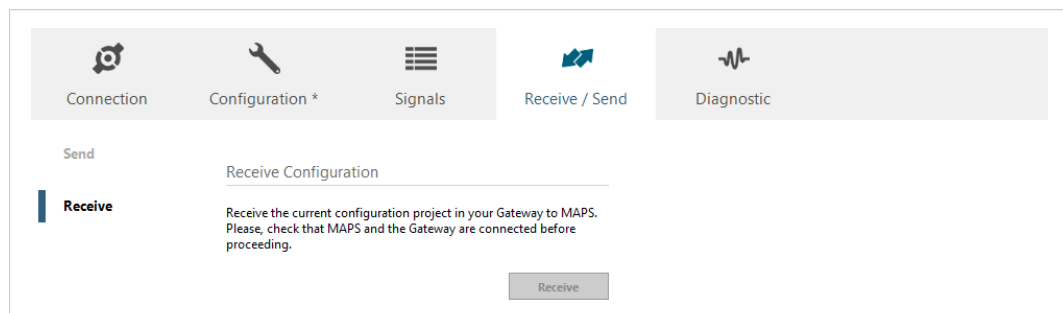


Fig. 20 Receive configuration

5.6 Diagnostic Tab

The Diagnostic view can be used for analysis and troubleshooting when building and implementing configuration projects. Multiple *Viewers* can be added to the interface to monitor communication on the protocols as well as general gateway information.

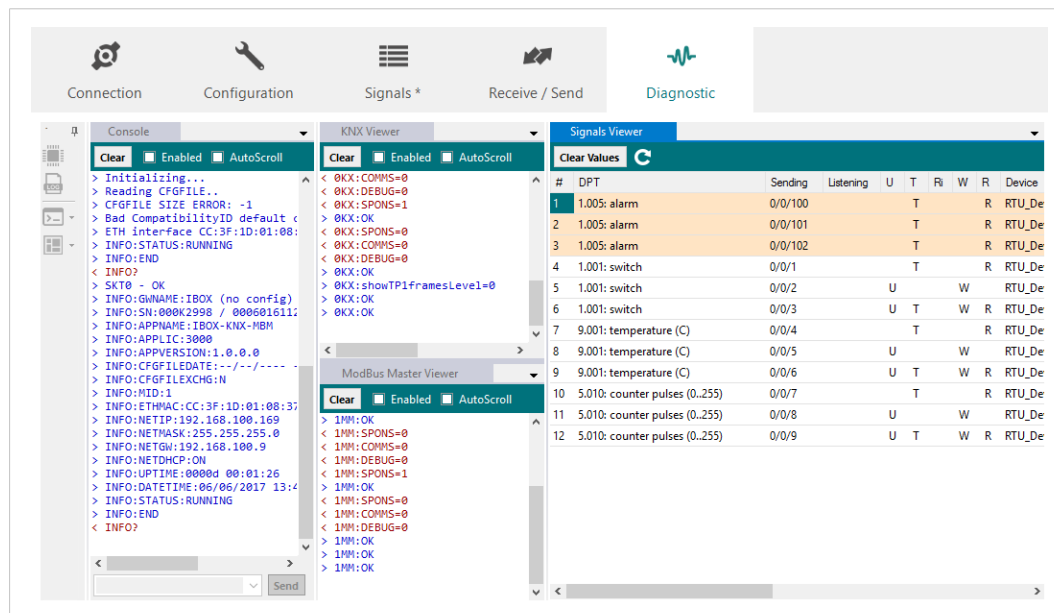


Fig. 21 Diagnostic tab

5.6.1 ToolBox

The ToolBox is located on the left side of the Diagnostic view.



Hardware Test

Initiates a hardware test on the gateway to identify possible hardware issues. During the hardware test normal communication with the protocols will stop.



Log

Records all information present in all viewers and saves it to a zip archive. This file can then be sent to Anybus support to assist troubleshooting.



Commands

Can be used to send specific commands to the gateway:

- INFO?** Requests general information from the gateway.
- RESET** Resets the gateway.
- Enable COMMS** Enables communication in all viewers.
- Disable COMMS** Disables communication in all viewers.



Panel Distribution

Preset window layouts for the Diagnostic view. The viewers can then be moved as required.

5.6.2 Viewers

The data in each viewer is updated in real time when the gateway is connected and active. If the gateway is disconnected, the last received data will remain in the viewer until cleared. The viewers can be rearranged in the window by clicking and dragging.

Three viewers are used to monitor communications: Console, KNX, and Modbus Master. Each of these viewers has the following common options:

Clear	Clears all data from the viewer.
Enable	Enables/disables the viewer. This can be useful to reduce communication workload. To enable/disable all viewers simultaneously, use the ToolBox.
Autoscroll	Enables automatic scrolling of the viewer window as new data is added.

Console Viewer

This viewer displays general information about the gateway and the connection status.

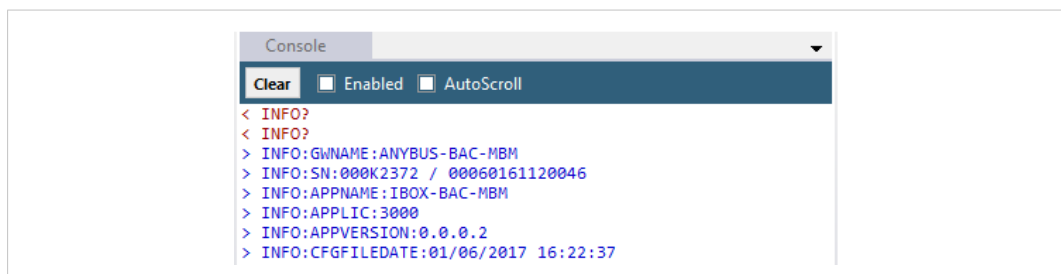


Fig. 22 Console viewer

KNX Viewer

This viewer displays frames related to KNX communication.

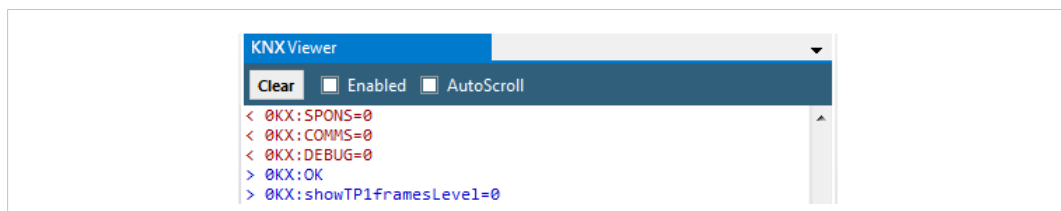


Fig. 23 KNX Server viewer

Modbus Master Viewer

This viewer displays frames related to Modbus communication.

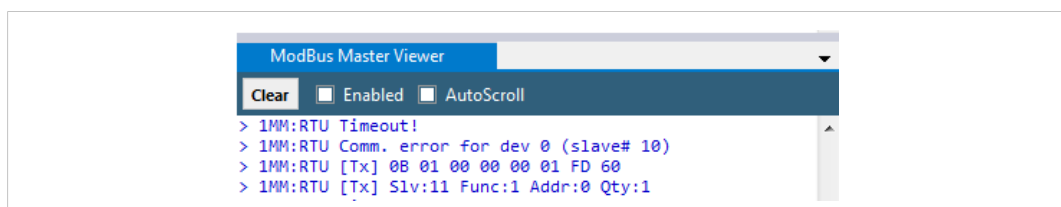



Fig. 24 Modbus Master viewer

Signals Viewer

The Signals viewer displays all active signals in the gateway with its main configuration parameters and its real-time value (if connected).

To manually refresh the values, click on . This may be necessary if the gateway has already been running for some time.


Signals Viewer								
Clear Values 								
#	Name	Type	Instance	Device	Read Func	Write Func	Address	Priority
1	Comm Error Device 0	3: BI	0	RTU_Device 0	-	-	-	RD
2	Comm Error Device 1	3: BI	1	RTU_Device 1	-	-	-	
3	Comm Error Device 2	3: BI	2	RTU_Device 2	-	-	-	
4	Analog Input	0: AI	0	RTU_Device 0	3: Read Holding Registers	-	0	16 ▾
5	Analog Output	1: AO	0	RTU_Device 0	-	6: Write Single Register	1	
6	Analog Value	2: AV	0	RTU_Device 0	3: Read Holding Registers	6: Write Single Register	2	
7	Binary Input	3: BI	3	RTU_Device 1	1: Read Coils	-	0	RD ▾
8	Binary Output	4: BO	0	RTU_Device 1	-	5: Write Single Coil	1	
9	Binary Value	5: BV	0	RTU_Device 1	1: Read Coils	5: Write Single Coil	2	
10	Multistate Input	13: MI	0	RTU_Device 2	3: Read Holding Registers	-	0	RD ▾
11	Multistate Output	14: MO	0	RTU_Device 2	-	16: Write Multiple Regist...	2	
12	Multistate Value	19: MV	0	RTU_Device 2	3: Read Holding Registers	16: Write Multiple Regist...	4	

Fig. 25 Signals viewer

A Technical Data

General	
Model name	Anybus Modbus to KNX Gateway
Order code	AB9901-nnnn (nnnn = number of datapoints)
Dimensions (L x W x H)	90 x 88 x 56 mm
Operating temperature	0 to +60 °C
Storage temperature	-40 to +85 °C
Humidity range	5 to 95 % non-condensing
Mechanical rating	IP20
Mounting	DIN rail or screw mount
Power supply	Must be NEC Class 2 or LPS and SELV rated AC: 24 VAC ±10 %, max. 127 mA DC: 9 to 36 VDC ±10 %, max. 140 mA (Recommended: 24 VDC)
Terminal wiring	Use solid or stranded wires (twisted or with ferrule) 1 core: 0.5 to 2.5 mm ² 2 cores: 0.5 to 1.5 mm ² 3 cores: not permitted
Certifications	CE and RoHS compliant See www.anybus.com/support for more information.

Communication			
Interface	Ethernet	KNX TP1 (Port A)	EIA-485 (Port B)
Compliance	IEEE 802.3	-	Modbus V1.02
Protocols	Modbus TCP (client)	KNX	Modbus RTU (master)
Data rate	10/100 Mbit/s	9.6 kbps	2.4, 4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbps
Physical layer	10BASE-T, 100BASE-TX	KNX TP1, two twisted pairs, overall shield and sheath 29 VDC / 5 mA	EIA-485, 3-wire isolated
Maximum cable length	100 m	-	2.4 to 57.6 kbps: 1200 m 115.2 kbps: 1000 m
Port connector	Shielded RJ-45	2-pin pluggable terminal block	3-pin pluggable terminal block
Isolation	1500 VDC	2500 VDC	1500 VDC (except from D-sub connector)

KNX						
Order Code	AB9901 –	100	250	600	1200	3000
Maximum number of KNX Communication Objects		100	250	600	1200	3000
Maximum number of KNX Main Group Addresses		100	250	600	1200	3000
Maximum number of KNX Associations		200	500	1200	2400	6000
Supported Modbus slave device types		Modbus RTU (EIA485), Modbus TCP				
Maximum number of Modbus Slave devices		Up to 255 devices per node (RTU and TCP) Up to 5 TCP connections				

