



Intesis ASCII Server User Manual

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Intesis™
BY HMS NETWORKS

ASCII Server

KNX

Hms Connecting Devices™

USER MANUAL

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Intesis™ ASCII Server – KNX

Important User Information

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Gateway for the integration of KNX installations into ASCII IP or ASCII Serial enabled monitoring and control systems.

ORDER CODE	LEGACY ORDER CODE
INASCKNX6000000	IBASCKNX6000000
INASCKNX6000000	IBASCKNX3K00000

Description

Introduction

This document describes the integration of KNX installations into ASCII serial (EIA232 or EIA485) or ASCII IP compatible devices and systems using the Intesis ASCII Server – KNX gateway.

The aim of this integration is to make accessible KNX system signals and resources from any system capable to be programmed to read and write simple text messages through EIA232 or EIA485 serial port or Ethernet TCP/IP port (for example Extron, LiteTouch systems).

The gateway acts as a KNX device in its KNX interface, reading/writing points of other KNX device(s), and offering this point's values of KNX device(s) through its ASCII interface using simple ASCII messages.

Configuration is carried out using the configuration software Intesis™ MAPS.

This document assumes that the user is familiar with ASCII and KNX technologies and their technical terms.

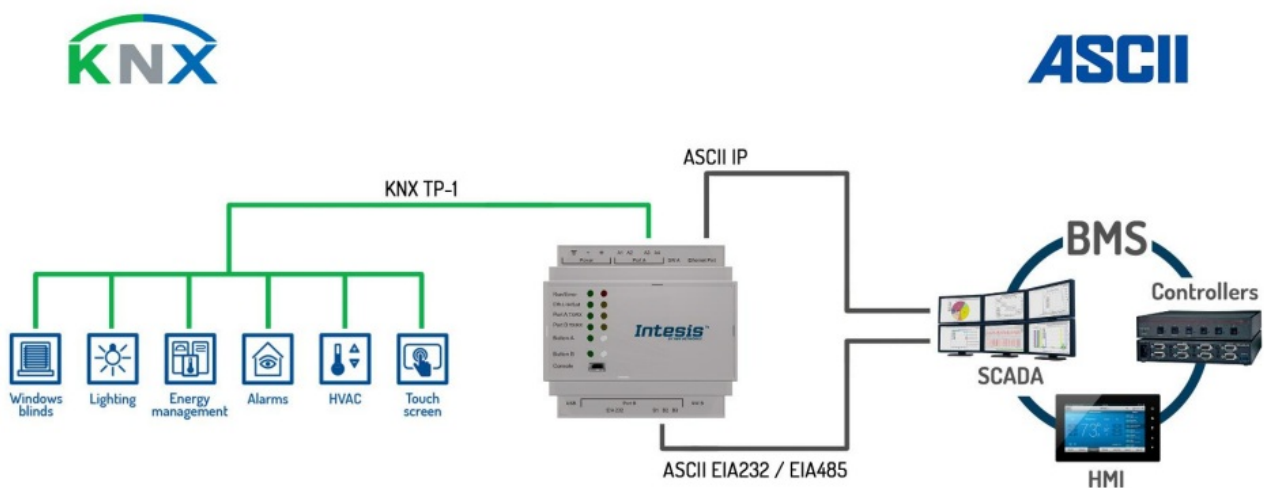


Figure 1.1 Integration of KNX into ASCII IP or ASCII Serial control and monitoring systems

Functionality

From the KNX system point of view, after the start-up process, the gateway reads the points configured to be read at the start and remains listening for changes of value of group addresses associated with internal data points. Any of these changes, when detected, are immediately updated in memory and become available to be read by the ASCII system at any moment.

From the ASCII system point of view, after the start-up process of the gateway, Intesis waits for any query (ASCII messages requesting readings of points or ASCII messages requesting writings of points) and acts according to the message received. See the ASCII interface section for details about these ASCII messages.

Each KNX group address from the KNX is associated with an ASCII, with this, all the configured points of the KNX are seen as a single ASCII point.

When a new value is read from the KNX group address, the new value is updated in the gateway's memory and made accessible at ASCII Server interface.

Gateway's capacity

Intesis capacity is listed below:

Element	600 version	version	Notes
KNX groups	600	3000	A maximum number of different KNX group addresses can be defined.
KNX associations	1200	6000	A maximum number of KNX associations are supported.
Number of ASCII Registers	600	3000	Maximum number of points that can be defined in the virtual ASCII Server device inside the gateway
ASCII link layers supported	Serial (EIA485/EIA485) TCP/IP		Communication with ASCII client with simple messages through a TCP/IP or serial connection

KNX System

In this section, a common description for all Intesis KNX series gateways is given, from the point of view of the KNX system which is called from now on the internal system. The ASCII system is also called from now on an external system.

Description

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

Internally, the circuit part connected to the KNX bus is optoisolated from the rest of the electronics.

Intesis-KNX receives, manages, and sends all the telegrams related to its configuration to the KNX bus.

On receiving telegrams of KNX Groups associated with internal data points, the corresponding messages are sent to the external system (ASCII) to maintain both systems synchronized at 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 synchronized at every moment.

The status of the KNX bus is checked continuously and, if a bus drops down is detected, due to a failure in the bus power supply for example, when the KNX bus is restored again, Intesis 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 behavior of each individual point into Intesis is determined by the flags configured for the point. See details in section 4.

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 as sociated with the external system in every case. In some integrations, it is selectable, in othe rs 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 from 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 exte rnal system, a written telegram of the group address will be sent to the KNX bus.
U	Update. If this flag is activated, on Intesis start-up or after a KNX bus reset detection, objects will be updated from KNX.
Active	If activated, the point will be active in Intesis, if not, the behavior will be as if the point is not d efined. This allows deactivating points without the need of deleting them for possible future u se.

These properties are common for all Intesis KNX series gateways. Although each integration may have specific properties according to the type of signals of the external system.

ASCII interface

This section describes the ASCII interface of the Intesis, its configuration, and its functionality.

Description

The gateway can be connected to any ASCII-enabled device using its EIA232 interface (DB9 connector DTE), EIA485 interface, or TCP/IP (Ethernet connector) and offers through this interface the possibility of supervision and control of its internal KNX addresses using simple ASCII messages.

On receiving messages corresponding to write commands in its ASCII interface, the gateway sends the corresponding write command message to the associated KNX group.

When a new value for a point is received from KNX, the corresponding ASCII message indicating the new value will be sent through the ASCII interface, but only if the point is configured for sending these “spontaneous messages” if it is not configured to do so, then the new value will be available to be polled in any moment from the ASCII enabled device connected to this ASCII interface. This behavior of sending or not through the ASCII interface the new values received from KNX is configurable individually per point in the gateway.

ASCII Serial

Serial communication for the ASCII communication can be configured to match the ASCII master device. Only the RX, TX, and GND lines of the EIA232 connector are used (TX/RX+ and TX/RX- for EIA485).

ASCII TCP

The TCP port to use can be configured (by default 5000 is used).
The IP address, subnet mask, and default router address to use by Intesis can be also configured.

Address Map

The ASCII address map is fully configurable; any point in the Intesis can be freely configured with the desired internal register address. Check the configuration tool manual for more information.

Points definition

Every point defined in the gateway has the following ASCII features associated with it, which can be configured:

Feature	Description								
Signal	Signal or point description. Only for information purposes at the user level.								
ASCII string	Defines the ASCII string that will be used to access this register <ul style="list-style-type: none">Max length: 32 characters								
Read/Write	Defines the current function (read, write, or both) to be used from the ASCII side with this register. It can't be configured as it is directly set when selecting the current KNX flags applying to the communication object. <table><tr><th>Function</th><th>Read</th><th>Write</th><th>Read/Write</th></tr><tr><td>KNX communication object flags</td><td>R T R T</td><td>W U W U Ri U W Ri U</td><td>R W Ri T U R W T U W T</td></tr></table>	Function	Read	Write	Read/Write	KNX communication object flags	R T R T	W U W U Ri U W Ri U	R W Ri T U R W T U W T
Function	Read	Write	Read/Write						
KNX communication object flags	R T R T	W U W U Ri U W Ri U	R W Ri T U R W T U W T						
Spontaneous	Determines if any change of value for the point received from KNX will generate a spontaneous ASCII message to send through the ASCII interface informing about the new value.								
A/D	Defines the current variable type for this register from the ASCII side. It can't be configured as it is directly set when selecting the current KNX flags applying to the communication object <table><tr><th>Type</th><th>Analog</th><th>Digital</th></tr><tr><td>KNX communication object</td><td>Communication objects > 1bit</td><td>1bit communication objects</td></tr></table>	Type	Analog	Digital	KNX communication object	Communication objects > 1bit	1bit communication objects		
Type	Analog	Digital							
KNX communication object	Communication objects > 1bit	1bit communication objects							

ASCII messages

Communication from the ASCII side is carried out thanks to simple ASCII messages. Note that these messages can be configured from the configuration tool to match the ASCII master device.

The ASCII messages used to read/write points into the gateway through this interface have the following format

- Message to read a point's value:**

ASCII_String?**r**

Where:

Characters	Description
ASCII_String	A string indicating the point's address inside the gateway
?	The character used to indicate that this is a reading message (configurable from the configuration tool)
\r	Carriage return character (HEX 0x0D, DEC 13)

- Message to write a point's value:**

ASCII_String=vv\r

Where:

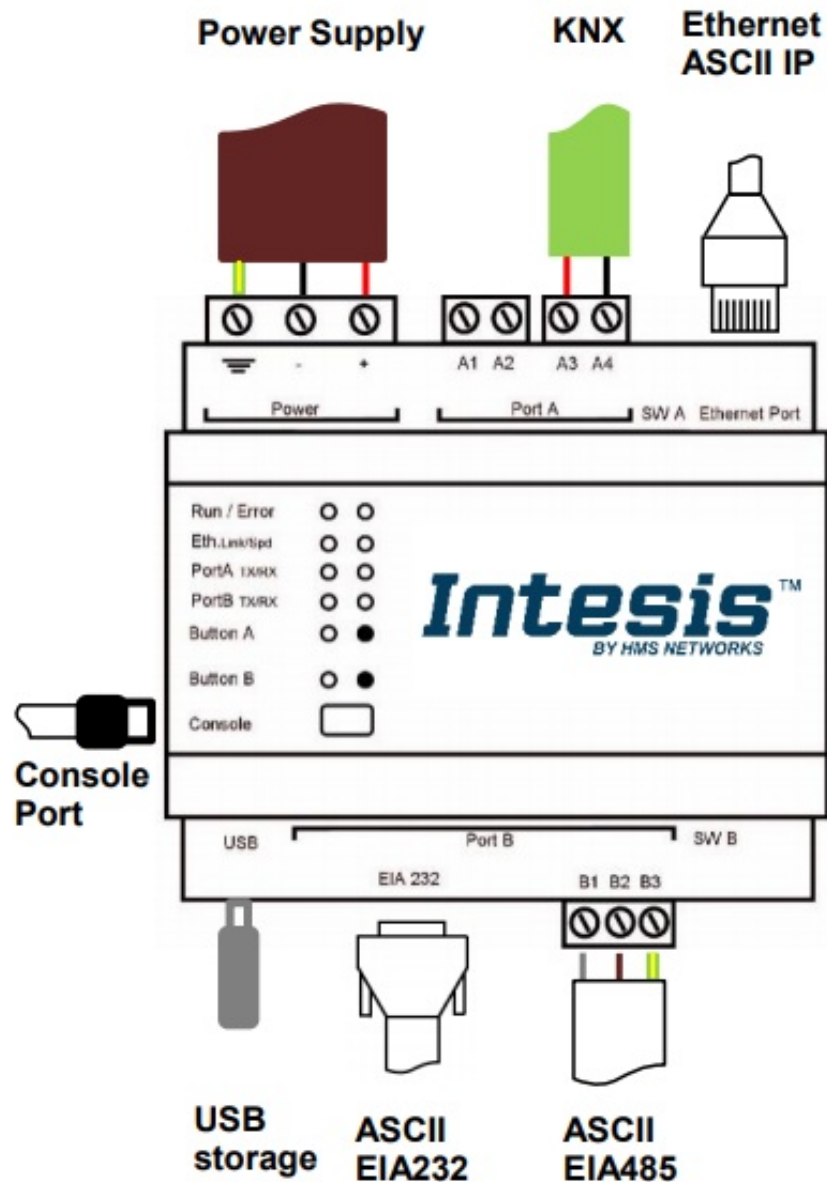
Characters	Description
ASCII_String	A string indicating the point's address inside the gateway
=	The character used to indicate that this is a reading message (configurable from the configuration tool)
vv	Current point's value
\r	Carriage return character (HEX 0x0D, DEC 13)

- Message informing about a point's value (sent spontaneously by the gateway when receiving a change from KNX or sent by the gateway in response to a previous poll for the point):

Characters	Description
ASCII_String	A string indicating the point's address inside the gateway
=	Character used to indicate where to point's data starts
vv	Current point's value
\r	Carriage return character (HEX 0x0D, DEC 13)

Connections

Find below information regarding the Intesis connections available.



Power Supply

Must use NEC Class 2 or Limited Power Source (LPS) and SELV-rated power supply.

If using DC power supply:

Respect polarity applied of terminals (+) and (-). Be sure the voltage applied is within the range admitted (check table below).

The power supply can be connected to earth but only through the negative terminal, never through the positive terminal.

If using AC power supply:

Make sure the voltage applied is of the value admitted (24 Vac).

Do not connect any of the terminals of the AC power supply to the earth, and make sure the same power supply is not supplying any other device.

Ethernet / ASCII IP

Connect the cable coming from the IP network to the connector ETH of the gateway. Use an Ethernet CAT5 cable. If communicating through the LAN of the building, contact the network administrator and make sure traffic on the port used is allowed through all the LAN path (check the gateway user manual for more information). With factory settings, after powering up the gateway, DHCP will be enabled for 30 seconds.

After that time, if no IP is provided by a DHCP server, the default IP 192.168.100.246 will be set.

PortA / KNX

Connect the KNX TP1 bus to connectors A3 (+) and A4 (-) of the gateway's PortA. Respect the polarity

PortB / ASCII Serial

Connect the EIA485 bus to connectors B1 (B+), B2 (A-), and B3 (SNGD) of the gateway's PortB. Respect the polarity.

Connect the serial cable EIA232 coming from the external serial device to the EIA232 connector of the gateway's PortB.

This is a DB9 male (DTE) connector in which only the lines TX, RX, and GND are used. Respect the maximum distance of 15 meters.

Note: Remember the characteristics of the standard EIA485 bus: maximum distance of 1200 meters, maximum 32 devices connected to the bus, and at each end of the bus, it must be a termination resistor of 120 Ω . The port includes a DIP-Switch for configuration of biasing circuit as well as termination:

SW1:

ON: 120 Ω termination active

OFF: 120 Ω termination inactive (default)

SW2-3:

ON: Polarization active

OFF: Polarization inactive

If the gateway is installed in one bus end, make sure that termination is active.

Console Port

Connect a mini-type B USB cable from your computer to the gateway to allow communication between the Configuration Software and the gateway. Remember that Ethernet connection is also allowed. Check the user manual for more information.

USB

Connect a USB storage device (not an HDD) if required. Check the user manual for more information.

Ensure proper space for all connectors when mounted (see section 7).

Powering the device

A power supply working with any of the voltage range allowed is needed (check section 6). Once connected the RUN

led (Figure above) will turn on.

WARNING! In order 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 the earth. Never use a DC power supply with the positive terminal connected to the earth.
- The use of AC power supplies only if they are floating and not powering any other device.

Connection to ASCII

ASCII TCP/IP

Connect the communication cable coming from the network hub or switch to the ETH port of Intesis. The cable to be used shall be a straight Ethernet UTP/FTP CAT5 cable.

Connect the communication cable coming from the ASCII network to the port marked as Port B of Intesis. Connect the EIA485 bus to connectors to connectors B1 (B+), B2 (A-), and B3 (SNGD) of the gateway's PortB. Respect the polarity.

Remember the characteristics of the standard EIA485 bus: maximum distance of 1200 meters, maximum 32 devices connected to the bus, and in each end of the bus it must be a termination resistor of 120 Ω . Set port switch SW1 to ON if the gateway is installed on one bus end. SW2-3 will generally go OFF (no polarization), as polarization will typically be provided in the ASCII Serial master device.

Connection to KNX

Connect the communication cable coming from the KNX bus to the PortA of Intesis.

In case there is no response from the KNX installation of KNX devices to the telegrams sent by the Intesis, check that they are operative and reachable from the KNX installation used by Intesis.

Check as well if there is a line coupler that it is not filtering the telegrams from/to the Intesis.

Connection to the configuration tool

This action allows the user to have access to the configuration and monitoring of the device (more information can be found in the configuration tool User Manual). Two methods to connect to the PC can be used:

- **Ethernet:** Using the Ethernet port of Intesis.
- **USB:** Using the console port of Intesis, connect a USB cable from the console port to the PC.

5 Set-up process and troubleshooting

5.1 Pre-requisites

It is necessary to have an ASCII IP client or ASCII Serial master operative and well connected to the corresponding

ASCII port of Intesis as well as the KNX devices connected to their corresponding ports as well.

Connectors, connection cables, PC to use the configuration tool and other auxiliary material, if needed, are not supplied

by HMS Industrial Networks SLU for this standard integration.

Items supplied by HMS Networks for this integration are:

- Intesis gateway.
- Mini-USB cable to connect to PC
- Link to download the configuration tool.
- Product documentation.

Intesis MAPS. Configuration & monitoring tool for Intesis ASCII series

Introduction

Intesis MAPS is a Windows® compatible software developed specifically to monitor and configure the Intesis ASCII series.

The installation procedure and main functions are explained in the Intesis MAPS User Manual for ASCII. This

document can be downloaded from the link indicated in the installation sheet supplied with the Intesis device or on the product website at

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In this section, only the specific case of KNX to ASCII systems will be covered.

Please check the Intesis MAPS user manual for specific information about the different parameters and how to configure them.

Connection

To configure the Intesis connection parameters press on the Connection button in the menu bar.

In this section, only the specific case of KNX to ASCII systems will be covered.

Please check the Intesis MAPS user manual for specific information about the different parameters and how to configure them.

Connection

To configure the Intesis connection parameters press the **Connection** button in the menu bar.

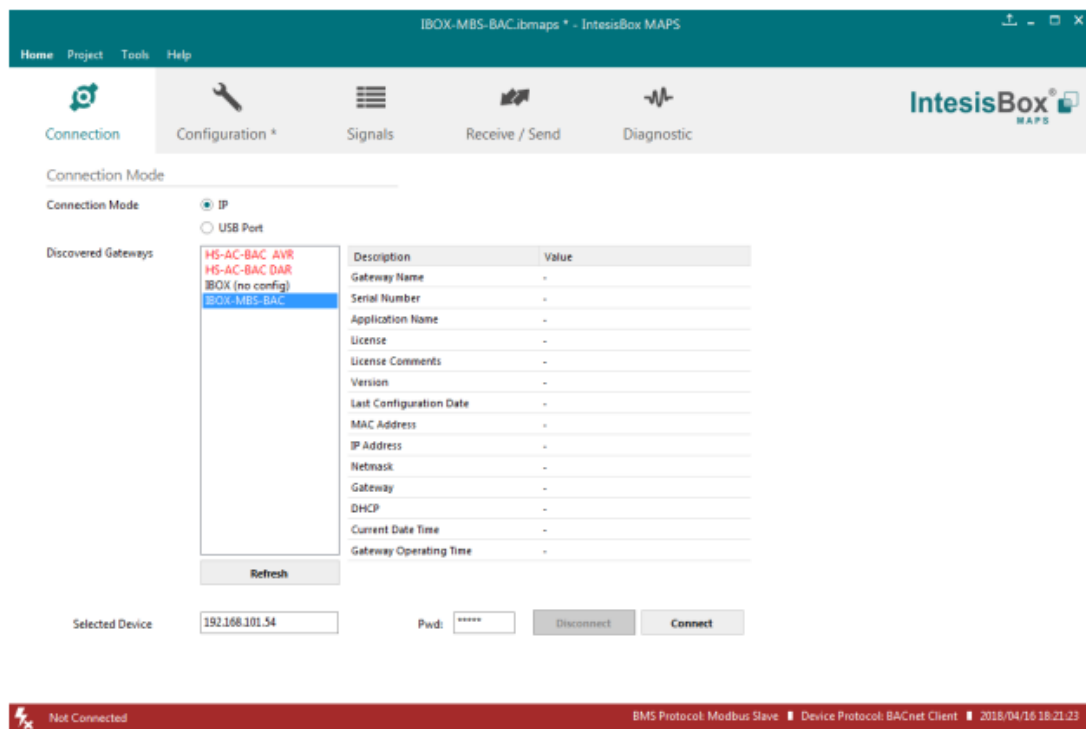


Figure 5.1 MAPS connection

Configuration tab

Select the Configuration tab to configure the connection parameters. Three subsets of information are shown in this window: General (Gateway general parameters), ASCII (ASCII interface configuration), and KNX (KNX TP-1 interface configuration).

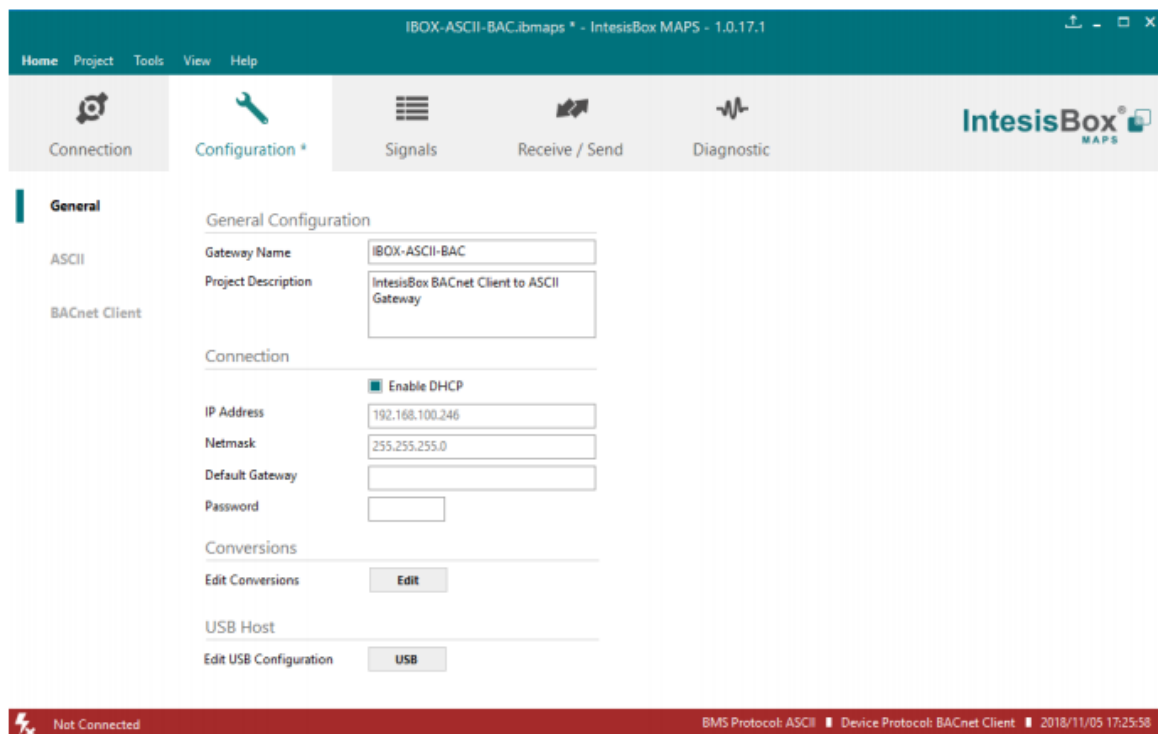


Figure 5.2 Intesis MAPS configuration tab

General parameters are explained in the Intesis MAPS user manual for Intesis ASCII Server Series.

ASCII Configuration

Set the parameters for connection to the ASCII device.

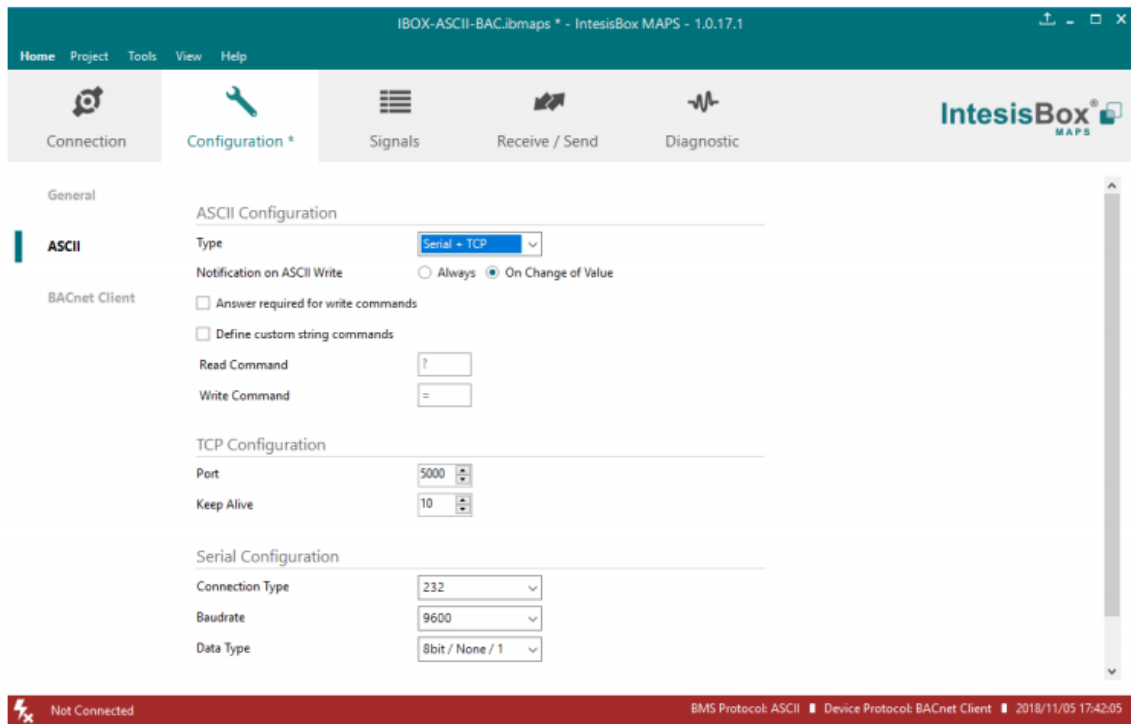


Figure 5.3 Intesis MAPS configuration tab for ASCII Server

- Communication type: Select if ASCII communication will be through TCP/IP, serial (EIA232 or EIA485) or both.
- Notification on ASCII Value: Gateway will allow sending spontaneous messages to the ASCII bus when a change of value is received in the KNX side.
- Answer required for write commands: If enabled, the gateway will send back an OK message to the ASCII master device.
- Define custom string commands: Define the special character to be used to read or write the internal gateway datapoint.
- Port: TCP port to be used for the ASCII communication. By default, it is set to 5000.
- Keep Alive: Time of inactivity before sending a keep-alive message.
 - o 0: Disabled
 - o 1...1440: Possible values expressed in minutes. By default, it is set to 10.
- Connection type: Physical connection, between EIA232 and EIA485, can be selected.
- Baud rate: Selectable from 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200.
- Data type:
 - o Data Bits: 8
 - o Parity can be selected from: none, even, odd.
 - o Stop Bits: 1 and 2

Signals

All available objects, Object Instances, their corresponding ASCII register, and other main parameters are listed in the signals tab. More information on each parameter and how to configure it can be found in the Intesis MAPS user manual for ASCII.

IBOX KNX-BAC.imaps - IntesisBox MAPS - 1.0.23.0									
KNX									
#	Active	Description	EPT	Sending	Listening	U	T	R	W
1	<input checked="" type="checkbox"/>	New Object	1.001 switch	0/0/1					
2	<input checked="" type="checkbox"/>	New Object	1.001 switch	0/0/11					
3	<input checked="" type="checkbox"/>	New Object	1.001 switch	0/0/9					
4	<input checked="" type="checkbox"/>	New Object	1.001 switch	0/0/9					
5	<input checked="" type="checkbox"/>	New Object	1.001 switch	0/0/9					
6	<input checked="" type="checkbox"/>	New Object	1.001 switch	0/0/7					
7	<input checked="" type="checkbox"/>	New Object	1.001 switch	0/0/9					
8	<input checked="" type="checkbox"/>	New Object	1.001 switch	0/0/9					
9	<input checked="" type="checkbox"/>	New Object	1.001 switch	0/0/4					
10	<input checked="" type="checkbox"/>	New Object	1.001 switch	0/0/3					
11	<input checked="" type="checkbox"/>	New Object	1.001 switch	0/0/2					

Sending the configuration to Intesis

When the configuration is finished, follow the next steps.

1. – Save the project (Menu option Project->Save) on your hard disk (more information in Intesis MAPS User Manual).
2. – Go to the tab 'Receive / Send' of MAPS, and in Send section, press Send button. Intesis will reboot automatically once the new configuration is loaded.

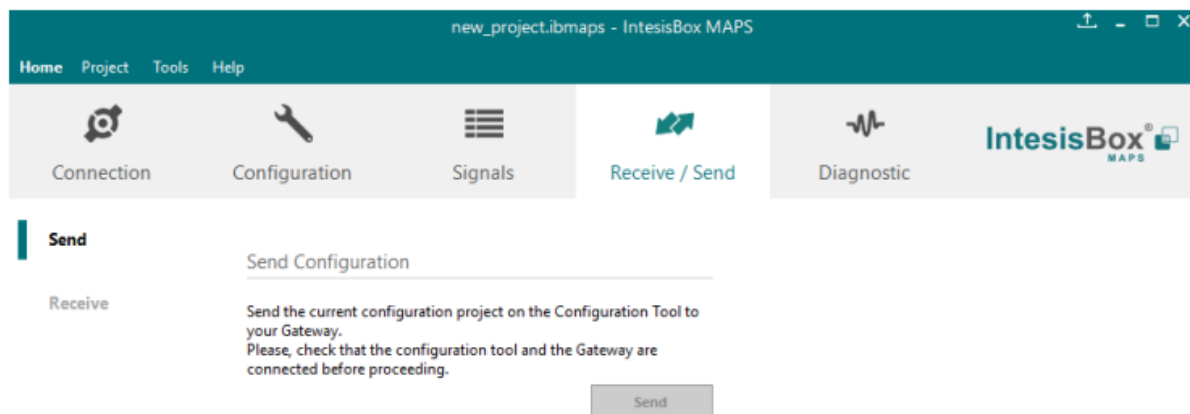


Figure 5.5 Intesis MAPS Receive/Send tab

After any configuration change, do not forget to send the configuration file to the Intesis using the Send button in the Receive / Send section.

Diagnostic

To help integrators in the commissioning tasks and troubleshooting, the Configuration Tool offers some specific tools and viewers.

In order to start using the diagnostic tools, a connection with the Gateway is required.

The Diagnostic section is composed of two main parts: Tools and Viewers.

- Tools

Use the tools section to check the current hardware status of the box, log communications into compressed files to be sent to the support, change the Diagnostic panels' view or send commands to the gateway.

- Viewers

In order to check the current status, viewers for the Internal and External protocols are available. It is also available a generic Console viewer for general information about communications and the gateway status and finally a Signals Viewer to simulate the BMS behavior or to check the current values in the system.

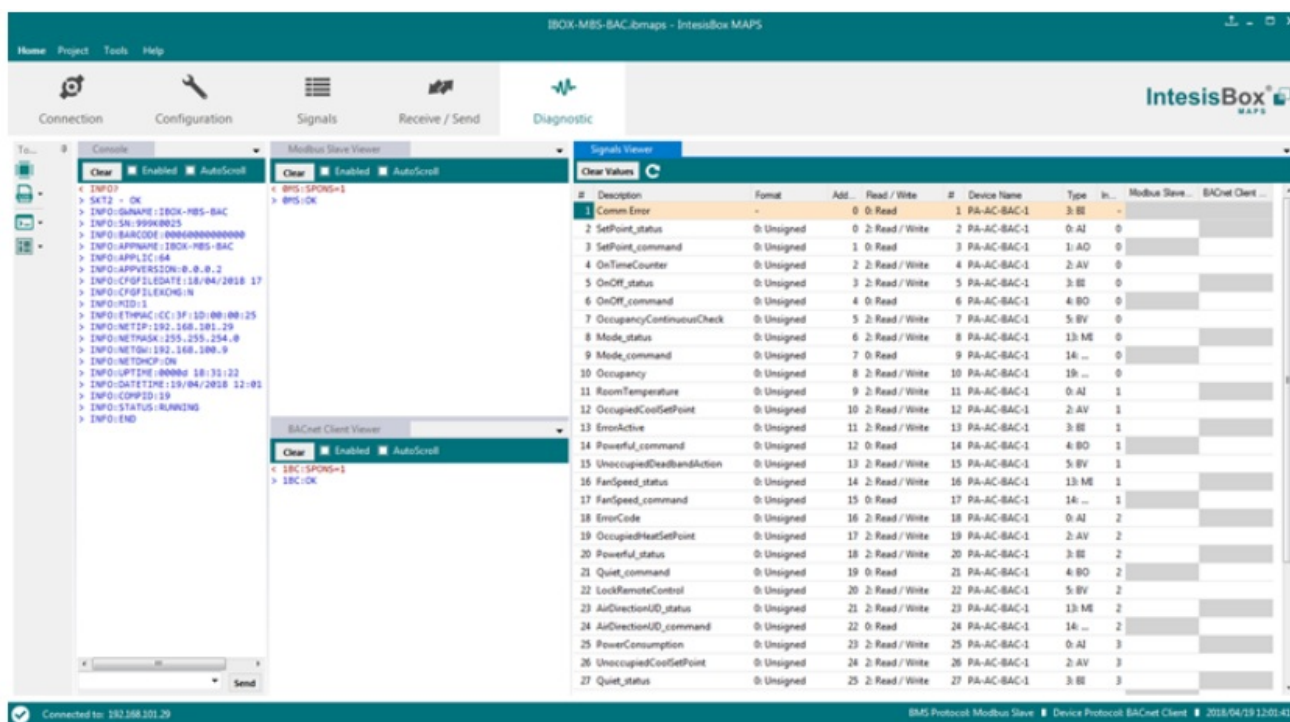


Figure 5.6 Diagnostic

More information about the Diagnostic section can be found in the Configuration Tool manual.

Set-up procedure

1. Install Intesis MAPS on your laptop, use the setup program supplied for this and follow the instructions given by the Installation wizard.
2. Install Intesis in the desired installation site. Installation can be on DIN rail or on a stable not vibrating surface (DIN rail mounted inside a metallic industrial cabinet connected to ground is recommended).
3. If using, ASCII Serial, connect the communication cable coming from the EIA485 port or the EIA232 port of the ASCII installation to the port marked as Port B of Intesis (More details in section 2).
If using, ASCII TCP/IP, connect the communication cable coming from the Ethernet port of the ASCII installation to the port marked as Ethernet of Intesis (More details in section 2).
4. Connect the KNX communication cable coming from the KNX network to the port marked as Port A on Intesis (More details in section 2).
5. Power up Intesis. The supply voltage can be 9 to 30 Vdc or just 24 Vac. Take care of the polarity of the supply voltage applied.

WARNING! In order to avoid earth loops that can damage Intesis 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 the positive terminal connected to earth.**
 - The use of AC power supplies only if they are floating and not powering any other device.
6. If you want to connect using IP, connect the Ethernet cable from the laptop PC to the port marked as Ethernet of Intesis (More details in section 2). Using a hub or switch may be required.
If you want to connect using USB, connect the USB cable from the laptop PC to the port marked as Console of Intesis (More details in section 2).
 7. Open Intesis MAPS, create a new project selecting a template for **INASCKNX—0000**.
 8. Modify the configuration as desired, save it and download the configuration file to Intesis as explained in the

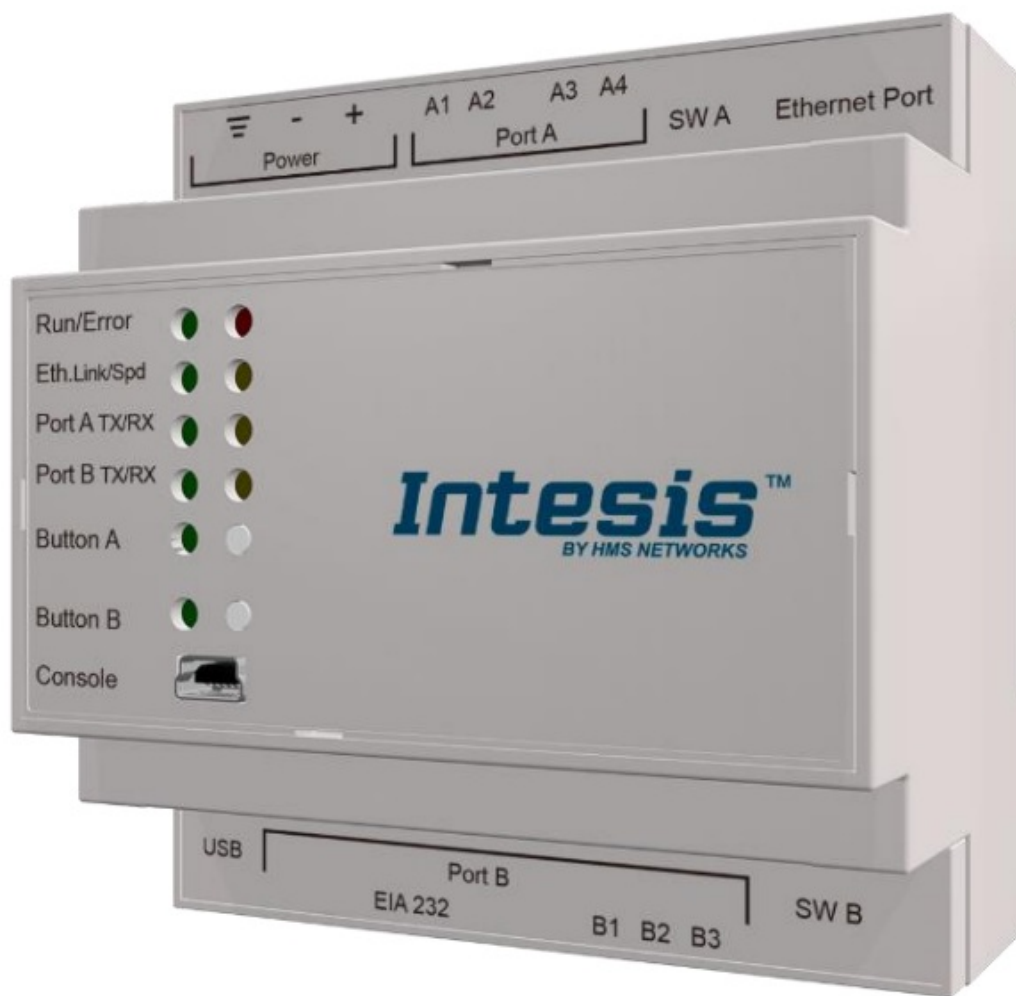
Intesis MAPS user manual.

9. Visit the Diagnostic section, enable COMMS and check that there is communication activity, some TX frames and some other RX frames. This means that the communication with the Centralized Controller and ASCII Master devices is OK. In case there is no communication activity between Intesis and the Centralized Controller and/or ASCII devices, check that those are operative: check the baud rate, the communication cable used to connect all devices and any other communication parameter.



Figure 5.7 Enable COMMS

Electrical & Mechanical Features

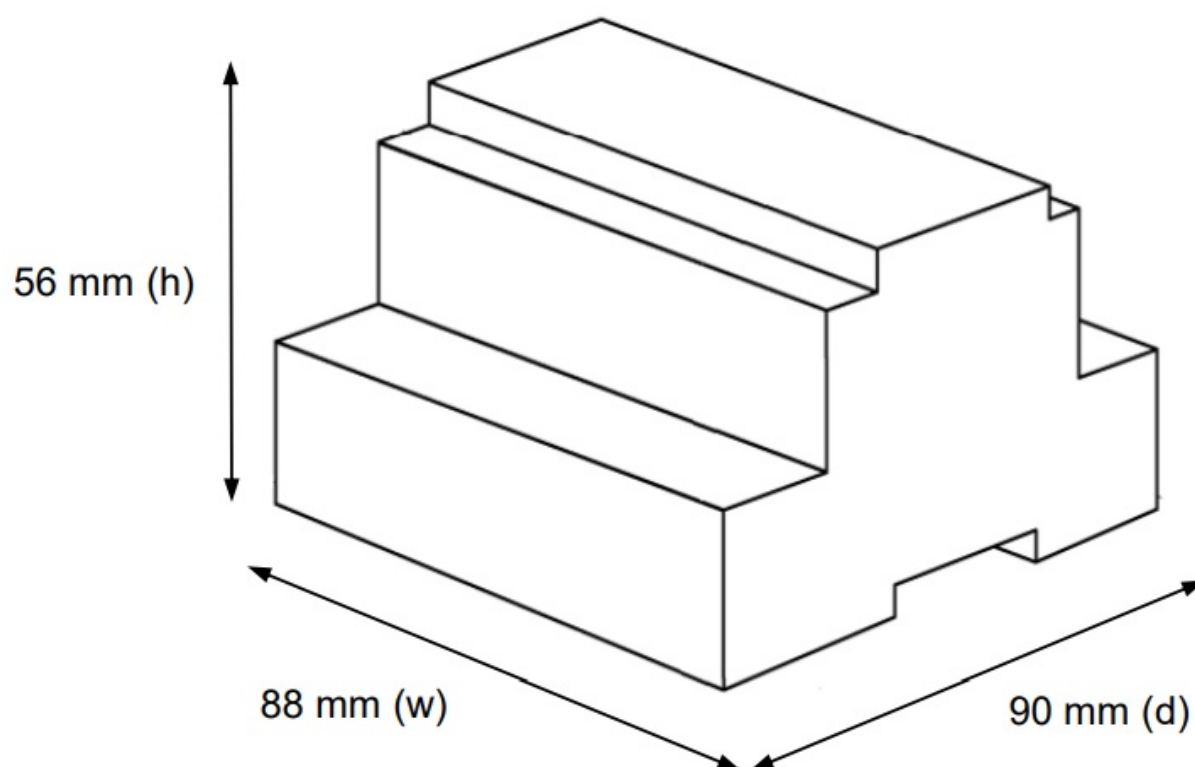


Enclosure	Plastic, type PC (UL 94 V-0) Net dimensions (dxwxh): 90x88x56 mm Recommended space for installation (dxwxh): 130x100x100mm Color: Light Grey. RAL 7035
Mounting	Wall. DIN rail EN60715 TH35.
Terminal Wiring (for power supply and low-voltage signals)	Per terminal: solid wires or stranded wires (twisted or with ferrule) 1 core: 0.5mm ² ... 2.5mm ² 2 cores: 0.5mm ² ... 1.5mm ² 3 cores: not permitted
Power	1 x Plug-in screw terminal block (3 poles) 9 to 36VDC +/-10%, Max.: 140mA. 24VAC +/-10% 50-60Hz, Max.: 127mA Recommended: 24VDC
Ethernet	1 x Ethernet 10/100 Mbps RJ45 2 x Ethernet LED: port link and activity

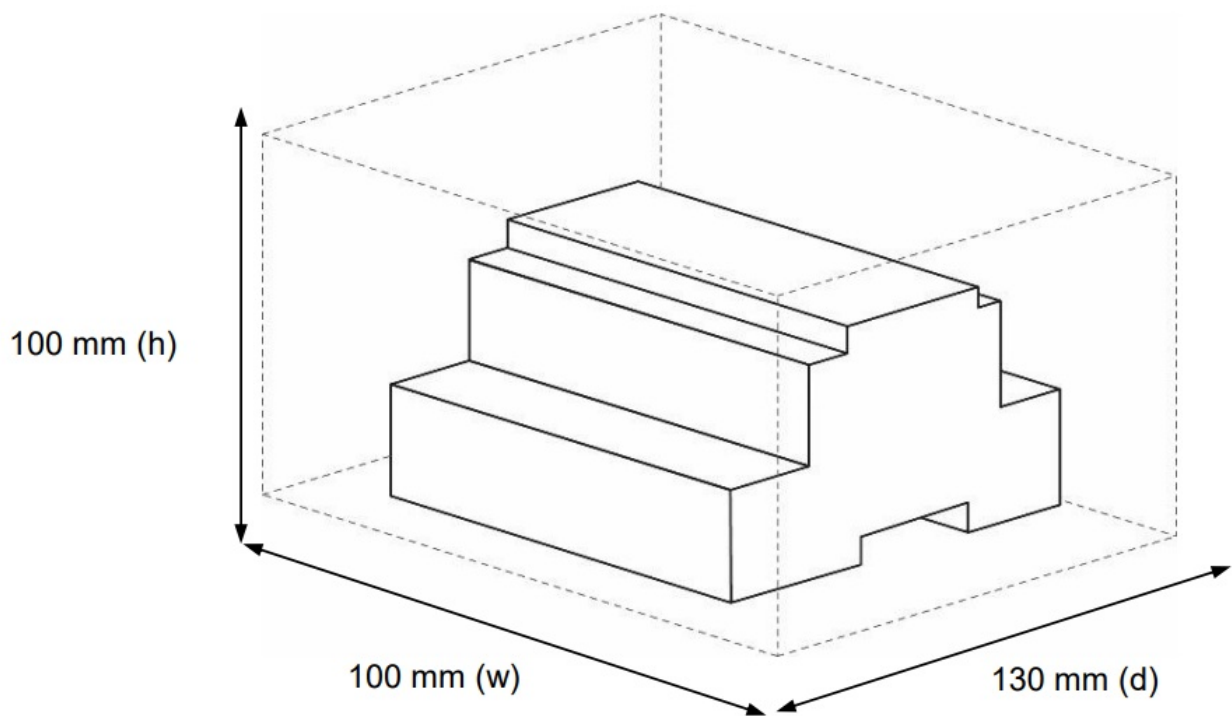
Port A	1 x KNX TP-1 Plug-in screw terminal block orange (2 poles) 2500VDC isolation from other ports KNX power consumption: 5mA Voltage rating: 29VDC 1 x Plug-in screw terminal block green (2 poles) Reserved for future use
Switch A (SWA)	1 x DIP-Switch for PORT A configuration: Reserved for future use
PORT B	1 x Serial EIA232 (SUB-D9 male connector) Pinout from a DTE device 1500VDC isolation from other ports (except PORT B: EIA485) 1 x Serial EIA485 Plug-in screw terminal block (3 poles) A, B, SGND (Reference ground or shield) 1500VDC isolation from other ports (except PORT B: EIA232)
Switch B SWB)	1 x DIP-Switch for serial EIA485 configuration: Position 1: ON: 120 Ω termination active Off: 120 Ω termination inactive (default) ON: Polarization active Off: Polarization inactive (default)
Battery	Size: Coin 20mm x 3.2mm Capacity: 3V / 225mAh Type: Manganese Dioxide Lithium
Console Port	Mini Type-B USB 2.0 compliant 1500VDC isolation
USB port	Type-A USB 2.0 compliant Only for USB flash storage device (USB pen drive) Power consumption limited to 150mA (HDD connection not allowed)
Push Button	Button A: Reserved for future use Button B: Reserved for future use
Operation Temperature	0°C to +60°C
Operational Humidity	5 to 95%, no condensation
Protection	IP20 (IEC60529)

LED Indicators	10 x On board LED indicators 1 x Error LED 1 x Power LED 2 x Ethernet Link/Speed 2 x Port A TX/RX 2 x Port B TX/RX 1 x Button A indicator 1 x Button B indicator
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Dimensions




Recommended available space for its installation into a cabinet (wall or DIN rail mounting), with space enough for external connections



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URL <https://www.intesis.com>

Documents / Resources

 <p>Intesis ASCII Server 1000 USER MANUAL KNX</p>	<p>Intesis ASCII Server [pdf] User Manual Intesis, ASCII Server, KNX</p>
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References

- [Intesis | Gateway solutions for Building Automation](#)
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