IntesisBox MAPS

Configuration & monitoring software of IntesisBox KNX series

User's manual

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1. Introduction

IntesisBox MAPS is a Windows compatible software tool developed specifically to monitor and configure the IntesisBox KNX series (IntesisBox KNX integrating an *External Protocol*). In this document, its use and how to configure the IntesisBox is explained.

Following nomenclatures are used in this document:

- *External Protocol:* Protocol that the IntesisBox integrates besides KNX. i.e: if using the IBOX-KNX-MBM, MBM would be the *External Protocol*.

- IntesisBox or gateway: the words "gateway" or "IntesisBox" are used instead of the full product name (IntesisBox KNX integrating an *External Protocol*). Any other use of the word "gateway" not meaning that will be specifically indicated.

- Configuration Tool: IntesisBox MAPS

2. Installation

The tool is supplied in the shape of a self-extracting setup utility. Supported operating systems are Windows 7 and onwards versions of the Windows OS.

The configuration tool can be downloaded from:

http://intesisbox.com/intesis/software/intesisbox_maps_installer.exe

The web browser will ask for saving the file. Select ***Save File*** and wait for the file to download.
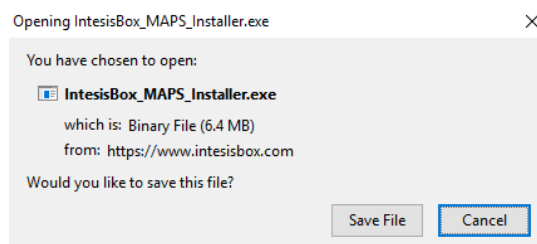

Figure 2.1 Downloading IntesisBox MAPS

Once downloaded, double click on the ***intesisbox_maps_installer.exe*** file and follow instructions provided by the installation wizard.

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3. Welcome page

After starting the IntesisBox MAPS, by clicking its program entry under Windows Start menu (or any other established link), the welcome page will prompt.

This window is used to show general information, latest news and the project management and creation. All this sections are explained in the detail in the following sections.
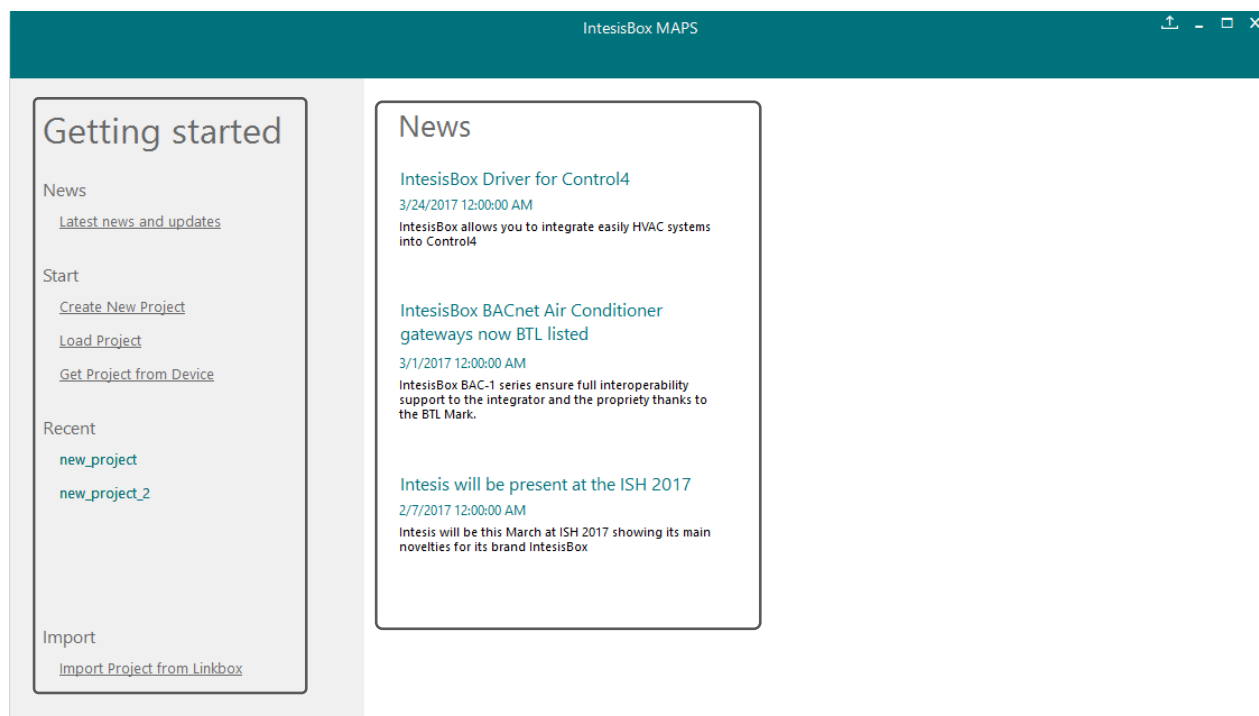

Figure 3.1 Welcome page

3.1 News

This link provides access to the welcome page to check the latest news related to the IntesisBox gateways and MAPS configuration tool.

Use this section to get the latest information related with our products.

3.2 Create New Project

Create a new project from an existing template. In order to start a specific integration project, simply select one of the available templates from the list.

Note: The template is an example of an integration and may be used under this scope. Depending on the type of integration, some parameters may not be left as by default and shall be modified. Please check your IntesisBox gateway user manual for more information on some of the specific parameters configuration.

Click on the KNX logo to list all available project templates for the KNX gateway series.

Make sure that you select the right template according to the external protocol of the gateway.
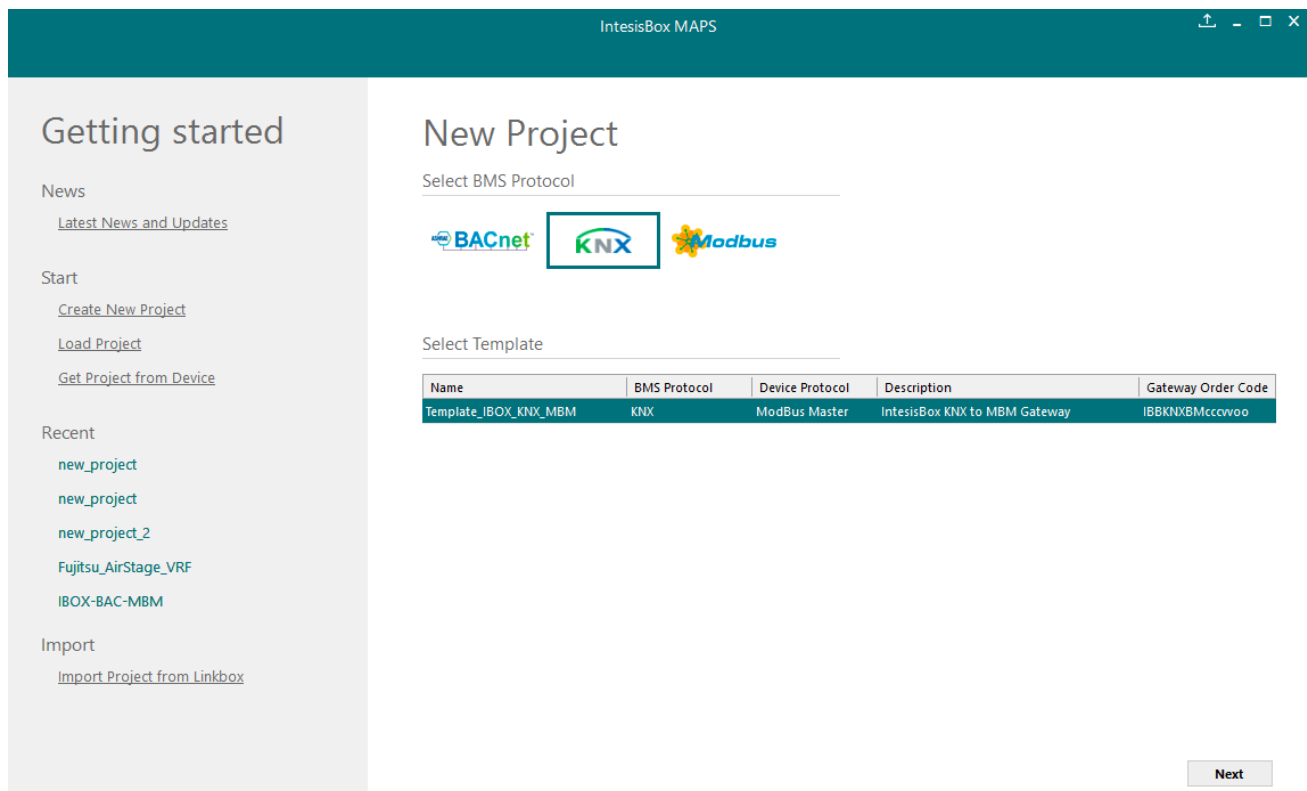

Figure 3.2 Project template selection

3.3 Load Project

Load an already existing project to the configuration tool. In order to import an existing project already programmed, use the **Load Project** option and select the project from the PC or external storage device where the project is stored.
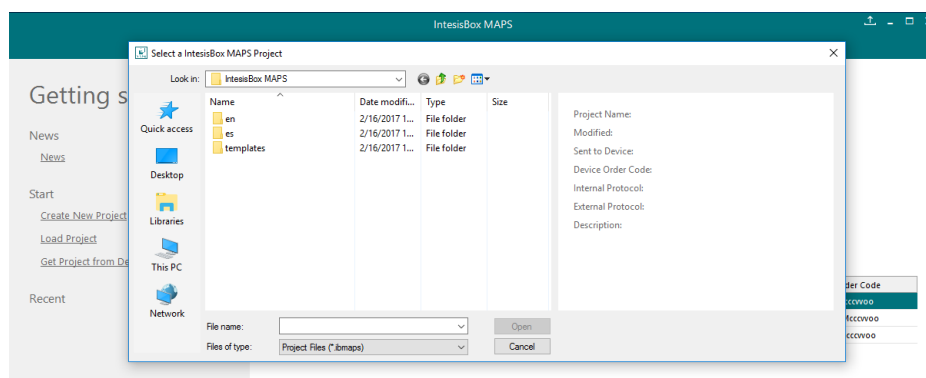

Figure 3.3 Project selection window

After selection, the project will be loaded and configuration can be started as if using a brand-new project, but with all previous work in the project present.

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3.4 Get Project from Device

Use this function to download the current configuration running in the gateway and to import it to the configuration tool. Notice that connection from the configuration tool to the gateway is required.

Depending on your firewall configuration, a warning message like the one below may appear:
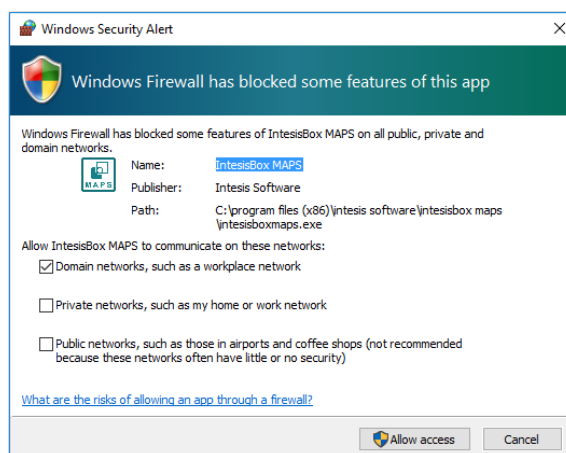

Figure 3.4 Firewall warning message

After that, the tool will ask you where to download the project. Please select the location and press the save button.

3.5 Recent

In this section, the last edited projects in this installation will be shown. It can be used for fast checking of the last projects updated.

3.6 Import Project from LinkBox

This special function allows the use of old LinkBox projects on the configuration tool. To import the project, simply select the folder and click on the "Select Folder" button.

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4. Navigation

To work with the configuration tool, the menu and the tool bar (Figure 4.1) need to be used. In the following lines a brief explanation and links to the corresponding sections can be found.
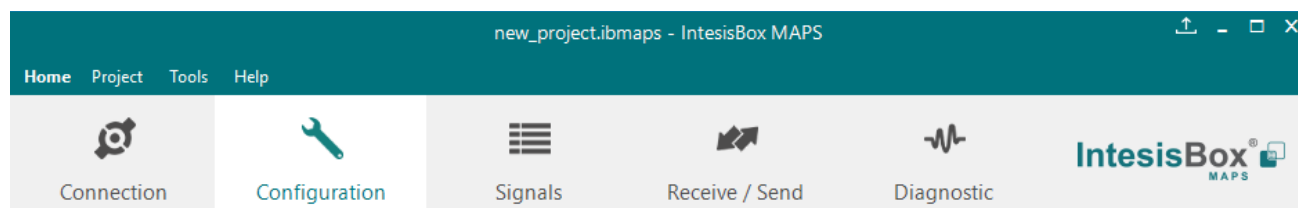

Figure 4.1 Menu and Tool Bar

4.1   Home

This options brings you back to the Welcome page. Check section 3 for more information.

4.2   Project

This option let the user apply basic functions to the project, such as create new projects, load an already existing project, save the project and close the configuration tool.
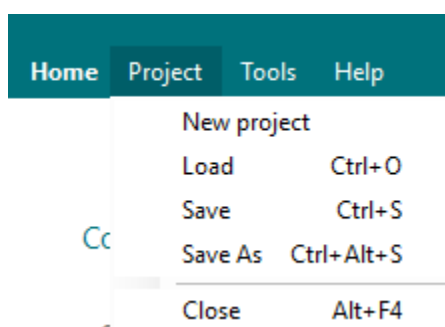

Figure 4.2 Project options

- **New project:** Moves back to the Welcome page and let you select a new project.

- **Load:** Opens a selection window to pick up the project you wanted to load.

- **Save:** Saves the current project changes in the same file. If it is the first time, it will ask for the project location. Otherwise, it will automatically update the current project file.

- **Save As:** Saves the current project into a different location or with a different name from the current one.

- **Close:** Closes the configuration tool.

4.3 Tools

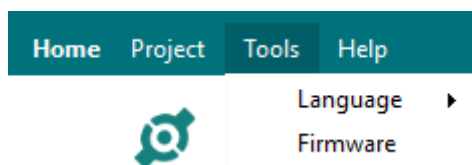This option provides access to language settings and Gateway firmware update.

Figure 4.3 Tools options

- **Language**: This option allows the user to select one of the available languages. Once the language is selected, you need to reboot the software for the new language configuration to be applied.
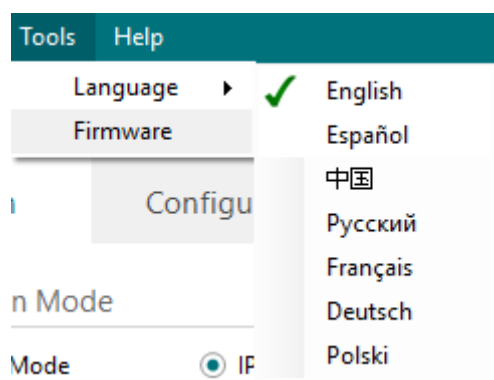

Figure 4.4 Language selection

- **Firmware**: By default, information shown is only the one coming from the current gateway status. In case the user is interested in checking for new firmware updates, the "Check for Update" button needs to be pressed.

  In case there is any update available, a summary for the new update information will be shown in the "Firmware Update Information" side of the window. If the user is interested, the "send" button should be pressed to update the box.

> **IMPORTANT:** Please notice that the firmware update process shall not be interrupted. Make sure that you go for the update process while in a safe location (no risk of power blackouts or similar).

> **NOTE:** If the Gateway is already working as expected, the update may not be advisable. Please, make sure that you update the gateway only when required.

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Figure 4.5 Firmware Manager view

4.4   Help

Extra information about the software is shown in this section.
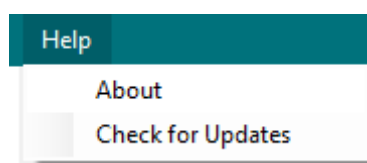
Figure 4.6 Help menu

- **About:**

  It prompts information about the current configuration tool version.

Figure 4.7 About information

- **Check for Updates**
  Periodically, new free versions of Configuration Tool are released. Those new releases include improvements, fixes, support for new firmware versions of IntesisBox or support for newer IntesisBox products.

  This option automatically checks if there is any newer version and in case it exists, it offers the possibility to download and update the software. Notice that this requires Internet connection.

4.5 Footer

In the footer, relevant information about the connection status and protocols used can be found.
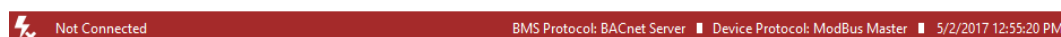

Figure 4.8 Footer

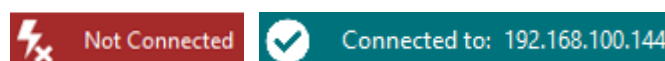- **Connection Status:** It indicates if the Configuration Tool is connected or not with the Gateway.

Figure 4.9 Connection status options

It can also be used to connect or disconnect clicking directly on the icons

- **Internal Protocol:** It indicates the current Internal Protocol (KNX in this case).

- **External Protocol:** It indicates the current External Protocol (it will depend on the specific Gateway model.

- **Date**: Current time and date.

NOTE: Footer color may change from red to any other when there is connection between the gateway and the configuration tool.

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5. Connection

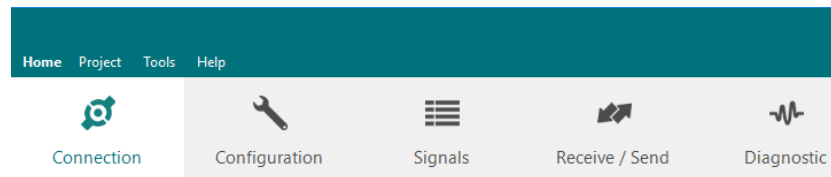In this section, it is detailed how to set the communication and monitor the IntesisBox.

Figure 5.1 Connection section

There are two different ways of communicating the Configuration Tool with the IntesisBox (check the Connection section in your IntesisBox User Manual): using the USB port or the Ethernet network. In the following lines the configuration of both is explained as well as the functionalities of the Configuration Tool when connected or not.

When there is no connection with the IntesisBox, IntesisBox MAPS allows the creation and edition of configuration projects. That includes setting the linked signals, protocol parameters …

When the Configuration Tool is connected to the IntesisBox, it can perform other functionalities such as monitoring the communication and sending the configuration files to the device (sections 9.2 and 8.1 respectively).

5.1 IP connection

If connection with the Gateway shall be done by Ethernet IP network, select IP as the *connection mode*. The software will automatically scan the current network where the PC is connected looking for IntesisBox gateways.
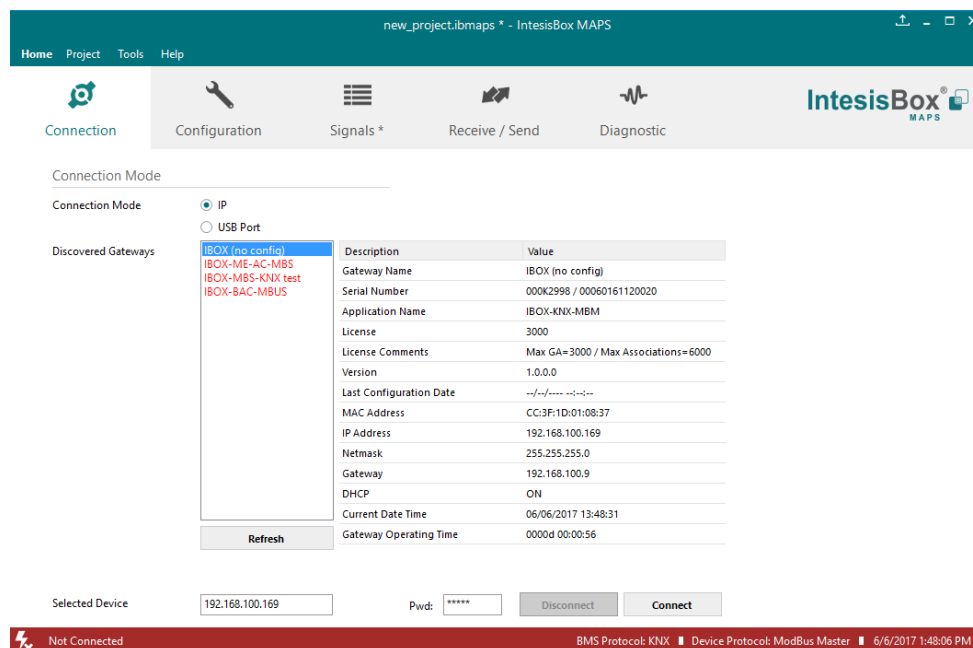

Figure 5.2 IP connection

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In the *Discovered Devices* list, all gateways found will be listed. In black, gateways that match the current project selected. In red, gateways that do not match the current project selected.

If no gateways are shown, please check your network connection parameters and make sure that the gateway is powered and connected.

Notice that relevant information can be checked by clicking on each gateway (Figure 5.3).

Once the device is selected, connection will be started by pressing the connect button ⚡, on the bottom left corner, or clicking on the *Connect* button.
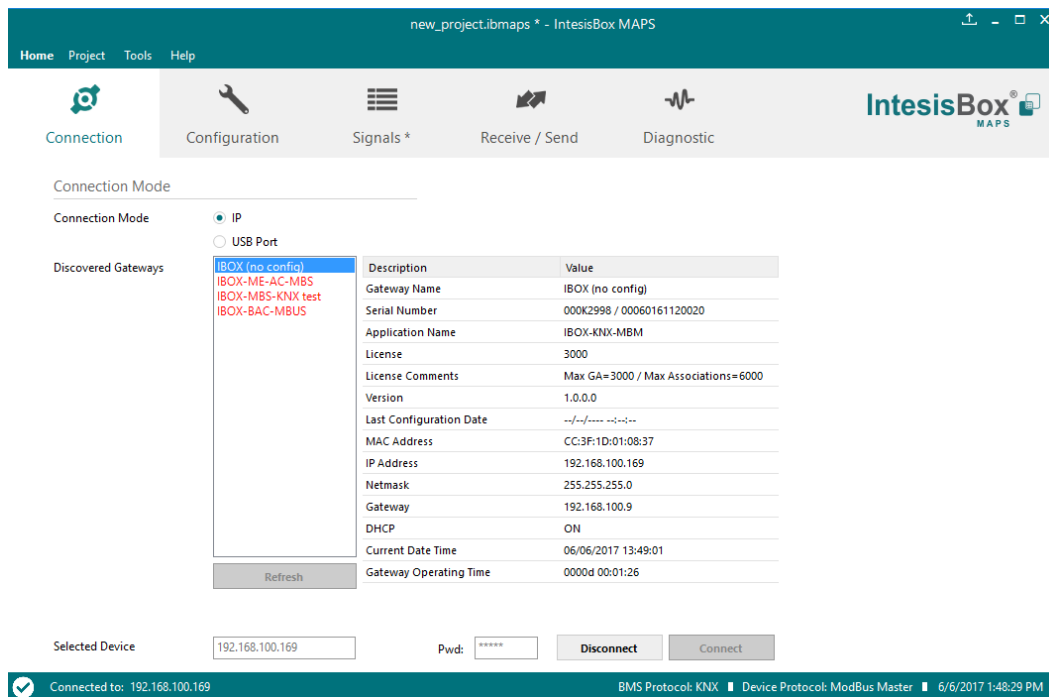
Figure 5.3 IP connection

If connection has been successful, the footer will turn from red to any other color prompting the current IP of the gateway where the configuration tool is connected to.

To disconnect, simply click on the connect button again.

> **IMPORTANT**: Notice that if connecting through IP, a password is required. By default, the password is "admin". Find more information on how to change the password on section 6.

> **NOTE:** By default, the gateway is offered with DHCP enabled. If you want to change this setting, please check section 6.

5.2 USB connection

If Ethernet IP connection is not possible or if USB is preferred, select USB port in the *Connection Mode*. A list of available COM ports on the PC will be listed. Select the COM port where the USB cable is connected.

Figure 5.4 USB connection

If the device does not appear or if the COM port list is empty, please check the USB connection on both sides (gateway and PC) and check the Windows Device Manager to check if there is any issue regarding COM ports.

To disconnect simply click on the *Connect* button again.

6. Configuration

In this section, main configuration parameters for the gateway and both, internal and external protocols, can be modified to match the project requirements.
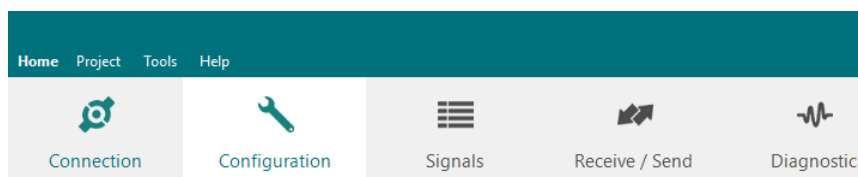

Figure 6.1 Configuration

6.1 General

In the general section, all options related to generic gateway parameters can be defined.
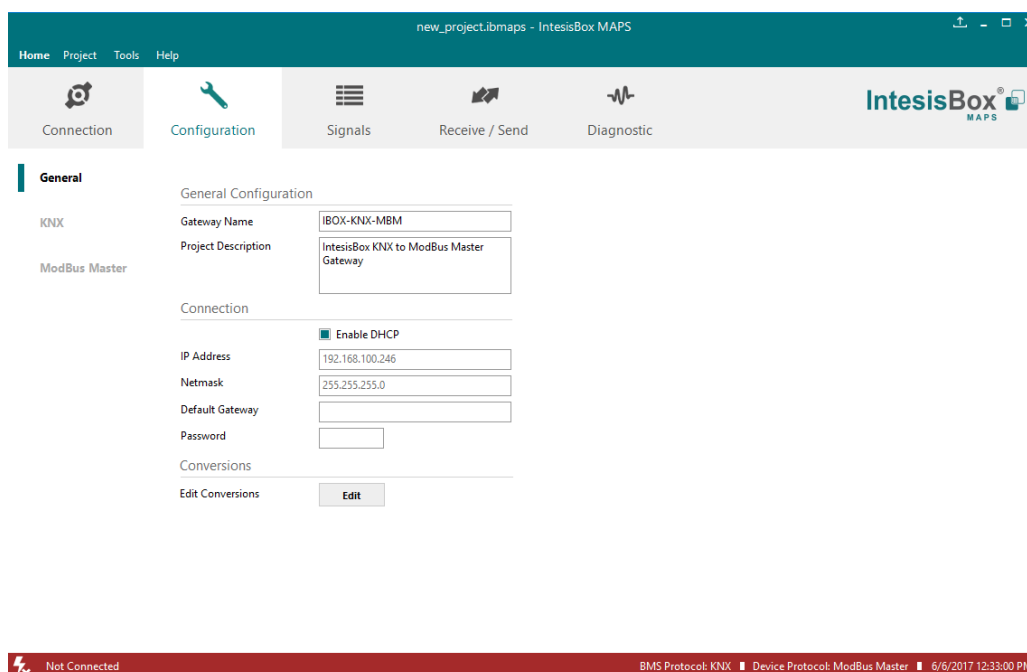

Figure 6.2 General configuration

1. **Gateway name**
   Name of device. It can be modified by the user to simplify its identification inside the project. This name is not related to neither the external or internal protocol.

2. **Project description**
   Short description of the project. It can be modified by the user to simplify its identification inside the project. This name is not related to neither the external or internal protocol.

3. **IP** [1]

   IP address associated to the gateway. It can be modified by the user to match the project requirements. This IP will be the same one to be used on any other External protocol using Ethernet communication.

4. **Netmask** [1]

   Network mask to be applied on the IP communication. It can be modified by the user to match the project requirements. This IP will be the same one to be used on any other External protocol using Ethernet communication.

5. **Gateway** [1]

   Default gateway to be applied on the IP communication. It can be modified by the user to match the project requirements. This IP will be the same one to be used on any other External protocol using Ethernet communication.

6. **Password**

   This is the password to allow connection to the Gateway when using IP connection (see section 5.1). By default, the password is set as "admin", but can be modified by the user at any time.

   In order to change the password, simply set the desired password in this field and download the configuration to the Gateway. You can find more information on how to download the configuration in section 8.1.

   > **IMPORTANT:** Please, in case of changing the default password, please keep it posted or noted in a safe place to be used in the future.

7. **Conversions**

   In this section, different conversions can be defined on the MAPS so values from the Internal to the External protocol or vice versa can be modified to help the integrator matching the project requirements.

Figure 6.3 Conversions

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[1] This setting does not apply if the "Enable DHCP" option is selected. In that case, this parameter will be automatically set by the DHCP server.

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6.2   KNX

In the KNX section, all parameters related to the KNX side can be configured.
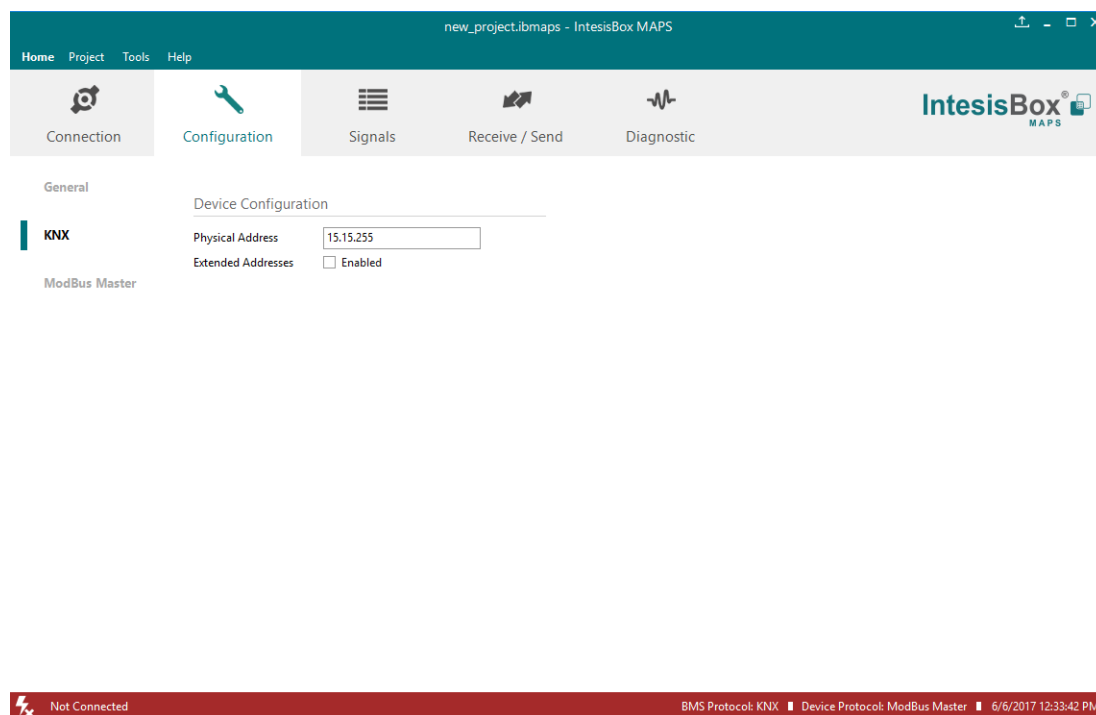

Figure 6.4 KNX configuration

1. **Physical Address**
   This parameter is used to set the KNX Physical Address (Individual Address) to set to the gateway. This is a unique identifier for the gateway inside a single KNX TP-1 segment. Max value is 15.15.255.

2. **Extended Addresses**
   This parameter is used to enable 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.

   IMPORTANT: Please, do not enable this feature unless required or under clear control of the integrator.

6.3   External protocol

Please, check the Annex section and your Gateway User Manual for more information on the specific configuration of the external protocol parameters.

7. Signals

In this section, the main configuration for the signals on both external and internal protocols will be set.

Figure 7.1 Default view

7.1 Extra functions

Find below a list of extra functions or tools available in the Signals view.

7.1.1 Edit Columns [Edit Columns]

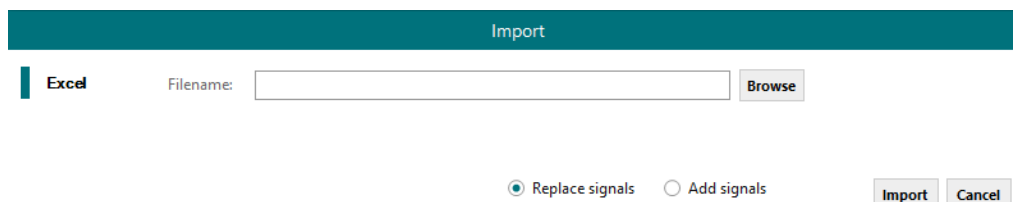It shows/hides columns on the Signal table to help the integration tasks.

Figure 7.2 Edit Columns view

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7.1.2 Import Import

Import previous exported Excel files to the project. This can be useful in case you want to manage some special configuration on Excel to speed up the signals list creation. Notice that this will need to be used in very few scenarios as the Configuration Tool already offers lots of options and tips to create the signal's table in a fast and easy way.

Notice that there are two Import options: *Replace* and *Add Signals*.

- **Replace:** This will replace (overwrite) current signals in the Signal table.

- **Add Signals:** This will add the imported signals to the Signal table without replacing the current ones.

7.1.3 Export Export

This function will allow two different types of exportations: *Excel* and *EDE*.

- **Excel:** This will export the Signal table into Excel format to allow extra manipulation or consultation from Excel. This may be helpful to share integration information with other integrators that do not have the Configuration Tool.

7.1.4 Font size AA

It changes the font size to help on the visualization. It is a toggle function: on each click it will change from big to small and vice versa.

7.1.5 Move Up/Down ↑ ↓

It moves one row Up or Down the selected signal inside the Signal table on each click.

7.1.6 Add Multiple Rows + (N) 1

It adds new signals to the Signal table. The number of new signals can be selected in the text box.

7.1.7 Delete Rows -

It deletes the selected rows. If it is required to erase more than one signal (row), select them previously and then press the *Delet Rows* button to erase all selected rows.

7.1.8   Check Table [Check table]

This options verifies that the current configuration in the Signal Table is OK from a theoretical point of view. That means that this check will not include integration issues related to bad addresses, mistakes or confusions of the integrators information. It will only check that the standard defined conditions and properties are fulfilled.

7.2   Signals configuration

Next, there is the description for common and KNX specific parameters to be configured on each signal.

1. **Active**
   If selected, the signal will be considered in the configuration and will be downloaded to the Gateway as active.

2. **Description**
   Descriptive name of the signal. It is only used for information purposes.

3. **Data Type**
   EIS data type corresponding to the selected DPT column. Not editable, just for information.

4. **DPT**
   Select the KNX Data Point Type (DPT) to be used for each signal or KNX communication object.

5. **Sending**
   KNX sending group address associated to the communication object. 2 (P/S) and 3 (P/I/S) level format is supported.

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6. **Listening**
7. 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.

8. **U**
   If selected, the KNX Communication Object will be updated after a KNX bus failure.

9. **T**
   If selected, the KNX Communication Object will be updated when a transmit telegrams are sent from KNX.

10. **Ri**
    If selected, the KNX Communication Object will be updated on initialization.

11. **W**
    If selected, the KNX Communication Object is ready to be written from KNX.

12. **R**
    If selected, the KNX Communication Object is ready to be read from KNX.

13. **Priority**
    Define the KNX priority for each KNX Communication Object. Values go from 0 to 3, being the '0' the one with the highest priority and 3 the one with the lowest priority.

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7.3   Tips and tricks

7.3.1   Text Edit

On editable cells, click on the cell. The text is going to be highlighted and it can then be modified.

7.3.2   Multiple Values selection

1. Select using the left mouse button (clicking and dragging), the field of all the rows in the list which you want to change the values (must be consecutive rows). In case you want to use non-consecutive rows, use the CTRL+click option.

2. Click in the cell options icon.

3. A contextual menu with the possible values will show up.

4. Select the desired value.

5. All the selected cells are going to be changed to the chosen value

Figure 7.3 Multiple value selection

7.3.3   Auto numeration

In some cells values, can be either modified one by one or auto numerated. To do so follow the steps below:

1. Select using the left mouse button (clicking and dragging), the field of all the rows in the list which you want to automatically assign values (must be consecutive rows). In case you want to use non-consecutive rows, use the CTRL+click option.

2. Click right mouse button over the selected fields and select *Auto Enumeration* option from the pop-up menu that will appear.
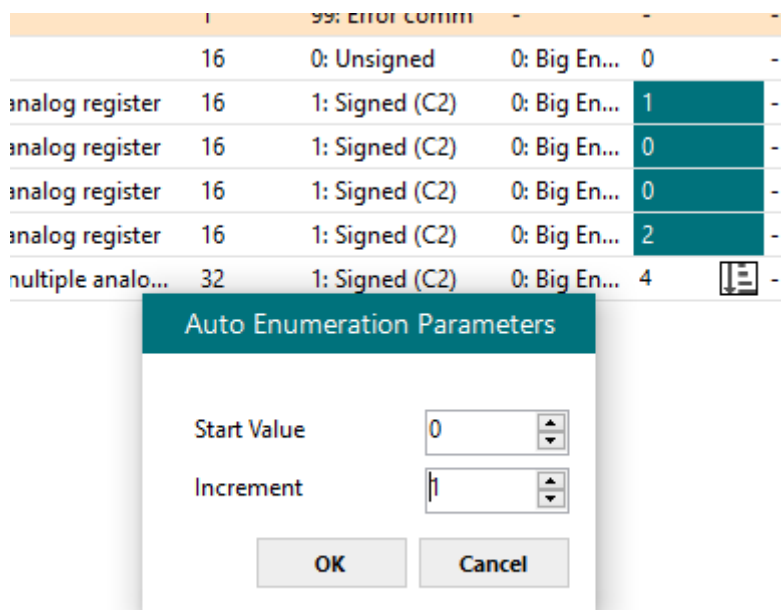
Figure 7.4 Auto numeration selection

3. Enter the Start Value.

4. Enter the increment between consecutive assignments.

   For example selecting 100 for the first value and an increment of 1, the values generated will be 100, 101, 102, 103, 104.. and so on. To assign the same value to all the rows (useful to assign the same Device number in the column *Dev* for some consecutive rows) just select the desired value and an increment of 0.

5. The values are changed accordingly.

Figure 7.5 Values auto numerated

8. Send/Receive

8.1 Send

This option will send the current configuration to the Gateway.

If the project was not saved, it will ask you first to save the changes and afterwards starts the download.
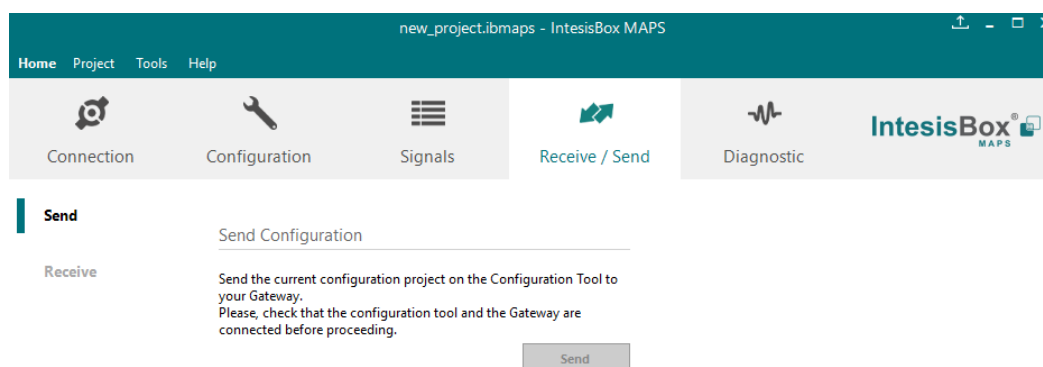
Figure 8.1 Button Bar

8.2 Receive

This option will download the current configuration from the Gateway to be stored in the PC.

Figure 8.2 Button Bar

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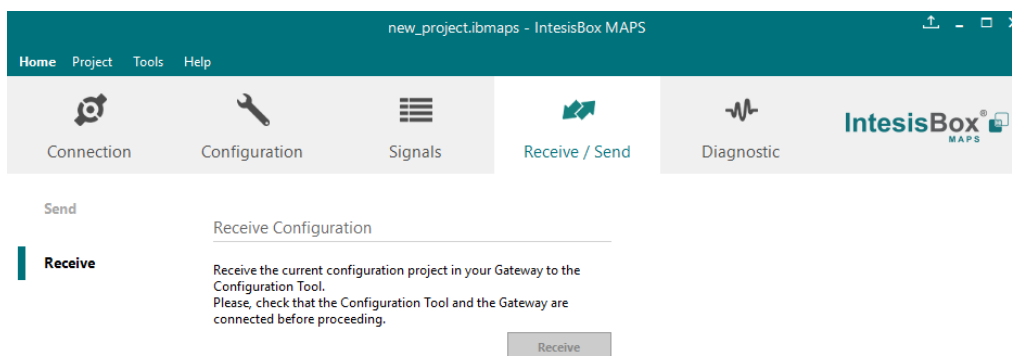
9. Diagnostic

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, connection with the Gateway is required.

The Diagnostic section is composed by two main parts: Tools and Viewer.
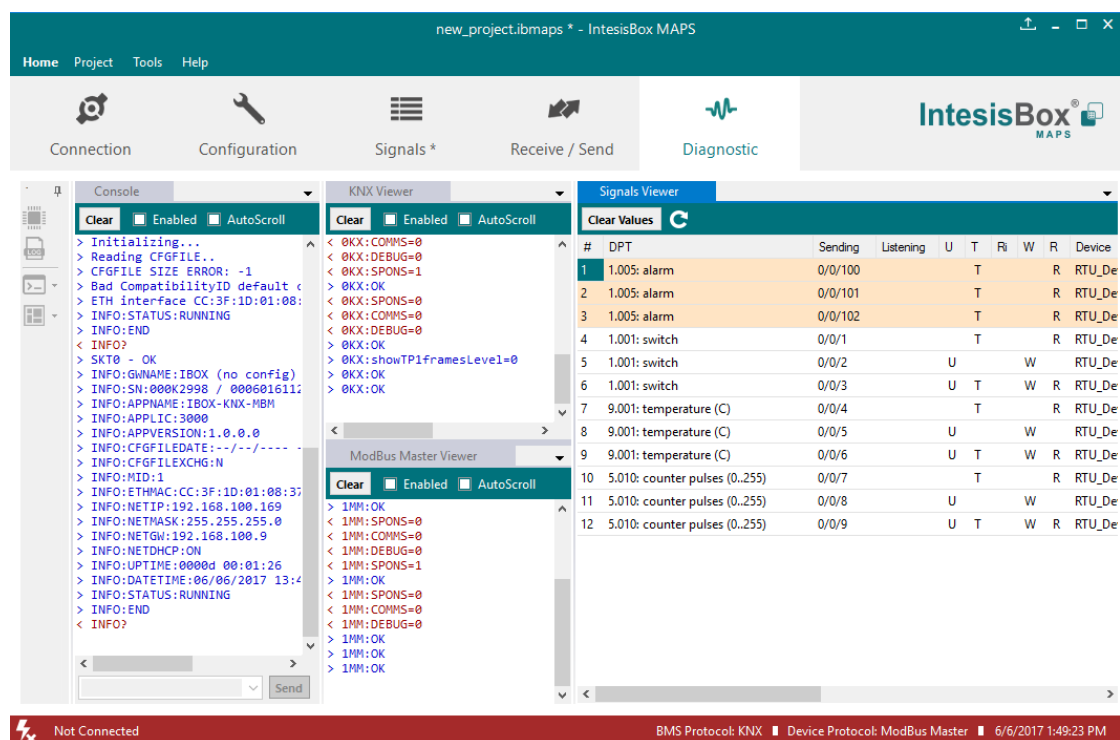
Figure 9.1 Diagnostic

9.1   Tools
The tool bar located in the left side of the window.

Figure 9.2 Tool bar

It offers 4 main tools:

9.1.1　Hardware Test

It initiates a hardware test on the gateway to identify possible hardware issues. During the hardware test, standard communications with external and internal protocols will stop.

9.1.2　Log

It sets the Configuration Tool into *logging mode*. This will record all information present in all viewers and zip it in a compressed file. This file can be then sent to the support team to help in any issue you may have.

9.1.3　Commands

It is used to send specific commands to the Gateway, such as:
- INFO?: Requests general information from the Gateway
- RESET: Resets the Gateway
- Enable COMMS: Enable communications in all viewers
- Disable COMMS: Disables communications in all viewers
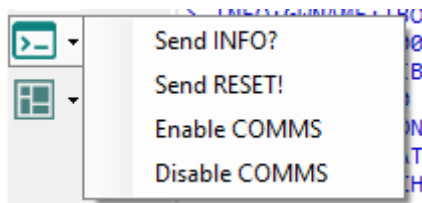
Figure 9.3 Available commands

9.1.4　View preferences

It offers several viewers layouts to help the integrator checking the required information on each moment.
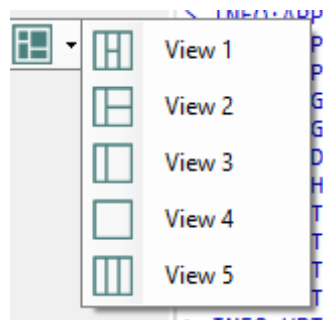
Figure 9.4 View selection

Notice that apart from the predefined options, the user will be able to place the different viewers according to its own needs manually.

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9.2　Viewers

The Configuration Tool offers 3 different viewers to monitor communications: ***Console, Internal Protocol (KNX)*** and ***External Protocol***.

On each viewer, there are some common options:

- **Clear**
  It clears all information in the viewer.

- **Enable**
  It enables/disables the information to be shown in the viewer. It may be helpful if information from a specific viewer is not required and communication payload is required to be reduced to improve other viewers' performance.

- **Autoscroll**
  It enables/disables autoscroll on the specific viewer so when new information is received the viewer automatically will scroll down to allow last information to be visible.

9.2.1　Console

It is used to display general information of the gateway not related to specific Internal or External protocol communication. Remember that the Gateway
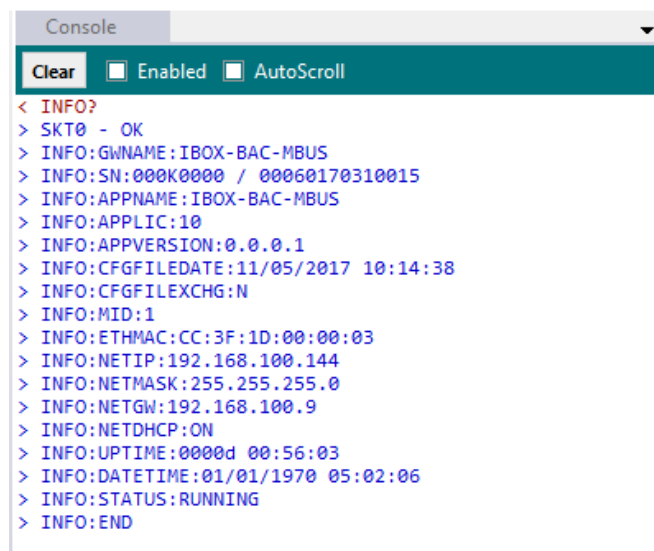
Figure 9.5 Console View

9.2.2　KNX Viewer

To monitor the KNX bus, the software needs to be connected to the Gateway. It shows frames related to the KNX communication.
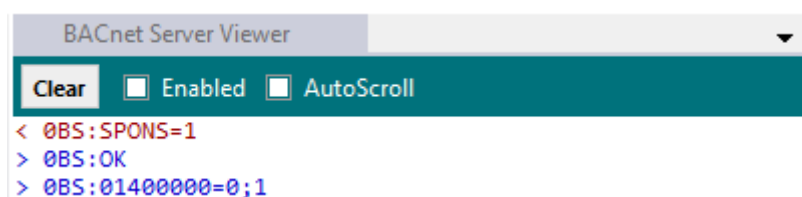
Figure 9.6 Console View

9.2.3 External Protocol Viewer

To monitor the External protocol bus, the software needs to be connected to the Gateway. It shoes frames related to the External protocol communication.

9.2.4 Signals Viewer

To supervise the configured signals, either being connected to the Gateway or not, check the Signals Viewer window. This window shows all active signals within the gateway with its main configuration parameters and its real-time value (if connected to the Gateway).

| #	Name	Type	Instance	Device	Read Func	Write Func	Address	Priority	BACnet Serve...	ModBus Mast...
1	Comm Error Device 0	3: BI	0	RTU_Device 0	-	-	-			
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 analog registers	-	0			
5	Analog Output	1: AO	0	RTU_Device 0	-	6: Write 1 analog register	1	16 ▾		
6	Analog Value	2: AV	0	RTU_Device 0	3: Read analog registers	6: Write 1 analog register	2			
7	Binary Input	3: BI	3	RTU_Device 1	1: Read digital outputs	-	0			
8	Binary Output	4: BO	0	RTU_Device 1	-	5: Write 1 digital output	1	16 ▾		
9	Binary Value	5: BV	0	RTU_Device 1	1: Read digital outputs	5: Write 1 digital output	2			
10	Multistate Input	13: MI	0	RTU_Device 2	3: Read analog registers	-	0			
11	Multistate Output	14: MO	0	RTU_Device 2	-	16: Write multiple analo...	2	16 ▾		
12	Multistate Value	19: MV	0	RTU_Device 2	3: Read analog registers	16: Write multiple analo...	4			

Figure 9.7 Signal Viewer

If you connect to the IntesisBox when it's been running for a certain time, you should press the *Refresh* button ( ) to get updated values.

In order to force a specific value to a signal, double-click its *Value* field. This will display a dialog in which the desired value can be entered. This change will be transferred to the internal and External Protocol depending on their configurations (more information in the signals configuration of the User Manual of the Used IntesisBox).

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10. External protocols

10.1 Modbus Master

10.1.1 Standard Configuration

Figure 10.1 Modbus Master configuration

1. **Modbus Type**
   Select the type of Modbus communication required with the Modbus Slave devices:

   1. **Modbus RTU**
      Modbus connection through EIA485.

   2. **Modbus TCP**
      Modbus connection through Ethernet. More than one Modbus master device allowed.

   3. **Both**
      Modbus RTU and Modbus TCP connections active and allowed simultaneously.

2. **RTU devices configuration**
   Depending on selection made on Modbus type parameter, different options will be available.

---

1. **Modbus RTU**
   There are two main sections to configure: the node and the device itself.

   For the node, the user can configure the following parameters:

   - **Baud rate**
     Defines the communication speed for the RTU communication.
     Values from 2400 to 115200 bps

   - **Data Type**
     8 bits of data / Parity / Stop bits

   - **Time Interframe**
     Minimum time between received frame and sent frame.
     Values from 0 to 2000 ms.

   - **Add Device**
     Creates new devices to be included in the configuration.

Figure 10.2 Modbus RTU node configuration

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

Figure 10.3 Modbus RTU device configuration

- **Device Name**
  Descriptive name for the Modbus RTU slave device

- **Slave Number**
  Modbus slave address

- **Delete Device**
  This options deletes the current selected device

- **Device Timeout**
  Time to wait before sending a timeout message if there is no response from the slave device.

2. **Modbus TCP**
   For the Modbus TCP, the following standard parameters can be configured:

   - **Name**
     Descriptive device name

   - **IP**
     IP for the Modbus TCP server to connect

   - **Port**
     Port for the Modbus TCP server to connect. By default, it is 502 (standard)

   - **Add Device**
     Adds as many devices as the ones set in the combo box.

Figure 10.4 Modbus TCP node configuration

Moreover, the following advanced settings can be configured too:

- **Time Interframe**
  Minimum time between received frame and sent frame.
  Values from 0 to 10000 ms.

- **Retry Timeout**
  Minimum time before launching a retry frame after no response on the TCP connection.
  Values from 0 to 30000 ms

- **Conn. Timeout**
  Minimum time before launching an error message after no TCP connection.
  Values from 0 to 30000 ms

- **Rx. Timeout**
  Minimum time before launching an error message after no TCP frames received, but TCP connection is OK.
  Values from 0 to 30000 ms

- **Time Slave Chg**
  Minimum time of silence when changing from one slave device to another.
  Values from 0 to 10000 ms

3. **Both**
   In this case, simply both options are active and enabled.

Figure 10.5 Modbus TCP node configuration

3. **Modbus Poll Records**
    The gateway allows the use of Modbus Poll Records.

    Available options for poll records will be shown in the Poll Records window according to the current Modbus configuration.
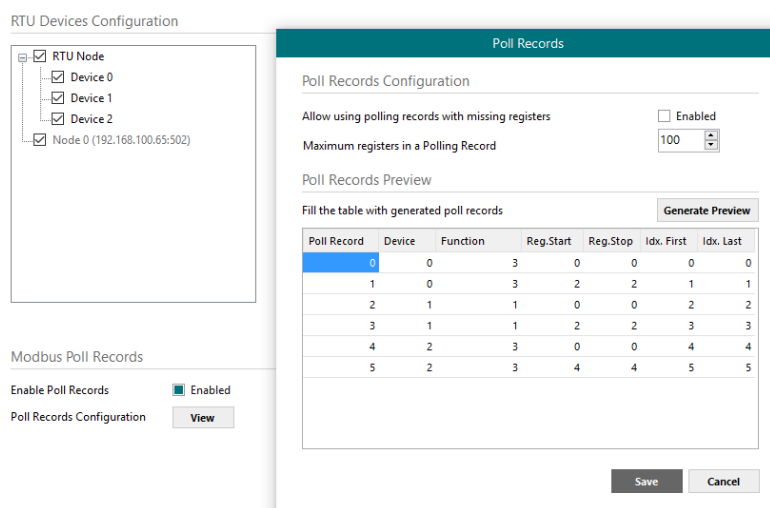

Figure 10.6 Modbus Poll Records configuration

1. **Allow using polling records with missing registers**
    If enabled, it allows nonconsecutive registers to be grouped in the same Poll Record.

2. **Maximum registers in a Polling Record**
    Max number of registers to be grouped in a single Poll Record.

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

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10.1.2 Signals configuration

For the Modbus configuration as an external protocol, the following parameters need to be considered:

1. **Device**
   It indicates the Modbus device.

2. **Read Function**
   It indicates the Modbus function used to read, if allowed or required.
   Modbus functions 1, 2, 3 and 4 supported.

3. **Write Function**
   It indicates the Modbus function used to write, if allowed or required
   Modbus functions 5, 6, 15 and 16 supported.

4. **#bit**
   It indicates the signal size expressed in bits.

5. **Format**
   It indicates the register information format.
   Unsigned, Signed C2, Signed C1, Float and Bit Fields.
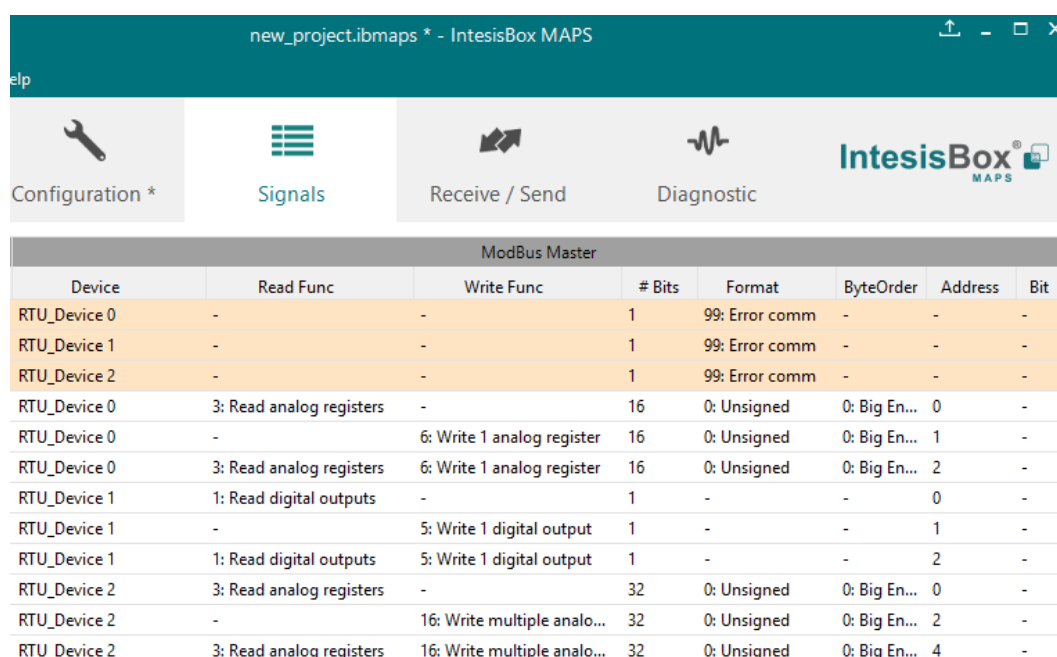
6. **ByteOrder**
   It indicates the byte order.

7. **Address**
   It indicates the register signal starting address.

8. **Bit**
   If using multiple bit (bit fields), it indicates the bit you want to read.

Device	Read Func	Write Func	# Bits	Format	ByteOrder	Address	Bit
RTU_Device 0	-	-	1	99: Error comm	-	-	-
RTU_Device 1	-	-	1	99: Error comm	-	-	-
RTU_Device 2	-	-	1	99: Error comm	-	-	-
RTU_Device 0	3: Read analog registers	-	16	0: Unsigned	0: Big En…	0	-
RTU_Device 0	-	6: Write 1 analog register	16	0: Unsigned	0: Big En…	1	-
RTU_Device 0	3: Read analog registers	6: Write 1 analog register	16	0: Unsigned	0: Big En…	2	-
RTU_Device 1	1: Read digital outputs	-	1	-	-	0	-
RTU_Device 1	-	5: Write 1 digital output	1	-	-	1	-
RTU_Device 1	1: Read digital outputs	5: Write 1 digital output	1	-	-	2	-
RTU_Device 2	3: Read analog registers	-	32	0: Unsigned	0: Big En…	0	-
RTU_Device 2	-	16: Write multiple analo…	32	0: Unsigned	0: Big En…	2	-
RTU_Device 2	3: Read analog registers	16: Write multiple analo…	32	0: Unsigned	0: Big En…	4	-

Figure 10.7 Modbus signals configuration