

# Modbus Server

## Open Charge Point Protocol (OCPP)

### USER MANUAL

Issue date: 09/2020 r1.3 ENGLISH



## Important User Information

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Gateway for the integration of Charging Points into Modbus TCP and RTU enabled monitoring and control systems.

| ORDER CODES     | LEGACY ORDER CODE |
|-----------------|-------------------|
| INMBSOCP0010100 | -                 |
| INMBSOCP0200100 | -                 |

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## 1 Description

### 1.1 Introduction

This document describes the Intesis gateway to integrate OCPP devices (EV Chargers) into Modbus TCP and RTU compatible devices and systems.

The aim of this integration is to make accessible OCPP signals and resources from a Modbus based control system or device, as if it was a part of the own Modbus system and vice-versa.

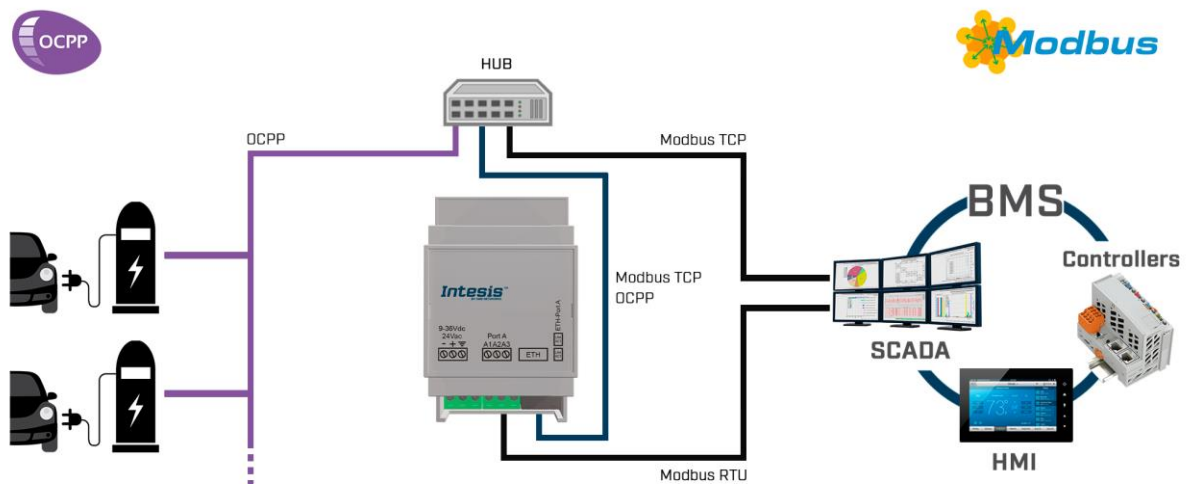
The gateway acts as a Modbus TCP Server or a Modbus RTU master in its Modbus interface, allowing a Modbus client/master device to read/write to its internal points. From OCPP point of view, Intesis gateway acts parsing data from OCPP messages to their corresponding Modbus registers and vice-versa. Keep in mind that in OCPP installations must be present a Central System, which must be implemented on the Modbus side.

Important note: Other OCPP connections to external Central Systems are NOT allowed when connecting this gateway. When using Intesis Gateway, the Modbus BMS becomes the Central System in the OCPP architecture.

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

This document assumes that the user is familiar with Modbus and OCPP technologies and their technical terms.

For a detailed information about the necessary steps to integrate the gateway in a Modbus BMS, please review the *Intesis Configuration Guide* for more information. Available in [www.intesis.com](http://www.intesis.com)



**Integration of OCPP devices into Modbus TCP and RTU control and monitoring systems**

## 1.2 Functionality

From the OCPP system point of view, after the start up process, all EV Chargers will try to connect with Intesis gateway (Intesis gateway must be configured as a Central System in the EV Chargers configuration). Then if gateway has EV Chargers configured will accept the connections. Then EV Chargers will notify any event or update to the gateway.

Please review the Intesis *Configuration Guide* for more information. Available in [www.intesis.com](http://www.intesis.com)

From the Modbus system point of view, after the start up process, the gateway presents its points as Modbus Registers, to be read or written by a Modbus client/master device using standard Modbus functions. The values received from Modbus are immediately written in an OCPP message and sent to the EV Charger.

## 1.3 Gateway's capacity

Intesis capacity is listed below:

| Element                         | Capacity                                | Notes   |
|---------------------------------|---|---|
| Number of OCPP devices          | Model INMBSOCP0010100: 1 device         | Maximum number of different OCPP devices the Intesis can communicate to |
|                                 | Model INMBSOCP0200100: Up to 20 devices |   |
| Connectors per device supported | 7                                       | Maximum number of connectors integrable in an OCPP device               |
| OCPP protocol version supported | OCPP 1.6                                | JSON version implemented  |
| Modbus link layers supported    | Modbus RTU (EIA485)<br>Modbus TCP       | Those supporting Modbus protocol. Communication over TCP/IP and RTU     |
| Number of Modbus Master devices | Up to 6 TCP connections                 | Number of Modbus Master devices supported by the device                 |

## 2 Modbus interface

### 2.1 Description

Intesis acts as a server device in its Modbus TCP or RTU interface, connecting to the Ethernet port of the gateway or the RS485 port. To access the points and resources of the Intesis from a Modbus client/master device, see details below in this document.

### 2.2 Functions supported

Modbus functions 01 and 02 (*coils and digital input registers*) can be used to read Modbus registers.

Modbus functions 03 and 04 (*read holding registers and read input registers*) can be used to read Modbus registers.

Modbus functions 05 and 15 (*Single digital Holding Registers and Write Multiple Holding Registers*) can be used to write Modbus registers.

Modbus functions 06 and 16 (*Single Multiple Holding Registers and Write Multiple Holding Registers*) can be used to write Modbus registers.

If *poll records* are used to read or write more than one register, it is necessary that the range of addresses requested contains valid addresses; if not the corresponding Modbus error code will be returned.

All the registers are of 2 bytes, even if they are associated to signals of type bit in the external system, and its content is expressed in MSB..LSB.

Modbus error codes are fully supported; they will be sent whenever a non-valid Modbus action or address is required.

### 2.3 Modbus TCP

The TCP port to use can be configured (by default 502 is used).

The IP address, subnet mask and default router address to use by Intesis gateway can be also configured.

### 2.4 Modbus RTU

Connect the communication cable coming from the Modbus network to the port marked as Modbus of Intesis. Connect the EIA485 bus to connectors A3 (B+), A2 (A-) and A1 (SGND). 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  $\Omega$ .

### 2.5 Address Map

The Modbus address map is predefined and it's not configurable. Check the *Configuration Guide* to find a list with all the available registers implemented in the gateway.

### 2.6 Points definition

Every point defined in the gateway has the Modbus *Format*, *Point* and *R/W* features associated to it. These features are explained in section 4.2.4.

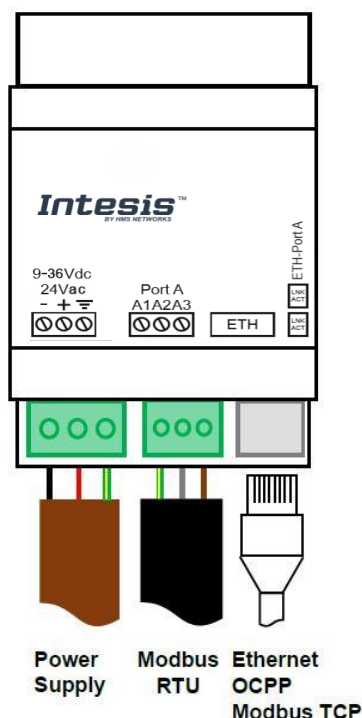
Each point defined in Intesis has the following Modbus features associated to it:

| Feature                 | Description  |
|-------------------------|--|
| #Bits                   | <b>One of the following bit lengths can be used:</b> <ul style="list-style-type: none"> <li>• 1 bit</li> <li>• 16 bits</li> <li>• 32 bits</li> </ul>   |
| Data Coding Format      | <b>One of the following Modbus data coding formats can be used:</b> <ul style="list-style-type: none"> <li>• 16/32 unsigned.</li> <li>• 16/32 bits signed (one's complement – C1).</li> <li>• 16/32 bits signed (two's complement – C2).</li> <li>• 16/32 bits Float.</li> <li>• 16/ bits Bitfields.</li> <li>• Error comm</li> </ul>  |
| Function code           | <b>One of the following Modbus function codes can be used:</b> <ul style="list-style-type: none"> <li>• 1- Read Coils.</li> <li>• 2- Read Discrete Inputs.</li> <li>• 3- Read Holding Registers.</li> <li>• 4- Read Input Registers.</li> <li>• 5- Write Single Coil.</li> <li>• 6- Write Single Register.</li> <li>• 15- Write Multiple Coils.</li> <li>• 16- Write Multiple Registers.</li> </ul>      |
| Byte Order              | <ul style="list-style-type: none"> <li>• Big Endian</li> <li>• Little Endian</li> <li>• Word Inverted Big Endian</li> <li>• Word Inverted Little Endian</li> </ul>   |
| Register Address        | The Modbus register address inside the slave device for the point.   |
| Bit inside the register | <p>Bit inside the Modbus register (optional). The gateway allows bit decoding from generic 16 bits input/holding Modbus registers.</p> <p><i>Bit coding into 16 bits 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></p> |
| Read/Write              | 0: Read<br>1: Write<br>2: Read / Write   |



### 3 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. 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.

#### Ethernet / Modbus TCP / OCPP

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

#### Port Modbus RTU

Connect the EIA485 bus to connectors A3 (B+), A2 (A-) and A1 (SNGD) of Intesis gateway's Port. Respect the polarity.

**Note for EIA485 port;** 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  $\Omega$  Not used.

Ensure proper space for all connectors when mounted (see section 6).

|  |  |
|--|--|
| <b>Terminal Wiring</b><br>(for power supply and low-voltage signals) | Per terminal: solid wires or stranded wires (twisted or with ferrule)<br>1 core: 0.5mm <sup>2</sup> ... 2.5mm <sup>2</sup><br>2 cores: 0.5mm <sup>2</sup> ... 1.5mm <sup>2</sup><br>3 cores: not permitted |
| <b>Power</b>   | 1 x Plug-in screw terminal block (3 poles)<br>Positive, Negative, Earth<br>9-36 VDC / 24 VAC / 50-60 Hz / 0.140 A / 1.7 W  |
| <b>Ethernet</b>  | 1 x Ethernet 10/100 Mbps RJ45<br>2 x Ethernet LED: port link and activity  |
| <b>Port</b>  | 1 x Serial EIA485 (Plug-in screw terminal block 3 poles)<br>A1, A2, A3 (Reference ground or shield)<br>1500VDC isolation from other ports  |

## 3.1 Powering the device

A power supply working with any of the voltage range allowed is needed (check section 5).

**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 earth. **Never use a DC power supply with the positive terminal connected to earth.**

## 3.2 Connection to Modbus

### 3.2.1 Modbus TCP

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.

### 3.2.2 Modbus RTU

Connect the communication cable coming from the Modbus network to the port marked as Modbus of Intesis. Connect the EIA485 bus to connectors A3 (B+), A2 (A-) and A1 (SGND). 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  $\Omega$ .

## 3.3 Connection to the configuration tool

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

- **Ethernet:** Using the Ethernet port of Intesis.

## 4 Set-up process and troubleshooting

### 4.1 Pre-requisites

It is necessary to have a Modbus TCP client or RTU master device operative and well connected to the corresponding Modbus port of Intesis and OCPP devices connected to its corresponding port as well.

Connectors, connection cables, PC to use the configuration tool and other auxiliary material, if needed, are not supplied by HMS Industrial Networks S.L.U for this standard integration.

Items supplied by HMS Networks for this integration are:

- Intesis gateway.
- Link to download the configuration tool.
- Product documentation.

### 4.2 Intesis MAPS. Configuration & monitoring tool for Intesis Modbus series

#### 4.2.1 Introduction

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

The installation procedure and main functions are explained in the *Intesis MAPS User Manual*. This document can be downloaded from the link indicated in the installation sheet supplied with the Intesis device or in the product website at [www.intesis.com](http://www.intesis.com)

In this section, only the specific case of Modbus OCPP gateway will be covered.

Please check the *Intesis MAPS User manual* and *Configuration guide* for specific information about the different parameters and how to configure them.

## 4.2.2 Connection

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

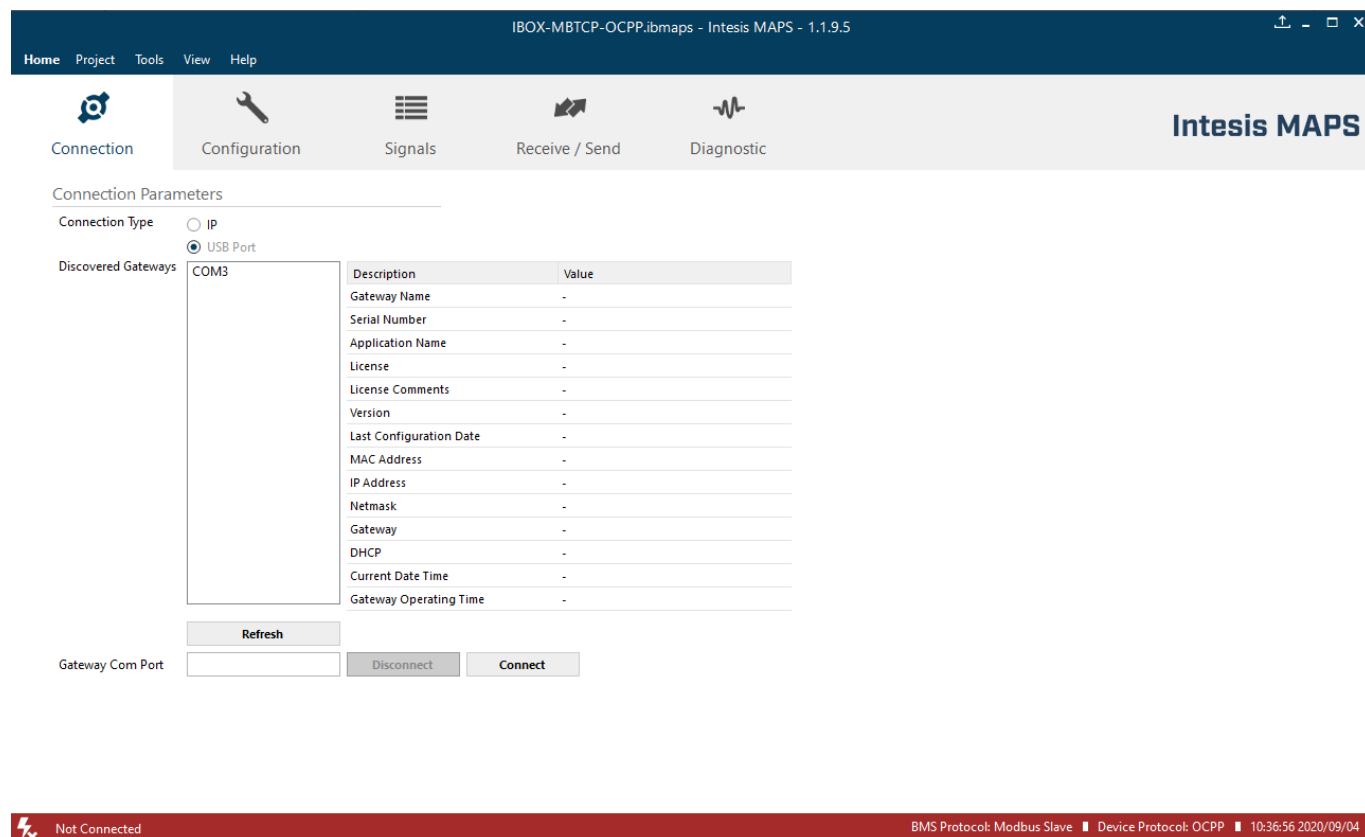


Figure 4.1 MAPS connection

### 4.2.3 Configuration tab

Select the **Configuration** tab to configure the connection parameters. Three subsets of information are shown in this window: General (Gateway general parameters), Modbus slave (Modbus TCP and RTU interface configuration) and OCPP (OCPP configuration and devices parameters).

The screenshot displays the Intesis MAPS software interface. The title bar reads "IBOX-MBTCP-OCPP.ibmaps - Intesis MAPS - 1.1.9.5". The main menu includes "Home", "Project", "Tools", "View", and "Help". A toolbar contains icons for "Connection", "Configuration" (selected), "Signals", "Receive / Send", and "Diagnostic". The "Intesis MAPS" logo is in the top right.

On the left, a sidebar lists "General", "Modbus Slave", and "OCPP". The "General" section is active, showing "General Configuration" with fields for "Gateway Name" (IBOX-MBTCP-OCPP) and "Project Description" (OCPP to Modbus Slave Gateway). Below this is the "Connection" section with a checked "Enable DHCP" box, and input fields for "IP Address" (192.168.100.246), "Netmask" (255.255.255.0), "Default Gateway", and "Password". The "USB Host" section includes an "Edit USB Configuration" button with a "USB" dropdown.

The bottom status bar is red and shows "Not Connected" on the left, and "BMS Protocol: Modbus Slave | Device Protocol: OCPP | 10:37:18 2020/09/04" on the right.


Figure 4.2 Intesis MAPS configuration tab


## 4.2.4 Signals


All available OCPP signals, its corresponding Modbus 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.


IBOX-MBTCP-OCPP.ibmaps - Intesis MAPS - 1.1.9.5


HomeProjectToolsViewHelp

Connection

Configuration

Signals

Receive / Send

Diagnostic

Intesis MAPS

| #  | Active                              | Description                                       | Modbus Slave |             |         |     |                 | OCPP       |           |
|----|-------------------------------------|---|--------------|-------------|---------|-----|-----------------|------------|-----------|
|    |                                     |   | Data L...    | Format      | Address | Bit | Read / Write    | String ... | Charger   |
| 1  | <input checked="" type="checkbox"/> | BMS Communication & Time sync - Heartb...         | 16           | 0: Unsigned | 0       | -   | 2: Read / Write | -          | -         |
| 2  | <input checked="" type="checkbox"/> | BMS Communication & Time sync - SECOND            | 16           | 0: Unsigned | 1       | -   | 2: Read / Write | -          | -         |
| 3  | <input checked="" type="checkbox"/> | BMS Communication & Time sync - MINUTE            | 16           | 0: Unsigned | 2       | -   | 2: Read / Write | -          | -         |
| 4  | <input checked="" type="checkbox"/> | BMS Communication & Time sync - HOUR              | 16           | 0: Unsigned | 3       | -   | 2: Read / Write | -          | -         |
| 5  | <input checked="" type="checkbox"/> | BMS Communication & Time sync - DAY               | 16           | 0: Unsigned | 4       | -   | 2: Read / Write | -          | -         |
| 6  | <input checked="" type="checkbox"/> | BMS Communication & Time sync - MONTH             | 16           | 0: Unsigned | 5       | -   | 2: Read / Write | -          | -         |
| 7  | <input checked="" type="checkbox"/> | BMS Communication & Time sync - YEAR              | 16           | 0: Unsigned | 6       | -   | 2: Read / Write | -          | -         |
| 8  | <input checked="" type="checkbox"/> | Charger information - Charger Communicat...       | 16           | 0: Unsigned | 100     | -   | 0: Read         | -          | Charger 1 |
| 9  | <input checked="" type="checkbox"/> | Charger information - Charge Box Serial Nu...     | -            | 5: String   | 101     | -   | 0: Read         | 26         | Charger 1 |
| 10 | <input checked="" type="checkbox"/> | Charger information - Charge Point Serial N...    | -            | 5: String   | 114     | -   | 0: Read         | 26         | Charger 1 |
| 11 | <input checked="" type="checkbox"/> | Charger information - Charge Point Vendor         | -            | 5: String   | 127     | -   | 0: Read         | 20         | Charger 1 |
| 12 | <input checked="" type="checkbox"/> | Charger information - Charge Point Model          | -            | 5: String   | 137     | -   | 0: Read         | 20         | Charger 1 |
| 13 | <input checked="" type="checkbox"/> | Authorization Registers - Authorization Flag      | 16           | 0: Unsigned | 164     | -   | 0: Read         | -          | Charger 1 |
| 14 | <input checked="" type="checkbox"/> | Authorization Registers - Id Tag Authorization    | -            | 5: String   | 165     | -   | 0: Read         | 20         | Charger 1 |
| 15 | <input checked="" type="checkbox"/> | Authorization Registers - Authorization proc...   | 16           | 0: Unsigned | 177     | -   | 1: Trigger      | -          | Charger 1 |
| 16 | <input checked="" type="checkbox"/> | Authorization Registers - Parent Id Tag           | -            | 5: String   | 178     | -   | 1: Trigger      | 20         | Charger 1 |
| 17 | <input checked="" type="checkbox"/> | Authorization Registers - Expiration Date         | 32           | 0: Unsigned | 188     | -   | 1: Trigger      | -          | Charger 1 |
| 18 | <input checked="" type="checkbox"/> | Authorization Registers - Authorization result    | 16           | 0: Unsigned | 190     | -   | 1: Trigger      | -          | Charger 1 |
| 19 | <input checked="" type="checkbox"/> | Start Transaction Registers - Start Transactio... | 16           | 0: Unsigned | 194     | -   | 0: Read         | -          | Charger 1 |
| 20 | <input checked="" type="checkbox"/> | Start Transaction Registers - Connector ID        | 16           | 0: Unsigned | 195     | -   | 0: Read         | -          | Charger 1 |
| 21 | <input checked="" type="checkbox"/> | Start Transaction Registers - Id Tag              | -            | 5: String   | 196     | -   | 0: Read         | 20         | Charger 1 |
| 22 | <input checked="" type="checkbox"/> | Start Transaction Registers - Meter Value         | 32           | 3: Float    | 206     | -   | 0: Read         | -          | Charger 1 |
| 23 | <input checked="" type="checkbox"/> | Start Transaction Registers - Reservation ID      | 16           | 0: Unsigned | 208     | -   | 0: Read         | -          | Charger 1 |

Active signals: 197 / -


☐ Hide Disabled signals

Edit Columns

Export

AA

Check table

Not Connected

BMS Protocol: Modbus Slave

Device Protocol: OCPP

10:38:06 2020/09/04

Figure 4.3 Intesis MAPS Signals tab

## 4.2.5 Sending the configuration to Intesis

When the configuration is finished, follow the next steps.

- 1.- Click on **Save** button to save the project to the project folder on your hard disk (more information in Intesis MAPS User Manual).
- 2.- You will be prompted to generate the configuration file to be sent to the gateway.
  - a.- If **Yes** is selected, the file containing the configuration for the gateway will be generated and saved also into the project folder.
  - b.- If **NO** is selected, remember that the binary file with the project needs to be generated before the Intesis starts to work as expected.
- 3.- Press the **Send File** button to send the binary file to the Intesis device. The process of file transmission can be monitored in the Intesis Communication Console window. Intesis will reboot automatically once the new configuration is loaded.

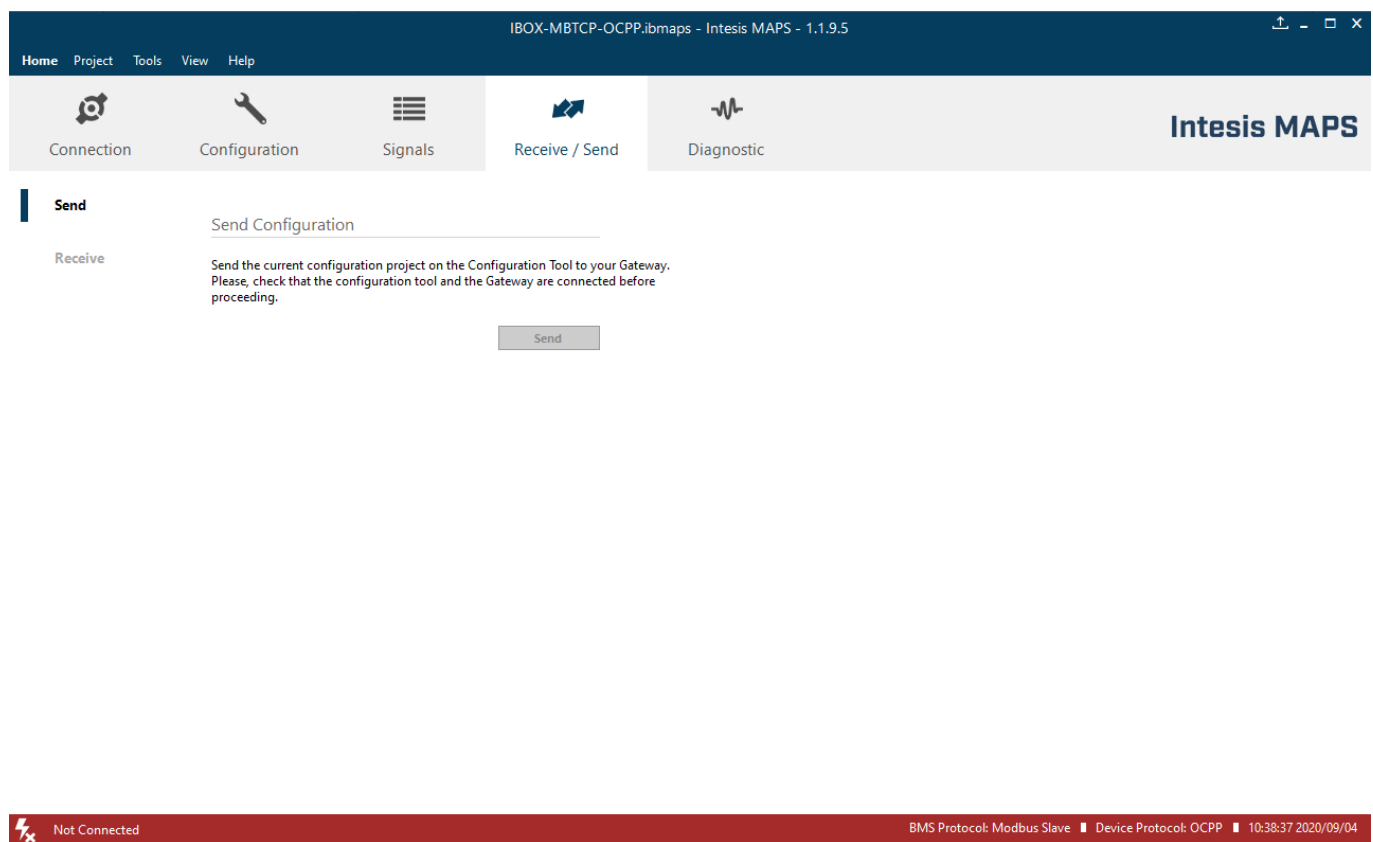


Figure 4.4 Intesis MAPS Receive/Send tab

**After any configuration change, do not forget to send the configuration file to the Intesis using button Send File.**

### 4.2.6 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 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, viewer 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 behaviour or to check the current values in the system.

The screenshot displays the Intesis MAPS software interface. The top menu bar includes Home, Project, Tools, View, and Help. Below it, a toolbar contains icons for Connection, Configuration, Signals, Receive / Send, and Diagnostic. The main workspace is divided into several panels. On the left, there's a 'ToolBox' and a 'Console' panel with 'Clear' and 'AutoScroll' buttons. The central area features a 'Modbus Slave Viewer' and an 'OCPP Viewer', both with 'Clear', 'Comms', 'Debug', and 'AutoScroll' options. The rightmost panel is the 'Signals Viewer', which contains a table of system data. At the bottom, a status bar indicates 'Not Connected' and shows protocol details: 'BMS Protocol: Modbus Slave', 'Device Protocol: OCPP', and a timestamp '10:39:05 2020/09/04'.

| #  | Modbus | OCPP | Description                                       | Format      | Address | Read / Write    |   |
|----|--------|------|---|-------------|---------|-----------------|---|
| 1  |        |      | BMS Communication & Time sync - Heartb...         | 0: Unsigned | 0       | 2: Read / Write | - |
| 2  |        |      | BMS Communication & Time sync - SECOND            | 0: Unsigned | 1       | 2: Read / Write | - |
| 3  |        |      | BMS Communication & Time sync - MINUTE            | 0: Unsigned | 2       | 2: Read / Write | - |
| 4  |        |      | BMS Communication & Time sync - HOUR              | 0: Unsigned | 3       | 2: Read / Write | - |
| 5  |        |      | BMS Communication & Time sync - DAY               | 0: Unsigned | 4       | 2: Read / Write | - |
| 6  |        |      | BMS Communication & Time sync - MONTH             | 0: Unsigned | 5       | 2: Read / Write | - |
| 7  |        |      | BMS Communication & Time sync - YEAR              | 0: Unsigned | 6       | 2: Read / Write | - |
| 8  |        |      | Charger information - Charger Communicat...       | 0: Unsigned | 100     | 0: Read         | C |
| 9  |        |      | Charger information - Charge Box Serial Nu...     | 5: String   | 101     | 0: Read         | C |
| 10 |        |      | Charger information - Charge Point Serial N...    | 5: String   | 114     | 0: Read         | C |
| 11 |        |      | Charger information - Charge Point Vendor         | 5: String   | 127     | 0: Read         | C |
| 12 |        |      | Charger information - Charge Point Model          | 5: String   | 137     | 0: Read         | C |
| 13 |        |      | Authorization Registers - Authorization Flag      | 0: Unsigned | 164     | 0: Read         | C |
| 14 |        |      | Authorization Registers - Id Tag Authorization    | 5: String   | 165     | 0: Read         | C |
| 15 |        |      | Authorization Registers - Authorization proc...   | 0: Unsigned | 177     | 1: Trigger      | C |
| 16 |        |      | Authorization Registers - Parent Id Tag           | 5: String   | 178     | 1: Trigger      | C |
| 17 |        |      | Authorization Registers - Expiration Date         | 0: Unsigned | 188     | 1: Trigger      | C |
| 18 |        |      | Authorization Registers - Authorization result    | 0: Unsigned | 190     | 1: Trigger      | C |
| 19 |        |      | Start Transaction Registers - Start Transactio... | 0: Unsigned | 194     | 0: Read         | C |
| 20 |        |      | Start Transaction Registers - Connector ID        | 0: Unsigned | 195     | 0: Read         | C |
| 21 |        |      | Start Transaction Registers - Id Tag              | 5: String   | 196     | 0: Read         | C |

Figure 4.5 Diagnostic

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



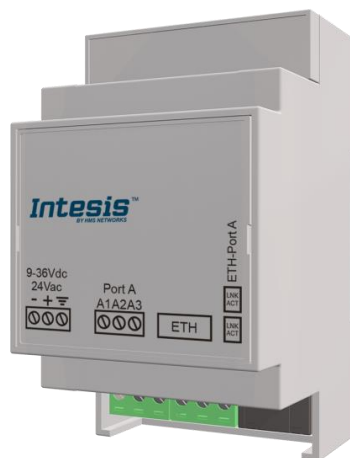
### 4.3 Set-up procedure

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, Modbus RTU, connect the communication cable coming from the EIA485 port of the Modbus RTU installation to the port marked as Port A of Intesis (More details in section 3).
4. Connect the communication cable coming from the Modbus TCP and/or OCPP installations to the port marked as ETH of Intesis gateway (More details in section 3).
5. Power up Intesis. The supply voltage can be 9 to 24 Vdc. 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:

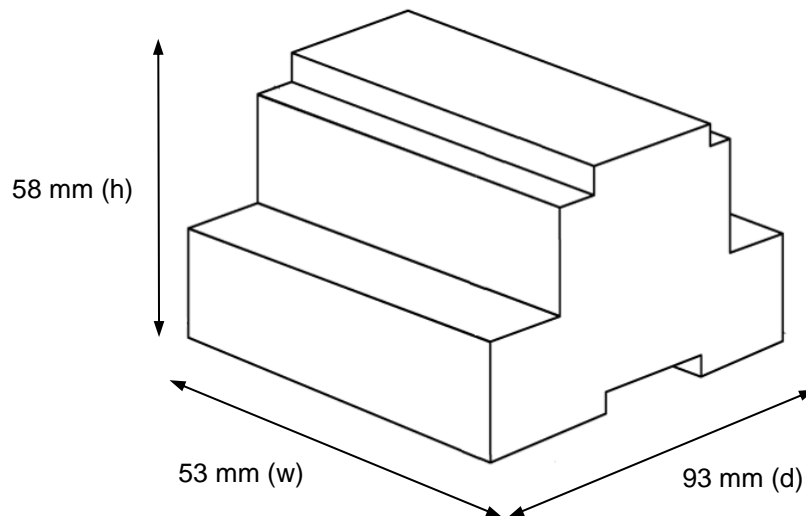
- The use of DC power supplies, floating or with the negative terminal connected to earth. **Never use a DC power supply with the positive terminal connected to earth.**
6. If you want to connect using IP, connect the Ethernet cable from the laptop PC to the port marked as ETH of Intesis (More details in section 3).
  7. Open Intesis MAPS, create a new project selecting a copy of the one named **INMBSOCPxxx0100**.
  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 and check that there is communication activity, some TX frames and some other RX frames. This means that the communication with the Modbus TCP Client device/s and OCPP devices is OK. In case there is no communication activity between Intesis and the OCPP or Modbus devices, check that those are operative: check the baud rate, the communication cable used to connect all devices and any other communication parameter.

## 5 Electrical & Mechanical Features



|  |  |
|--|--|
| <b>Enclosure</b>   | Plastic, type PC (UL 94 V-0)<br>Net dimensions (dxwxh): 93x53x58 mm<br>Recommended space for installation (dxwxh): 100x60x70mm<br>Color: Light Grey. RAL 7035  |
| <b>Mounting</b>  | Wall.<br>DIN rail EN60715 TH35.  |
| <b>Terminal Wiring</b><br>(for power supply and low-voltage signals) | Per terminal: solid wires or stranded wires (twisted or with ferrule)<br>1 core: 0.5mm <sup>2</sup> ... 2.5mm <sup>2</sup><br>2 cores: 0.5mm <sup>2</sup> ... 1.5mm <sup>2</sup><br>3 cores: not permitted |
| <b>Power</b>   | 1 x Plug-in screw terminal block (3 poles)<br>Positive, Negative, Earth<br>9-36 VDC / 24 VAC / 50-60 Hz / 0.140 A / 1.7 W  |
| <b>Ethernet</b>  | 1 x Ethernet 10/100 Mbps RJ45<br>2 x Ethernet LED: port link and activity  |
| <b>Port</b>  | 1 x Serial EIA485 (Plug-in screw terminal block 3 poles)<br>A, B, SGND (Reference ground or shield)<br>1500VDC isolation from other ports  |
| <b>Operation Temperature</b>   | 0°C to +60°C   |
| <b>Operational Humidity</b>  | 5 to 95%, no condensation  |
| <b>Protection</b>  | IP20 (IEC60529)  |

## 6 Dimensions



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

