

# User Manual

Revision 1.000

English

## LoRaWAN Gateway / MQTT - Converter

(Order Code: HD67F36-B2-xxxMHz)

For Website information:

[www.adfweb.com?Product=HD67F36-B2](http://www.adfweb.com?Product=HD67F36-B2)

For Price information:

[www.adfweb.com?Price=HD67F36-B2-xxxMHz](http://www.adfweb.com?Price=HD67F36-B2-xxxMHz)

### Benefits and Main Features:

- ⊕ Very easy to configure
- ⊕ Power Supply 12...35V DC and 8...24 V AC
- ⊕ Temperature range: -40°C/+85°C (-40°F/+185°F)



User Manual

For others LoRaWAN products, see also the following links:

### Converter LoRaWAN to

- |  |                             |
|--|-----------------------------|
| <a href="http://www.adfweb.com?Product=HD67F01">www.adfweb.com?Product=HD67F01</a> | <b>(Modbus Master)</b>      |
| <a href="http://www.adfweb.com?Product=HD67F02">www.adfweb.com?Product=HD67F02</a> | <b>(Modbus Slave)</b>       |
| <a href="http://www.adfweb.com?Product=HD67F03">www.adfweb.com?Product=HD67F03</a> | <b>(Modbus TCP Master)</b>  |
| <a href="http://www.adfweb.com?Product=HD67F04">www.adfweb.com?Product=HD67F04</a> | <b>(Modbus TCP Slave)</b>   |
| <a href="http://www.adfweb.com?Product=HD67F05">www.adfweb.com?Product=HD67F05</a> | <b>(Serial)</b>             |
| <a href="http://www.adfweb.com?Product=HD67F15">www.adfweb.com?Product=HD67F15</a> | <b>(M-Bus)</b>              |
| <a href="http://www.adfweb.com?Product=HD67F16">www.adfweb.com?Product=HD67F16</a> | <b>(BACnet Master)</b>      |
| <a href="http://www.adfweb.com?Product=HD67F17">www.adfweb.com?Product=HD67F17</a> | <b>(BACnet Slave)</b>       |
| <a href="http://www.adfweb.com?Product=HD67F18">www.adfweb.com?Product=HD67F18</a> | <b>(Ethernet)</b>           |
| <a href="http://www.adfweb.com?Product=HD67F19">www.adfweb.com?Product=HD67F19</a> | <b>(CAN)</b>                |
| <a href="http://www.adfweb.com?Product=HD67F20">www.adfweb.com?Product=HD67F20</a> | <b>(CANopen)</b>            |
| <a href="http://www.adfweb.com?Product=HD67F21">www.adfweb.com?Product=HD67F21</a> | <b>(DeviceNet Master)</b>   |
| <a href="http://www.adfweb.com?Product=HD67F22">www.adfweb.com?Product=HD67F22</a> | <b>(DeviceNet Slave)</b>    |
| <a href="http://www.adfweb.com?Product=HD67F23">www.adfweb.com?Product=HD67F23</a> | <b>(DMX)</b>                |
| <a href="http://www.adfweb.com?Product=HD67F24">www.adfweb.com?Product=HD67F24</a> | <b>(EtherNet/IP Master)</b> |
| <a href="http://www.adfweb.com?Product=HD67F25">www.adfweb.com?Product=HD67F25</a> | <b>(EtherNet/IP Slave)</b>  |
| <a href="http://www.adfweb.com?Product=HD67F26">www.adfweb.com?Product=HD67F26</a> | <b>(J1939)</b>              |
| <a href="http://www.adfweb.com?Product=HD67F27">www.adfweb.com?Product=HD67F27</a> | <b>(KNX)</b>                |
| <a href="http://www.adfweb.com?Product=HD67F28">www.adfweb.com?Product=HD67F28</a> | <b>(NMEA 0183)</b>          |
| <a href="http://www.adfweb.com?Product=HD67F29">www.adfweb.com?Product=HD67F29</a> | <b>(NMEA 2000)</b>          |
| <a href="http://www.adfweb.com?Product=HD67F30">www.adfweb.com?Product=HD67F30</a> | <b>(PROFIBUS Master)</b>    |
| <a href="http://www.adfweb.com?Product=HD67F31">www.adfweb.com?Product=HD67F31</a> | <b>(PROFIBUS Slave)</b>     |
| <a href="http://www.adfweb.com?Product=HD67F32">www.adfweb.com?Product=HD67F32</a> | <b>(PROFINET Master)</b>    |
| <a href="http://www.adfweb.com?Product=HD67F33">www.adfweb.com?Product=HD67F33</a> | <b>(PROFINET Slave)</b>     |
| <a href="http://www.adfweb.com?Product=HD67F34">www.adfweb.com?Product=HD67F34</a> | <b>(IEC61850 Client)</b>    |
| <a href="http://www.adfweb.com?Product=HD67F35">www.adfweb.com?Product=HD67F35</a> | <b>(IEC61850 Server)</b>    |
| <a href="http://www.adfweb.com?Product=HD67F37">www.adfweb.com?Product=HD67F37</a> | <b>(OPC UA Client)</b>      |
| <a href="http://www.adfweb.com?Product=HD67F38">www.adfweb.com?Product=HD67F38</a> | <b>(OPC UA Server)</b>      |
| <a href="http://www.adfweb.com?Product=HD67F39">www.adfweb.com?Product=HD67F39</a> | <b>(S7comm)</b>             |
| <a href="http://www.adfweb.com?Product=HD67F40">www.adfweb.com?Product=HD67F40</a> | <b>(SNMP Manager)</b>       |
| <a href="http://www.adfweb.com?Product=HD67F41">www.adfweb.com?Product=HD67F41</a> | <b>(SNMP Agent)</b>         |

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**UPDATED DOCUMENTATION:**

Dear customer, we thank you for your attention and we remind you that you need to check that the following document is:

- ✚ Updated
- ✚ Related to the product you own

To obtain the most recently updated document, note the “document code” that appears at the top right-hand corner of each page of this document.

With this “Document Code” go to web page [www.adfweb.com/download/](http://www.adfweb.com/download/) and search for the corresponding code on the page. Click on the proper “Document Code” and download the updates.

**REVISION LIST:**

Revision	Date	Author	Chapter	Description
1.000	03/12/2021	Ff	All	First release version

**WARNING:**

ADFweb.com reserves the right to change information in this manual about our product without warning. ADFweb.com is not responsible for any error this manual may contain.

**TRADEMARKS:**

All trademarks mentioned in this document belong to their respective owners.

**SECURITY ALERT:****GENERAL INFORMATION**

To ensure safe operation, the device must be operated according to the instructions in the manual. When using the device, legal and safety regulation are required for each individual application. The same applies also when using accessories.

**INTENDED USE**

Machines and systems must be designed so the faulty conditions do not lead to a dangerous situation for the operator (i.e. independent limit switches, mechanical interlocks, etc.).

**QUALIFIED PERSONNEL**

The device can be used only by qualified personnel, strictly in accordance with the specifications. Qualified personnel are persons who are familiar with the installation, assembly, commissioning and operation of this equipment and who have appropriate qualifications for their job.

**RESIDUAL RISKS**

The device is state-of-the-art and is safe. The instruments can represent a potential hazard if they are inappropriately installed and operated by untrained personnel. These instructions refer to residual risks with the following symbol:

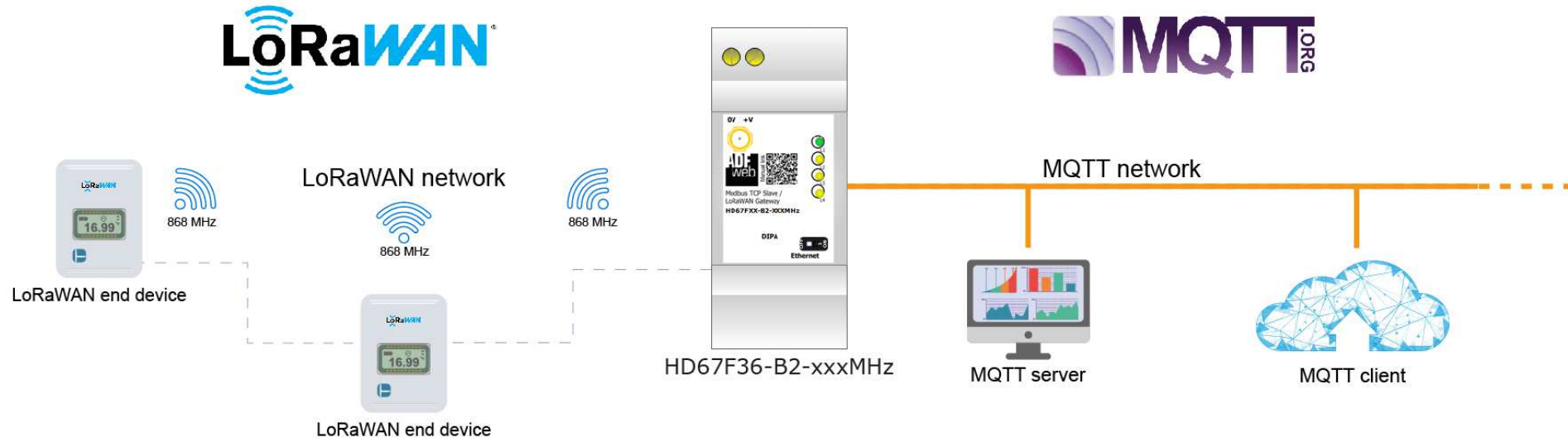


This symbol indicates that non-observance of the safety instructions is a danger for people that could lead to serious injury or death and / or the possibility of damage.

**CE CONFORMITY**

The declaration is made by our company. You can send an email to [support@adfweb.com](mailto:support@adfweb.com) or give us a call if you need it.

**EXAMPLE OF CONNECTION:**



**CONNECTION SCHEME:**

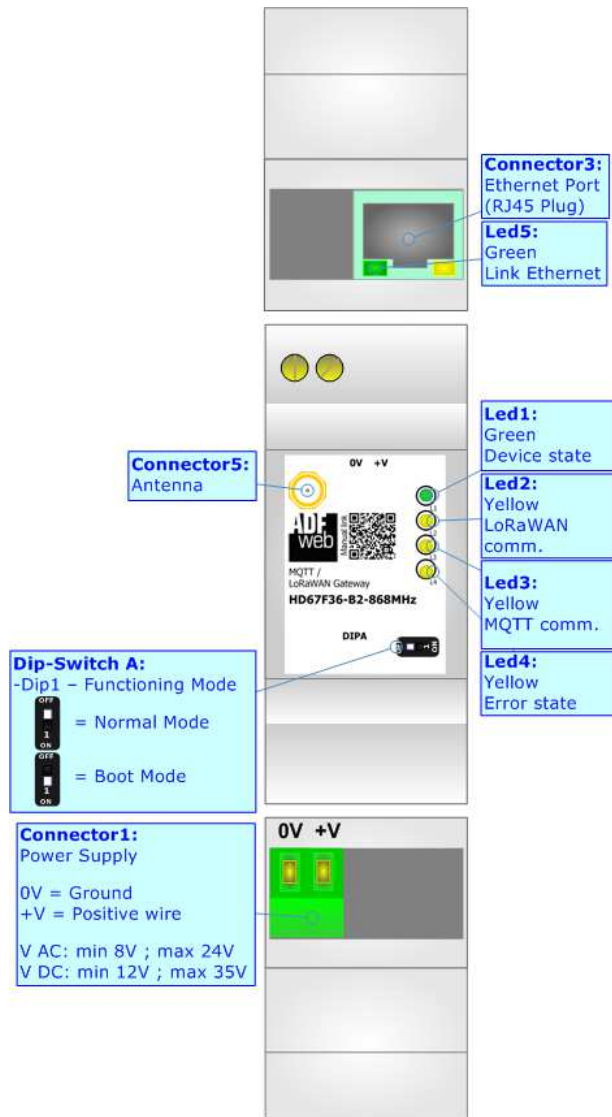


Figure 1: Connection scheme for HD67F36-B2-xxxMHz

**CHARACTERISTICS:**

The HD67F36-B2 is a LoRaWAN Gateway / MQTT.

It allows the following characteristics:

- Electrical isolation between MQTT and Power Supply;
- Mountable on 35mm Rail DIN;
- Wide power supply input range: 12...35V DC and 8...24V AC;
- Wide temperature range: -40°C / 85°C [-40°F / +185°F].



**CONFIGURATION:**

You need Compositor SW67F36 software on your PC in order to perform the following:

- Define the parameter of MQTT line;
- Define the parameter of LoRaWAN line;
- Define the list of LoRaWAN end-devices to connect;
- Define the LoRaWAN messages to send/receive from each LoRaWAN end-device;
- Define the MQTT topics in publish and subscribe;
- Update the device.

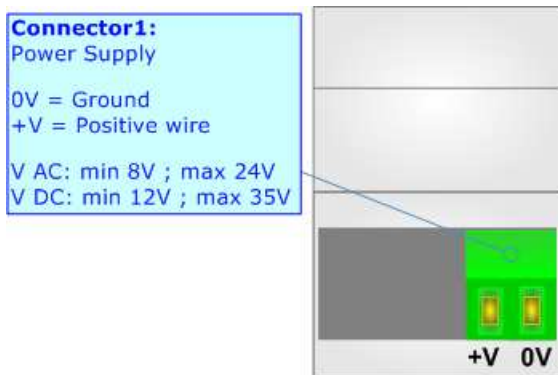
**POWER SUPPLY:**

The devices can be powered at 8...24V AC and 12...35V DC. For more details see the two tables below.

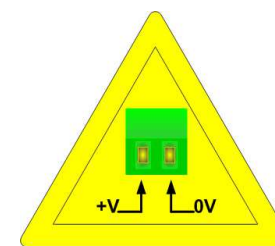
VAC 		VDC 	
Vmin	Vmax	Vmin	Vmax
8V	24V	12V	35V

Consumption at 24V DC:

Device	Consumption [W/VA]
HD67F36-B2-xxxMHz	3.5



**Caution: Not reverse the polarity power**



HD67F36-B2-xxxMHz

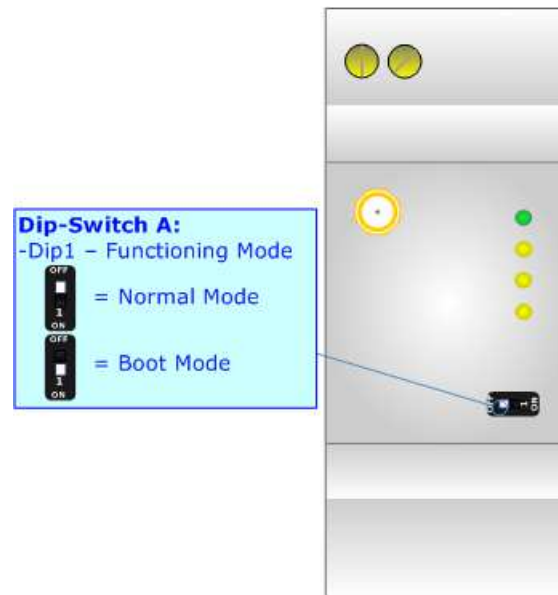
**FUNCTION MODES:**

The device has got two functions mode depending of the position of the 'Dip1 of Dip-Switch A':

- The first, with 'Dip1 of Dip-Switch A' at "OFF" position, is used for the normal working of the device.
- The second, with 'Dip1 of Dip-Switch A' at "ON" position, is used for upload the Project and/or Firmware.

For the operations to follow for the updating, see 'UPDATE DEVICE' section.

According to the functioning mode, the LEDs will have specifics functions, see 'LEDS' section.

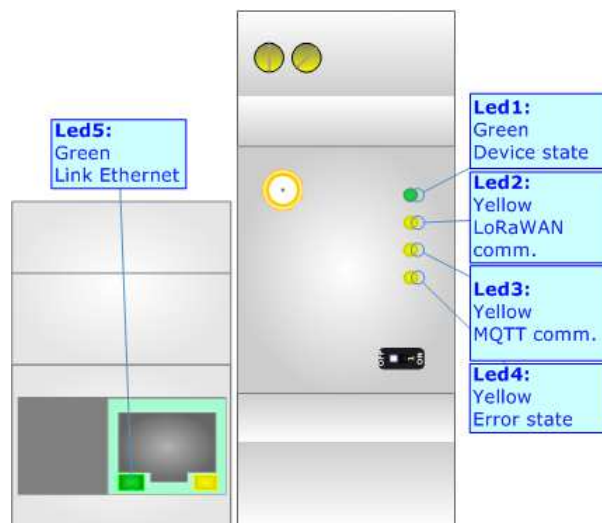




**LEDS:**

The device has got five LEDs that are used to give information of the functioning status.  
The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: Device State (green)	Blinks slowly (~1Hz)	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
2: LoRaWAN communication (yellow)	Blinks when a LoRaWAN message is received	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
3: MQTT communication (yellow)	Blinks when a MQTT message is received	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
4: Error state (yellow)	<b>ON:</b> An error in the communication busses occurs <b>OFF:</b> No errors are present	<b>Blinks quickly:</b> Boot state <b>Blinks very slowly (~0.5Hz):</b> update in progress
5: Link Ethernet (Green)	<b>ON:</b> Ethernet cable inserted <b>OFF:</b> Ethernet cable not inserted	<b>ON:</b> Ethernet cable inserted <b>OFF:</b> Ethernet cable not inserted



**LORAWAN:**

The LoRaWAN® specification is a Low Power, Wide Area (LPWA) networking protocol designed to wirelessly connect battery operated 'things' to the internet in regional, national or global networks, and targets key Internet of Things (IoT) requirements such as bi-directional communication, end-to-end security, mobility and localization services.

LoRaWAN® network architecture is deployed in a star-of-stars topology in which gateways relay messages between end-devices and a central network server.

The wireless communication takes advantage of the Long Range characteristics of the LoRa physical layer, allowing a single-hop link between the end-device and one or many gateways. All modes are capable of bi-directional communication, and there is support for multicast addressing groups to make efficient use of spectrum during tasks such as Firmware Over-The-Air (FOTA) upgrades or other mass distribution messages.

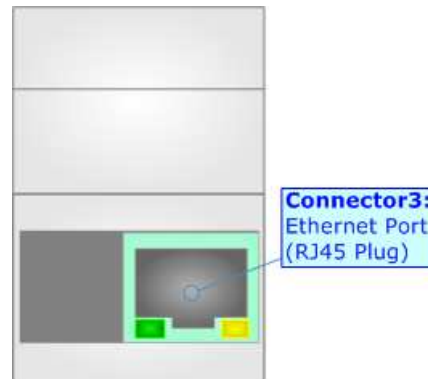
The converters support all the standard datarates and they work both on public and private networks.



**ETHERNET:**

The Ethernet port is used for MQTT communication and for programming the device.

The Ethernet connection must be made using Connector3 of HD67F36-B2 with at least a Category 5E cable. The maximum length of the cable should not exceed 100m. The cable has to conform to the T568 norms relative to connections in cat.5 up to 100 Mbps. To connect the device to an Hub/Switch is recommended the use of a straight cable, to connect the device to a PC is recommended the use of a cross cable.



### USE OF COMPOSITOR SW67F36:

To configure the Converter, use the available software that runs with Windows called SW67F36. It is downloadable on the site [www.adfweb.com](http://www.adfweb.com) and its operation is described in this document. The software works with MS Windows (XP, Vista, Seven, 8, 10, 11; 32/64bit).

When launching the SW67F36, the window below appears (Fig. 2).



**Note:**

It is necessary to have installed .Net Framework 4.

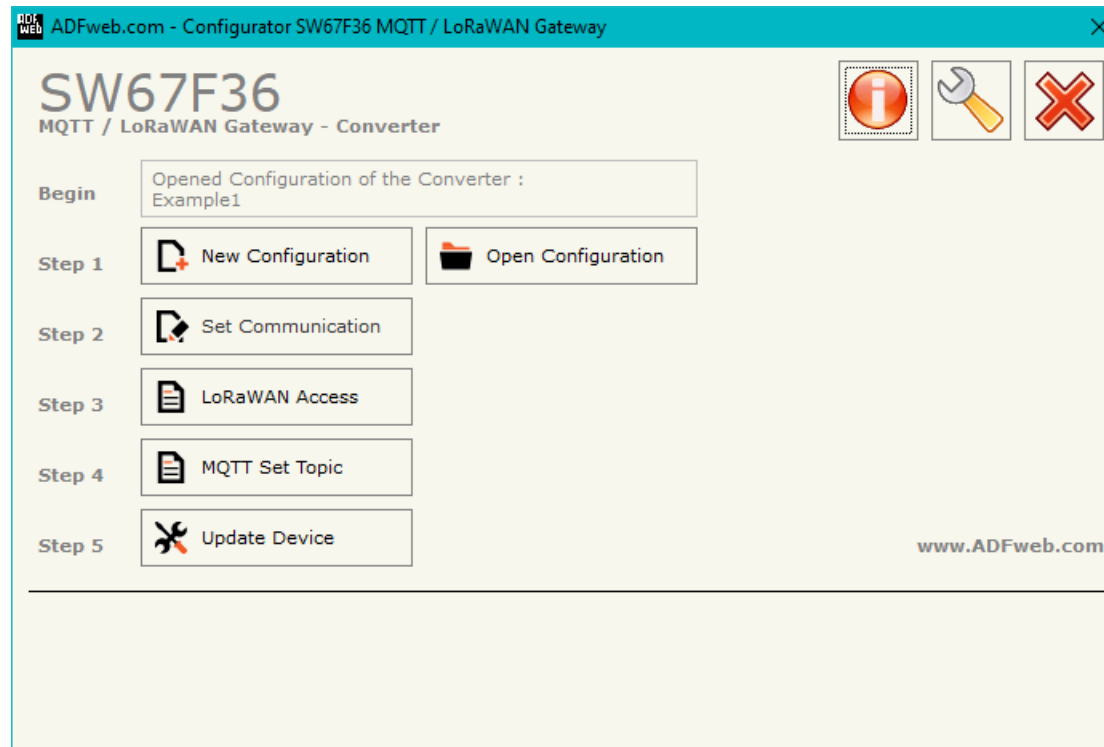
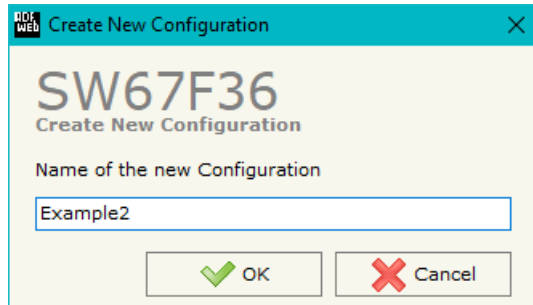


Figure 2: Main window for SW67F36

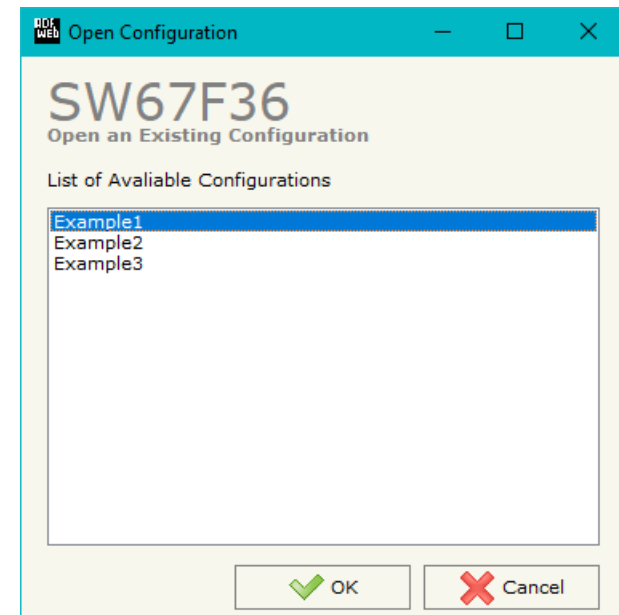
**NEW CONFIGURATION / OPEN CONFIGURATION:**

The “**New Configuration**” button creates the folder which contains the entire device’s configuration.




A device’s configuration can also be imported or exported:

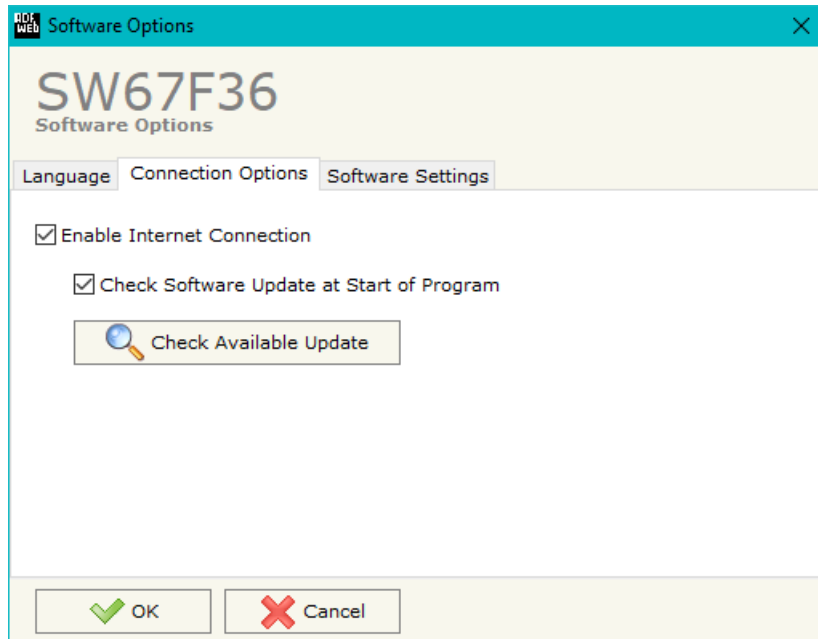
- To clone the configurations of a Programmable “LoRaWAN Gateway / MQTT - Converter” in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button “**Open Configuration**”.



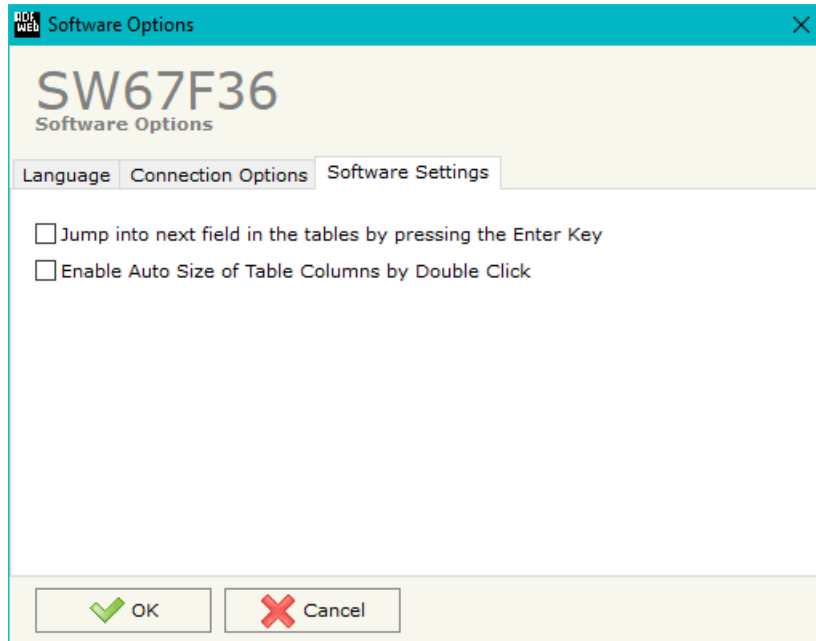
**SOFTWARE OPTIONS:**

By pressing the “**Settings**” () button there is the possibility to change the language of the software and check the updatings for the compositor.

In the section “Language” it is possible to change the language of the software.



In the section “Connection Options”, it is possible to check if there are some updatings of the software compositor in ADFweb.com website. Checking the option “**Check Software Update at Start of Program**”, the SW67F36 check automatically if there are updatings when it is launched.



In the section "Software Settings", it is possible to enable/disable some keyboard's commands for an easier navigation inside the tables contained in the different sections of the software.

**SET COMMUNICATION:**

By Pressing the **"Set Communication"** button from the main window for SW67F36 (Fig. 2) the window "Set Communication" appears (Fig. 3).

The window is divided in different sections in order to define the different parameters of the converter:

- ➔ Select Device
- ➔ Ethernet Connection
- ➔ LoRaWAN
- ➔ MQTT
- ➔ Ethernet
- ➔ TLS (Transport Layer Security)
- ➔ NTP (Network Time Protocol)
- ➔ Wi-Fi
- ➔ GSM / GPRS / LTE

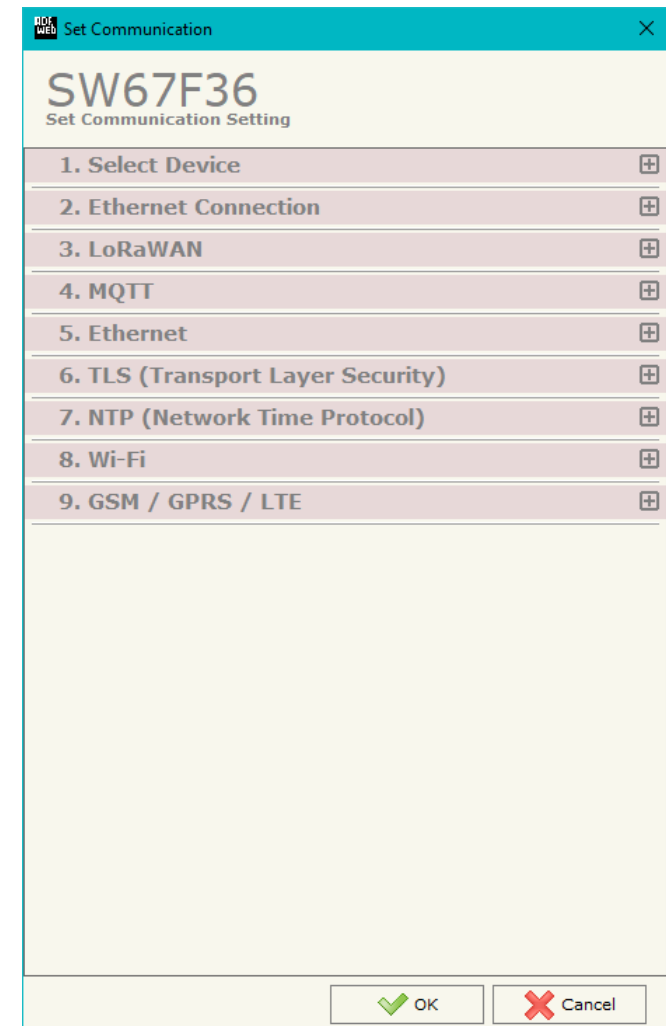


Figure 3a: "Set Communication" window



**SELECT DEVICE:**


This section is used to define the type of Ethernet connection used. It is possible to select:

- Only Ethernet Cable
- Ethernet cable + Wi-Fi

**ETHERNET CONNECTION:**

The means of the fields for "Ethernet Connection" are:

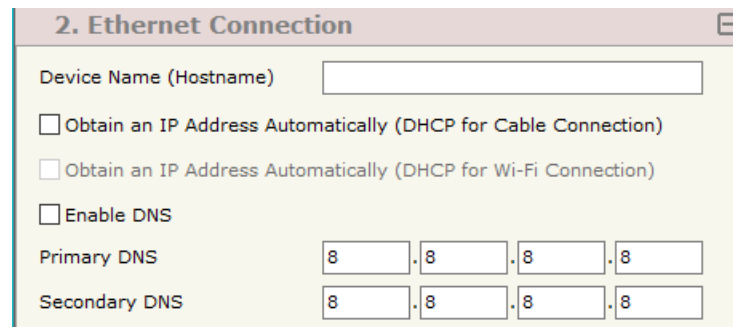
- In the field "**Device Name (Hostname)**" the Hostname to assign to the converter is defined;
- If the field "**Obtain an IP Address Automatically (DHCP for Cable Connection)**" is checked, DHCP for LAN connection is enabled;
- If the field "**Obtain an IP Address Automatically (DHCP for Wi-Fi Connection)**" is checked, DHCP for Wi-Fi connection is enabled;
- If the field "**Enable DNS**" is checked, DNS protocol is enabled;
- In the field "**Primary DNS**" the IP Address of the primary DNS server is defined;
- In the field "**Secondary DNS**" the IP Address of the secondary DNS server is defined.



1. Select Device

Type Only Ethernet Cable

Figure 3b: "Set Communication → IO-Link" window



2. Ethernet Connection

Device Name (Hostname)

Obtain an IP Address Automatically (DHCP for Cable Connection)

Obtain an IP Address Automatically (DHCP for Wi-Fi Connection)

Enable DNS

Primary DNS  8  .  8  .  8  .  8

Secondary DNS  8  .  8  .  8  .  8

Figure 3c: "Set Communication → Ethernet connection" window

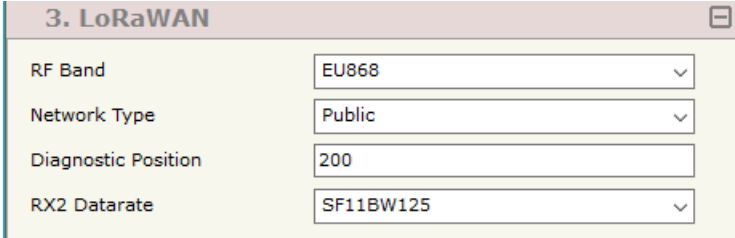
**LoRaWAN:**

This section is used to define the general parameters of LoRaWAN. The means of the fields are:

- In the field "**RF Band**" the wireless band used for LoRaWAN communication is defined;
- In the field "**Network Type**" the type of LoRaWAN network is defined;
- In the field "**Diagnostic Position**" it is possible to define an offset into the internal memory array where the status of the LoRaWAN end devices configured is saved. The diagnostic is made bit to bit, so each bit will represent a status of a single end device:
  - 1 → End device connected;
  - 0 → End device not connected.

The bits' order will be the same of the end devices' definition inside the LoRaWAN Access section;

- In the field "**RX2 Datarate**" the data rate on RX2 window is defined.



3. LoRaWAN	
RF Band	EU868
Network Type	Public
Diagnostic Position	200
RX2 Datarate	SF11BW125

Figure 3d: "Set Communication → LoRaWAN" window

## MQTT:

This section is used to define the main parameters of MQTT line. The means of the fields are:

- In the field "**Server URL**" the URL or the IP Address of the MQTT Server is defined;
- In the field "**Server Port**" the port used for MQTT communication is defined;
- In the field "**Client ID**" the Client ID of the converter is defined (if ned);
- In the field "**Keep Alive (seconds)**" the delay with which the Keep Alive message is sent on MQTT is defined;
- If the field "**Clean Session**" is checked, the last MQTT messages are deleted by the Server and the Client in case of missing ACK. If unchecked, the Server and the Client hold the last MQTT messages and, in case of incorrect disconnection or missing ACK, they try to send again them since all the ACK messages are exchanged correctly (valid only for QoS 1 and QoS 2);
- If the field "**Will Flag**" is checked, the converter will publish the Will topic at the connection to the Server. With this feature, in case of incorrect disconnection, the Server will publish this topic to all the MQTT Clients that subscribed it;
- In the field "**Topic Name Will**" the topic used for Will message is defined;
- In the field "**Message Will**" the payload of the Will message is defined;
- In the field "**Retained Will**" the converter will send the Will message with Retain flag enabled. In this way, the Server will hold the last Will message;
- In the field "**QoS Will**" the QoS type for Will message is defined;
- If the field "**Publish Topic on Connection**" is checked, the converter will publish a topic at the connection to the Server.
- In the field "**Topic Name Connection**" the topic published at the connection is defined;
- In the field "**Message Connection**" the payload of the connection topic is defined;
- In the field "**Retained Connection**" the converter will send the connection topic with Retain flag enabled. In this way, the Server will hold the last connection message;
- In the field "**Username**" the username for the connection to the MQTT server is defined;
- In the field "**Password**" the password for the connection to the MQTT server is defined.

4. MQTT	
Server URL	<input type="text"/>
Server Port	<input type="text" value="1883"/>
Client ID	<input type="text"/>
Keep Alive (seconds)	<input type="text"/>
<input type="checkbox"/> Clean Session	
<input checked="" type="checkbox"/> Will Flag	
Topic Name Will	<input type="text"/>
Message Will	<input type="text"/>
<input type="checkbox"/> Retained Will	
QoS Will	<input type="text" value="0"/>
<input checked="" type="checkbox"/> Publish Topic on Connection	
Topic Name Connection	<input type="text"/>
Message Connection	<input type="text"/>
<input type="checkbox"/> Retained Connection	
Username	<input type="text"/>
Password	<input type="text"/>

Figure 3e: "Set Communication → MQTT" window

**TLS (TRANSPORT LAYER SECURITY):**

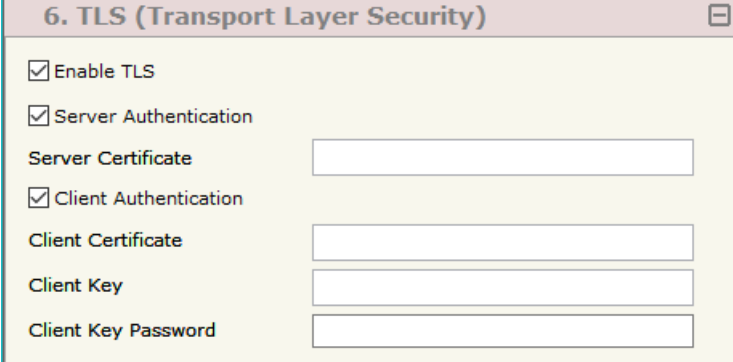
This section is used to define the parameters of TLS protocol. The means of the fields are:

- ➔ If the field "**Enable TLS**" is checked, the TLS protocol for secure connection is enabled;
- ➔ If the field "**Server Authentication**" is checked, the authentication of the Server using TLS is enabled. If enabled, in the field "**Server Certificate**" the certificate from the Server is defined;
- ➔ If the field "**Client Authentication**" is checked, the authentication of the Client using TLS is enabled. If enabled:
  - in the field "**Client Certificate**" the certificate from the Client is defined;
  - in the field "**Client Key**" the private key of the Client is defined;
  - in the field "**Client Key Password**" the password for the private key of the Client is defined.

**NTP (NETWORK TIME PROTOCOL):**


This section is used to define the parameters of NTP protocol. The means of the fields are:

- ➔ In the field "**Server URL**" the URL or the IP Address of the NTP Server is defined;
- ➔ In the field "**Poll Time (seconds)**" the polling time for the time synchronization is defined.



6. TLS (Transport Layer Security)	
<input checked="" type="checkbox"/> Enable TLS	
<input checked="" type="checkbox"/> Server Authentication	
Server Certificate	<input type="text"/>
<input checked="" type="checkbox"/> Client Authentication	
Client Certificate	<input type="text"/>
Client Key	<input type="text"/>
Client Key Password	<input type="text"/>

Figure 3f: "Set Communication → TLS" window



7. NTP (Network Time Protocol)	
Server URL	<input type="text" value="pool.ntp.org"/>
Poll Time (seconds)	<input type="text" value="1000"/>

Figure 3g: "Set Communication → NTP" window

**Wi-Fi:**

This section is used to define the general parameters of Wi-Fi. It is possible to defined the type of Wi-Fi communication:

- Access Point;
- Station.

The means of the fields for Access Point configuration are:

- In the field "**IP Address**" the IP address of the converter is defined;
- In the field "**Subnet Mask**" the SubNet Mask of the converter is defined;
- In the field "**GATEWAY**" the default gateway of the net is defined. This feature can be enabled or disabled pressing the Check Box field. This feature is used for going out of the net;
- In the field "**SSID**" the name of the Wi-Fi network to create is defined;
- In the field "**Secure Type**" the type of security protocol used by the Wi-Fi network is defined;
- In the field "**Password**" the password used for Wi-Fi connection is defined;
- If the field "**Enable DHCP**" is checked, the converter acts as DHCP Server for the Clients connected. If the option is enabled, in the fields "**DHCP First IP Address**" and "**DHCP SUBNET Mask**" the IP Addresses range used for DHCP is defined. In the field "**Lease Time (seconds)**" the required time for the renewing of the IP Address assigned to the Client is defined;
- In the field "**Max Client**" the maximum number of Wi-Fi Clients accepted is defined;
- In the field "**Channel**" the channel for Wi-Fi communication is defined.

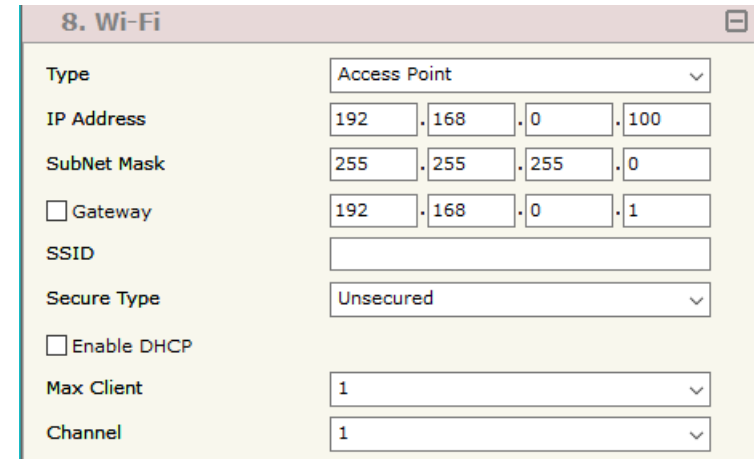
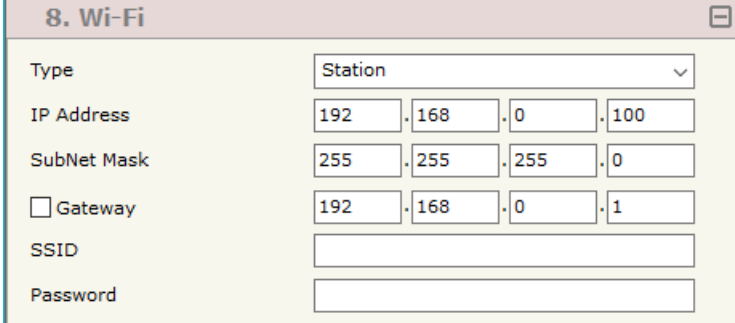


Figure 3h: "Set Communication → Wi-Fi (Access Point)" window

The means of the fields for Station configuration are:

- In the field "**IP Address**" the IP address of the converter is defined;
- In the field "**Subnet Mask**" the SubNet Mask of the converter is defined;
- In the field "**GATEWAY**" the default gateway of the net is defined. This feature can be enabled or disabled pressing the Check Box field. This feature is used for going out of the net;
- In the field "**SSID**" the name of the Wi-Fi network to connect is defined;
- In the field "**Password**" the password used to connect to the Wi-Fi network is defined.



The screenshot shows a configuration window titled "8. Wi-Fi". It contains the following fields:

Type	Station			
IP Address	192	. 168	. 0	. 100
SubNet Mask	255	. 255	. 255	. 0
<input type="checkbox"/> Gateway	192	. 168	. 0	. 1
SSID				
Password				

Figure 3i: "Set Communication → Wi-Fi (Station)" window

**LORAWAN ACCESS:**

By Pressing the **“LoRaWAN Access”** button from the main window for SW67F36 (Fig. 2) the window **“LoRaWAN Gateway Set Access”** appears (Fig. 4). This section is used to define the LoRaWAN end devices that will connect to the converter and the list of LoRaWAN messages to read (Uplink Rules) and write (Downlink Rules) from each one.

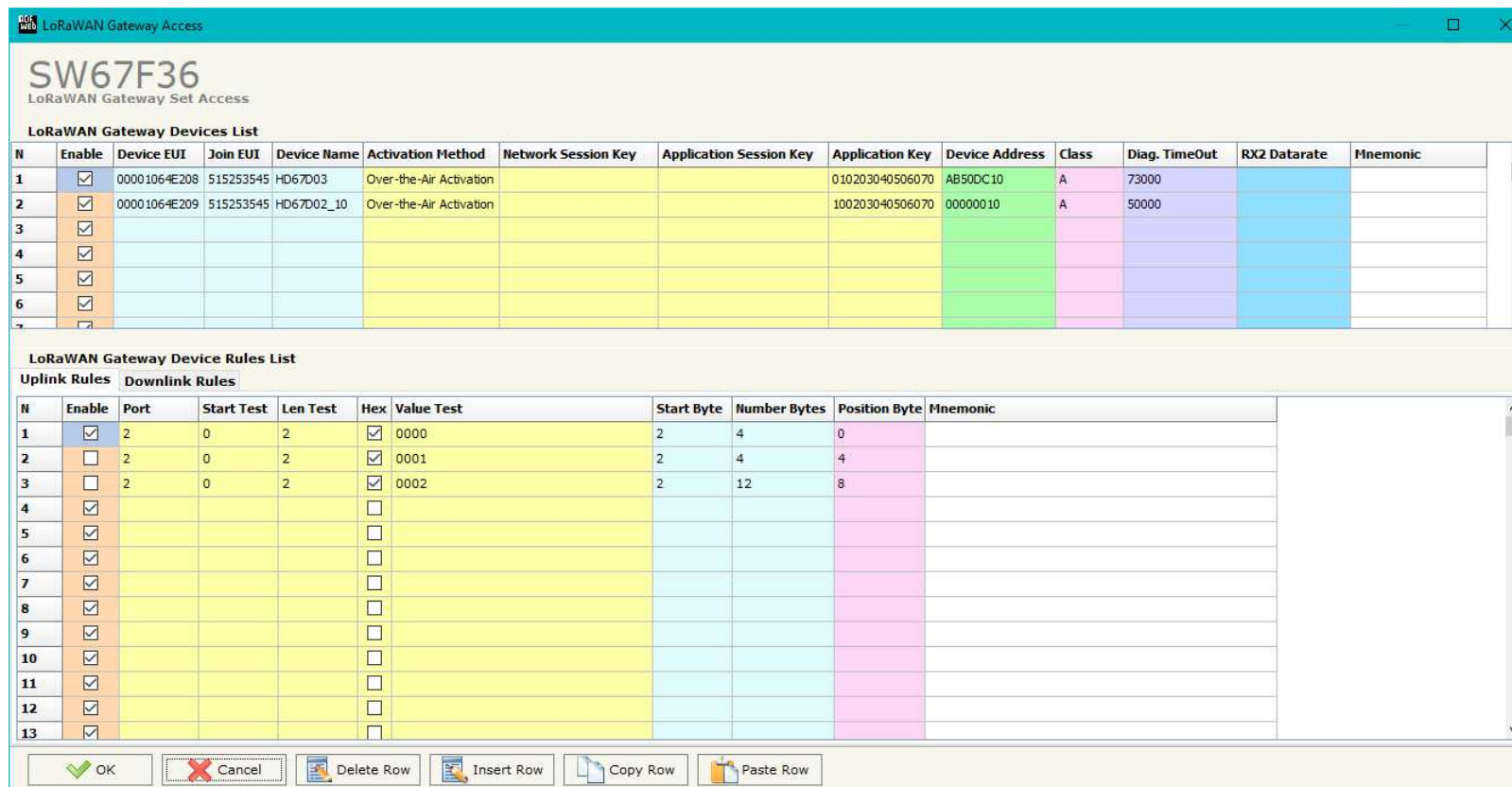


Figure 4a: "LoRaWAN Gateway Set Access" window

In the "**LoRaWAN Gateway Devices List**", the list of LoRaWAN end devices to connect is defined. The means of the fields for configuration are:

- If the field "**Enable**" is checked, the LoRaWAN end device is enabled;
- In the field "**Device EUI**" the Device EUI for the LoRaWAN device is defined;
- In the field "**Join EUI**" the Join EUI for the LoRaWAN device is defined;
- In the field "**Device Name**" the name of the LoRaWAN device is defined;
- In the field "**Activation Method**" the activation method for LoRaWAN device is defined;
- In the field "**Network Session Key**" the Network session key for LoRaWAN connection is defined;
- In the field "**Application Session Key**" the Application session key for LoRaWAN connection is defined;
- In the field "**Application Key**" the Application key for LoRaWAN connection is defined;
- In the field "**Device Address**" the address of the LoRaWAN device is defined;
- In the field "**Class**" the Class of the LoRaWAN device is defined;
- In the field "**Diag. TimeOut**" the timeout in ms for LoRaWAN communication is defined. If the LoRaWAN messages are received for this timeout, the correspondent bit for the diagnostic of Modbus side is set to 1;
- In the field "**RX2 Datarate**" the datarate used into the RX2 window is defined (optional).
- In the field "**Mnemonic**" a description of the LoRaWAN device is defined.



**Note:**

It is recommended to set the "Diag. Timeout" with a higher time than the cyclic delay used by the LoRaWAN device to send data.



In the “**LoRaWAN Gateway Device Rules List**”, the list of rules to get LoRaWAN data from selected end device is defined. The table is splitted in two: “Uplink Rules” for the data to be received from LoRaWAN and mapped to Modbus side and “Downlink Rules” for the data to be written from Modbus to LoRaWAN side.

LoRaWAN Gateway Device Rules List											
Uplink Rules						Downlink Rules					
N	Enable	Port	Start Test	Len Test	Hex	Value Test	Start Byte	Number Bytes	Position Byte	Mnemonic	
1	<input checked="" type="checkbox"/>	2	0	2	<input checked="" type="checkbox"/>	0000	2	4	0		
2	<input type="checkbox"/>	2	0	2	<input checked="" type="checkbox"/>	0001	2	4	4		
3	<input type="checkbox"/>	2	0	2	<input checked="" type="checkbox"/>	0002	2	12	8		
4	<input checked="" type="checkbox"/>				<input type="checkbox"/>						
5	<input checked="" type="checkbox"/>				<input type="checkbox"/>						
6	<input checked="" type="checkbox"/>				<input type="checkbox"/>						
7	<input checked="" type="checkbox"/>				<input type="checkbox"/>						
8	<input checked="" type="checkbox"/>				<input type="checkbox"/>						
9	<input checked="" type="checkbox"/>				<input type="checkbox"/>						
10	<input checked="" type="checkbox"/>				<input type="checkbox"/>						
11	<input checked="" type="checkbox"/>				<input type="checkbox"/>						
12	<input checked="" type="checkbox"/>				<input type="checkbox"/>						
13	<input checked="" type="checkbox"/>				<input type="checkbox"/>						

Figure 4b: “Uplink Rules” table

The means of the fields in the window “Uplink Rules” are the following:

- If the field “**Enable**” is checked, the LoRaWAN rule is enabled;
- In the field “**Port**” the port used for LoRaWAN communication is defined;
- In the field “**Start Test**” it is possible to define the starting byte to check (offset inside the LoRaWAN message) for recognizing specific LoRaWAN messages from end device (optional);
- In the field “**Len Test**” the number of bytes to check from the starting one is defined (optional);
- If the field “**Hex**” is checked, the data inside the LoRaWAN message is defined as Hex string (optional);
- In the field “**Value Test**” the data to look for inside the test bytes is defined (optional);
- In the field “**Start Byte**” the starting byte to save from the LoRaWAN message (offset) is defined;
- In the field “**Number Bytes**” the number of consecutive bytes to save from starting byte is defined;
- In the field “**Position Byte**” the address of internal memory array where mapping the data from LoRaWAN is defined;
- In the field “**Mnemonic**” a description of the LoRaWAN rule is defined.

LoRaWAN Gateway Device Rules List										
Uplink Rules		Downlink Rules								
N	Enable	Port	Start Byte	Number Bytes	On Change	On CMD	On Timer	Time (ms)	Position Byte	Mnemonic
1	<input checked="" type="checkbox"/>	2	2	6	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10000	0	
2	<input type="checkbox"/>	2	2	6	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1000	4	
3	<input type="checkbox"/>	2	2	14	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1000	8	
4	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
5	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
6	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
7	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
8	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
9	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
10	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
11	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
12	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
13	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

Figure 4c: "Downlink Rules" table

The means of the fields in the window "Uplink Rules" are the following:

- If the field "Enable" is checked, the LoRaWAN rule is enabled;
- In the field "Port" the port used for LoRaWAN communication is defined;
- In the field "Start Byte" the starting byte of the LoRaWAN message to write from Modbus is defined;
- In the field "Number Bytes" the number of consecutive bytes to write from starting byte is defined;
- If the field "On Change" is checked, the LoRaWAN message is sent only when the data from MQTT change;
- If the field "On CMD" is checked, the LoRaWAN message is sent when a MQTT message is received;
- If the field "On Timer" is checked, the LoRaWAN message is sent cyclically with the delay defined in "Time (ms)" field;
- In the field "Position Byte" the address of internal memory array from which taking the data is defined;
- In the field "Mnemonic" a description of the LoRaWAN rule is defined.

### MQTT SET TOPIC:

By Pressing the **"MQTT Set Topic"** button from the main window for SW67F36 (Fig. 2) the window "Set MQTT Topics" appears (Fig. 5). This section is used to define the MQTT topics where the converter will publish the data from LoRaWAN and the topic that the converter will subscribes for writing the data to LoRaWAN.

### MQTT PUBLISH

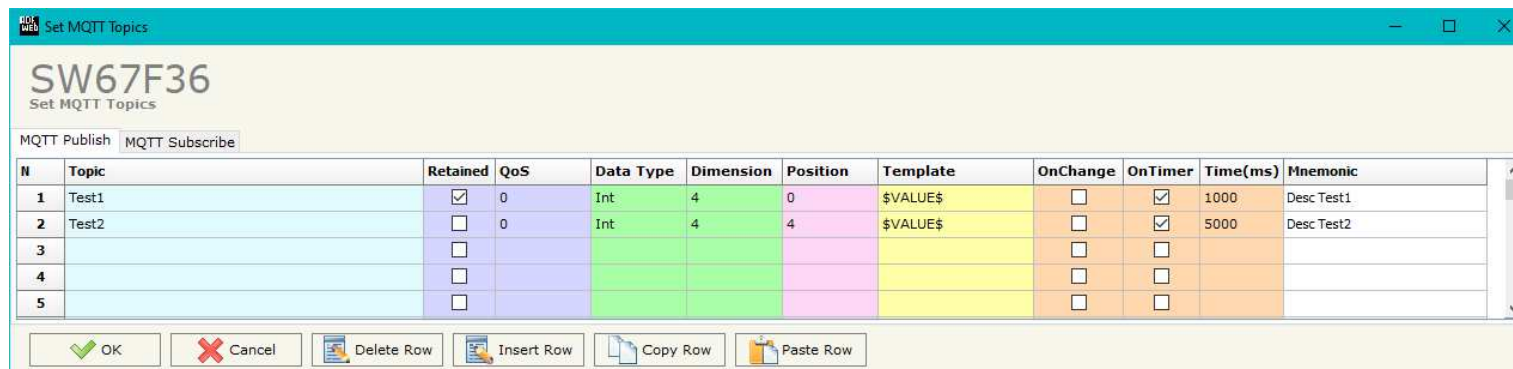


Figure 5a: "Set MQTT Topics → MQTT Publish" window

The means of the fields are:

- In the field **"Topic"** the MQTT topic is defined;
- If the field **"Retained"** is defined, the retained flag is enabled. The MQTT server will hold the last topic published;
- In the field **"QoS"** the QoS level is defined;
- In the field **"Data Type"** the type of data to use is defined;
- In the field **"Dimension"** the dimension in byte of the data is defined;
- In the field **"Position"** the starting byte of the internal memory array where taking the data is defined;
- In the field **"Template"** the structure of the MQTT payload is defined. With a double click on it, it is possible to open a window for editing it;
- If the field **"On Change"** is checked, the converter publishes the topic when the data from LoRaWAN are changed;
- If the field **"On Timer"** is checked, the converter publishes the topic cyclically with the delay defined in the field **"Time (ms)";**
- In the field **"Mnemonic"** a description of the topic is defined.

**MQTT SUBSCRIBE**

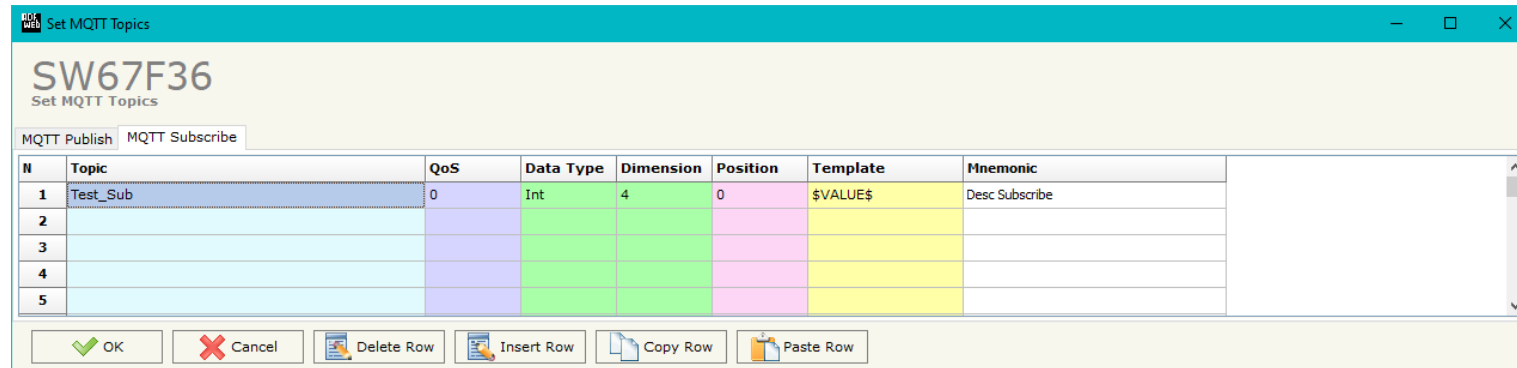


Figure 5b: "Set MQTT Topics → MQTT Subscribe" window

The means of the fields are:

- In the field "**Topic**" the MQTT topic is defined;
- If the field "**Retained**" is defined, the retained flag is enabled. The MQTT server will hold the last topic published;
- In the field "**QoS**" the QoS level is defined;
- In the field "**Data Type**" the type of data to use is defined;
- In the field "**Dimension**" the dimension in byte of the data is defined;
- In the field "**Position**" the starting byte of the internal memory array where placing the data is defined;
- In the field "**Template**" the structure of the MQTT payload is defined. With a double click on it, it is possible to open a window for editing it;
- In the field "**Mnemonic**" a description of the topic is defined.

### UPDATE DEVICE:

By pressing the **“Update Device”** button, it is possible to load the created Configuration into the device; and also the Firmware, if necessary. This by using the Ethernet port.

If you don't know the actual IP address of the device you have to use this procedure:

- Turn OFF the Device;
- Put Dip1 of `Dip-Switch A` in ON position;
- Turn ON the device
- Connect the Ethernet cable;
- Insert the IP **“192.168.2.205”**;
- Select which operations you want to do;
- Press the **“Execute update firmware”** button to start the upload;
- When all the operations are “OK” turn OFF the Device;
- Put Dip1 of `Dip-Switch A` in OFF position;
- Turn ON the device.

If you know the actual IP address of the device, you have to use this procedure:

- Turn ON the Device with the Ethernet cable inserted;
- Insert the actual IP of the Converter;
- Select which operations you want to do;
- Press the **“Execute update firmware”** button to start the upload;
- When all the operations are “OK” the device automatically goes at Normal Mode.

At this point the configuration/firmware on the device is correctly updated.

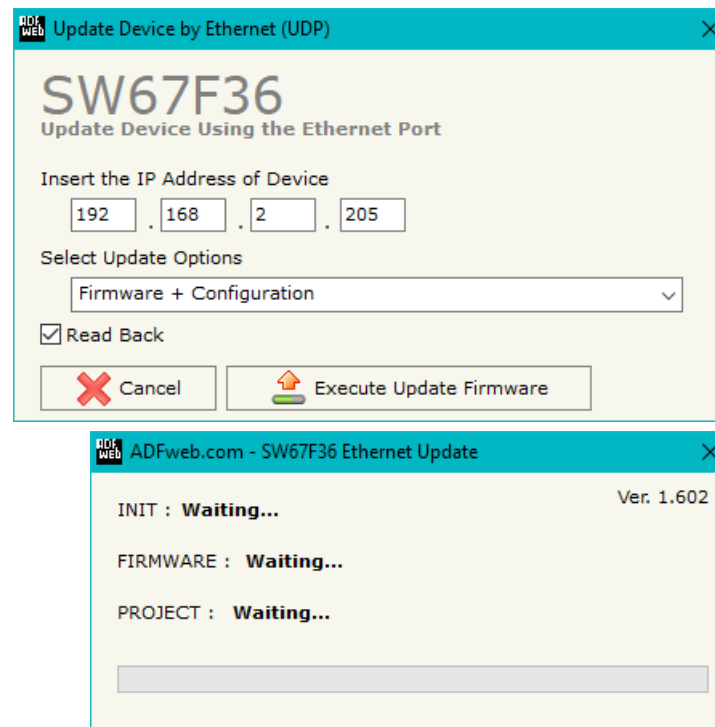


Figure 6: “Update device” windows

**Note:**

When you receive the device, for the first time, you also have to update the Firmware in the HD67F36 device.

**Warning:**

If Fig. 7 appears when you try to do the Update try these points before seeking assistance:

- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- Check the LAN settings;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven, Vista, 8, 10 or 11 make sure that you have the administrator privileges;
- In case you have to program more than one device, using the "UDP Update", you have to cancel the ARP table every time you connect a new device on Ethernet. For do this you have to launch the "Command Prompt" and write the command "arp -d". Pay attention that with Windows Vista, Seven, 8, 10, 11 you have to launch the "Command Prompt" with Administrator Rights;
- Pay attention at Firewall lock.

**Warning:**

In the case of HD67F36 you have to use the software "SW67F36": [www.adfweb.com/download/filefold/SW67F36.zip](http://www.adfweb.com/download/filefold/SW67F36.zip).

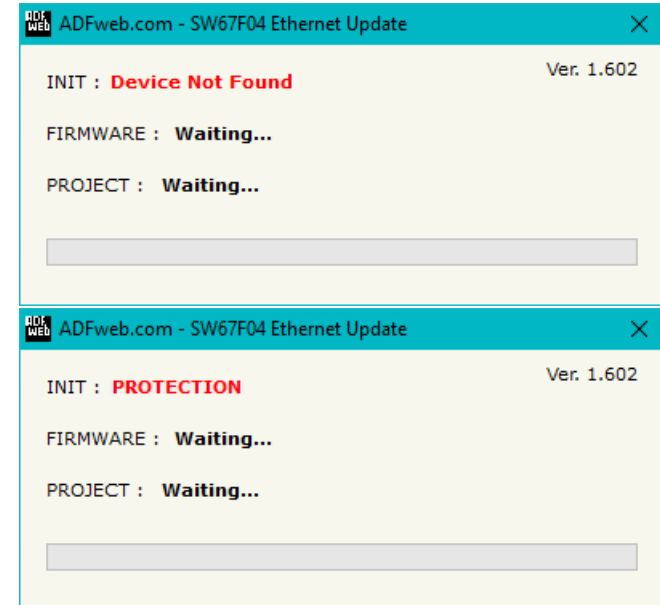


Figure 7: "Error" window

### **TEMPLATE STRING: DEFINITION OF MQTT PAYLOAD**

In the section "Set Communication" of the SW67F36, it is possible to define a Template string for the MQTT messages. The template is necessary in order to define the structure of the payload of the MQTT message and the info contained. It is possible to have a simple text format or a JSON format.

The definition of the template can be done using Key words, used to link a specific information of the Modbus requests. The key words used and their meanings are:

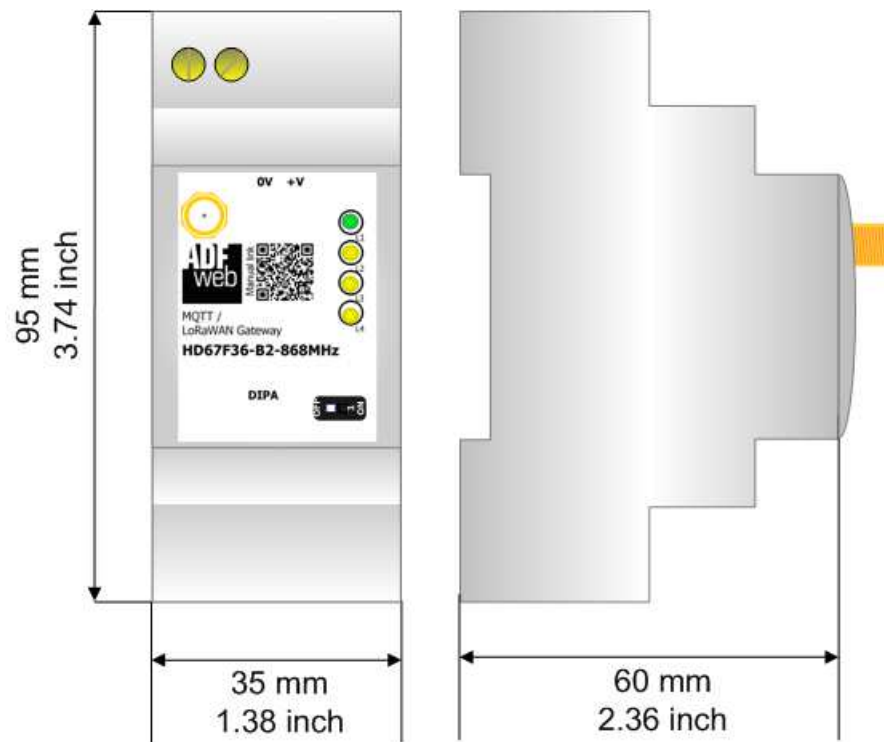
- VALUE: value of the Modbus variable
- TIME: date and time of the MQTT message



**Warning:**

The key words must be defined between "\$" chars in order to be recognized (Ex.: \$VALUE\$).

**MECHANICAL DIMENSIONS:**



Housing: PVC  
 Weight: 200g  
 (Approx)

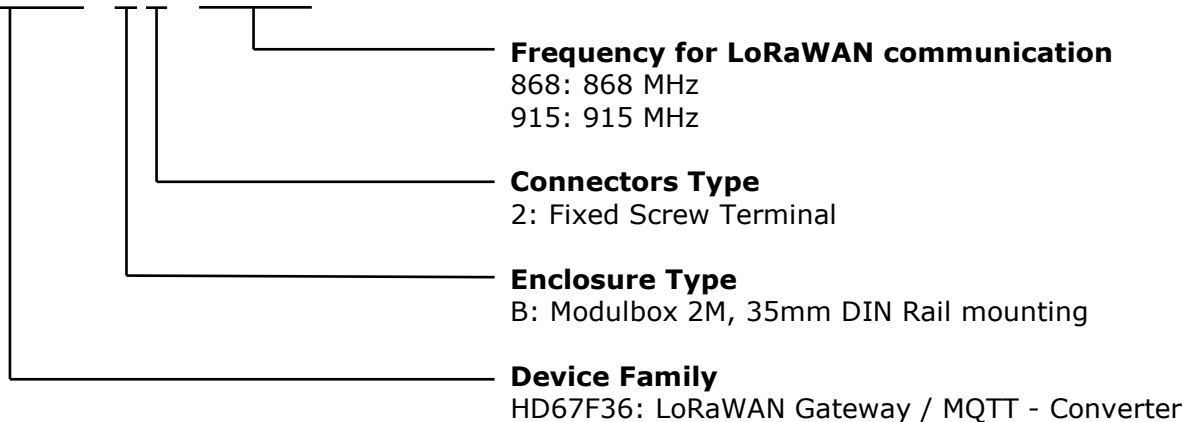
Figure 8: Mechanical dimensions scheme for HD67F36-B2-xxxMHz



**ORDERING INFORMATIONS:**

The ordering part number is formed by a valid combination of the following:

**HD67F36 - B 2 - xxxMHz**



Order Code: **HD67F36-B2-868MHz** - LoRaWAN Gateway / MQTT – Converter (868MHz)

Order Code: **HD67F36-B2-915MHz** - LoRaWAN Gateway / MQTT – Converter (915MHz)

**ACCESSORIES:**

Order Code: **AC34011** - 35mm Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V DC

Order Code: **AC34012** - 35mm Rail DIN - Power Supply 220/240V AC 50/60Hz – 24 V DC

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**OTHER REGULATIONS AND STANDARDS:****WEEE INFORMATION**

Disposal of old electrical and electronic equipment (as in the European Union and other European countries with separate collection systems).

— This symbol on the product or on its packaging indicates that this product may not be treated as household rubbish. Instead, it should be taken to an applicable collection point for the recycling of electrical and electronic equipment. If the product is disposed correctly, you will help prevent potential negative environmental factors and impact of human health, which could otherwise be caused by inappropriate disposal. The recycling of materials will help to conserve natural resources. For more information about recycling this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

**RESTRICTION OF HAZARDOUS SUBSTANCES DIRECTIVE**

The device respects the 2002/95/EC Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (commonly referred to as Restriction of Hazardous Substances Directive or RoHS).

**CE MARKING**

The product conforms with the essential requirements of the applicable EC directives.

**WARRANTIES AND TECHNICAL SUPPORT:**

For fast and easy technical support for your ADFweb.com SRL products, consult our internet support at [www.adfweb.com](http://www.adfweb.com).  
Otherwise contact us at the address [support@adfweb.com](mailto:support@adfweb.com)

**RETURN POLICY:**

If while using your product you have any problem and you wish to exchange or repair it, please do the following:

- Obtain a Product Return Number (PRN) from our internet support at [www.adfweb.com](http://www.adfweb.com). Together with the request, you need to provide detailed information about the problem.
- Send the product to the address provided with the PRN, having prepaid the shipping costs (shipment costs billed to us will not be accepted).

If the product is within the warranty of twelve months, it will be repaired or exchanged and returned within three weeks. If the product is no longer under warranty, you will receive a repair estimate.



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