

User Manual

Revision 1.002
English

DeviceNet Slave / Modbus TCP Master - Converter

- ▶ Very easy to configure
- ▶ Low cost
- ▶ Rail mountable
- ▶ Wide supply input range
- ▶ Galvanic isolation between two buses
- ▶ Industrial temperature range:
-40°C / 85°C (-40°F / 185°F)



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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/ and search for the corresponding code on the page. Click on the proper "Document Code" and download the update.

To obtain the updated documentation for the product that you own, note the "Document Code" (Abbreviated written "Doc. Code" on the label on the product) and download the updated from our web site www.adfweb.com/download/

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.000	16/04/2010	Fl	All	First release version
1.001	22/07/2011	Fl	All	Software changed (v1.000)
1.002	13/02/2013	Nt	All	Added new chapters

WARNING:

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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 are required for each individual application, legal and safety regulation. 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 instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

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

CE CONFORMITY

The declaration is made by us. You can send an email to or give us a call if you need it.

CONNECTION SCHEME:

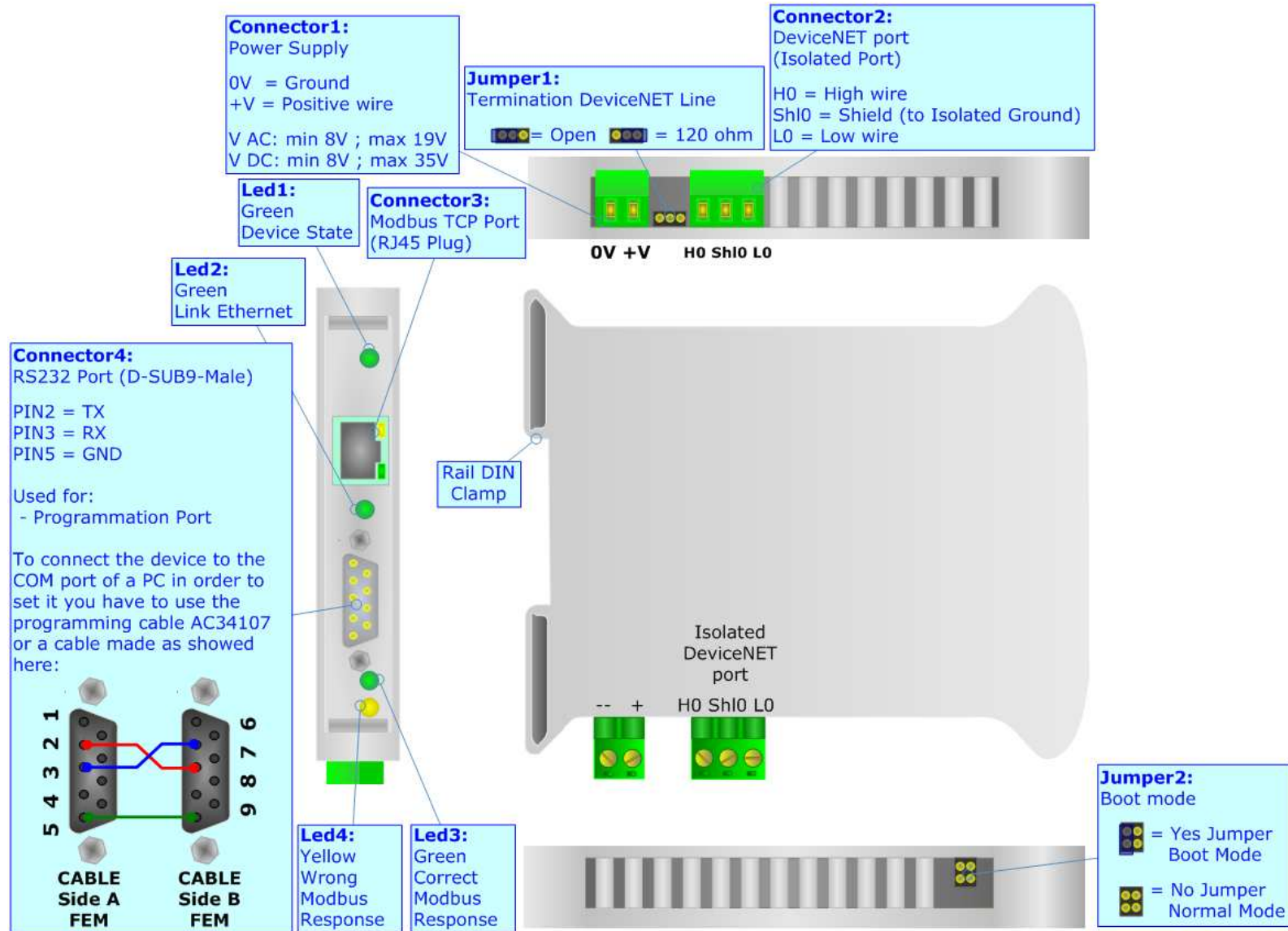


Figure 1: Connection scheme for HD67139-A1

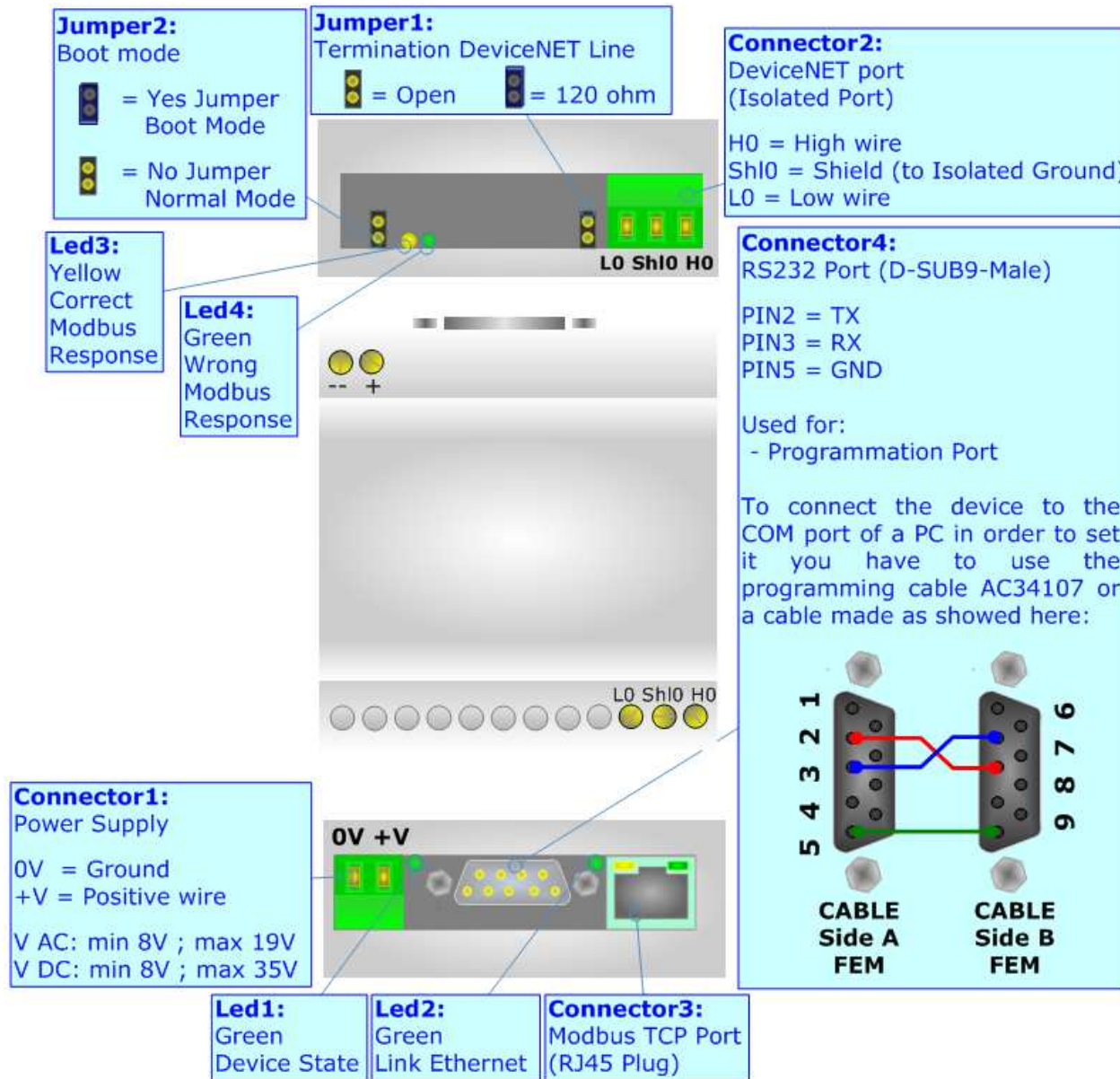


Figure 2: Connection scheme for HD67139-B2

CHARACTERISTICS:

The Modbus TCP Client (i.e. Master) from/to DeviceNet Slave Gateway allows the following characteristics:

- Up to 455 bytes in reading and 455 bytes in writing on DeviceNet side;
- Two-directional information between Modbus and DeviceNet bus;
- Electrical isolation between two buses;
- Power supply of 8...19 VAC 4VA or 8...35 VDC 4W;
- 35mm Rail DIN mounting;
- Temperature range -40°C to 85°C.

CONFIGURATION:

You need Compositor SW67139 software on your PC in order to perform the following:

- Define the parameters of Modbus TCP;
- Define the parameters of DeviceNet;
- Define the read/write registers;
- Update the Firmware and/or the Project.

POWER SUPPLY:

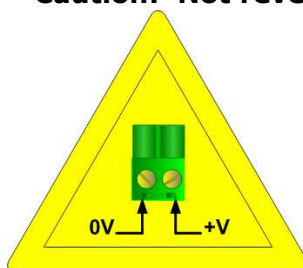
The device can be powered at 8...19V AC and 8...35V DC. For more details see the two tables below.

VAC		VDC	
Vmin	Vmax	Vmin	Vmax
8V	19V	8V	35V

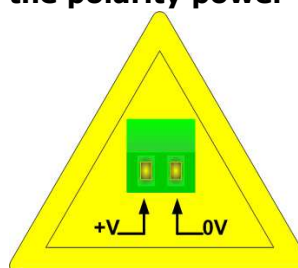
Consumption at 24V DC:

Device	W/VA
HD67139-A1	4
HD67139-B2	4

Caution: Not reverse the polarity power



HD67139-A1



HD67139-B2

Connector1:
Power Supply
0V = Ground
+V = Positive wire
V AC: min 8V ; max 19V
V DC: min 8V ; max 35V



Connector1:
Power Supply
0V = Ground
+V = Positive wire
V AC: min 8V ; max 19V
V DC: min 8V ; max 35V

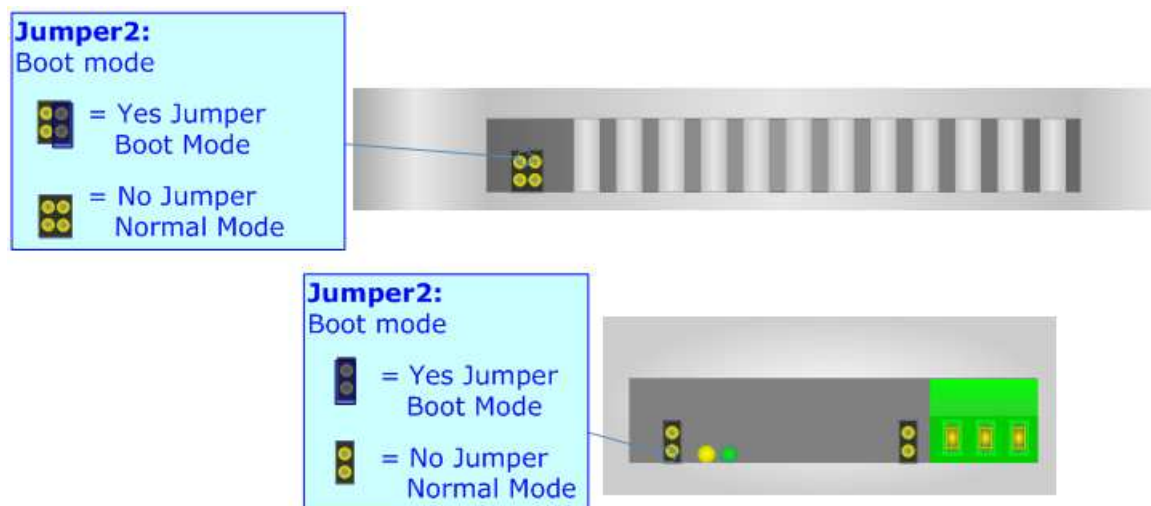
FUNCTION MODES:

The device has got two functions mode depending of the position of the 'Jumper 2':

- The first, with 'Jumper 2' not inserted (factory setting), is used for the normal working of the device.
- The second, with 'Jumper 2' inserted, is used for upload the Project and/or Firmware.

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

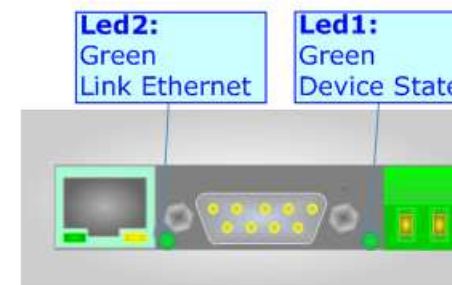
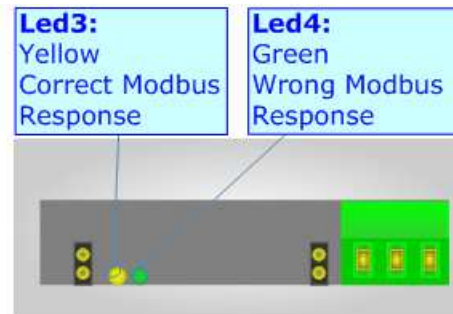
According to the functioning mode, the LEDs will have specifics functions (see 'LEDS' section).



LEDS:

The device has got four green 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	Blink slowly	Blink quickly
2: Link Ethernet	On: Cable connected Off: Cable disconnected	On: Cable connected Off: Cable disconnected
3: Correct Modbus Response	Change state when a Modbus the reply of a request is correct	Off
4: Wrong Modbus Response	Change state when a Modbus the reply of a request is wrong	Off



USE OF COMPOSITOR SW67139:

To configure the Gateway, use the available software that runs with Windows, called SW67139. It is downloadable on the site www.adfweb.com and its operation is described in this document.

When launching the SW67139 the right window appears (Fig. 3).

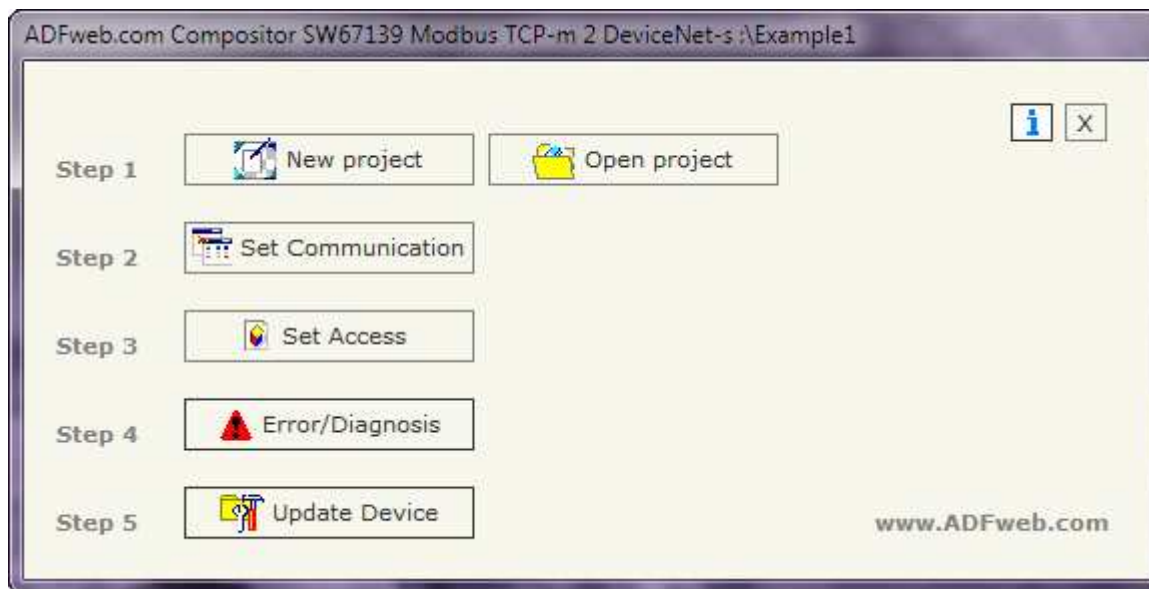


Figure 3: Main window for SW67139

NEW PROJECT / OPEN PROJECT:

The “**New Project**” button creates the folder which contains the entire device configuration. A device configuration can also be imported or exported:

- To clone the configurations of a Programmable Modbus TCP Client to DeviceNet Slave Gateway 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 Project**”.

SET COMMUNICATION:

This section defines the fundamental communication parameters of two Buses Modbus and DeviceNet.

By pressing the **"Set Communication"** button from the main window for SW67139 (Fig. 3) the "SET COMMUNICATION" window appears (Fig. 4).

The means of the fields for "Modbus TCP" are:

- In the field **"IP Address"** insert the IP address;
- In the field **"Subnet Mask"** insert the Subnet Mask;
- In the field **"Port"** insert the number of the port;
- If the field **"Don't disconnect the socket"** is checked, when the gateway receives the TCP response it doesn't disconnect the opened socket (it opens the socket only at the first TCP request and then the socket remains opened); otherwise for every TCP request the gateway opens the socket and when it receives the response it closes it;
- In the field **"TimeOut [mS]"** there is the maximum time that the device attends for the answer from the slave interrogated;
- If the field **"Write only when data change"** is checked, the gateway makes the "write request" on Modbus only if a data from DeviceNet IN changes; otherwise it makes these requests also if the data are not changed;
- In the field **"Cyclic Time [mS]"** the delay between two requests is defined. This time is expressed in mS.

The means of the fields for the "DeviceNet" section are:

- In the **"ID Dev."** field the Gateway address of the DeviceNet is defined.
- In the **"Baud rate"** field the DeviceNet baud rate is defined;
- In the field **"Num Byte IN"** the number of byte from the DeviceNet to the gateway is defined (at maximum it is possible to use 455 byte);
- In the field **"Num Byte OUT"** the number of byte from the gateway to the DeviceNet is defined (at maximum it is possible to use 455 byte);
- By checking the field **"Enable check Modbus Error"** it is possible to see in some DeviceNet OUT bytes if the communication with the Modbus TCP Devices is working or not;
- In the field **"Number Continuous Error"** insert the number of consecutively requests that the Modbus TCP device doesn't reply, before considering the Slave absent;
- In the field **"Start Address DeviceNet"** insert the address of OUT bytes that is used for the Diagnosis. The diagnosis occupy 8 consecutively bytes;
- If the field **"Enable Cancel Data"** is checked when the Slave device is considered absent, the gateway cancels the OUT data referred to it.

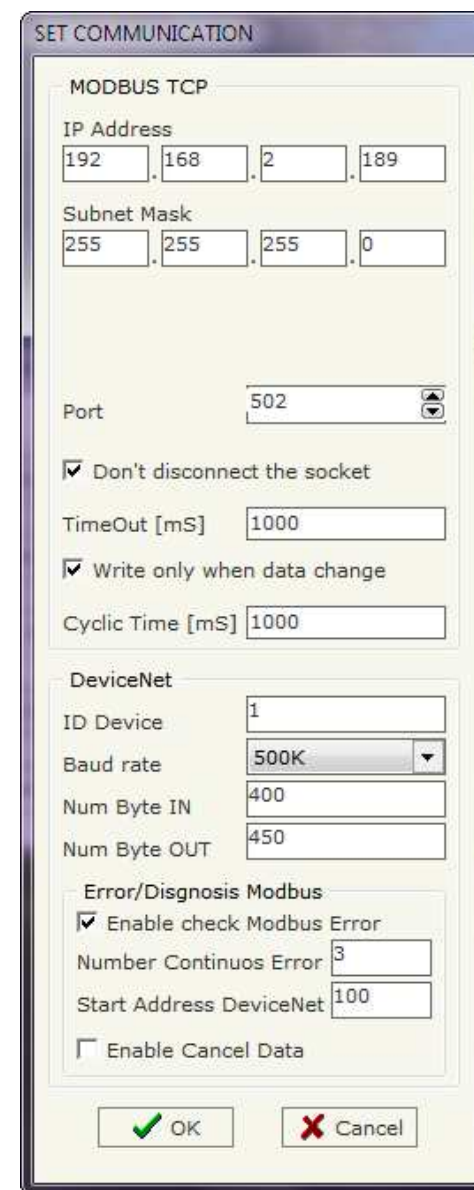


Figure 4: "Set Communication" window

SET ACCESS:

By pressing the "Set Access" button from the main window for SW67139 (Fig. 3) the window "Set Access" appears (Fig. 5).

This window is divided in two parts, the "Modbus Read --> DeviceNet OUT" and the "DeviceNet IN --> Modbus Write".

The first part ("DeviceNet OUT --> Modbus Read") is used to read the data from the Modbus Line and make available such data to a DeviceNet master through the DeviceNet OUT.

The second part ("Modbus Write --> DeviceNet IN") is used to write the data that arrive at DeviceNet side (DeviceNet IN) into the defined Modbus registers.

DeviceNet OUT --> Modbus Read

The means of the fields are:

- In the field "IP Address Slave", the IP address for the Slave Modbus device to be read is defined;
- In the field "Type" insert the data type of the Register you like read.
- In the field "Address Register" the start address of the register to be read is defined;
- In the field "NPoint" insert the number of consecutive register to be read;
- If the field "SWAP" is checked the data read is swapped;
- In the field "Address DeviceNet" the position where the data will be write in the DeviceNet array is defined;
- In the field "Mnemonic" the description for the request is defined.

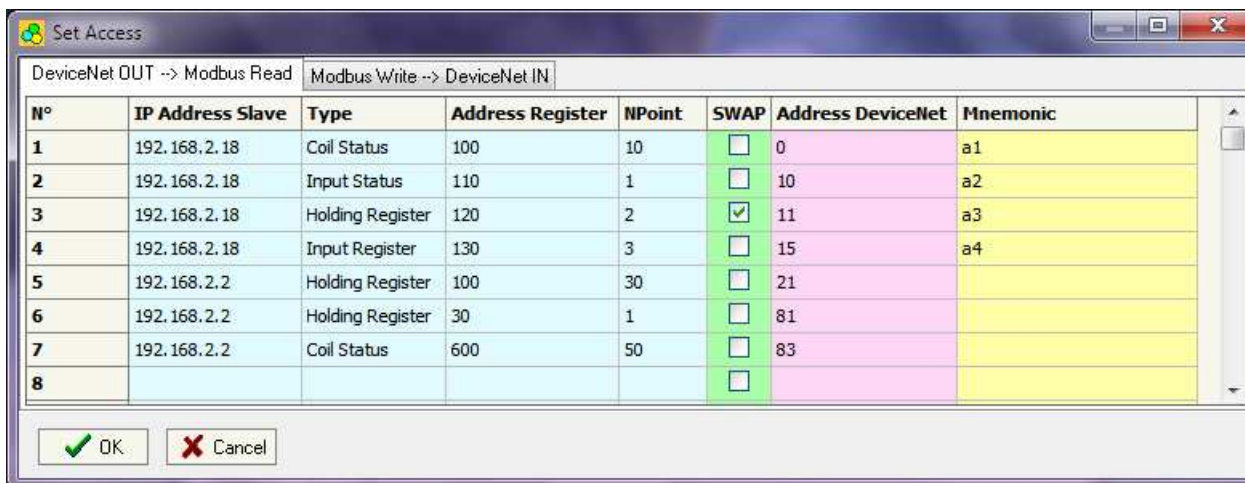


Figure 5: "Set Access" window

Modbus Write --> DeviceNet IN

The means of the fields are:

- In the field "**IP Address Slave**", the IP address for the Slave Modbus device to be write is defined;
- In the field "**Type**" insert the data type of the Register you like write.
- In the field "**Address Register**" the start address of the register to be write is defined;
- In the field "**NPoint**" insert the number of consecutive register to be write;
- If the field "**SWAP**" is checked the data written is swapped;
- In the field "**Address DeviceNet**" the position where the data will be read from the DeviceNet array is defined;
- In the field "**Mnemonic**" the description for the request is defined.

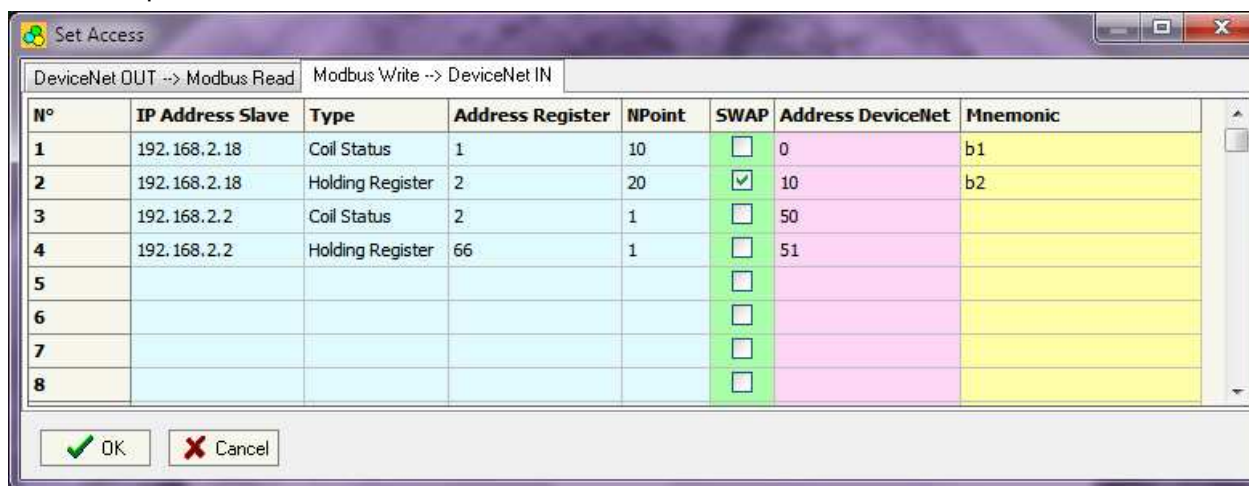


Figure 6: "Set Access" window

ERROR / DIAGNOSIS

By pressing the “**Error/Diagnosis**” button from the main window for SW67139 (Fig. 3) the window “Error/Diagnosis” appears (Fig. 7).

In this window is possible to insert all the Slave ID Address devices checked by the gateway.

The table give the position of the bit that are set if the device is in error in the Diagnosis bytes of DeviceNet.

The Diagnosis has always 8 byte fixed.

If the bit is to 1 there is a problem on it device. Each byte can contain at maximum 8 Modbus devices.

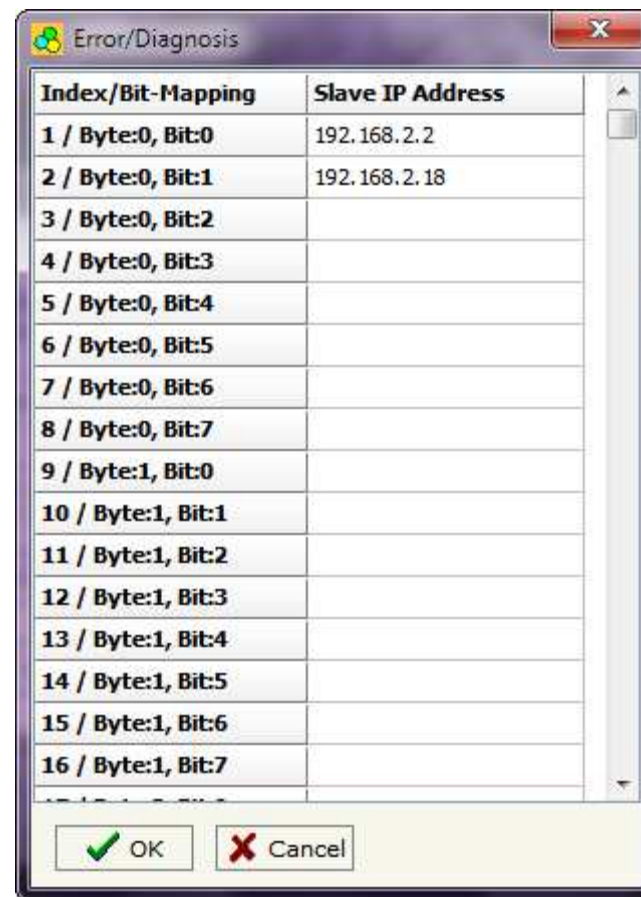


Figure 7: “Error/Diagnosis” window

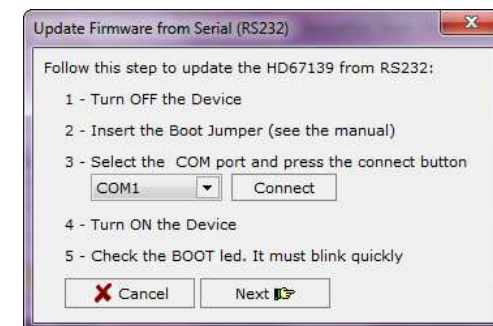
UPDATE DEVICE:

Section **"Update Firmware"** (Fig. 8):

In order to load the parameters or update the firmware in the device, follow these instructions:

- Turn off the Device;
- Connect the Null Modem Cable from your PC to the Gateway;
- Insert the Boot Jumper (For more info see Fig. 1 or Fig. 2);
- Select the COM port and press the **"Connect"** button;
- Turn on the device;
- Check the BOOT Led. It must blink quickly (For more info see Fig. 1 or Fig. 2);
- Press the **"Next"** button;
- 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;
- Disconnect the Boot jumper;
- Disconnect the RS232 Cable;
- Turn on the device.

Figure 8: "Update Device" windows

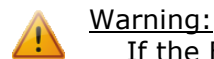


At this point the configuration/firmware on the device is correctly update.



Note:

When you install a new version of the software it is better if the first time you do the update of the Firmware in the HD67139-xx device.

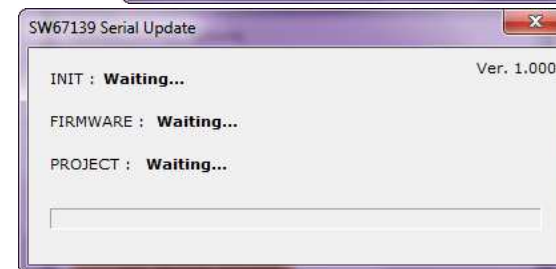


Warning:

If the Fig. 9 appears when you try to do the Update before require assistance try these points:

- Check if the serial COM port selected is the correct one;
- Check if the serial is connected between the PC and the device;
- Try to repeat the operations for the updating;
- If you are using a dongle try with a native COM port or change the dongle;
- Try with another PC.

Figure 9: "Protection" window



CHARACTERISTICS OF THE CABLES:

The connection from RS232 socket to a serial port (example one from a personal computer) must be made with a NULL MODEM cable (a serial cable where the pins 2 and 3 are crossed).

It is recommended that the RS232C Cable not exceed 15 meters.

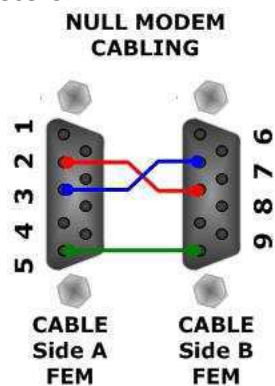


Figure 10: Null modem cabling

MECHANICAL DIMENSIONS:

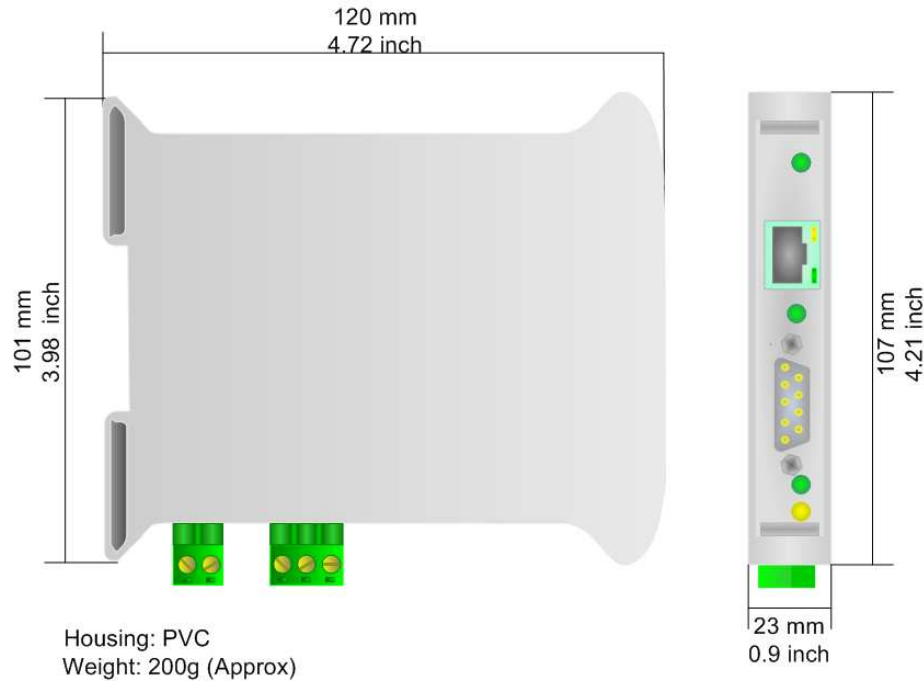


Figure 11: Mechanical dimensions scheme for HD67139-A1

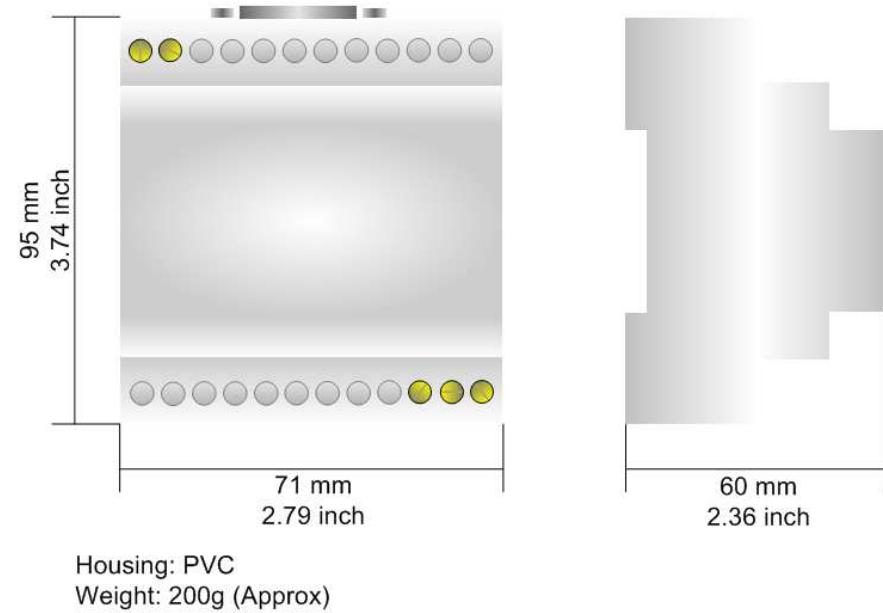


Figure 12: Mechanical dimensions scheme for HD67139-B2

ORDER CODE:

Order Code: **HD67139-A1-** DeviceNet Slave / Modbus TCP Master - Converter

Order Code: **HD67139-B2-** DeviceNet Slave / Modbus TCP Master - Converter

ACCESSORIES:

Order Code: **AC34107** - Null Modem Cable Fem/Fem DSub 9 Pin 1,5 m

Order Code: **AC34114** - Null Modem Cable Fem/Fem DSub 9 Pin 5 m

DISCLAIMER

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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 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. Otherwise contact us at the address 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:

- 1) Obtain a Product Return Number (PRN) from our internet support at www.adfweb.com. Together with the request, you need to provide detailed information about the problem.
- 2) Send the product to the address provided with the PRN, having prepaid the shipping costs (shipment costs billed to us will not be accepted).
- 3) 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.

PRODUCTS AND RELATED DOCUMENTS:

Part	Description	URL
HD67117	CAN Repeater/Isolator	www.adfweb.com?Product=HD67117
HD67216	Can Analyzer	www.adfweb.com?Product=HD67216
HD67221	Translate CAN bus Gateway	www.adfweb.com?Product=HD67221