User Manual

Revision 2.000
English

M-Bus Analyzer / Scanner / Sniffer

(Order Code: HD67031-B2-xxx)

for Website information:
www.adfweb.com?Product=HD67031

for Price information:
www.adfweb.com?Price=HD67031-20-B2
www.adfweb.com?Price=HD67031-40-B2
www.adfweb.com?Price=HD67031-80-B2
www.adfweb.com?Price=HD67031-160-B2
www.adfweb.com?Price=HD67031-250-B2

Benefits and Main Features:

- Very easy to use
- Power supply of 15…21V AC or 18…35V DC
- Industrial temperature range: -40°C / 70°C (-40°F / 158°F)

For other M-Bus products:
See also the following link:
Converter M-Bus to
www.adfweb.com?Product=HD67021 **(RS232)**
www.adfweb.com?Product=HD67022 **(RS485)**
www.adfweb.com?Product=HD67030 **(Ethernet)**

Extender and Repeater, M-Bus
www.adfweb.com?Product=HD67032

Gateway M-Bus / Modbus RTU
www.adfweb.com?Product=HD67029M-232 **(on RS232)**
www.adfweb.com?Product=HD67029M-485 **(on RS485)**

Gateway M-Bus / Modbus TCP
www.adfweb.com?Product=HD67044M

Gateway M-Bus / CANopen
www.adfweb.com?Product=HD67051

Gateway M-Bus / PROFIBUS
www.adfweb.com?Product=HD67053M

Do you have an your customer protocol?
See the following link:
www.adfweb.com?Product=HD67003

Do you need to choose a device? do you want help?
Ask it to the following link:
www.adfweb.com?Cmd=helpme

User Manual

INDEX:

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 updates.

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.000	07/01/2010	Fl	All	First release version
1.100	31/03/2011	Fl	All	Software changed (v3.000)
1.001	03/04/2013	Nt	All	Added new chapters
2.000	20/06/2016	Ff	All	New hardware version

WARNING:

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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 or give us a call if you need it.

CONNECTION SCHEME:

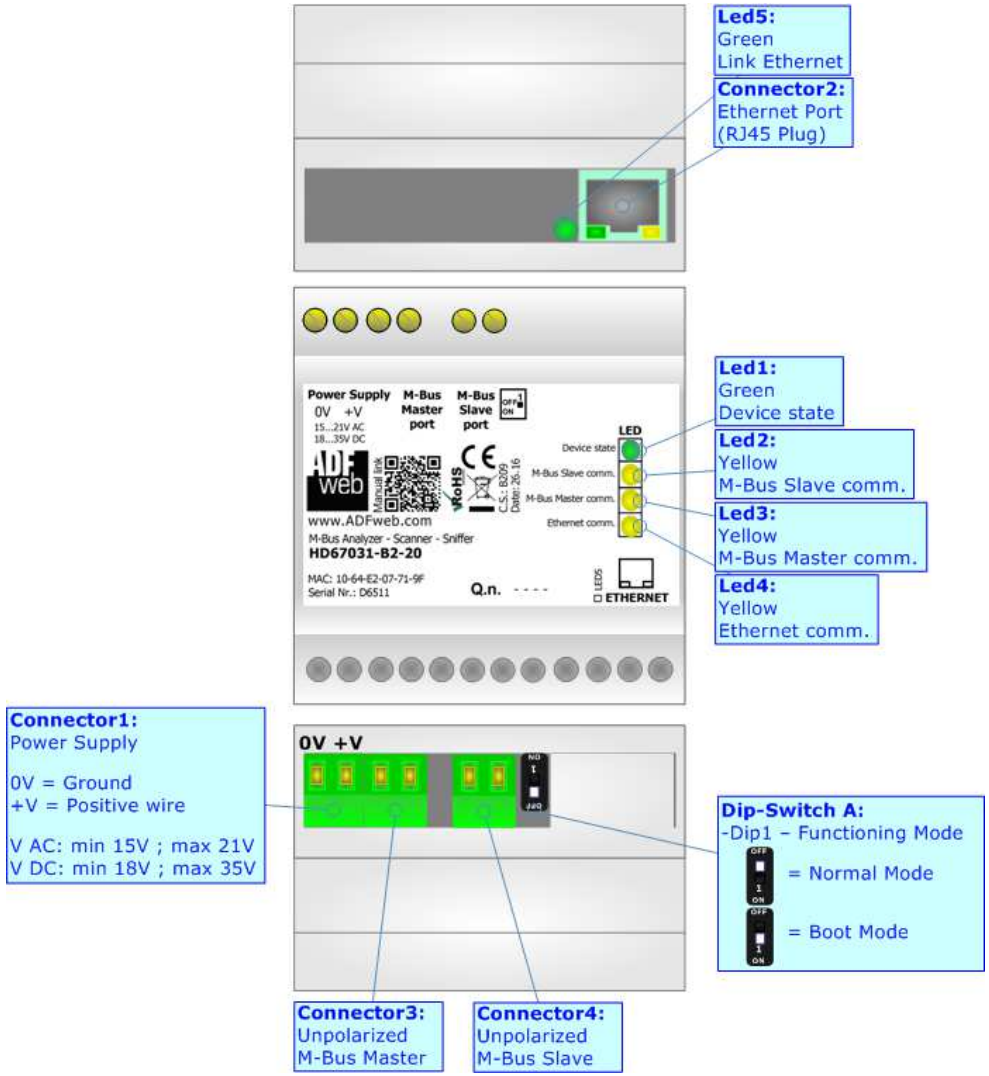


Figure 1: Connection scheme for HD67031-B2-xxx

CHARACTERISTICS:

The HD67031 series are M-Bus Analyzers - Scanner- Sniffer with the following features:

- Electrical isolation between Ethernet and M-Bus;
- Mountable on Rail DIN;
- Power Supply 15…21V AC or 18…35V DC;
- Temperature range -40°C to 70°C.

CONFIGURATION:

You need Compositor SW67031 software on your PC in order to perform the following:

- Manage the analyzer's functions;
- Update Firmware

POWER SUPPLY:

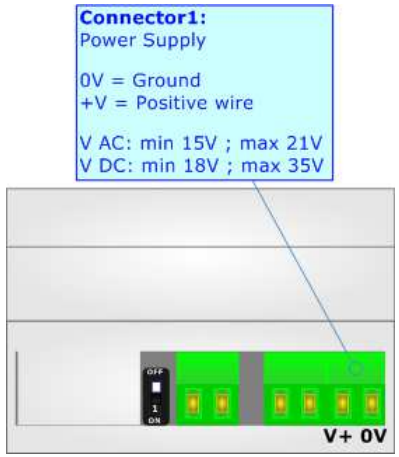
The devices can be powered at 15…21V AC and 18…35V DC. The consumption depends to the code of the device. For more details see the two tables below.

VAC ~		VDC ⎓	
Vmin	**Vmax**	**Vmin**	**Vmax**
15V	**21V**	**18V**	**35V**

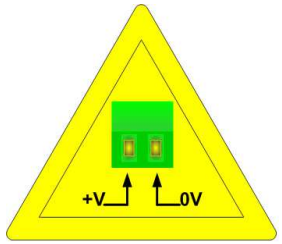
Consumption at 24V DC:

Device	No Load [W/VA]	Full Load [W/VA]*
HD67031-B2-20	3.5	4
HD67031-B2-40		5
HD67031-B2-80		8
HD67031-B2-160		14
HD67031-B2-250		30

* This value is with all the Slave M-Bus devices of the code (20, 40, 80, 160, 250) connected to the line



Caution: Do not reverse the polarity power



HD67032-B2-xxx

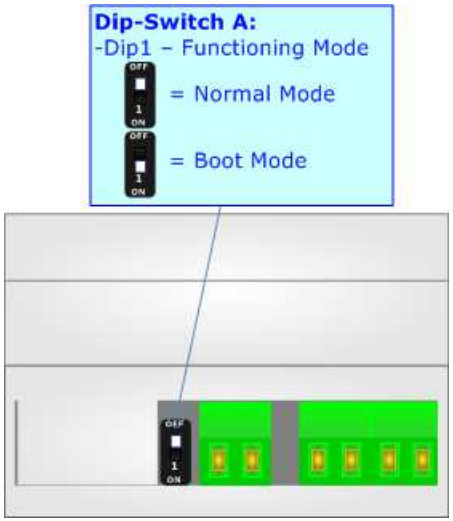
FUNCTION MODES:

The device has got two functions mode depending of the position of the 'Dip1 of Dip-Switch A' of HD67031-B2-xxx:

- 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 update the firmware.

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

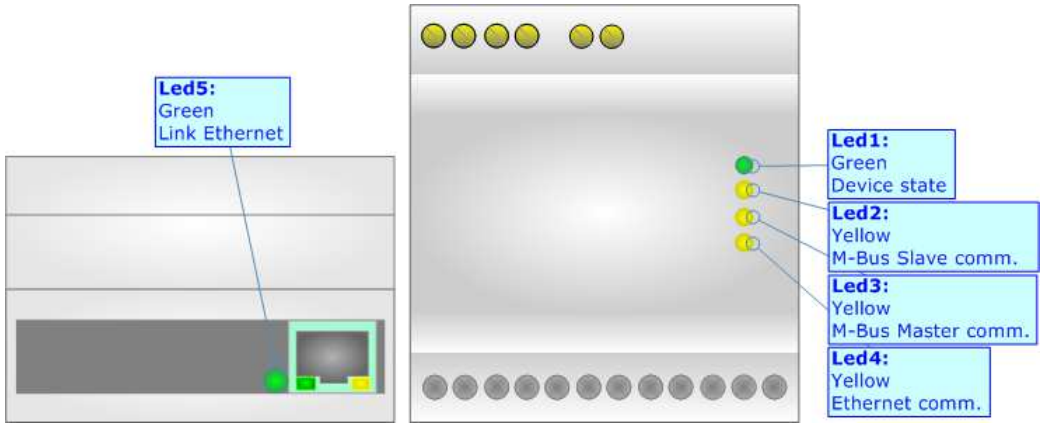
According to the functioning mode, the LEDs will have specifics functions, see 'LEDS' section.



LEDS:

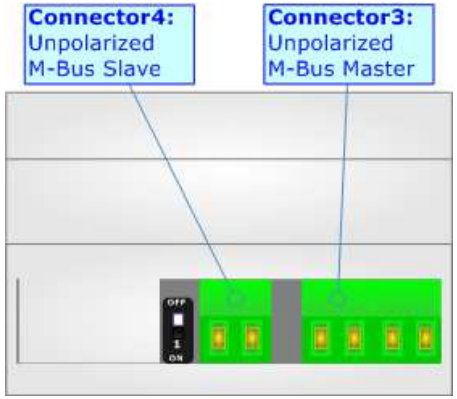
The HD67031-B2-xxx device has got five LEDs that are used to give information of the functioning status.
The various meanings of the LEDs are described in the table below.

LED	Normal Mode	Boot Mode
1: Device State (green)	Blinks slowly (~1Hz)	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
2: M-Bus Slave communication (yellow)	Blinks when correct M-Bus request is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
3: M-Bus Master communication (yellow)	Blinks when correct M-Bus response is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
4: Ethernet communication (yellow)	Blinks when an Ethernet request is received	**Blinks quickly:** Boot state **Blinks very slowly (~0.5Hz):** update in progress
5: Ethernet Link (green)	**ON:** Ethernet cable connected **OFF:** Ethernet cable disconnected	**ON:** Ethernet cable connected **OFF:** Ethernet cable disconnected



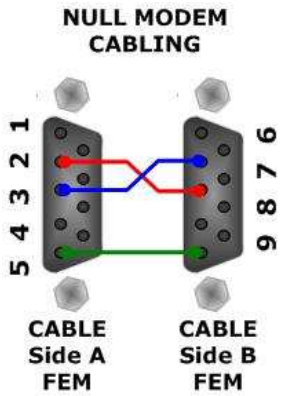
M-BUS:

The M-Bus is a unpolarized bus.
A two wire standard telephone cable (JYStY N*2*0.8 mm) is used as the transmission medium for the M-Bus. The maximum distance between a slave and the repeater is 350m; this length corresponds to a cable resistance of up 29Ω. This distance applies for the standard configuration having Baud rates between 300 and 9600 Baud, and a maximum of 250 slaves. The maximum distance can be increased by limiting the Baud rate and using fewer slaves, but the bus voltage in the space state must at no point in a segment fall below 12V, because of the remote powering of the slaves. In the standard configuration the total cable length should not exceed 1000m, in order to meet the requirement of a maximum cable capacitance of 180nF. *(Taken from M-Bus specifics)*



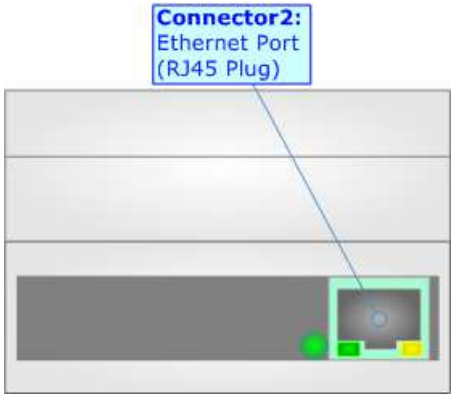
RS232 (for old version with RS232):

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.



ETHERNET:

The Ethernet connection must be made using Connector2 of HD67031-B2-xxx 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/PLC/other is recommended the use of a cross cable.



USE OF SW67031 ANALYZER & SCANNER M-BUS:

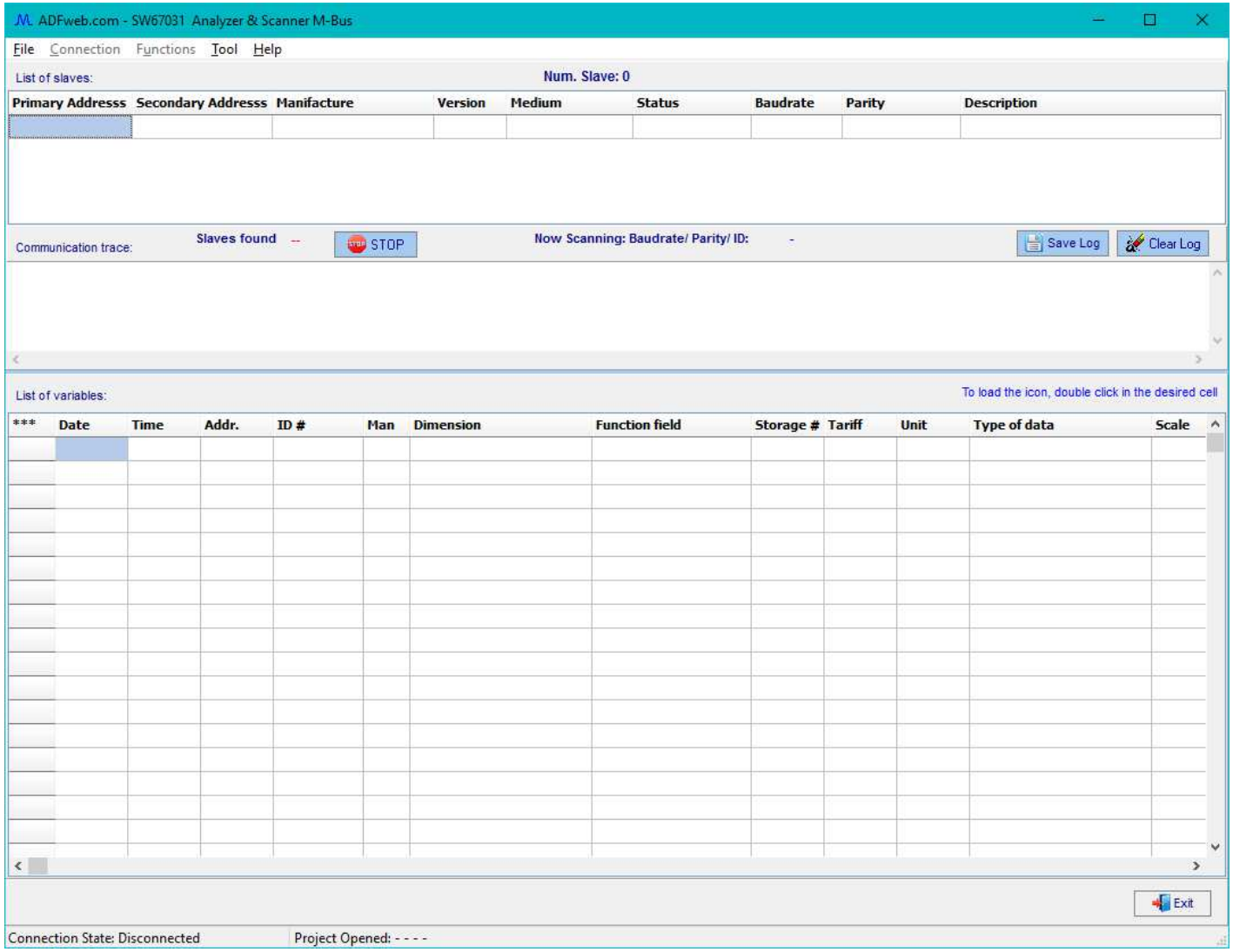


Figure 1: Main window for SW67031

SECTION FILE:

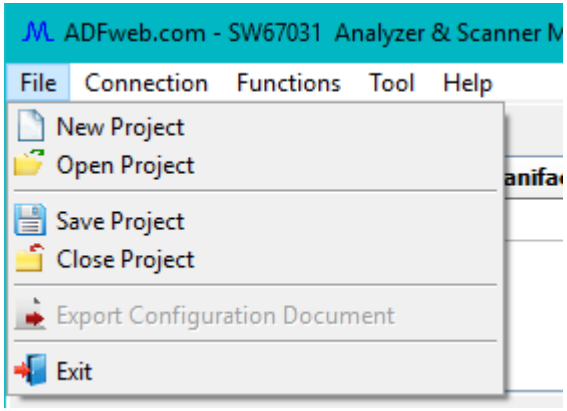


Figure 2: Section "File"

In this section it is possible to create a new project, open a saved project, save the existing project or close it. Moreover it is possible to export the configuration for one of our M-Bus converters.

NEW PROJECT:

The "**New Project**" button creates the folder which contains the new project files.

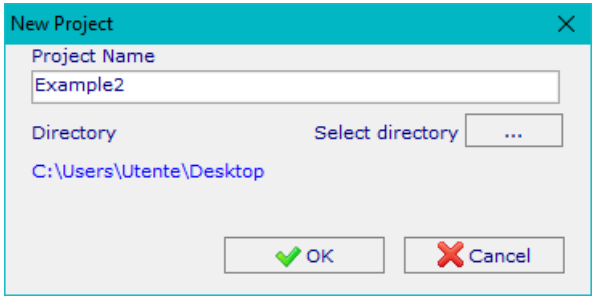


Figure 3: "New Project" window

OPEN PROJECT:

By pressing "**Open Project**" button it is possible to open a saved project with all the characteristics saved this project. i.e. device selected, baudrate and parity, devices found at the scan, descriptions of variables…

SAVE PROJECT:

By pressing "**Save Project**" button it is possible to save the current workspace with all the project characteristics. i.e. device selected, baudrate and parity, devices found at the scan, descriptions of variables…

CLOSE PROJECT:

By pressing "**Close Project**" button it is possible to close the current workspace.

EXPORT CONFIGURATION DOCUMENT:

By pressing the "**Export Configuration Document**" it is possible to save a .xml file used to configure the others our M-Bus products.

SECTION CONNECTION:

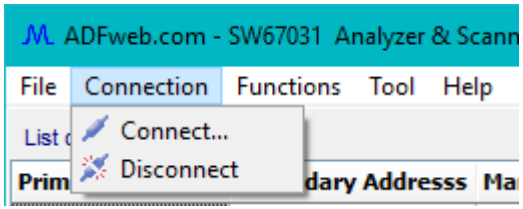


Figure 4: Section "Connection"

In this section it is possible to manage the connection parameters.

Note:
This section isn't available until a new project was created or an existing one was opened.

CONNECT...:

In this form it is possible to select the device in your possess between "HD67031 Serial" and "HD67031 Ethernet".

If the device selected is the "**HD67031 Serial**", in the field "Serial COM Port" you have to select the serial port used to connecting to the device.

If the device selected is the "**HD67031 Ethernet**", in the field "IP Address" you have to insert the programmed IP Address of the Analyzer.

If you want to send the SND_NKE command when you do the scanning you have to check the "**Send SND_NKE**" field.

If you want to send the Application reset command when you do the scanning you have to check the "**Send Appl. Reset**" field.

If the meters are Multi-Telegram meters, you can filter the ones that you need with the "**Cut After**" field.

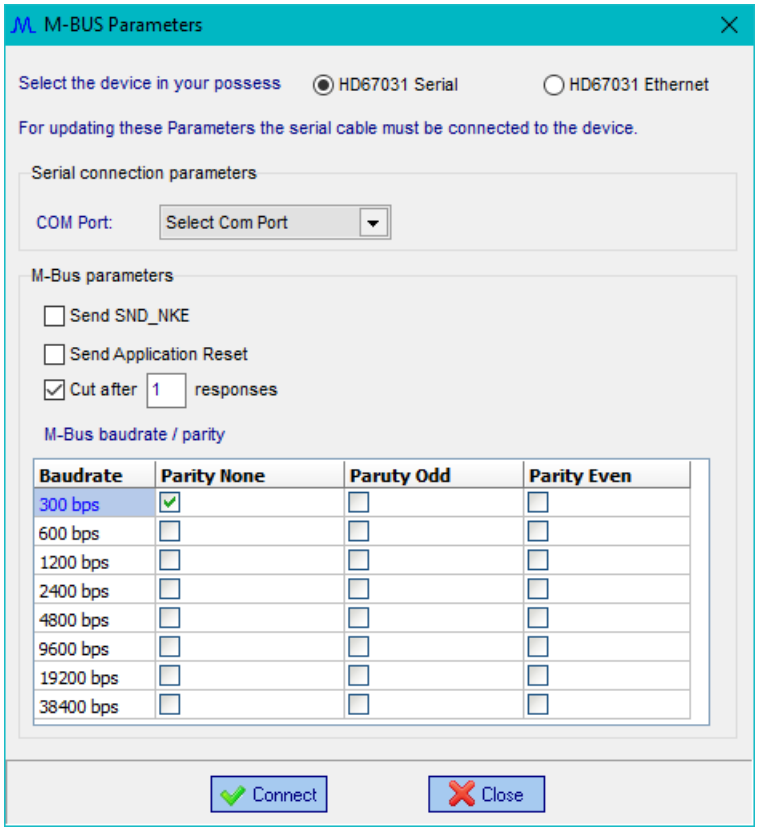


Figure 5: "M-Bus Parameters" window

SECTION FUNCTIONS:

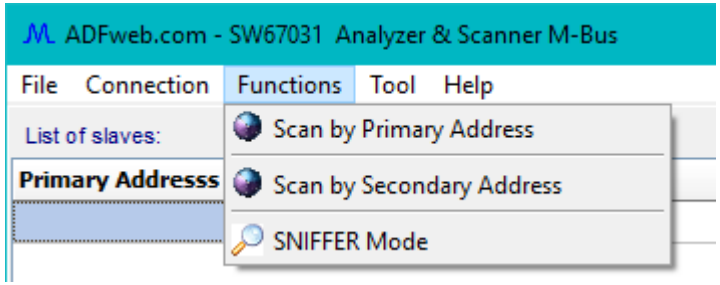


Figure 6: Section "Functions"

Note:
This section isn't available until a new project was created or an existing one was opened.

SCAN BY PRIMARY/SECONDARY ADDRESS:

With this button, the Network scanning by Primary or Secondary Address starts.

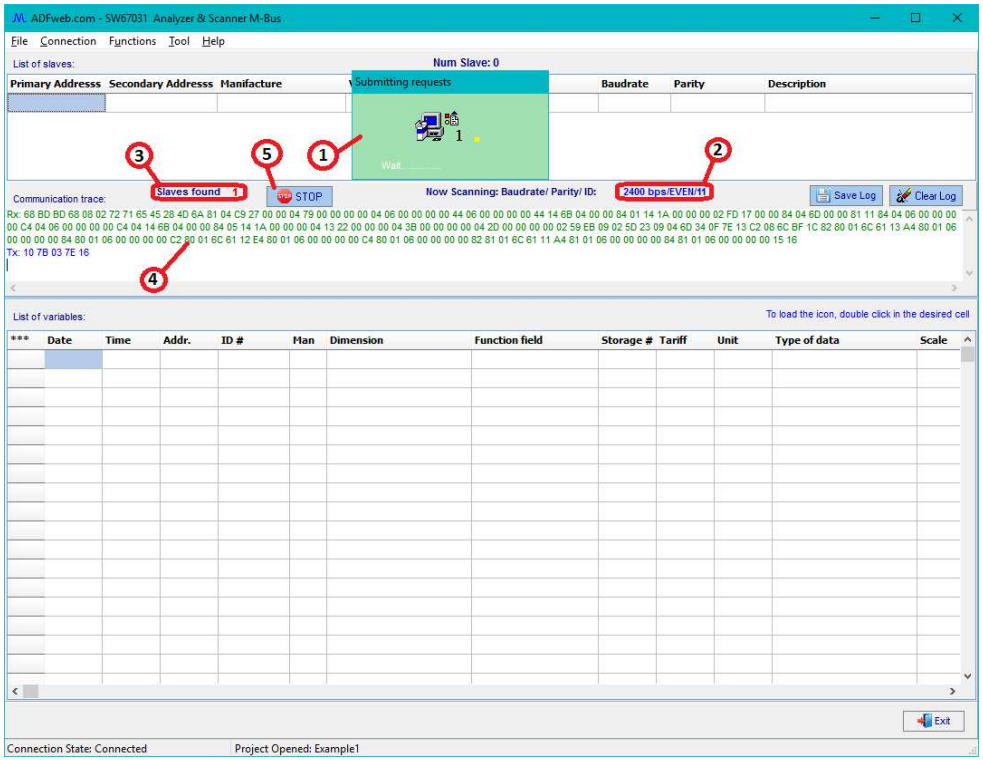


Figure 7: Scanning window

1: This window indicates that the software is doing the requests for scanning the devices;

2: This label indicates the baudrate, parity and the ID now scanned;

3: This label indicates the number of slaves found until now;

4: In this field it is possible to see the data logged;

5: With this button it is possible to stop the scanning. For example if you have four devices and the scan has found four devices, you can stop it.

If, when you have stopped the scan or it was completed, the software hasn't found any device connected the right window appear (Fig. 8).

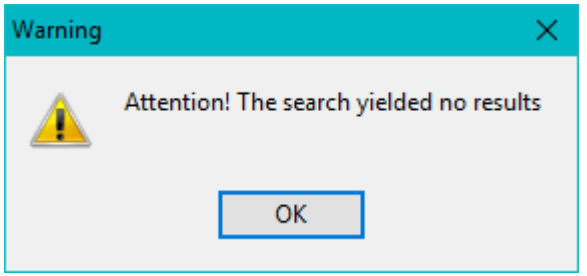


Figure 8: Warning window

Otherwise:

1: At this table it is possible to see the main information of the devices found by the scan. i.e. Primary Address, Secondary Address, manufacturer, version, medium, status, baudrate, parity. In the field "Description" you can insert a brief description of the device.

2: At this table it is possible to see all the variables of the scanned devices. Also in this table is present a field "Description" that allows you to insert a description of the variable.

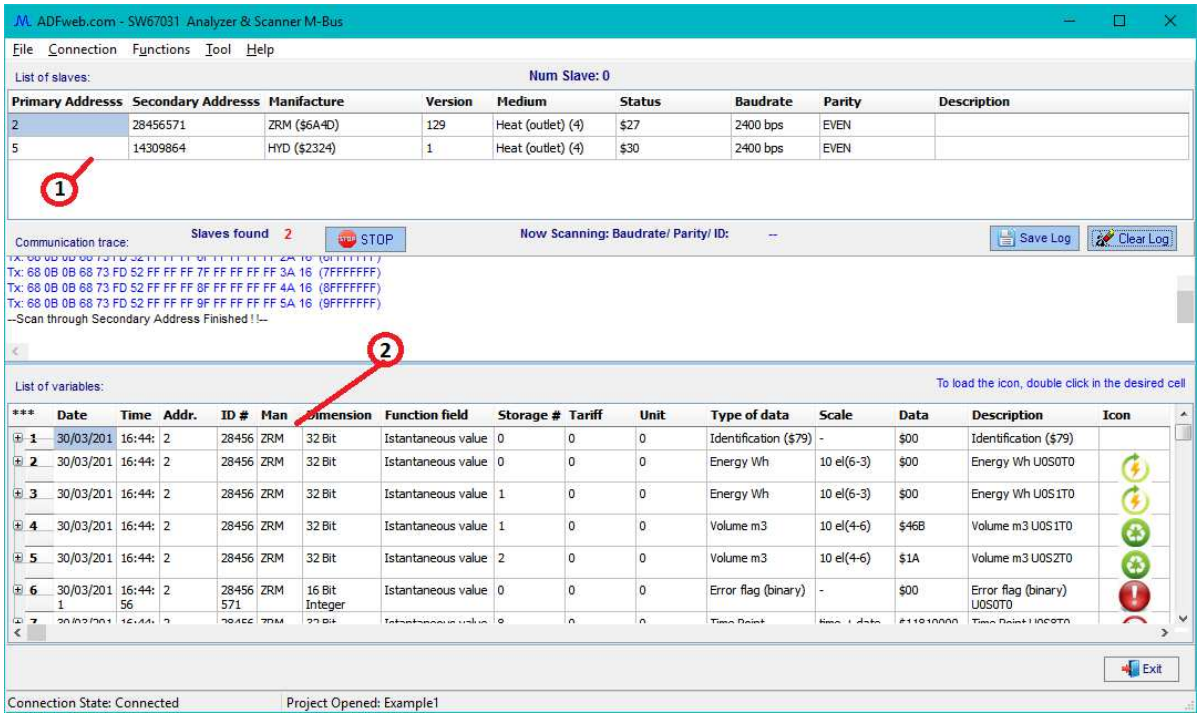


Figure 9: Scanning window

SNIFFER MODE:

With this button is possible to sniff the traffic in the network. To do this, it is necessary to connect the existing Master M-Bus to the "M-Bus Slave connector" and the slaves to the "M-Bus Master connector".

1: This label indicates the number of slaves found until now;

2: With this button it is possible to stops the scanning. For example if you have four devices and the scan has found four devices, you can stop it;

3: In this field it is possible to see the data logged.

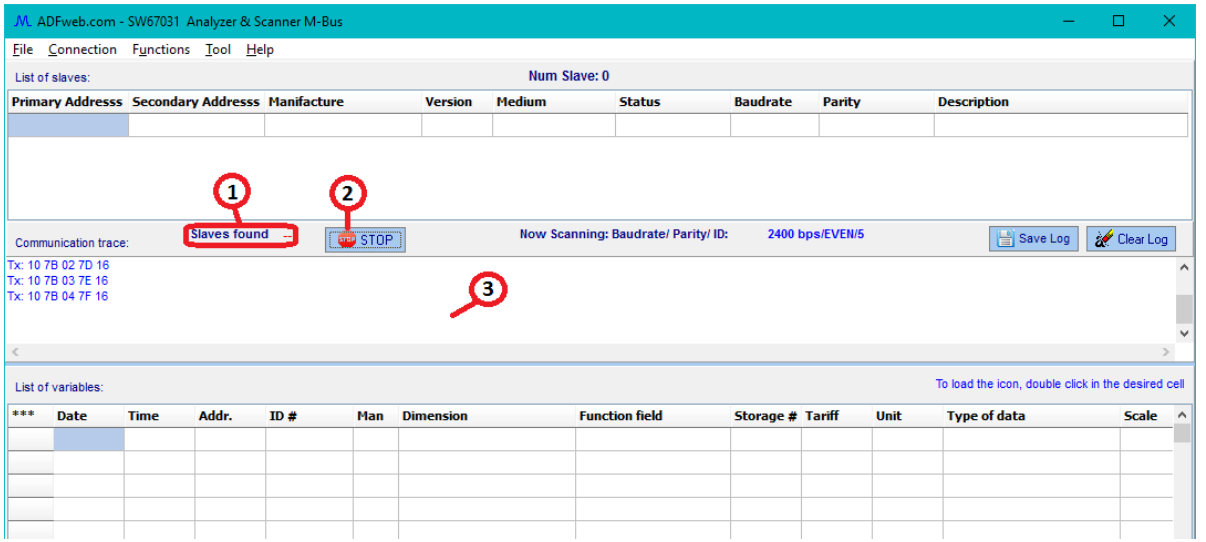


Figure 10: Scanning window

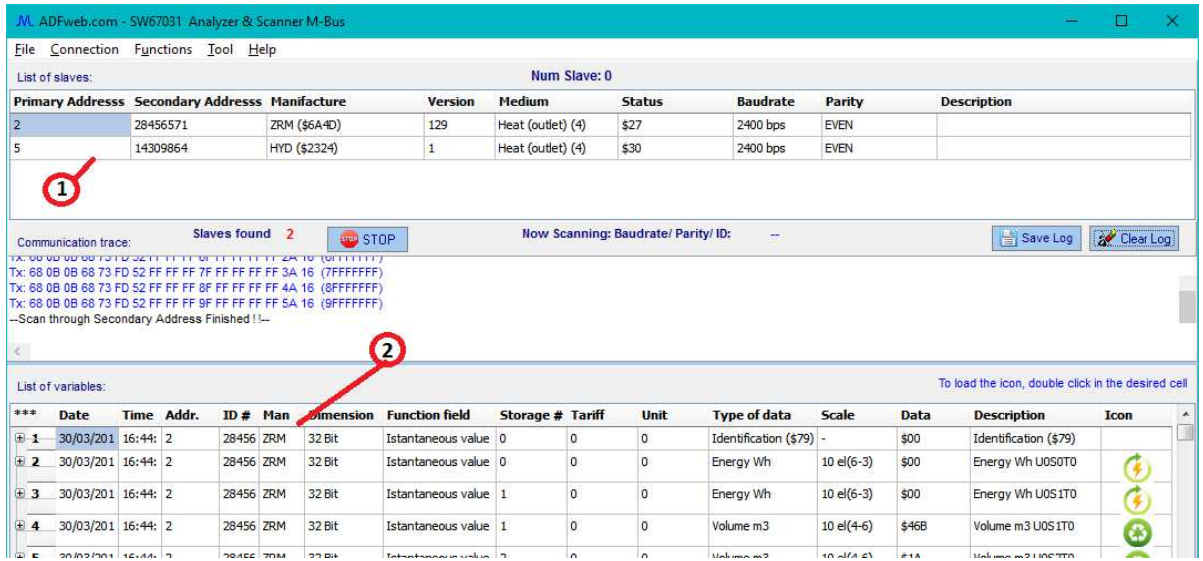


Figure 11: Scanning window

When you have stopped the Sniffer Mode functioning the window on the left appears (Fig. 11).

1: At this table it is possible to see the main information of the devices found by the scan. i.e. Primary Address, Secondary Address, manufacturer, version, medium, status, baudrate, parity. In the field "Description" you can insert a brief description of the device.

2: At this table it is possible to see all the variables of the scanned devices. Also in this table is present a field "Description" that allows you to insert a description of the variable.

OPERATIONS SLAVES LIST:

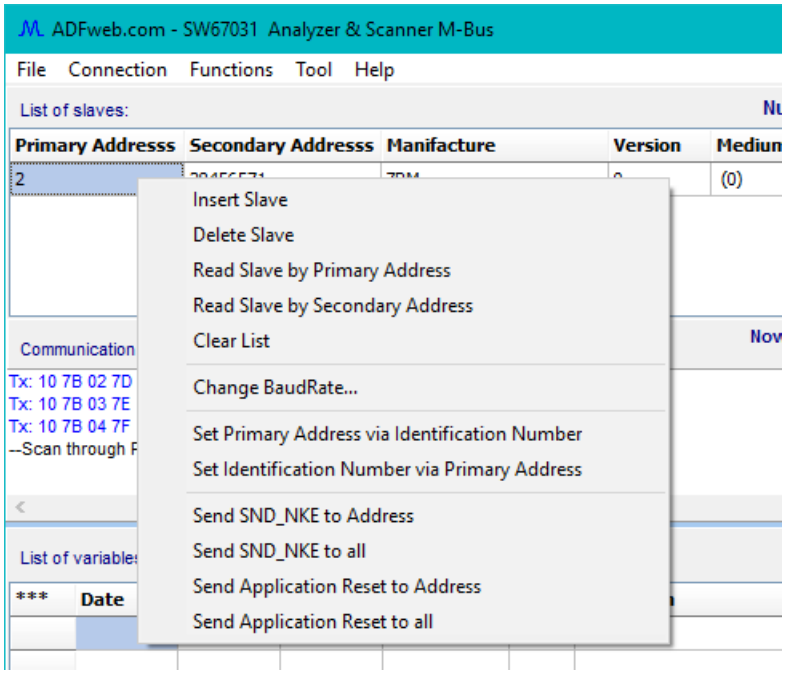


Figure 12: Operations by right click of mouse on "Slaves List" table

Note:
Some operations are available only when the connection is established, other only when there are present slaves.

INSERT SLAVE:

By pressing the "**Insert Slave**", a new row where it is possible to edit the Primary Address, Secondary Address, Baudrate and Parity is inserted.

DELETE SLAVE:

By pressing the "**Delete Slave**" button, the selected slave is deleted.

READ SLAVE BY PRIMARY ADDRESS:

By pressing the "**Read Slave by Primary Address**" button, a command for reading the data, using the Primary Address, of the selected slave is sent.

READ SLAVE BY SECONDARY ADDRESS:

By pressing the "**Read Slave by Primary Address**" button, a command for reading the data, using the Secondary Address, of the selected slave is sent.

CLEAR LIST:

By pressing the "**Clear List**" button all the informations present in the two tables, "Slaves List" and "List's Variables", are cleared.

CHANGE BAUDRATE...:

By pressing the "**Change Baudrate...**" it is possible to change the baudrate of the devices. In the field "**New Baud Rate**" you can select the new baudrate of the device.
When you press the "**OK**" button, the software sends the frame for changing the baudrate.

SET PRIMARY ADDRESS VIA IDENTIFICATION NUMBER:

By pressing the "Set Primary Address via Identification Number" button it is possible to change the Primary Address. To do this you have just to set the desired Primary Address and then with the right button of mouse select the function for changing the address.

SET IDENTIFICATION NUMBER VIA PRIMARY ADDRESS:

By pressing the "**Set Identification Number via Primary Address**" button it is possible to change the Secondary Address. To do this you have just to change the desired Secondary Address and then with the right button of mouse select the function for changing the address.

SEND SND_NKE TO ADDRESS:

By pressing the "**Send SND_NKE to Address**" button, you can send the SND_NKE command to the selected slave.

SEND SND_NKE TO ALL:

By pressing the "**Send SND_NKE to all**" button, you can send the SND_NKE command to all slaves (broadcast command).

SEND APPLICATION RESET TO ADDRESS:

By pressing the "**Send Application Reset to all**" button, you can send an Application Reset command to the selected slave.

SEND APPLICATION RESET TO ALL:

By pressing the "**Send Application Reset to all**" button, you can send an Application Reset command to all slaves (broadcast command).

SECTION TOOL:

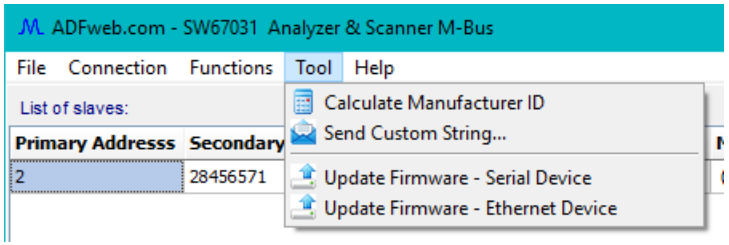


Figure 13: Section "Tool"

In this section you have some tools and the possibility to update the firmware of the device.

CALCULATE MANUFACTURER ID:

By pressing the "**Calculate Manufacturer ID**" button the right window appear (Fig. 14).

In this form it is possible to calculate the Manufacturer ID of the M-Bus devices.

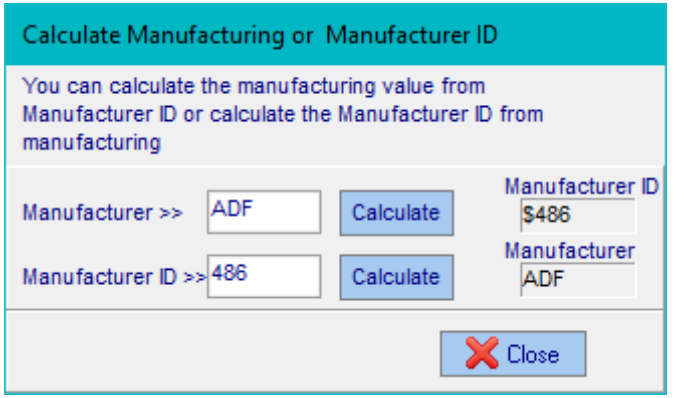


Figure 14: "Calculate Manufacturing" window

SEND CUSTOM STRING...:

By pressing the "**Send Custom String...**" button the right window appears (Fig. 15).

This form allows you to send a frame and see the reply of the device. The frame must be written in the first Edit-Box; the values are expressed in hexadecimal format. If the slave has replied the reply is displayed in the memo under "Send" button. It is possible to copy or clear the memo by pressing the corresponding buttons "Copy" or "Clear".

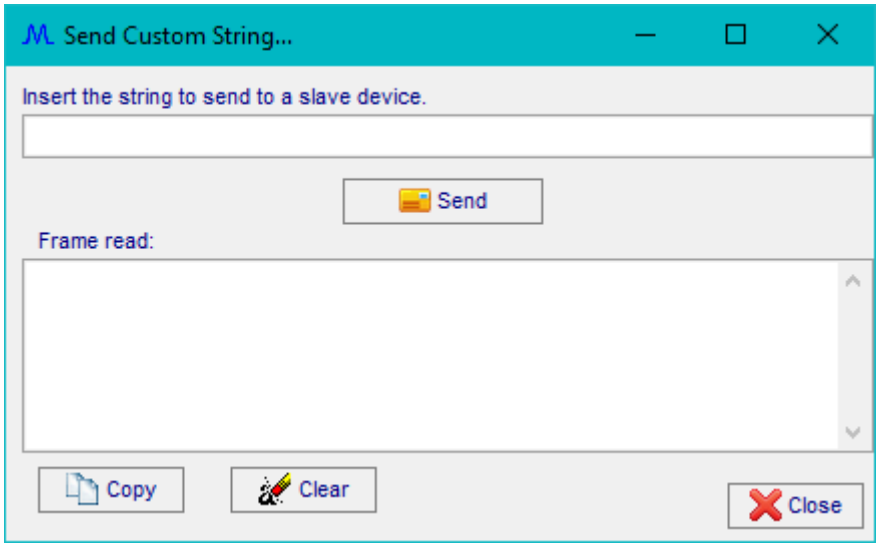


Figure 15: "Send Custom String..." window

UPDATE FIRMWARE – SERIAL DEVICE (OLD VERSION WITH RS232):

By pressing the "**Update Firmware – Serial Device**" button it is possible to update the Firmware using the RS232 port.

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

- Turn OFF the Device;
- Connect the RS232 cable from your PC to the Analyzer;
- Put Dip1 of 'Dip-Switch A' in ON position;
- Select the "**COM port**" and press the "**Connect**" button;
- Turn ON the device;
- 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;
- Put Dip1 of 'Dip-Switch A' in OFF position;
- Disconnect the RS232 cable;
- Turn ON the device.

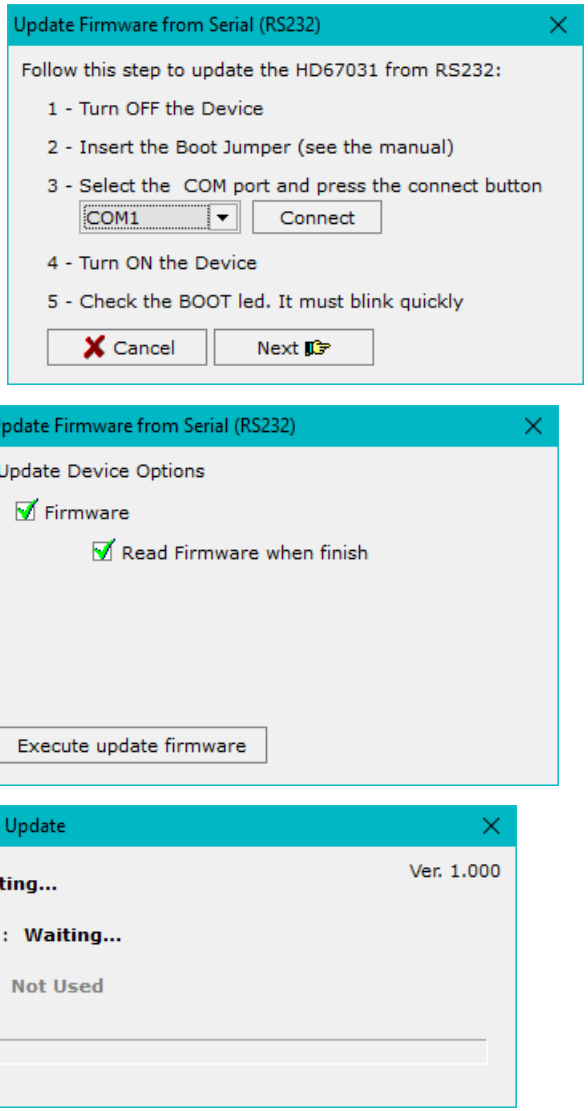


Figure 16: "Update via Serial" windows

UPDATE FIRMWARE – ETHERNET DEVICE

By pressing the "**Update Firmware – Ethernet Device**" button, it is possible to load the created Configuration into the device; and also the Firmware, if necessary.

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**";
- Set the IP Address, the SubNet Mask and the Default Gateway that you want to use;
- 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.

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

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;
- Set the IP Address, the SubNet Mask and the Default Gateway that you want to use;
- Press the "**Execute update firmware**" button to start the upload;
- When all the operations are "OK" the device automatically goes at Normal Mode.

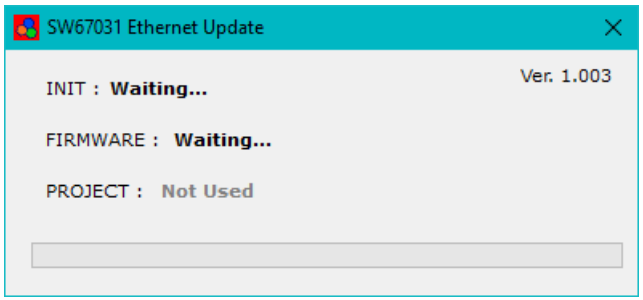


Figure 17: "Update via UDP" windows

Note:
When you install a new version of the software, if it is the first time it is better you do the update of the Firmware in the HD67031 device.

Note:
When you receive the device, for the first time, you also have to update the Firmware in the HD67031 device.

Warning:
If Fig. 18 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;
- Check the Wi-Fi 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 or 10 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 you have to launch the "Command Prompt" with Administrator Rights;
- Pay attention at Firewall lock.

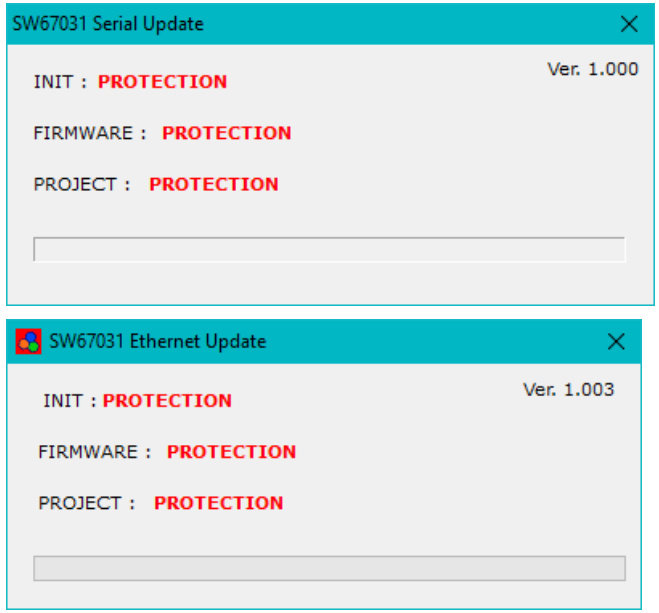
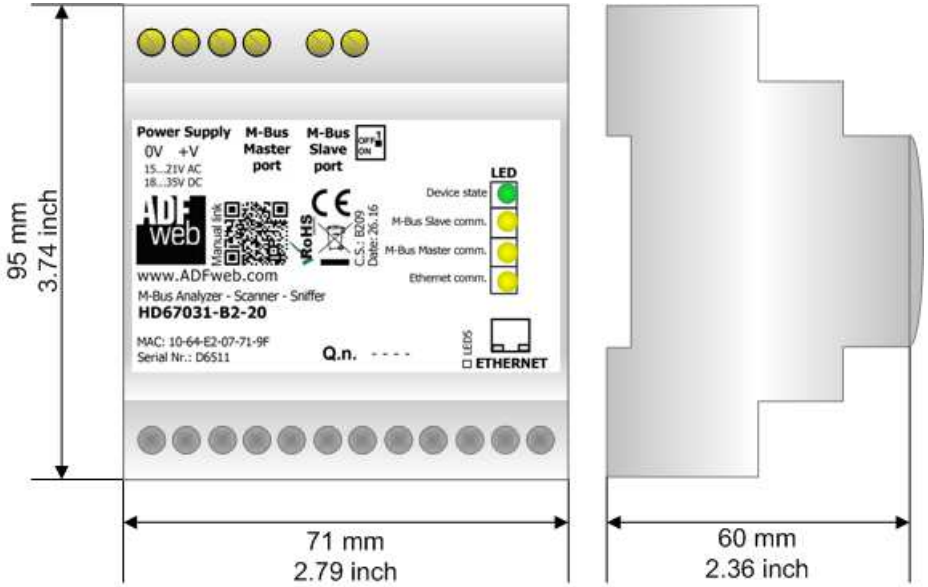


Figure 18: "Protection" windows

In the case of HD67031 you have to use the software "SW67031": www.adfweb.com\download\filefold\SW67031.zip.

MECHANICAL DIMENSIONS:



Housing: PVC
Weight: 200g (Approx)

Figure 19: Mechanical dimensions scheme for HD67031-B2-xx

ORDERING INFORMATIONS:

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

HD67031 – B 2 – xxx

Maximum number of slaves supported
20: up to 20 standard slaves (1.5mA consumption) connected to M-Bus
40: up to 40 standard slaves (1.5mA consumption) connected to M-Bus
80: up to 80 standard slaves (1.5mA consumption) connected to M-Bus
160: up to 160 standard slaves (1.5mA consumption) connected to M-Bus
250: up to 250 standard slaves (1.5mA consumption) connected to M-Bus

Connectors Type
2: Fixed Screw Terminal

Enclosure Type
B: Modulbox 4M, 35mm DIN Rail mounting

Device Family
HD67031: M-Bus Analyzer – Scanner - Sniffer

Order Code:	**HD67031-B2-20**	**-**	M-Bus Analyzer – Scanner - Sniffer (up to 20 slaves connected to M-Bus)
Order Code:	**HD67031-B2-40**	**-**	M-Bus Analyzer – Scanner - Sniffer (up to 40 slaves connected to M-Bus)
Order Code:	**HD67031-B2-80**	**-**	M-Bus Analyzer – Scanner - Sniffer (up to 80 slaves connected to M-Bus)
Order Code:	**HD67031-B2-160**	**-**	M-Bus Analyzer – Scanner - Sniffer (up to 160 slaves connected to M-Bus)
Order Code:	**HD67031-B2-250**	**-**	M-Bus Analyzer – Scanner - Sniffer (up to 250 slaves connected to M-Bus)

ACCESSORIES:

Order Code:	**APW020**	-	Power Supply for M-Bus Master device that supports up to 20 Slaves
Order Code:	**APW040**	-	Power Supply for M-Bus Master device that supports up to 40 Slaves
Order Code:	**APW080**	-	Power Supply for M-Bus Master device that supports up to 80 Slaves
Order Code:	**APW160**	-	Power Supply for M-Bus Master device that supports up to 160 Slaves
Order Code:	**APW250**	-	Power Supply for M-Bus Master device that supports up to 250 Slaves

DISCLAIMER:

All technical content within this document can be modified without notice. The content of the document is a under continual renewal.
For losses due to fire, earthquake, third party access or other accidents, or intentional or accidental abuse, misuse, or use under abnormal conditions repairs are charged to the user. ADFweb.com S.r.l. will not be liable for accidental loss of use or inability to use this product, such as loss of business income. ADFweb.com S.r.l. shall not be liable for consequences of improper use.

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.
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:

- 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.
- 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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