

User Manual

Revision 1.000
English

M-Bus Master / Modbus Slave – Converter (Modbus Slave Port: USB)

(Order Code: HD67076-B2-20, HD67076-B2-40,
HD67076-B2-80, HD67076-B2-160,
HD67076-B2-250)

for Website information:

www.adfweb.com?Product=HD67076-B2

for Price information:

www.adfweb.com?Price=HD67076-B2-20
www.adfweb.com?Price=HD67076-B2-40
www.adfweb.com?Price=HD67076-B2-80
www.adfweb.com?Price=HD67076-B2-160
www.adfweb.com?Price=HD67076-B2-250

Benefits and Main Features:

- ▶ Very easy to configure
- ▶ Up to 250 standard M-Bus devices connected to the Converter
- ▶ Power Supply 15...21V AC or 18...35V DC
- ▶ Industrial temperature range:
-40°C / 85°C (-40°F / 185°F)

HD67076-B2



Similar Products →

For other M-Bus products see also the following link:

Converter - M-Bus /

- www.adfweb.com?Product=HD67021 (RS232)
- www.adfweb.com?Product=HD67022 (RS485)
- www.adfweb.com?Product=HD67030 (Ethernet)

Analyzer & Scanner M-Bus

www.adfweb.com?Product=HD67031

M-Bus – Repeater - Isolator

www.adfweb.com?Product=HD67032

Converter - M-Bus Master/ Modbus Slave

- www.adfweb.com?Product=HD67029M-232 (on RS232)
- www.adfweb.com?Product=HD67029M-485 (on RS485)

M-Bus Master / PROFIBUS Slave - Converter

www.adfweb.com?Product=HD67053M

M-Bus – Concentrator - Datalogger

www.adfweb.com?Product=HD67054M

M-Bus Slave / Modbus Master - Converter

www.adfweb.com?Product=HD67059M-232

Do you need to choose a device? do you want help?

Ask it to the following link: www.adfweb.com?Cmd=helpme

INDEX:

	Page
INDEX	2
UPDATED DOCUMENTATION	2
REVISION LIST	2
WARNING	2
TRADEMARKS	2
SECURITY ALERT	3
EXAMPLE OF CONNECTION	4
CONNECTION SCHEME	5
CHARACTERISTICS	6
POWER SUPPLY	7
FUNCTION MODES	8
LEDS	9
MODBUS	10
M-BUS	10
USE OF COMPOSITOR SW67044	11
NEW PROJECT / OPEN PROJECT	11
SET COMMUNICATION	12
M-BUS	13
UPDATE DEVICE (ONLY FOR HD67044-B2 SERIES)	27
MECHANICAL DIMENSIONS	29
ORDER CODES	30
ACCESSORIES	30
DISCLAIMER	31
OTHER REGULATIONS AND STANDARDS	31
WARRANTIES AND TECHNICAL SUPPORT	32
RETURN POLICY	32
PRODUCTS AND RELATED DOCUMENTS	32

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.

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	05/07/2013	FI	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 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

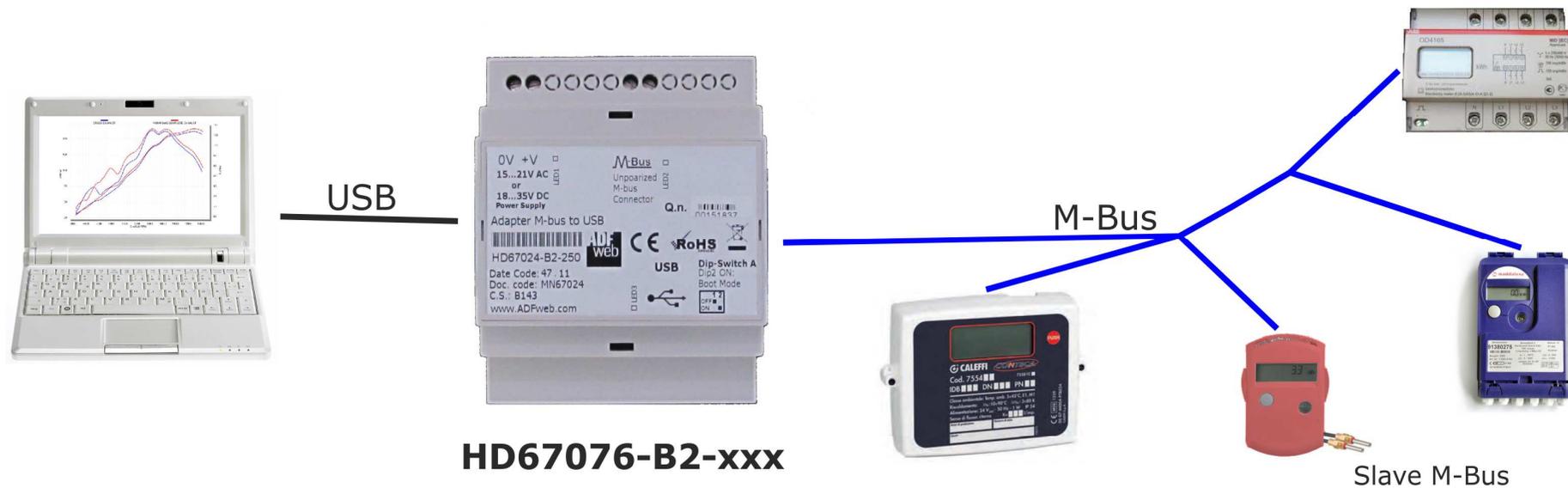
The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

 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 support@adfweb.com or give us a call if you need it.

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:

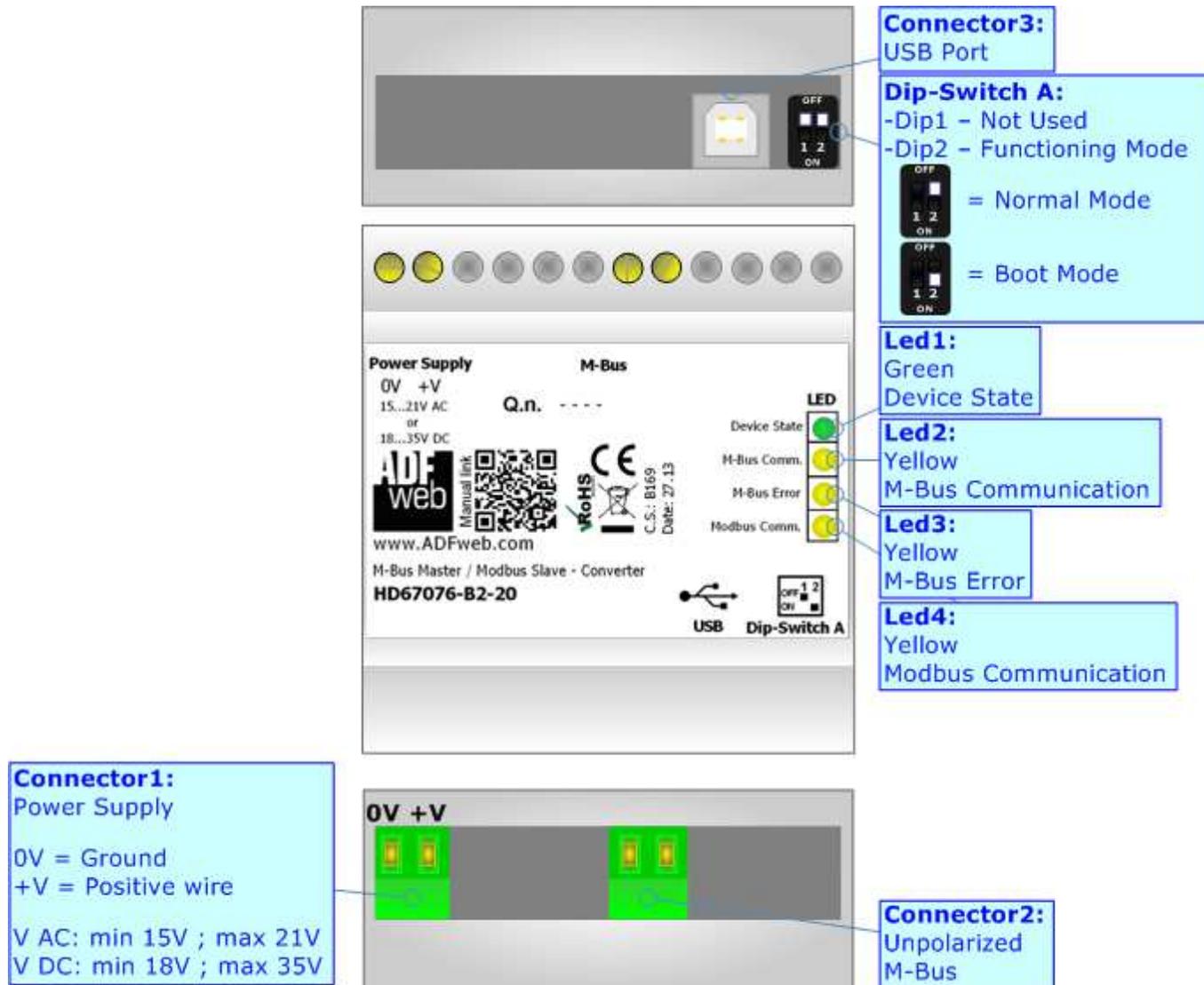


Figure 1: Connection scheme for HD67076-B2-xxx

CHARACTERISTICS:

The HD67076-B2-xxx is a M-Bus Master / Modbus Slave Converter.

It allows the following characteristics:

- Electrical isolation between Ethernet and M-Bus;
- Mountable on 35mm Rail DIN;
- Power Supply 15...21V AC or 18...35V DC;
- Temperature range -40°C to 85°C.

At the Converter can be connected up to 250 standard M-Bus devices. This number depends of the code expressed by the xxx number:

- HD67076-B2-20 support up to 20 M-Bus devices;
- HD67076-B2-40 support up to 40 M-Bus devices;
- HD67076-B2-80 support up to 80 M-Bus devices;
- HD67076-B2-160 support up to 160 M-Bus devices;
- HD67076-B2-250 support up to 250 M-Bus devices.

 In the case of HD67076-B2-160 the device must be mounted on 35mm DIN rail which is horizontally mounted on a wall or cabinet back-plate. To avoid obstructions to the airflow around the unit it is recommended to not cover the paths of air.

 In the case of HD67076-B2-250 the device must be mounted on 35mm DIN rail which is horizontally mounted on a wall or cabinet back-plate. These units have a fan in the top of the enclosure. To avoid obstructions to the airflow around the unit it is recommended to not cover the paths of air. Take care to not cover the fan. It is recommended to put the device into a ventilated cabinet.

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.

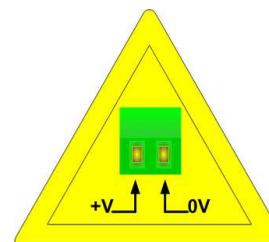
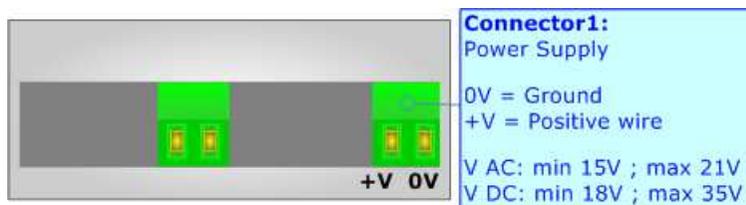
VAC		VDC	
Vmin	Vmax	Vmin	Vmax
15V	21V	18V	35V

Consumption at 24V DC:

Device	No Load [W/VA]	Full Load [W/VA]*
HD67076-B2-20	3.5	4
HD67076-B2-40		5
HD67076-B2-80		8
HD67076-B2-160		14
HD67076-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: Not reverse the polarity power



HD67076-B2-xxx

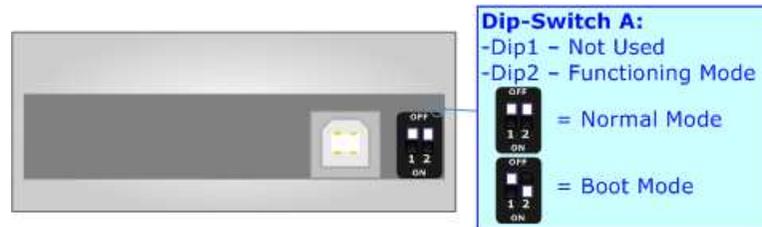
FUNCTION MODES:

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

- The first, with 'Dip2 of Dip-Switch A' at "OFF" position, is used for the normal working of the device.
- The second, with 'Dip2 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.

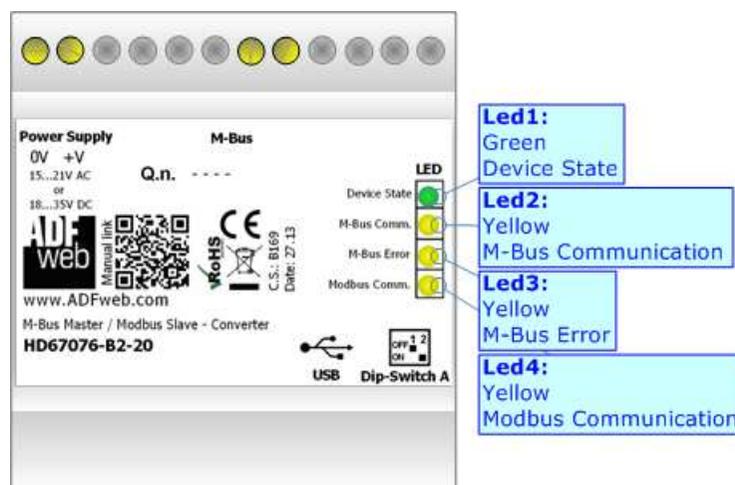
According to the functioning mode, the LEDs will have specifics functions, see 'LEDS' section.



LEDS:

The device has got four 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
2: M-Bus Comm.	Blinks quickly when a reply to a M-Bus request arrives	Blinks quickly
3: M-Bus Error	Becomes ON when the reply to M-Bus interrogation isn't arrived	Blinks quickly
4: Modbus Comm.	Changes state when receive a correct Modbus request	Blinks quickly



MODBUS:

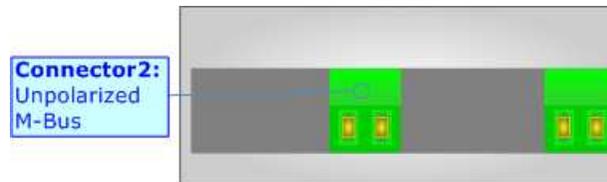
The Modbus connection must be made using Connector3 of HD67076-B2.
 The USB connector (Connector3) is a Type-B Female; so the cable must be a Type-B Male.
 The USB port is used for:

- Programming the device;
- Modbus communication.



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)*



USE OF COMPOSITOR SW67076:

To configure the Converter, use the available software that runs with Windows, called SW67076. It is downloadable on the site www.adfweb.com and its operation is described in this document. (This manual is referenced to the last version of the software present on our web site). The software works with MSWindows (MS 2000, XP, Vista, Seven, 8; 32/64bit).

When launching the SW67076 the right window appears (Fig. 2).

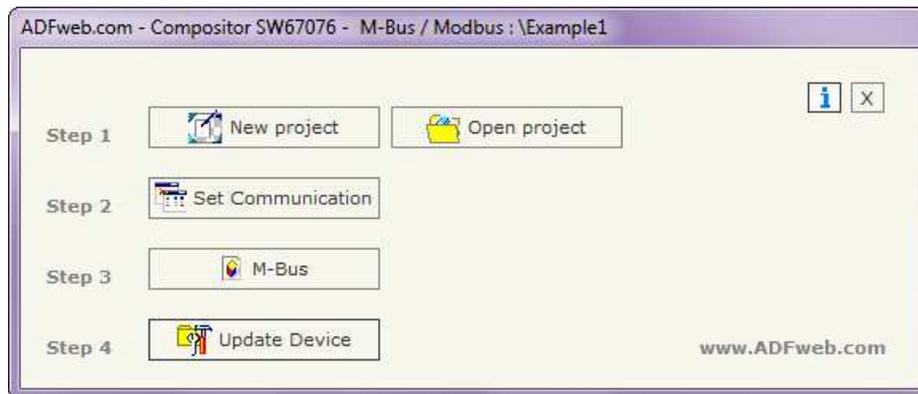


Figure 2: Main window for SW67076

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 "M-Bus Master / Modbus Slave – 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 Project"**.

SET COMMUNICATION:

This section define the fundamental communication parameters of two buses, Modbus and M-Bus.

By Pressing the **"Set Communication"** button from the main window for SW67029 (Fig. 2) the window "Set Communication" appears (Fig. 3).

The window is divided in two sections, one for the Modbus line (USB) and the other for the M-Bus.

The means of the fields for USB are:

- If the device is HD67029M-232, the field **"RS232"** must be checked, otherwise if is the HD67029M-485 it is possible to check the field **"RS232"** or **"RS485"**;
- In the field **"Baudrate"** the baudrate of the serial line in use is defined;
- In the field **"Parity"** the parity of the serial line is defined;
- In the field **"ID Dev."** the ID for the Modbus side is defined.
- In the subsection "Protocol" it is possible to select the protocol to use in Modbus line from the following:
 - **Modbus RTU**;
 - **Modbus ASCII**;
 - **JBUS**;
 - **Binary**: simple protocol defined by Us, whose functions are described in the document "Simple Protocol" downloadable at www.adfweb.com/download/filefold/Simple_Protocol_ENG.pdf;
 - **ASCII**: simple protocol defined by Us, whose functions are described in the document "Simple Protocol" downloadable at www.adfweb.com/download/filefold/Simple_Protocol_ENG.pdf.

The means of the fields for M-Bus are:

- In the field **"Baudrate"** the baudrate of the M-Bus net is defined;
- In the field **"Parity"** the parity of the M-Bus line is defined;
- If the field **"M-Bus Poll on request"** is checked, the Gateway makes the request only if a Modbus register is requested; otherwise if **"Cyclic request"** is checked, the Gateway makes the request in M-bus network each time the time defined under passes;
- In the field **"Delay"** insert a time expressed in seconds. This time is used for the "Cyclic request".

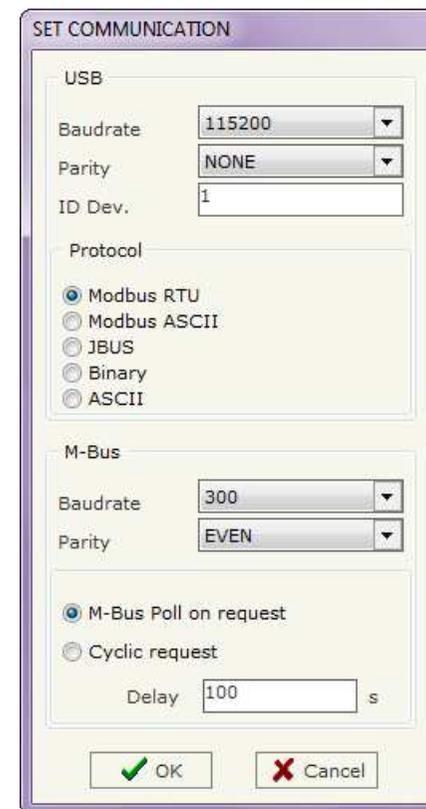


Figure 3: "Set Communication" window

M-BUS

By Pressing the “**M-Bus**” button from the main window for SW67044 (Fig. 2) the window “M-Bus Network” appears (Fig. 4).

SECTION NODES:

In the section “Nodes” it is possible to create the nodes of M-Bus line. In order to create a new node it is necessary to select which address use, selecting “**Primary ID**” or “**Secondary ID**”, to makes the requests and then insert the “Primary Address” (from 1 to 250) or the Secondary Address” (from 0 to 99999999) of M-Bus device in the field “**ID Node M-Bus**”. In the field “**Description**” it is possible to write a short description of the node.

In the field “**Node State**” it is possible to insert an address Modbus that contain the Status of the M-Bus device. If you don’t need to know this, put this register at 0.

In the field “**Identification Number**” it is possible to insert an address Modbus that contain the Identification Number of the M-Bus device. You have to read two consecutive registers for knowing the value. If you don’t need to know this, put this register at 0.

If the field “**Convert BCD in Integer Identification Num.**” is checked the Converter converts the Identification Number that is normally expressed in BCD in a Integer.

In the field “**Swap Identification Num.**” it is possible to select the swap mode of the Identification Number. If swap isn’t necessary you have to select “None”; otherwise see the section “Swap Identification” (page 20) of this document for select the swap mode.

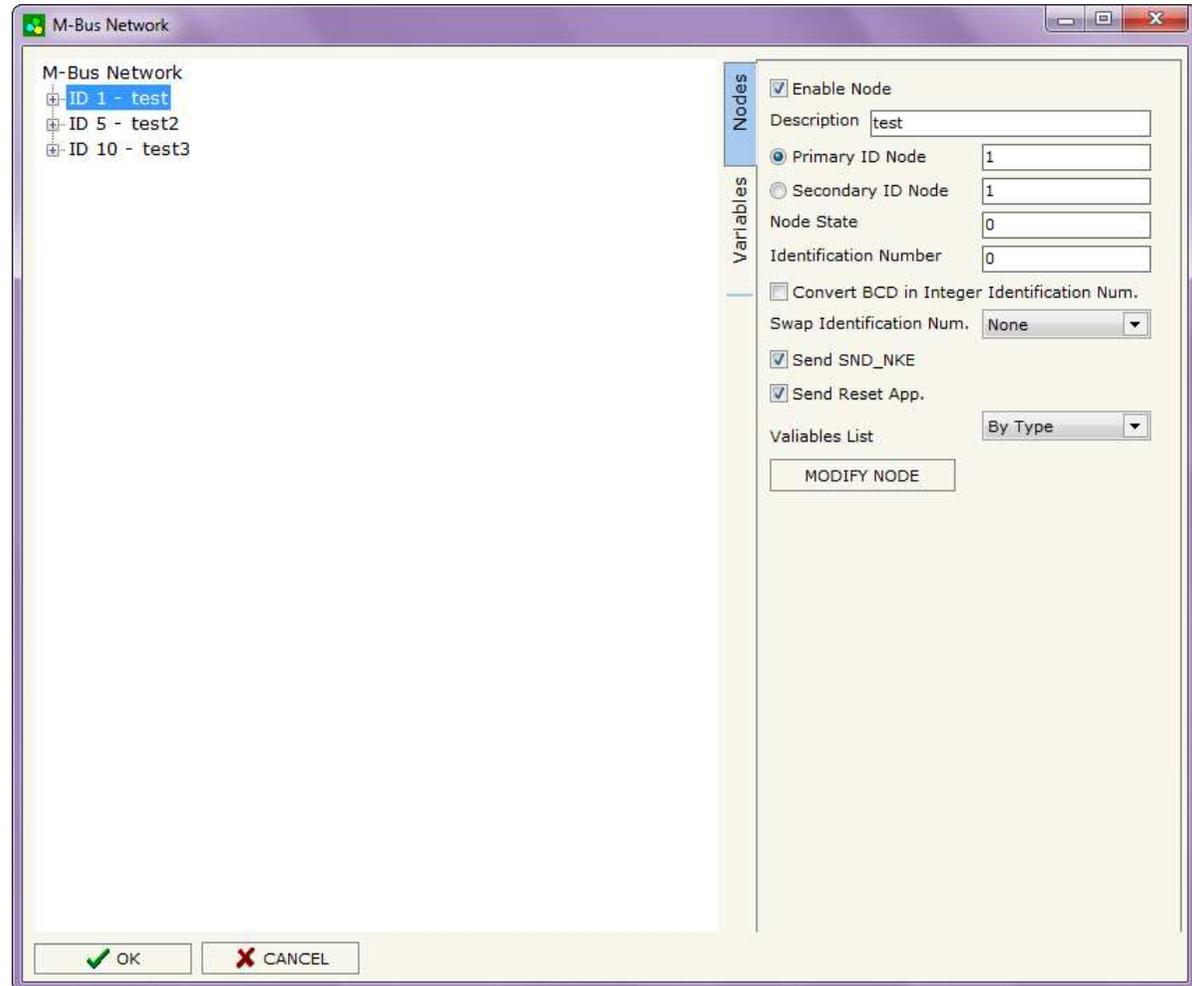


Figure 4: “M-Bus Network” window

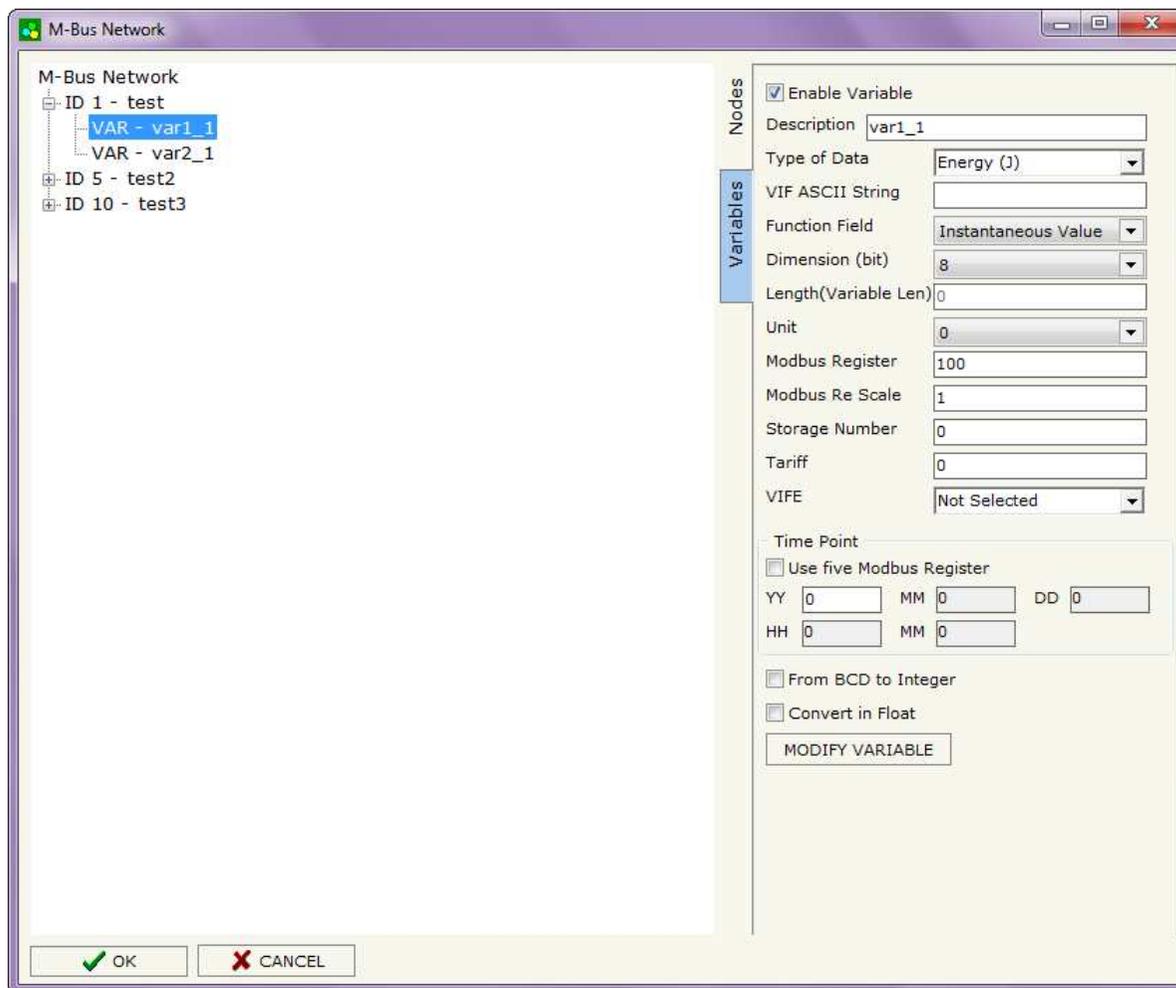
If the field "**Send SND_NKE**" is checked, the Converter send the "SND_NKE" frame to start the communication.
In the field "**Send Reset App.**" Is checked the Converter send the "Application Reset" command to the slave. In the field "**Variables List**" it is possible to select which type of variables definition to use. If is selected "By Type" it is necessary to fill all fields, in the section Variables, with the correct values; otherwise if "By Position" is selected you can insert the progressive number of the variable that you need (page 18 for more information).

After that, pressing the "**ADD NODE**" button, a new node appears in the left side of the window. In order to modify a created node it is necessary to select the desired node, change the wrong items and then press the "**MODIFY NODE**" button.

SECTION VARIABLES (BY TYPE):

Selecting the desired node it is possible to add a variable. In order to create a new variable it is necessary to fill these items:

- To use the created variable the field **"Enable Variable"** must be checked. If you have created a variable but for the moment it is unused it is possible to uncheck the field "Enable Variable" without delete it;
- In the field **"Description"** it is possible to write a description of the variable (it isn't a necessary information,
- it helps the readability of the tree of network);
- The field **"Type of Data"** is used to select the unit of measure;
- In the field **"VIF ASCII String"** insert the string of VIF. It is possible to use this field only if the "Type of Data" is "VIF is in ASCII";
- In the field **"Function Field"** it is necessary to select the type of data;
- The field **"Dimension"** is used to select the dimension of the variable (8, 16, 24, 32, 32 real, 48, 64 bit, Variable Length);
- In the field **"Length(Variable Len)"** insert the length of the data in the case of the dimension is "Variable Length";
- In the field **"Unit"** if it is necessary it is possible to select the unit of that variable. The Unit is used for indicates from which device the data come;
- In the field **"Modbus Register"** it is necessary to insert the value of Modbus Register that contains the data of the M-Bus device. It is possible to insert from Modbus Register "1" to "60000";



- In the field "**Modbus Re Scale**" it is necessary to insert the value of Modbus Register that contains the value of measure scale. If the scale is not necessary, you have to insert the number "0" in this field. It is possible to insert from Modbus Register "1" to "60000";
- In the field "**Storage Number**" if it is necessary it is possible to insert the value of storage counter of that variable. With this field the slave can indicate and transmit various stored counter states or historical values, in the order in which they occur;
- In the field "**Tariff**" if it is necessary it is possible to insert the value of the tariff of that variable. The Tariff is used for indicates from which device the data come;
- In the field "**VIFE**" it is possible to select a sub-type of "Type of Data";
- If the field "**Use Five Modbus Register**" and the "Type of Data" is "Time Point" it is possible to read the information of Year, Month, Day, Hour, Minutes on five consecutive Modbus registers without decoding the data (if not selected the values are the same of the reply of the slave device, so coded with a determinate structure). You have to insert the first Modbus Register.
- If the field "**From BCD to Integer**" is checked the Converter converts the BCD value of variable in Integer format. This happens only if the variable is in BCD format; if it isn't nothing changes.
- If the field "**Convert in Float**" is checked the Converter converts the data into Float type. Every variable occupies two consecutive Modbus Registers and the first one is the one defined in "Modbus Register". In this case the float value is multiplied by the "Modbus Re Scale" automatically.

Having completed this fields, to add the variable the button "**ADD VARIABLE**" must be pressed.

In order to modify a created variable it is necessary to select the desired variable, change the wrong items and then press the "**MODIFY VARIABLE**" button.

SECTION VARIABLES (BY POSITION):

Selecting the desired node it is possible to add a variable. In order to create a new variable it is necessary to fill these items:

- To use the created variable the field "**Enable Variable**" must be checked. If you have created a variable but for the moment it is unused it is possible to uncheck the field "Enable Variable" without delete it;
- In the field "**Description**" it is possible to write a description of the variable (it isn't a necessary information, it helps the readability of the tree of network);
- The field "**Dimension**" is used to select the dimension of the variable (8, 16, 24, 32, 32 real, 48, 64 bit, Variable Length);
- In the field "**Length(Variable Len)**" insert the length of the data in the case of the dimension is "Variable Length";
- In the field "**Modbus Register**" it is necessary to insert the value of Modbus Register that contains the data of the M-Bus device. It is possible to insert from Modbus Register "1" to "60000";
- In the field "**Modbus Re Scale**" it is necessary to insert the value of Modbus Register that contains the value of measure scale. If the scale is not necessary, you have to insert the number "0" in this field. It is possible to insert from Modbus Register "1" to "60000";

The screenshot shows the 'M-Bus Network' software interface. On the left, a tree view displays the network structure with nodes: 'ID 1 - test', 'VAR - var1_1' (selected), 'VAR - var2_1', 'ID 5 - test2', and 'ID 10 - test3'. The 'Variables' configuration window is open on the right, showing the following settings:

- Enable Variable
- Description: var1_1
- Dimension (bit): 8
- Length(Variable Len): 0
- Modbus Register: 100
- Modbus Re Scale: 1
- Time Point:
 - Use five Modbus Register
 - YY: 0 MM: 0 DD: 0
 - HH: 0 MM: 0
- From BCD to Integer
- Convert in Float
- Position: 1
- MODIFY VARIABLE button

At the bottom of the window are 'OK' and 'CANCEL' buttons.

- If the field "**Use Five Modbus Register**" and the "Type of Data" is "Time Point" it is possible to read the information of Year, Month, Day, Hour, Minutes on five consecutive Modbus registers without decoding the data (if not selected the values are the same of the reply of the slave device, so coded with a determinate structure (page 25 for more information)). You have to insert the first Modbus Register.
- If the field "**From BCD to Integer**" is checked the Converter converts the BCD value of variable in Integer format. This happens only if the variable is in BCD format; if it isn't nothing changes;
- If the field "**SWAP**" is checked the byte of data of that variable are swapped. Example: from 0x01020304 to 0x04030201;
- In the field "**Position**" insert the number of the variable that you want on Modbus.

Example:

0x68 - Start Byte
 0xBD - L Fied
 0xBD - L Field
 0x68 - Start Byte
 0x08 - C Field
 0x02 - A Field
 0x72 - CI Field

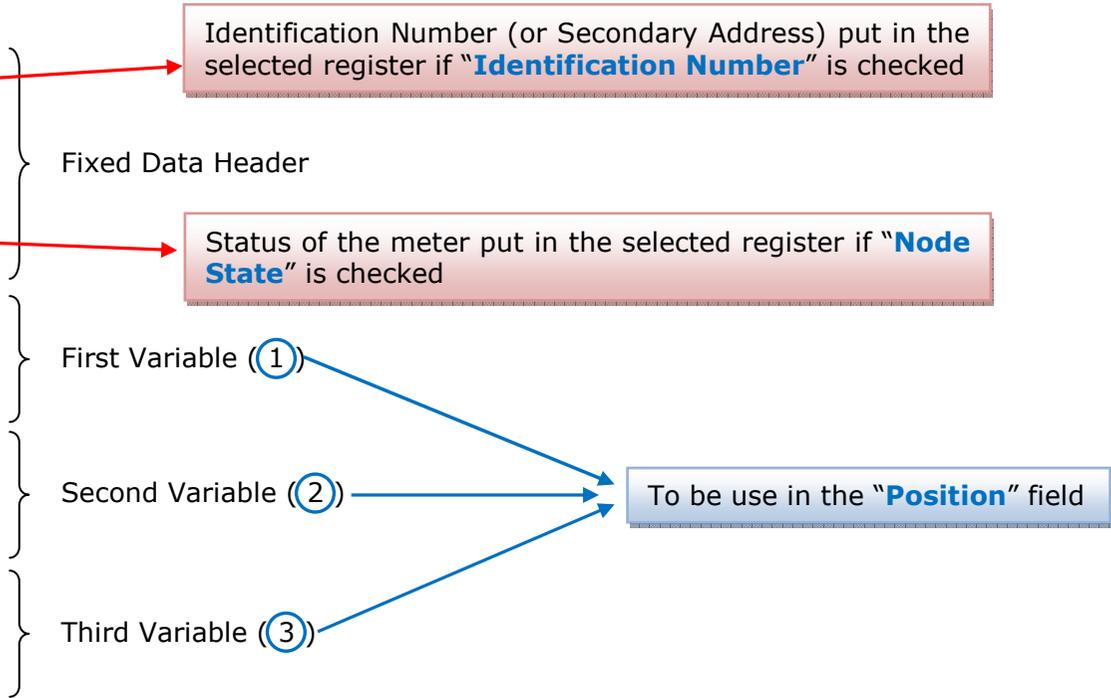
0x71 - Identification Number (Byte 4of4)
 0x65 - Identification Number (Byte 3of4)
 0x45 - Identification Number (Byte 2of4)
 0x28 - Identification Number (Byte 1of4)
 0x4D - Manufacturer (Byte 2of2)
 0x6A - Manufacturer (Byte 1of2)
 0x81 - Version
 0x04 - Medium
 0x3E - Access Number
 0x27 - Status
 0x00 - Signature (Byte 2of2)
 0x00 - Signature (Byte 1of2)

0x04 - DIF
 0x79 - VIF Identification
 0x00 - Data (Byte 4of4)
 0x00 - Data (Byte 3of4)
 0x00 - Data (Byte 2of4)
 0x00 - Data (Byte 1of4)

0x04 - DIF
 0x06 - VIF Energy
 0x00 - Data (Byte 4of4)
 0x00 - Data (Byte 3of4)
 0x00 - Data (Byte 2of4)
 0x00 - Data (Byte 1of4)

0x44 - DIF
 0x06 - VIF Energy
 0x00 - Data (Byte 4of4)
 0x00 - Data (Byte 3of4)
 0x00 - Data (Byte 2of4)
 0x00 - Data (Byte 1of4)

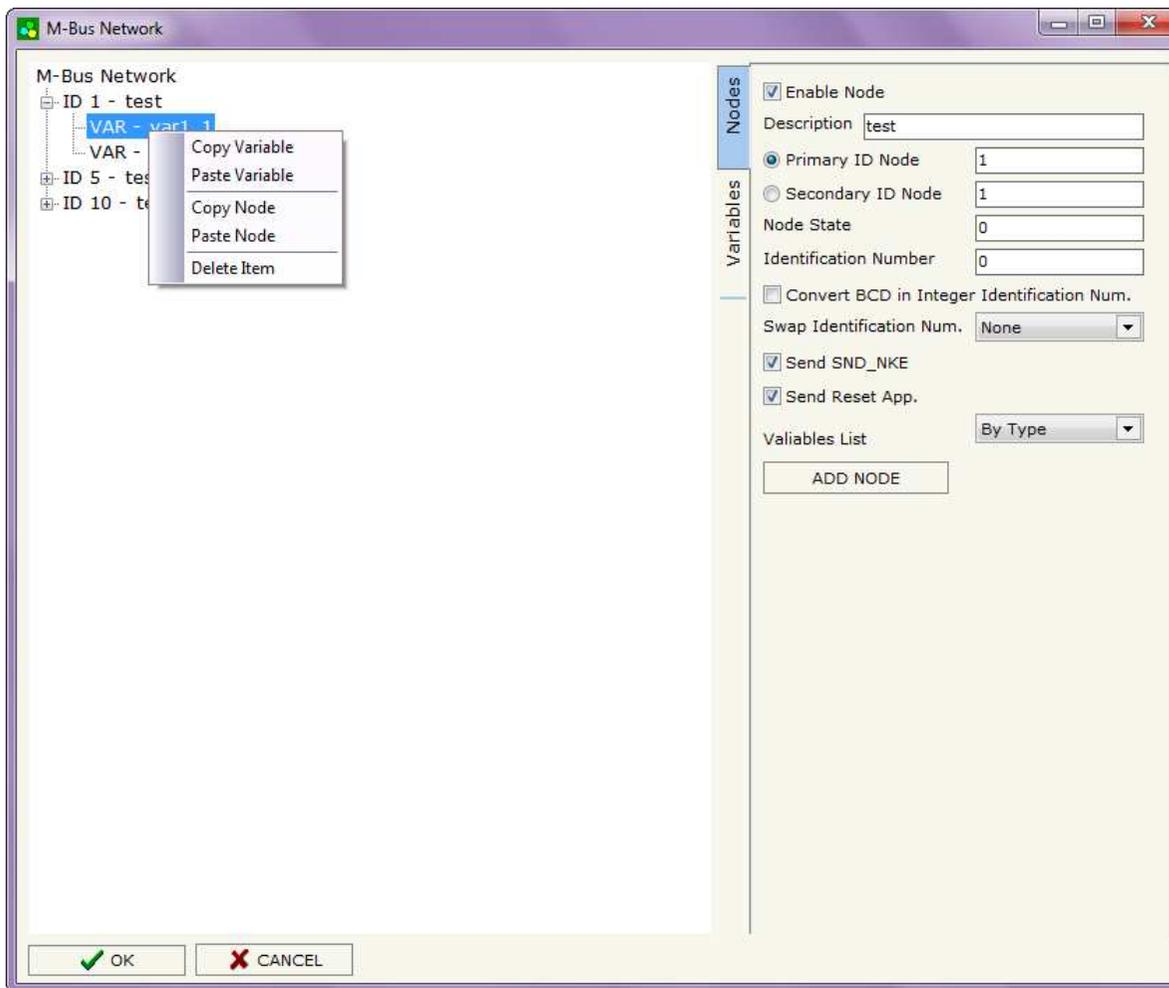
... Other Variables
 ...
 0x55 - Check Sum
 0x16 - Stop Byte



COPY / PASTE / DELETE ITEMS:

By right click of mouse on a Node / Variable is possible to Copy / Paste / Delete the item.

Is also possible to copy the Node / variable in another project. For do that you have to copy the variable from the first Project, open the new Project and paste the item.



Possible choices for the fields used to create a variable:

Type of Data:

- |_Energy (Wh)
- |_Energy (J)
- |_Volume (m³)
- |_Mass (Kg)
- |_On Time
- |_Operating Time
- |_Power (W)
- |_Power (J/h)
- |_Volume Flow (m³/h)
- |_Volume Flow Ext. (m³/min)
- |_Volume Flow Ext. (m³/s)
- |_Mass Flow (Kg/h)
- |_Flow Temperature (°C)
- |_Return Temperature (°C)
- |_Temperature Difference (K)
- |_External Temperature (°C)
- |_Pressure (bar)
- |_Averaging Duration
- |_Actuality Duration
- |_Type of data in VIFE
- |_Time Point
- |_VIF is in ASCII
- |_Unit for H.C.A.
- |_Fabrication No
- |_(Enhaced) Identification
- |_Bus Address

Function Field:

- |_Instantaneous Value
- |_Minimum Value
- |_Maximum Value
- |_Value During Error State

Dimension (bit):

- |_8
- |_16
- |_24
- |_32
- |_32 real
- |_48
- |_64
- |_Variable Length

VIFE:

- Not Selected
- Credit of the nominal local legal currency units
- Debit of the nominal local legal currency units
- Access Number (transmission count)
- Medium (as in fixed header)
- Manufacturer (as in fixed header)
- Parameter set identification
- Model/Version
- Hardware Version #
- Firmware Version #
- Software Version #
- Customer Location
- Customer
- Access Code User
- Access Code Operator
- Access Code System Operator
- Access Code Developer
- Password
- Error flags (binary)
- Error mask
- Digital Output (binary)
- Digital Input (binary)
- Baudrate [Baud]
- response delay time [bittimes]
- Retry
- First storage # for cyclic storage
- Last storage # for cyclic storage
- Size of storage block
- Storage interval [sec(s)..day(s)]
- Storage interval month(s)
- Storage interval year(s)
- Duration since last readout[sec(s)..day(s)]
- Start (date/time) of tariff
- Duration of tariff (nn=01..11:min to day)
- Period of tariff [sec(s) to day(s)]
- Period of tariff months(s)
- Period of tariff year(s)
- dimensionless/ no VIF
- Volts
- Ampere
- Reset counter
- Comulation counter
- Control signal
- Day of week
- Week number
- Time point of day change
- State of parameter activation
- Special supplier information
- Duration since last comulation [hour(s)..year(s)]
- Operation time battery [hour(s)..year(s)]
- Date and time of battery change
- Energy MWh
- Energy GJ
- Volume
- Mass
- Volume 0,1 feet³
- Volume 0,1 american gallon
- Volume 1 american gallon
- Volume flow 0,001 american gallon/min
- Volume flow 1 american gallon/min
- Volume flow 1 american gallon/h
- Power MW
- Power GJ/h
- Flow Temperature
- Return Temperature
- Temperature Difference
- External Temperature
- Cold/Warm Temperature Limit °F
- Cold/Worm Temperature Limit °C
- Cumul. count max power

- _ per second
- _ per minute
- _ per hour
- _ per day
- _ per week
- _ per month
- _ per year
- _ per revolution/measurement
- _ increment per input pulse on input channel
- _ increment per output pulse on output channel
- _ per liter
- _ per m³
- _ per kg
- _ per K (Kelvin)
- _ per kWh
- _ per GJ
- _ per kW
- _ per (K*I)(Kelvin*liter)
- _ per V (Volt)
- _ per A (Ampere)
- _ multiplied by sek
- _ multiplied by sek/V
- _ multiplied by sek/A
- _ start date(/time) of
- _ VIF contains uncorrected unit instead of corrected unit
- _ Accumulation only if positive contributions
- _ Accumulation of abs value only if negative contributions
- _ upper/lower limit value
- _ # of exceeds of lower/upper limit
- _ Date(/time) of begin/end of first/last lower/upper limit exceed

- _ Duration of limit exceed
- _ Duration of first/last
- _ Date(/time) of first/last begin/end
- _ Multiplicative currection factor
- _ Additive correction constant * unit of VIF (offset)
- _ Multiplicative correction factor: 10³
- _ future value
- _ next VIFE's and data of this block are manufacturer specific
- _ None
- _ Too many DIFE's
- _ Storage number not implemented
- _ Unit number not implemented
- _ Tariff number not implemented
- _ Function not implemented
- _ Data class not implemented
- _ Data size not implemented
- _ Too many VIFE's
- _ Illegal VIF-Group
- _ Illegal VIF-Exponent
- _ VIF/DIF mismatch
- _ Unimplemented action
- _ No data available (undefined value)
- _ Data overflow
- _ Data underflow
- _ Data error
- _ Premature end of record

Swap Identification:

This field is used for select the Swap mode of Identification Number.

At the moment there are these possibilities:

- None;
- Type 1.

Examples:

- Identification Number (Secondary Address): 12345678; Address Register 1000; Convert BCD in Integer Identification Num. not checked.

None	Type 1
1000: 0x1234	1000: 0x5678
1001: 0x5678	1001: 0x1234

- Identification Number (Secondary Address): 12345678; Address Register 1000; Convert BCD in Integer Identification Num. checked.

None	Type 1
1000: 0x00BC	1000: 0x614E
1001: 0x614E	1001: 0x00BC

To know the meaning of value read in the "Modbus Re Scale" field, you must follow this table (x = Value read in Modbus Re Scale):

Description	Range Coding	Range
Energy	$10^{(x-3)}$ Wh	0.001 Wh to 10000 Wh
Energy	$10^{(x)}$ J	0.001 kJ to 10000 kJ
Volume	$10^{(x-6)}$ m ³	0.001 l to 10000 l
Mass	$10^{(x-3)}$ kg	0.001 kg to 10000 kg
On Time	x = 0 Seconds x = 1 Minutes x = 2 Hours x = 3 Days	
Operating Time	coded like On Time	
Power	$10^{(x-3)}$ W	0.001 W to 10000 W
Power	$10^{(x)}$ J/h	0.001 kJ/h to 10000 kJ/h
Volume Flow	$10^{(x-6)}$ m ³ /h	0.001 l/h to 10000 l/h
Volume Flow Ext.	$10^{(x-7)}$ m ³ /min	0.0001 l/min to 1000 l/min
Volume Flow Ext.	$10^{(x-9)}$ m ³ /s	0.001 ml/s to 10000 ml/s
Mass Flow	$10^{(x-3)}$ kg/h	0.001 kg/h to 10000 kg/h
Flow Temperature	$10^{(x-3)}$ °C	0.001 °C to 1 °C
Return Temperature	$10^{(x-3)}$ °C	0.001 °C to 1 °C
Temperature Difference	$10^{(x-3)}$ K	1 mK to 1000 mK
External Temperature	$10^{(x-3)}$ °C	0.001 °C to 1 °C
Pressure	$10^{(x-3)}$ bar	1 mbar to 1000 mbar
Averaging Duration	coded like On Time	
Actuality Duration	coded like On Time	
Time Point	x = 0 Date x = 1 Time&Date	Data type G Data type F
Unit for H.C.A.		dimensionless

Data type F:

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^9	2^8
2^{23}	2^{22}	2^{21}	2^{20}	2^{19}	2^{18}	2^{17}	2^{16}
2^{31}	2^{30}	2^{29}	2^{28}	2^{27}	2^{26}	2^{25}	2^{24}

- Min (0 ... 59);
- Hour (0 ... 23);
- Day (1 ... 31);
- Month (1 ... 12);
- Year (0 ... 99);
- Time Invalid (0=Valid, 1=Invalid);
- Summer Time (0=Standard Time, 1=Summer Time);
- Reserved (0).

Data type G:

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^9	2^8

- Day (1 ... 31);
- Month (1 ... 12);
- Year (0 ... 99).

For example, if you have defined:

- Type of Data= Energy (J);
- Function Field=Instantaneous Value;
- Dimension= 32 bit;
- Modbus Register=150 (Register 151 declared implicitly because the dimension is 32 bit);
- Modbus Re Scale=152.

After the request, in Modbus register 150 you read 0x0004, in 151 you read 0x5678 and in register 152 is write 0x0006. The value obtained is: $284280 \times 10^{(6)}$ J.

UPDATE DEVICE:

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

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

- Turn off the Device;
- Put Dip2 of Dip-Switch A at "ON" position (see "FUNCTION MODES" section);
- Connect the USB cable from your PC to the Converter;
- Check the LEDs, they must blink quickly (see "LEDS" section);
- Select the **COM port** and press the **Connect** button;
- 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" disconnect the USB Cable;
- Put Dip2 of Dip-Switch A at "OFF" position;
- Turn on the device.

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

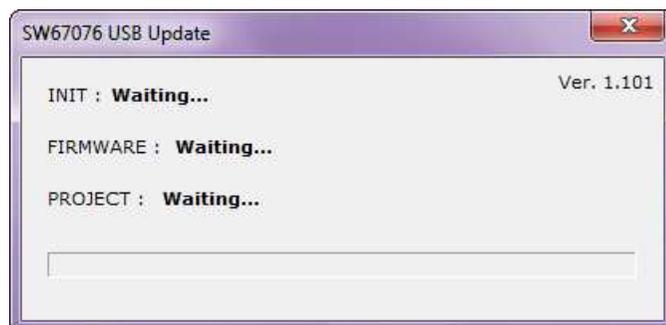


Figure 6: "Update Device" windows

**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 HD67076-B2-xxx device.

**Note:**

When you receive the device, for the first time, you have to update also the Firmware in the HD67076-B2-xxx device.

**Warning:**

If the Fig. 6 appears when you try to do the Update before require assistance try these points:

- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven or Vista or 8, make sure that you have the administrator privileges;
- Take attention at Firewall lock.

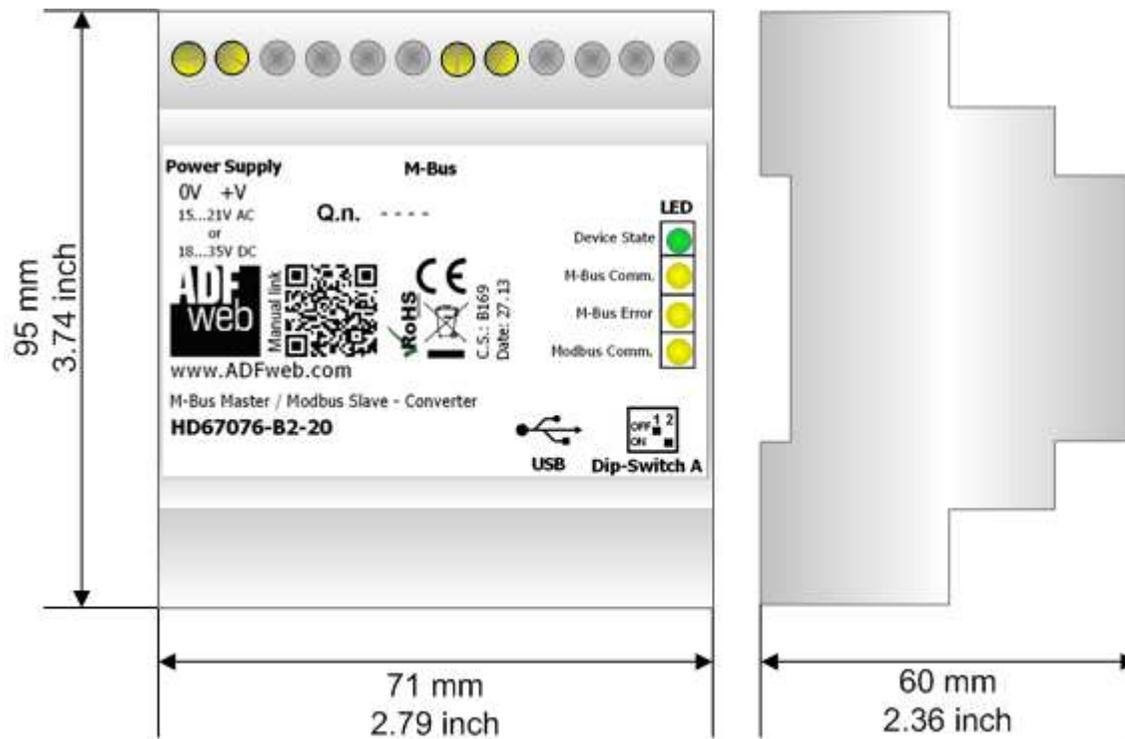


In the case of HD67076-B2-xxx you have to use the software "SW67044": www.adfweb.com/download/filefold/SW67076.zip.



Figure 6: "Protection" window

MECHANICAL DIMENSIONS:



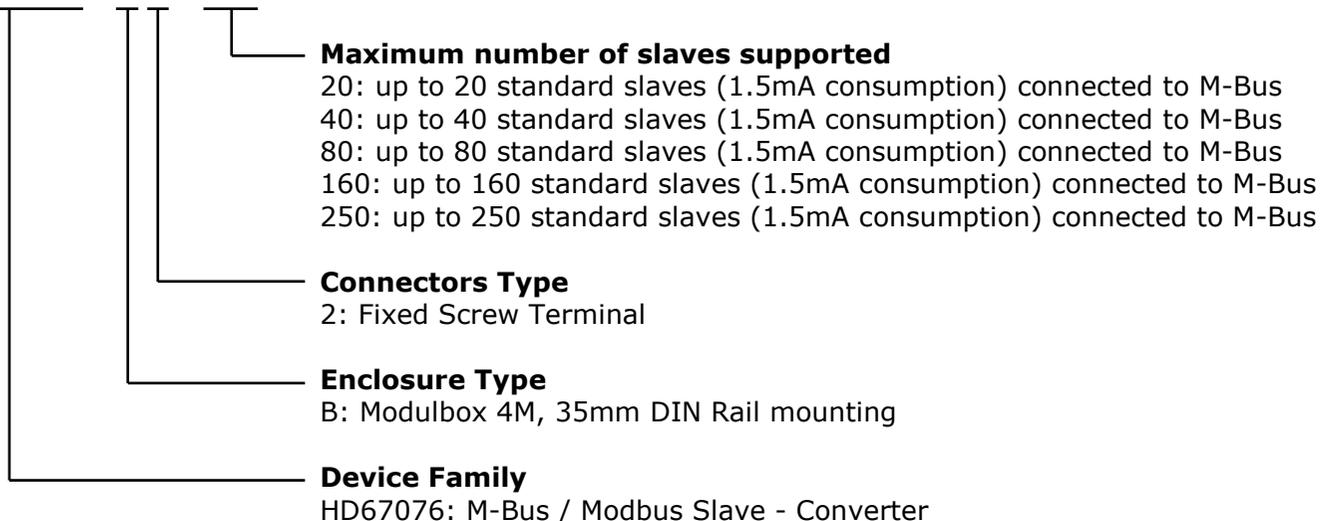
Housing: PVC
 Weight: 200g (Approx)

Figure 9: Mechanical dimensions scheme for HD67076-B2-xxx

ORDERING INFORMATIONS:

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

HD67076 - B 2 - xxx



- Order Code: **HD67076-B2-20** - M-Bus Master / Modbus Slave - Converter (up to 20 slaves connected to M-Bus)
- Order Code: **HD67076-B2-40** - M-Bus Master / Modbus Slave - Converter (up to 40 slaves connected to M-Bus)
- Order Code: **HD67076-B2-80** - M-Bus Master / Modbus Slave - Converter (up to 80 slaves connected to M-Bus)
- Order Code: **HD67076-B2-160** - M-Bus Master / Modbus Slave - Converter (up to 160 slaves connected to M-Bus)
- Order Code: **HD67076-B2-250** - M-Bus Master / Modbus Slave - Converter (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 content is a recurring audit. 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 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).

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
HD67648	Ethernet / Serial - Converter	www.adfweb.com?product=HD67648
HD67119	USB / RS485 - Converter	www.adfweb.com?product=HD67119
HD67507	Modbus TCP Slave / Modbus Master - Converter	www.adfweb.com?product=HD67507
HD67510	Modbus Slave / Modbus TCP Master - Converter	www.adfweb.com?product=HD67510