

# User Manual

Revision 1.001  
English

## M-Bus Master / CANopen - Converter

(Order Code: HD67051-B2-20  
HD67051-B2-40  
HD67051-B2-80  
HD67051-B2-160  
HD67051-B2-250)

for Website information:

[www.adfweb.com?Product=HD67051-B2](http://www.adfweb.com?Product=HD67051-B2)

for Price information:

[www.adfweb.com?Price=HD67051-B2-20](http://www.adfweb.com?Price=HD67051-B2-20)  
[www.adfweb.com?Price=HD67051-B2-40](http://www.adfweb.com?Price=HD67051-B2-40)  
[www.adfweb.com?Price=HD67051-B2-80](http://www.adfweb.com?Price=HD67051-B2-80)  
[www.adfweb.com?Price=HD67051-B2-160](http://www.adfweb.com?Price=HD67051-B2-160)  
[www.adfweb.com?Price=HD67051-B2-250](http://www.adfweb.com?Price=HD67051-B2-250)

### Benefits and Main Features:

- ▶ Very easy to configure
- ▶ Electrical isolation
- ▶ Industrial temperature range:  
-40°C / 70°C (-40°F / 158°F)

Similar  
Products 

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

#### Converter M-Bus to

[www.adfweb.com?Product=HD67021](http://www.adfweb.com?Product=HD67021) (RS232)  
[www.adfweb.com?Product=HD67022](http://www.adfweb.com?Product=HD67022) (RS485)  
[www.adfweb.com?Product=HD67030](http://www.adfweb.com?Product=HD67030) (Ethernet)

#### Analyzer & Scanner M-Bus

[www.adfweb.com?Product=HD67031](http://www.adfweb.com?Product=HD67031)

#### Extender and Repeater, M-Bus

[www.adfweb.com?Product=HD67032](http://www.adfweb.com?Product=HD67032)

#### Gateway M-Bus / Modbus RTU

[www.adfweb.com?Product=HD67029M-232](http://www.adfweb.com?Product=HD67029M-232) (on RS232)  
[www.adfweb.com?Product=HD67029M-485](http://www.adfweb.com?Product=HD67029M-485) (on RS485)

#### Gateway M-Bus / Modbus TCP

[www.adfweb.com?Product=HD67044](http://www.adfweb.com?Product=HD67044)

#### Gateway M-Bus / PROFIBUS

[www.adfweb.com?Product=HD67053M](http://www.adfweb.com?Product=HD67053M)

#### Gateway M-Bus Concentrator

[www.adfweb.com?Product=HD67054M](http://www.adfweb.com?Product=HD67054M)

#### Gateway M-Bus Slave / Modbus RTU master

[www.adfweb.com?Product=HD67059M-232](http://www.adfweb.com?Product=HD67059M-232)

Do you have an your customer protocol?

[www.adfweb.com?Product=HD67003](http://www.adfweb.com?Product=HD67003)

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

[www.adfweb.com?Cmd=helpme](http://www.adfweb.com?Cmd=helpme)

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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.

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**REVISION LIST:**

Revision	Date	Author	Chapter	Description
1.000	03/02/2011	Fl	All	First release version (1.000)
1.002	18/02/2013	Nt	All	Added new chapters

**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:**

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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 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](mailto:support@adfweb.com) or give us a call if you need it.

**CONNECTION SCHEME:**

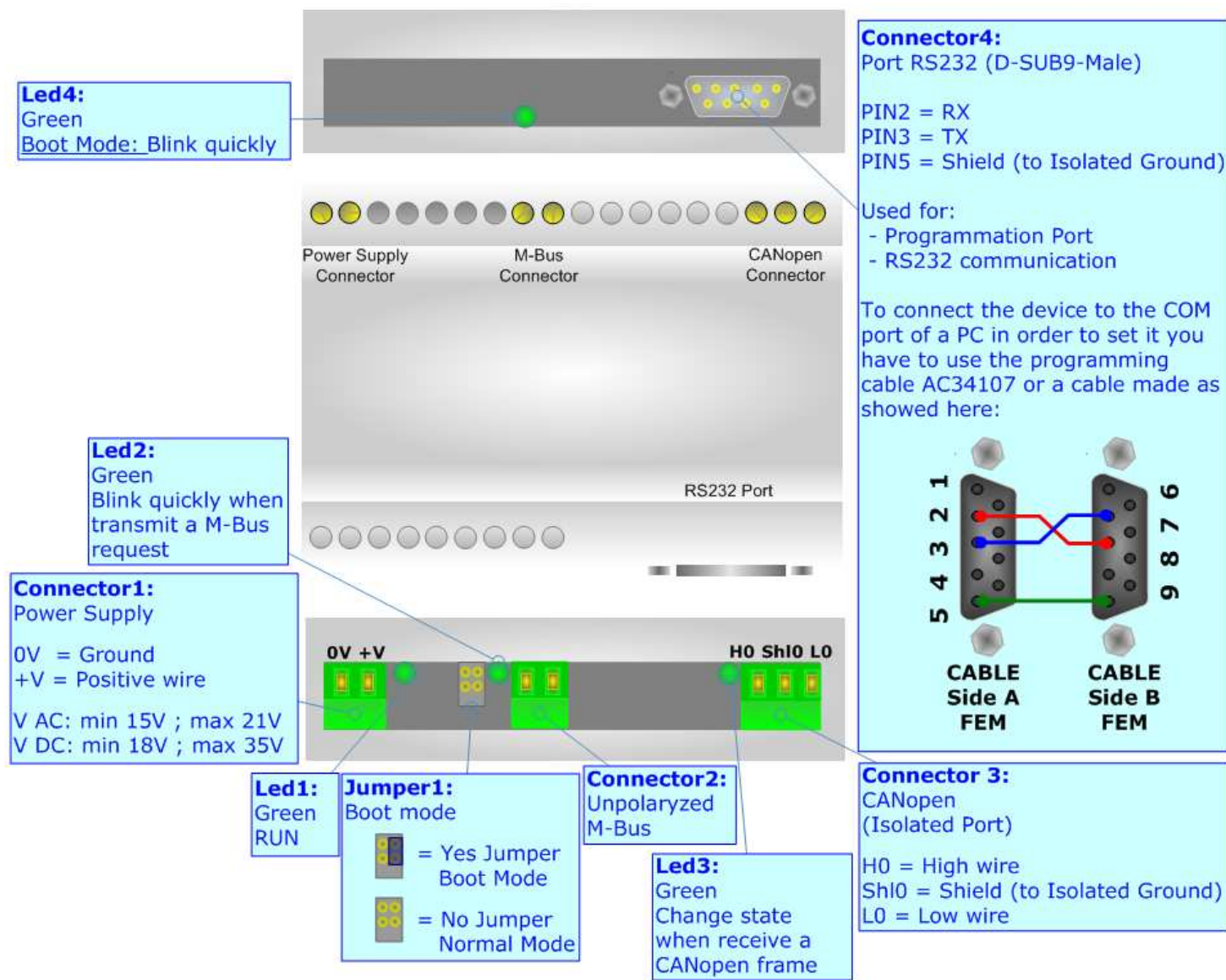


Figure 1: Connection scheme for HD67051-B2-xxx

**CHARACTERISTICS:**


The HD67051-B2-xxx is Gateway M-Bus to CANopen.


It allows the following characteristics:

- Electrical isolation between CANopen and M-Bus;
- Baud Rate and Parity changeable with software;
- Mountable on Rail DIN;
- Power Supply 15...21V AC or 18...35V DC;
- Temperature range -40°C to 70°C.

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

- HD67051-B2-20 support up to 20 M-Bus devices;
- HD67051-B2-40 support up to 40 M-Bus devices;
- HD67051-B2-80 support up to 80 M-Bus devices;
- HD67051-B2-160 support up to 160 M-Bus devices;
- HD67051-B2-250 support up to 250 M-Bus devices.

 In the case of HD67051-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 HD67051-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.

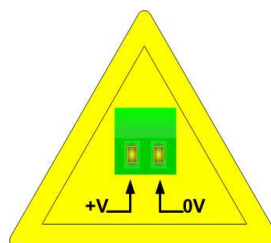
VAC		VDC	
Vmin	Vmax	Vmin	Vmax
15V	21V	18V	35V

Consumption at 24V DC:

Device	No Load [W/VA]	Full Load [W/VA]*
HD67051-B2-20	3.5	4
HD67051-B2-40		5
HD67051-B2-80		8
HD67051-B2-160		14
HD67051-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**



HD67051-B2-xxx

## CONFIGURATION:

You need Compositor SW67051 software on your PC in order to perform the following:

- Define the parameter of CANopen line;
- Define the parameter of M-Bus line;
- Define the M-Bus devices on the line and select the desired values;
- Create the EDS file to import on your PLC or other;
- Update the device.

## USE OF COMPOSITOR SW67051:

To configure the Gateway, use the available software that runs with Windows, called SW67051. It is downloadable on the site [www.adfweb.com](http://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).

When launching the SW67051 the right window appears (Fig. 2).

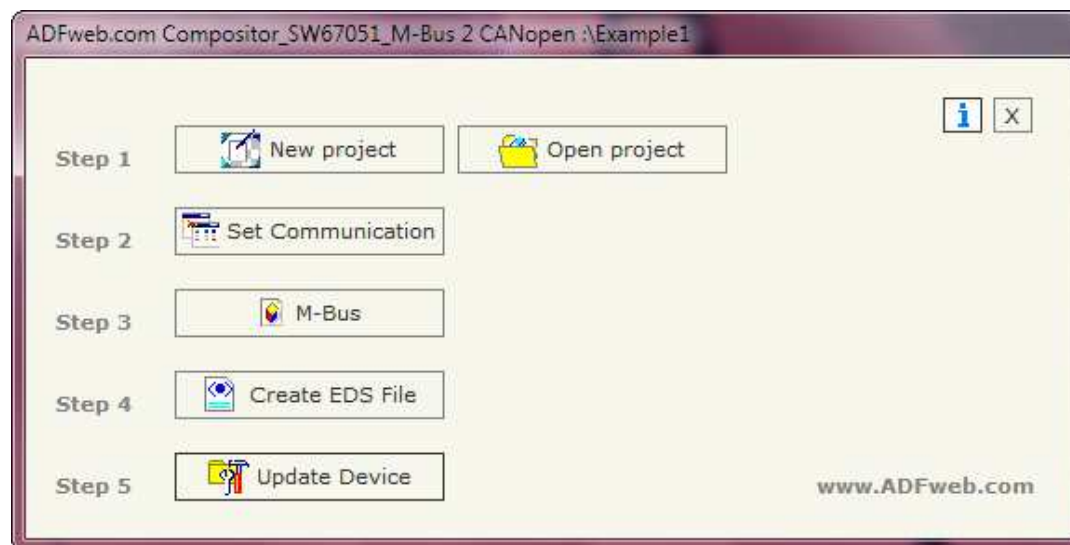


Figure 2: Main window for SW67051

**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 to CANopen 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**";
- When a new project is created or an existent project is open, it will be possible to access the various sections of the software:
  - "**Set Communication**";
  - "**M-Bus**";
  - "**EDS File**";
  - "**Update Device**".



## SET COMMUNICATION:

This section define the fundamental communication parameters of two Buses, CANopen and M-Bus.

By Pressing the "**Set Communication**" button from the main window for SW67051 (Fig. 2) the window "SET COMMUNIATION" appears (Fig. 3).

The window is divided in two sections, one for the CANopen and the other for the M-Bus.

The means of the fields for CANopen are:

- In the field "**ID Dev.**" the ID for the CANopen side is defined;
- In the field "**Baudrate**" it is possible to select the baudrate of the CANopen line;
- In the field "**Set Operational State at Start-Up**" the state of the CANopen is defined. I.e. if it is checked the board starts in Operational State, else it starts in Preoperational;
- In the field "**Network Start ar Start-Up**" the state of the network CANopen is defined. I.e. if it is checked the board sends a command to set the Operational State of all the devices present in the network;
- In the field "**Delay**" the delay before sending the network command for the CANopen is defined;
- In the field "**Producer Time (mS)**" insert a delay time for sending the Heartbeat in the Network. If the value of this field is zero the gateway send only one Heartbeat when the gateway starts, otherwise it sends this every xx mS;
- In the subsection "TPDO" the functioning of Transmit PDO is defined. I.e. if "**Send on change data**" is checked the gateway sends the PDO only when it's data are changed; otherwise if "**Send cyclically**" is checked the gateway sends the PDO with the defined interval of the time expressed in mS.

The means of the fields for M-Bus are:

- In the field "**Baudrate**" it is possible to select the baudrate of the M-Bus line;
- In the field "**Parity**" it is possible to select the parity of the line;
- In the field "**Cyclic Delay**" insert the time (expressed in seconds) between two scans.

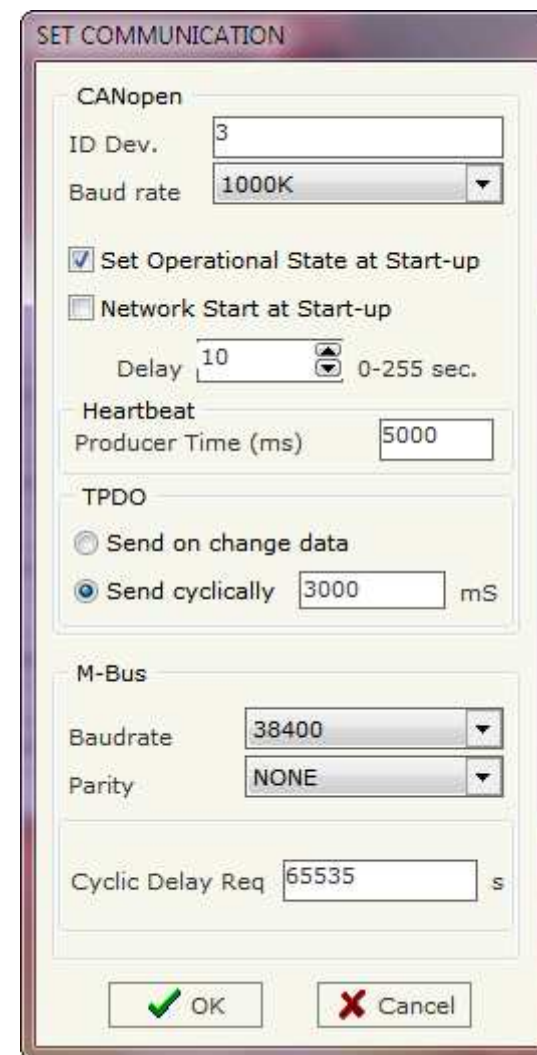


Figure 3: "Set Communication" window

**M-BUS:**

By Pressing the "**M-Bus**" button from the main window for SW67051 (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.

If the field "**Send SND\_NKE**" is checked, the Gateway send the "SND\_NKE" frame to start the communication.

In the field "**Send Reset App.**" Is checked the gateway 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 13 for more information).

In the subsection "Node State" it is possible to select if it is necessary to save the Node State of the Slave. It's possible to use SDO and/or PDO. For use the SDO the field "**Enable SDO**" must be checked and in the field "**Index SDO**" it is necessary to insert the SDO Index used. For use the PDO the field "**Enable PDO**" must be

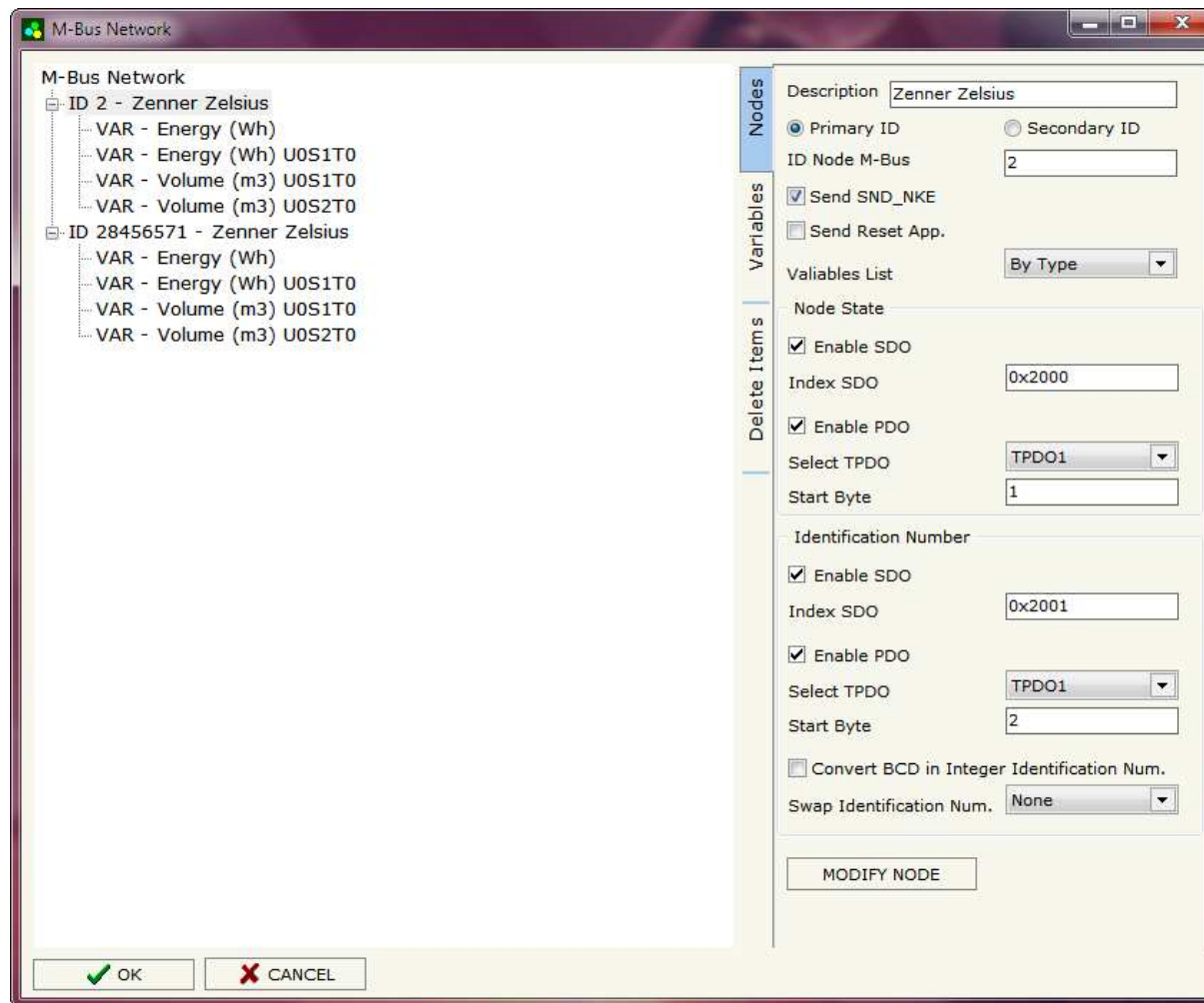


Figure 4: "M-Bus Network" window

checked, then it is necessary to select which TPDO uses by the field "**Select TPDO**" (TPDO1, TPDO2, TPDO3, TPDO4) and the start byte where saving the data (1...8) by the field "**Start Byte**". The Node State occupy only one byte.

In the subsection "Identification Number" it is possible to select if it is necessary to save the Identification Number of the Slave. It's possible to use SDO and/or PDO. For use the SDO the field "**Enable SDO**" must be checked and in the field "**Index SDO**" it is necessary to insert the SDO Index used. For use the PDO the field "**Enable PDO**" must be checked, then it is necessary to select which TPDO uses by the field "**Select TPDO**" (TPDO1, TPDO2, TPDO3, TPDO4) and the start byte where saving the data (1...8) by the field "**Start Byte**". The Identification Number occupy four byte.

If the field "**Convert BCD in Integer Identification Num.**" is checked the gateway converts the Identification Number that is normally expressed in BCD in a Integer Number and saves the number in the reserved positions.

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 17) of this document for select the swap mode.

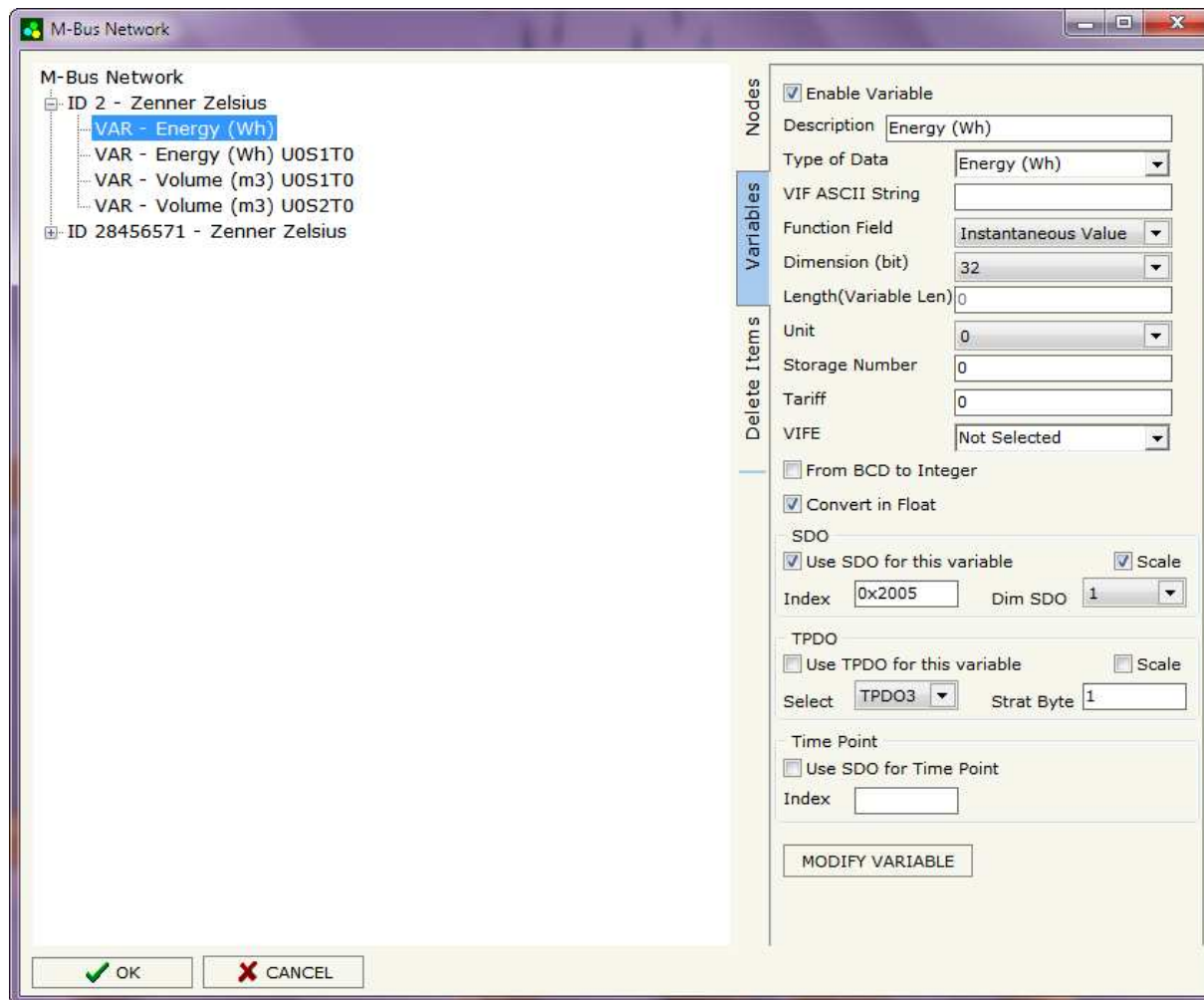
After that, pressing the "**ADD NODE**" button, a new node appears in the left side of the window.

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);
- 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 **“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 "**From BCD to Integer**" is checked the Gateway 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 Gateway converts the data into Float type. Every variable occupies four bytes. In this case the float value is multiplied by the "Scale" automatically;
  - For use the SDO the field "**Use SDO for this variable**" must be checked and in the field "**Index**" it is necessary to insert the SDO Index used. With the field "**Dim SDO**" the number of data byte of SubIndex is defined. If the field "**Scale**" is checked is created another SubIndex that contain the Scale. For use the PDO the field "**Use TPDO for this variable**" must be checked, then it is necessary to select which TPDO uses by the field "**Select**" (TPDO1, TPDO2, TPDO3, TPDO4) and the start byte where saving the data (1..8) by the field "**Start Byte**". If the field "**Scale**" is checked after the bytes of data there is another byte that contain the scale;
  - If the field "**Use SDO for Time Point**" and the "Type of Data" is "Time Point" it is possible to read the information of Year, Month, Day, Hour, Minutes on five consecutive SubIndex in a SDO (if not selected the values are the same of the reply of the slave device, so coded with a determinate structure (page 19 for more information)).

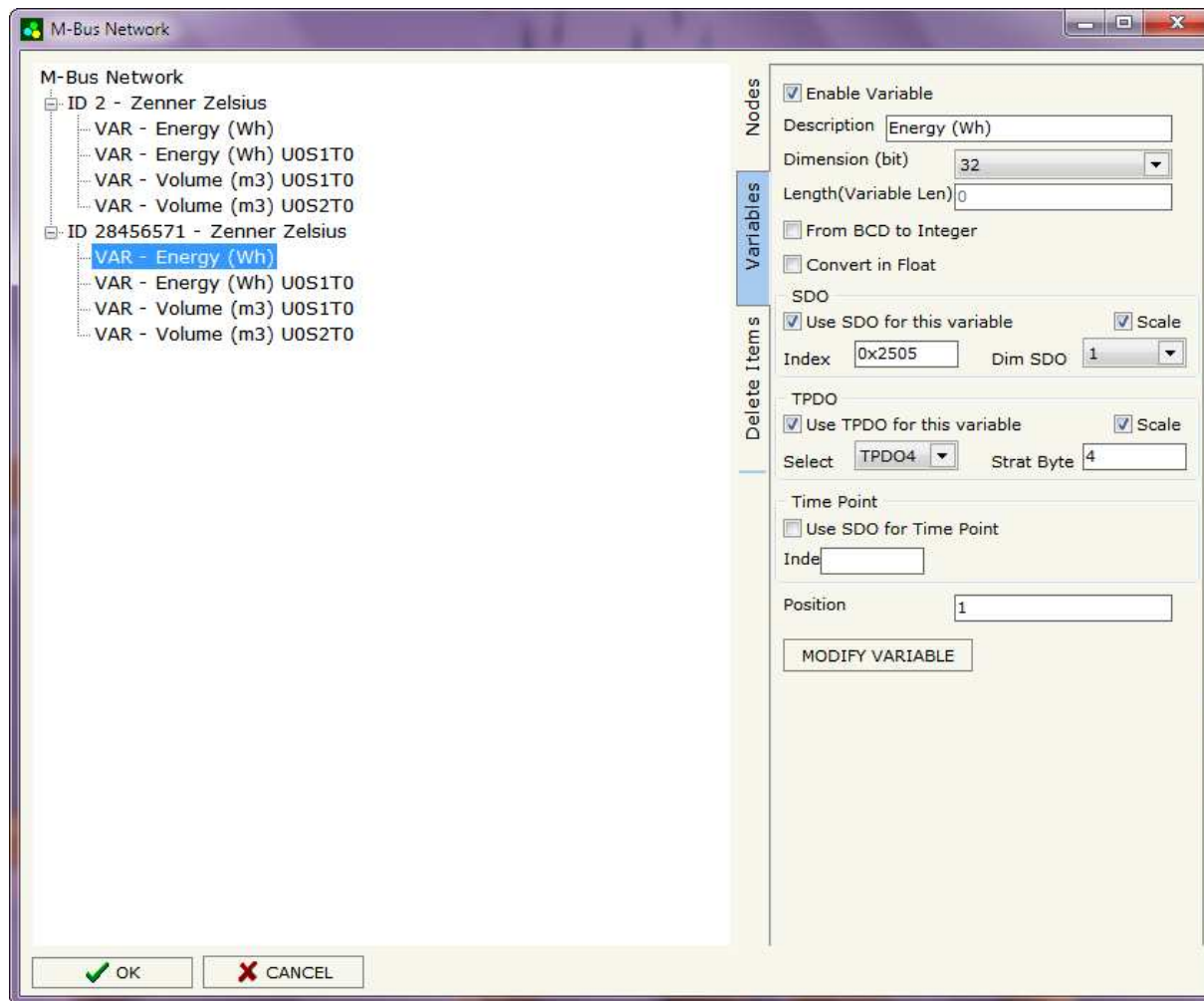
Having completed these fields, to add the variable the button "**ADD VARIABLE**" must be pressed.

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);
- In the field **“Length(Variable Len)”** insert the length of the data in the case of the dimension is **“Variable Length”**;
- If the field **“From BCD to Integer”** is checked the Gateway 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 Gateway converts the data into Float type. Every variable occupies four bytes. In this case the float value is multiplied by the **“Scale”** automatically;
- For use the SDO the field **“Use SDO for this variable”** must be checked and in the field **“Index”** it is necessary to insert the SDO Index used. With the field **“Dim SDO”** the number of data byte of SubIndex is defined. If the field **“Scale”** is checked is created another SubIndex that contain the Scale. For use the PDO the field



“**Use TPDO for this variable**” must be checked, then it is necessary to select which TPDO uses by the field “**Select**” (TPDO1, TPDO2, TPDO3, TPDO4) and the start byte where saving the data (1...8) by the field “**Start Byte**”. If the field “**Scale**” is checked after the bytes of data there is another byte that contain the scale;

- If the field “**Use SDO for Time Point**” and the “Type of Data” is “Time Point” it is possible to read the information of Year, Month, Day, Hour, Minutes on five consecutive SubIndex in a SDO (if not selected the values are the same of the reply of the slave device, so coded with a determinate structure (page 19 for more information)).
- In the field “**Position**” insert the number of the variable that you want on CANopen.

Example:

0x68 - Start Byte  
 0xBD - L Field  
 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

Fixed Data Header

First Variable (1)

Second Variable (2)

Third Variable (3)

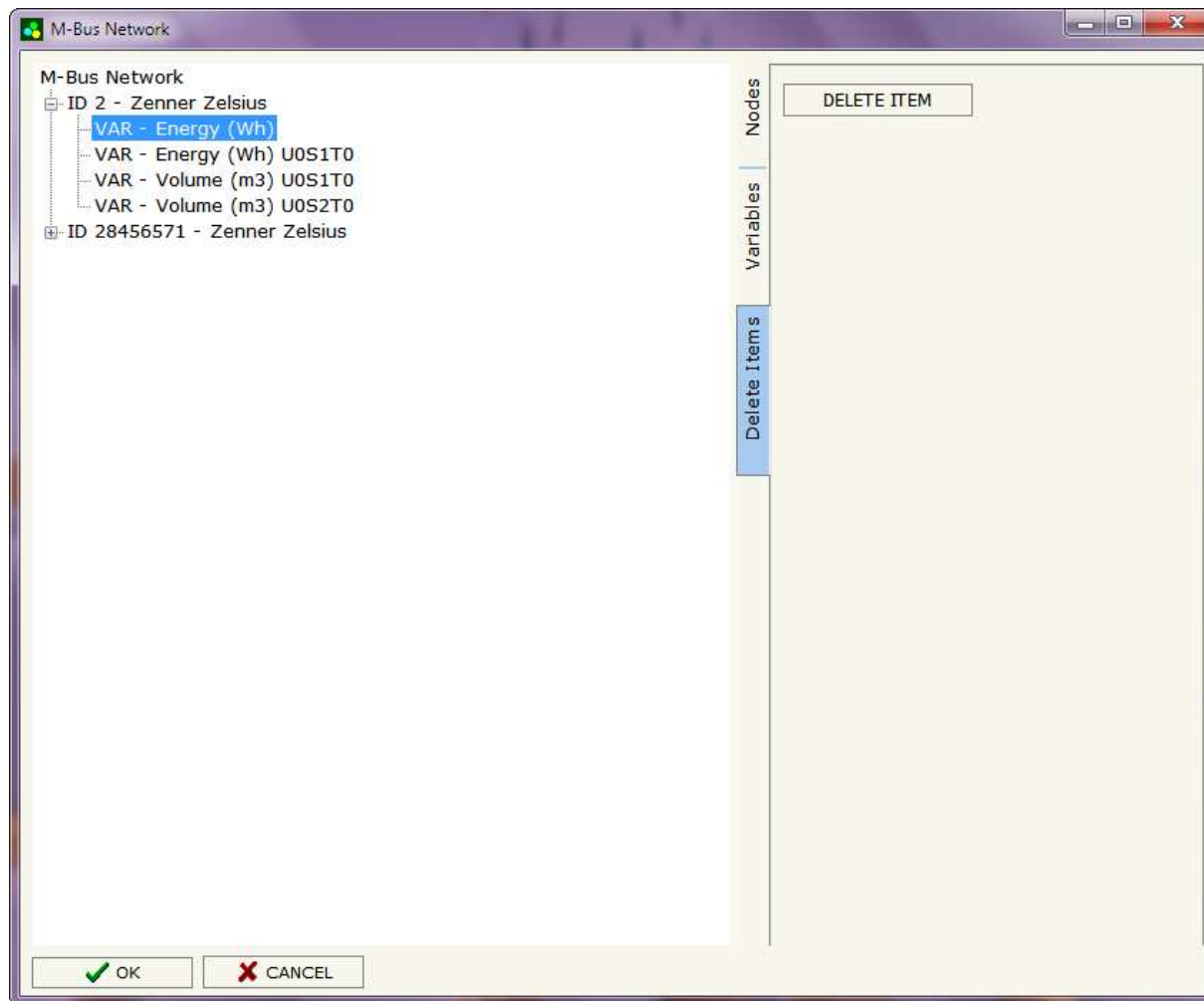
Identification Number (or Secondary Address) putted in the reserved fields if “**Identification Number**” is checked

Status of the meter putted in the reserved field if “**Node State**” is checked

To be use in the “**Position**” field

**SECTION DELETE ITEMS:**

If it is necessary to delete a node or a variable, you have to select the node or the variable and then press the **“DELETE ITEM”** button.





Possible choices for the fields used to create a variable:

**Type of Data:**

- |\_Energy (Wh)
- |\_Energy (J)
- |\_Volume (m<sup>3</sup>)
- |\_Mass (Kg)
- |\_On Time
- |\_Operating Time
- |\_Power (W)
- |\_Power (J/h)
- |\_Volume Flow (m<sup>3</sup>/h)
- |\_Volume Flow Ext. (m<sup>3</sup>/min)
- |\_Volume Flow Ext. (m<sup>3</sup>/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
- |\_(Enhanced) 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 feet<sup>3</sup>
- 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 m<sup>3</sup>
- \_ 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: 10<sup>3</sup>
- \_ 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): 28456571; Convert BCD in Integer Identification Num. not checked.

None	Type 1
0x28	0x65
0x45	0x71
0x65	0x28
0x71	0x45

- Identification Number (Secondary Address): 28456571; Convert BCD in Integer Identification Num. checked.

None	Type 1
0x01	0x36
0xB2	0x7B
0x36	0x01
0x7B	0xB2

To know the meaning of value read in the "Scale" byte position, you must follow this table (x = Value read in Scale location):

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 <sup>3</sup>	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 <sup>3</sup> /h	0.001 l/h to 10000 l/h
Volume Flow Ext.	$10^{(x-7)}$ m <sup>3</sup> /min	0.0001 l/min to 1000 l/min
Volume Flow Ext.	$10^{(x-9)}$ m <sup>3</sup> /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).

## UPDATE DEVICE:

Section "Update device" (Fig. 5):

In order to load the parameters or update the firmware in the gateway, 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);
- 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);
- Press the "Next" button;
- Select which operations you want to do. You can select only "Firmware", only "Project" or both of them;
- 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.

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

Figure 5: "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 HD67051-B2-xxx device.

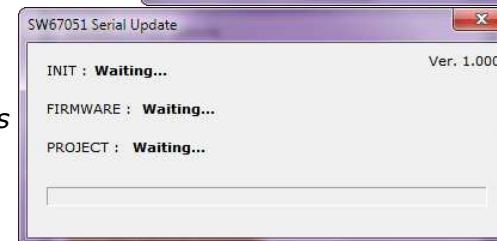
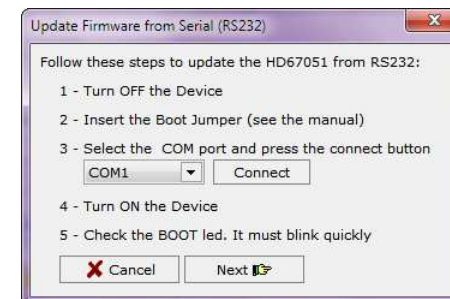


### Warning:

If the Fig. 6 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;
- Try to restart the PC.

Figure 6: "Protection" window



**CHARACTERISTICS OF THE CABLES:**

**SERIAL 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.

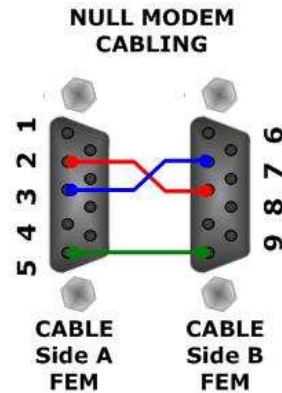


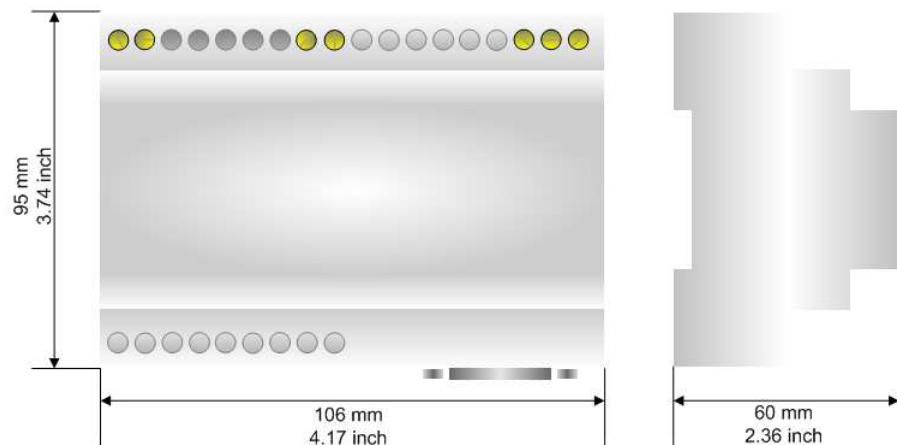
Figure 7: Null modem cabling

**M-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)*

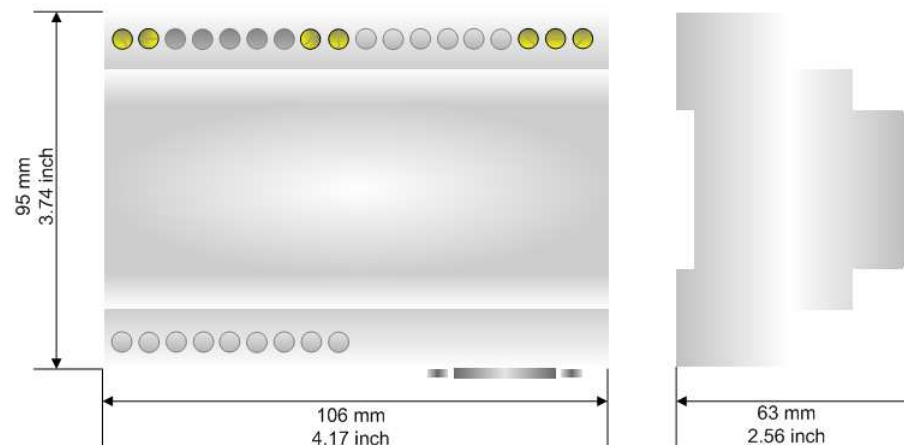


**MECHANICAL DIMENSIONS:**



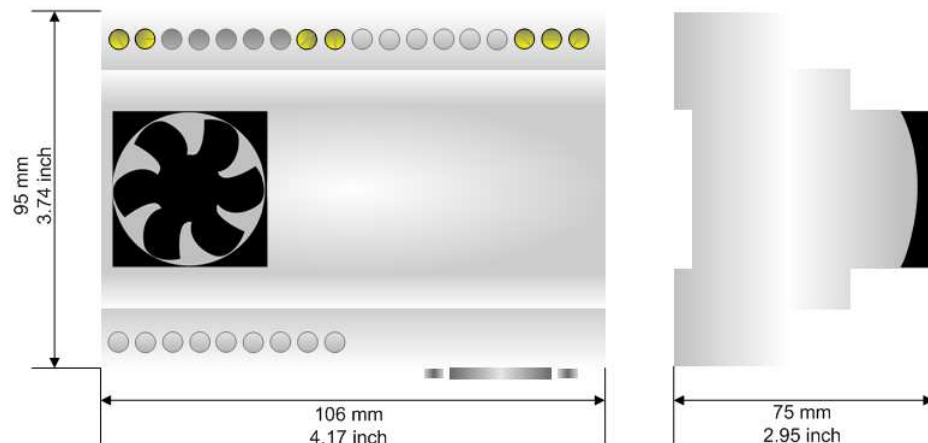
Housing: PVC  
Weight: 200g (Approx)

Figure 8: Mechanical dimensions scheme for HD67051-B2-20, -40, -80



Housing: PVC  
Weight: 200g (Approx)

Figure 9: Mechanical dimensions scheme for HD67051-B2-160



Housing: PVC  
Weight: 200g (Approx)

Figure 10: Mechanical dimensions scheme for HD67051-B2-250

**ORDER CODES:**

- Order Code: **HD67051-B2-20** - M-Bus Master / CANopen - Converter (up to 20 slaves connected to M-Bus)
- Order Code: **HD67051-B2-40** - M-Bus Master / CANopen - Converter (up to 40 slaves connected to M-Bus)
- Order Code: **HD67051-B2-80** - M-Bus Master / CANopen - Converter (up to 80 slaves connected to M-Bus)
- Order Code: **HD67051-B2-160** - M-Bus Master / CANopen - Converter (up to 160 slaves connected to M-Bus)
- Order Code: **HD67051-B2-250** - M-Bus Master / CANopen - Converter (up to 250 slaves connected to M-Bus)

**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](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:

- 1) 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.
- 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
HD67120	Converter Ethernet to RS232/RS485	<a href="http://www.adfweb.com?product=HD67120">www.adfweb.com?product=HD67120</a>
HD67119	Converter USB 2.0 to RS485 Isolated	<a href="http://www.adfweb.com?product=HD67119">www.adfweb.com?product=HD67119</a>
HD67507	Gateway Modbus TCP Server to RTU Master	<a href="http://www.adfweb.com?product=HD67507">www.adfweb.com?product=HD67507</a>
HD67510	Gateway Modbus TCP Client to RTU Slave	<a href="http://www.adfweb.com?product=HD67510">www.adfweb.com?product=HD67510</a>