

www.processcenter.se

HD67059-B2-485 20-40-80-160-250 Modbus slavar



www.processcenter.se

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	7
CONFIGURATION	7
POWER SUPPLY	8
FUNCTION MODES	9
LEDS	10
RS232	11
RS485	12
M-BUS	13
ETHERNET	13
USE OF COMPOSITOR SW67059	14
NEW CONFIGURATION / OPEN CONFIGURATION	15
SOFTWARE OPTIONS	16
SET COMMUNICATION	18
M-BUS	21
UPDATE DEVICE	27
MECHANICAL DIMENSIONS	30
ORDERING INFORMATIONS	31
ACCESSORIES	31
DISCLAIMER	32
OTHER REGULATIONS AND STANDARDS	32
WARRANTIES AND TECHNICAL SUPPORT	33
RETURN POLICY	33

REVISION LIST:

Revision	Date	Author	Chapter	Description
1.002	08/04/2011	FI	All	Revision
1.010	05/10/2011	FI	All	Software changed (v1.100)
1.011	18/02/2013	Nt	All	Added new chapters
2.000	15/12/2017	Ff	All	New hardware version

TRADEMARKS:

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

SECURITY ALERT:

GENERAL INFORMATION

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

INTENDED USE

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

QUALIFIED PERSONNEL

The device can be used only by qualified personnel, strictly in accordance with the specifications.

Qualified personnel are persons who are familiar with the installation, assembly, commissioning and operation of this equipment and who have appropriate qualifications for their job.

RESIDUAL RISKS

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



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

EXAMPLE OF CONNECTION:



CONNECTION SCHEME:



Figure 1a: Connection scheme for HD67059-232-B2

www.processcenter.se



Figure 1b: Connection scheme for HD67059-485-B2

CHARACTERISTICS:

The HD67059 is a M-Bus slave to Modbus master converter.

It allows the following characteristics:

- Electrical isolation between RS232/RS485 M-Bus Power Supply;
- Baud Rate and Parity changeable with software;
- Mountable on 35mm Rail DIN;
- ✤ Wide power supply input range: 8...24V AC or 12...35V DC;
- ➡ Wide temperature range: -40°C / 85°C [-40°F / +185°F].

CONFIGURATION:

You need Compositor SW67059 software on your PC in order to perform the following:

- Define the parameter of Modbus and M-Bus line;
- Define the map between M-Bus and Modbus sides;
- Update the device.

POWER SUPPLY:

The devices can be powered at 8...24V AC and 12...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
8V	24V	12V	35V

Consumption at 24V DC:

Device	[W/VA]
HD67059-232-B2	4
HD67059-485-B2	4



Warning: Not reverse the polarity power



FUNCTION MODES:

The device has got two functions mode depending of the position of Dip1 of 'Dip-Switch A' of HD67059-xxx-B2:

- ✤ 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 uploading the Project and/or Firmware.

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

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



LEDS:

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

Т

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: Not used (yellow)	OFF	Blinks quickly: Boot state
		Blinks very slowly (~0.5Hz): update in progress
2. M. Due Comment (mellow)	Blinks when a M-Bus request is	Blinks quickly: Boot state
3: M-Bus Comm. (yellow)	received	Blinks very slowly (~0.5Hz): update in progress
4: Modbus comm.	Blinks when a Modbus response is	Blinks quickly: Boot state
(yellow)	received	Blinks very slowly (~0.5Hz): update in progress
5. Ethernot Link (groop)	ON: Ethernet cable connected	ON: Ethernet cable connected
5. Luiemet Link (green)	OFF: Ethernet cable disconnected	OFF: Ethernet cable disconnected



www.processcenter.se

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 RS232 cable not exceed 15 meters.



RS485:

To terminate the RS485 line with a 120Ω resistor, it is necessary to put dip 1 ON, like in figure.



The maximum length of the cable should be 1200m (4000 feet).

Here some codes of cables:

- ✤ Belden: p/n 8132 2x 28AWG stranded twisted pairs conductor + foil shield + braid shield;
- Belden p/n 82842 2x 24AWG stranded twisted pairs conductor + foil shield + braid shield;
- ✤ Tasker: p/n C521 1x 24AWG twisted pair conductor + foil shield + braid shield;
- ✤ Tasker: p/n C522 2x 24AWG twisted pairs conductor + foil shield + braid shield.

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.



ETHERNET:

The Ethernet connection must be made using Connector3 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 COMPOSITOR SW67059:

To configure the Converter, use the available software that runs with Windows called SW67059. It is downloadable from the site <u>www.adfweb.com</u> and its operation is described in this document (*this manual is referenced to the last version of the software present on the web site*). The software works with MSWindows (XP, Vista, Seven, 8, 10; 32/64bit).

When launching the SW67059, the window below appears (Fig. 2).



It is necessary to have installed .Net Framework 4.

WE ADFweb.c	com - Configurator SW67059 - Modbus Master / M-Bus Slave	×
	67059 Master / M-Bus Slave - Converter	
Begin	Opened Configuration of the Converter : Example1	
Step 1	New Configuration	
Step 2	Set Communication	
Step 3	M-Bus	
Step 4	X Update Device UDP	www.ADFweb.com

Figure 2: Main window for SW67059

NEW CONFIGURATION / OPEN CONFIGURATION:

The "New Configuration" button creates the folder which contains the entire device's configuration.

🟙 Create New Configuration	\times
SW67059 Create New Configuration	
Example2	
OK Cancel	

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

- To clone the configurations of a programmable "M-Bus Slave / Modbus Master -Converter" in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button "Open Configuration".



www.processcenter.se

SOFTWARE OPTIONS:

Software Options

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

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

	Web Software	Options		×	
ne	Software	67059			
	Language	Connection Options	Software Settings		
	Selected	Language :			
		English			
			Page 1 / 1		
	V	ок 🗙 Са	ancel		

SW657059 Software Options Language Connection Options Software Settings Check Software Update at Start of Program Check Available Update In the section updatings of the Checking the options SW67059 check

In the section "Connection Options", it is possible to check if there are some updatings of the software compositor in ADFweb.com website. Checking the option "**Check Software Update at Start of Program**", the SW67059 check automatically if there are updatings when it is launched.

www.processcenter.se

Web Software	e Options			×
Softwar	67059			
Language	Connection Options	Software Settings		
☐ Jump i	into next field in the ta	ables by pressing the	a Enter Key lick	
V	Рок 🛛 🗙 с	ancel		

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

SET COMMUNICATION:

By Pressing the "**Set Communication**" button from the main window for SW67059 (Fig. 2) the window "Set Communication" appears (Fig. 3).

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

- ✤ Select Device
- + M-Bus
- Ethernet
- Modbus Master

Set Communication		×
SW67059 Set Communication Setting		
1. Select Device		Ð
2. M-Bus		Ð
4. Ethernet		Ð
3. Modbus Master		÷
	🔷 ок	Cancel

Figure 3a: "Set Communication" window

SELECT DEVICE:

This section is used to define hardware type used:

- HD67059M (Serial Update): old hardware version (6M box)
- HD67059-B2 (Serial Update): new hardware version (4M box)

M-Bus:

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

- In the field "Baudrate" the data rate of the M-Bus line is defined;
- In the field "Parity" the parity of the M-Bus line is defined;

MODBUS MASTER:

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

- In the field "Serial" the serial port to use is defined (RS232 or RS485);
- In the field "Baudrate" the baudrate for the serial line is defined;
- In the field "Parity" the parity of the serial line is defined;
- In the field "TimeOut (ms)" the maximum time that the converter attends for the answer from the Slave interrogated is defined;
- In the field "Cyclic Delay (ms)" the delay (idle time) between two Modbus requests is defined;
- In the field "Protocol" the protocol used on serial side is defined.

1. Select Device		Ξ
Select Device	HD67059-B2 (Ethernet Update)	~

Figure 3b: "Set Communication → Select Device" window

2. M-Bus		Ξ
Baudrate	2400 🗸	
Parity	EVEN ~	

Figure 3c: "Set Communication \rightarrow M-Bus" window

3. Modbus Master			Ξ
Serial	RS232	~	
Baudrate	2400	~	
Parity	EVEN	~	
TimeOut (ms)	10000		
Cyclic Delay (ms)	1000		
Protocol	Modbus RTU	~	

Figure 3d: "Set Communication \rightarrow Modbus Master" window

ETHERNET:

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

- ✤ In the field "Ip Address" the IP address of the converter is defined;
- In the field "SubNet Mask" the Subnet Mask of the converter is defined;
- In the field "Gateway" the default gateway of the net is defined. This feature can be enabled or disabled pressing the Check Box field. This feature is used for going out of the net;

4. Ethernet		Ξ
IP Address	192 . 168 . 0 . 10	
SubNet Mask	255 . 255 . 255 . 0	
Gateway	192 .168 .0 .1	

Figure 3e: "Set Communication → Ethernet" window

M-BUS

By Pressing the "M-Bus" button from the main window for SW67059 (Fig. 2) the window "M-Bus Network" appears (Fig. 4).

In the section "Nodes" it is possible to create the nodes of M-Bus line:

- In the field "Description" it is possible to write a short description of the node.
- In order to create a new virtual node it is necessary to define the "Primary ID" and the "Secondary ID".

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.



Figure 4: "M-Bus Network" window

M M-Bus Network

SECTION VARIABLES:

the desired node it is possible to add a variable. In create a new variable it is necessary to fill these items:	SW67059 M-Bus Network			
o use the created variable the field "Enable Variable"	M-Bus Network V Primary Address 2 - Secondary Address 0 - Slave 1	Service Servic	<u> </u>	
ne moment it is unused, it is possible to uncheck the	VAR - S1 - Var1	2 Slave ID Type of Data	1 Holding Register	
eld "Enable Variable" without deleting it;	> Primary Address 5 - Secondary Address 0 - Slave 3	8 Modbus Register	100	-
a the field "Slave ID" you have to insert the Modbus		Number of Points	2	
ave ID of the device that contain the values that you		Swap	None	
ant to import on M-Bus;		Description S1 - V	arl	
the field "Type of Data" you have to select the type of		Type of Data	Energy (Wh)	
odbus data. It is possible to select: Coil Status, Input		Function Field	Instantaneous Value	•
tatus, Holding Register, Input Register;		Dimension (bit)	32	
the field "Modbus Register" the start address of the		Unit	0	
egister to be read is defined:		Scale	Wh * (10 ^ -3)	
the field "Number of Deinte" insert the number of		Storage Number	50	
onsecutive registers to be read:		Tariff	66	
		VIFE	Not Selected	
rder;		MODIFY VARIABL	E	
the field "Description" it is possible to write a escription of the variable;				
he field "Type of Data " is used to select the unit of neasure;				
n the field "Function Field" it is necessary to select the	V OK Cancel P Import Network			

- Selecting order to
 - ÷ T n tł fi
 - I ÷. sl W
 - 🖈 Ti Μ S
 - re
 - 🔹 Ti C
 - 🕴 II 0
 - + II d
 - 🖢 T m
 - 🔶 Tr type of data;
 - The field "Dimension" is used to select the dimension of the variable (8, 16, 24, 32, 48, 64 bit, 32 bit Real or Variable Length);
 - In the field "Length" you have to insert the length of the variable only if 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 "Scale" it is necessary to select the value of Scale of the measure;
 - ✤ 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;

www.processcenter.se

- 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".

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.

COPY, PASTE AND DELETE ITEMS:

By pressing the right button of the mayse over an item (Variable or Nede), it is possible to Capy. Basta		M-Bus Network		
by pressing the right button of the mouse over an item (variable of Node) it is possible to Copy, Paste	 Primary 	Addrose 2 - Secondary	Address	
and Delete.	VAR	Copy Variable		
It is possible to Copy a variable from a Node and copy it to another Node, or copy a Variable from a	> Primary	Paste Variable	Address	
project and paste in another one.	> Primary		Address	
It is also possible to copy an entire Node with all its Variables.		Copy Node		

Paste Node

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 (m^3/h) Volume Flow Ext. (m^3/min) Volume Flow Ext. (m^3/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	<pre>_ Period of tariff months(s)</pre>
Credit of the nominal local legal currency units	Period of tariff year(s)
Debit of the nominal local legal currency units	j dimensionless/ no VIF
Access Number (transmission count)	Volts
Medium (as in fixed header)	Ampere
Manufacturer (as in fixed header)	Reset counter
Parameter set identification	Comulation counter
Model/Version	Control signal
Hardware Version #	Day of week
Firmware Version #	Week number
Software Version #	Time point of day change
Customer Location	State of parameter activation
_ Customer	_ Special supplier information
_ Access Code User	_ Duration since last comulation [hour(s)year(s)]
_ Access Code Operator	_ Operation time battery [hour(s)year(s)]
_ Access Code System Operator	_ Date and time of battery change
_ Access Code Developer	_ Energy MWh
_ Password	_ Energy GJ
_ Error flags (binary)	_ Volume
_ Error mask	_ Mass
_ Digital Output (binary)	_ Volume 0,1 feet^3
_ Digital Input (binary)	<pre> _ Volume 0,1 american gallon</pre>
_ Baudrate [Baud]	<pre>Volume 1 american gallon</pre>
<pre> _ response delay time [bittimes]</pre>	<pre> _ Volume flow 0,001 american gallon/min</pre>
_ Retry	<pre> _ Volume flow 1 american gallon/min</pre>
<pre> _ First storage # for cyclic storage</pre>	<pre> _ Volume flow 1 american gallon/h</pre>
_Last storage # for cyclic storage	_ Power MW
_ Size of storage block	_ Power GJ/h
<pre> _ Storage interval [sec(s)day(s)]</pre>	_ Flow Temperature
_ Storage interval month(s)	_ Return Temperature
_ Storage interval year(s)	_ Temperature Difference
<pre> _ Duration since last readout[sec(s)day(s)]</pre>	_ External Temperature
<pre> _ Start (date/time) of tariff</pre>	_ Cold/Warm Temperature Limit °F
_ Duration of tariff (nn=0111:min to day)	_ Cold/Worm Temperature Limit °C
<pre> _ Period of tariff [sec(s) to day(s)]</pre>	<pre>_ Cumul. count max power</pre>

<pre>_ 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 _ increment per output pulse on output channel _ per liter _ per m^3 _ per kg _ per kg _ per k(Kelvin) _ per kW _ per GJ _ per kW _ per (K*1)(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 exceede of lower(unpage limit</pre>	 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) Moltiplicative correction factor: 10^3 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 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 error Premature end of record
---	---

|_ Date(/time) of begin/end of first/last lower/upper limit exceed

UPDATE DEVICE (FOR HD67059M):

By pressing the "**Update Device**" button it is possible to load the created Configuration into the device, and also the Firmware if is necessary, 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 Converter;
- Insert the Boot Jumper;
- Select the "COM port" and press the "Connect" button;
- Turn ON the device;
- Check the "Boot state" Led. It must blink quickly;
- 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;
- Remove the Boot Jumper;
- Disconnect the USB/RS232 cable;
- ✤ Turn ON the device.

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

🟙 Update Device by Serial	×	
SW67059 Update Device Using the Serial Port		
Select the COM Port for the Update		
СОМ1 🗸 🄄		
Select Update Options		
Firmware + Configuration	~	
Read Back		
Cancel]	
SW67059 Serial Update	×	
INIT : Waiting	Ver. 1.100	
FIRMWARE : Waiting		
PROJECT : Waiting		

Figure 5a: "Update Device" windows

UPDATE DEVICE (FOR HD67059-B2):

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

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

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

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

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

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

🟙 Update Device by Ethernet (UDP)	×
SW67059 Update Device Using the Ethernet Port	
Insert the IP Address of Device	
Select Update Options	
Firmware + Configuration	~
Read Back	
Cancel]
ADFweb.com - SW67059 Ethernet Update	×
INIT : Waiting	Ver. 1.500
FIRMWARE : Waiting	
PROJECT : Waiting	

Figure 5b: "Update device" windows

Kote:

When you receive the device, for the first time, you also have to update the Firmware in the HD67059 device.

<u>Warning:</u>

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

- Check if the serial COM port selected is the correct one;
- Check if the serial cable is connected between the PC and the device;
- Try to repeat the operations for the updating;
- Try with another PC;
- Try to restart the PC;
- Check the LAN settings;
- If you are using the program inside a Virtual Machine, try to use in the main Operating System;
- If you are using Windows Seven, Vista, 8 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.

FIRMWARE : Waiting	
PROJECT : Waiting	
🚟 ADFweb.com - SW67059 Ethernet Update	×
INIT : PROTECTION	Ver. 1.500
FIRMWARE : Waiting	
PROJECT : Waiting	

×

Ver. 1.500

Figure 6: "Error" window

ADFweb.com - SW67059 Ethernet Update

INIT : Device Not Found

Warning:

In the case of HD67059 you have to use the software "SW67059": www.adfweb.com\download\filefold\SW67059.zip.

MECHANICAL DIMENSIONS:



Weight: 200g (Approx)

Figure 7: Mechanical dimensions scheme for HD67059-xxx-B2

ORDERING INFORMATIONS:

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



Order Code:HD67059-232-B2- M-Bus Slave / Modbus Master (RS232)Order Code:HD67059-485-B2- M-Bus Slave / Modbus Master (RS485)

ACCESSORIES:

Order Code:	AC34011	-	Isolated Converter 100240V AC to 12V DC stabilized - AC/DC
Order Code:	AC34012	-	Isolated Converter 100240V AC to 24V DC stabilized - AC/DC
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