

## Operating Manual

# Appendix to the operating manual

Energy manager RMX621

DP-slave module (“PROFIBUS-coupler”) from V2.01.00

Connecting the energy manager to PROFIBUS DP via the RS485 serial interface using the external module (HMS AnyBus communicator for PROFIBUS)



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# 1 General

## 1.1 Transport damage

Please inform both your supplier and transport company.

## 1.2 Delivery

- These operating instructions
- The DP-slave module HMS AnyBus communicator for Profibus
- Serial connection cable for the energy manager
- CD-ROM containing the GSD-file and Bitmaps

**Should anything be missing please inform your supplier immediately!**

Please take note of the following pictograms:

**Note:**  Recommendations for better installation and commissioning

**Attention:**  Non compliance can lead to the unit becoming defective or to faulty operation!

## 1.3 Abbreviations/terminology explanation

**PROFIBUS-coupler:** In the following text the external DP-slave module HMS AnyBus communicator for Profibus will be known as the **PROFIBUS-coupler**.

**PROFIBUS-master:** All units such as DCS, PLC, PC-plug in boards, that operate as a Profibus-DP master, will be known as the **PROFIBUS-master**.

## 2 Installation

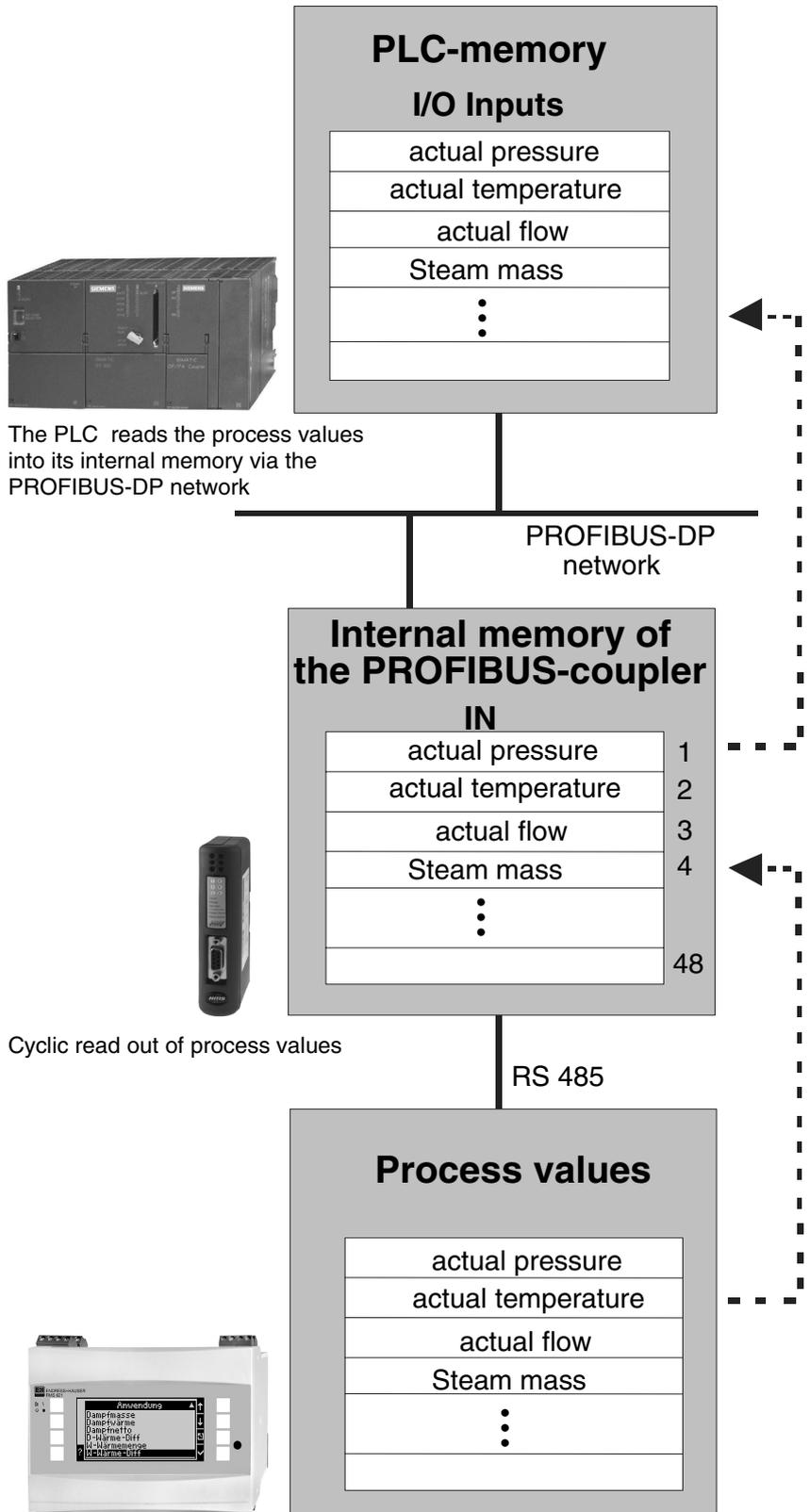
### 2.1 Function description

The Profibus-DP connection is made using an external PROFIBUS-coupler.

This module is connected to the energy manager using the RS485-serial interface (RxTx1). The PROFIBUS-coupler operates as a master in the direction of the energy manager and reads out the process values in every second and then places these into its buffer memory.

In the direction of the Profibus DP system the PROFIBUS-coupler operates with the function of a DP-slave for cyclic data transfer and on request makes the buffer stored process values available to the Bus.

Architecture, see the diagram opposite.



### 2.2 Conditions

That this option is available in the RMS 621 energy manager by using the Firmware-Version V 2.00.04.

## 2.3 Connections and operating elements

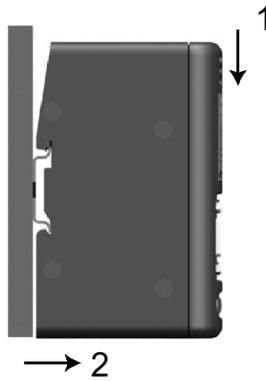


## 2.4 Installation on DIN rail

A - Snap ON

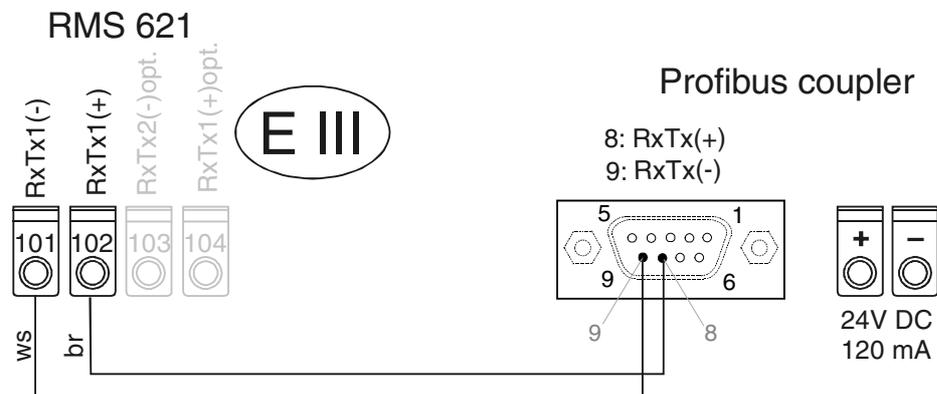


B - Snap OFF



## 2.5 Connections and terminal layout

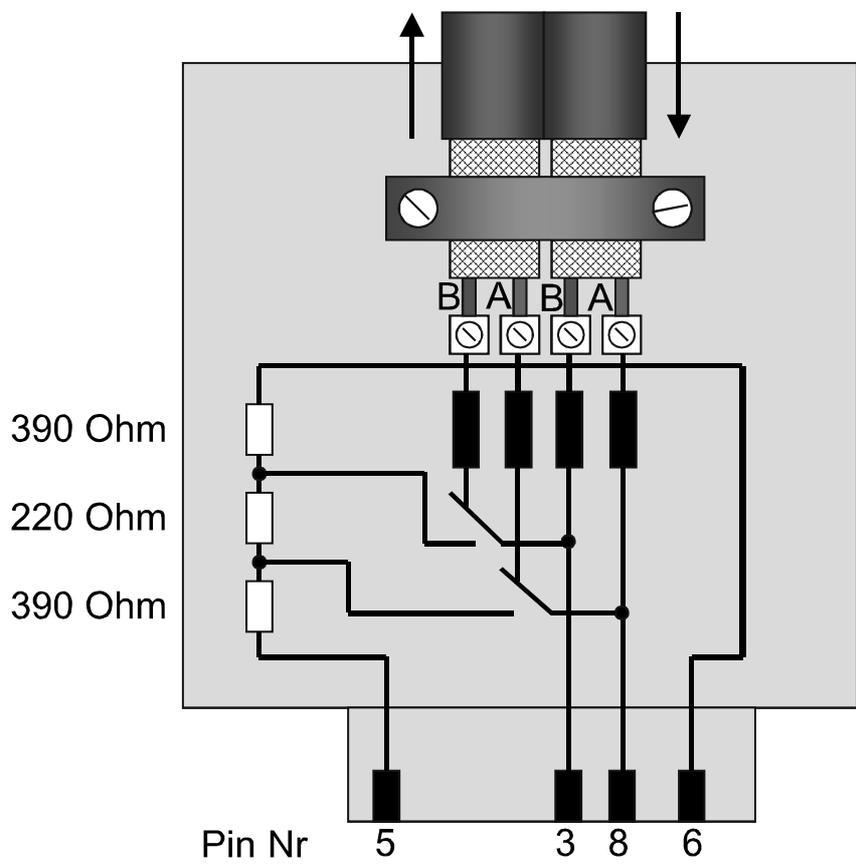
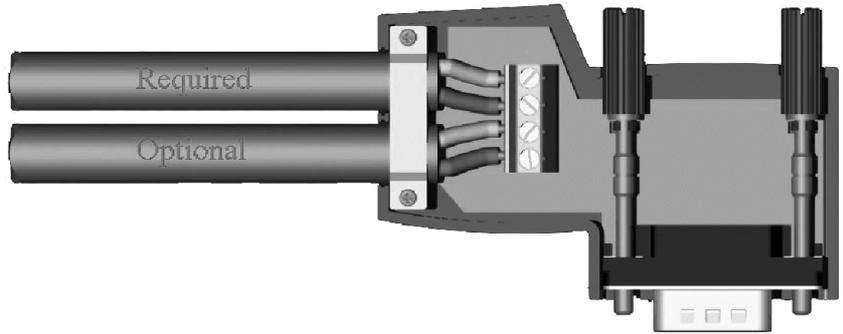
Connecting the RMS 621 energy manager with the PROFIBUS-coupler



Note: The colour indication is valid for the cable supplied.

PROFIBUS DP connections (to the PROFIBUS-coupler)

For connection to the PROFIBUS we recommend the use of an EN 50170 compliant 9-pole Sub-D plug with an integrated Bus termination resistance.

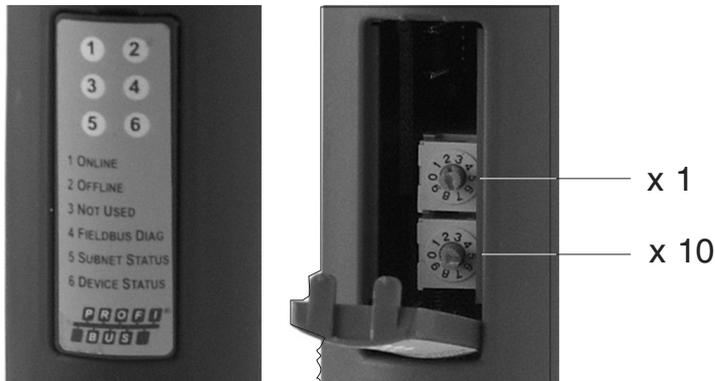


**2.6 PROFIBUS-DP terminal layout**

Pin No.	Signal	Description
Housing	Screen	Functional ground
3	B-cable	RxTx (+)
5	GND	Operational potential
6	VP	Supply for the termination resistors
8	A-cable	RxTx (-)

## 2.7 Bus address set-up

The two selector switches used for the set up of the Bus address are available after carefully opening the front cover.



Using these selector switches Bus addresses within a range of 00 to 99 can freely set up.

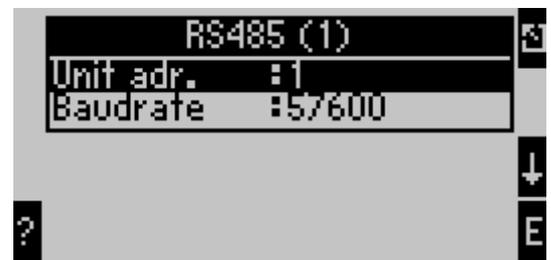


Note: Only use valid addresses.

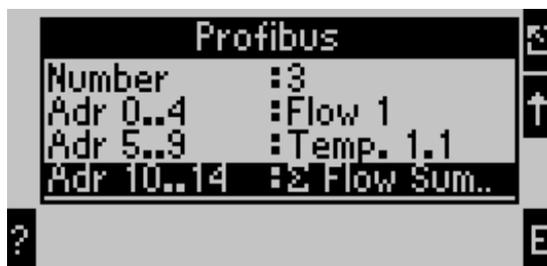
## 3 Commissioning

### 3.1 Set-up for the RMS 621 energy manager

In the main menu Communication -> RS485(1) of the RMS 621 the parameters for the RS485 (1) interface should be set up as Unit address to 1 and Baudrate to 57600.



How many process values are to be transmitted can be set up in the main menu Communication -> Profibus -> number, whereby the maximum number is limited to 48. In further steps each offset address can be allocated to the required process value using selection lists.



For simple and easy further evaluation of the process values the list of offset addresses can be printed out using the ReadWin 2000 operating software.



Note: Please note that when setting the process values to be displayed by the Profibus DP, that the same process values can be set to more than one address.

### 3.2 Set-up for the PROFIBUS-coupler

The PROFIBUS-coupler is already set-up by the factory. Apart from the Bus addresses no further set-up is required. A match to the Profibus-DP data transmission rate is done automatically.

### 3.3 Status display

The 6 LEDs display the actual unit status and data exchange.



LED	Description	Display	Status	Actions
1	ONLINE	Green Off	PROFIBUS-coupler ready for operation	
2	OFFLINE	Red Off	PROFIBUS-coupler not ready for operation	Check connector Check Profibus network
3	NOT USED			
4	FIELD BUS DIAG	Red flashing Off	Configuration error No Bus error detected	Check PLC set-up
5	SUBNET STATUS	Green Green flashing Red Off	Data exchange running Data exchange halted data exchange not possible Power supply failure	Check connection between PROFIBUS-coupler and the energy manager; Check communication parameter in the energy manager Check the power supply
6	DEVICE STATUS	Green Green flashing Red/Green flashing Off	Initialisation running PROFIBUS-coupler operating Faulty set-up Power supply failure	Unit defective Check the power supply

## 4 Data transmission

### 4.1 General

In the energy manager various process values are calculated dependent on the preset applications and are then made available for read out.

In addition to the calculated values the input values can also be read out from the energy manager.

### 4.2 Usable data construction

Each process value takes up 5 Bytes in the process picture.

The first 4 Bytes are compliant to an IEEE-754 (MSB first) 32-Bit floating point number,

### 4.3 32-Bit floating point number (IEEE-754)

Octet	8	7	6	5	4	3	2	1
1	VZ	(E) $2^7$	(E) $2^6$					(E) $2^1$
2	(E) $2^0$	(M) $2^{-1}$	(M) $2^{-2}$					(M) $2^{-7}$
3	(M) $2^{-8}$							(M) $2^{-15}$
4	(M) $2^{-16}$							(M) $2^{-23}$

VZ = 0: Positive number

VZ = 1: Negative number

E = Exponent, M = Mantisse

$$Zahl = -1^{VZ} \cdot (1 + M) \cdot 2^{E-127}$$

Example: 40 F0 00 00 h = 0100 0000 1111 0000 0000 0000 0000 0000 b

$$\begin{aligned} \text{Value} &= -1^0 \cdot 2^{129-127} \cdot (1 + 2^{-1} + 2^{-2} + 2^{-3}) \\ &= 1 \cdot 2^2 \cdot (1 + 0,5 + 0,25 + 0,125) \\ &= 1 \cdot 4 \cdot 1,875 = 7,5 \end{aligned}$$

The last Byte transmits the value's status:

80h = Valid value

81h = Valid value with alarm set point violation

10h = Faulty value (e.g. Cable open circuit)

00h = No value available (e.g.: due to communication error in the sub-net)

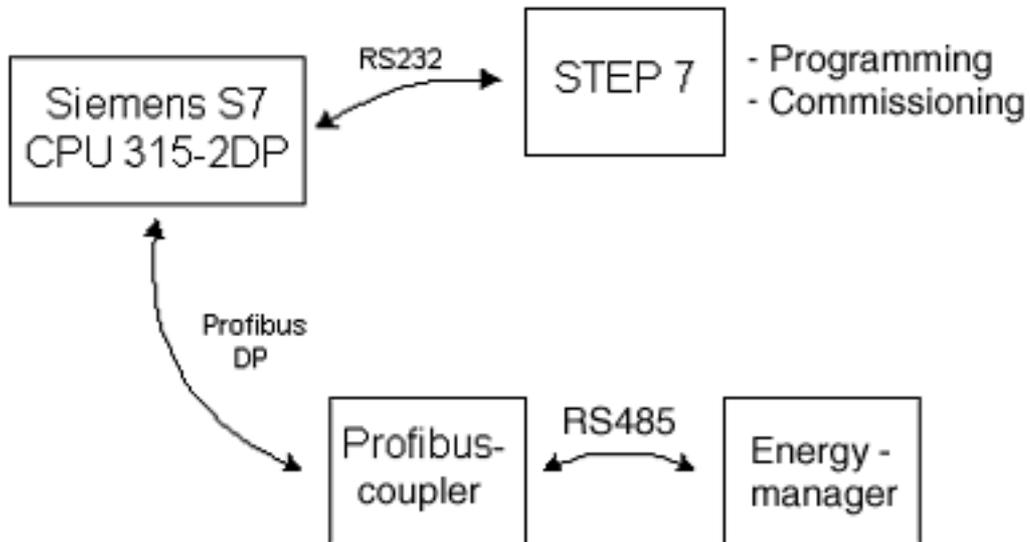


Note: All values meet the physical basic units:  
°C, bar, /s, kg, kJ, dm<sup>3</sup>, kg/m<sup>3</sup> (Dichte), kJ/kg (Enthalpy)

The number of process values transmitted is laid down in the energy manager set-up, see chapter 3.1. The minimum number is 1 process value (5 Byte), the maximum is 48 process values (240 Byte).

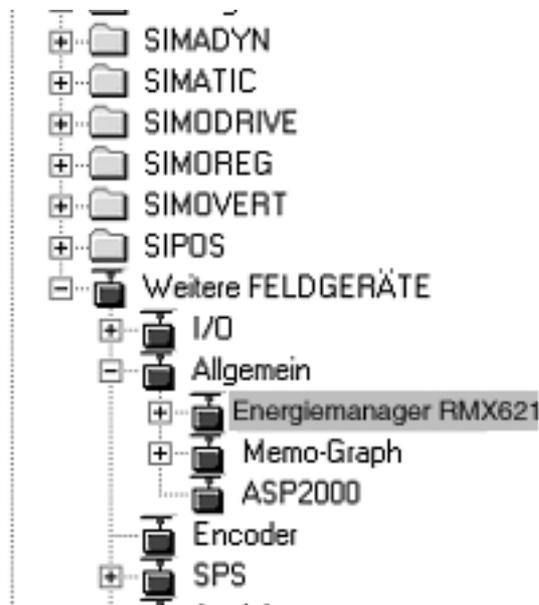
## 5 Installation in a Simatic S7

### 5.1 Network overview



### 5.2 GSD file EH\_x153F.gsd

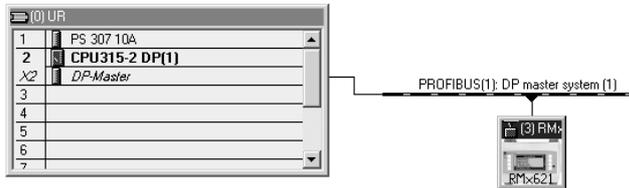
- Either install using **Extras/install new GSD**
- or copy the GSD- and BMP- files into the required directory of the Software STEP 7.  
z.B.: c:\...\Siemens\Step7\S7data\GSD  
c:\...\Siemens\Step7\S7data\NSBMP



### 5.3 Projecting the energy manager as a slave

Hardware configuration:

- Pull out the **Energymanager RMx621** unit from the hardware catalogue -> PROFIBUS DP -> further field units -> General in the Profibus DP network
- Set the user addresses



Slot	Module / ...	Order number	I Address	Q Address	Comment
1	64	4 AI: 20 Byte	0..19		
2	64	4 AI: 20 Byte	20..39		
3	64	AI: 5 Byte	40..44		
4					
5					

The GSD-File has two modules defined:

Input (SPS)	RMS621 -> Profibus master	Config string
AI: 5 Byte	one numeric value + status	0x40, 0x84
4 AI: 20 Byte	four numeric values with status each	0x40, 0x93

Use as many modules onto the individual plug in points until the number of process values corresponds with the number set up in the energy manager. More than one process value can be combined in one module.



Note: The projected unit address must correspond with the actual set up hardware addresses. The address range of the process values must be uninterrupted.

## 6 Technical data

Dimensions:	120mm x 75mm x 27mm (Höhe, Tiefe, Breite)
Power supply:	24V DC +/-10%
Power consumption:	Typical 120mA, Max. 280mA
PROFIBUS-DP Baud rate	9.600, 19.200, 45.450, 93.750, 187.500, 500.000, 1.5M, 3M, 6M, 12M
RS485 interface parameters	Baud rate 57600, 8 Data bit, 1 Stop bit, unit address 01
Ambient temperature:	+5 ... +55 °C
Storage temperature:	-55 ... +85 °C
Air humidity:	5 .. 95%, non condensation
Ingress protection:	IP 20
Ground cable connection:	Grounded internally via the DIN rail
Approvals:	UL - E214107

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