

EY-CM 731: Communication module with M-Bus and EIA-232 interfaces, modu731

How energy efficiency is improved

SAUTER EY-modulo 5 technology: modular, fast and universal

Features

- Part of the SAUTER EY-modulo system family
- Plug-in element for extending the modu525 automation station (AS)
- One or two COM modules per modu525 AS
- Modular design (baseplate/electronics/LED indicators)
- EIA-232 interface for point-to-point connection with an M-Bus level converter
- Two-wire M-Bus network (as per EN 1434-3)
- Connection to M-Bus meter networks for up to 200 meters (heat meter, electricity meter, etc.)
- Recording counter readings at automation level allows optimum control and regulation of systems and offers the option of using BACnet/IP communication at the management level.
- Without external power supply: up to 10 M-Bus meters
- With external power supply: up to 50 M-Bus meters
- D-sub plugs (9-pin, male, DTE) for connecting to external M-Bus level converter
- Direct labelling on the front



EY-CM731F020

Technical data

Power supply

Power supply	From modu525
Current consumption	≤ 200 mA
Power loss	≤ 3.28 W

External power supply

For 1...50 meters on the M-Bus network	24 V~ (±20%)/24 V= (±20%)
Power consumption	5 W, 6 VA (for 11...50 meters on the M-Bus network)
Screw terminals	2 (MM, LS)

Ambient conditions

Operating temperature	0...45 °C
Storage and transport temperature	-25...70 °C
Admissible ambient humidity	10...85% rh, no condensation

Architecture

Protocol processor	FPGA
COM interface	UART
Memory	Flash memory (user and protocol data)
Number of data points	≤ 200

Interfaces and communication

COM port, EIA-232 (DTE)	D-sub connector (9-pin, male)
COM interface, M-Bus (EN 1434-3)	4 screw terminals (2 × M+, 2 × M-)
Baud rate	0.3...9.6 (38.4) kBit/s
Connection, I/O bus	12-pin, integrated in socket
Protocol	M-Bus (master)

Construction

Fitting	on top-hat rail
Dimensions W x H x D	42 × 170 × 115 mm
Weight	0.8 kg

Standards and directives

Type of protection	IP 20 (EN 60529)
Protection class	III (EN 60730-1)
Environment class	3K3 (IEC 60721)



	Software class A	EN 60730-1 Annexe H
CE conformity as per	EMC directive 2004/108/EC ¹⁾	EN 61000-6-1, EN 61000-6-3, EN 61000-6-4

Overview of types

Type	Properties
EY-CM731F020	Communication module with M-Bus and EIA-232 interface, modu731

Accessories

Type	Description
7010037001	Manual for moduCom communication modules, German
7010037002	Manual for moduCom communication modules, French
7010037003	Manual for moduCom communication modules, English
0386301001	Connection cable COM DB9(f)-DB9(f), 3 m (null modem)

Description of operation

moduCom works as a Modbus or M-Bus master, which supports reading out and – in the case of Modbus/RTU – sending of data points in the field devices. The values are mapped to the present value of a BACnet I/O object in the AS.

Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the “Description of operation” section.

All related product documents must also be adhered to. Changing or converting the product is not admissible.

Engineering notes

General for moduCom

The configuration of the communication modules (in short: COM modules), the system protocol parameters and user-specific data point parameters is carried out with the software tools of SAUTER CASE Suite. Information regarding the exact configuration and function are described in CASE Suite (online help) and the moduCom manual (7010037).

Reading and writing data points is generally supported by field bus devices. The present values of BACnet are written into the data point values of the third-party system or are read from the data point values of the third-party system.

The following functions apply to “mapping” from the point of view of the AS (BACnet object):

BACnet alien systems – mapping

AS (BACnet object)	Function	CM (FS data point)
BI (Present Value)	Reading	Bit data point
AI (Present Value)	Reading	Float data point Unsigned data point Signed data point
MI (Present Value)	Reading	Unsigned data point
BO (Present Value) BO (Feedback Value)	Writing (reading)	Bit data point (feedback)
AO (Present Value)	Writing	Float data point Unsigned data point Signed data point
MO (Present Value) MO (Feedback Value)	Writing (reading)	Unsigned data point (feedback)
PC (count)	Reading	Unsigned data point

Erroneous reading or writing can be supported with the BACnet property “Reliability”. When converting unsigned/signed values to or from analogue objects, the value may lose accuracy and resolution. *Listening function for commissioning, monitoring, analysis, etc.:*

there is an AS TELNET interface (via special TELNET/TCP port) for data logging. This allows the listening data to be recorded in a legible text format (TELNET client, etc.).

More detailed information on the protocols and functions can be taken from the function module description and the moduCom manual (7010037).

¹⁾ EN 61000-6-1: EIA-232 cable max. 15 m in length. M-Bus cable: two-core, twisted pair

EY-CM731F020: modu731 M-Bus (master) (EIA-232 or M-Bus interface)

For M-Bus protocol implementation, the following M-Bus functions are supported (in accordance with EN 1434 or EN 13757 (partially)):

- As master only
- Range of primary addresses 1...250
- The max. number of M-Bus counters is:
 - 10 without external power supply,
 - 50 with external power supply
 - or is defined by the level converter (up to 200).
- Max. 200 objects/data points
- Data point sequence is defined by the manufacturer's description ("M-Bus Records")
- "Response with fixed data structure and response with variable data structure"
- Transmission format low byte/high byte only (CI-Field = 0x72)
- Initialisation telegram SND_NKE
- Query of values from several memory pages (Multi-telegram counter with "M-Bus Pages")
- REQ_UD2 only
- Decoding of the data fields of the DIF and VIF frame part (data/value information field)
- Time- or command-controlled retrieval of counters (battery protection)
- Automatic detection of M-Bus units and adaptation to SI units

Restrictions – the following functions are not supported:

- Secondary addressing and network support
- Broadcast telegrams
- Manufacturer-specific frame parts (DIF 0x0F)
- Frame parts such as medium, DIFE (Data Inform. Field Extension)
- Frame parts VIFE (Value Information Field (Extension))

The following data types are used for the master functionality:

- 8-, 16-, 24-, 32-, 48-, 64-bit integer
- 32-bit IEEE float (real)
- 2-, 4-, 6-, 8-, 12-digit BCD

Counter readings can be converted to the 32-bit IEEE real-float format for the present value of the BACnet object. Values larger than 16,777,215 exceed the resolution of 1 and may no longer be displayed correctly. The use of the pulse-converter object with the property count as an unsigned 32 value increases the maximum counter reading (4,294,967,296).

General for modu731**COM module with the following 6 or 7 LED functions:**

LED name I/O bus	Status	Frequency ²⁾	Description
(No designation)	Continuous green light	—————	moduCom mode ok ('running')
	Pulsating green	o o o o o	No channel configuration
	Rapid pulsating green	oooooooooooo	Device in configuration
	Pulsating red	o o o o o	No protocol loaded in device
	Rapid pulsating red	oooooooooooo	No communication to the automation station
	Flashing red	— — — — —	Internal error
	Green – red – off alternating	— — — — —	Lamp test active (indicator type priority)
LED no.			
1	Continuous green light	—————	Voltage 1 available at moduCom
2			Not used
3			Not used
4			Not used
5	Green	o o o o o o o	Specific to protocol, such as Requirement (SEND)
	Red	o o or ———	Specific to protocol, such as erroneous requirement (Tg error)

²⁾ pulsating: 0,1 s / 10% duty cycle, pulsating quickly: 0.1 s / 50% d.c., flashing: 0.5 s / 50% d.c., alternating: per 1 s

LED name I/O bus	Status	Frequency ²⁾	Description
6	Green	◦◦◦◦◦◦◦◦	Specific to protocol, such as Response (RECEIVE)
	Red	◦◦	Specific to protocol, such as erroneous response (time-out, Tg error)

COM module with a 12-bank terminal block and the following terminal assignment:

Terminals	Designation	Description
01-06	NC	Not connected
07	LS	Power supply (+)
08	MM	Ground wire (GND, -) of the power supply
09, 11	M+	M-Bus data line (+)
10, 12	M-	M-Bus data line (-)

The M-Bus network must be wired and installed in accordance with the guidelines for M-Bus counter networks.

The COM module has an integrated M-Bus interface as per EN 1434 3. M-Bus counters can be connected directly to the COM module at the specified M-Bus terminals (signal cables M+ and M-). It is recommended that the M-Bus networks be wired with twisted 2-wire data lines.

In the case of smaller M-Bus networks (up to 10 counters), the M-Bus network is supplied directly with the internal power supply of the AS and with the COM module. In the case of medium-sized M-Bus networks (up to 50 counters), the power supply must be supported by an additional supply of 24 V~ or 24 V= (terminals: LS and MM). In the case of large M-Bus networks (> 50 and up to 250 counters), a powerful external M-Bus level converter must be used.

COM module with 9-pole D-Sub plug and following pin assignment (in accordance with DTE):

PIN	Direction	Designation	Description
1	Input	DCD	Data Channel Detect
2	Input	RxD	Receive Data
3	Output	TxD	Transmit Data
4	Output	DTR	Data Terminal Ready
5	-	GND	Ground
6	Input	DSR	Data Set Ready
7	Output	RTS	Ready to Send
8	Input	CTS	Clear to Send
9	Input	RI	Ring Indicator
SH	-	GND	Ground ("shield" – cable screening)

In the case of a large M-Bus network with a powerful, external M-Bus level converter, the EIA-232 interface is used. The correct connection of the EIA-232 interface to the M-Bus level converter must be taken from the documentation for the level converter. The connection of the data pins (pin 2 and 3) and the GND pin (pin 5) is usually sufficient.

The maximum cable length of the EIA-232 line may not exceed 15 m. Burst interference greater than 1 kV may disrupt communication of the EIA-232 supply line. Larger distances should be covered with the EIA-485<>M-Bus level converter and the modu721 COM module.

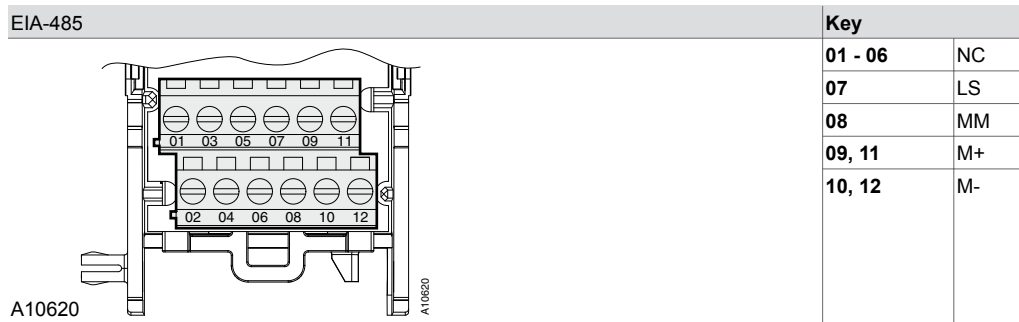
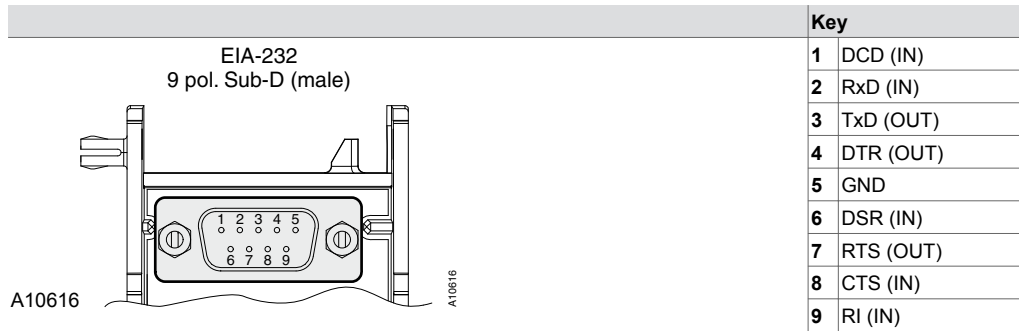
Disposal

When disposing of the product, observe the currently applicable local laws.

More information on materials can be found in the Declaration on materials and the environment for this product.

²⁾ pulsating: 0,1 s / 10% duty cycle, pulsating quickly: 0.1 s / 50% d.c., flashing: 0.5 s / 50% d.c., alternating: per 1 s

Connection diagram



Dimension drawing

