Energy meters

ENERGY • FAST • MEASURE



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•



CERTIFICAT

CERTIFICADO

•

CEPTUDUKAT

認器器書

CERTIFICATE

•

ZERTIFIKAT

CERTIFICATE

The Certification Body of TÜV SÜD Management Service GmbH

certifies that



MBS AG

Fishachstraße 51 74429 Sulzbach-Laufen Germany

has established and applies an Energy Management System for

Development, production and distribution of measuring energy meters, low voltage current transforme split core current transformers, all current sens bus bar isolators / supports, switchgear cabinet h and control equipment, "State approved test organiz measurement and calibration of current transformers and a

An audit was performed, Order No. 70003062. Proof has been furnished that the requirements according to

ISO 50001:2018

The certificate is valid from 2020-03-08 until 2023-0 Certificate Registration No.: 12 340 20346 TMS





TÜV SÜD Management Service GmbH • Zentiftzierungsstelle • Filderstrasse 57 • 80339 München • www.tue-sued.de/certificate-validity-check

CERTIFICATE

The Certification Body of TÜV SÜD Management Service GmbH

certifies that



MBS AG

Eisbachstr. 51 • 74429 Sulzbach-Laufen Germany

> including the sites and scope of application see enclosure

has established and applies a Quality Management System.

An audit was performed, Order No. 70003062.

Proof has been furnished that the requirements according to

ISO 9001:2015

are fulfilled.

The certificate is valid from 2019-04-05 until 2022-04-04. Certificate Registration No.: 12 100 20346 TMS.







TUV S00 Management Service Gmoll • Zertifzierungsstelle • Ridderstrasse 57 • 80309 München • Germany www.tuse soud.de/certificate-vallet by check

TUV®

MID Energy Meters









Capture Energy

Visualize Energy

Charge Energy

If you want to save energy, you have to make energy visible. That means: measure, change, transfer and analyze. The prerequisite for this are energy meters that precisely record all energy consumption.

The measurement is designed for 1- and 3-phase systems. Two tariffs and 4 quadrants are available.

You can choose from M-Bus, Modbus, KNX, LAN-TCP / IP, eVision and Wireless M-Bus interfaces. An S0 pulse, an M-Bus or Modbus interface is integrated in the 4 DU narrow housings.

In addition, the individual interfaces M-Bus, Modbus RTU, LAN-TCP / IP, KNX, eVision or Wireless M-Bus as communication modules with a width of 1TE via an infrared interface to the Energy meters can be connected.

The two meter series offer you the possibility to precisely record your energy consumption, to recognized quickly the sources of error and thus increase your energy efficiency.

Energy Meters	Seite
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Direct measurement - Single-Phase M1PRO







Three-phase energy meters

Current transformer meters

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... 1/5 A







Direct measurement meters

page 11





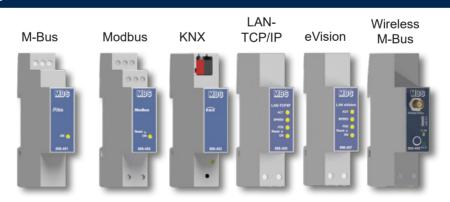


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APPROVED

Communication modules

page 12



Single-phase meter M1PRO







Technical specification	Single-p	hase meter	M1PRO			
Communication link	5	30	M-E	Bus	Mod	dbus
Current	40	0 A	40	Α	40) A
Certification	M	IID	M	D	M	ID
Housing DIN modules (wide)	1	DU	1 [DU	11	DU
Operating voltage range VAC	184.	276	184	.276	92	.276
Certified voltage VAC	1x	230	1x2	230	1x2	230
Operating frequency range Hz	49.	51	45	.51	49.	51
Certified frequency Hz	5	50	5	0	5	50
Starting current (Ist) mA	1	15	1	5	1	5
Reference current (Iref) A		5	5	5		5
Display	LC	D(7)	LCE	0(7)	LCI	D(7)
Display green backlighted		-	-			-
Main terminal max mm ²	1	16	1	6	1	6
Operating temperature °C	-25 b	is +55	-25 bi	s +55	-25 b	is +55
Pulse output S0		-	-			1
Measuring accuracy V-A-P (reading) PF (4 quadrants) Hz Active energy (EN 50470-1-3) class B Reactive energy (EN 62053-23) class 2	± ±	1% 0,05% 0,04 (1%)	± 1 ± 0 ± 0 B (,05% ,04	± (1% 0,05% 0,04 (1%)
Voltage L	A	•	A	•	A	•
Current L	A	•	A	•	A	•
Power Factor L	A	•	A	•	A	•
Frequency L	A	•	A	•	A	•
Active Power L	A	•	A	•	A	•
Reactive Power L		-		•		-
Apparent Power L				•		-
Communication ◆ IR-Side: M-Bus, Modbus RTU, KNX,LAN/TCP, eVision	,	V	-			-
Article number	888-	-104*	888-	103*	888-	·102*

*Minimum order value 25 pieces

▲ Measured parameters displayed • Measured parameters through built-in Bus • Measured parameters through IR side modules

Technical specification	ons			Sing	le-phas	e mete	r M1PR	0				
Communication link		S0	Mod	bus	M-E	3us	S)	Mod	lbus	M	-Bus
Connection		80 A	80	Α	80) A	125	Α	12	5 A	1:	25 A
Certification		MID	MI	D	М	ID	MII)	М	ID	N	/IID
Housing DIN module	es (wide)	2 DU	2 🗅	U	2 [DU	3 D	U	3 [DU	3	DU
Operating voltage ra	nge VAC	92276	92	276	92	.276	922	276	92	276	92	276
Certified voltage VAC	C	1x230	1x2	30	1x2	230	1x2	30	1x2	230	1>	(230
Operating frequency	range Hz	4565	45	.65	45.	65	45	65	45	65	45	65
Certified frequency F	-lz	50	50)	5	0	50)	5	0		50
Starting current (Ist)	mA	15	15	5	1	5	20)	2	0		20
Reference current (II	ref) A	5	5		į	5	5		5	5		5
Display		LCD	LC	D	LC	D	LCD	(8)	LCE	(8)	LC	D (8)
Display green backli	ghted	√	/		٧	/	✓		V	/		✓
Main terminal max m	nm²	35	38	5	3	5	50)	5	0		50
Operating temperatu	ıre °C	-10 bis +55	-10 bis	s +55	-10 bi	s +55	-25 bis	+55	-25 bi	s +55	-25 k	ois +55
Pulse output S0		2	-			-	2		-	-		-
Measuring accurac V-A-P (reading) PF (4 quadrants) Hz Active energy (EN 50 class B	0470-1-3)	±0,5% 0,03% ± 0,2 B(1%)	±0,5 0,03 ± 0 B(1	3% ,2	0,0 ± (5% 3%),2 %)	±0,5 0,03 ± 0 B(1°	3% ,2	±0, 0,0 ± 0	3%),2	0, ±),5% 03% 0,2 (1%)
Reactive energy (EN class 2	I 62053-23)	2%	2%	6	2	%	29	ó	29	%	2	2%
Voltage	L	A	A	•	A	•	•		•	•	•	•
Current	L	A	A	•	A	•	•		•	•	•	•
Power Factor	L	A	A	•	A	•	•		•	•	•	•
Frequenc	L	A	A	•	A	•	•		•	+	•	•
Active Power	L	A	A	•	A	•	A	•	A (• •	A	• •
Blindleistung	L	A	A	•	A	•	A	•	A (• •	A	• •
Reactive Power	L	-		•		•		•	•	•	•	•
Import Active Energy	Total (T1+T2)	A	A	•	A	•	A	•	A (• •	A	• •
	Tarif 1, Tarif 2	A	A	•	A	•	A	•	A (• •	A	• •
Export Active Energy	Total (T1+T2)	A	A	•	A	•	A	•	A (• •	A	• •
	Tarif 1, Tarif 2	A	A	•	A	•	A	•	A (• •	A	• •
Import Reactive Energy	Total(T1+T2)	A	A	•	A	•	A	•	A (• •	A	• •
	Tarif 1, Tarif 2	A	A	•	A	•	A	•	A (• •	A	• •
Export Reactive Energy	Total(T1+T2)	A	A	•	A	•	A	•	A (• •	A	• •
	Tarif 1, Tarif 2	A	A	•	A	•	A	•	A (• •	A	• •
Partial Active Energy	Tarif 1, Tarif 2	A	A	•	A		-			-		
Communication • IR-side: M-Bus, Mod KNX,LAN/TCP, eVisi		√	✓	,	v	/	/		V	/		√
Article number		888-105*	888-	106*	888-	107*	888-1	08*	888-	109*	888	3-110*

*Minimum order value 25 pieces

[▲] Measured parameters displayed • Measured parameters through built-in Bus

[♦]Measured parameters through IR side modules

Technical specifications	Cur	rent transformer meter M3P	RO
Communication link	S0	Modbus	M-Bus
Connection	/1-5 A	/1-5 A	/1-5 A
Certification	MID	MID	MID
Housing DIN modules (wide)	4 DU	4 DU	4 DU
Operating voltage range VAC	92276/160480	92276/160480	92276/160480
Certified voltage VAC	3x230/400	3x230/400	3x230/400
Operating frequency range Hz	4565/4565	4565	4565
Frequency Hz	50	50	50
Starting current (Ist) mA	3	3	3
Reference current (Iref) A	5	5	5
Display	LCD	LCD	LCD
Display green backlighted	✓	✓	✓
Main terminal max mm ²	6	6	6
Operating temperature °C	-10 bis +55	-10 bis +55	-10 bis +55
Burden. 1A / 5A	≤ 0,02 VA / ≤ 0,5 VA	≤ 0,02 VA / ≤ 0,5 VA	≤ 0,02 VA / ≤ 0,5 VA
Pulse output S0	2	-	-
Measuring accuracy V-A-P PF (4 quadrants) Hz Active energy (EN 50470-1-3) class B Reactive energy (EN 62053-23) class 2	± 0,5% ± 0,03% ± 0,2 B (1%) 2%	± 0,5% ± 0,03% ± 0,2 B (1%) 2%	± 0,5% ± 0,03% ± 0,2 B (1%) 2%
Voltage L1,L2,L3	A •	A • •	A • •
L1-2,L2-3,L3-1	A •	A • •	A • +
Current L1,L2,L3	A	A •	A •
N	A •	A • •	A • •
Power Factor L1,L2,L3	A +	A • •	A • •
ΣL	A •	A • •	A • •
Frequency	A +	A • •	A • •
Active Power L1,L2,L3	A +	A • •	A • •
ΣL	A +	A • •	A • •
Reactive Power L1,L2,L3	A +	A • •	A • •
ΣL	A +	A • •	A • •
Apparent Power L1,L2,L3	A +	A • •	A • •
ΣL	A •	A • •	A • •
Import Active Energy L1,L2,L3, ∑L	A •	A • •	A • •
Tariff 1, Tariff 2	A •	A • •	A • •
Export Active Energy L1,L2,L3, ΣL	A •	A • •	A • •
Tariff 1, Tariff 2	A •	A • •	A • •
Import Reactive Energy L1,L2,L3, ΣL	A •	A • •	A • •
Tariff 1, Tariff 2	A +	A • •	A • •
Export Reactive Energy L1,L2,L3, ΣL Tariff 1, Tariff 2		A • •	A • •
	A +	A • •	A • •
		A •	
	A	A •	
THD% Current L1,L2,L3 Article number	888-301	888-302	888-303
ALUVIE HUHIDEI	000-001	000-002	000-000

[▲] Measured parameters displayed • Measured parameters through built-in Bus

[♦]Measured parameters through IR side modules

Technical specificati	on			Direc	t mea	suring m	neter M	3PRO			
Communication link		5	30	N	/lodbu	s		M-Bus	3	;	S0
Connection		80	ΟA		80 A			80 A		12	25 A
Certification		N	IID		MID			MID		N	1ID
Housing DIN modul	es (wide)	4	DU		4 DU			4 DU		6	DU
Certified voltage VA	С	92276/	160480	922	76/160)480	922	76/160	0480	110276	6/190480
Nennspannung VAC	;	3x23	0/400	3x	230/4	00	3x	230/4	00	3x23	30/400
Operating frequency	/ range Hz	4565	/4565	4	1565	5		456	5	48	62
Frequency Hz		5	50		50			50			50
Starting current (Ist)	mA	1	15		15			15		:	20
Reference current (5		5			5			5
Display	,	L	CD		LCD			LCD		LC	D (8)
Display green backl	ighted		√		✓			✓			✓
Main terminal max r	-	3	35		35			35			50
Betriebstemperatur			is +55	-10) bis +	·55	-10) bis +	-55	-25 k	ois +55
Pulse output S0			2		-			-			2
Measuring accurac	CV										
V-A-P	-		0,5%		£ 0,5%			± 0,59			± 0,5%
PF (4 quadrants)			0,03%		£ 0,03	%		± 0,03	3%		± 0,03%
Hz Active energy (EN 50	470 1 2) class B		0,2 (1%)		± 0,2 3 (1%)	\		± 0,2 B (1%	.)		± 0,2 B (1%)
Reactive energy (EN		29			2%)		2%	"		2%
Voltage	L1,L2,L3	A	•	A	•	+	A	•	•		+
	L1-2,L2-3,L3-1	A	•	A	•	•	A	•	•		•
Current	L1,L2,L3	A		A	•		A	•			•
	N	A	•	A	•	+	A	•	•		
Power Factor	L1,L2,L3	A	•	A	•	+	A	•	•		•
	ΣL	A	•	A	•	+	A	•	•		•
Frequency		A	•	A	•	+	A	•	•		•
Active Power	L1,L2,L3	A	•	A	•	+	A	•	•		•
	ΣL	A	•	A	•	*	A	•	*	A	*
Reactive Power	L1,L2,L3	A	•	A	•	•	A	•	•		•
	ΣL	A	•	A	•	•	A	•	•	A	•
Apparent Power	L1,L2,L3	A	•	A	•	•	A	•	•		•
	ΣL	A	•	A	•	•	A	•	•		•
Import Active Energy	L1,L2,L3, ∑L	A	•	A	•	•	A	•	•	A	•
	Tariff 1, Tarif 2	A	•	A	•	•	A	•	•	A	•
Export Active Energy	L1,L2,L3, ∑L	A	•	A	•	•	A	•	•	A .	•
	Tariff 1, Tarif f2	A	•	A	•	*	A	•	•	A	•
Import Reactive Energ	jy L1,L2,L3, ΣL	A	•	A	•	•	A	•	•	A	•
	Tariff 1, Tariff2	A	+	A	•	+	A	•	•	A	*
Export Reactive Energ	yy L1,L2,L3, ΣL	A	+	A	•	+	A	•	*	A	•
	Tariff 1, Tariff 2	A	•	A	•	+	A	•	•	A	*
Partial Active Energ	y ΣL	A		A	•		A				
THD% Voltage	L1,L2,L3	A		A	•		A				
THD% Current	L1,L2,L3	A		A	•		A				
Article number		000	-304		88-30	_		88-30		000	-307*

*Minimum order value 25 pieces

Communication modules

Add-on communication modules and Data concentrator for M1PRO and M3PRO Energy Meters.

Among the advanced features guaranteed by ECS's portfolio of products, communications play a key role. Communication between Meters and local or remote management systems opens up a new range of opportunity for home and building automation applications. For communications ECS uses standard protocols such M-Bus, Modbus RTU, KNX and LAN-TCP/IP, which can be found either directly built into the units or as supplementary modules connected by

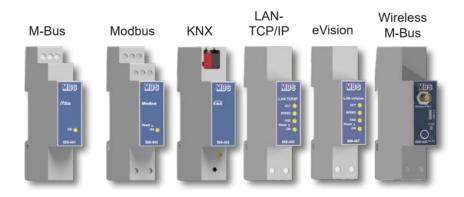
infrared ports. The main goal of communications is the opportunity to manage from remote power quality and consumption for each individual users in real time. The energy can be recorded with its date/time to analyze efficiency. The manageability through ECS's software solutions provides unlimited flexibility of use for these solutions.



Communication modules

The universal modules of communication are used to enhance the Meters with additional communication functions. The units are installed directly next to the Meter and communicate via the infrared interface equipped on the side. Supported protocols are Modbus RTU, KNX, LAN-TCP/IP and M-Bus. The communication module receives data through an infra-red interface (IrDA) - placed on its side at 9.600 baud which is coupled with the mirror interface placed on the measuring device.

These standard rail mounting modules occupy single DIN unit (18 mm) and can be powered directly by the bus or by a separate DIN power supply depending on the version.



Communication modules with infra	ared interface	Te	chnical specifica	ation	
Communication link	M-Bus	Modbus	KNX	LAN/TCP	eVision
Connection	Through side IR	Through side IR	Through side IR	Through side IR	Through side IR
According to EN 61000-6-2-3, EN 61000-4-2	√	✓	✓	√	✓
According to	EN 1434/ IEC 60950 EN 13757-1- 2-3	IEC 60950	EN 60664-1, EN 50090- 2-2	EN 60950	EN 60950
Housing DIN modules	1 DU	1 DU	1 DU	1 DU	1 DU
Suitable 1/3-phase energy, Power meters, Network analysis	√	√	✓	√	√
Power supply					
Voltage range	through bus	230V AC ± 20%	through bus	230V AC ± 20%	230V AC ± 20%
Self supplied	Yes	-	Yes	-	-
Aux. power rating	-	≤1VA	-	≤1,5Watt	≤1,5Watt
Frequency range	-	4565 Hz	-	4565 Hz	4565 Hz
Operation feature					
BUS-hardware-interface	2 screw clamps	3 screw clamps	black/red connector	RJ45	RJ45
BUS-software-protocol	acc. EN 1434	RS-485	KNX	TCP/IP	TCP/IP
BUS-Bandrate	300-9600	≤38.400	9600	≤100Mbit/s	≤100Mbit/s
Adressing	primary + secondary	1247	through ETS	IP address	IP address
User interface for setup and management	-	-	-	W3C HTML4.01	W3C HTML4.01
Infrared data exchange	Tx/Rx	Tx/Rx	Tx/Rx	Tx/Rx	Tx/Rx
Infrared-software-protocol	proprietary	proprietary	proprietary	proprietary	proprietary
Real-time clock	<u>-</u>	-	-		✓
Safety acc. to IEC 60950					
Pollution degree	2	2	2	2	2
Overvoltage category	II	II	II	II	II
Working voltage	24-36	300V AC	30V DC max.	300V AC	300V AC
Test voltage impulse 1,2/50µs peak value kV 50 Hz 1 min kV	2,5 1,35	2,5 2,5	2,5 1,35	4 4	4 4
Environmental conditions					
Operating temperature	-10 bis 55°C	-10 bis 55°C	-10 bis 55°C	-25 bis 55°C	-25 bis 55°C
Limit temperature of storage	-25 bis 70°C	-25 to 70°C	-25 bis 70°C	-25 bis 70°C	-25 bis 70°C
Relative humidity	≤ 80%	≤80%	≤80%	≤80%	≤80%
Vibrations amplitude at 50 Hz	0,25 mm	0,25 mm	0,25 mm	0,25 mm	0,25 mm
Protection class	II	II	II	II	II
Degree of protection	IP 20	IP 20	IP 20	IP 20	IP 20
Article number	888-401	888-403 Little Endian 888-404 Big Endian	888-402	888-405	888-407

Wireless M-Bus

This lateral IR communication module is suitable to be mounted next to any single and three phase Energy Meters, active and reactive, imported and exported energies under 2 Tariffs measured by the Wireless M-Bus and consequently can be recorded on a .csv file.

Overview

- The Module has 3 communication interfaces:
 - an Infrared interface, receiving data from the Meter
 - an USB 2.0 interface, used to configure and monitor the Module
 - a wireless M-Bus interface, compliant with EN 13757-4, used to transmit data using a RF band around 868 MHz
- Both USB and MBus interface are 4 kV isolated from main supply
- On the front of the module are present:
 - a receptacle for a SMA 868 MHz RF antenna
 - a micro USB connector (micro USB A or B)
 - a yellow LED that is lighted when a wireless transmission takes place
 - a green LED indicating the status of the infrared communication with the meter
 - both LED blink during a hard configuration reset
 - a miniature push-button key to reset the module parameters to their default values

RF features

- Selectable mode: S1-m or T1 (one way, TX only)
- Transmission is spontaneous, and there is no RF receptior
- Chip Rate: 32768 cps (S1-m) or 100 kcps (T1)
- Internal RF module: AMB8426-M
- Antenna: Any 868 MHz dipole Antenna



Electrical characteristics

- The device is normally powered by mains supply
- Supply Voltage: 230 VAC, 50 Hz
- Power consumption:
 - normal operation ≤ 0.5 VA,
 - during RF transmission ≤ 0.75 VA
 - alternatively, it can be fully supplied by a USB interface (normal operation ≤ 40 mA, during RF transmission ≤ 60 mA)

Communication link Wireless M-Bus Connection Through side IR According to EN 300 200, EN 301 489, EN 60950, EN 50371 ✓ Housing DIN modules 1 DU RF features acc. to EN 13757-4: 2013 Mode T1 S1-m Data rate (kcps) 100 32.768 Range up to 2000m (*) Max RF Output Power 12 dBm Power supply Voltage range 92276 VAC Aux. power rating ≤ 1,5 VA Frequency range 4565 Hz Wiring Connection VOZIDRIV PZO Solid wire min (max) section 0,15 (2,5) mm² Stranded wire min (max) section 0,15 (2,5) mm² Stranded wire min (max) section 0,15 (2,5) mm² Electric Safety VOID (2,5) mm² Pollution degree 2 Overvoltage category II Working voltage 300 V Flammability (acc. to UL 94) Klasse VO Environmental conditions VOID (2,5) is 55°C Limit temperature of storage -25°C bis 75°C <	Technical specifications		
According to EN 300 200, EN 301 489, EN 60950, EN 50371 Housing DIN modules 7	Communication link	Wireless M-Bus	
EN 301 489, EN 60950, EN 50371 Housing DIN modules RF features acc. to EN 13757-4: 2013 Mode T1 S1-m Data rate (kcps) 100 32.768 Range up to 2000m (*) Max RF Output Power 12 dBm Power supply Voltage range 92276 VAC Aux. power rating Frequency range 4565 Hz Wiring Connection Screw head Z+/- Solid wire min (max) section Stranded wire min (max) section Electric Safety Pollution degree 2 Overvoltage category II Working voltage 300 V Flammability (acc. to UL 94) Environmental conditions Operating temperature -25°C bis 55°C Limit temperature of storage Relative Humidity ≥80% Degree of Protection	Connection	Through side IR	
RF features acc. to EN 13757-4: 2013 Mode T1 S1-m Data rate (kcps) 100 32.768 Range up to 2000m (*) Max RF Output Power 12 dBm Power supply Voltage range 92276 VAC Aux. power rating ≤ 1,5 VA Frequency range 4565 Hz Wiring Connection Viring Connection Screw head Z+/- POZIDRIV PZO Solid wire min (max) section 0,15 (2,5) mm² Stranded wire min (max) section 0,15 (2,5) mm² Electric Safety Volution degree Overvoltage category II Working voltage 300 V Flammability (acc. to UL 94) Klasse V0 Environmental conditions Operating temperature Operating temperature of storage -25°C bis 75°C Limit temperature of storage -25°C bis 75°C Relative Humidity ≤80% Degree of Protection IP 20		✓	
Mode T1 S1-m Data rate (kcps) 100 32.768 Range up to 2000m (*) Max RF Output Power 12 dBm Power supply Voltage range 92276 VAC Aux. power rating ≤ 1,5 VA Frequency range 4565 Hz Wiring Connection Screw head Z+/- POZIDRIV PZO Solid wire min (max) section 0,15 (2,5) mm² Stranded wire min (max) section 0,15 (2,5) mm² Electric Safety Pollution degree 2 Overvoltage category II Working voltage 300 V Flammability (acc. to UL 94) Klasse V0 Environmental conditions Operating temperature -25°C bis 55°C Limit temperature of storage -25°C bis 75°C Relative Humidity ≤80% Degree of Protection IP 20	Housing DIN modules	1 DU	
Data rate (kcps) 100 32.768 Range up to 2000m (*) Max RF Output Power 12 dBm Power supply Voltage range 92276 VAC Aux. power rating ≤ 1,5 VA Frequency range 4565 Hz Wiring Connection Varing Connection Screw head Z+/- POZIDRIV PZO Solid wire min (max) section 0,15 (2,5) mm² Stranded wire min (max) section 0,15 (2,5) mm² Electric Safety Varing voltage Pollution degree 2 Overvoltage category II Working voltage 300 V Flammability (acc. to UL 94) Klasse V0 Environmental conditions Operating temperature Operating temperature of storage -25°C bis 55°C Limit temperature of storage -25°C bis 75°C Relative Humidity ≤80% Degree of Protection IP 20	RF features	acc. to EN 13757-4: 2	2013
Range up to 2000m (*) Max RF Output Power 12 dBm Power supply Voltage range 92276 VAC Aux. power rating ≤ 1,5 VA Frequency range 4565 Hz Wiring Connection Screw head Z+/- POZIDRIV PZO Solid wire min (max) section 0,15 (2,5) mm² Stranded wire min (max) section 0,15 (2,5) mm² Electric Safety Pollution degree 2 Overvoltage category II Working voltage 300 V Flammability (acc. to UL 94) Klasse V0 Environmental conditions Operating temperature -25°C bis 55°C Limit temperature of storage -25°C bis 75°C Relative Humidity ≤80% Degree of Protection IP 20	Mode	T1	S1-m
Max RF Output Power 12 dBm Power supply 92276 VAC Aux. power rating ≤ 1,5 VA Frequency range 4565 Hz Wiring Connection POZIDRIV PZO Screw head Z+/- POZIDRIV PZO Solid wire min (max) section 0,15 (2,5) mm² Stranded wire min (max) section 0,15 (2,5) mm² Electric Safety Pollution degree Povervoltage category II Working voltage 300 V Flammability (acc. to UL 94) Klasse V0 Environmental conditions -25°C bis 55°C Limit temperature of storage -25°C bis 75°C Relative Humidity ≤80% Degree of Protection IP 20	Data rate (kcps)	100	32.768
Power supply Voltage range 92276 VAC Aux. power rating ≤ 1,5 VA Frequency range 4565 Hz Wiring Connection POZIDRIV PZO Solid wire min (max) section 0,15 (2,5) mm² Stranded wire min (max) section 0,15 (2,5) mm² Electric Safety Pollution degree Pollution degree 2 Overvoltage category II Working voltage 300 V Flammability (acc. to UL 94) Klasse V0 Environmental conditions V Operating temperature -25°C bis 55°C Limit temperature of storage -25°C bis 75°C Relative Humidity ≤80% Degree of Protection IP 20	Range	up to 2000m (*)	
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Aux. power rating ≤ 1,5 VA Frequency range 4565 Hz Wiring Connection Screw head Z+/- POZIDRIV PZO Solid wire min (max) section 0,15 (2,5) mm² Stranded wire min (max) section 0,15 (2,5) mm² Electric Safety Pollution degree 2 Overvoltage category II Working voltage 300 V Flammability (acc. to UL 94) Klasse V0 Environmental conditions Operating temperature -25°C bis 55°C Limit temperature of storage -25°C bis 75°C Relative Humidity ≤80% Degree of Protection IP 20	Power supply		
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Working voltage 300 V Flammability (acc. to UL 94) Klasse V0 Environmental conditions Operating temperature -25°C bis 55°C Limit temperature of storage -25°C bis 75°C Relative Humidity ≤80% Degree of Protection IP 20	Pollution degree	2	
Flammability (acc. to UL 94) Environmental conditions Operating temperature -25°C bis 55°C Limit temperature of storage Relative Humidity Selform Selform Flammability (acc. to UL 94) -25°C bis 55°C -25°C bis 75°C Relative Humidity Selform IP 20	Overvoltage category	II	
Environmental conditions Operating temperature -25°C bis 55°C Limit temperature of storage -25°C bis 75°C Relative Humidity ≤80% Degree of Protection IP 20	Working voltage	300 V	
Operating temperature -25°C bis 55°C Limit temperature of storage -25°C bis 75°C Relative Humidity ≤80% Degree of Protection IP 20	Flammability (acc. to UL 94)	Klasse V0	
Limit temperature of storage -25°C bis 75°C Relative Humidity ≤80% Degree of Protection IP 20	Environmental conditions		
Relative Humidity ≤80% Degree of Protection IP 20	Operating temperature	-25°C bis 55°C	
Degree of Protection IP 20	Limit temperature of storage	-25°C bis 75°C	
<u> </u>	Relative Humidity	≤80%	
Article number 888-406	Degree of Protection	IP 20	
	Article number	888-406	





Suggested Optional Antennas



SMA 868 MHz Dipole Antenna

• Center Frequency: 868 MHz Wavelength: Half wave • Impedance: 50 Ohm • Connection: SMA • Tilt: 90 degrees • Rotation: 360 degrees



868 MHz Magnetic Mounted Antenna

Alternatively, if necessary, an external magnetic mount antenna can be used. This antenna has the same RF characteristics as the dipole antenna, but is suitable to be mounted out of the cabinet, having a 2.5 meter RF cable.

^{*} in free air, depending on antenna choice and environmental conditions.

eVision Communication module

An intelligent System with a built-in LAN Server



Home: Indication of the actual consumption and hour cost of your house or office.



Cost: Visualization of the month and day balance showed in your currency. Possibility to have the indication of generated Energy if there are solar panels or windmills.



Graph: A clear and friendly indication of your consumption flow expressed in kWh or currency for day, week, month or year with the possibility to compare in with the previous ones.



Events: display of consumption and costs per hour. Setting a defined measured value and notification via email.



Setting: Setting the tariff costs for import and

The intelligent control of energy consumption

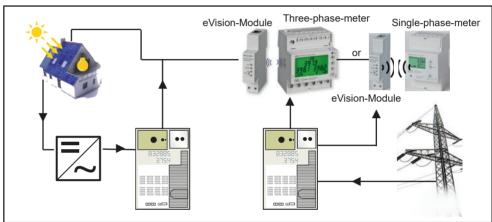
Through the collected and visualized information from the embedded WEB application of eVison Module, it is possible to optimize the use of the electric energy choosing the most convenient tariff hours in order to avoid excessive charges.

eVision Module constantly controls the energy consumption and allows for the real time visualization of the energy cost of house or office, advising with an e-mail, once the set limits are exceeded.

Because of the LAN connection, the user can consult eVision Module wherever he likes

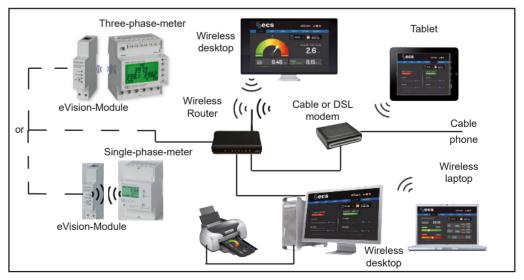
through PC, Smartphone or Tablet (*). The Internet web access allows to analyze different information, including the instant consumption shown in kWh, or monetarily. The data can be shown in a clear and simple graphic.

(* Designed for Google Chrome browser)



Example of a possible installation for import and export energies in a solar plant or in Wireless.

eVision Module allows to visualize with a simple click your actual, day, week, month and annual Energy consumption. Understand how and how much you are spending has never been so simple. This communication module is perfectly adaptable to a solar plant. It will indicate the quantity of generated and consumed Energy calculating automatically the cost or the earning of your house or office.



LAN Server - Modbus/TCP Data Concentrator

This LAN Server gathers measurement data from our Energy Meters, connected via a serial Modbus and shows the electrical values on web browser interface thanks to a Ethernet (RJ45) connection. Moreover, it can issue configuration and operation commands from a supervisor unit and store locally measured data (log) for long time period.

Overview

- •The data logger has the following characteristics
 - Modbus interface
 - TCP/IP interface supporting HTTP, SNTP, SMTP and FTP protocols
 - Connect up to 31 devices with Modbus
 - Plug-and-play and easy to use
 - Advanced web browser user interface
 - Large storage capacity (up to 2 Gigabytes) for long length logging
 - 4 DIN modules (72 mm)



The intuitive web based interface supports different lanquages and allows to:

- Select and configure every device connected via Modbus
- Show real time electrical measured value get from the Energy Meters
- View the log of electrical measured data gathered from the units and stored into the internal large mass memory
- Configure LAN server parameters (i.e. network, log data types, store frequency, etc.)

Protocol of data

- Data connection between LAN Server and PC is based on TCP/IP and HTTP protocol
- Log file can be download to user PC thanks to an internal FTP server

Date and time

 LAN Server has a built-in Real Time Clock features to keep accurate local time and date and it is capable to get synchronized using NTP network protocol

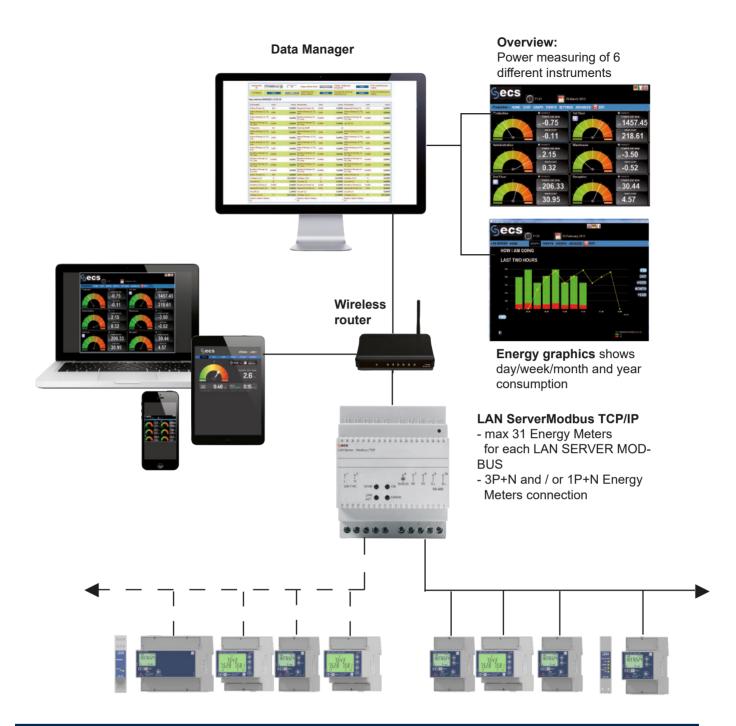
Data storage

- The data retention is guaranteed for at least 10 years thanks to an internal 2 Gbytes micro SDcard. Its large storage capability allows user to collect large amount of a log data.
- For example it can store data coming from 5 energy meters every minute and keep working for 2 years before the memory becomes full



Type LAN Server Modbus/TCP * Description Data concentrator Modbus/TCP According to IEE 802.3 AS IEC 60950, EN 61000-6-2 EN 61000-4-2, EN 60950 Housing DIN modules 4 DU Voltage range 230 VAC ± 20% Aux. power rating ≤ 10 VA Frequency range 4565 Hz Memory storage 2 Gigabyte intern LAN hardware interface RJ 45 LAN software protocol TCP/IP LAN Bandrate 10/100 Mbits/s Application level protocols HTTP-FTP Modbus TCP Interface of instruments RS-485 Hardware interface 3 Klemmen Software protocol Modbus RTU und ASCII Directly connected instruments 31 Pollution degree 2 Overvoltage category II Working voltage300 VAC Test voltage impulse (1,2/50чs) peak value kV 50 Hz 1 min kV 4 Operating temperature -10 bis 55°C Limit temperature of storage .25 bis 70°C Relative humidity ≤ 80 % Vibrations amplitude at 50 Hz ± 0,25 mm Protection class II Degree of protection IP 20 Article number 888-501	66668	3333
Description Data concentrator Modbus/TCP According to IEE 802.3 AS IEC 60950, EN 61000-6-2 EN 61000-4-2, EN 60950 Housing DIN modules 4 DU Voltage range 230 VAC ± 20% Aux. power rating Frequency range 4565 Hz Memory storage 2 Gigabyte intern LAN hardware interface LAN software protocol LAN Bandrate 10/100 Mbits/s Application level protocols HTTP-FTP Modbus TCP Interface of instruments RS-485 Hardware interface 3 Klemmen Software protocol Directly connected instruments 31 Pollution degree 2 Overvoltage category II Working voltage III Uperating temperature -10 bis 55°C Limit temperature of storage RS-25 mm Protection class II Degree of protection IP 20	Techniical specifications	
According to IEE 802.3 AS IEC 60950, EN 61000-6-2 EN 61000-4-2, EN 60950 Housing DIN modules 4 DU Voltage range 230 VAC ± 20% Aux. power rating Frequency range 4565 Hz Memory storage LAN hardware interface LAN software protocol LAN Bandrate Application level protocols HTTP-FTP Modbus TCP Interface of instruments RS-485 Hardware interface 3 Klemmen Software protocol Directly connected instruments 10/100 Mbits/s HTTP-FTP Modbus TCP Interface of instruments RS-485 Hardware interface 3 Klemmen Software protocol Modbus RTU und ASCII Directly connected instruments 31 Pollution degree 2 Overvoltage category II Working voltage Test voltage impulse (1,2/50чs) peak value kV 50 Hz 1 min kV 4 Operating temperature -10 bis 55°C Limit temperature of storage Relative humidity ≤ 80 % Vibrations amplitude at 50 Hz Protection class II Degree of protection IP 20	Туре	LAN Server Modbus/TCP *
IEC 60950, EN 61000-6-2 EN 61000-4-2, EN 60950 Housing DIN modules Voltage range 230 VAC ± 20% Aux. power rating Frequency range 4565 Hz Memory storage 2 Gigabyte intern LAN hardware interface LAN software protocol LAN Bandrate 10/100 Mbits/s Application level protocols Interface of instruments RS-485 Hardware interface 3 Klemmen Software protocol Modbus RTU und ASCII Directly connected instruments 31 Pollution degree 2 Overvoltage category Working voltage (1,2/50чs) peak value kV 50 Hz 1 min kV 4 Operating temperature Limit temperature of storage Relative humidity Vibrations amplitude at 50 Hz Protection class II Degree of protection IP 20	Description	
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Memory storage2 Gigabyte internLAN hardware interfaceRJ 45LAN software protocolTCP/IPLAN Bandrate10/100 Mbits/sApplication level protocolsHTTP-FTP Modbus TCPInterface of instrumentsRS-485Hardware interface3 KlemmenSoftware protocolModbus RTU und ASCIIDirectly connected instruments31Pollution degree2Overvoltage categoryIIWorking voltage300 VACTest voltage impulse (1,2/50чs) peak value kV 50 Hz 1 min kV4Operating temperature-10 bis 55°CLimit temperature of storage-25 bis 70°CRelative humidity≤ 80 %Vibrations amplitude at 50 Hz± 0,25 mmProtection classIIDegree of protectionIP 20	Aux. power rating	≤ 10 VA
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LAN software protocol LAN Bandrate Application level protocols Interface of instruments RS-485 Hardware interface Software protocol Directly connected instruments Pollution degree Overvoltage category Working voltage Test voltage impulse (1,2/50чs) peak value kV 50 Hz 1 min kV Operating temperature RS-485 HTTP-FTP Modbus TCP Modbus RTU und ASCII Modbus RTU und ASCII II Und ASCII II Vorking voltage 11 Vorking voltage 12 Overvoltage category II Vorking voltage (1,2/50чs) peak value kV 50 Hz 1 min kV A Operating temperature -10 bis 55°C Limit temperature of storage Relative humidity ✓ 80 % Vibrations amplitude at 50 Hz Protection class II Degree of protection IP 20	Memory storage	2 Gigabyte intern
LAN Bandrate Application level protocols Interface of instruments RS-485 Hardware interface Software protocol Directly connected instruments Pollution degree Overvoltage category Working voltage Test voltage impulse (1,2/50чs) peak value kV 50 Hz 1 min kV Operating temperature Limit temperature of storage Pollution class Il Degree of protection Invited Modbus RTU und ASCII Modbus RTU und ASCII III Modbus RTU und ASCII III Ascillation ASCII Ascillation ASCII III III III IIII IIIIIIIIIIII	LAN hardware interface	RJ 45
Application level protocols Interface of instruments RS-485 Hardware interface Software protocol Directly connected instruments Pollution degree Overvoltage category Working voltage (1,2/50чs) peak value kV 50 Hz 1 min kV Operating temperature Limit temperature of storage Pollution degree -10 bis 55°C Limit temperature of storage Relative humidity Vibrations amplitude at 50 Hz Pogree of protection HTTP-FTP Modbus TCP RS-485 3 Klemmen 3 Klemmen 3 1 2 Wodbus RTU und ASCII 11 2 4 2 Overvoltage category II Vibration storage -10 bis 55°C -25 bis 70°C Relative humidity ✓ 80 % Vibrations amplitude at 50 Hz Protection class II Degree of protection IP 20	LAN software protocol	TCP/IP
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Hardware interface 3 Klemmen Software protocol Modbus RTU und ASCII Directly connected instruments 31 Pollution degree 2 Overvoltage category II Working voltage300 VAC Test voltage impulse (1,2/50чs) peak value kV 50 Hz 1 min kV 4 Operating temperature -10 bis 55°C Limit temperature of storage -25 bis 70°C Relative humidity ≤ 80 % Vibrations amplitude at 50 Hz ± 0,25 mm Protection class II Degree of protection IP 20	Application level protocols	HTTP-FTP Modbus TCP
Software protocol Directly connected instruments Pollution degree Overvoltage category Working voltage Test voltage impulse (1,2/50чs) peak value kV 50 Hz 1 min kV Operating temperature Limit temperature of storage Relative humidity Vibrations amplitude at 50 Hz Pegree of protection Modbus RTU und ASCII Modbus RTU und ASCII 11 4 2 2 Overvoltage impulse300 VAC 4 4 4 4 Characteristics 11 12 13 14 15 15 16 17 18 18 18 18 18 18 18 18 18	Interface of instruments	RS-485
Directly connected instruments 31 Pollution degree 2 Overvoltage category II Working voltage300 VAC Test voltage impulse (1,2/50чs) peak value kV 50 Hz 1 min kV 4 Operating temperature -10 bis 55°C Limit temperature of storage -25 bis 70°C Relative humidity ≤ 80 % Vibrations amplitude at 50 Hz ± 0,25 mm Protection class II Degree of protection IP 20	Hardware interface	3 Klemmen
instruments Pollution degree 2 Overvoltage category II Working voltage 300 VAC Test voltage impulse (1,2/50чs) peak value kV 50 Hz 1 min kV 4 Operating temperature -10 bis 55°C Limit temperature of storage Relative humidity Vibrations amplitude at 50 Hz Protection class II Degree of protection IS II II II II II II II II I	Software protocol	Modbus RTU und ASCII
Overvoltage category Working voltage 300 VAC Test voltage impulse (1,2/50чs) peak value kV 50 Hz 1 min kV 4 Operating temperature -10 bis 55°C Limit temperature of storage -25 bis 70°C Relative humidity ≤ 80 % Vibrations amplitude at 50 Hz Protection class II Degree of protection IP 20		31
Working voltage300 VAC Test voltage impulse (1,2/50чs) peak value kV 4 50 Hz 1 min kV 4 Operating temperature -10 bis 55°C Limit temperature of storage -25 bis 70°C Relative humidity ≤ 80 % Vibrations amplitude at 50 Hz ± 0,25 mm Protection class II Degree of protection IP 20	Pollution degree	2
Test voltage impulse (1,2/50 $ ext{vs}$) peak value kV 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Overvoltage category	II
(1,2/504s) peak value kV 50 Hz 1 min kV 4 Operating temperature -10 bis 55°C Limit temperature of storage -25 bis 70°C Relative humidity ≤ 80 % Vibrations amplitude at 50 Hz Protection class II Degree of protection IP 20	Working voltage	300 VAC
Limit temperature of storage -25 bis 70°C Relative humidity ≤ 80 % Vibrations amplitude at 50 Hz ± 0,25 mm Protection class II Degree of protection IP 20	(1,2/50чs) peak value kV	·
Relative humidity ≤ 80 % Vibrations amplitude at 50 Hz ± 0,25 mm Protection class II Degree of protection IP 20	Operating temperature	-10 bis 55°C
Vibrations amplitude at 50 Hz	Limit temperature of storage	-25 bis 70°C
Protection class II Degree of protection IP 20	Relative humidity	≤ 80 %
Degree of protection IP 20	Vibrations amplitude at 50 Hz	± 0,25 mm
	Protection class	II
Article number 888-501	Degree of protection	IP 20
,	Article number	888-501

^{*} Minimum order quantity 15 pieces



Remote read-out with a PC and central data logging on a LAN Server



Equipment Front panel mounting frame

Article number	Description
59501	ER Frontm installation kit, 6 DU Hinged window KF self-closing, transparent, IP44 with touch protection and Mounting bracket
59502	KF Hinged window, 2 DU
59503	KF, Hinged window, 4 DU
59507	KF Hinged window, 5 DU
59504	KF Hinged window, 6 DU
59505	KF Hinged window, 8 DU
59506	Lock set for KF, upgradeable





- Current transformers for industry
- Current transformers for tariffs
- Accessories for current transformers
- Medium-voltage transformers
- Bus bar insulators / -supports
- Shunts
- Voltage transformers
- All current sensors
- Measuring transducers
- Energy meters with or without MID approval
- Accessories for energy meters
- Panel board heaters, filter fans, roof fans and control units



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