

Energy Meters

We make Energy measurable and secure your future





www.g-mw.de





10 Reasons for GMW 🗸

- Customer-Specific solutions
- Individual consultation and support
- Satisfied customers in all continents
- Wide range of products
- Multiple of international licences and certificates
- 🖌 Supreme technical quality
- Excellent service
- Reliability
- 🖌 Fast deliveries
- Experience since 1950

Gilgen, Müller & Weigert (GMW) GmbH & Co. KG

Am Farrnbach 4A · 90556 Cadolzburg Germany



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On the next pages you will find energy meters, data loggers and software made by the Swiss company EMU AG in Baar.

The goods are developed and produced 100% in Switzerland.

We hereby guarantee short distances and advanced technology with MID certification.

The energy meters "Allrounder" and "Professional" are setting new standards in the complexity of data collection in the scope of DIN rail energy meters. A multiplicity of measurement data can be transferred by a multiple of readout interfaces. The instruments offer the highest standard of flexibility.

- Transformer connection 1A and 5A
- Direct connection up to 75A
- On site adjustable: transformer ratio, impulse rate, impulse time
- Width of instrument 5 TE (90mm)
- Low own consumption

You also can profit from the excellent quality "Made in Switzerland".

Quality is connected!



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GMW "Allrounder"

3-phase energy meter

Features / Benefits

- Direct connection up to 75 A or current transformer connection for x/1A and x/5 A (up to 4000/1 A and 20000/5 A)
- Accuracy class B according to EN 50470-1 (MID)
- Accuracy class 1 according to EN 62053-21
- MID approval module B and D for tariff applications
- Usable for tariff applications
- S0 output impulse
- Multiple tariff
- Optional M-Bus read-out interface

Application

Electronic energy meter for the recording of the electric active energy in AC current supply systems. The energy meters are used in the industry, panel board manufacturing, trade and also by private users.

With the S0 output impulse the processing of the measured energy data is guaranteed. I.e. cost center accounting, central building control system and energy management.

Technical Parameters:					
Measurement input					
Rated input voltage U _N :	3 x 230/400 V AC (voltage range: ± 20 %)				
Measurement range (direct connection):	0.012 75 A				
Measurement range (current transformer connection):	1 and 5 A, transformer ratio adjustable				
Starting current (direct connection):	9 mA				
Starting current (current transformer connection):	1 mA				
Nominal frequency f _N :	50 Hz (frequency range: 45 65 Hz)				
Own consumption:	< 0.8 W / phase				
Tariff changeover	230 V AC				
S0-interface according to EN 62053-31					
Pulse width (direct connection):	40 ms (factory set)				
Pulse width (current transformer connection):	120 ms (factory set)				
Impulse value (direct connection):	1000 pulses per kWh (factory set)				
Impulse factor (current transformer connection):	10 pulses per kWh (factory set)				
	Impulse rate and impulse width individually adjustable on meter				
Minimum voltage:	5 V DC				
Maximum voltage:	600 V AC				
Current:	max. 90 mA				
Display					
LCD display:	Dimension 60 x 30 mm, 8-digit, one decimal digit (0000000.0 kWh)				
Further display:	active tariff, rotating field display, energy direction, real power				
Read-out interface					
Optional read-out interface:	M-Bus				

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Further informations	
Accuracy class:	B (according to EN 50470-1, MID)
Protection fuse (direct connection):	max. 75 A
Protection fuse (current transformer connection):	max. 6 A
Protection class:	I
Protection degree:	IP 20
Weight:	330 g
Mounting:	DIN rail according to EN 60715
Ambient temperature:	- 25 °C + 55 °C
Connection of tariff changeover:	2,5 x 3 mm
Connection S0 impulse:	2,5 x 3 mm
Connection measurement input:	7 x 8 mm

Order list							
Order-no.	So Output impulse	Wi-Bus Interface	LCD display	Current range			
10EMA4176-4	•		•	75 A			
10EMA4776-4	•	•	•	75 A			
10EMA4177-2	•		•	1 A and 5 A			
10EMA4777-2	•	•	•	1 A and 5 A			

Display data:

	Total 3-phases	Per phase	Per tariff
Active energy import (kWh)	•		•
Active energy import (kWh) resettable	•		•
Active power (kW)	•	•	
Current (A)	•	•	
Voltage (V) L-N		•	
Number of power outages	•		

Interface reports are available on our website.

Dimensions and connection drawings see page 16

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GMW "Professional"

3-phases energy meter

Features / Benefits

- direct connection up to 75 A or current transformer for x/1 A and x/5 A (up to 4000/1 A and 20000/5 A)
- accuracy class B according to EN 50470-1 (MID)
- accuracy class 1 according to EN 62053-21
- MID approval module B and D for tariff applications

Technical Parameters:

- applicable to billing
- 4 S0 output impulses
- multiple tariff
- optional read-out interfaces: M-Bus, KNX, TCP/IP, LON or MODBUS RTU-ASCII

Application

Electronic energy meter for the recording of the electric active energy in AC current supply systems. The energy meters are used in the industry, panel board manufacturing, trade and also by private users.

With the S0 output impulse the processing of the measured energy data is guaranteed. I.e. cost center accounting, central building control system and energy management.

Measurement input	
Rated input voltage U _N :	3 x 230/400 V AC (voltage range: ± 20 %)
Measurement range(direct connection):	0.012 75 A
Measurement range (current transformerconnection):	1 and 5 A, transformer ratio adjustable
Starting current (direct connection):	9 mA
Starting current (current transformer connection):	1 mA
Nominal frequency f _N :	50 Hz (frequency range: 45 65 Hz)
Own consumption:	< 0.8 W / phase
Tariff changeover:	230 V AC
S0-interface according to EN 62053-31	
Pulse width (direct connection:	40 ms (factory set)
Pulse width (current transformer connection):	120 ms (factory set)
Pulse value (direct connection):	1000 pulses per kWh (factory set)
Pulse value (current transformer connection):	10 pulses per kWh (factory set)
	Impulse rate and Impulse width individually adjustable on meter
Minimum voltage:	5 V DC or 5 V AC
Maximum voltage:	600 V AC
Current:	max. 90 mA
Display	
LCD display:	Dimension 60 x 30 mm, 8-digits, one decimal digit (0000000.0 kWh)
Further display data:	active tariff, rotating field display, energy direction, real power
Read-out interface	
Optional read-out interfaces:	M-Bus, KNX, TCP/IP, LON, MODBUS RTU-ASCII
Further informations	
Accuracy class:	B (according to EN 50470-1, MID)
Protection fuse (direct connection):	max. 75 A
Protection fuse (current transformer connection):	max. 6 A
Protection class:	

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IP 20

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Protection degree:



Weight:	330 g
Mounting:	DIN rail according to EN 60715
Ambient temperature:	- 25 °C + 55 °C
Connection tariff changeover:	2,5 x 3 mm
Connection S0 impulse:	2,5 x 3 mm
Connection measurement input:	7 x 8 mm

Order list S0 MODBUS Order-no. M-Bus KNX TCP/IP LON LCD Display impulse-**Current range RTU-ASCII** output 10EMP4176-4 75 A 4x • 10EMP4776-4 4x 75 A • . 10EMP4576-4 75 A 4x • • 10EMP4676-4 4x 75 A • • 10EMP4076-4 75 A 4x • • 10EMP4276-4 75 A 4x • • 10EMP4177-2 4x 1 A and 5 A • 10EMP4777-2 1 A and 5 A 4x • • 10EMP4577-2 4x 1 A and 5 A • • 10EMP4677-2 1 A and 5 A 4x • • 1 A and 5 A 10EMP4077-2 4x • • 10EMP4277-2 4x • • 1 A and 5 A

Output impulse can also be used as a switch contact!

Display data:

	Total 3-phases	Per phase	Min. measurement value	Max. measurement value	Per tariff
Active energy import (kWh)	•	•			•
Active energy export (kWh)	•				•
Reactive power inductive (kvarh)	•	•			•
Reactive power capacitive (kvarh)	•				•
Active power (kW)	•	•	•	•	
Reactive power (kvar)	•	•			
Apparent power (kVA)	•	•			
Current (A)	•	•	•	•	
Voltage (V) L-N		•	•	•	
Voltage (V) L-L		•			
Power supply factor (cos phi)		•			
System frequency (Hz)	•				
Number of voltage outages	•				
ongoing x min. maximum (kW)*					•
x min. maximum of active power					•
date / time	•				

* measurement period 1, 5, 15, 30 or 60 minutes

Interface reports are available on our website.

Dimensions and connection drawings see pages 17 and 18

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Technical details

of GMW "Allrounder" and GMW "Professional"

Operating & Display

A 60x30 mm graphic LC-Display with a LED background lighting makes it possible for parameters and settings to be read, and the figures are excellently visible.

The desired menu language can be chosen by keys.

The clear and easy operating simplify the start-up and also the daily use of the energy meters.



MID-Approval B + D

The GMW "Allrounder" and GMW "Professional" are tested and approved according to the MID-modules B + D (Measurement Instrument Directive). With additional certification according to module D, QM-system for the production and final test, GMW "Professional" and GMW "Allrounder" can be used ex factory for tariff applications within the European Union.

Calibration and Load LED

The front of the GMW "Professional" and the GMW "Allrounder" display two red calibration- and load-LEDs. They blink dependant on the instantaneous active and reactive power. The impulse valence is 10 pulses per Wh/varh.

Adjustable current transformer factor

The current transformer ratio can be set by the use of keys at GMW "Professional" and also at GMW "Allrounder" with MID-approval from 5/5 A up to 20.000/5 A or from 1/1A up to 4.000/1A. The set-up button can be sealed and prevents manipulations. The GMW-Team will gladly give you advice to prevent from a S0-continuous impulse.

Accuracy in photovoltaic installations



GMW "Professional" and GMW "Allrounder" were tested specifically for the application with inverters in solar power installations. This additional inspection guarantees that GMW energy meters will provide an exact measurement result within the not officially regulated frequency range between 2 kHz and 150 kHz.

Renowned specialist journals highlight this problem, that measurement errors up to a rate of 18% can occur.

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Peak Control

by S0 Output impulse

A power supplier desires plannable and consistent energy consumption. In order to cover short-term peak demand, power tarrifs have been introduced.

These are based on the highest monthly quarter-hour active energy peak value. These peak values relate to severely increased energy costs for hotels, hospitals and industry.

At this point the MBS Professional comes into its own and reduces the power of selected consumers. The peak values are optimised immediately and the energy costs are decreased.

Functional principle

The S0-outputs (Opto Power MOSFET 5–600V AC or V DC, 90 mA) can be used as switch contacts. If a specific threshold value is exceeded for a set time, the switch contact is activated for a specific time.



Application

- Reduction of energy costs by avoiding active power peaks
- Alerts upon impending overload, maximum-alert
- energy direction contact
- prevents overloads and interruptions in production process
- photovoltaic facilities, industry, hotels, hospitals, energy intensive consumers

S0 Output impulses

The 4 S0 output impulses of GMW "Professional" can be used as switches when they are connected with the TCP/IP-module, in order to switch a relay on or off. With this output impulse you can activate for example the heating in your holiday home.

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M-Bus Interface and MB-Connect Software

The M-Bus interface according to EN13757-2, -3 (former EN1434-3) is integrated in the energy meter and protected against pollution and tampering.

Read-out data and configuration

On the M-Bus a variety of read-out data are at your disposal; i.e. active and reactive energy, current, voltage, form factor and net frequency.

When using the control keys on the energy meter the primary and secondary addresses as well as the baud rate can be set-up.

The read-out data can be parameterised with our free MB-Connect software. So you can compile your individual M-Bus protocol.

The M-Bus load of the GMW "Allrounder" and the GMW "Professional" amounts to 1.5 mA which is a standard load.



MB-Connect Software

For the configuration of the energy meters with M-Bus interface our free MB-Connect software is at your disposal on our website. All energy meters with M-Bus interfaces, according to EN13757, can be configured and read-out by the use of the MB-Connect software.

The read-out can be done manually or periodically in an adjustable interval.

The read-out data can be exported in a CSV-file (comma-separated values) and for example be edited in Excel.

Do you request special read-out data for your project?

No problem. Compile a M-Bus parameter set with MB-connect software and note it on your order.

We parameterise the requested read-out data for you during the production process.

Functions

- Controlling of a M-Bus installation
- Addressing energy meters
- Setting-up of individual read-out data
- Changing of the baud rate
- Analysis of the response times
- Automatic read-out of the meters
- Export of the read-out data to a CSV file
- Switching on/off S0-outputs

	(Suchen Auslesung Logger
	Name	Primär Adresse	Sekundär Adresse	Hersteller	Medium	Baudrate	
1	Zähler (00019362)	1	00019362	EMU	Elektrizität	2400	Suche nach Primär Adresse
1	Zähler (00019224)	2	00019224	EMU	Elektrizität	2400	
1	Záhler (00020885)	3	00020885	EMU	Elektrizität	2400	Suche nach Sekundär Adresse
1	Zähler (00018955)	4	00018965	EMU	Elektrizität	2400	
Ne	r Daten						Aktionen
							Zähler auslesen
					U		© Prinse <u>k</u> © Sekundar 00015902 <u>s</u> Senden
	ramme						

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ctive	Energy (-	-)			
	Total	Tartf 1	Tar/fl 2	Tariff 3	Tarifi 4
fotal	14.899 XWh	14.899 kWh	0.000 kWh	0.000 kWh	0.000 kWh
.1	0.000 kWh	0.000 kWh	0.000 kWh	0.000 kWh	0.000 kWh
2	0.000 kWh	0.000 kWh	0.000 kWb	0.000 kWh	0.000 kWh
2	0.000 kWh	0,000 kWh	0.000 kWh	0.000 kWh	0.000 kWh
eact	ive Energy	(+)			
	Total	Tanti 1	Tariff 2	Tariff 3	Taciff 4
fotal	0.000 kvarh	0.000 kvam	0.000 kvarh	0.000 kvarh	0.000 kvarti
1	0.000 kvarti	0.000 kvam	0.000 kvarts	0.000 kvarh	0.000 kvam
2	0.000 kvarts	0.000 kviarth	0.000 kvarh	0.000 kvarh	0.000 kvarh
3	0.000 kvarti	0.000 kvarth	0.000 kvarh	0.000 kvarh	0.000 kvarh
a ppar	0.000 kvam rent Energy Total	0.000 keem y (+) Tariil 1	0.000 kvarti	0.000 kvarh	0.000 kvarti
.a .ppar	0.000 kvarh rent Energy Total	0.000 kvath y (+) Tatil 1 15.312 kVAh	0.000 kvarti Tarifi 2 0.000 kVAb	0.000 kvarh Tariff 3 0.000 kVAh	0.000 kvam Taritt 4
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a ppar rossi rossi rossi	0.000 kvam rent Energy Total 15.312 kVAh ive Energy Total 0.000 kvam e Power Actual	0.000 kvath y (+) Tarrif 1 15.312 kVAh (-) Tarrif 1 0.000 kvath Min	0.000 kvam Tariff 2 0.000 kVAh Tariff 2 0.000 kvam	0.000 kvath Tariff 3 0.000 kVAh Tariff 3 0.000 kvath	0.000 kvam Tariff 4 0.000 kvAn Tariff 4 0.000 kvam
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3 ppar fotal fotal cotive	0.000 keem rent Energy Total 15.312 kVAh Ver Energy Total 0.000 keem Actual 0.001 kW 0.001 kW	0.000 knam Tavili 1 15.312 kVAh (-) Tavili 1 0.000 knam Mm .33315 .33315	0.000 kvam Tarifi 2 0.000 kvAh Tarifi 2 0.000 kvAh 0.000 kvAh 0.000 kvAh	0.000 kwath Teriff 3 0.000 kVAh Tariff 3 0.000 kwath 0.000 kwath 3.3315.000 3.3315.000	0.000 kvam Tariff 4 0.000 kvam Tariff 4 0.000 kvam
3 ppar fotal cotive fotal fotal fotal fotal	0.000 kvam rent Energy Total 15.312 kVAh Ve Energy Total 0.000 kvam Actual 0.01 kva 0.020 kW 0.020 kW	0.000 isosifi y (+) Terrifi 1 15.312 kVAh Tacrifi 1 0.000 knam Min 30315 30315 30315	0.000 kvam Tanti 2 0.000 kVAb Tanti 2 0.000 kvam 0.000 kva 0.000 kva 0.0000 kva 0.0000 kva 0.000 kva 0.000 kva 0.000 kva 0.000 kva	0.000 kwarh Teriff 3 0.000 kWAh Tariff 3 0.000 kwarh 3.0000 kwarh 3.000 kwarh 3.000 kwarh 3.000 kwarh 3.000 kwarh	0.000 kvam Tariff 4 0.000 kvam Tariff 4 0.000 kvam
a ppar fotal fotal fotal fotal 1 2 2 4	0.000 kvam rent Energy Total 15.312 kVAn the Energy Total 0.000 kvam 6 Power Actual 0.001 kW 0.000 kVW 0.000 kVW	0.000 isoath Y (+) Teriff 1 15.312 KVA1 (-) Tariff 1 0.000 isoath Min 33315 33315 33315 33315	0.000 kvami Tanti 2 0.000 kvAb 0.000 kvam 0.000 kva 0.000 kva 0.000 kva 0.000 kva	0.000 kwarh Teriff 3 0.000 KVAh 0.000 kwarh 0.000 kwarh 33315 000 33315 000 33315 000	0.000 kraiti Tariff 4 0.000 kraiti Tariff 4 0.000 kraiti XWV XWV

TCP/IP-module

of the energy meter GMW "Professional"

Features / Benefits

- Good value for money
- Easy and comfortable access via web browser
- Continuous monitoring and analysis of the measurement data
- Easy installation

With the TCP/IP-module different measurement values and a load profile can be analysed via a web browser and IP-address in a LAN or WAN.

The module logs measurement values into a configurable interval and exports them to a CSV-file (Comma-Separated Values).

The integrated alarm system will reliably warn you by E-Mail (or E-Mail to SMS Gateway) if a defined measurement value has exceeded or fallen below .

The SO output impulses (Opto Power MOSFET, 600 V AC or V DC, 90 mA) can be converted to a switch and can for example control a relay in order to activate the heating in the holiday home.

Functions

- Display of the current measurement values
- Display of a graphic load profile
- Logging of various measurement values
- Display of minimum and maximum values
- Alerts by E-Mail if measurement values have exceeded or fallen below
- Turning on/off of SO output impulses
- Access protection with password
- Remote read-out via Modbus TCP and BACnet IP

Integrated alarming system

An alarming system reliably warns you about the energy consumption in your company, even when travelling. If a defined measurement value has exceeded you receive a message via E-Mail or SMS. For example you are warned, if the current input of the heating falls below a defined value.

Monsissionen Larbproß Rondgranderen Datenslegger 3 Distanlegger 4 Eliptet	
Wirkenergie Bezng Total Alle Tarife 246 Start Datum Automatisch	
8.413	
7.859-	X
6.750	\wedge
8.198-	12
§ 5.642- 5.008-	
4.534-	
3.979-	
2871 220120120853 220120120120120120120053	23.01.2012.08.53
	62
The network Leddenberg, Technologuemer (2001) 1429 22 Juli 12 08:23:36 Permissis Network Zabler, 0.1 Module, 0.8	emu

Data logger

The TCP/IP-module stores four configurable measurement values in intervals of 10 seconds, 5, 15, 30 or 60 minutes.

In the TCP/IP-module can be stored up to 245'000 values. The complete values are recorded and remain stored, even if the GMW "Professional" is not connected to the LAN network.

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S0 Impulse-Logger

Features / benefits

- Good value for money
- Easy and comfortable access via web browser
- Continuous monitoring and analysis of the measurement data
- Easy installation
- System is suitable to independent suppliers
- Connection of up to 9 energy meters and two terminal devices

Application

A useful building management system is only possible, if all appropriate consumption values are recorded continuously.

With the S0-Impulse-Logger this is possible in a very easy way.

The Impulse-Logger utilizes the S0-Impulse interface of water meters, heat meters, energy meters, gas meters.

Additionally it is possible to monitor the outdoor and indoor temperatures.

All you need is a notebook (PC) with a RJ45 (LAN) connection and an installed web browser (Internet Explorer, Mozilla Firefox etc.)

Technical parameters:

Interfaces	
S0 impulse input:	9x
Temperature input	2x
Read-out connection:	RJ45 (LAN)
Data	
Analysis:	Via web browser and IP-address (Fix IP or DynDns for remote access)
Log-interval:	10 seconds, 1, 5, 15, 30 and 60 minutes
Storage:	2 GB micro SD card, removable card 8 million log-records (all entries assigned: 20 years)
Data export:	Via website in a CSV-file
Data protection in voltage outage:	Yes (micro SD card)
Voltage supply	
S0 impulse-Logger:	230 V AC
S0 impulse output of the meters:	The S0 impulse-Logger generates 13 V DC
Further informations	
Protection class:	IP 20
Mounting:	DIN rail according to EN 60715

Order list			
Order-no.	Description		
10EMI6	S0 impulse-Logger with 9 S0 impulse entries and 2 temperature entries		
10EMT	Temperature sensor for S0 impulse-Logger (- 55 °C + 155 °C)		

Dimensions and connection drawings see page 19

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M-Bus-Logger

Features / Benefits

- Good value for money
- Easy and comfortable access by web browser
- Continuous monitoring and analysis of the measurement data
- Easy installation
- System is suitable to independent suppliers
- Connection plugs for up to 60 M-Bus terminal devices

Application

A useful building control management system is only possible, if all appropriate consumption values are recorded continuously. This can easily be done by the M-Bus-Logger.

The M-Bus-Logger utilizes the M-Bus-interface of water meters, heat meters, energy meters and gas meters.

All you need is a notebook (PC) with a RJ45 (LAN) connection and an installed web browser (Internet Explorer, Mozilla Firefox etc.) With aforementioned you have access to the records of the requested measurement data inclusive of the profile of the load on the website of the energy meter (access by IPaddress of the energy meter).

Due to the integrated webserver you don't need a special read-out software and you can access the records of the data from any PC, notebook, tablet PC or smartphone.

Technical Parameters:	
Interfaces	
M-Bus input:	60x
Read-out connection:	RJ45 (LAN)
Data	
Analysis:	By Web browser and IP-address (Fix IP or DynDns for remote access)
Log-interval:	10 seconds, 1, 5, 15, 30 and 60 minutes, 6, 12, 24 hours
Store:	2 GB Micro SD card, removable approximately 5 million meter read-outs / M-Bus telegrams
Data export:	by website in CSV-file
Data protection at voltage outage	Yes (Micro SD card)
Voltage supply	
M-Bus -Logger:	100 - 240 V AC
Further informations	
Protection class:	IP 20
Mounting:	DIN rail according to EN 60715
	Order list

Article no.	Description
10LM620000	M-Bus-Logger 60 TCP/IP (webserver, FTP upload) for the connection of up to 60 terminal devices

Dimensions and connection drawings see page 19

Gilgen, Müller & Weigert (GMW) GmbH & Co. KG

Am Farrnbach 4A · 90556 Cadolzburg Germany



GMW Bill & Report

The GMW Bill & Report software is easy to use and produces customized billings and reports by a touch of a button. The consumption values are read-out and processed by the GMW M-Bus-Logger

Functions

ter 0459111-

- Administration of all energy meters which are connected to a GMW M-Bus-Logger
- Display of all measurement values of an energy meter
- Load profile of all energy values, bar chart
- Display of a virtual meter, sum of other meters
- Compiling of a consumption overview for each meter, starting and end time freely selectable
- Allocating of meters and virtual meters to cost centers
- Billing for cost centers, period freely selectable
- No online mode (24h) necessary, measurement values are read-out by the GMW M-Bus-Logger, software has not to be non-stop operating.
- Individual reports, design and bills, invoiced at cost by GMW.



Order list

Article no	Description
Article IIO.	Description
10SW1M000020	Bill & Report Software 20 – for 20 energy meter
10SW1M000060	Bill & Report Software 60 – for 60 energy meter
10SW1M000120	Bill & Report Software 120 – for 120 energy meter
10SW1M000180	Bill & Report Software 180 – for 180 energy meter
10SW1M000240	Bill & Report Software 240 – for 240 energy meter
10SW1M000300	Bill & Report Software 300 – for 300 energy meter
10SW1M000400	Bill & Report Software 400 – for 400 energy meter
10SW1M000500	Bill & Report Software 500 – for 500 energy meter

Gilgen, Müller & Weigert (GMW) GmbH & Co. KG

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GMW "Allrounder"

Direct connection and current transformer connection



Gilgen, Müller & Weigert (GMW) GmbH & Co. KG

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GMW "Professional"

Direct connection



Gilgen, Müller & Weigert (GMW) GmbH & Co. KG

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GMW "Professional"

Current transformer connection



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Data Logger



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A 11 10 50 Jan m.	Analogue Panel Meters
5.70 · 767 8.57 ·	Digital Panel Meters
	Energy Meters for Industry and Tariff
	Current-and Voltage Transformers
	Measuring Transducers
	Thermal Printers, Text Displays, Probes
	Switchboard - Components

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