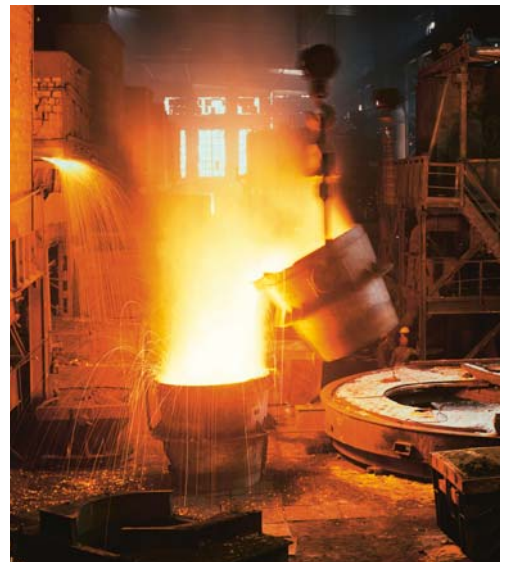


- System state monitoring: class 0.2
- All-purpose: V/I, P/Q/S, f, PF etc.
- Remote communication via Modbus
- DM5S: Energy metering class 0.5S
- DM5F: Response time 15...25ms
- Configuration even without power supply

SINEAX DM5S/DM5F

Programmable
premium class
heavy current transducers



DM5S/DM5F - The next transducer generation

SINEAX DM5S and SINEAX DM5F are free-programmable universal measurement devices for heavy-current systems: Classical high-accuracy transducer, suited for monitoring tasks and retrofit applications in energy distribution and industry.

The devices can be adapted fast and easily to the measurement task by means of the CB-Manager software – even if there is no power supply available. Depending on the device version measured quantities can be mapped proportionally to analog DC current outputs or to Modbus.

The measurement is done uninterrupted in all four quadrants and can be adapted optimally to the system to be monitored. Both the average time of the measurement and the expected maximum signal level can be configured.

Commissioning is very easy and is supported by means of service functions, such as nameplate printing, connection check, measurement acquisition as well as simulation and trimming of the analog outputs.

Device version	SINEAX DM5S	SINEAX DM5F
Measurement time, programmable	4...1024 cycles	½, ½ (1), 1, 2, 4, 8 cycles
Fastest response time (at 50Hz)	85...165ms	15...25ms
Energy metering	max. 32 meters	not supported
Auto-scaling V/I inputs	supported	not supported

System state monitoring in class 0.2

These instantaneous values will be calculated in regular configurable intervals and provided to analog outputs and Modbus interface.

Description	14	2L	3G	3U	3A	4U	40
System voltage	•	•	–	–	–	–	–
Voltage L1-N	–	•	–	–	–	•	•
Voltage L2-N	–	•	–	–	–	•	•
Voltage L3-N	–	–	–	–	–	•	•
Voltage L1-L2	–	–	•	•	•	•	•
Voltage L2-L3	–	–	•	•	•	•	•
Voltage L3-L1	–	–	•	•	•	•	•
Zero displacement voltage	–	–	–	–	–	•	•
System current	•	–	•	–	–	–	–
Current in phase L1	–	•	–	•	•	•	•
Current in phase L2	–	•	–	•	•	•	•
Current in phase L3	–	–	–	•	•	•	•
Neutral current (calculated)	–	•	–	–	–	•	•
Active power of the system	•	•	•	•	•	•	•
Active power in phase L1	–	•	–	–	–	•	•
Active power in phase L2	–	•	–	–	–	•	•
Active power in phase L3	–	–	–	–	–	•	•
Reactive power of the system	•	•	•	•	•	•	•
Reactive power in phase L1	–	•	–	–	–	•	•
Reactive power in phase L2	–	•	–	–	–	•	•
Reactive power in phase L3	–	–	–	–	–	•	•
Apparent power of the system	•	•	•	•	•	•	•
Apparent power in phase L1	–	•	–	–	–	•	•
Apparent power in phase L2	–	•	–	–	–	•	•
Apparent power in phase L3	–	–	–	–	–	•	•

Description	14	2L	3G	3U	3A	4U	40
System frequency	•	•	•	•	•	•	•
Active power factor of the system, PF=P / S	•	•	•	•	•	•	•
Active power factor in phase L1	–	•	–	–	–	•	•
Active power factor in phase L2	–	•	–	–	–	•	•
Active power factor in phase L3	–	–	–	–	–	•	•
Reactive power factor of the system, QF=Q / S	•	•	•	•	•	•	•
Reactive power factor in phase L1	–	•	–	–	–	•	•
Reactive power factor in phase L2	–	•	–	–	–	•	•
Reactive power factor in phase L3	–	–	–	–	–	•	•
LF factor of the system, sign(Q)-(1-abs(PF))	•	•	•	•	•	•	•
LF factor in phase L1	–	•	–	–	–	•	•
LF factor in phase L2	–	•	–	–	–	•	•
LF factor in phase L3	–	–	–	–	–	•	•
Average voltage	•	•	•	•	•	•	•
Average current	•	•	•	•	•	•	•
Average current with sign of P	•	•	•	•	•	•	•
Bimetal current of the system	•	–	•	–	–	–	–
Bimetal current in phase L1	–	•	–	•	•	•	•
Bimetal current in phase L2	–	•	–	•	•	•	•
Bimetal current in phase L3	–	–	–	•	•	•	•
Slave pointer of bimetal current of the system	•	–	•	–	–	–	–
Slave pointer of bimetal current in phase L1	–	•	–	•	•	•	•
Slave pointer of bimetal current in phase L2	–	•	–	•	•	•	•
Slave pointer of bimetal current in phase L3	–	–	–	•	•	•	•

- 14** = Single phase system or 4-wire balanced or 3-wire unbalanced phase shift
2L = two-phase system (split phase)
3G = 3-wire balanced

- 3U** = 3-wire unbalanced
3A = 3-wire unbalanced in Aron connection
4U = 4-wire unbalanced
40 = 4-wire unbalanced in Open-Y connection

DM5S: Energy consumption monitoring in class 0.5S

The DM5S supports up to 32 energy meters. To each of these meters a base measurement quantity and a tariff can be assigned. The present tariff is set via Modbus.

For application with short measurement times, e.g. energy consumption for a single working day or production lot, the resolution can be adapted.

Thanks to uninterrupted measurement and automatic range detection a high accuracy is achieved.

- Up to 32 meters
- Up to 16 tariffs (Control via Modbus)
- Free selectable base quantity (P, Q, S, I)
- High accuracy 0.5S
- Uninterrupted measurement
- Free selectable meter resolution

Free device assembly

For parameterization the DM5 is equipped with a USB interface as a standard.

The measurement output can be performed via analog outputs and / or a Modbus interface.

For the designation of the device the marking of the Power LED can be overwritten with the device description. The associated label can then be printed.

DM5x-

Application

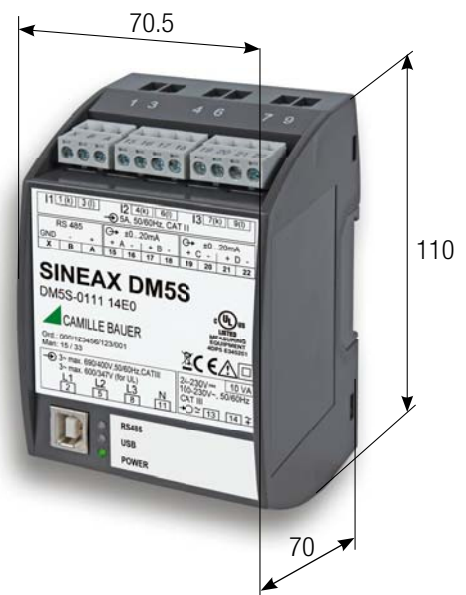
- Universal version (for all system types)
- Balanced systems
- Single-phase systems and 4-wire balanced

Analog outputs

- None
- 1,2,3 or 4 galvanically isolated $\pm 20\text{mA}$

Modbus interface (Modbus/RTU protocol)

- Without
- With

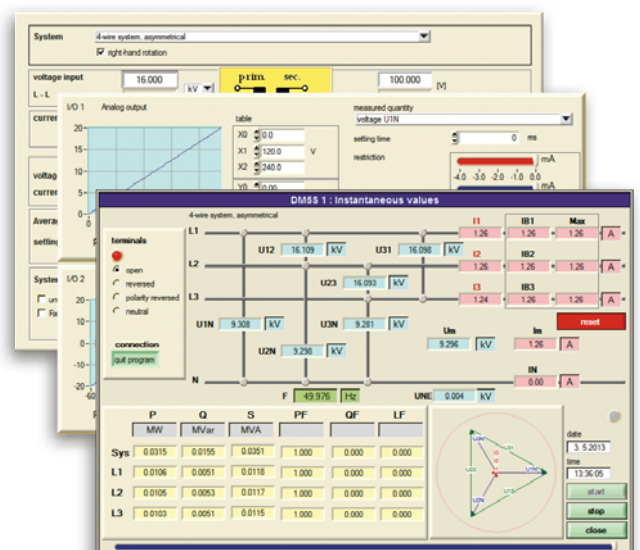


Parameterization, service and measurement acquisition

The **CB-Manager** software provides the following functions to the user:

- Full parameterization of DM5S/DM5F
 - Locally: Via USB interface (even without power supply)
 - Remote: Via Modbus interface
 - OFFLINE: No device connected
 - Data label printing of present parameterization
 - Free selectable LED marking
- Acquisition and recording of measured quantities
- Check of proper device connection
- Archiving of configuration and measurement files
- Setting or resetting of meter contents
- Simulation and trimming of analog outputs
- Comprehensive parameterization help

A security system can be activated to restrict the access to device data.



Technical data

Inputs	via screw terminals 6mm ²
Nominal current:	adjustable 1...5 A
Maximum:	7.5 A (sinusoidal)
Consumption:	≤ I ² x 0.01 Ω per phase
Overload capability:	10 A continuous 100 A, 10 x 1 s, interval 100 s
Nominal voltage:	57.7...400 V _{LN} , 100...693 V _{LL}
Maximum:	480 V _{LN} , 832 V _{LL} (sinusoidal)
Consumption:	≤ U ² / 1.54 MΩ per phase
Impedance:	1.54 MΩ per phase
Overload capability:	480 V _{LN} , 832 V _{LL} continuous 600 V _{LN} , 1040 V _{LL} , 10 x 10 s, interval 10 s 800 V _{LN} , 1386 V _{LL} , 10 x 1 s, interval 10 s
Nominal frequency:	45... 50 / 60 ...65 Hz
Measurement TRMS:	up to 31st harmonic
Systems	Single phase Split phase (2 phase system) 3-wire, balanced load 3-wire, balanced load, phase shift (DM5S only) 3-wire, unbalanced load 3-wire, unbalanced load, Aron connection 4-wire, balanced load 4-wire, unbalanced load 4-wire, unbalanced load, Open-Y
Power supply	via screw terminals 6mm ²
Nominal voltage:	100...230 V AC ±15%, 50...400 Hz 24...230 V DC ±15%
Consumption:	≤ 10 VA
Analog outputs	via plug-in terminals 2.5mm ² , galvanically isolated
Linearization:	Linear or kinked
Range:	± 20 mA (24 mA max.), bipolar
Uncertainty:	± 0.1% (included in basic accuracy)
Response time (50Hz):	DM5S: 85...165ms (for 4 cycles measurement) DM5F: 15...25ms (for ½ cycle measurement)
Burden:	≤ 500 Ω (max. 10 V / 20 mA)
Burden influence:	≤ 0.1%
Residual ripple:	≤ 0.2%
Modbus/RTU	via plug-in terminals 2.5mm ²
Physics:	RS-485, max. 1200 m (4000 ft)
Baud rate:	2.4 up to 115.2 kBaud
Number of participants:	≤ 32
Configuration interface USB	
Physics:	USB, max. 3m
Connection:	Socket USB-B
Device class:	Human interface device (HID)
Measurement uncertainty	
Reference conditions:	Ambient 23°C ±1K, sinusoidal, PF=1, (acc. IEC/EN 60688) Frequency 50...60 Hz, burden 250 Ω, Measurement over 8 cycles (DM5S), 1 cycle (DM5F)
Voltage, current:	± 0.15% FSU / FSI ^{1) 2)}
Power:	± 0.2% (FSU x FSI) ²⁾
Power factor:	± 0.1° ²⁾
Frequency:	± 0.01 Hz
Active energy (DM5S only):	Class 0.5S, EN 62 053-22
Reactive energy (DM5S only):	Class 2, EN 62 053-23
¹⁾ FSU / FSI – Configured maximum value of voltage / current inputs	
²⁾ Additional uncertainty if neutral wire not connected (3-wire connections)	
• Voltage, power: 0.1% of measurement value; Load factor: 0.1°	
• Energy: Voltage influence x 2, angle uncertainty x 2	
Safety	
Current inputs are galvanically isolated from each other.	
Protection class:	II (protective insulation, voltage inputs via protective impedance)
Pollution degree:	2
Protection rating:	IP30 (housing), IP20 (terminals)
Overvoltage category:	CAT III up to 600V

Ambient conditions, general information

Operating temperature:	-20 up to 22 up to 24 up to +55°C
Storage temperature:	-25 up to +70 °C
Temperature influence:	0.5 x measurement uncertainty per 10 K
Long term drift:	0.5 x measurement uncertainty per year
Others:	Usage group II (EN 60 688)
Relative humidity:	< 95% no condensation
Altitude:	≤ 2000m max.

Device to be used indoor only!

Mechanical attributes

Dimensions (H x B x D):	110 x 70 x 70mm
Housing material:	Polycarbonat
Weight:	500 g
Flammability class:	V-0 acc. UL94, self-extinguishing, non dripping, free of halogen

Order code

SINEAX DM5S, programmable, up to 4 analog outputs, USB, Modbus/RTU, meters			
SINEAX DM5F, programmable, 1/2 cycle measurement, up to 4 analog outputs, USB, Modbus/RTU			
Features, selection	Blocking code	No-go with blocking code	DM5x-
1 Basic device Without display, for rail mounting			0
2 Application Universal version for all applications (3U,3I) Single phase, 3/4-wire balanced load (3U,1I) Single phase or 4-wire balanced load (1U,1I)			1 2 3
3 Nominal frequency range 45...50/60...65 Hz			1
4 Power supply Nominal voltage 24...230V DC, 100...230V AC			1
5 Bus connection without RS-485 (Modbus/RTU protocol)	A		0 1
6 Outputs without 1 analog output, bipolar ±20mA 2 analog outputs, bipolar ±20mA 3 analog outputs, bipolar ±20mA 4 analog outputs, bipolar ±20mA		A	0 1 2 3 4
7 Test certificate Without test certificate Test certificate in German Test certificate in English			0 D E
8 Configuration Basic configuration			0



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