

Instruction manual

Wattmeter

CLM1000 Home



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1. General information

1.1 Maintenance



INFORMATION!

This device is made to DIN EN ISO 9001 standard and has left the factory in flawless condition regarding technical safety.

To maintain this condition and ensure safe operation pay attention to the information and warnings contained in this instruction manual.

1.2 Safety instructions



DANGER!

If the casing, connection cable or another part of the device is damaged, it is to be unplugged and switched off immediately.

DANGER!

Before opening the casing unplug connecting cable.

The screws at the battery cover on the back of the device shall not be opened.

Warranty voids if the device is opened.

DANGER!

Ensure that any repairs to the unit are carried out by qualified personnel. Substantial risk for the user arises from improper repairs.

Liquids and dust shall not enter the device. Don't expose the device to humidity or solar radiation for any length of time!

DANGER!

Connect the CLM1000 only to approved security sockets 100-264 VAC/47-63 Hz with protective earth conductor.

Maximum power of any kind of load shall not exceed 4424 Watt (max. 16A).



CAUTION!

If the device is diverted from its intended use or operated wrongly no liability can be assumed for possible harms.

The device shall not be handled with abrasive and sharp-edged objects.

The device shall not be cleaned with solvent-containing or acidic substances.

2. Operation

2.1 CLM1000-Home operational system

The **Wattmeter CLM1000 – Home** is made for measuring the following electric parameters:


- instantaneous real power [W]
- active energy (consumption) [kWh]
- active energy / 24 hours [kWh]
- test time [hh:mm]




Switch between the different modes using the arrow keys.

2.2 Brief instruction

Connecting:	
<p>socket</p> <p>power plug load</p> <p>Adapter wattmeter</p>	<p>Unplug the load (e.g. household appliance, HIFI, PC...) and plug it in the adapter of the measuring device. Subsequently connect the adapter of the measuring device to the socket.</p> <p>Now the measuring device is interposed between load and socket, so it can measure power and current consumption.</p>
Menu item 1(3)	
<p>35.9 WATT</p> <p>1(3)</p> <p>menu item</p>	<p>When the CLM1000 is plugged in it automatically switches on and displays the instantaneous power of the connected electric appliance.</p>
Press to continue to menu item 2(3) .	
<p>0.1500 kWh</p> <p>5:00 h</p> <p>2(3)</p>	<p>By selecting the second menu item the current consumption of the connected electric appliance is displayed.</p> <p>e.g.: the refrigerator has consumed 0.15 killowatt hours in 5 hours.</p> <p>By pressing both arrow keys for approx. 2 seconds the measuring will be reset to zero. + </p>

Press  to continue to menu item 3(3).

placeholder

 kWh/24h
12:05
3(3)

already measured time
(12 hours and 5 minutes of
24 hours)

4.2500
KWh/24h
3(3)



Through this measuring the 1-day consumption of an appliance can be specified. Just connect the wattmeter to any load for 24 hours.

After a successful measurement the display backlight switches from blue to green. It now displays the current consumption of the 24-hour measuring.

e.g.: The result of the 24-hour measuring was 4,25 kWh. To calculate the daily consumption costs multiply your kWh price with the current consumption.





At 17 Cent per kWh:
 $4,25 \text{ kWh} * 0,17 \text{ €} = 0,72 \text{ €}$

Here too, it is advisable to reset the wattmeter to zero, through pressing both arrow keys for approx. 2 seconds before starting the measuring.

 + 

All readings are saved even after unplugging the wattmeter or a mains failure. They will be recalled by plugging in again.

2.3 Contrast setting

-  +  **Increase contrast:**
Press the "OK" button and the "arrow up" button simultaneously to increase contrast.
-  +  **Decrease contrast:**
Press the "OK" button and the "arrow down" button simultaneously to decrease contrast.

The contrast setting is saved after switching off the wattmeter.

3. Error handling



The CML1000 gives users warning of internal errors which occurred!

If there is an error the display is red.

Error	Meaning	Solution
ERROR1	Internal error 1! CLM1000 doesn't start!	Unplug the CLM1000 and plug it again! If the error continues to exist the CLM1000 can't be used. ! Please send in !
ERROR2	Internal error 2! The CLM1000 shows the error and all readings are reset. The CLM1000 starts a new measuring!	If this error keeps occurring during start-up the CLM1000 has to be sent in for further inspection.
ERROR3	Amperage above the maximum allowable value (more than 16 ampere)	Unplug wattmeter!

4. Technical data

4.1 CLM1000 variant types and measurings

CLM1000	H=Home	S=Standard	P=Professional			
Modes	Range	Resolution	H	S	P	
Real power	0,0 - 4224 W	0,1 W / 1 W	•	•	•	
Real power (min/max)	0,0 - 4224 W	0,1 W / 1 W		•	•	
Apparent power	0,0 - 4224 VA	0,1 VA / 1 VA			•	
Reactive power	0,0 - 4224 var	0,1 var / 1 var			•	
Active energy (consumption)	0,0000 - 99999,99 kWh	0,0001 - 0,01 kWh	•	•	•	
Active energy / 24 h (consumption / 24 h)	0,0000 - 108,0000 kWh	0,0001 kWh	•	•		
Apparent energy	0,0000 - 99999,99 kVAh	0,0001 - 0,01 kVAh			•	
Reactive energy	0,0000 - 99999,99 kvarh	0,0001 - 0,01 kvarh			•	
Consumption costs	0,00 - 99999,99 €	0,01 €		•		
Consumption costs / 24 h	0,00 - 99999,99 €	0,01 €		•		
Tariff	0,000 - 99,999 €	0,001 €		•		
Testing time	00:00 - 9999:59 h	1 minute	•	•	•	
% ON (threshold measuring)	0,0 - 100,0 %	0,1 %		•	•	
Voltage	100,0 - 264,0 V	0,1 V		•	•	
Voltage (min/max)	100,0 - 264,0 V	0,1 V		•	•	
Current	0,000 - 16,00 A	0,001 A / 0,01 A		•	•	
Current (min/max)	0,000 - 16,00 A	0,001 A / 0,01 A		•	•	
Load recognition	resistance, capacitance, inductance				•	
Power factor	0,000 - 1,000	0,001			•	
Data logger (option)					•	
USB interface (option)					•	

4.2 Display and operation

Display	128*64 Display with varying background lighting
Control elements	3 membrane buttons

4.3 Measuring principle and accuracy

Measuring principle	Voltage is measured directly at the load and current is measured by a precision shunt.
Measuring rate	approx. 1 second
Sampling rate	approx. 2000 Hz
Open-circuit recognition	At $I < 0,002$ ampere current and power values are set to zero. At $P < 0,5$ Watt power values are set to zero.
EEPROM-Memory	All readings are saved even after unplugging
Measuring error	$\pm 0,3 \% \pm 3$ digit from reading at power factor $> 0,3$

4.4 Voltage supply

Connection	Socket at the adapter, permanent load max. 16 A
Supply voltage	100 - 264 V _{AC} , 47 - 63 Hz
Power consumption	< 4 VA

4.5 Environment and dimensions

Dimensions	ABS plastic casing approx. 200*95*35 [mm] (L*W*H)
Weight	approx. 490 g
Connection cable	approx. 1,2 m
Working temperature	0° C - 50° C, dew not permissible
Degree of protection	IP 50 according to DIN EN 60529 (with USB-interface IP40) with seal kit even higher values are permissible
Protection class	Protection class II (protective insulation) according to DIN EN 61140
Measuring category	CAT II according to DIN EN 61010-1