Short Manual EMU Check

LIMITATION OF LIABILITY

The manufacture or retailer shall assume no liability for incorrect measured values or the consequences thereof.

This device may not be used for medical purposes or for public information.
The technical data of the device are subject to change without notice.
Damage to this product resulting from disregard, misuse or failure to comply with the information in this operating manual shall void the warranty.

SERVICE- AND MANUFACTURER‘S ADDRESS

EMU Electronic AG
Jöchlerweg 2
CH-6340 Baar

Phone: +41 (0)41 545 03 00
Fax: +41 (0)41 545 03 01

Email:info@emuag.ch
Web: www.emuag.ch

DESCRIPTION OF DEVICE

The EMU Check is a measuring device that can be used to calculate the cost of electricity required for single electrical appliances. When the appliance to be checked is plugged into the device, the EMU Check automatically starts a 24-hour measurement. After completion of the measurement, the power consumption and the energy costs for the measuring period are displayed. The measuring period can be set to 1, 7 or 30 days and can also be started and stopped manually. The price per kWh can be entered to 3 decimal places. During and after the measurement, the following values can be retrieved: power output, costs per year, energy consumption, costs and equivalent CO_2 consumption in the measuring period, voltage, supply frequency, current, reactive power, apparent power, phase angle, power factor, minimum and maximum power.
All measured values are also retained in case of power supply permanently stored and can be retrieved at restoration of the mains supply.

INSTRUCTIONS FOR SAFETY AND USE

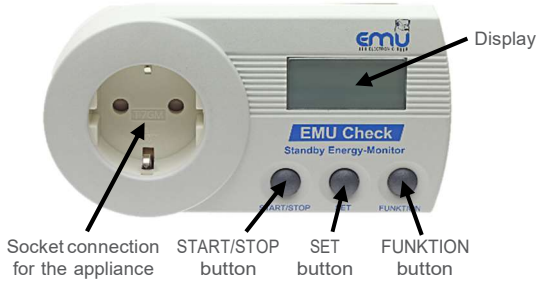
During storage, transport and operation the standby energy monitor must be protected from moisture, dirt and damage. The connected load must never exceed 3680W (16A). If there is any indication that safe operation is no longer possible, then the device must be shut down at once. If damaged, the device cannot be repaired by the user. Inspect the product for damage at regular intervals.

Operation of the EMU Check is permitted only indoors and in a dry environment. The recommended operating temperature is between 0 and +45°C. Higher temperatures, especially during measuring of appliances with a high power draw, can result in overheating, excessive warming of the housing surface or complete destruction of the EMU Check. Prior to cleaning or maintenance, the device must always first be disconnected from the power supply. These devices are not intended for use by persons (including children) with reduced physical, sensory or mental abilities or lack of experience and/or knowledge, unless they are supervised by a person which is responsible for their safety or received an instruction in how to use the device.

Children should be supervised to ensure that they do not play with the device. We shall assume no liability for material damages or personal injury resulting from improper handling or failure to comply with the operating manual or the safety instructions. In such cases, all warranty claims shall be voided.

The EMU Check was designed to calculate the energy consumption and the energy costs of electric loads of single appliances. Despite the high accuracy of the device, it is not suitable for the official billing of measured energy costs between the power company and the user.

THE FEATURES OF YOUR EMU Check



Values shown in display

Energy consumption in kilowatt hours (kWh), Energy costs in measuring period (costs), Annual energy costs (costs), Minimum power in watts (W), Maximum power in watts (W), Present power in watts (W), Present current draw in amperes (A), Present voltage in volts (V), Equivalent CO2 consumption in kilograms (kg), Supply frequency in hertz (Hz), Reactive power in (var), Apparent power in (VA), Phase shift angel in (° degrees), Power factor in cos phi

Operation

After plugging the device into the power outlet, the EMU Check displays the present power in watts and the projected costs for one year caused by the appliance at the present power. Press the FUNCTION button to navigate through the menu. If the menu item displays 2 or 3, you can use the SET button to switch to the time display.

HOW TO MEASURE USING THE EMU Check

1. Plug the EMU Check into a power outlet (using an extension cord if necessary).

2. Plug the appliance into the EMU Check. Measuring (24 hours) starts as soon as the appliance is plugged into the unit.

   Read “How to set a different measuring period” for a measuring period other than 24 hours.

3. The display shows the present power in watts and the projected costs for one year caused by the appliance (if the appliance is in operation around the clock).

4. Press FUNCTION button to browse through the following informations on the display:

1) The present power in watts (W) with the annual power costs (costs/y)

2) 2) The energy consumption in kilowatt hours (kWh) in the present measuring period REC TIME Total time since measuring started; The energy consumption in kilowatt hours (kWh) in the present measuring period REC TIME Total time since measuring started; see number 5

3) The energy costs in (costs) in the present measuring period ON TIME. The time in which the connected appliance has consumed power 5

4) Equivalent CO2 consumption in (kg)

5) The present voltage in volts (V) with the supply frequency in hertz (Hz)

6) The present current in amperes (A)

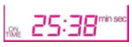
7) The present reactive power in (var) with the phase shift angle in degrees

8) The present apparent power in (VA) with the power factor cos phi

9) The minimum power in watts (W) and the maximum power in watts (W) during the measurement. The display switches automatically.

5) Press SET to switch between the following information on the display:

REC TIME Total time since measuring started



ON TIME The time in which the connected appliance has consumed power. For appliances that automatically switch on and off, such as a refrigerator or iron, this display shows how long the appliance was actually active. An appliance is considered switched on if it has a power draw of 1 watt or more.

The measuring times are first shown in minutes / seconds, then in hours / minutes and finally in days / hours.

6) At the end of the measuring time, measuring is ended automatically if the duration of the measuring period has not been set differently (see Measuring period). You can continue to switch between the various displays, as described in numbers 4 and 5.

7) After measuring has stopped and the measurements have been analyzed, the results can be reset to '0'. To do this, you have to open either menu item 2) Energy costs or 3) Energy consumption. Now press the START/STOP button for 3 seconds to reset all values to '0' with the exception of the setting for the electricity price. The measuring result can also be reset to '0' while a measurement is in progress.

Now it is possible to carry out a new measurement.

HOW TO RESET YOUR MEASURING RESULTS

All values measured by the EMU Check can be reset to '0' only in the menu items Energy consumption and Energy costs. Press the START/STOP button for about 3 seconds to reset all values, such as the energy consumption, energy costs, CO2 consumption and the power measurements, minimum and maximum power. Then you can start a new measurement.

HOW TO SET A DIFFERENT MEASURING PERIODE

To achieve the most exact measuring results possible, the measurement must be conducted over a defined period of time. In the standby energy monitor a measuring time (0, 1 day, 7 days or 30 days) can be set; after this time, the measuring stops automatically. Measuring starts automatically as soon as an appliance is plugged into the unit. Measuring can also be started and stopped manually.

The measuring period depends on the appliances to be measured: For an appliance that is continuously switched on 365 days a year and has a constant energy consumption (e.g. a clock), a short measuring period is sufficient.

The projected energy costs for one year are displayed immediately. Appliances with fluctuating energy consumption have to be monitored over a longer period. For an appliance with relatively constant energy consumption from day to day (e.g. a refrigerator), a measuring period of one day can already provide very accurate results. Appliances with constant energy consumption over a period of one week (e.g. a television) can be measured effectively over a measuring period of 7 days. Appliances that are operated at regular intervals (e.g. a washing machine or printer) should be measured over an extended period (30 days, manual start/stop). In general, the longer the measuring period, the more accurate the cost estimate will be.

1) Press the START/STOP and SET buttons simultaneously until "REC TIME" "1d" (d = day) appears on the display.

2) Press the START/STOP button to switch between 7, 30 or 0 days and back to 1 day.

Setting for measuring period of one day. (1 d = 1 day) Setting

for measuring period of one week. (7 d = 7 days) Setting for

measuring period of one month. (30 d = 30 days)

Setting for user-defined measuring period.
(0 d = start and end of measuring period can be selected freely)

3) If you select a measuring period of "0 days" you can automatically start the measurement by pressing the START/STOP button and stop the measurement by again pressing the START/STOP button.

   Press the START/STOP and SET buttons simultaneously for 3 seconds again to save the selected measuring period and exit the menu. The configured measuring period is now stored in the unit and will be retained even after resetting the measured values.

PROJECTION OF CONSUMPTION DATA FOR DIFFERENT PERIODS

The displayed value after a complete measurement period can easily be projected to longer period.

Conversion example:

Measurement period 1 day

Monthly energy consumption [kWh] = energy consumption per day * 30
Annual energy consumption [kWh] = energy consumption per day * 365
Monthly energy costs (e.g. €) = energy costs per day * 30
Annual energy costs (e.g. €) = energy costs per day * 365

Measurement period 7 days

Monthly energy consumption [kWh] = energy costs per week * 4
Annual energy consumption [kWh] = energy consumption per week * 52
Monthly energy costs (e.g. €) = energy costs per week * 4
Annual energy costs (e.g. €) = energy costs per week * 52

Measurement period 30 days

Annual energy consumption [kWh] = energy costs per month * 12
Annual energy costs (e.g. €) = energy costs per month * 12

Individual Measurement period or measuring in progress

Daily energy consumption [kWh] = value time [hours] * 24 [hours]
Monthly energy consumption [kWh] = value time [hours] * 720 [hours]
Annual energy consumption [kWh] = value time [hours] * 8760 [hours]
Daily energy costs (e.g. €) = value time [hours] * 24 [hours] Monthly energy costs (e.g. €) = value time [hours] * 720 [hours]
Annual energy costs (e.g. €) = value time [hours] * 8760 [hours]

HOW TO SET THE ELECTRICITY PRICE AND THE CO_2 VALUE ON YOUR EMU Check

The electricity price is set at the factory to 0.20 costs per kWh and does not refer to a specific currency. To set the rate to the electricity price of your power supply company, you can change the default value in the EMU Check as follows:

1. Press the START/STOP and SET buttons simultaneously until “0.240 costs / kWh” appears in the display.

2. Press the START/STOP button one or more times to increase the value of the digit to the far right (3rd decimal place). Press SET to jump one digit to the left (2nd decimal place). Now you can increase the value of this digit by pressing the START/STOP button one or more times. Proceed in the same manner for the remaining digits.

3. When the desired amount is shown in the display, again press the SET and FUNCTION buttons simultaneously. This value is now used by the EMU Check for calculating your energy costs.

4. Then you switch to the item where you can set the CO_2 value. Following the same procedure as described in number 2, you can set this value by pressing the START/STOP and SET buttons.

5. When the desired value is shown in the display, again press the SET and FUNCTION buttons simultaneously until the display switches back to the starting point.

   The electricity price and CO_2 emissions factor you have saved in the unit are retained even when the EMU Check is unplugged from the power supply. The next time you operate the unit the programmed values will be used again.

You can change the electricity price and the CO2 value at any time.

!!! Note: The ‘costs’ symbol is the currency-neutral symbol for the currency used. In Germany and many European countries it represents ‘€’ (e.g.: 0.150 costs/kWh = 0.15€/kWh).

!!! Tip:Your power supply company can provide you with the applicable price per kWh.

!!! Tip:Your power supply company can provide you with the applicable emissions factors for the CO2 calculation.

MAINTENANCE

Inspect the EMU Check regularly for signs of damage. To clean the device and the display, use only a dry, soft cloth; do not use any cleaning agents. Never immerse the device in water. The unit is maintenance free. Repairs may be carried out only by trained specialists who are familiar with the applicable regulations. The EMU Check has to buffer the time of a lithium coin-cell battery that can only be changed by the manufacturer. In accordance with European directive 2006/66/EC Battery Law

DISPOSAL

The packaging material consists entirely of environmentally friendly materials. They can be disposed of in the local recycling containers. Never dispose of electrical devices in the household trash. According to European Directive 2002/96/EC Waste Electrical and Electronic Equipment and its implementation in national law, no longer needed electrical appliances must be collected separately and recycled in an environmentally sound manner. For information on the correct disposal of electrical equipment, please contact the municipal or local authorities.

WARRANTY AND SERVICE - Warranty

2 year warranty starting from date of purchase; applies only to the original buyer and is not transferable. The warranty applies only to defects in material and workmanship, but not to wearing parts or damage resulting from improper use. The warranty shall be voided in case of unauthorized alterations, modifications or repairs. This warranty does not affect your statutory rights. In case of a warranty claim, please contact your retailer to avoid having to pay the cost of shipping your device.

DECLERATION OF CONFORMITY

The CE symbol was affixed to designate compliance with the following
European directives: 2006/95/EC Low-voltage directive 2004/108/
ECEMC directive the declaration of conformity is available from the manufacturer.

Technical data	EMU Check
Voltage (U)	230 V; ±10%
Current (I) max.	16 A
Frequency (f)	50 Hz
Measuring range (P)	0,1 ... 3.680 W
Measuring category	CAT II
Lithium battery	-
Precision	1 %; ± 1 Digit
Self consumption (Pe)	1,1 W
Temperature range (Tb) operating/storage	0 ... +45°C / -10 ... +70°C
Protection typer	IP 20
Protection class	1
Dimensions (B x H x T)	138 x 70 x 57 mm
Weight	0,2 kg