



## User manual Technical parameters

multimesh

### Energy measuring device

1D4



Your partner for  
network analysis

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Subject to technical changes

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# 1 Introduction

Thank you for choosing this KBR quality product. In order to familiarize yourself with the operation and configuration of the device, we recommend that you read this manual thoroughly, so that you are able to make use of the entire range of functions of this high-quality product.

The individual chapters serve to explain the technical details of the device and show how to avoid damage by means of proper installation and commissioning.

## 1.1 User manual

This user manual describes the **multimes 1D4** device version with **multimes 1F96-DS** display.

This user manual is included in the scope of delivery of the device and must be accessible for the user at all times (e.g. in the switchgear cabinet). Even when the device is resold to third parties, the manual remains part of the device.


Although we used the utmost care in assembling this user manual, we would like to thank you in advance for notifying us about any errors or ambiguous descriptions you might notice.

## 1.2 Intended use

This device is intended for measuring electrical parameters via external transformers in the low-voltage network (400VAC Ph-Ph).

### 1.3 Explanation of safety relevant symbols

This user manual contains notes that must be observed for your personal safety and to avoid damage to equipment.

These notes are identified by an  or information symbol, depending on the degree of hazard they represent.



#### Warning

"Warning" means that death, major injuries or damage may occur in case the appropriate safety measures are not taken.

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#### Caution

"Caution" means that minor injuries or damage may occur in case the appropriate safety measures are not taken.

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#### Note

"Note" is an important information on the product, its operation or the respective part of the user manual to which special reference is made.

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#### Disclaimer

The content of this user manual has been carefully reviewed in terms of the hardware and software described. Certain deviations, however, cannot be excluded, and the manufacturer is not liable for complete conformity. The specifications made in this user manual are checked on a regular basis, necessary corrections will be included in the next revision.

## 1.4 Safety notes

- In order to prevent operating errors, operation of this device is kept as simple as possible. This way, you will be able to quickly start working with the device.
- In your own interest, however, you should read the following safety notes carefully. During assembly, the applicable DIN / VDE regulations must be observed!
- Power supply connection, setup and operation of the device must be performed by qualified personnel only. Qualified personnel in accordance with the safety notes in this user manual are persons authorized to set up, ground and mark devices, systems and circuits in accordance with the applicable standards and regulations.
- To avoid fire and electrical shock, the device must not be exposed to rain or humidity!
- Before connecting the device to the power supply, check whether the local power supply conditions comply with the specifications on the nameplate.
- A faulty connection can lead to the destruction of the device!
- When connecting the device, observe the connection chart (see chapter "Connection chart") and make sure that no voltage is applied to the connection lines. Only use proper wiring material and observe the correct polarity when wiring!
- In order to ensure proper and safe operation of the product, it must be transported, stored, installed and assembled in accordance with the specifications and operated and maintained carefully.
- A visibly damaged device must generally be considered unfit for use and disconnected from the power supply!
- Error detection, repair and maintenance work may only be carried out in our facilities or after contacting the service team.
- Unauthorized opening of the device voids any warranty. Correct operation can no longer be guaranteed!
- Opening the device may expose live parts. Capacitors in the device may still be loaded, even if the device has been disconnected from all voltage sources. It is generally not allowed to operate an open device!

- In systems susceptible to lightning, lightning protection must be provided for all input and output lines (for recommendations, see chapter “Protective measures”)!

## 1.5 Product liability

You have acquired a high quality product. In its manufacture, only components of the highest reliability and quality were used. Each device is subject to long-term testing before it is delivered. Regarding product liability, we refer to our general terms and conditions for electronic equipment, which you can find at [www.kbr.de](http://www.kbr.de). The warranted characteristics of the device only apply for operation in accordance with its intended use!

## 1.6 Disposal

Defective, outdated or no longer used devices must be properly disposed of. At your request, we will dispose of the devices for you.



## 2 Range of functions

multimes 1D4 is a multimeter for busbar mounting. On the output side, it can measure all typical alternating and direct current parameters of consumers.

The device can record 1x 3-phase as well as 3x single-phase measured values. A prerequisite for single-phase measurement is that the neutral conductors of the individual measuring channels have the same potential.

The following device expansion stages are possible, featuring different ranges of function:

- “**multimes 1D4-BS** with **multimes 1F96-DS**” on page 9
- “**multimes 1D4-BS** with **multisio 6D6** and **multisio 6F96-DS**” on page 10
- “**multimes 1D4-BS** with **multisys 3D2-ESBS**” on page 10

### 2.1 multimes 1D4-BS with multimes 1F96-DS

Connection of the optional **multimes 1F96-DS** display can be established with a ready-made RJ12 cable. For operation of the display, an additional power supply unit is needed, e. g. the **multisys 1D4-PS-24V**. This way, no complicated wiring of voltage and current paths from the converter to the switchgear cabinet door is necessary. Up to 10 measuring modules can be read out and displayed. Connection between the modules is also established via ready-made RJ12 cables.

Power supply of the measuring device is provided by the measuring voltage. A separate control voltage is not necessary.



#### Note

multimes 1D4-BS with multimes 1F96-DS is the version described in this user manual.

## 2.2 multimes 1D4-BS with multisio 6D6 and multisio 6F96-DS

If the multimes 1D4 is connected to the **multisio 6D6** instead of to the display, the multisio 6D6 creates a load profile memory (P+ P-/ Q+ Q-) and an eBus interface. Five measuring modules can be connected to each central storage module. Connection between the modules is established via ready-made RJ12 cables.

## 2.3 multimes 1D4-BS with multisys 3D2-ESBS

For direct connection of the **multimes 1D4** to the KBR eBus, the **multisys 3D2-ESBS** gateway is required, which also provides the supply voltage for the module bus interface via ready-made RJ12 cables. A maximum of 15 measuring modules can be connected (power consumption of the measuring module interface approx. 0.3 W, power output of the **multisys 3D2-ESBS** gateway approx. 5 W at 24 VDC). For a larger number of measuring modules, the multisys 1D4-PS-24V power supply unit is required (power output 24 VDC, 10 W).

## 3 Device overview

### multimes 1D4 measuring module



For busbar assembly (7.5 mm rail)

Connection to measuring voltage Ph-N 230 VAC

Measuring current connection via transformer x/1A or x/5A

Plug terminal connection 2.5 mm<sup>2</sup>

RJ12 display connection

RJ12 module bus connection for supply voltage of the bus interface / connection of additional measuring modules.

Recording of momentary current and voltage values.

Continuous energy meter for active and reactive energy

**multimes 1F96-DS**

Display illumination (Dot Matrix 128x96)

Brightness and contrast adjustable

Display dimming time adjustable  
(energy saving function)

Operation via sensor buttons

Mounting depth 40 mm

Door assembly cut-out 92x92 mm

Module bus connection RJ12 for measuring  
modules and supply voltage

Display of momentary current and voltage  
values

Continuous energy meter for active and  
reactive energy

Management of up to 10 measuring modules

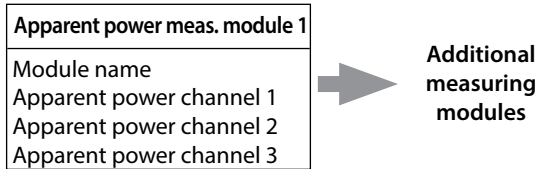
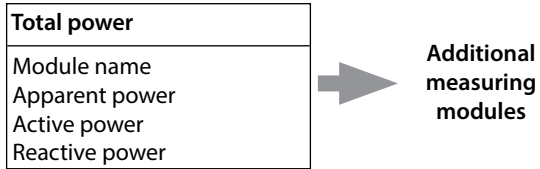
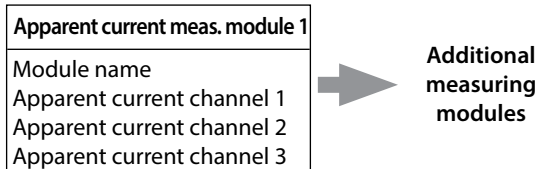
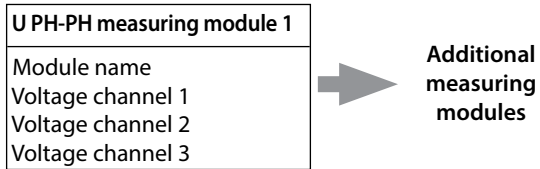
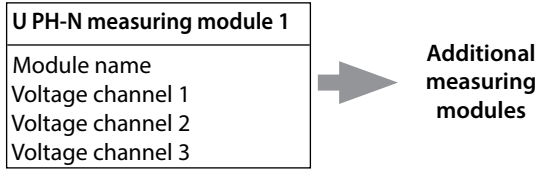
Assignment of station names to the measuring  
modules

Display language selectable  
German ("deut") / English ("engl")

### 3.1 Operating structure

The following overview gives you an idea of the multimes 1D4 operating structure with the 1F96-DS display. For a detailed description, please refer to "Menu overview" on page 24.

#### Instantaneous value display





<b>Active power meas. module 1</b>
Module name
Active power channel 1
Active power channel 2
Active power channel 3



**Additional measuring modules**

<b>Reactive power meas. module 1</b>
Module name
Reactive power channel 1
Reactive power channel 2
Reactive power channel 3



**Additional measuring modules**

<b>Cosine Phi measuring module 1</b>
Module name
Cosine Phi channel 1
Cosine Phi channel 2
Cosine Phi channel 3



**Additional measuring modules**

<b>Frequency</b>
Module name
Network frequency



**Additional measuring modules**

<b>Energy meter:</b>
Continuous counter active energy
Continuous counter reactive energy



**Additional measuring modules**

<b>Extras (Settings)</b>
Display firmware version
Commissioning
Configuration

<b>Commissioning</b>
Password
Module name
Scan / remove module
Reset display
Single-phase / 3-phase measurement
Transformer I 1 / 2
Transformer U 1 / 2

<b>Configuration</b>
Display firmware module
Measuring module selection
LCD contrast
LCD brightness
LCD dimmer brightness
Dimmer delay
Display test
Language selection

EDEBDA0193-4314-1\_EN

## 4 Installation

In this chapter, you will find a description of:

“Device assembly” on page 14

“Connections” on page 15

“Commissioning” on page 16

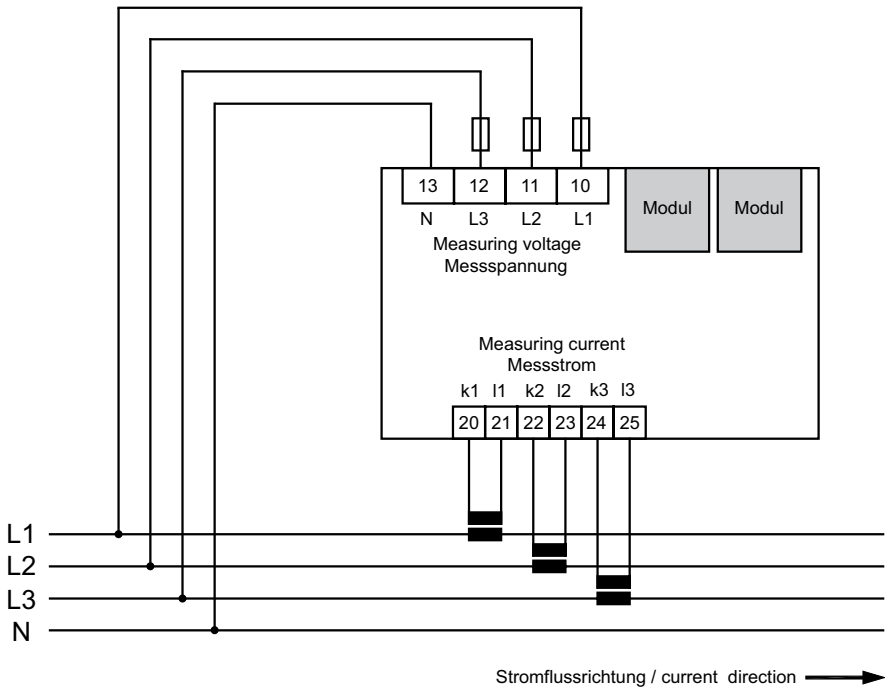
### 4.1 Device assembly

During installation, the applicable DIN / VDE regulations must be observed! Before connecting the device to the power supply, check whether the local power supply conditions comply with the specifications on the nameplate. A faulty connection may destroy the system! The device must be connected in accordance with the connection chart. For energy and synchronous pulse input, polarity must be observed (contact your energy supplier).

In systems susceptible to lightning, lightning protection must be provided for the control voltage, bus line and pulse lines (e.g. energy supplier pulse lines from the transformer station to the location of the energy control system).

## 4.2 Connections

Terminals 10 - 13 (L1, L2, L3, N)	<b>Measuring voltage.</b> The power supply of the device is also provided by the measuring voltage. For technical data, please refer to the nameplate.
Terminals 20 (k1) and 21 (I1), 22 (k2) and 23 (I2), 24 (k3) and 25 (I3)	<b>Measuring inputs for current.</b> The measuring inputs for current must be connected via current transformers $x/1A$ AC or $x/5A$ AC. When connecting transformers, pay attention to the energy flow direction and the correct assignment of measuring voltage inputs to the current transformers.



### 4.3 Start-up

The following section describes the start-up procedure for the different device versions.

#### 4.3.1 Start-up of the multimes 1D4 with multimes 1F96-DS display

For starting up the multimes 1D4 with multimes 1F96-DS display, please proceed as follows:

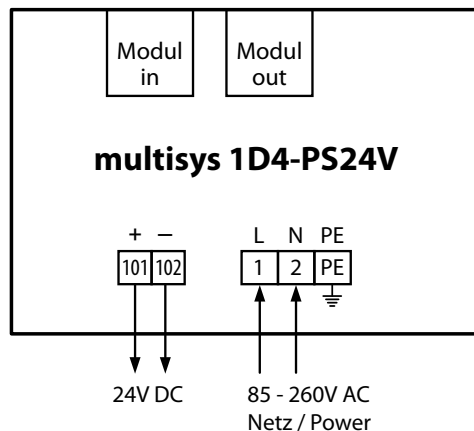
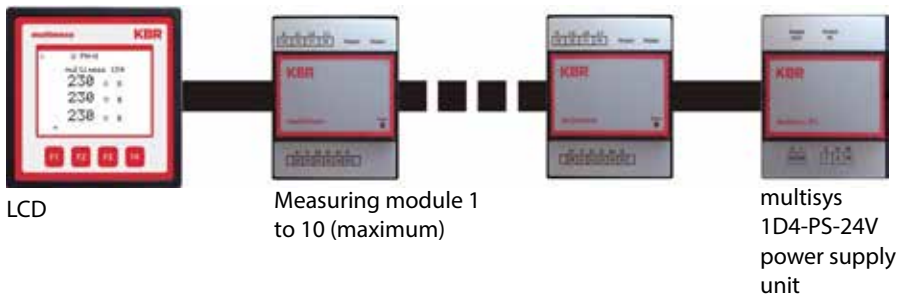
1. Connect the measuring module to the multimes 1F96-DS display via the module bus interface.
2. With the "Module out" connector, connect the measuring module to the multisys 1D4-PS-24V power supply unit via the second module bus interface.
3. At the multisys 1D4 power supply unit, connect the supply voltage (refer to nameplate). The operation LED on the device is illuminated green.
4. At the terminals 10 (L1), 11 (L2), 12 (L3) and 13 (N), connect the measuring voltage (the operating voltage of the measuring module).
5. At the display, select the menu Extras > Commissioning to scan measuring modules connected.
6. Displayed are modules already existing, as well as the menu items "scan" and "rem." (for removing measuring modules from the module bus list).
7. After selection of the menu item "scan", the scan mode is activated and the function LED at the measuring modules flashes slowly.





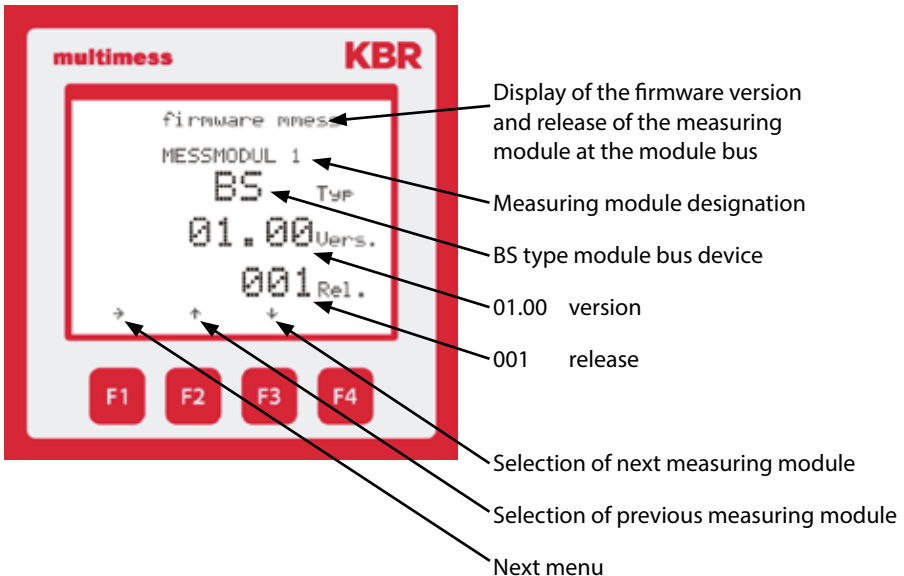
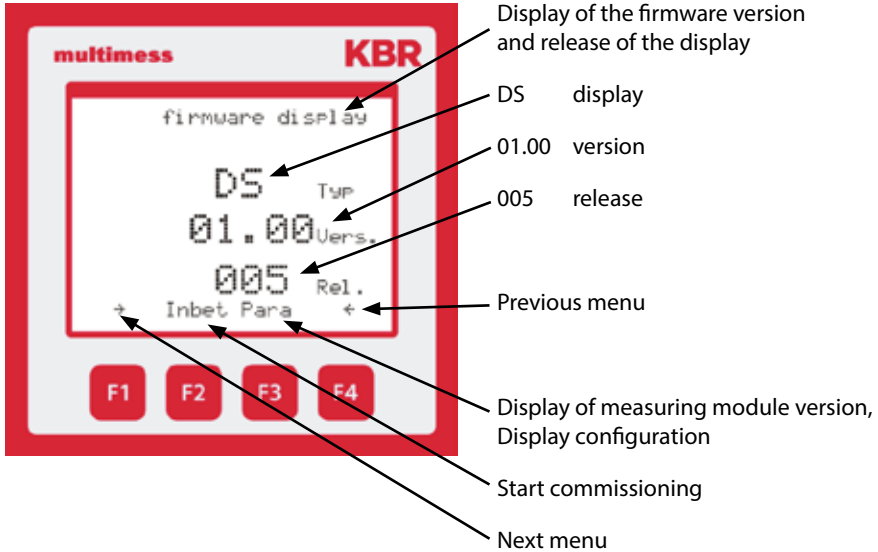
8. At the measuring module, the scan sensor button (close to the status LED, flashing green) is unlocked.
9. To set the measuring module into scan mode, touch the scan sensor button for about 4 seconds (the green status LED flashes more quickly)
10. The multimess display recognizes the measuring module and adds it to the list of modules connected.
11. You can now scan further modules, which are automatically added to the module list or, by touching the stop button, end the scanning process. The display can manage a maximum number of ten modules.

### Set-up diagram for operation of the multimess 1D4 with multimess 1D4-DS (example):



## Configuration

### Extras menu



### 4.3.2 Start-up of the multimess 1D4 at the multisiso 6D6 with multisiso 6F96-DS

For starting up the multimess 1D4 at the multisiso 6D6, please proceed as follows:

1. Connect the measuring module to the multisiso 6D6 via the module bus interface.
2. At the terminals 10 (L1), 11 (L2), 12 (L3) and 13 (N), connect the measuring voltage (the operating voltage of the measuring module).
3. On the display, select the menu Settings > Module management.
4. Displayed are the multisiso basic module as well as modules already existing and the menu item "scan".
5. After selecting this menu item with the cursor buttons, the scan mode can be started with the scan button and the scan display begins to flash. This way, the scan button at the measuring module (close to the status LED, flashing green) is unlocked.
6. By pressing the scan sensor button for approx. 4 seconds, set the measuring module into scan mode (the green status LED flashes more quickly).

The multisiso basic module now recognizes the measuring module and adds it to the list of modules connected.

You can now scan further modules, which are automatically added to the module list or, by touching the stop button, end the scanning process. The multisiso 6D6 can manage a maximum number of ten modules.

You can now read out and process the data.

### 4.3.3 Start-up of the multimes 1D4 with multisys 3D2-ESBS

For starting up the multimes 1D4 at the KBR eBus via the multisys 3D2-ESBS gateway, please proceed as follows:

1. Connect the measuring module to the multisys 3D2 gateway via the module bus interface.
2. At the terminals 10 (L1), 11 (L2), 12 (L3) and 13 (N), connect the measuring voltage (the operating voltage of the measuring module).
3. Connect the multisys 3D2 gateway to the KBR eBus using terminals 90, 91 and 92.

A command, triggered by the visual energy computer software, unlocks the scan button at the measuring module (close to the status LED, flashing green).

4. By pressing the scan sensor button for approx. 4 seconds, set the measuring module into scan mode (the green status LED flashes more quickly).

The measuring module is detected and included in the bus list. You can now read out and process the data.

## 5 System operation

In this chapter, you will find instructions on how to operate the multimes 1D4 with the multisio 1D4-DS display in daily use. Furthermore, it contains references to the complete range of functions.

### 5.1 Configuration of system parameters in the Extras menu

To adapt multimes 1D4 to the system monitored, its parameters have to be configured.

- Press the F1 key eleven times, selecting the Extras menu.

Here, measuring modules connected and the firmware version of the display are shown.

You have access to the following functions:

- "Commi function" on page 22
- "Para function" on page 22

The menu navigation of the multimes 1D4-DS is self-explanatory. The operator is guided and supported by the device through operating instructions displayed for the respective situation.

## The following signs and abbreviations will be used in the display:

→	Scroll forward (through main menu or submenu)
←	Scroll backwards (through main menu or submenu)
↵	Return
→	Next measuring module
←	Previous measuring module
+	Value input
⊗	Select next screen
Para	Return for configuration
EDIT	Perform configuration
cosφ	Fundamental power factor
U PH-N	Voltage phase / neutral conductor
Freq.	Network frequency
PΣ	Active power – total (3-phase)
PQS Σ	Active power / reactive power / apparent power – total (3-phase)
YES	Confirmation to save configuration
NO	Discard configuration
SCAN	Scan mode (search mode) for module search
Firmware	Operating software of the measuring module or display module
1x3P	3-phase measurement
3x1P	single-phase measurement
IIIU	Measuring voltage transformer 1 / 2
III I	Main current transformer 1 / 2
LCD	LCD parameter (display module)
code	Password protection
reset	Reset function display

### 5.1.1 Commissioning function

With the commissioning start-up function, up to 10 measuring modules connected can be integrated.

- This includes:
- Password protection for configuration
  - Assigning names to individual measuring modules
  - Scan menu for reading in measuring modules connected
  - Removing measuring modules connected
  - Selection of single-phase or 3-phase measurements
  - Configuration of current transformer primary / secondary
  - Configuration of voltage transformer primary / secondary



#### Note

#### Single-phase or 3-phase measurement:

Ensure that you match the current transformer inputs to the correct measurement phases.

Each phase is recorded and displayed individually for both measurement methods.

For the single-phase totals of apparent, active and reactive power, the measured values of the individual phases are added.  
For 3-phase measurements, the total power values are calculated (3-phase current value).

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### 5.1.3 Para function

With the "para" configuration function, you can display the firmware version of the measuring modules connected, change the LCD settings and choose between English and German as the display language.

### 5.1.4 Consumption monitoring

In this operating mode, momentary measured values as well as continuous meters for active and reactive energy consumption can be read out directly at the display.



The respective module name is included on each screen, depending on the measuring module selected.

The following momentary values can be displayed:

1<sup>st</sup> screen: Voltage Ph-N for phase L1, L2 and L3 individually

2<sup>nd</sup> screen: Voltage Ph-Ph for phase L1-2, L2-3 and L3-1 individually

3<sup>rd</sup> screen: Apparent current for phase L1, L2 and L3 individually

4<sup>th</sup> screen: Total power for apparent, active and reactive power

5<sup>th</sup> screen: Apparent power for phase L1, L2 and L3 individually

6<sup>th</sup> screen: Active power for phase L1, L2 and L3 individually

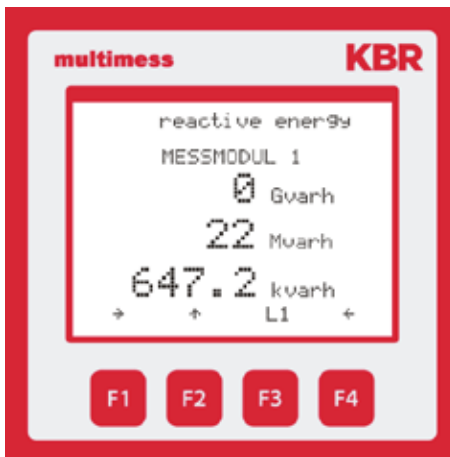
7<sup>th</sup> screen: Reactive power for phase L1, L2 and L3 individually

8<sup>th</sup> screen: Cosine Phi for phase L1, L2 and L3 individually

9<sup>th</sup> screen: Power frequency

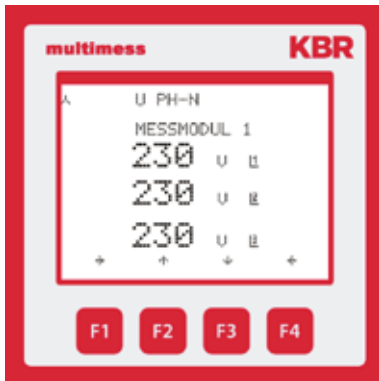
10<sup>th</sup> screen: Continuous energy meter for active energy consumption  
Continuous energy meter for reactive energy consumption

11<sup>th</sup> screen: Commissioning (Extras menu)  
LCD parameters



## 6 Menu overview

In this chapter, you will find a complete overview of all menus and menu items of the multimes.



Display of momentary measuring voltage for

Phase L1-N

Phase L2-N

Phase L3-N



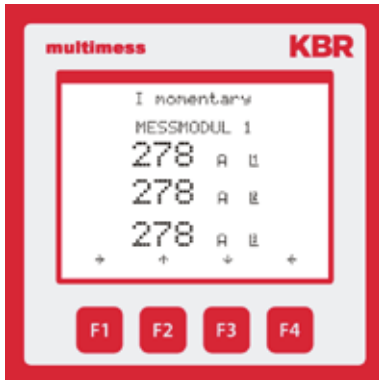
Display of momentary measuring voltage for

Phase L1-2

Phase L2-3

Phase L3-1



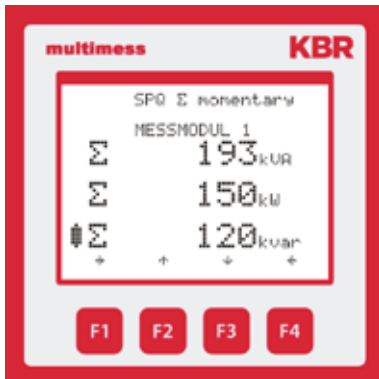


Display of momentary  
apparent current for

Phase L1

Phase L2

Phase L3

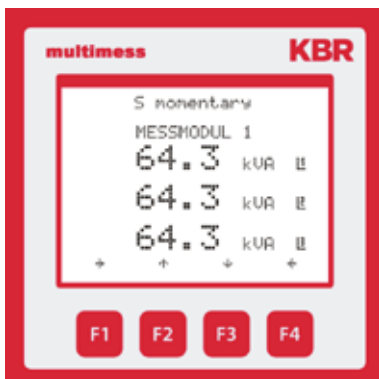


Display of total values of

Apparent power

Active power

Reactive power

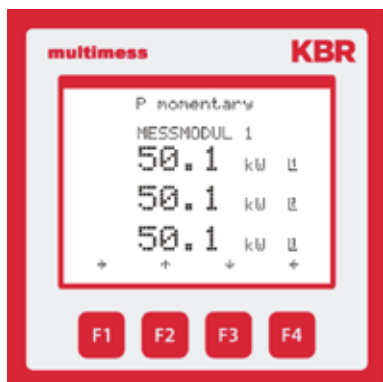


Display of momentary  
apparent power for

Phase L1

Phase L2

Phase L3

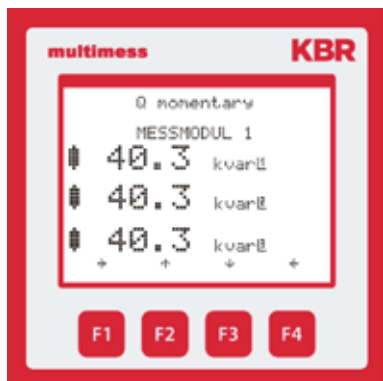


Display of momentary active power for

Phase L1

Phase L2

Phase L3

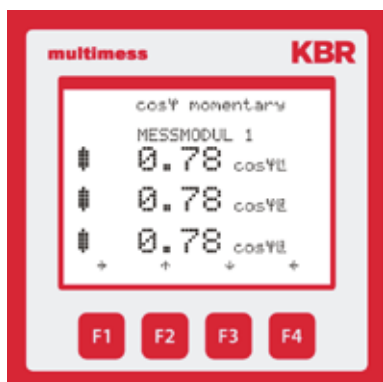


Display of momentary reactive power for

Phase L1

Phase L2

Phase L3



Display of momentary values of cosine Phi for

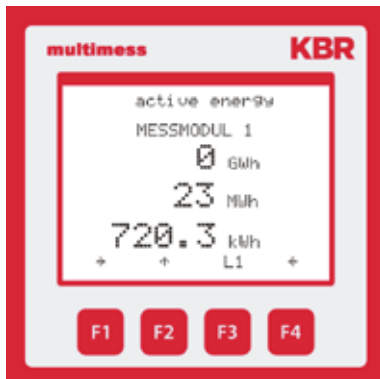
Phase L1

Phase L2

Phase L3

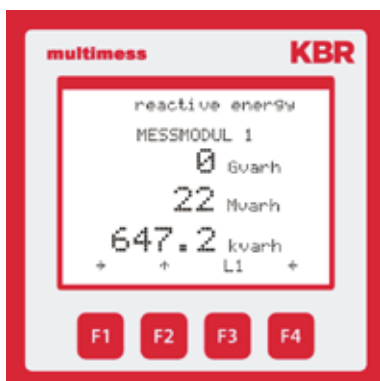


Display of momentary network frequency



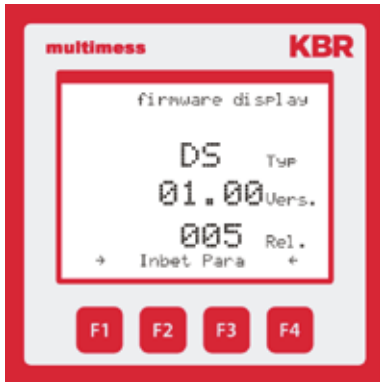
Display of the continuous energy meter for active energy (total value).

In the submenus (**F3**), the values of the individual phases can be seen.



Display of the continuous energy meter for reactive energy (total value).

In the submenus (**F3**), the values of the individual phases can be seen.



Display of the firmware version of the display.

Furthermore, the Commissioning and Configuration submenus are included.

## 7 Technical data

### 7.1 Technical data of the multimes 1D4 measuring module

#### 7.1.1 Measuring accuracy

Current	$\pm 0.5 \% / \pm 1$ digit
Voltage	$\pm 0.5 \% / \pm 1$ digit
Apparent power	$\pm 1 \% / \pm 1$ digit
Active power	$\pm 1 \% / \pm 1$ digit
Reactive power	$\pm 1 \% / \pm 1$ digit
Frequency	$\pm 0.1 \text{ Hz} / \pm 1$ digit

#### 7.1.2 Measuring principle

Reading	128 measured values per period
A/D converter	12 bit
Measurement of U and I	simultaneous recording of measured values for U and I;
Update speed (complete measuring cycle)	< 1 sec.
Harmonics calculation	DFT with 128 points over one period
Frequency measurement	Mode: Voltage measured between phase L1, L2, L3 – N

### 7.1.3 Device memory

Main and data memory		16kB RAM unbuffered
Program / parameter memory		256 kB Flash / 4kB EEP
Energy counter P+, P-, Q+, Q-		saved in EEP
Limit violation	Time for acquisition	8 min. for average current value, saved in RAM

### 7.1.4 Power supply

Measuring module power supply	50...230...280 VAC Ph-N, 3,2VA, 50/60 Hz, provided by the measuring voltage
Module bus power supply	ext. 24VDC, 0.3W, via RJ12 module bus connector

### 7.1.5 Hardware inputs and outputs

#### 7.1.5.1 Inputs

Measuring inputs for voltage	$U_{L1-N}; U_{L2-N}; U_{L3-N}$	3 x 50V...230V...280V AC, 50/60 Hz
	Input impedance	900 kOhm each (Ph-N)
Measuring inputs for current	$I_{L1}; I_{L2}; I_{L3}$	3 x 0,02A...5A...6A AC
	Power consumption	<_ 0.3 VA per input at 6A

#### 7.1.5.2 Outputs

Serial interface	Module bus	RS485 via RJ12 interface
	Baud rate	38400
	Addressing	Can be addressed using the display or visual energy (connection via multisio 3D2 ESBS gateway)

### 7.1.6 Electrical connection

Connection elements		Plug terminals
Permissible cross section of the connection lines		2.5 mm <sup>2</sup>
Measuring voltage inputs	Fuse protection	max. 6 A
Measuring current inputs	Fuse protection	NONE!!! Always short-circuit current transformer terminals k and l prior to opening the circuit!
Input control voltage		via measuring voltage
Module bus connection	Connection material	ready-made KBR system cable (6 pole modular cable, unshielded), max. length 30m if placed accordingly

### 7.1.7 Mechanical data

Busbar devices	Housing measurements	90 x 71 x 61 mm (H x W x D)
	Mounting type	Wall mounting on DIN rail 7.5mm deep, in accordance with DIN EN 50022 Suitable for distribution board mounting
	Weight	approx. 175g

### 7.1.8 Standards and miscellaneous

Environmental conditions	Standards and amendments	DIN EN 60721-3-3/A2: 1997; 3K5+3Z11; (IEC721-3-3; 3K5+3Z11)
	Operating temperature	-5°C ... +55°C
	Humidity	5% ... 95% non-condensing
	Storage temperature	-25°C ... +70°C
Electrical safety	Standards and amendments	DIN EN 61010: 2001 +B1: 2002; +B2: 2004
	Protection class	II
	Overtoltage category	CAT III: $U_{PH-PH}$ up to 400V
	Degree of protection	IP 20 DIN EN 60529:1991 +A1:2000
	Electromagnetic compatibility	DIN EN 61000-6-1: 2007, DIN EN 61000-6-2: 2005, DIN EN 61000-6-3: 2007, DIN EN 61000-6-4: 2007

## 7.2 Technical data of the multimes 1D4-DS display

### 7.2.1 Power supply

Power supply	ext. 24VDC, 1W, via RJ12 module bus connector
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### 7.2.2 Hardware inputs and outputs

Serial interface	Module bus	RS485 via RJ12 interface
	Baud rate	38400

### 7.2.3 Electrical connection

Module bus connection	Connection material	ready-made KBR system cable (6 pole modular cable, unshielded), max. length 30m if placed accordingly
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### 7.2.4 Mechanical data

Flush-mounted device	Housing dimensions	96 x 96 x 46 mm (H x W x D)
	Mounting cutout	92 x 92 mm (according to manufacturer's specifications)
	Protection type	Front IP 51
	Weight	approx. 175g



## 7.2.5 Standards and miscellaneous

Environmental conditions	Standards and subsequent amendments	DIN EN 60721-3-3/A2: 1997; 3K5+3Z11; (IEC721-3-3; 3K5+3Z11)
	Operating temperature	-5°C ... +55°C
	Humidity	5% ... 95%, non-condensing
	Storage temperature	-25°C ... +70°C
Electrical safety	Standards and subsequent amendments	DIN EN 61010-1/A2: 1996-05; (IEC1010-1/A2)
	Protection type	IP20 in accordance with DIN EN 40050 part 9: 1993-05
	Electromagnetic compatibility	DIN EN 61000-6-3: 2005-06; (IEC 61000-6-3) DIN EN 61000-6-2: 2000-03; (IEC 61000-6-2)

## 7.3 Protective measures

### 7.3.0.1 Overvoltage and lightning protection

It is recommended to install overvoltage protection measures to protect our high-quality devices from damage. We also recommend to protect control voltage inputs and pulse lines, if required.

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**ERKLÄRUNG DER KONFORMITÄT**  
**DECLARATION OF CONFORMITY**  
**DÉCLARATION DE CONFORMITÉ**

Wir **KBR GmbH Schwabach**

We/Nous (Name des Anbieters / supplier's name / nom du fournisseur)

**Am Kieferschlag 7**  
**D-91126 Schwabach**

(Anschrift / address / adresse)

erklären in alleiniger Verantwortung, dass das (die) Produkt(e) /  
declare under our sole responsibility that the product(s) / Déclarons sous notre seule responsabilité, que le(s) produit(s)

**multimes 1D4-BS**  
**multimes 1D4-DS**

(Bezeichnung, Typ oder Modell oder Seriennummer / name, type or model or serial number / nom, type ou modèle, N° de lot ou de série)

mit folgenden Europäischen Richtlinien übereinstimmt (übereinstimmen)  
is (are) in conformity with the following directives / Répond(e)nt aux directives suivantes

**Niederspannungsrichtlinie Nr.**

Low Voltage Directive No.  
Directive Basse Tension N°

**EMV-Richtlinie Nr.**

EMV Directive No.  
EMV Directive N°

**2006/95/EG**

2006/95/EC  
2006/95/CE

**2004/108/EG**

2004/108/EC  
2004/108/CE

Dies wird nachgewiesen durch die Einhaltung folgender Norm(en)

This is documented by the accordance with the following standard(s) / Justifié par le respect de la (des) norme(s) suivante(s)

**DIN EN 61010-1-2001;**

**DIN EN 61010-1/B1:2002**

**DIN EN 61010-1/B2:2004**

**DIN EN 61000-6-1:2007**

**DIN EN 61000-6-2:2005**

**DIN EN 61000-6-3:2007**

**DIN EN 61000-6-4:2007**

(Titel und/oder Nr. sowie Ausgabedatum der Norm(en))

Title and/or number and date of issue of the standard(s)

Titre et/ou numéro et date d'édition de la (des) norme(s)



**Schwabach, 12.07.2011**

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Place and date of issue

Lieu et date de l'édition



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