



Quick guide Technical parameters

multimax

Load management system

4D6



**Your partner for
network analysis**

Table of contents

1	Introduction	3
1.1	Manual	3
1.2	Intended use	3
1.3	Safety notes	4
1.4	Product liability	5
1.5	Disposal	5
2	Installation	6
2.1	Device memory, battery-buffered.....	6
2.1.1	Inserting or replacing the backup battery	6
2.2	Device installation.....	6
3	Connection diagram	8
4	Control and display panel	9
4.1	Description of buttons and displays, default settings, setting ranges.....	9
5	Technical data multimax 4D6	12
5.1	General technical data for additional modules	12
5.2	Technical data for multimax 4D6 basic module.....	13
5.2.1	Operating and display elements	13
5.2.2	Device memory	13
5.2.3	Power supply	14
5.2.4	Hardware inputs	14
5.2.5	Electrical connection.....	14
5.2.6	Hardware outputs	15
5.2.7	Mechanical data and dimensioned drawing of the basic module.....	15
5.2.8	Environmental conditions / electrical safety	16
5.2.9	Mechanical data for multimax 4F96-DS display.....	16

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1 Introduction

Thank you for choosing this KBR quality product. To familiarize yourself with device operation and configuration, we recommend you read this manual carefully. This will enable you to make use of the entire range of functions that this high-quality product offers.

The individual chapters serve to explain the technical details of the device and show how to properly install and start up the device to prevent damage.

1.1 Manual

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



Note

The more comprehensive version of the manual is available online from the service center at www.kbr.de.

Although the utmost of care has been taken in putting together this user manual, errors may still occur. We would be very grateful if you could notify us of any errors or unclear descriptions you may notice. The form included in the appendix to this manual can be used to send us your correction or improvement suggestions.

1.2 Intended use

This device helps you to optimize energy consumption and avoid expensive load peaks.

It assists you in monitoring the energy consumption of your consumers, enables you to make optimum use of your tariff and lower your energy costs permanently.

This device does not, however, render careful system planning indispensable. Moreover, it is essential that you take time to configure the device in line with your system parameters on start-up and carry out proper consumer shutdown planning.

Disclaimer

The contents of this user manual have been carefully reviewed with regard to the hardware and software described.

Nonetheless, deviations cannot be ruled out, and the manufacturer cannot guarantee 100% conformity. The specifications given in these operating instructions are reviewed on a regular basis; any corrections required will be included in the next revision.

1.3 Safety notes

In order to prevent operating errors, device operation is kept as simple as possible. This will enable you to start your device up quickly.

In your own interest, however, the following safety notes should be read carefully. The applicable DIN / VDE regulations must be observed for installation!

Power supply connection, setup and operation of the device must be performed by qualified personnel only. Qualified personnel as defined in the safety notes in this user manual are those authorized to set up, ground and mark devices, systems and circuits in accordance with applicable standards and regulations.

To prevent fire and electric shocks, 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 device nameplate.



Caution

A faulty connection can lead to the destruction of the device!

For device connection, the data given in the connection chart must be complied with (see "Connection chart") and there must be no voltage in the connection lines. When wiring, always ensure that all wiring material used is neither damaged nor defective and that the polarity is correct!

In order to ensure proper and safe product operation, it must be transported, stored, installed and assembled in accordance with the specifications, as well as carefully operated and maintained.

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 our service team. Opening the device unauthorized shall render your warranty null and void. Correct operation can no longer be guaranteed!

Opening the device may expose live parts. Capacitors in the device may still be under load, even if the device has been disconnected from all voltage sources. Open devices must not be operated!

Systems that are at risk from lightning strikes must feature lightning protection for all input and output lines!

1.4 Product liability

You have purchased a high-quality product. Only components of the highest quality and maximum reliability are used.

Each device is subject to long-term testing before it is delivered.

For details on product liability, please refer to our general terms and conditions for electronic equipment, which you can find at **www.kbr.de**.

Warranty device properties apply only if the device has been operated in accordance with its intended use!

1.5 Disposal

Defective, outdated or disused devices must be properly disposed of.

If required, we are happy to dispose of the devices for you.

2 Installation

2.1 Device memory, battery-buffered

The device is equipped with an internal data memory which is battery buffered to preserve long-term data. To prevent it from being discharged, this backup battery (e.g. Varta CR 2032) is not built in when the device is delivered, but included separately in the delivery. Before the initial start-up of the device, please insert the backup battery first (as described in the following), as otherwise any stored data would be lost in the event of power failure.

2.1.1 Inserting or replacing the backup battery

1. Disconnect the device from the supply voltage.
2. Lift the upper housing cover using a suitable tool (e.g. a small screwdriver).
3. When replacing a battery, remove the empty battery from the clamping bracket using the tool.
4. Push the new battery into the clamping bracket and make sure that it is inserted correctly and has the right polarity.
5. Replace the upper housing cover and click it back into place.
6. Reconnect the device to the supply voltage.



Caution

When the battery is empty or has been removed, there is no supply voltage. In this case, not only the storage data is lost, but the time settings have to be reset as well!

2.2 Device installation

The applicable DIN / VDE regulations must be observed for installation!

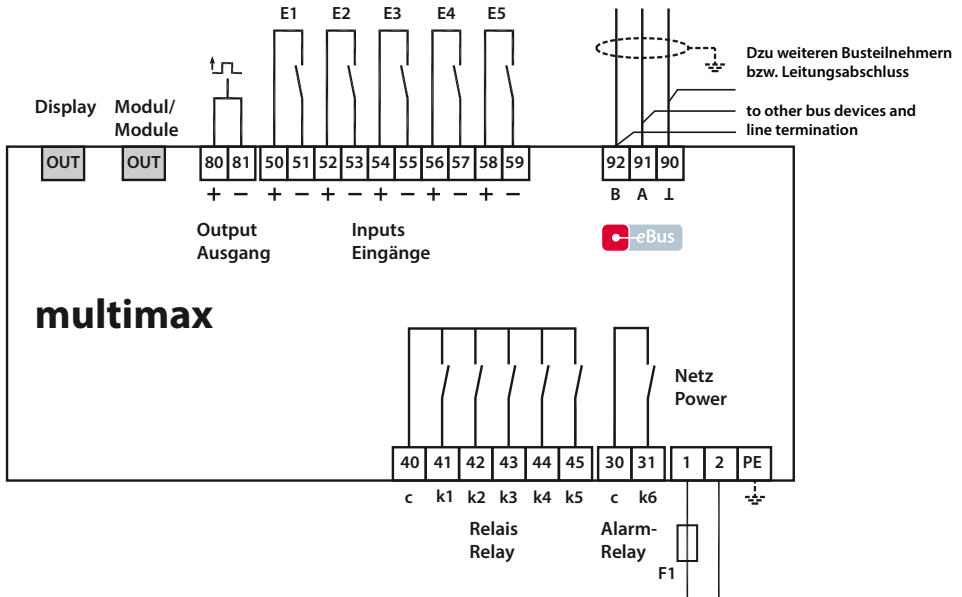
Before the device is connected to the power supply, check whether the local power supply conditions comply with the specifications on the nameplate. A faulty connection may destroy the system!

The device must be connected in accordance with the connection diagram. For energy and synchronous pulse input, the correct polarity must be observed (contact your energy supplier).

Systems that are at risk from lightning strikes must feature lightning protection 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).

Terminals 1 (L) / 2 (N) and PE	Power supply connection. Auxiliary voltage is required for device operation. For technical data, please refer to the nameplate.
Terminals 90 (earth), 91 (A) and 92 (B)	Interface connection for communication at the energy bus
Terminal 40 (C)	Supply voltage connection to the relay output terminals 41 to 45 The relays for the control outputs share the same connection to the supply voltage.
Terminals 41 (k1) to 45 (k5)	Non-floating relay contacts These contacts serve as control outputs. In the currentless state of the device, the contacts are open for stages that are not hooked up. Maximum switching capacity of 2A at 250V AC.
Terminal 30 (C)	Supply voltage connection to the relay output terminal 31 (k6)
Terminal 31 (k6)	Floating relay contact. This contact serves as a message or alarm output. During operation, an audible or visual message may be activated or a consumer switched off. The contact is open as long as the device is dead as well as when there is an active message. Maximum switching capacity 2A at 250V AC.
Terminals 80 and 81	Digital output
Terminals 50 to 59	Digital inputs, e.g. for pulse counter

3 Connection diagram



Klemmenbelegung

lt. Werkseinstellung

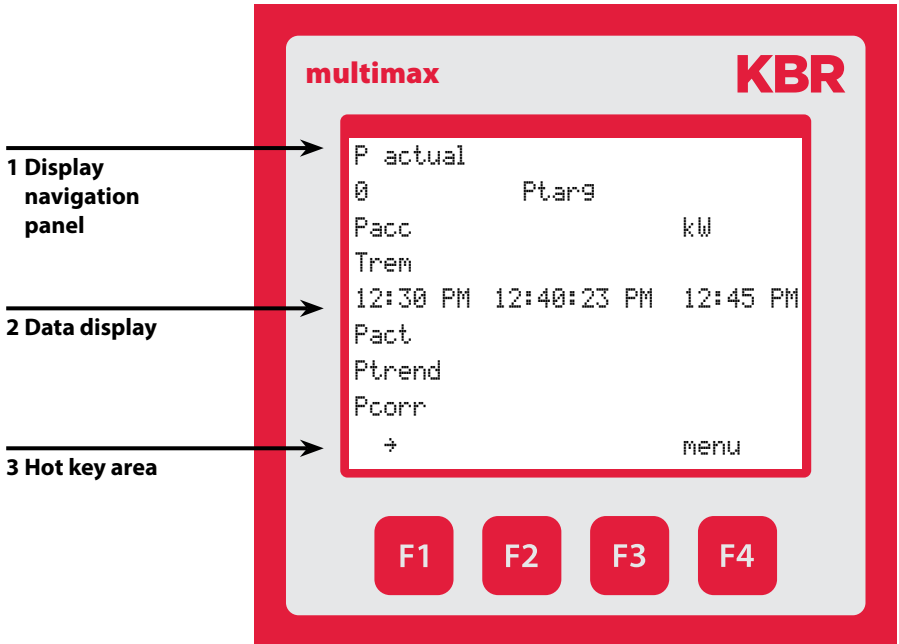
- tn = Digitalausgang
- E1 = Zählereingang 1
- E2 = Zählereingang 2
- E3 = Sollwert-umschalteingang
- E4 = Tarif-Umschalteingang
- E5 = Messperioden-Synchroneingang
- 40 = Schaltspannung
- 41 = Relaisausgang Linie 1
- 42 = Relaisausgang Linie 2
- 43 = Relaisausgang Linie 3
- 44 = Relaisausgang Linie 4
- 45 = Relaisausgang Vorwarnkontakt

Terminal assignment

in acc. with factory settings

- tn = Digital output
- E1 = Counter input 1
- E2 = Counter input 2
- E3 = Target value switchover input
- E4 = Tariff change input
- E5 = Measuring periods synchronous pulse input
- 40 = Control voltage input
- 41 = Relay output line 1
- 42 = Relay output line 2
- 43 = Relay output line 3
- 44 = Relay output line 4
- 45 = Relay output prewarning contact

4 Control and display panel



4.1 Description of buttons and displays, default settings, setting ranges

1 Display navigation panel

The navigation panel shows the main menu selected, considerably simplifying device operation.

The operator can immediately see what menu he is in.

2 Unit display

The DOT matrix display is normally used to show measured values.

In some submenus, this display area is used to show additional information to assist operation.

3 Hot key area

The text line corresponds to the function keys below it and is used to issue messages and text. The interaction between key and corresponding display ensures user-friendly and self-explanatory operation.

I/O parameters		Basic module	Function	
Inputs	E01	Pulse counter		Terminals 50 and 51
	E02	Pulse counter		Terminals 52 and 53
	E03	Setpoint switching input	NO contact	Terminals 54 and 55
	E04	Tariff switching input	NO contact	Terminals 56 and 57
	E05	Measuring interval synchronous input	NO contact	Terminals 58 and 59
Outputs	A01	Relay output		Terminals 40 and 41
	A02	Relay output		Terminals 40 and 42
	A03	Relay output		Terminals 40 and 43
	A04	Relay output		Terminals 40 and 44
	A48	Early-warning contact relay output	NO contact	Terminals 40 and 45
A49	Alarm relay		NC contact, currentless and open in the event of errors	Terminals 30 and 31
A50	Digital output	Digital output	Digital output	Terminals 80 and 81
Module number Input number	M00.1	Pulse counter E 01	Inverse	No
			t Pact => 0	0 sec.
			Pulse value	1 p/kWh
			U primary	1V
			U secondary	1V
			I primary	1A
I secondary	1A			

Module number Input number	M00.2	Pulse counter E 02	inverse t Pact => 0 Pulse value U primary U secondary I primary I secondary	no 0 sec. 1 p./kWh 1V 1V 1A 1A
	M00.3	Digital setpoint switching input	E 03	not inverse
	M00.4	Tariff switching input	E 04	not inverse, HT, if active = LT
	M00.5	Synchronous input	E 05	not inverse
	M00.6	Relay output	A 01	not inverse, relay group 0
	M00.7	Relay output	A 02	not inverse, relay group 0
	M00.8	Relay output	A 03	not inverse, relay group 0
M00.9	Relay output	A 04	not inverse, relay group 0	
M00.10	Relay output early-warning contact	A 48	not inverse, relay group 0	
M00.11	Alarm relay	A 49	Inverse	
M00.12	Digital output	A 50	not inverse, relay group 0	

5 Technical data multimax 4D6

5.1 General technical data for additional modules

Power supply:	via module bus	24VDC / approx. 2W for multimes 1D4 only for the interface RS485 24VDC / ca. 0.3 W
	Connection	Modular connector RJ12 6P6C
Module bus interface:	Serial interface	RS485
	Module bus connection	RJ12 for ready-made KBR system cable, max. length 30 m when placed suitably
	Transmission speed	38400 Bps
	Bus protocol	KBR module bus

Mechanical data (for all models except for multisio 1D4-4RO-ISO and multimes 1D4):

Top hat rail device	Housing dimensions	90 x 36 x 61 mm (H x W x D)
	Mounting type	Wall mounting on DIN rail 7.5 mm deep, in accordance with DIN EN 50022. Suitable for distribution board mounting
	Weight	approx. 100g

Mechanical data multisio 1D4-4RO-ISO:

Top hat rail device	Housing dimensions	90 x 71 x 61 mm (H x W x D)
	Mounting type	Wall mounting on DIN rail 7.5 mm deep, in accordance with DIN EN 50022. Suitable for distribution board mounting
	Weight	approx. 130g

Mechanical data multimes 1D4:

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

Standards and miscellaneous:		
Ambient conditions:	Standards	DIN EN 60721-3-3/A2: 1997-07; 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	DIN EN 61010-1/A2: 2001 + B1: 2002-11 + B2: 2004-1; (IEC1010-1/A2)
	Protection type	IP20 in accordance with DIN EN 40050 part 9:1993-05
	Electromagnetic compatibility	DIN EN 61000-6-3: 2001 + A11: 2004; (IEC61000-6-3) DIN EN 61000-6-2: 2001 (IEC61000-6-2)

5.2 Technical data for multimax 4D6 basic module

5.2.1 Operating and display elements

Operation	Pushbutton for reset and scan mode (accessible after housing cover removal)
Control display	6 green LEDs: 5 x input status, 1 x operating status

5.2.2 Device memory

Energy, data and program memory	2 MB RAM battery-buffered/ 256k Flash
Memory type	Ring buffer
Long-term memory for max. 160 days, min. 64 hours, depending on memory configuration	Load profile memory: Maximum of 4*3840 entries; 60 / 30 / 15 / 1 min. interval duration
Event memory	A maximum of 4096 entries to record tariff switching commands, mains failures, error messages etc.
Parameter memory	non volatile
Switching operation memory	maximum 2450 entries
Operating logbook	maximum 512 entries
Time programs	maximum 512 entries
Password memory	4-digit code

5.2.3 Power supply

Power supply	85 to 265V AC/DC; 50/60Hz
Power consumption	15 VA

5.2.4 Hardware inputs

Digital inputs	As pulse counter input 1 to 5	Digital input for floating contact, S_0 compatible, pulse length ≥ 30 ms
	As status input	Digital input for floating contact, S_0 compatible, e.g. to synchronize the measuring interval; pulse length ≥ 250 ms

5.2.5 Electrical connection

Connection elements		Screw terminals
Max. permissible connection line cross-section		2.5 mm ²
Input power supply	Fuse protection	F1: Recommended: 1A slow-blowing < fuse < 4 A slow-blowing
KBR eBus connection	Connection material	For proper operation, use shielded twisted-pair cables only, e.g. I-Y(St)Y 2x2x0.8
Pulse inputs	Connection and cables	Ensure proper polarity!
Synchronous input	Connection and cables	Ensure proper polarity!
KBR eBus connection	via RS485	Terminal 90 (L) Terminal 91 (A) Terminal 92 (B)

5.2.6 Hardware outputs

Interface	Serial interface	RS 485 for connection to the KBR eBus; a maximum of 32 devices per bus segment, up to 1000 m without bus repeater if placed suitably. For additional information, see KBR eBus installation guide.
	Transmission speed	38,400 baud
	Bus protocol	KBR eBus
	KBR eBus address assignment	Can be addressed up to address number 9999, scan mode can be activated on the device
Module bus interface	Serial interface	RS 485 (RJ12) for ready-made KBR system cable (modular cable)
Display and configuration interface	Serial interface	RS485 (RJ12)
Relay outputs	Switching stages	5 relays
	Switching capacity	250V (AC) / 2A per relay, potential depending on shared connection
Alarm relay	Switching capacity	250V (AC) / 2A potential-free
1 digital output	S ₀ compatible	max. 35V / 50mA

5.2.7 Mechanical data and dimensioned drawing of the basic module

Top hat rail device	Housing dimensions	90 x 106 x 61 mm (H x W x D)
	Mounting type	Wall mounting on DIN rail 7.5 mm deep, in accordance with DIN EN 50022; suitable for distribution board mounting
	Weight	approx. 650g

5.2.8 Environmental conditions / electrical safety

Ambient conditions	Standards	DIN EN 60721-3-3/A2: 1997-07; 3K5+3Z11; (IEC721-3-3; 3K5+3Z11)
	Operating temperature	-5°C ... +55°C
	Humidity	5% ... 95%
	Storage temperature	-25°C ... +70°C
Electrical safety	Standards and amendments	DIN EN 61010-1: Aug. 2002 (IEC1010-1/A2)
	Protection class	I, in accordance with DIN EN 61010-/August 2002
	Overvoltage category	CAT III: Relay CAT II
	Protection type	IP20 in accordance with DIN EN 40050 part 9: 1993-05
	Electromagnetic compatibility	DIN EN 61000-6-2: 2000-03; (IEC 61000-6-2) DIN EN 61000-6-3: 2000-03; (IEC 61000-6-3); 2005 - 06

5.2.9 Mechanical data for multimax 4F96-DS display

Power supply:	via module bus	ext. 24VDC, 1W,
	Connection	Module bus connector RJ12
Serial interface:	Module bus	RS485 via RJ12 interface
	Baud rate	38,400
Module bus connection	Connection material	ready-made KBR system cable (6-pole modular cable, unshielded), max. length 30m if placed suitably

Mechanical data:

Switchboard installation	Housing dimensions	96 x 96 x 46 mm (H x W x D)
	Assembly cut-out	92 x 92 mm (according to manufacturer's specifications)
	Protection type	Front IP 51
	Weight	approx. 175g

Standards and miscellaneous:		
Ambient conditions:	Standards	DIN EN 60721-3-3/A2: 1997-07; 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	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



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**Am Kieferschlag 7
D-91126 Schwabach**

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EMV-Richtlinie Nr.
EMV Directive No.
EMV Directive N°

2004/108/EG
2004/108/EC
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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, 27.05.2014

(Ort und Datum der Ausstellung)
Place and date of issue
Lieu et date de l'édition

Geschäftsführer
General manager



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KBR Kompensationsanlagenbau GmbH

Am Kiefernschlag 7
D-91126 Schwabach,
Germany

P +49 (0) 9122 6373-0
F +49 (0) 9122 6373-83
E info@kbr.de

www.kbr.de