KBR
Energy Management

Operating Instructions
Technical Parameters

multisio

ebus

4D6-ESBS-5DI6RO1DO

Electronic impuls metering device

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Dear Customer

We would like to thank you for choosing a KBR GmbH quality product.

In order to familiarize yourself with the operation and programming of the device and always be able to use the whole functionality of this high-quality product, we recommend that you read this manual thoroughly.
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.

The 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 manual, we would like to thank you in advance for notifying us about any errors or ambiguous descriptions that might be in it. You will find a form for corrections in the appendix.

Sincerely,

KBR GmbH Schwabach

Safety Precautions

This manual contains notes that must be observed for your personal safety and to avoid damage to equipment. Notes are identified by a warning sign or an info symbol according to the degree of hazard they represent.

Danger

means that death, major injuries or damage **will** occur in case the appropriate safety measures are not performed.

Warning

means that death, major injuries or damage **may** occur in case the appropriate safety measures are not performed.

Caution

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

Note

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

Disclaimer

The contents of this manual has been checked with the described hardware and software components. Certain deviations, however, cannot be excluded, so the manufacturer is not liable for complete conformity. The specifications made in this manual are checked on a regular basis, necessary corrections are included in the next revision.
We appreciate your corrections and comments.

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Subject to change

General Safety Precautions

In order to prevent operating errors, handling of the device is kept as simple as possible. This way, you will be able to use the device very soon.

In your own interest, however, you should read the following safety precautions carefully.

⚠ Warning

During installation, the applicable DIN / VDE regulations must be observed!

Mains connection, setup and operation of the device must only be performed by qualified personnel. Qualified personnel as understood in the safety precautions of this manual are persons authorized to setup, ground and mark equipment, systems and wiring systems in accordance with applicable standards.

To avoid the hazard of fire and electrical shock, the device must not be subjected to rain or other humidity!

Before the device is connected to the mains, you will have to check whether the local mains conditions comply with the specifications on the manufacturer's label. A wrong connection may destroy the device!

When connecting the device, the connection chart must be observed (see chapter "Connection chart") and the connection lines must be powerless. Only use proper line material and watch the correct polarity when wiring!

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

A device showing visible damage must by all means be considered as unfit for operation and must be disconnected from the mains!

Error detection, repairs and maintenance work may only be carried out in our facilities or after contacting our service team. Every warranty obligation of the manufacturer expires if the device is opened without written consent from our service team. Proper operation can no longer be guaranteed!

Opening the device may expose parts under voltage. Capacitors in the device may still be loaded even if the device was disconnected from all voltage sources. It is generally not allowed to operate the open device!

In facilities subject to hazard of lightning, lightning protection must be provided for all input and output lines (recommendations see chapter "Protective measures")!

Product Liability

With these product, you have acquired a 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.

For information on product liability, please refer to our General Terms and Conditions for electronic devices**.**

The warranted properties of the device apply only if it is operated in accordance with its intended use!

Disposal

Please dispose of defective, outdated or no longer used devices properly.
At your request, we will be pleased to dispose of the devices for you.

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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.

> **Caution**
>
> **Before the initial commissioning of the device, please insert the backup battery first (as described in the following), as otherwise all storage data would be lost in case of a power failure.**

Inserting or replacing backup battery:

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

> **Caution**
>
> **As, when the battery is empty or removed and there is no supply voltage, not only the storage data are lost but the time is not correct anymore either, the time has to be reset in Visual Energy with the corresponding command!**

Caution!
Danger of short-circuit:
Adjustment screwdriver recommended!
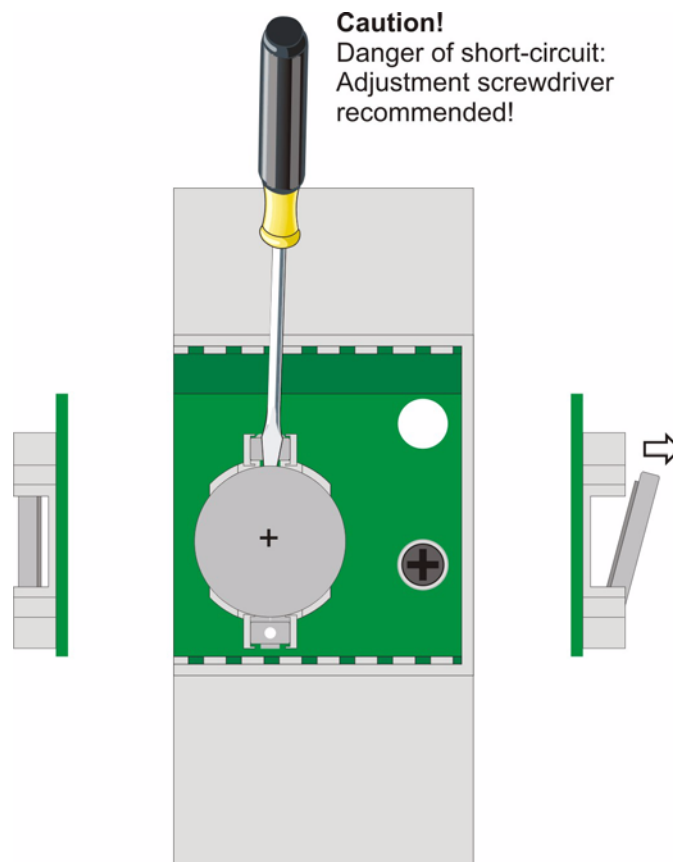
2 Definition of Terms

Below you will find brief explanations of the terminology used in this manual.

Firmware:	Operating system software implemented in the microcontroller of the **multisio 4D6-ESBS-5DI6RO1DO.**
Load profile memory:	Saves the actual values of the measuring periods with timestamp.
Measuring period max:	The measuring period containing the highest (maximum) value that occurred.
Period value	Cumulated value within a measurement period.
Measuring period:	Refers to the period of time used to form average values. Typical intervals: e.g. 15, 30, 60 minutes.
DIN rail:	Top hat rail / mounting rail acc. to DIN EN 50022

3 Implementation/Function

The **multisio 4D6-ESBS-5DI6RO1DO** is the central storage module for the multiso signal detection system. It can record pulses from different pulse generators via five S_0 compatible inputs. The input pulses for each input are added together and divided into measuring periods, given a time stamp and stored in an internal ring buffer. For a measuring period duration of 15 minutes this results in a recording duration of 40 days. A synchronous pulse input is available for direct synchronization, and can be addressed via a floating contact. The floating error message contact of the **multisio 4D6-ESBS-5DI6RO1DO** can be used to monitor errors and passed on to a central process control, for example (selectable via a KBR eBUS NC or NO contact). The additionally available four floating relay outputs can be assigned to KBR eBUS relay groups and used as NC or NO contacts (selectable via KBR eBUS).

Furthermore, the device is equipped with a module bus interface for connection of up to five additional modules.

The following modules are available:

- **multisio 2D2-BS-4DI**
  The module disposes of four **S_0-compatible** digital inputs.

  Function: If a switch connected to the digital input is closed, the module detects it as active. An open switch is detected as passive.

  The module can be addressed by a master device (**multisio 4D6-ESBS-5DI6RO1DO**) via module bus. The master device has to configure the module and read out the data acquired by the module for further processing.

  The **multisio 2D2-4DI** manages the digital inputs using two selectable methods. Each input can be configured individually as a pulse counter input or state controlled input.

- **multisio 2D2-4RO**
  The module disposes of four non-floating relay outputs..

  Function: The relays for the control outputs share the same connection to the supply voltage. These contacts serve as control outputs or signal outputs. In a currentless state of the device, the contacts are opened for stages that are not hooked up. Maximum switching capacity of 2A at 250V AC. The module can be addressed by a master device (**multisio 4D6-ESBS-5DI6RO1DO**) via module bus. The master device has to configure the module. Each output can be used individually as alarm output, message output for limit violations or digital output (assigned to an KBR eBUS –relay group).

Two-tariff counter function (HT/LT)

The consumption during the various tariff periods is stored separately. Switching between the tariff periods is done either via a digital input, by the KBR eBUS (centrally from the Multimaster or the computer), or through the internal clock.

Configurable pulse inputs

The five configurable pulse inputs, implemented as an S0 interface, can process pulses from pulse generators up to an input frequency of 16 Hertz (minimum pulse length 30 ms, pulse/idle time ratio 1:1). All five pulse inputs can be configured independently. Both the pulse value (number of pulses per unit) and the unit itself (pulse/ kWh, pulse/l, pulse/m3, pulse/hPah or pulse/unit) can be configured. The cycle duration and the tariff can be stored in the energy type (current or similar). These functions are available via the KBR eBUS.
Each pulse is visualized by a flashing LED.
Furthermore, the pulse inputs can optionally be used as a digital input (status display), synchronous pulse input or for tariff switching.

Configurable pulse output (pulse totalizer)

The configurable pulse output, implemented as an S0 interface, can process pulses from pulse totalizers up to an input frequency of 16 Hertz (minimum pulse length 30 ms, pulse/idle time ratio 1:1). You can total or subtract up to 9 pulse inputs (5 at the basic module + 1 expansion module). If the module bus is extended via (multisys) gateway, even remote counters can be totaled. If only one pulse input is selected as source, this at the same time enables pulse extension via KBR eBUS. In this case, observe the following: Input pulses are recorded up to a maximum frequency of 20 Hz. However, output pulses are emitted with a maximum of 16 Hz. Due to the pulse value adaptation, this is however no real limitation in practice.
Configuration is performed via the KBR eBUS.

Recording of operating hours

It is possible to record the operating hours using the input status. For this purpose, a limit is configured, which has to be exceeded or fallen below for the recording to be activated. This configuration is also performed via the KBR eBUS.

Serial port for connection to the KBR eBUS

In its default configuration, the **multisio 4D6-ESBS-5DI6RO1DO** has a serial port (RS485) for operation with the KBR eBUS.
Configuration of the unit, as well as reading out the instantaneous or storage data, is possible exclusively via the KBR eBUS.

Extensive memory functions

The **multisio 4D6-ESBS-5DI6RO1DO** has extensive memory functions:

- **Cycle memory** for recording cumulated input pulses (separate for each input)
- Memory for **daily values** for 365 days (separate for each input), sorted by tariff and total
- Memory for the **Measuring period maximum** of the previous month (separate for each input), sorted by tariff
- Memory for the **consumption** of the current month (separate for each input), sorted by tariff
- Memory for the **consumption** of the previous month (separate for each input), sorted by tariff

- **Event memory** (4096 entries), for logging actions of the **multisio 4D6-ESBS-5DI6RO1DO** such as mains failures, tariff switching actions, delete functions and many more.
- Operation log for logging events caused by the device operation (with timestamp). In detail:

  - Each address assignment (date and new address)
  - Each parameter change (date and "parameter change")
  - Activation and deactivation of the project parameter protection (date and "PPP activated" / "PPP deactivated")
  - Each supply voltage loss and return (date and event).

User-specific and device-specific events (limit violations, switching operations, errors etc.) are not recorded in the operation log, but in the event memory.

These memory functions are exclusively available via the KBR eBUS.

Synchronization

For synchronization of the load profile memory, each digital input can be optionally configured in the multiso. Here, you can for example connect the synchronization signal of the energy supplier. Synchronization can also be controlled centrally via the KBR eBUS.

Tariff switching

For tariff switching, each digital input can be optionally configured in the multiso. Here, you can for example connect the tariff switching signal of the energy supplier. Tariff switching can also be controlled centrally via the KBR eBUS or via internal clock (refer to chapter **Two-tariff counter function**).

Software (necessary to configure and read the memory)

The Visual Energy product family is available to you for comfortable programming and storage of long-term data.

For questions on this device or on our software products please don't hesitate to contact us. We will be glad to assist you.
Please see the cover sheet of this manual for your contact.

4 Connecting the multisio 4D6-ESBS-5DI6RO1DO

4.1 Installation and Assembly

The **multisio 4D6-ESBS-5DI6RO1DO** housing has been designed for wall mounting on 35 mm DIN rail. The module is snapped on the mounted DIN rail.
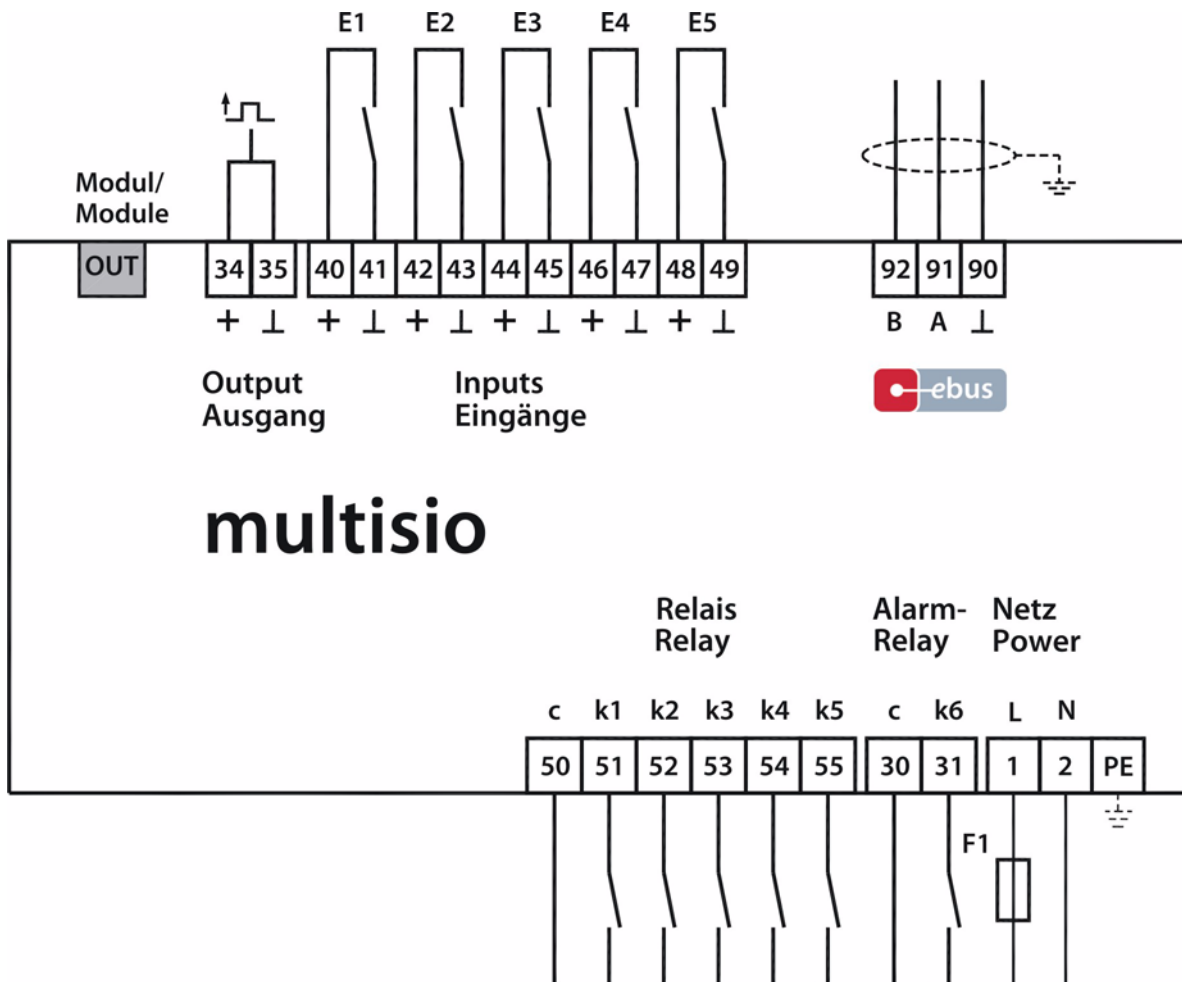
> **!** **Caution**
>
> **The control voltage of the device must be protected by means of a back-up fuse.**

During installation, please also observe our notes on safety measures against overvoltage and lightning in the chapter "Protective Measures" of this manual.

4.2 Connection diagram

4.3   Terminal assignment

Terminals 50 and 51:	**Relay contact, switching capacity 250V(AC) / 2A**
Terminals 50 and 52:	**Relay contact, switching capacity 250V(AC) / 2A**
Terminals 50 and 53:	**Relay contact, switching capacity 250V(AC) / 2A**
Terminals 50 and 54:	**Relay contact, switching capacity 250V(AC) / 2A**
Terminals 50 and 55:	**Relay contact, switching capacity 250V(AC) / 2A**

Terminals 30 and 31:   **Floating relay contact, switching capacity 250V(AC) / 2A**

To pass on malfunction messages, e.g. to a master central process control.

Terminal   1 (L) / 2 (N) and PE: **Connection power supply**

The device can be operated with a voltage from 85V to 265V AC/DC 50/ 60 Hz.

Terminal   34 (+) and 35 (-):   **Pulse output for pulse totalizer**

Terminal   40 (+) and 41 (-):   **Counter input 1**
A floating contact of a pulse generator can be connected to this input

Terminal   42 (+) and 43 (-):   **Counter input 2**
A floating contact of a pulse generator can be connected to this input

Terminal   44 (+) and 45 (-):   **Counter input 3**
A floating contact of a pulse generator can be connected to this input

Terminal   46 (+) and 47 (-):   **Counter input 4**
A floating contact of a pulse generator can be connected to this input

Terminal   48 (+) and 49 (-):   **Counter input 5**
A floating contact of a pulse generator can be connected to this input

Terminal   92 (B)   **Bus connection**

91 (A)   For communication at the KBR eBUS

90 (ground):

Out   **Module bus connection**
for communication with expansion modules

5 Commissioning

5.1 LEDs

LED „Power"   This LED lights up when the power supply of the device is connected. The device can be operated with a voltage from 85V to 265V.

LED „1 - 5"   This LED always **flashes** when the corresponding **pulse input** is active.

5.2 Reset

Note

Reset procedure:

Disconnect the device from supply voltage.
Remove the cover using a suitable screwdriver for the four indentations provided.
Press the button on the right beneath the memory battery and keep it depressed.
Switch on the supply voltage again.
The LEDs remain lit up.
After the button has been released, the device is back in its default state; data and parameter memory are deleted.

5.3 Default settings after reset

Pulse significance counter channels 1 to 5	1 pulse / unit
Energy form counter channels 1 to 5	Current
Measuring period duration counter channels 1 to 5	15 min.
Assignment of counter channels 1 to 5	Main module, lines 1 to 5
Synchronization type counter channels 1 to 5	internal
Operating hours counter counter channels 1 to 5	No assignment, make contact logic
Inputs channels 1 to 5	No assignment, make contact logic
Relay outputs 1 to 5	Main module, lines 1 to 5, make contact logic, no relay group assignment
Daylight saving time	from March to October
Energy form of the ext. synchronous input	Current
Logic of the ext. synchronous input	Make contact logic
Tariff switching	via bus
Tariff	HT
Default setting for tariff switching over time by internal clock	Start time: 00:00:00 for LT start End time: 00:00:00 for LT end
All measurements	Restart
Data storage	Deleting all data memories
Measuring period memory	Deleting all entries
Alarm relay	Error message dialog completely set, break contact logic
Password	Basic setting 9999 device can be accessed

Unchanged by a RESET
Bus address and time

5.4 Basic configuration when delivered

All settings are applied according to the factory defaults acc. to Chapter 4.3.

Bus address	0000

5.5 Enabling the scanning mode on the device

Remove the cover using a suitable screwdriver for the four indentations provided.
Hold down the button on the right beneath the memory battery for approx. 3 seconds.
The LED's flash.
During this phase it is possible to assign an address via the KBR eBUS PC
software. Details of this can be found in the user manual for the corresponding PC software.
After the address has been successfully assigned, the device goes into normal operation.

6 Storage

6.1 Device settings

All device settings and parameter data for storage utilization are stored in the device.

6.1.1 Long-term memory

The **multisio 4D6-ESBS-5DI6RO1DO** offers the user the long-term memory described in the following section.

6.1.1.1 Cycle memory

The **multisio 4D6-ESBS-5DI6RO1DO** has a cycle memory that can record max. 5x3840 entries, depending on the measuring period selected by the user (possible period values 60 / 30 / 15 / 1 minutes). This means that a period of 60 min. results in a storage duration of 160 days max.
The measuring period can be programmed via the PC using the optionally available software.

When all 5 additional modules are connected, the cycle memory is increased to a total of 25 x 3840 entries.

> **ⓘ Note**
>
> **Setting the device-internal clock:**
> **If the clock** <u>time</u> **of the multisio 4D6-ESBS-5DI6RO1DO is adjusted by less than the duration of one period, the measurement for the instantaneous period is finished at the next synchronization event and saved.**
> **If the time of the multisio 4D6-ESBS-5DI6RO1DO is moved back by more than the duration of one period, the load profile memory is deleted and restarted.**
> **In both cases, a clock adjustment event is created and saved in the event memory.**
>
> **Adjusting the period duration**
> **If the** <u>period duration</u> **is adjusted, the load profile memory is deleted and restarted. An adjustment event (adjustment of the period duration) is created and entered in the event memory.**

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6.1.1.2 Event memory

The event memory saves 4096 events with date, time and status in a ring buffer.

The following events are acquired:

Event	Acquisition
Tariff switching (via KBR eBUS)	Switchover signal => HT with date and time Switchover signal => LT with date and time
Sync input	Signal pulse with date and time
Mains failures	with date, time and duration of the mains failure
Error	Error type with date and time
Changed settings / deletions	e.g. reset via KBR eBUS / set clock / deletions / general parameter changes

Note

The described memories can only be read or parameterized via the KBR eBUS by means of optionally available software (e.g. Visual Energy).

6.1.2 Measuring period synchronization

The measuring period synchronization of the **multisio 4D6-ESBS-5DI6RO1DO** can be performed in four different ways. The measuring period synchronization is dependent on the energy form of the sync input on the **multisio 4D6-ESBS-5DI6RO1DO** and on the energy form of the individual inputs. This means that for example only those inputs are synchronized that have the same energy form as the sync inputs on the device.

The following 4 types of synchronization are possible:

6.1.2.1 Synchronization only by internal clock.

The synchronization by internal clock is started with the manufacturer's reset. From this starting time the clock synchronizes the measuring cycle every 15 minutes, irrespective of the energy form of the inputs. If the set period duration is in accordance with the 60 minute pattern, the synchronization time is always 00:00 (hh:mm).

6.1.2.2 Synchronization by the energy supplier's synchronous pulse.

If the synchronous pulse is available as floating contact from the energy supplier, it can be connected to the synchronization input. If the contact closes for at least 250 ms it is detected as a synchronous pulse and the measuring period of the input that has the same energy form as the synchronization input is restarted.

Under certain operating conditions, the energy supplier may carry out an intermediate synchronization while a measuring period is still running. The **multisio 4D6-ESBS-5DI6RO1DO** terminates the instantaneous period measurement and saves the period value together with a time stamp.

Example:
Period duration is set to 15 min
   i.e. 20 kW input power results in a period value of 20 kW (15 min period)
   if there is an intermediate synchronization 3 min after period start and this 3 min period is saved,
   the period value to be recorded will be 4 kW.
If the energy supplier's synchronous pulse does not take place, the error message **External synchronous pulse missing** will be displayed and the internal clock will continue with the time pattern.

6.1.2.3 Synchronization by KBR eBUS

Synchronization is carried out via a telegram created either by the PC or by the MULTIMASTER and sent via the KBR eBUS to the selected recipients. This telegram contains the energy form of the input to be synchronized.

Under certain operating conditions, an intermediate synchronization may be carried out while a measuring period is still running. The **multisio 4D6-ESBS-5DI6RO1DO** terminates the instantaneous period measurement and saves the period value together with a time stamp.

Example:
Period duration is set to 15 min
   i.e. 20 kW input power results in a period value of 20 kW (15 min period)
   if there is an intermediate synchronization 3 min after period start and this 3 min period is saved,
   the period value to be recorded will be 4 kW.
If the BUS synchronous pulse does not take place, the error message **External synchronous pulse missing** will be displayed and the internal clock will continue with the time pattern.

6.1.2.4 Synchronization when tariffs are changed

This type of synchronization makes it possible for the counter to change tariffs immediately after the tariff HT/LT has been switched instead of waiting until the end of the measuring period. Tariff switching is carried out via a telegram created either by the PC or by the MULTIMASTER and sent via the KBR eBUS to the selected recipients.
The internal clock synchronizes the measuring period. If there is a tariff change, depending on the configuration of the inputs, this event in addition synchronizes the measuring period.

Under certain operating conditions, the synchronization pulse and the internal measuring period synchronization may not be in accordance with the same time pattern. The **multisio 4D6-ESBS-5DI6RO1DO** terminates the instantaneous period measurement and saves the period value together with a time stamp.

Example:
Period duration is set to 15 min
   i.e. 20 kW input power results in a period value of 20 kW (15 min period)
   if synchronization is carried out 3 min after period start and if this 3 min period is saved,
   the period value to be recorded will be 4 kW.

7 Technical Data

7.1 Operating and display elements

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

7.2 Device memory

Main data and program memory	1 MB RAM battery-buffered/ 256k EPROM
Memory type	Ring buffer
Long-term memory for max. 160 days, min. 64 hours depending on memory configuration	Load profile memory: Maximum of 5*3840 entries; 60 / 30 / 15 / 1 – cycle duration for high tariff, low tariff, configurable via operating software!
Event memory	A maximum of 4096 entries to record tariff switching commands, mains failures, error messages, and many more.
Parameter memory	non volatile
Password memory	Code 4-digit

7.3 Power supply

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

7.4 Hardware inputs

Digital inputs	Pulse counter input 1 to 5	Digital input for floating contact, S_0-compatible, pulse length $\geq$ 30ms
	State input	Digital input for floating contact, S_0-compatible For the synchronization of measuring period; pulse length $\geq$ 250ms

7.5 Electrical connection

| Connection elements		Screw-type terminal
Max. permissible cross-section of connecting cables		2.5 mm^2
input Power supply	Fuse protection	F1: Recommended 1AT < fuse < 4 AT
KBR eBUS connection	Connection material	For proper operation please only use shielded twisted-pair cables; e.g. I-Y(St)Y 2x2x0.8
Pulse inputs	Connection & Cables	Ensure proper polarity!
Synchronous input	Connection & Cables	Ensure proper polarity!
KBR eBUS connection	via RS485	**Device** **MULTIMASTER or** **interface adapter** terminal 90 ($\perp$) $\rightarrow$ Pin $\perp$ $\rightarrow$ see software manual terminal 91 (A) $\rightarrow$ Pin A $\rightarrow$ see software manual terminal 92 (B) $\rightarrow$ Pin B $\rightarrow$ see software manual

7.6   Hardware outputs

Serial interface	KBR eBUS	RS 485 for connection to the KBR eBUS; a max. of 32 devices per bus segment, up to 1000 m without bus amplifier, for additional information see installation guide KBR eBUS
	Baud rate	38400
	Bus protocol	KBR eBUS
	Addressing	Can be addressed up to address 9999; automatically via software, scanning mode can be activated on the device
Modulbus interface	Serial interface	RS 485 (RJ12) for ready-made KBR system cable (6-pole modular cable, unshielded), max. length 30 m when properly installed.

7.7   Mechanical data

Top hat rail device	Housing measures	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

7.8   Dimensioned drawing
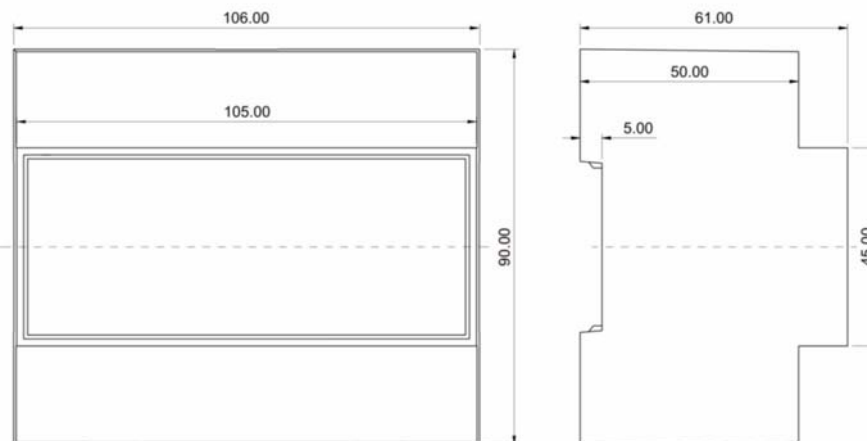
7.9   Environmental conditions / Electrical safety

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	II, in accordance with DIN EN 61010-/Aug. 2002
	Overvoltage category	CAT III: U_{PH-PH} up to 400V
	Mode of protection	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

8 Serial interface

8.1 Operating modes and interface configuration

8.1.1 RS 485 Bus operation

The RS485 port of the counter is designed for operation at the KBR eBUS. You can operate one or several **multisio 4D6-ESBS-5DI6RO1DO** devices together with the KBR eBUS across great distances. You can operate one or several **multisio 4D6-ESBS-5DI6RO1DO** devices together with the KBR eBUS across great distances. The bus is connected to the PC via the KBR eBUS-TCP gateway. With the corresponding Windows® Software, all bus devices can be parameterized and visualized. On request, we will be glad to provide information on which other devices you can connect to the KBR eBUS and on the functions of our software.

Information on the structure and the technical parameters of the KBR eBUS can be found in our installation guide for the KBR eBUS. Just send a request for this installation guide.

8.2 Protective measures

8.2.1 Overvoltage and lightning protection

We recommend installing overvoltage protection in order to prevent damage to our high-quality electronic products. It is recommended to protect control voltage inputs and pulse lines.

9 Error detection

No function.

Check power supply, back-up fuse and supply line.

No display of pulse inputs (LED's flash)

Check supply line. Check that polarity of inputs is connected properly.

10 Appendix

10.1 Digital input module **multisio** 2D2-4DI

10.1.1 Digital input module - connection chart

IN / OUT: Module bus / supply voltage

Terminal assignment

Terminal 50: Digital input 1 +
Terminal 51: Digital input 1 -
Terminal 52: Digital input 2 +
Terminal 53: Digital input 2 -
Terminal 54: Digital input 3 +
Terminal 55: Digital input 3 -
Terminal 56: Digital input 4 +
Terminal 57: Digital input 4 -

Note:

> The module inputs are designed as floating S_0-compatible inputs. The negative connection terminals are combined in the device.

10.1.2 Function of scan button

The scanning mode button serves to activate the module's scanning mode (login via multisio 4D6).

Note:

> The scan button and the DIP switches can be reached by lifting the upper cover with a suitable tool.
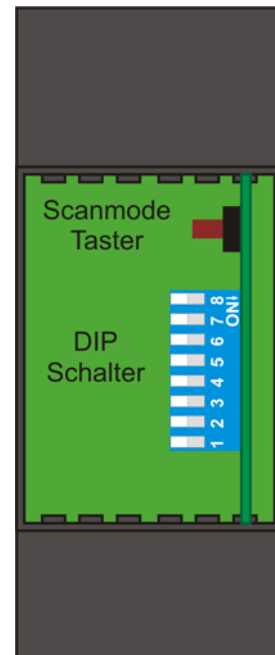
> ### ⓘ Note
>
> **If the Scanmode button is pressed briefly, the
> module will switch to Scanmode.**

Switch setting illustrated:

OFF	= white
ON	= grey

10.1.3   Function of the DIP switches:

The switches 5, 6, 7 and 8 are designed for switching from automatic ope-
ration to manual operation.
The following assignement applies:

	Off	On	
- 5	automatic	manual	Input 1
- 6	automatic	manual	Input 2
- 7	automatic	manual	Input 3
- 8	automatic	manual	Input 4
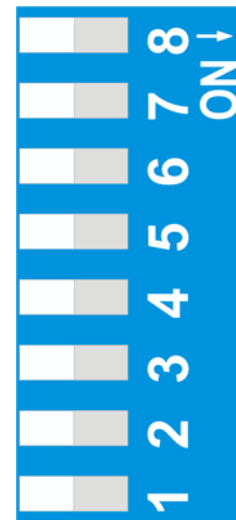
If the input is set to automatic assignment, the DIP switches 1 to 4 have no function.
If the DIP switches 5 to 8 are set to manually, the following applies for the DIP switches 1 to 4 :

	Off	On	
- 1	passive	active	input 1
- 2	passive	active	input 2
- 3	passive	active	input 3
- 4	passive	active	input 4

Explanation:
- Passive   Input is detected as not activated / open
- Active   Input is detected as activated / closed

10.1.4   Digital input module LED display

The LEDs at the digital input module indicate the current state of the digital input. If the input is active, the LED is lit. If the input is passive, the LED is off.

In KBR eBUS scanning mode, all 4 input LEDs are flashing.
In the module detection mode, the input LEDs generate a running light.

LED1:   Digital input 1

LED2:   Digital input 2

LED3:   Digital input 3

LED4:   Digital input 4

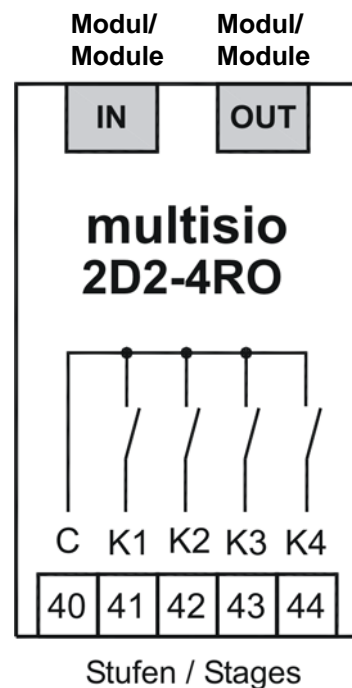Power-LED: operating voltage

10.2   Relay output module multisio 2D2-4RO

10.2.1   Relay module connection chart

IN / OUT: Module bus / supply voltage

Terminal assignment

Terminal 40: Common connection (C)
Terminal 41: Output relay 1 (K1)
Terminal 42: Output relay 2 (K2)
Terminal 43: Output relay 3 (K3)
Terminal 44: Output relay 4 (K4)

10.2.2   Relay output module LED display

The LEDs at the relay output module indicate the current state of the relay output. If the output is active (relay closed), the LED is lit. If the output is passive (relay open), the LED is off.

In KBR eBUS scanning mode, all 4 output LEDs are flashing.
In the module detection mode, the output LEDs generate a running light.

LED1:   Output relay 1

LED2:   Output relay 2

LED3:   Output relay 3

LED4:   Output relay 4

Power-LED: Opereting voltage

10.2.3   Funktion of scan button

> ℹ️ **Note**
>
> **When the scan button is pressed briefly, the module switches to scanning mode.**

Switch setting illustrated:

OFF = white
ON = grey

EDEBDA0141 / 0610-1 GB
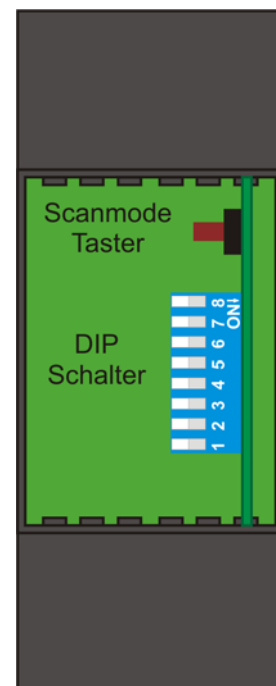
10.2.4 Function of the DIP switches:

Manual operation:

You can set the individual outputs to manually active. If the DIP switch for the channel is set to "OFF", the original state of the module is detected. If the DIP switch is set to "ON", the output state is set to active, irrespective of the output state actually detected.
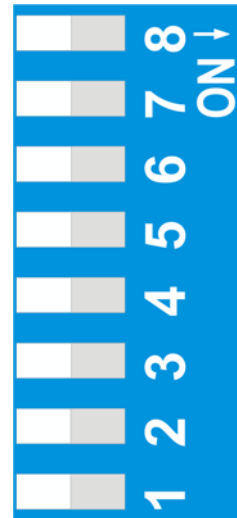
DIP	OFF	ON		
S8	automatic	manual		output 4
S7	automatic	manual		output 3
S6	automatic	manual		output 2
S5	automatic	manual		output 1
S4	no function	OFF	ON	output 4
		passive / off	active / on	
S3	no function	passive / off	active / on	output 3
S2	no function	passive / off	active / on	output 2
S1	no function	passiev / off	active / on	output 1

An	To
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Korrekturen:	Corrections:
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