

Signals and Energy Data
multimax Energy optimization system

THE ENERGY VIRTUOSO!

The best choice for optimum performance and maximum cost savings



One System. Best Solutions.

Monitoring



Optimization



Analysis

Ensure that energy costs do not peak in your company.

Thanks to its modular concept and innovative **OptiEnergy** calculation procedure, **multimax** considerably increases the energy efficiency of your company.

Energy optimization system

multimax



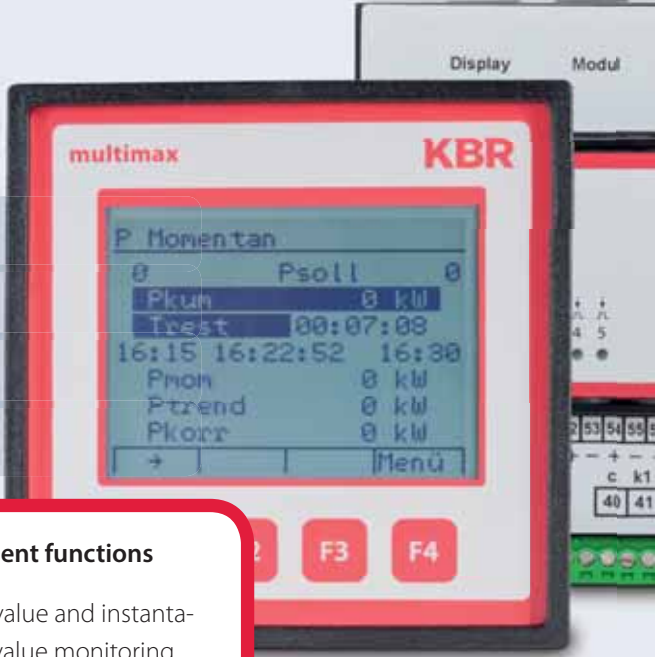
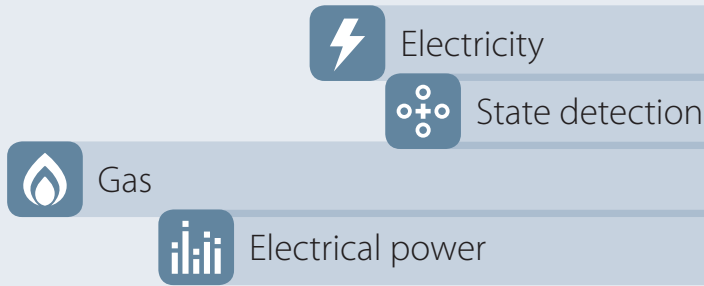
You may not be able to fully eliminate energy costs for power calculation, but you can reduce them significantly. You can, for example, reduce the consumption, create a state of subsidized non-typical network usage or benefit from personal grid usage fees. The **multimax energy optimization system** monitors, controls and optimizes the energy consumption behavior of connected consumers. While optimizing the operating process, the consumer properties and energy supply conditions are taken into account.

THE MULTIMAX FACTOR: HIGHLY FLEXIBLE AND EXTREMELY EFFICIENT.



Modular system

With the **multimes** and **multisio** modules, you can expand the load management system to control up to 80 consumers.



Intelligent functions

Target value and instantaneous value monitoring, target value tracking, prewarning contact (alarm), timer programs, emergency shut-down, etc.

Energy optimization is an important aspect of modern energy management. We will be happy to advise you on this.

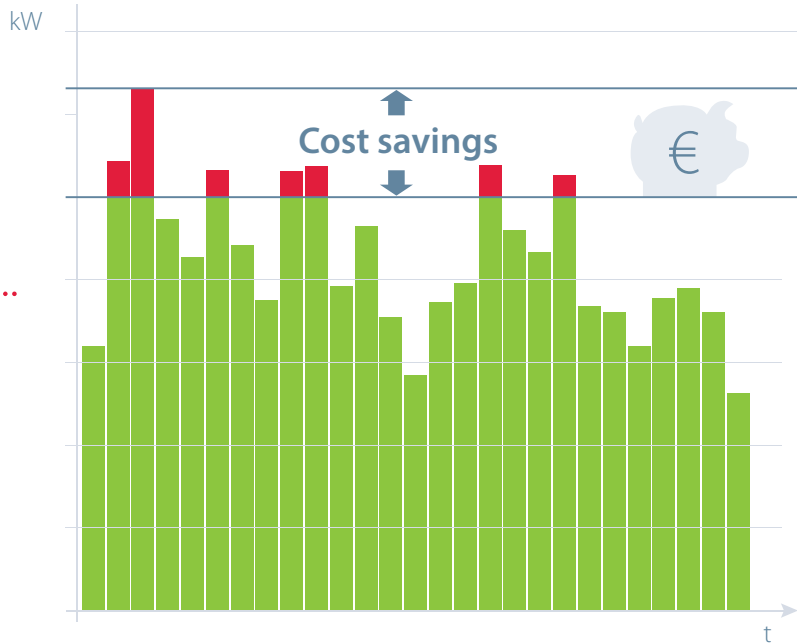
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The key to successful energy optimization is the perfect coordination of reliable product technology with flexible load control. With its modular system architecture and comprehensive functionality, the multimax energy optimization system is easy to expand and highly efficient for the most diverse applications.



Analog outputs

For consumers that are controlled continuously, the **multismo D2-2AO** module is the right choice. Inputs and outputs can be linked



Use the enormous savings potential wisely with our energy flow and consumption optimization measures.

Meter inputs with pulse totalizer function

multimax D6 can capture the values of up to 5 meters. You can connect additional meters with the **multismo D2-4DI** module.



multimax

Housing dimensions
(H x W x D in mm)

90 x 105 x 61

Data display

LCD*

Interface

**KBR eBus
KBR module bus
display**



* Via multimax 4F96-DS display

Energy optimization system with trend calculation function

Highlights

- High savings potential thanks to optimized energy consumption for electrical energy and gas
- Numerous monitoring functions for increased operational safety
- 10 internal timer programs for different actions
- Expansion modules to control up to 80 consumers
- Target value tracking for monthly and annual power price
- Prewarning contact (alarm messages) and emergency shut-down

A detailed overview of the **technical details** is provided on page 8.

The **multimax** energy optimization system monitors electrical consumption and maintains the defined average power by switching consumers connected to the system on or off. All the parameters that are relevant to energy optimization system are transmitted via the KBR eBus and displayed and processed by the analysis and visualization software **visual energy**.

Note: To switch consumers, **multisio D4-4RO-ISO relay modules** are required.

Communication between the central unit and relay module is carried out via KBR module bus.

Input and output configuration

DEVICE TYPE		multimax D6-ESBDS-5DI6RO1DO-4
INPUTS	Pulse inputs (working and synchronization pulse)	5
	Target value switching (for floating contact)	3
OUTPUTS	Relay outputs	via multisio D4-4RO-ISO-1
	Maximum prewarning relay	■
SERIAL INTERFACES	KBR eBus	■
	KBR module bus	■
	KBR Display	■
SOFTWARE SUPPORT	visual energy Starter / OPC server	yes
	visual energy 4	yes
POWER SUPPLY	Operating voltage	85 – 265 V AC/DC, 50/60 Hz
	Power consumption	15 VA
MECHANICAL DATA	Central unit: Modules and dimensions in mm (H x W x D)	6 modules (90 x 105 x 61 mm)
	Weight	Approx. 650 g
	Display	96 x 96 mm (visible 92 x 92 mm)

■ Standard version

Other features:

- Optimization is better than switching: thanks to its **analog signal outputs**, multimax can switch consumers according to the demand
- The **modular system** allows for unlimited application possibilities
- **Integrated programs** ensure that non-typical network usage is maintained or that the timer control of systems works
- The standard consumer feedback (on/off) **reduces the number of switching operations.**
- The instantaneous power consumption of the consumers is displayed, **increasing the savings potential** and **reducing the number of interventions in the production process**
- By **linking several values**, even sensitive consumers can be included in the optimization process (e.g. large thermal devices)

multimax Technical details

DEVICE TYPE	multimax D6-ESBDS-5DI6RO1DO-4	
MENU AND STATUS DISPLAYS	Energy: W_{act} Trend power: P_{trend} Instantaneous power: P_{act} Cumulative power: P_{cum} Corrective power: P_{corr} Measurement period average value: P Maximum daily and monthly values: P_{day} and P_{mon} Switching operations, error and alarm messages	
OPTIMIZATION LINES	Maximum expandability	32 lines (up to 80 devices)
SUBSTATIONS (MAX. 20 MODULES)	Output modules for switching consumers on and off	
	4 outputs, electrically isolated	multisio D4-4RO-ISO-1
	4 outputs, not electrically isolated	multisio D2-4RO-2
	2 outputs for analog consumer control	multisio D2-2AO-1
	Input modules for feedback on the device status	
	4 floating inputs	multisio D2-4DI-2
	3 inputs with consumer power recording	multimes D4-1
SWITCHING PERFORMANCE	Self-optimizing (circular switching of equal stages)	■
	The priority can be adjusted for each optimization output	■
OPTIMIZATION CRITERIA	Target value control (target values can be programmed freely)	3
	Target values can be controlled using timer programs	■
	Stage power and start-up probability	■
	Priority switching (circular switching with the same priority)	■
	Measurement period time-out, minimum switch-on time, minimum and maximum switch-off time	■
	Non-typical network usage	■
MONITORING FUNCTIONS	Maximum prewarning if power is exceeded	■
	Automatic emergency shutdown of selected devices in the event of malfunction	■
	Target value tracking if power value is exceeded	■
	Counter and synchronous pulse monitoring	■
	Period-independent monitoring of maximum instantaneous power	■
	Communication monitoring between central unit and substation	■
DISPLAYS	LCD (via multimax F96-DS-4 display)	■
MEASUREMENT	Combined pulse interval measuring / trend calculation	■
	Pulse summation function for multiple counters	■
	Direct measurement with multimes D4-1 additional module (transformer measurement)	■



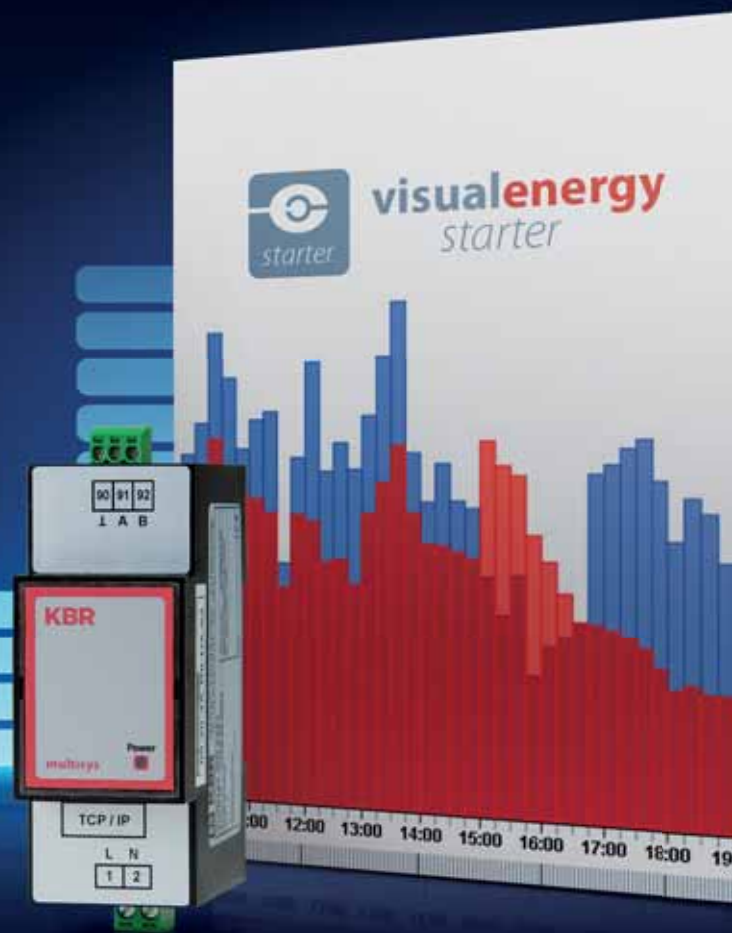
DEVICE TYPE	multimax D6-ESB SDS-5DI6RO1DO-4	
MEMORY	Load profile memory	■
	Active energy memory for high and low tariffs	■
	Switching operation memory	■
	Event memory (power failures, errors, programming actions, etc.)	■
	Memory can be read on the device memory can be read out via KBR eBus	■ ■
TIME FUNCTIONS	10 internal timer programs (global eBus master timer programs are processed)	■
	Calendar function	■
	Daylight saving time	■
	Leap year adjustment	■
PASSWORD PROTECTION	Digit code	■

■ Standard version

Green light for more energy efficiency!

- Visualization kit with »visual energy starter« analysis software and gateway module
- Comfortable analysis of energy consumption and comprehensive optimization by software

»visual energy starter« analysis tool + gateway



multimax as a ready-to-use system



Complete set with multimax energy optimization system

- Highlights**
- Complete system in switchgear cabinet, wired with terminals
 - Precision devices and components of proven KBR quality
 - Economical and cost-saving system
 - Configuration according to specific requirements possible
 - Integrated KBR eBUS interface

An overview of the **technical details** of the multimax is provided on page 8.

For in-depth information and technical details on the **multisio**, **multimes** and **multisys** expansion modules, please visit our website, www.kbr.de.
If you have any questions, feel free to call us: **+49 (9122) 6373-0**

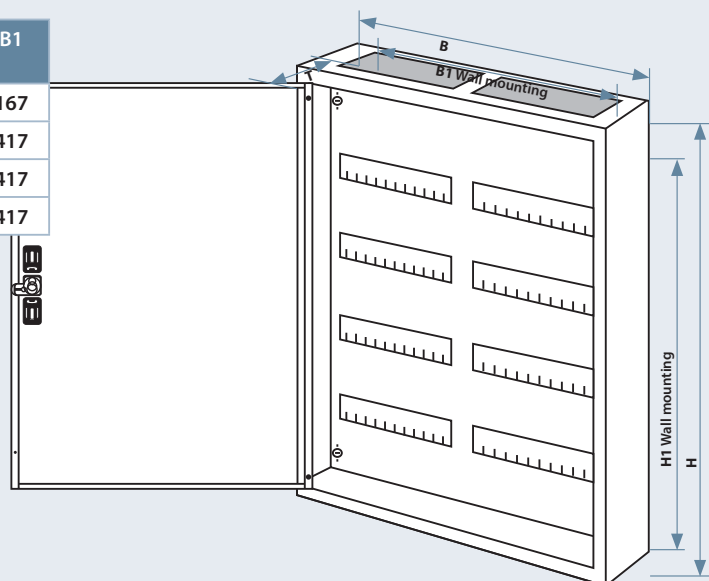
The **multimax** system contains all the devices and components needed to optimize the respective outputs or digital feedback. The table on the right side shows the different configuration options.

System variant overview

multimax 4 set	RELAY OUTPUTS	INPUTS	multimax D6	multimax F96-DS	multisio D4-4RO-ISO	multisio D2-4DI	multisys D4-PS-24V	Housing type
multimax 4RO-ISO-0DI	4	–	■	■	1	–	–	multimax WG-AT31
multimax 4RO-ISO-4DI	4	4	■	■	1	1	–	multimax WG-AT31
multimax 8RO-ISO-0DI	8	–	■	■	2	–	–	multimax WG-AT31
multimax 8RO-ISO-8DI	8	8	■	■	2	2	–	multimax WG-AT31
multimax 12RO-ISO-0DI	12	–	■	■	3	–	–	multimax WG-AT31
multimax 12RO-ISO-12DI	12	12	■	■	3	3	1	multimax WG-AT32
multimax 16RO-ISO-0DI	16	–	■	■	4	–	–	multimax WG-AT32
multimax 16RO-ISO-16DI	16	16	■	■	4	4	1	multimax WG-AT32
multimax 20RO-ISO-0DI	20	–	■	■	5	–	–	multimax WG-AT52
multimax 20RO-ISO-20DI	20	20	■	■	5	5	1	multimax WG-AT52
multimax 24RO-ISO-0DI	24	–	■	■	6	–	–	multimax WG-AT52
multimax 24RO-ISO-24DI	24	24	■	■	6	6	2	multimax WG-AT62
multimax 28RO-ISO-0DI	28	–	■	■	7	–	1	multimax WG-AT52
multimax 28RO-ISO-28DI	28	28	■	■	7	7	2	multimax WG-AT62
multimax 32RO-ISO-0DI	32	–	■	■	8	–	1	multimax WG-AT52
multimax 32RO-ISO-32DI	32	32	■	■	8	8	2	multimax WG-AT62

■ Standard version – Not available

Housing type	H	B	T	H1	B1
AT31	524	324	140	385	167
AT32	524	574	140	385	417
AT52	824	574	140	685	417
AT62	974	574	140	835	417



All dimensions are in mm. Not suitable for measurement purposes.

THE MULTIMAX METHOD: OUR MISSION: ENERGY OPTIMIZATION.



Maximum energy recovery

The user operates a large number of photovoltaic systems with a KW peak of up to 2.5 MW. The energy provider's customer is prohibited from feeding energy back into the public energy grid of the provider.

This might happen during low load periods, as the amount of energy the company requires is smaller than the photovoltaic system's output.



Consumer time control

An electroplating shop wants to reduce its power peak and automatically preheat its electroplating baths. For this task, weekend days, holidays and production downtimes must be considered.



Minimize the number of switching operations

The availability of the consumers that are to be included for energy optimization should be as high as possible. Avoid any unnecessary switching operations.

You want to know how to make the best possible use of multimax for your specific case? We will be happy to present the suitable solutions to you.

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In the best case, corporate measures to increase energy efficiency go hand in hand with those to tap into load management potentials. The practical examples provided in the following demonstrate how you can use **multimax** for successful energy management.



The KBR solution: Within this project, the KBR **multimax** energy optimization system is used in an »inverted« way, meaning we do not optimize an energy consumer but an energy provider. **multimax** monitors the energy consumption at the feeding point and, if required, switches some photovoltaic modules off if energy recovery is about to happen. This is an example of the energy optimization system's high flexibility in practical application.



The KBR recommendation

multimax D6 → p. 10



The KBR solution: The electroplating baths are switched on and off using the timer programs of a system center. The baths needed according to the production requirements are preheated before starting work. In the heating phase, the baths are optimized to ensure that there are no unnecessary load peaks. **multimax** also ensures that the set maximum value is not exceeded during operation either.



The KBR recommendation

multimax D6 → p. 10



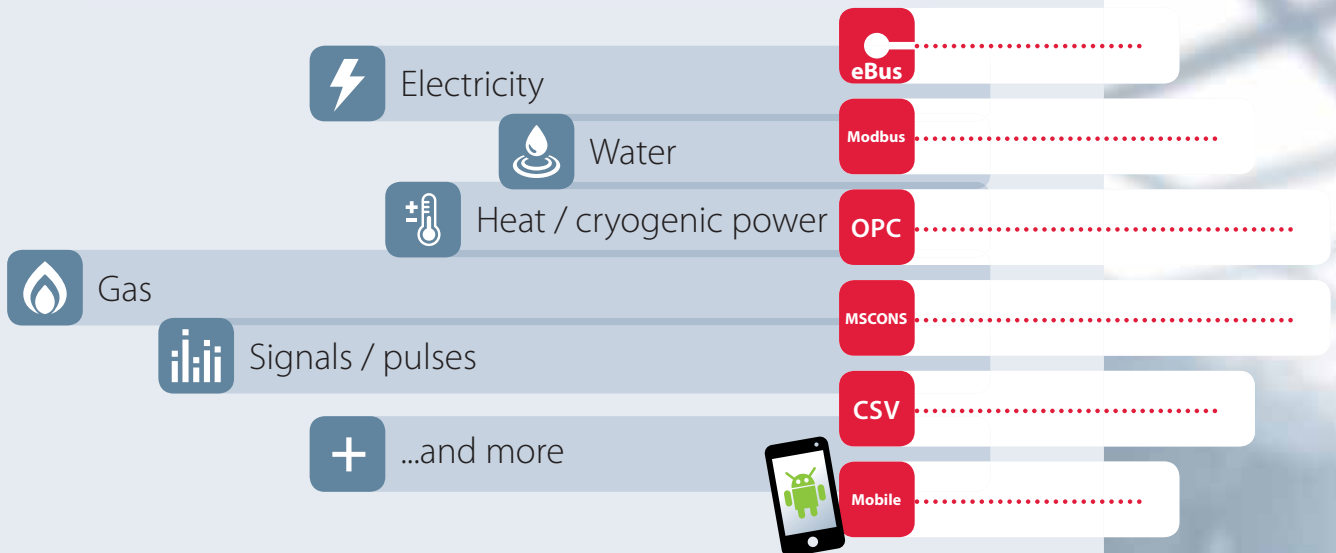
The KBR solution: Instead of the fixed feedback »Device connected«, **multimes D4 measuring modules** measure the instantaneous power and then send this data to the **multimax**. This way, the energy optimization unit utilizes the actual instantaneous power consumed. With this system, the number of switching operations can be considerably reduced.



The KBR recommendation

multimax D6
multimes D4 → p. 10

VISUAL ENERGY 4: EASY AND SAFE ENERGY DATA CONTROL.



Measurement & capture

- Current
- Gas
- Water
- Heat / cryogenic power
- Temperature
- Operating hours
- And much more

Transmission & import

- Automatic meter reading (current, water, gas, heat, etc.) with commercially available Modbus devices or via OPC
- Continuous capture of load profiles and long-term storage for comparative analyses
- Manual recording of meter data or mobile capture with Android smartphones
- Data import from the energy provider via MSCONS

For detailed information and technical specifications, please refer to our **visual energy brochure**.
You can **download it as a PDF online at kbr.de**

With its impressive functionality, the web-based **visual energy 4** software allows for transparent and efficient energy management. You can easily capture, monitor, analyze and process the most diverse energy information from networks or systems. This helps you keep track of the network quality, supply structure and energy costs.



PDF



CSV



MSCONS



OPC



SYSTEM INTEGRATION

Analysis & optimization

- Comprehensive consumption, billing, measuring point and cost center management
- Graphical representation and automatic plausibility check of the supply structure
- Load profile evaluation
- Automatic monitoring of the network quality, consumption values, projected energy volumes and device parameters

Processing & export

- Data output in different formats: PDF, CSV or OPC
- Convenient data transfer via MSCONS
- Excel interface for individual tables



KBR online service

For up-to-date product information, downloads and more, visit our website: www.kbr.de

KBR is your reliable energy management partner.
With precision technology, efficient solutions and a comprehensive range of services, the KBR system helps companies from the plant engineering, industry or craft sector maintain their technical edge.
For a sustainable and future-proof energy supply.

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