Electronic Multi-Channel Controller / Data Manager / Data Logger / Meter

KOBOLD

ZMC

Modbus

- Housing:
  96 x 96 mm or 144 x 144 mm

- Inputs:
  up to 18 x universal:
  up to 72 x analogue
  up to 36 x thermocouples
  up to 18 x RTD
  up to 24 x NTC
  up to 12 x counters with frequency
  up to 12 x flow rate / flow speed meters
  with frequency
  up to 18 x flow meters 0(4) ... 20 mA
  mixed inputs
  up to 73 x digital inputs

- Outputs:
  up to 24 x analogue
  up to 36 SPST relays
  up to 18 x SPDT relays
  up to 72 SSR

- Power Supply: 19 ... 50 V_{DC},
  16 ... 35 V_{AC} or 85 ... 260 $V_{AC/DC}$

- t_{max}: 0 ... +50 °C (optional -20 ... +50 °C)

- Communication: RS-485/232,
  USB Host, Ethernet

- Protocol: Modbus RTU Master or
  Slave, Modbus TCP Server, http,
  Web Server, NTP

- Display: graphic TFT 3,5" or 5,7",
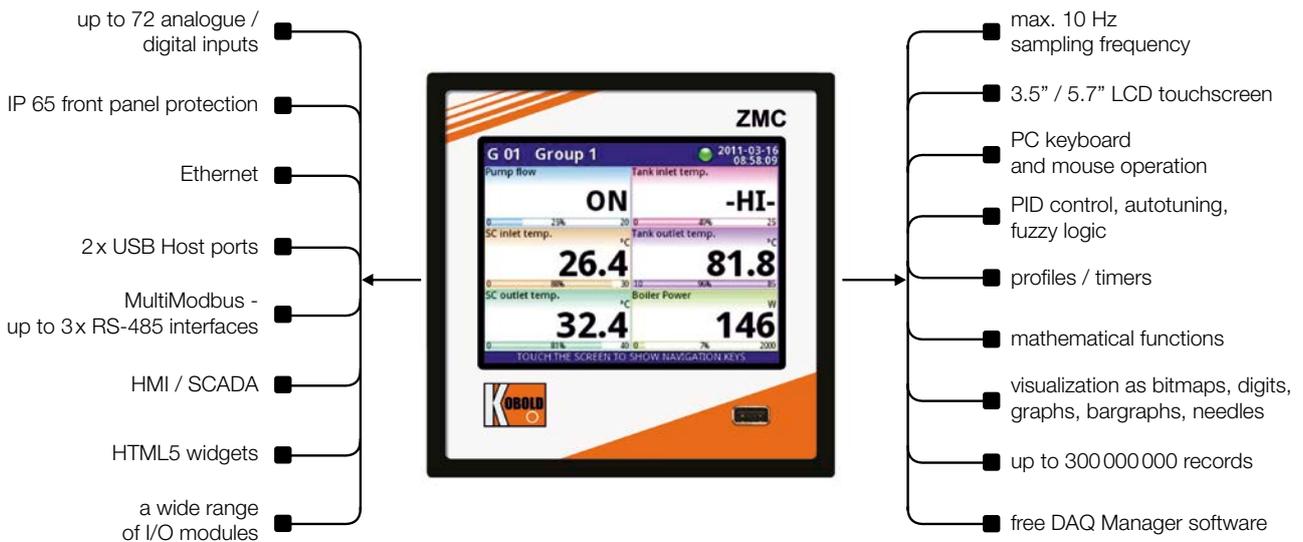 touchscreen

- Data memory: 4 GB

Z2

Introduction

ZMC = Meter + Controller + Recorder + HMI + SCADA in one package

The ZMC line includes advanced controllers and recorders with great potential closed in small casings. ZMC has been specifically designed for advanced applications in industrial automatic control engineering. It does not mean, however, that the device cannot be applied in smaller systems. ZMC can be equipped with three isolated RS-485 interfaces which make it a perfect solution for distributed systems to work as Master unit. Thanks to Ethernet port the device can be

monitored via the Internet. A wide range of input and output modules allows to customise ZMC precisely as the customer requires it. Thanks to a colour touchscreen working with the user interface becomes a pleasure, while ZMC operation playing the role of HMI is intuitive and comfortable.

Our devices are LINUX-based products to ensure stable operation.

- up to 72 analogue / digital inputs
- IP 65 front panel protection
- Ethernet
- 2 x USB Host ports
- MultiModbus - up to 3 x RS-485 interfaces
- HMI / SCADA
- HTML5 widgets
- a wide range of I/O modules

- max. 10 Hz sampling frequency
- 3.5" / 5.7" LCD touchscreen
- PC keyboard and mouse operation
- PID control, autotuning, fuzzy logic
- profiles / timers
- mathematical functions
- visualization as bitmaps, digits, graphs, bargraphs, needles
- up to 300 000 000 records
- free DAQ Manager software

Construction

Hardware inputs/ outputs

The biggest advantage of all devices from the ZMC line is a big number of built-in inputs / outputs accessible in one compact device. The most developed version ZMC-9/ZMC-6 has up to 48 measurement or digital inputs and 60 virtual channels whereas ZMC-1/ZMC-4 has 50% more inputs / outputs and virtual channels.

Thanks to a well-thought-out module design you can choose among a wide range of cards and connect them to slots in the way you wish but you do not have to use all slots. You can also decide on your own how to use virtual channels, if they are going to be used for direct measurement readings, mathematical functions, timers, profile creation, set points or virtual objects.

We offer the following cards:

Inputs:
- universal
- voltage
- current
- thermocouple
- RTD
- NTC
- digital
- counters
- totaliser
- rate

Outputs:
- relay
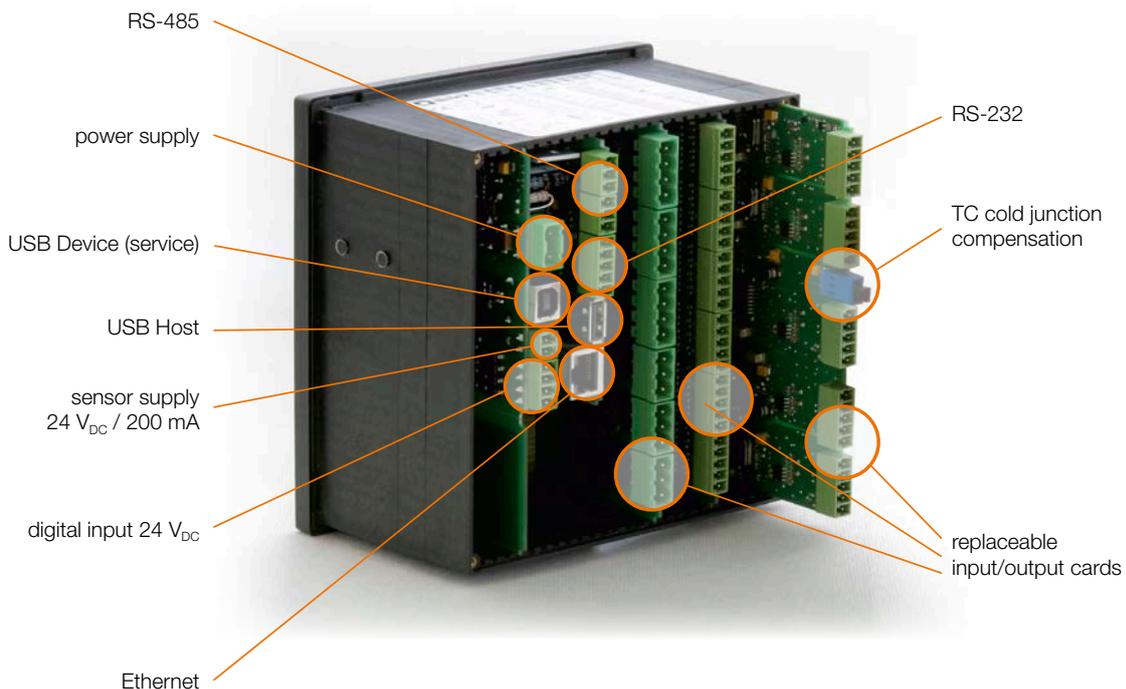- SSR
- current (4-20 mA) signals

Communication:
- Ethernet
- RS-485
- RS-232
- USB Host

Should you need to update your application or add new functionalities in the future?

All you have to do is to send your device to an authorised distributor who will perform the changes you require.

Sample configuration

- RS-485
- power supply
- USB Device (service)
- USB Host
- sensor supply 24 V$_{DC}$ / 200 mA
- digital input 24 V$_{DC}$
- Ethernet
- RS-232
- TC cold junction compensation
- replaceable input/output cards

ZMC family

ZMC-9/ ZMC-6 (briefly referred to as ZMC-9/-6) is the first device in ZMC line. It's equipped with a 3.5" colour LCD


touchscreen which makes user-friendly, easy and comfortable configuration and data presentation readable and attractive. Although the ZMC-9/-6 is build in a quite small housing, it can integrate up to 48 inputs, and its construction allows user almost free configuration by choosing up to 27 available input/output cards. In ZMC-9/-6 we have provided 60 logical channels, what is enough to build basic applications.

ZMC-1/ZMC-4 (briefly referred to as ZMC-1/-4) is ZMC-9/-6's bigger brother. It has all features included in ZMC-9/-6, but in addition it has a bigger display, more inputs/outputs and even more virtual channels. ZMC-1/-4 is equipped with a 5.7" LCD touchscreen. The number of virtual channels was
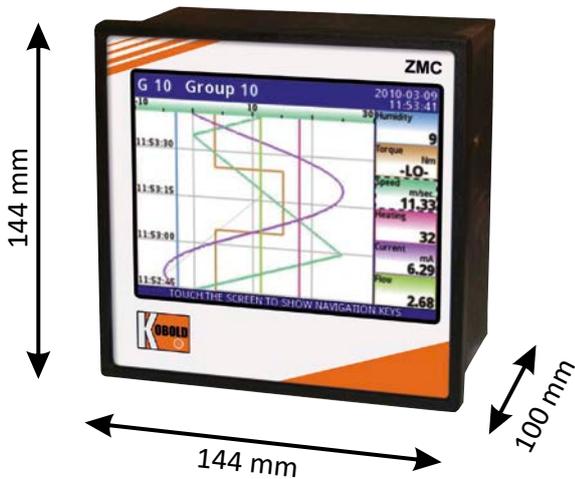
increased to 90, it helps to build sophisticated applications much easier. Despite of small, compact case, unit allows direct connection (in a maximum mount) as many as 72 analogue or digital inputs and thanks to its design the user can configure the device on his own, using a wide range of different I / O cards. Casing depth is still only 100 mm.

Colour LCD touchscreen

You no longer have to press the buttons to move the cursor over the virtual keyboard to input only one character. Thanks to the touchscreen, you can now operate the device more efficiently and comfortably. The screen is perfect for industrial environments; dirt and dust do not affect the precision of touch. The colour LCD display 3.5" TFT (5.7" in ZMC-1/-4), 320 x 240 pixels, 65 536 colours - data is presented in clear and pleasant colours. The devices also support USB keyboard and mouse. You can connect them and start using them immediately - just like on an ordinary PC.

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Data recording

up to 300 000 000 records!

Data recording makes a kind of a value added to the tremendous possibilities shown above. ZMC can record any 60 measurement channels at a speed of 10 samples per second. It has 4 GB built-in flash memory, enabling for data logging up to 300 000 000 records. The function of data logging has been also optimised for the use of hardware resources of this device - the channels for data logging are grouped (1-6 channels) and in each group a speed of data logging can be freely set. Additionally, there is a unique option of alternative (higher or lower) speed data logging, which is set off only under userspecified conditions. This solution allows you to precisely trace the object parameters in critical situations. **The data recording functionality requires the license key ZUB-ZMCLKS9614.**

recording mode	intense (every 1 sec.)	medium (every 10 sec.)	economy (every 1 min.)
60 channels	46 days	14 months	7 years
48 channels	70 days	18 months	9 years
24 channels	115 days	35 months	16 years

Memory buffer for a 4 GB card

Auto Log Creation - new recording possibilities

Data recording can be triggered in many ways and separately for each group of measurements. Logging can take place continuously or only under certain conditions, e.g. for a specific period. It is also possible to trigger recording only at key points in the production process with an individually set sampling time. A very useful feature of data logging is the so-called "Auto Log Creation", which creates a completely new file with recording data. Each file can contain any description and only the data that is relevant for the registered parameter group. This is a solution for all those interested, for example, in creating daily reports or dividing documentation into parts corresponding to the next stages of the process.
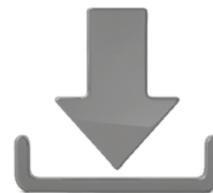
- individual files for single records
- new file created on demand
- custom description of the logging file
- simple reporting and data identification

Data download

The recorded data can be downloaded from the internal memory in a way which suits you best. Use a USB flashdrive or Ethernet which allows you to perform the task wherever you are. Retrieving data is very simple and you can choose to export from the device only selected and relevant files. Real-time measurements can be read-out via the Ethernet (Modbus TCP) or a RS-485 link (Modbus RTU).

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Control

Logical channels

A distinctive feature of ZMC is its ability to perform measurement, processing and control tasks at the same time. It is achieved by using the so-called "logical channels", which provide a virtual bridge between physical inputs/outputs and control and visualization processes. An extensive configuration menu of logical channels makes it possible to configure them in detail. The user alone can decide how to use the available logical channels in ZMC devices. A logical channel can represent data from physical inputs and outputs, process data from other logical channels using mathematical and logical functions, generate constant values (set points) or sequence diagrams (profiles), operate in the PID controller

mode, act as a virtual function key. Relationships between channels can be set directly in the device and it is not necessary to know any programming language. As the essence of any data processing are mathematical operations, the device supports many standard functions that can help build complex algorithms.

PID controller, autotuning, fuzzy logic ...

Process control is one of the main functions of ZMC device. Apart from simple threshold (ON/OFF) and proportional controls, it is also equipped with proportional-integral-derivative controllers (PID), used mainly to maintain stable conditions in the case of demanding applications. Their operation consists in calculating the difference between the measured and preset values as well as modifying the output signal in order to reduce the control error. A wide range of parameters and functions featured by PID controllers allows, among other things, the following actions:

- optimal adjustment of the controller coefficients to the process requirements through the autotuning function,
- optimization of the output signal owing to additional parameters, such as the inertia level or fuzzy logic,
- any (manual or automatic) starting-up and stopping of the controller operation.

ZMC is equipped with 8 controllers, each of which can accept independent setpoints and, at the same time, be used to adjust several independent processes, which allows the control of several processes with different characteristics using one device.
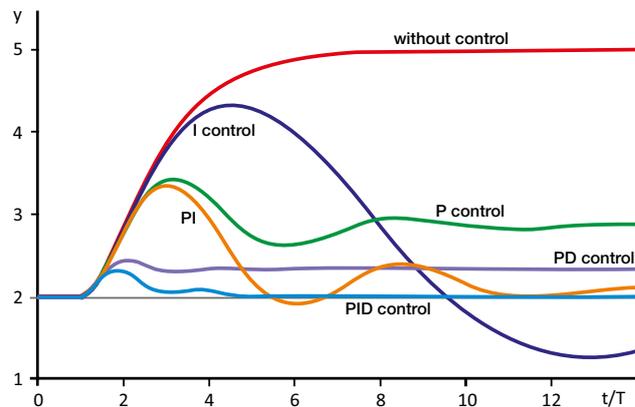
Mathematical functions

Over 30 mathematical functions allow the measurement results to be operated freely. ZMC allows you not only to use arithmetic and trigonometric functions such as addition, multiplication, sine, raising to a power, but also logical ones (comparing to a constant, comparing the measured values or multiplexer) which makes the developing of the advanced applications much more easy. The source of data in mathematical functions can be logical channels and constant values set in the menu.

Timing profiles

Software built-in timing profiles (free programmable runs) allow for the unique freedom in shaping a run control and possibility to start the control process at a preset time or when a defined event occurs. Their functions enable the control to be stopped at a specific time/conditionally at any point of the run, to be looped and it is possible to carry any other operation on a setpoint.

Communication

Interfaces

Almost every modern electronic measuring instrument is equipped with some type of a communication interface - ZMC has several of them. The primary type of an interface is USB Host. It allows you to connect the device not only with a standard PC mouse and keyboard, but also an external flash drive and to download recorded data. More interesting, from the point of view of the communication with the environment, RS-485 interface is available with Modbus RTU Protocol in standard equipment. Like other interfaces, RS-485 and RS-232 are available in an optional interface module, interface device, each of which can operate independently as Master or Slave at a different transmission speed. Enhanced menu interface allows you to easily configure it, so that ZMC will read data from any device equipped with RS-485 port and will control a condition of outputs in it, if it can be remotely controlled. However, the widest range of options is provided by the Ethernet port with implemented communication protocols. Built-in Web Server provides convenient access to the
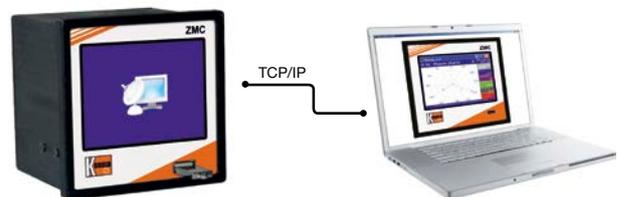

device via a web browser. In addition, support for dynamic objects in HTML5 allows you to create your own web pages that visualise the control process. Modbus TCP protocol supports reading data from the ZMC by master devices, e.g. PLCs and any SCADA software. HTTP protocol allows the user to retrieve the registered data from the recorder, and SNP support ensures synchronization of date and time on all devices installed on the site.

E-mail notifications

In response to our Customers' demands, the ZMC line devices are now equipped with a new function: an "E-mail notifications" system. It enables sending e-mails directly from the ZMC, which makes the device even better adapted to high-tech alarm and monitoring systems. The user can define up to 32 different messages to be sent in case of any of the specified events. An e-mail message consists of three elements: topic and text of the message (both with fixed content) and an attachment containing momentary values

from the selected groups of or individual measurement channels in the .csv format. The "E-mail notifications" function is now available as standard!

Remote display

One of the benefits of providing the ZMC device with Ethernet port includes video streaming. If the ETU or ACM communication card operates in the device, it is possible to transfer the image to a Windows computer. It should be directly connected with the device or operate in the same network. Most frequently, this is the plant LAN. After installation of the dedicated Xming software, the screen can be transfered to the computer, maintaining all functionalities of the device. The computer operator will obtain complete ZMC functionality, the same as in the case of direct access.

The transferred screen is handled using a mouse cursor under the same principles as in the case of a touchscreen.

This functionality is most often used for:

- device configuration,
- diagnostics,
- saving/loading the configuration file,
- previewing the current values.

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Presentation and data security

SCADALite

Information important for the operator can be presented in graphical form, including animations, dynamic charts, the most important numbers and, in the case of alarm, also sounds. SCADALite enables definition of a specified number of screens to present different ranges of the required information. The specified measurement parameters can be included in the graphics that reflects the monitored process/ facility by means of a photo or drawing. SCADALite is an innovation in data presentation.

✓ Photo

✓ Sketch

✓ CAD Project

SCADALite in 3 steps:
- take a photo / develop graphics
- upload to the device
- place the indicators

and enjoy the functionality!


Breakthrough in data presentation

- process management directly from the screen,
- different screens for a single process,
- graphics of the monitored process,
- quick visualization,
- free arrangement of indicators,
- operator's work comfort,

- easy adjustment to specialised requirements,
- quick editing - new graphics and change of indicator arrangement is enough,
- modification of indicator arrangement during the device operation.

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View linking

View linking is used to move directly to the view of a selected group of metering parameters. Each view created in the SCADALite mode can be now linked to another screen. Just place the magnifying glass button in any location of a specific view and assign the link to the selected group. This function can be used to create multilevel dependencies between view groups, e.g. creating a structure leading from the general application image to sets of detailed parameters.
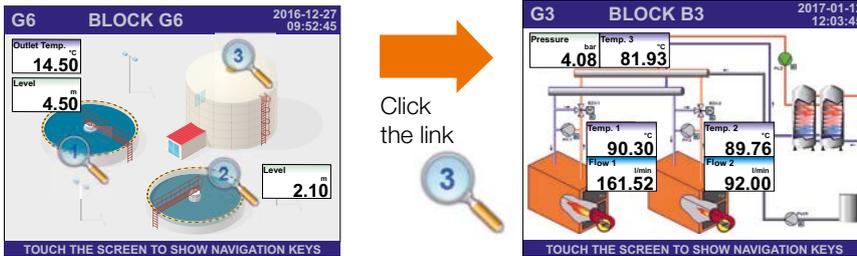

- linking between views
- up to 15 connected views
- easy switching between views

4ControllerView

The 4ControllerView functionality - a new mode of presenting the state of logic channels for a given measurement group, designed especially for the use of ZMC as a controller. Each ZMC line device has eight independent PID control loops. The 4ControllerView function displays four channels in the numerical value mode (including: two "major" and two "auxiliary" ones) and two in the binary mode. The first two lines are the typical PID control values which are PV and SV, each with its own percentage indication, description and process unit. The SV value as a variable parameter can be set directly from the screen in the dynamic configuration mode. Auxiliary values can indicate any parameters regarding the control process, e.g. % of the full range of the control signal or deviation value. The screen shows 1 controller (6 values) simultaneously by default. Optionally, after the screen split, it can show up to 4 different controllers at the same time (24 values). In such case, each controller is shown in a different colour and name. It is very useful, especially in monitoring processes that take place one after another.
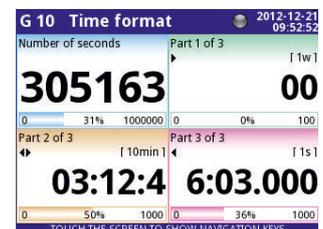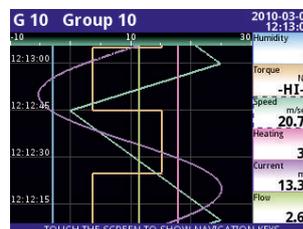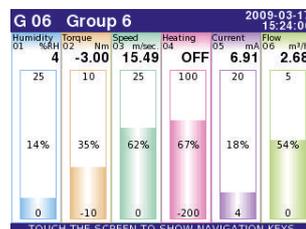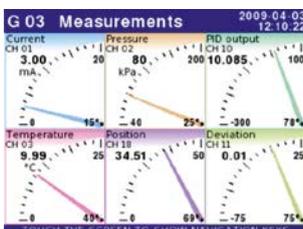

4ControllerView is:

- differentiation of individual values importance and their role in a controlled process,
- easier key data reading from a distance,
- clear presentation of data from many logical channels groups.
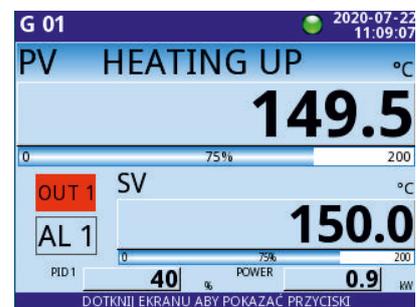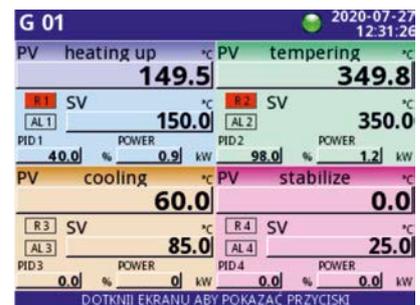
Parametric screens

Irrespective of the advanced SCADALite data visualization possibilities, the operator may select one of the standard views, according to individual preferences. Depending on whether we need a detailed information on the signal value, quick insight into the signal level, or parameter trend over time, the data can be presented as:

- numerical values,
- quasi-analog indicators,
- phasor charts,
- horizontal or vertical charts,
- horizontal or vertical bars,
- simultaneous presentation of many groups.

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Presentation and data security

HTML5 and Widgets

The ZMC line devices equipped with Ethernet port allow also a very easy remote monitoring of measurement results using a web browser, as well as a very attractive graphical presentation in the form of built-in or user-created websites.

Along with the device, the manufacturer supplies a set of built-in visual components (Widgets) which using the HTML5 protocol, provide the programmers with easy mechanisms to retrieve data from the device, as well as ready-to-use formats of data presentation on the computer, tablet or mobile phone screen.

Kobold Widgets
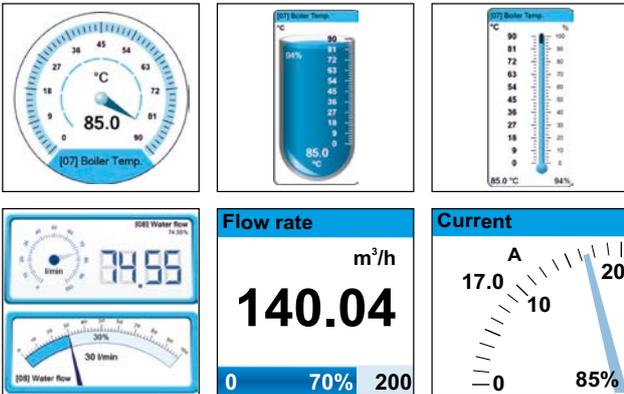
Bundled configuration

A very useful function that allows you to save the entire ZMC configuration on portable memory (pendrive). While saving data, the device will detect all configuration related files, e.g. background files for the SCADALite view, or header and footer for MultiPrint printouts and will automatically add them to the bundled configuration package.

In addition, it allows you to select other files saved on the device memory, e.g. Modbus templates or user characteristics and

pendrive

then to export them to the same folder. After moving the compressed folder to the computer memory, you can now freely modify the contents of the package, i.e. add / remove selected additional files and then import the lot again to the recorder.

MultiLevel Access

The MultiLevel Access mode defines the range of access to set-up and use a ZMC device, depending on user's permissions. You can set up to 16x user accounts (users) with a different scope of rules. The authorisation process is done

Worker
Engineer
Technologist
Administrator

by entering the password by an operator or plugging the USB dongle into the USB port, as an access key. The configuration file, which includes user's permissions, may be saved on the USB memory and moved quickly between devices.

LookUp Table - user characteristic tool

The LookUp Table in the user characteristics function is a great tool which allows entering individual points of the characteristics in the form of a csv file and then importing them to any ZMC logical channel. Additionally, the edited list may be saved, from the device level, in a new file and used to scale another channel.
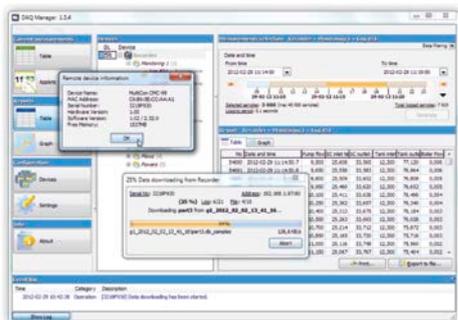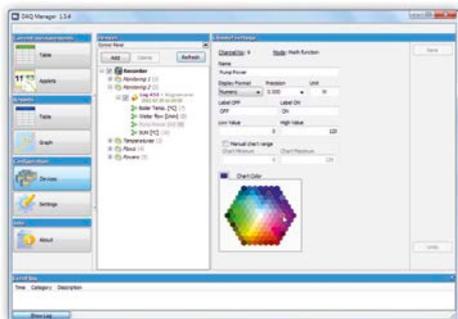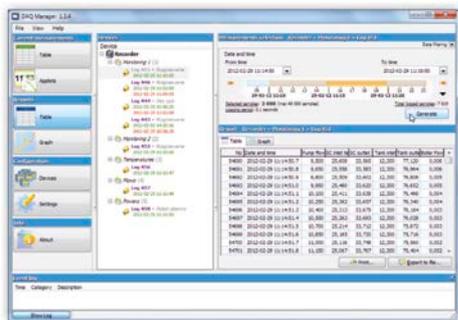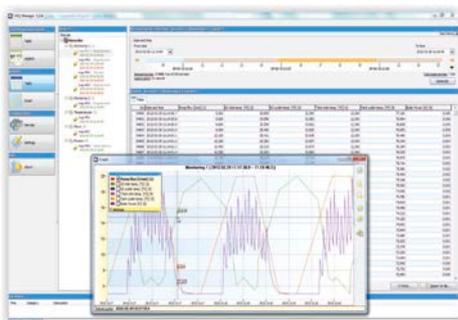

export csv file

Software

DAQ Manager

To manage such vast amounts of data we have designed the free of charge DAQ Manager software to help you.

The software allows to:

- visualise data in the form of graphs and tables,
- group measurement results,
- create reports,
- export data into other files.

In addition to the data presentation mode (chart/table), the user can also select only the logic channel group concerned. Transparency of presentation will be also enhanced by the change of the time range to such that is important for the

analysis being performed. Data and current measurement values recorded by the device can be downloaded automatically or manually by the user.

DAQ Manager offers the possibility of creating an individual schedule in accordance with which data will be downloaded only as selected by it.

Applications, in which data recorded by one device are handled by more than one person, or where the data are important in several process points, can be also implemented based on data downloading using the DAQ Manager. Several computers with an installed software can successfully download data from the same ZMC recorder at the same time.

You can download the fully functional free version from our website (www.kobold.com).

Firmware

Thanks to the cooperation with our customers we can continue to develop the software and provide it with new useful functions. Interesting suggestions and needs of our customers have been contributing to better firmware. ZMC update means three easy steps: download the update free of charge from the www.kobold.com website, send it to a USB flashdrive, start the procedure and it is done.

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Manage a developed network of devices

For more demanding customers with many needs we have prepared the Advanced Communication Module (ACM). This module includes interfaces such as: Ethernet, USB Host, RS-485 and RS-485 shared with RS-232. This is why ZMC can offer up to 3 isolated RS-485 interfaces which compose the base for the MultiModbus System. Having such a big number of RS-485 interfaces at your disposal, ZMC can communicate with other devices in several independent networks. All the Modbus interfaces can work in both master and slave mode. By means of an Ethernet link, the user can monitor the operation of the entire system via the Internet from every place in the world, where an Internet browser is within reach. Another way to monitor given data is to use the RS-485 interface along with PC software.

MODBUS RTU MASTER

PHYSICAL OUTPUTS

MODBUS RTU SLAVE

TCP/IP

PHYSICAL INPUTS

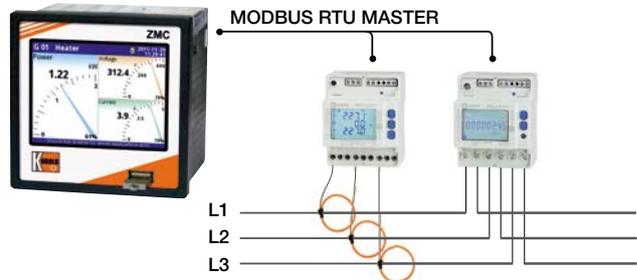rotational speed   pulses   pressure   flow   temperature
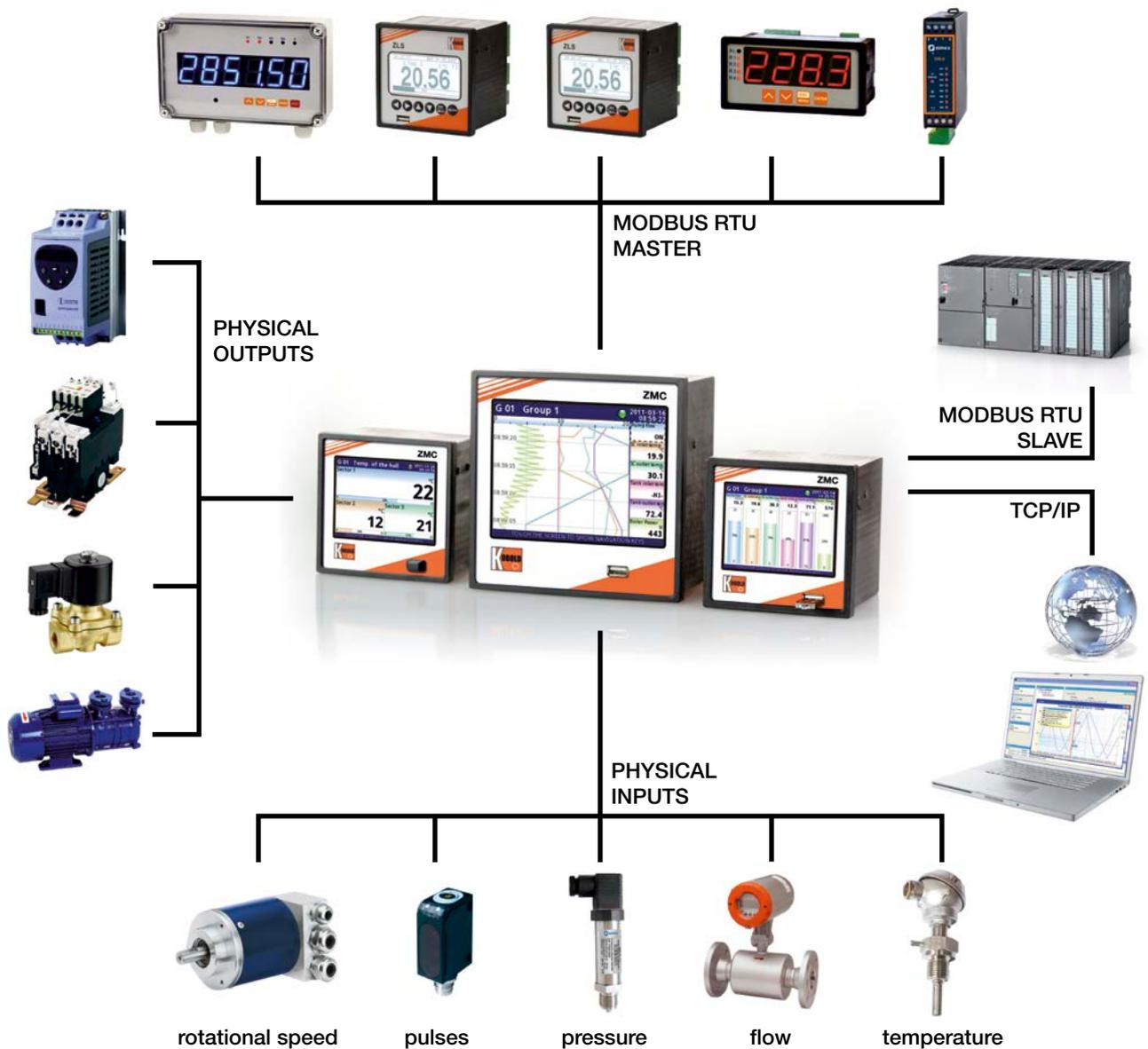
Some of the applications chosen by our customers:

● central temperature measurement and control system of energetic block,

● control of a multi-zone furnace,

● monitoring system for a pump station,

● multi-point parameters recording of power generators.

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Additional capabilities

ZMC as a power analyser

ZMC is also suitable in various industries. For some of them, it is extremely important to estimate the consumption of electricity. With energy counters and power analysers available in our offer and using a series of mathematical functions implemented, ZMC is a perfect diagnostic tool. It calculates the total and current energy consumption easily as well as it provides information about common parameters, starting from voltage, current, the sum of current of three phases, energy and ending with the phase shift and harmonic analysis.

Special designs

Our offer also includes interesting and special designs of ZMC device.

ZMC in wall-mounted ZUB-ZMCSWH96 or ZUB-ZMCSWH14 enclosure	• wall-mounted polycarbonate enclosure • dimensions (W x H x D): ZUB-ZMCSWH96: 130x130x125 mm ZUB-ZMCSWH14: 180x180x125 mm • ZUB-ZMCSWH96: up to 7xM12 or 4xM16 gland • ZUB-ZMCSWH14: up to 11xM12 or 7xM16 gland	
ZMC built-in a ZUB-ZMCP130 or ZUB-ZMCP150 portable case	• water- and dustproof IP 67 case • dimensions (W x H x D) P130: 285 x 246 x 174 mm P150: 464 x 366 x 176 mm • up to 23 input/output/communication connectors	

Technical Details

	ZMC-9/ ZMC-6	ZMC-1/ ZMC-4
Power supply/ consumption	19…50 V_{DC}, 16…35 V_{AC} or 85…260 $V_{AC/DC}$ / typ. 15 VA, max. 20 VA	19…50 V_{DC}, 16…35 V_{AC} or 85…260 $V_{AC/DC}$ / typ. 25 VA, max. 35 VA
Display	3.5" graphic TFT, 16-bit colour, 320 x 240 pxs, touchscreen navigation	5.7" graphic TFT, 16-bit colour, 320 x 240 pxs, touchscreen navigation
Measurement inputs	• up to 12 universal, isolated or unisolated: 0/4…20 mA; 0/1…5V, 0/2…10V, 0…30V; thermocouples: J, K, S, T, N, R, B, E (PN-EN), L (GOST); -10…25 mV, -10…100 mV, 0…600 mV; RTD (2/3/4 wire): Pt100, Pt500, Pt1000 (PN-EN), Pt'50, Pt'100, Pt'500 (GOST), Ni100, Ni500, Ni1000 (PN-EN), Cu50, Cu100 (PN-83M-53852), Cu'50, Cu'100 (PN-83M-53852); resistance 0…300 Ω, resistance 0…3 kΩ • up to 48 analogue: 0/4…20 mA, 0/1…5V, 0/2…10V • up to 24 thermocouples: J, K, S, T, N, R, B, E (PN-EN); L (GOST); ± 25 mV, ± 100 mV, -10…25 mV, -10…100 mV • up to 12 RTD: Pt100, Pt500, Pt1000 (PN-EN); Pt'50, Pt'100, Pt'500 (GOST); Ni100, Ni500, Ni1000 (PN-EN); Cu50, Cu100 (PN-83M-53852); Cu'50, Cu'100 (PN-83M-53852); resistance 0…300 Ω, resistance 0…3 kΩ • up to 24 NTC: 0…110 kΩ • up to 12 counters: max. freq. 5 kHz • up to 12 digital flow rate/flow speed meter: max. freq. 50 kHz • up to 12 analogue flow meter: 0/4…20 mA • mixed inputs: analogue-NTC temperature or analogue-digital: up to 12 x 0…20 mA, 4…20 mA and up to 12 x 0…5 V, 1…5 V, 0…10 V, 2…10 V and up to 24 x NTC or digital	• up to 18 universal, isolated or unisolated: 0/4…20 mA; 0/1…5V, 0/2…10V, 0…30V; thermocouples: J, K, S, T, N, R, B, E (PN-EN), L (GOST); -10…25 mV, -10…100 mV, 0…600 mV; RTD (2/3/4 wire): Pt100, Pt500, Pt1000 (PN-EN), Pt'50, Pt'100, Pt'500 (GOST), Ni100, Ni500, Ni1000 (PN-EN), Cu50, Cu100 (PN-83M-53852), Cu'50, Cu'100 (PN-83M-53852); resistance 0…300 Ω, resistance 0…3 kΩ • up to 72 analogue: 0/4…20 mA, 0/1…5V, 0/2…10V • up to 36 thermocouples: J, K, S, T, N, R, B, E (PN-EN); L (GOST); ± 25 mV, ± 100 mV, -10…25 mV, -10…100 mV • up to 18 RTD: Pt100, Pt500, Pt1000 (PN-EN); Pt'50, Pt'100, Pt'500 (GOST); Ni100, Ni500, Ni1000 (PN-EN); Cu50, Cu100 (PN-83M-53852); Cu'50, Cu'100 (PN-83M-53852); resistance 0…300 Ω, resistance 0…3 kΩ • up to 24 NTC: 0…110 kΩ • up to 12 counters: max. freq. 5 kHz • up to 12 digital flow rate/flow speed meter: max. freq. 50 kHz • up to 18 analogue flow meter: 0/4…20 mA • mixed inputs: analogue-NTC temperature or analogue-digital: up to 24 x 0…20 mA, 4…20 mA and up to 24 x 0…5 V, 1…5 V, 0…10 V, 2…10 V and up to 24 x NTC or digital
Digital inputs	• up to 49 *	• up to 73 *
Outputs	• up to 8 analogue 4…20 mA, passive, isolated, resolution 12 bit • up to 16 SPST relay 1A/250V • up to 4 SPDT relay 5A/250V • up to 48 SSR	• up to 24 analogue 4…20 mA, passive, isolated, resolution 12 bit • up to 36 SPST relay 1A/250V • up to 18 SPDT relay 5A/250V • up to 72 SSR
Sensor supply output	• 1 x 24 V_{DC} ±5%, 200 mA max.	• 1 x 24 V_{DC} ±5%, 200 mA max.
Communication interface	Basic version: RS-485, 1 x USB Host, ETU: 1 or 2 x USB Host, 1 x Ethernet ACM: 2 x RS-485, 1 x RS-485/232, 1 or 2 x USB Host, 1 x Ethernet	Basic version: RS-485, 1 x USB Host, ETU: 1 or 2 x USB Host, 1 x Ethernet ACM: 2 x RS-485, 1 x RS-485/232, 1 or 2 x USB Host, 1 x Ethernet
Protocols	Modbus RTU Master or Slave, Modbus TCP Server, HTTP, Web Server, NTP	Modbus RTU Master or Slave, Modbus TCP Server, HTTP, Web Server, NTP
IP rate protection	IP 65 (device front side), options: IP 65 version including gasket for panel cut-out sealing or IP 54 transparent door with key. IP 40 (front USB version).	IP 65 (device front side), optional IP 65 version including gasket for panel cut-out sealing or IP 54 transparent door with key. IP 40 (front USB version).
Operating temp.	0…+50°C (optional -20…+50°C)	0…+50°C (optional -20…+50°C)
Storage temp.	-10…+70°C (optional -20…+70°C)	-10…+70°C (optional -20…+70°C)
Data memory Data recording speed	internal 4 GB from 0.1 s to 24 h with resolution 0.1 s	internal 4 GB from 0.1 s to 24 h with resolution 0.1 s
Dimensions	case (WxHxD): 96 x 96 x 100 mm panel cut-out: 90.5 x 90.5 mm installation depth: min. 102 mm panel thickness: standard 7 mm or other depending on used board thickness brackets	case (WxHxD): 144 x 144 x 100 mm panel cut-out: 137 x 137 mm installation depth: min. 102 mm panel thickness: standard 7 mm or other depending on used board thickness brackets

* one digital input is available in standard, integrated on power supply module.

Order Details ZMC (Example: **ZMC 6 A 000 T4 N I16 0**)

Model	Housing/Power Supply Slot "P"	Communication Module Slot "D"	I/O Module Slot "C"
ZMC = Multichannel Controller/ Datalogger***	**9** = size 96 x 96 mm/ 19 ... 50 V_{DC}, 16 ... 35V_{AC} power supply, 1 x digital input, 1 x RS-485 **6** = size 96 x 96 mm/ 85 ... 260 $V_{AC/DC}$ power supply, 1 x digital input, 1 x RS-485 **1** = size 144 x 144 mm/ 19 ... 50V_{DC}, 16 ... 35V_{AC} power supply, 1 x digital input, 1 x RS-485 **4** = size 144 x 144 mm/ 85 ... 260 $V_{AC/DC}$ power supply, 1 x digital input, 1 x RS-485	**N** = no communication module (available for front USB option only) **E** = ETU communication module: 1 x USB Host, 1 x Ethernet 10 Mb/s **A** = ACM advanced communication module: 1 x RS-485, 1 x RS-485/232, 1 x USB Host, 1 x Ethernet 10 Mb/s **U** = USB port (back)	**Input Modules** **000** = empty slot (module: E) **T4N** = 4 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), non-isolated (module: EFUN4) **T6N** = 6 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), non-isolated* (module: EFUN6) **T4I** = 4 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), isolated (module: QFUN4) **T6I** = 6 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), isolated* (module: QFUN6) **U3I** = 3 x universal inputs U/I/RTD/TC/mV, isolated (module: UN3) **U5I** = 5 x universal inputs U/I/RTD/TC/mV, isolated* (module: UN5) **I16** = 16 x current inputs (module: I16) **I24** = 24 x current inputs* (module: I24) **IS6** = 6 x current (4 ... 20 mA) inputs, isolated (module: IS6) **U16** = 16 x voltage inputs (module: U16) **U24** = 24 x voltage inputs* (module: U24) **UI4** = 4 x voltage inputs + 4 x current inputs (module: UI4) **UI8** = 8 x voltage inputs + 8 x current inputs (module: UI8) **UIZ** = 12 x voltage inputs + 12 x current inputs* (module: UI12) **UIN** = 4 x voltage inputs + 4 x current inputs + 8 x NTC inputs (module: UI4N8) **UID** = 4 x voltage inputs + 4 x current inputs + 8 x digital inputs (module: UI4D8) **UIT** = 8 x voltage inputs + 8 x current inputs + 8 x NTC inputs* (module: UI8N8) **UII** = 8 x voltage inputs + 8 x current inputs + 8 x digital inputs* (module: UI8D8) **RT4** = 4 x RTD inputs (module: RT4) **RT6** = 6 x RTD inputs* (module: RT6) **TC4** = 4 x TC inputs (module: TC4) **TC8** = 8 x TC inputs (module: TC8) **TCZ** = 12 x TC inputs* (module: TC12) **D08** = 8 x digital inputs, isolated (module: D8) **D16** = 16 x digital inputs, isolated (module: D16) **D24** = 24 x digital inputs, isolated* (module: D24) **CP2** = 2 x pulse inputs, universal counters, isolated (module: CP2) **CP4** = 4 x pulse inputs, universal counters, isolated (module: CP4) **HM2** = 2 x hourmeters, isolated (module: HM2) **HM4** = 4 x hourmeters, isolated (module: HM4) **FT2** = 2 x pulse inputs (flow rate / flow totaliser), isolated + 2 x current inputs (module: FT2) **FT4** = 4 x pulse inputs (flow rate / flow totaliser), isolated + 4 x current inputs (module: FT4) **FI2** = 2 x current inputs (flow rate / flow totaliser) + 2 x current inputs (module: FI2) **FI4** = 4 x current inputs (flow rate / flow totaliser) + 4 x current inputs (module: FI4) **Output Modules** **R81** = 8 x SPST relay 1A outputs (module: R81) **RZ1** = 12 x SPST relay 1A outputs* (module: R121) **R45** = 4 x SPDT relay 5A outputs (module: R45) **R65** = 6 x SPDT relay 5A outputs* (module: R65) **SR5** = 4 x SSR driver outputs + 4 x SPDT relay 5A outputs (module: SR45) **S08** = 8 x SSR driver outputs (module: S8) **S16** = 16 x SSR driver outputs (module: S16) **S24** = 24 x SSR driver outputs* (module: S24) **IO2** = 2 x 4 ... 20 mA outputs, isolated (module: IO2) **IO4** = 4 x 4 ... 20 mA outputs, isolated (module: IO4) **IO6** = 6 x 4 ... 20 mA outputs, isolated* (module: IO6) **IO8** = 8 x 4 ... 20 mA outputs, isolated* (module: IO8)

* not for housing size 96 x 96 mm
** The installation of the R81 module in slot B is only possible in the case where in slot C another relay module (R81, R45 or SR5) was installed
*** Note: ZMC final hardware configuration requires at least one USB Port. The data recording functionality requires the license key ZUB-ZMCLKS9614.

No responsibility taken for errors;
subject to change without prior notice.

Order Details ZMC (Example: ZMC 6 A 000 T4N I16 0) (continued)

I/O Module Slot "B"	I/O Module Slot "A"	Special option
Input Modules **000** = empty slot (module: E) **T4N** = 4 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), non-isolated (module: EFUN4) **T6N** = 6 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), non-isolated* (module: EFUN6) **T4I** = 4 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), isolated (module: QFUN4) **T6I** = 6 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), isolated* (module: QFUN6) **U3I** = 3 x universal inputs U/I/RTD/TC/mV, isolated (module: UN3) **U5I** = 5 x universal inputs U/I/RTD/TC/mV, isolated* (module: UN5) **I16** = 16 x current inputs (module: I16) **I24** = 24 x current inputs* (module: I24) **IS6** = 6 x current (4 ... 20 mA) inputs, isolated (module: IS6) **U16** = 16 x voltage inputs (module: U16) **U24** = 24 x voltage inputs* (module: U24) **UI4** = 4 x voltage inputs + 4 x current inputs (module: UI4) **UI8** = 8 x voltage inputs + 8 x current inputs (module: UI8) **UIZ** = 12 x voltage inputs + 12 x current inputs* (module: UI12) **UIN** = 4 x voltage inputs + 4 x current inputs + 8 x NTC inputs (module: UI4N8) **UID** = 4 x voltage inputs + 4 x current inputs + 8 x digital inputs (module: UI4D8) **UIT** = 8 x voltage inputs + 8 x current inputs + 8 x NTC inputs* (module: UI8N8) **UII** = 8 x voltage inputs + 8 x current inputs + 8 x digital inputs* (module: UI8D8) **RT4** = 4 x RTD inputs (module: RT4) **RT6** = 6 x RTD inputs* (module: RT6) **TC4** = 4 x TC inputs (module: TC4) **TC8** = 8 x TC inputs (module: TC8) **TCZ** = 12 x TC inputs* (module: TC12) **D08** = 8 x digital inputs, isolated (module: D8) **D16** = 16 x digital inputs, isolated (module: D16) **D24** = 24 x digital inputs, isolated* (module: D24) **CP2** = 2 x pulse inputs, universal counters, isolated (module: CP2) **CP4** = 4 x pulse inputs, universal counters, isolated (module: CP4) **HM2** = 2 x hourmeters, isolated (module: HM2) **HM4** = 4 x hourmeters, isolated (module: HM4) **FT2** = 2 x pulse inputs (flow rate / flow totaliser), isolated + 2 x current inputs (module: FT2) **FT4** = 4 x pulse inputs (flow rate / flow totaliser), isolated + 4 x current inputs (module: FT4) **FI2** = 2 x current inputs (flow rate / flow totaliser) + 2 x current inputs (module: FI2) **FI4** = 4 x current inputs (flow rate / flow totaliser) + 4 x current inputs (module: FI4) **Output Modules** **R81** = 8 x SPST relay 1A outputs** (module: R81) **RZ1** = 12 x SPST relay 1A outputs* (module: R121) **R45** = 4 x SPDT relay 5A outputs* (module: R45) **R65** = 6 x SPDT relay 5A outputs* (module: R65) **SR5** = 4 x SSR driver outputs + 4 x SPDT relay 5A outputs* (module: SR45) **S08** = 8 x SSR driver outputs (module: S8) **S16** = 16 x SSR driver outputs (module: S16) **S24** = 24 x SSR driver outputs* (module: S24) **IO2** = 2 x 4 ... 20 mA outputs, isolated (module: IO2) **IO4** = 4 x 4 ... 20 mA outputs, isolated (module: IO4) **IO6** = 6 x 4 ... 20 mA outputs, isolated* (module: IO6) **IO8** = 8 x 4 ... 20 mA outputs, isolated* (module: IO8)	**Input Modules** **000** = empty slot (module: E) **T4N** = 4 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), non-isolated (module: EFUN4) **T6N** = 6 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), non-isolated* (module: EFUN6) **T4I** = 4 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), isolated (module: QFUN4) **T6I** = 6 x universal inputs U/I/RTD/TC/mV (incl. totaliser on 0/4 ... 20 mA input), isolated* (module: QFUN6) **U3I** = 3 x universal inputs U/I/RTD/TC/mV, isolated (module: UN3) **U5I** = 5 x universal inputs U/I/RTD/TC/mV, isolated* (module: UN5) **I16** = 16 x current inputs (module: I16) **I24** = 24 x current inputs* (module: I24) **IS6** = 6 x current (4 ... 20 mA) inputs, isolated (module: IS6) **U16** = 16 x voltage inputs (module: U16) **U24** = 24 x voltage inputs* (module: U24) **UI4** = 4 x voltage inputs + 4 x current inputs (module: UI4) **UI8** = 8 x voltage inputs + 8 x current inputs (module: UI8) **UIZ** = 12 x voltage inputs + 12 x current inputs* (module: UI12) **UIN** = 4 x voltage inputs + 4 x current inputs + 8 x NTC inputs (module: UI4N8) **UID** = 4 x voltage inputs + 4 x current inputs + 8 x digital inputs (module: UI4D8) **UIT** = 8 x voltage inputs + 8 x current inputs + 8 x NTC inputs* (module: UI8N8) **UII** = 8 x voltage inputs + 8 x current inputs + 8 x digital inputs* (module: UI8D8) **RT4** = 4 x RTD inputs (module: RT4) **RT6** = 6 x RTD inputs* (module: RT6) **TC4** = 4 x TC inputs (module: TC4) **TC8** = 8 x TC inputs (module: TC8) **TCZ** = 12 x TC inputs* (module: TC12) **D08** = 8 x digital inputs, isolated (module: D8) **D16** = 16 x digital inputs, isolated (module: D16) **D24** = 24 x digital inputs, isolated* (module: D24) **CP2** = 2 x pulse inputs, universal counters, isolated (module: CP2) **CP4** = 4 x pulse inputs, universal counters, isolated (module: CP4) **HM2** = 2 x hourmeters, isolated (module: HM2) **HM4** = 4 x hourmeters, isolated (module: HM4) **FT2** = 2 x pulse inputs (flow rate / flow totaliser), isolated + 2 x current inputs (module: FT2) **FT4** = 4 x pulse inputs (flow rate / flow totaliser), isolated + 4 x current inputs (module: FT4) **FI2** = 2 x current inputs (flow rate / flow totaliser) + 2 x current inputs (module: FI2) **FI4** = 4 x current inputs (flow rate / flow totaliser) + 4 x current inputs (module: FI4) **Output Modules** **R81** = 8 x SPST relay 1A outputs* (module: R81) **RZ1** = 12 x SPST relay 1A outputs* (module: R121) **R45** = 4 x SPDT relay 5A outputs* (module: R45) **R65** = 6 x SPDT relay 5A outputs* (module: R65) **SR5** = 4 x SSR driver outputs + 4 x SPDT relay 5A outputs* (module: SR45) **S08** = 8 x SSR driver outputs (module: S8) **S16** = 16 x SSR driver outputs (module: S16) **S24** = 24 x SSR driver outputs* (module: S24) **IO2** = 2 x 4 ... 20 mA outputs, isolated* (module: IO2) **IO4** = 4 x 4 ... 20 mA outputs, isolated* (module: IO4) **IO6** = 6 x 4 ... 20 mA outputs, isolated* (module: IO6) **IO8** = 8 x 4 ... 20 mA outputs, isolated* (module: IO8)	**0** = no option (Communication module required (option E, A or U)) **1** = front USB Host (IP 40) **C** = front USB Host (IP 40) + PCB conformal coating **K** = front USB Host (IP 40) + operating temp. -20°C ... +50°C + PCB conformal coating **D** = PCB conformal coating **T** = operating temp. -20°C ... +50°C + PCB conformal coating **G** = IP 65 gasket (USB Host must be on the back) **B** = IP 65 gasket + PCB conformal coating **P** = IP 65 gasket + operating temp. -20°C ... +50°C + PCB conformal coating **Y** = special (please specify in clear text)

* not for housing size 96 x 96 mm

** The installation of the R81 module in slot B is only possible in the case where in slot C another relay module (R81, R45 or SR5) was installed

*** Note: ZMC final hardware configuration requires at least one USB Port. The data recording functionality requires the license key ZUB-ZMCLKS9614.

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Accessories

Order Code	Description	Image
ZUB-ZMCSTD96 **ZUB-ZMCSTD14**	A transparent door with IP 54 rate and a key. The door and its frame are manufactured using the injection moulding technology which ensures that they fit perfectly. The material has been selected to eliminate corrosion and ensure maximum durability. This accessory is not available for a device with IP65 gasket (coding options: G, B, P)	
ZUB-ZMCSRH96 **ZUB-ZMCSRH14**	Assembly brackets for installation of the ZMC e.g. in control cabinets with typical 35 mm bus bars.	
DAQ Manager	Software for managing the recorded data. Its fully functional and free of charge version can be downloaded from our website	www.kobold.com
ZUB-ZMCSPH07 **ZUB-ZMCSPH05** **ZUB-ZMCSPH45**	Board thickness brackets ZUB-ZMCSPH07: 1 ... 7 mm board thickness brackets (2 pcs) standard included with device ZUB-ZMCSPH05: 1 ... 5 mm board thickness brackets (2 pcs) ZUB-ZMCSPH45: 1 ... 45 mm board thickness brackets (2 pcs)	
ZUB-ZMCMF16	Pendrive An unusually small and light USB flashdrive has been designed with easy storage and transport in mind. ZUB-ZMCMF fits perfectly into the ZMC controller's casing with closed IP 54 rate door. ZUB-ZMCMF16: mini pendrive / memory stick, 16 GB + strap	
ZUB-ZMCLKS9614	Data logging license key Free 30 day trials of license keys are also available.	