COMET

Monitoring Systems with datalogger MS

Software and Accessories

Stores

Server rooms

Building management

Hospitals, laboratories and pharmaceuticals

Industry

Traceable calibration certificate from the manufacturer with traceability in accordance with EN ISO/IEC 17025
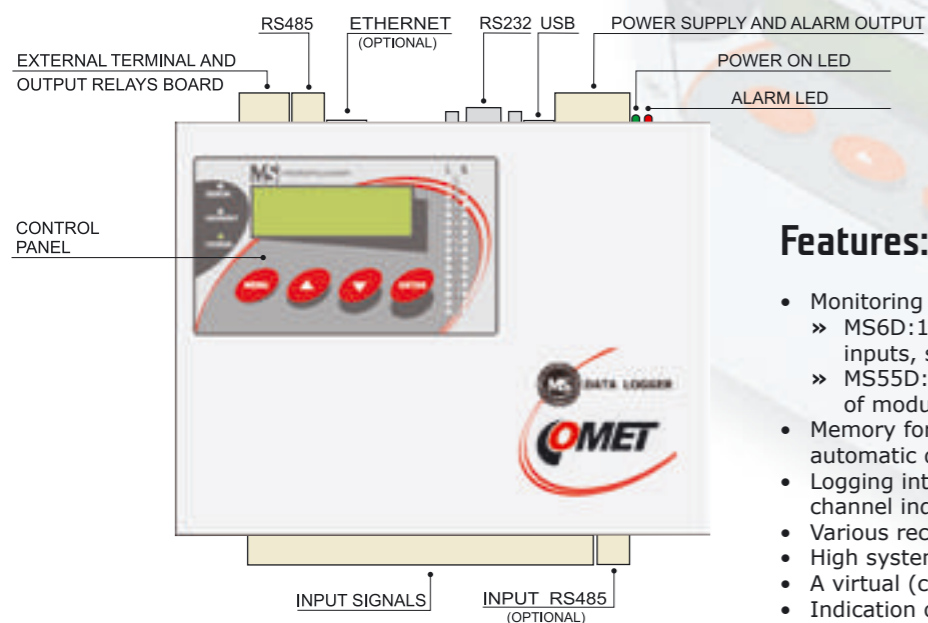
MS

• Universal 1-16 channel monitoring systems • Online monitoring
• Create alarm conditions • Recording • Regulation and control of processes
• Monitoring of temperature, humidity, CO_2 and other analog and and two-state values

Data loggers are designed for measurement, record, evaluation and consequent processing of input electrical signals, characterized by relatively slow changes (>1s). Together with proper transmitters and transducers are suitable for monitoring of physical values.
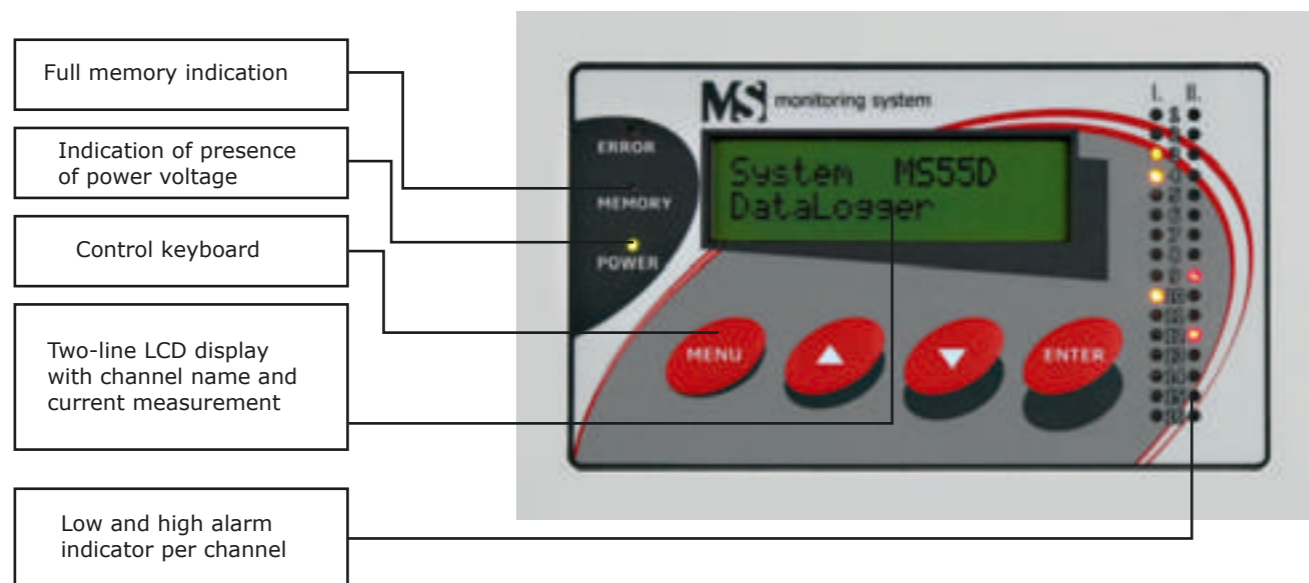
Device enables:

- to measure and process 1 to 16 input signals
- to acquire autonomous time record of measured values
- create alarm states
- to perform other actions based on created alarms (audible, visual indication, controlling of relay outputs, sending SMS message, controlling of telephone dialer, sending of messages via several protocols of the Ethernet interface etc.)
- to monitor on-line measured values and states

EXTERNAL TERMINAL AND OUTPUT RELAYS BOARD

RS485 ETHERNET (OPTIONAL) RS232 USB POWER SUPPLY AND ALARM OUTPUT

POWER ON LED

ALARM LED

CONTROL PANEL

INPUT SIGNALS INPUT_RS485 (OPTIONAL)

Features:

- Monitoring system MS contains up to 16 inputs
  - » MS6D:16 universal software programmable inputs, see page 8
  - » MS55D: modular 1 - 16 inputs, wide range of modules on the page 9
- Memory for 480 000 readings, automatic data download is possible
- Logging interval from 1 sec to 24 hours, for each channel individually selectable
- Various recording options
- High system accuracy
- A virtual (calculated) channels on unused inputs
- Indication of alarms states

Control panel

- Full memory indication
- Indication of presence of power voltage
- Control keyboard
- Two-line LCD display with channel name and current measurement
- Low and high alarm indicator per channel

The table below shows the characteristic differences between the systems. The Monitoring System MS55D uses hardware modules, while MS6D, MS6R or MS6-Rack is equipped with 16 universal, software configurable inputs.

MS6D and its variations

Each Monitoring System contains 16 software configurable inputs. See them on the page 8.

MS6D

MS55D

The user can select the hardware modules to be fitted into the monitoring system MS. See the page 9.

MS55D

Top view (communication interface)

RS232, RS485 and USB outputs. Ethernet output interface is optional.

Bottom view (sensor connections)

power voltage 12Vdc/24Vdc switch to power connected sensors

MS6-Rack - For mounting to 19" rack

MS6R - MS6R - For deskopt use

main differences	MS6D	MS55D
inputs	16 software programmable inputs	1 - 16 hardware input modules
maximum measured DC current	20 mA dc	5 A dc
maximum measured DC voltage	10 V dc	75 V dc
most sensitive measuring range of dc voltage	18 mV dc	100 mV dc
maximum measured AC current	-	5 A ac
maximum measured AC voltage	-	50 V ac
input for measurement of frequency	-	0 to 5 kHz
input for counting of pulses	-	Yes

Recording and online monitoring of temperature and humidity, leaks and smoke in data centers and server rooms.

Comet logger may be used in a wide range of applications, in clean and sterile environment as well as in the contaminated industrial environments. There is also the outdoor solution together with the watertight case. Below is an overview of some common applications.
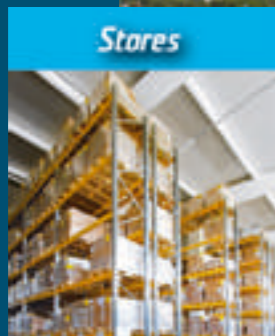
Server rooms

Building management

Industry

Building and energy management. Complete temperature, humidity, pressure and CO2 monitoring. Recording of energy consumption.

Recording of, inter alia, pulse signals, pressures, temperatures, voltages and flows.

Stores

Research and Development

Food industry and supermarkets. Registration and monitoring critical temperature with respect to HACCP regulations.

The registration and monitoring of processes, the registration of various parameters in test facilities.

Healthcare and Laboratory

Registration of temperatures, carbon dioxide (CO_2) and other critical parameters in the context of GLP or GMP regulations.

Recording

Recorded values are stored to a non volatile electronic memory and may be supplemented by the accompanying text - processes. Various options for data recording can be set up.

Various options for data recording

In addition to continuous recording mode with a constant interval can also enjoy a variety of other options. You can record data with its own interval only when certain conditions are valid, which may depend on measured values, time or direct user intervention. For example, you can control recording via an external contact or it is possible to set faster sampling mode during alarm conditions.

Processes

Process is the name of action recorded by data logger in time. User of data logger can enter from its keyboard to each input channel (except binary inputs) different previously preset names of processes and such way to distinguish in record, which action was performed at that time.

In case of power failure

In the event of a power failure, the backed up datalogger will continue to measure. Recorded data contains date and time of power failure. If the data logger is connected to GSM modem, the operator is immediately aware of difficulties.

Measuring and recording system MS has been developed to meet all requirements for the possibility of alarming. Each of the 16 channels offers setting of hysteresis, a delay and up to four conditions to active alarm. Alarm can be presented as sound (buzzer) and as visual signal (LED 1-32). For each alarm you can assign actions to be performed.

Alerts via:

» Integrated buzzer
» External siren or lights
» Email messages
» SMS texts via connected GPRS modem or router
» Telephone dialer

Relay on

Monitoring system MS activates selected relays (integrated relay ALARM OUT or external relays module) depending on alarm states.You can combine up to 16 switching external relay depending on arisen conditions. One of these conditions can be controlled via SMS messages.

Communication through GSM modem, GPRS / EDGE router

Modems can be used to set up a monitoring system MS, reading the recorded data, reading the current values and to communicate via SMS messages. The offered modems have been thoroughly tested to ensure maximum reliability.

Alerts via SMS texts

All data loggers are equipped with RS232 interface. GSM modem (GPRS router) can be connected to that port for transmitting alarm SMS texts. Up to four phone numbers can be set. Using text messages can also read the current values.

Email messages

Because of Ethernet interface you can expand communication possibilities of measuring system MS. Then alarm emails are sent directly to your email inbox.
You can also read the current data via web browser.
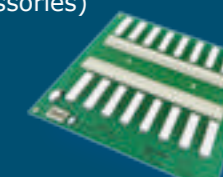
Communication interfaces
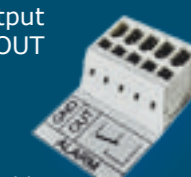
USB

RS-232/485

Ethernet (optional)

Relays module (accessories)

GSM/Wi-Fi (accessories)

Output ALARM OUT

Maximum connectable voltage on relay and current 1A/24Vac

Output signal 0V/4.8V max. current 50 mA

Monitoring system MS may be configured for almost any desired measurement application. Sensors can be wired to datalogger in star-like connection as well as in serial. Combination of both is also possible. The monitoring system MS is characterized by a wide range of communication interfaces such as the RS232, RS485, USB, Ethernet and GSM or GPRS modem. Thanks to Wi-Fi routers several measuring systems MS can be wirelessly connected to a network.
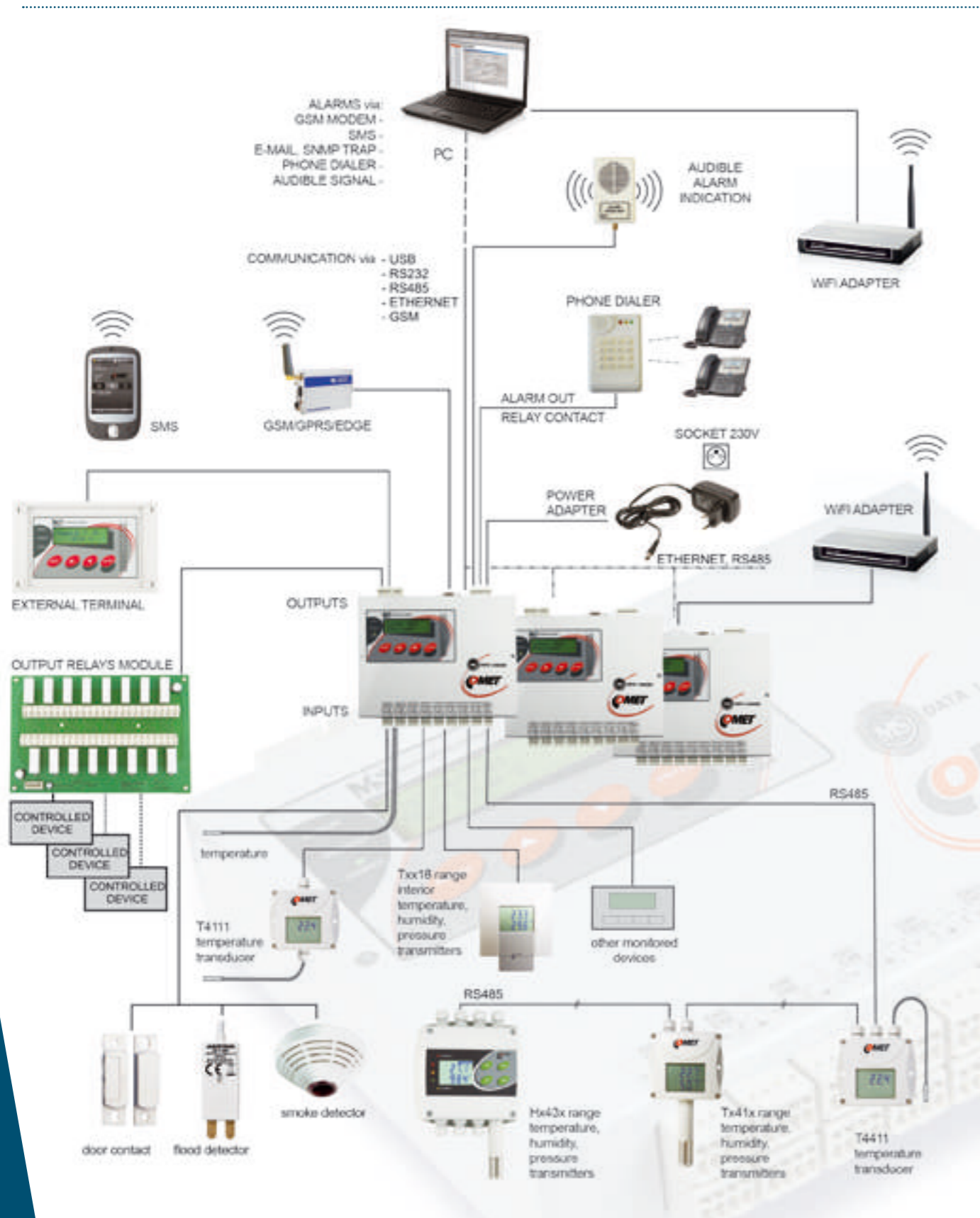
In the event that the number of 16 channels is insufficient, then it is possible to connect several units among themselves via RS485 or via the Ethernet network. A unique RS485 or IP address is assigned to each unit. However the distance between data loggers MS connected together via RS485 should not exceed 1200 meters.

RS485/USB

RS485/RS232
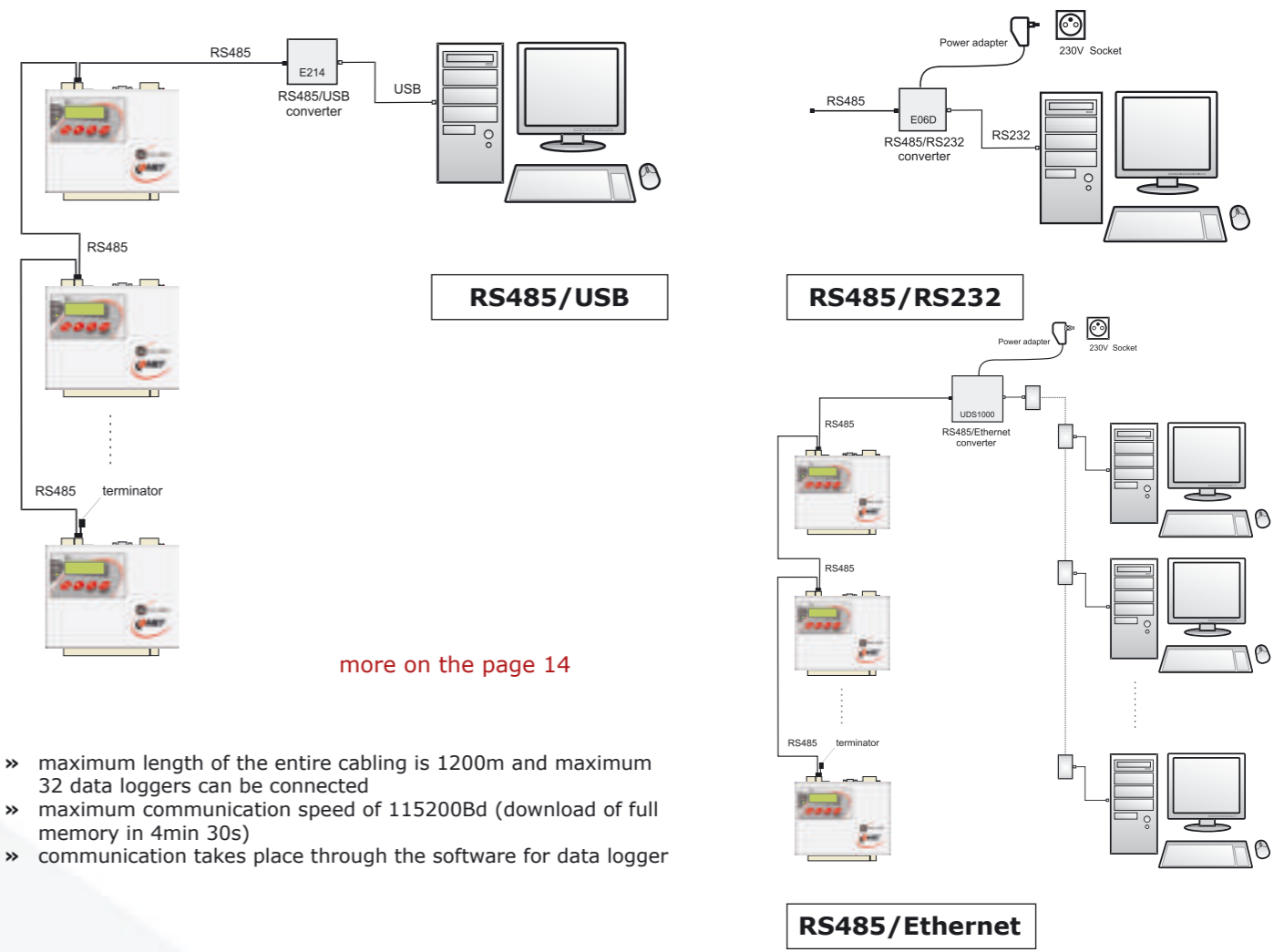
more on the page 14

» maximum length of the entire cabling is 1200m and maximum 32 data loggers can be connected
» maximum communication speed of 115200Bd (download of full memory in 4min 30s)
» communication takes place through the software for data logger
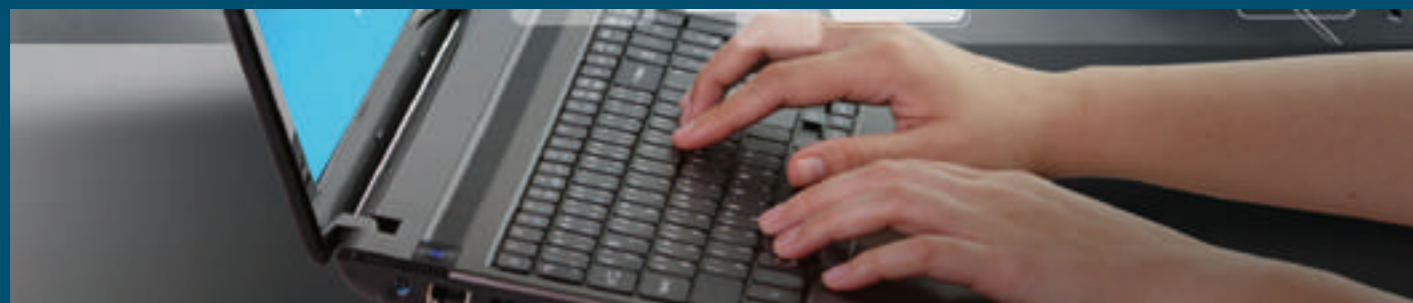
RS485/Ethernet
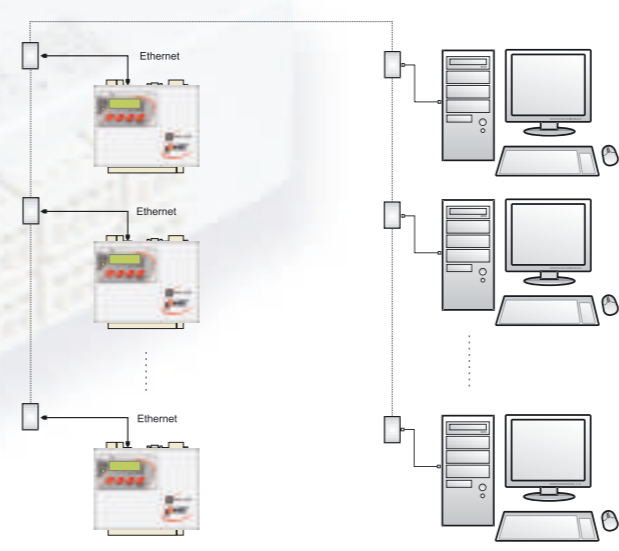
Ethernet

» download of memory in 2min 30s (depends on the network throughput)
» communication and sending alarm messages by means of several network protocols is enabled (web, SNMP, SMTP, SysLog, SOAP, ModBus)
» each data logger has its IP address (support DHCP)

SOAP SNMP WWW Syslog
XML Trap e-mail Modbus

Parameters of configurable inputs MS6D

Each Monitoring System contains 16 software configurable inputs from user PC. Also signals from sensors working on RS485 bus with ModBus or Advantech protocol can be recorded. RS485 input is available as optional accessory.

Measured values	Range	Accuracy	Note
current DC	4 to 20 mA	±0.1% FS (±0.02 mA)	it is possible to connect pasive sensors (powered by monitoring system) or active sensor with its own power supply. Input resistance about 110 Ohms.
voltage DC	-10 V to+10 V	±0.1% FS (±10 mV)	Input resistance about 10 MOhms
	-1 V to +1 V	±0.1% FS (±1 mV)	
	-100 mV to +100 mV	±0.1% FS (±100 uV)	
	-18 mV to +18 mV	±0,1% FS (±18 uV)	
resistance two-wire resistance measurement	0 to 300 Ohms	±0.1% FS (±0.3 Ohms)	measuring current approximately 0.8 mA @ 50 ms pulse
	0 to 3000 Ohms	±0.1% FS (±3 Ohms)	measuring voltage approximately 0.5 mA @ 50 ms pulse
	0 to 10000 Ohms	±0.1% FS (±10 Ohms)	measuring current approximately 0.1 mA @ 50 ms pulse
temperature probes Pt and Ni Ni1000	-50 °C to +250 °C	±0.2 °C (-50 °C to 100 °C)	Ni1000/6180 ppm, two-wire connection
		±0.2 % MV (100 °C to 250 °C)	measuring current approximately 0.5 mA @ 50 ms pulse
Pt100	-200 °C to +600 °C	±0.2 °C (-200 °C to+100 °C)	Pt100/3850 ppm, two-wire connection
		±0.2 % MV (+100 °C to +600 °C)	measuring current approximately 0.8 mA @ 50 ms pulse
Pt1000	-200 °C to +600 °C	±0.2 °C (-200 °C to+100 °C)	Pt1000/3850 ppm, two-wire connection
		±0.2 % MV (+100 °C to +600 °C)	measuring current about 0.5 mA @ 50 ms pulse
thermocouple K (NiCr-Ni)	-200 °C to 1300 °C	±(0.3 % MV +1.5 °C) MS6D only	linearized, with cold junction compensation, datalogger must be placed in recommendend working position
T (Cu-CuNi)	-200 °C to 400 °C		
J (Fe-Co)	-200 °C to 750 °C		
S (Pt10 % Rh-Pt)	0 to 1700 °C		
N (NiCrSi-NiSiMg)	-200 °C to 1300 °C		
B (Pt30 % Rh-Pt)	100 °C to 1800 °C	±(0.3 % MV +1.0 °C) in range 300 °C to 1800 °C	linearized, without cold junction compensation
thermistor NTC with selectable formula	up to maximum thermistor resistance 11000 Ohms	according to the used resistance range (see measurement of resistance)	the same characteristics for all connected thermistors
			default settings: R25=2252 Ohms, R80 = 282.7 Ohms
binary signal potential-less contact		binary signal	input voltage for state „L" (IN-COM) < 0.8 V
			input voltage for state „H" (IN-COM) > 2 V
open collector			resistance of closed contact for state „L" (IN-COM) < 1 kOhms
voltage levels			resistance of open contact for state „H" (IN-COM) > 10 kOhms"
			minimum duration for sensing of change: 200 ms
RS485 input for serial signal RS485		on request	input serves for reading from devices supporting protocol ModBus RTU or Advantech
			connected to terminals next to terminals for channel 15 and 16
			input can work with 16 devices
			galvanically isolated

Note: The inputs are not galvanically isolated (except RS485 input). If you need galvanically isolated inputs then you can choose from a wide range of input modules for monitoring system MS55D. FS means (full scale) and MV (measured value).

Parameters of inputs MS55D

The user can select the hardware modules to be fitted into the monitoring system MS. The modular design gives you the freedom to start with several input modules and to expand the system later on.

Measured values	Module types	Range	Accuracy	Notes
current DC	A0	4 to 20 mA	±0.1 % FS	with source approximately 21V for two-wire transducers with current loop (e.g. temperature and humidity transducers Comet).
	A1*	4 to 20 mA		only galvanic not isolated
	B0*	0 to 20mA		for passive sensing of current, Rin = 14 Ohms
	B1*	0 to 1 A		input resistance Rin = 0.04 Ohms
	B2*	0 to 5 A		
AC	C0	0 to 20 mA	±1 % FS	galvanic isolated, sinusoidal signal at a frequency of 50 Hz input resistance Rin by type 0.04 Ohm to 14 Ohms
	C1	0 to 1 A	±1 % FS	
	C2	0 to 5 A		
voltage DC	D0*	0 to 100 mV	±0.1 % FS	input resistance Rin by a 900 kOhms to 10 Mohms
	D1*	0 to 1 V		
	D2*	0 to 10 V		
	D4*	0 to 75 V		
	D5*	-10 V to +10 V	±0.1 % FS (± 20 mV)	
AC	E0	0 to 100 mV	±1 % FS	only galvanic isolated, sinusoidal signal at a frequency of 50 Hz input resistance Rin by type 700 kOhms to 10 Mohms
	E1	0 to 1 V		
	E2	0 to 10 V		
	E4	0 to 50 V		
resistance	F*	must be specified	±0.1 % FS	two-wire connection
temperature probes Pt and Ni Ni1000	J*	-50 °C to +250 °C	±0.2 °C (-50 °C to 100 °C)	Ni1000/6180 ppm, two-wire connection
			±0.2% MV (100 °C to 250 °C)	measuring current of approximately 0.25 mA continuously
Pt100	K*	-140 °C to +600 °C	±0.2 °C (-140 °C to +100 °C)	Pt100/3850 ppm, two-wire connection
			±0.2 % MV (+100 °C to +600 °C)	measuring current of approximately 2 mA continuously
Pt1000	K1*	-140 °C to +600 °C	±0.2 °C (-140 °C to +100 °C)	Pt1000/3850 ppm, two-wire connection
			±0.2 % MV (+100 to +600 °C)	measuring current of approximately 0.2 mA continuously
Pt1000	K3	-10 °C to +50 °C	±0.06 °C	Pt1000/3850 ppm, two-wire connection
				measuring current of approximately 0.2 mA continuously
thermocouple K (NiCr-Ni)	N*	-70 °C to +1300 °C	±0.3 % MV + 1.5 °C	linearized, cold junction compensation, datalogger must be placed in recommendend working position
T (Cu-CuNi)	T*	-200 °C to +400 °C		
J (Fe-Co)	O*	-200 °C to 750 °C		
S (Pt10 %Rh-Pt)	P*	0 °C to 1700 °C	±0.3 % MV +1.5 °C (200 °C to 1700 °C)	
B (Pt30 %Rh-Pt)	Q*	100 °C to 1800 °C	±0.3 % MV+1.0 °C (300 °C to 1800 °C)	linearized, without cold junction compensation
binary signal potential-less contact	S*	binary signal		maximum resistance of closed contact is 1000 Ohms
				minimum duration for recording is 200 ms
				voltage for „H" state is 3 V to 30 Vdc @ 9 mA max
voltage, galvanically isolated	S1	binary signal		minimum duration for recording: 200 ms
				galvanically isolated
pulse counter potential-less contact, galvanically isolated	CTU	31 bits, 5kHz max.		voltage change of the counter state is 3 V to 24 Vdc
				backup power, filter bouncing
				galvanically isolated
potential-less contact, open connector	CTK	31 bits, 5kHz max.		maximum resistance of closed contact is 10 kOhms
				minimum open contact resistance is 250 kOhms
				backup power, filter bouncing
frequency input voltage signal measurement, galvanically isolated	FU	0 to 5 kHz	±(0.2 % MV + 1 Hz)	input voltage for „H": 3 V to 24 Vdc @ 7 mA
				minimum duration of input pulse: 30 us
		resolution 1Hz		galvanically isolated
measurement frequency switching contact, galvanically not isolated	FK	0 to 5 kHz	±(0.2 % MV + 1 Hz)	maximum resistance of closed contact is 10 kOhms
				minimum open contact resistance is 250 kOhms
		resolution 1 Hz		minimum duration of input pulse: 30 us
RS485 input for serial signal RS485	RP	digital transmission		input supports Modbus RTU or Advantech
				connected devices must have the same communication parameters
				input can work with up to 16 devices
				galvanic isolated, MS can be equiped wit multiple RP modules

Clear presentation of measured data

For a clear reading and processing the collected data is available user-friendly software which consists two parts - communication and analysis that allows you to work with spreadsheets and graphs.

Software interface is intuitive and easy to use thanks to software wizard. It ensures easy operation even for beginner who starts working with monitoring system MS. Software is Compatible with Windows®.

Features:
» clear presentation of measured data in tables and charts
» easy export to MsExcel® files or PDF
» software allows to control all MS functions, settings of alarms, browsing and printing of recorded data in tables or charts
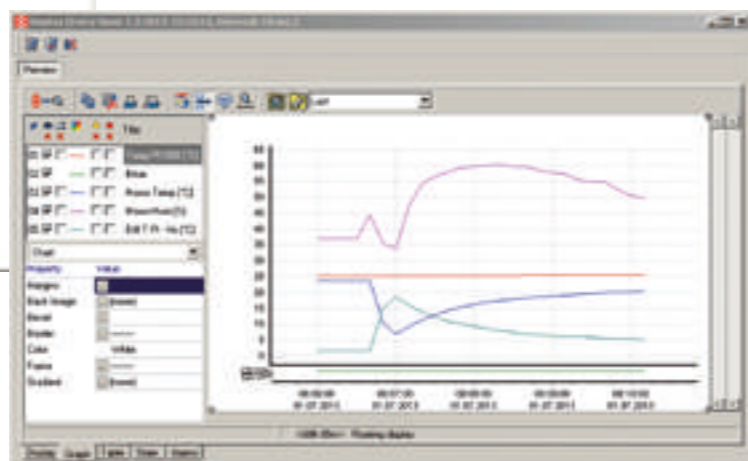

Table of measured values

Optional software for MS

chart of readings

Export

Easy export of measured data to XLS or DBF files. Export of measured data can be fully automatized. Software allows communication with MS monitoring systems via RS232, RS485, USB, via GSM modem or via Ethernet.

statistic data

Statistic

Maximal or minimal value, average, deviation, number of stored values, all these can be easily and clearly shown in table mode.

Data

Autodownload

Recording system MS is able to automatically send the measured data to a computer via the selected communication interface - USB, RS485, Ethernet or GSM modem connected to RS232.

Frequency of automatic reading can be set. This feature is available even if more MS systems is connected together.
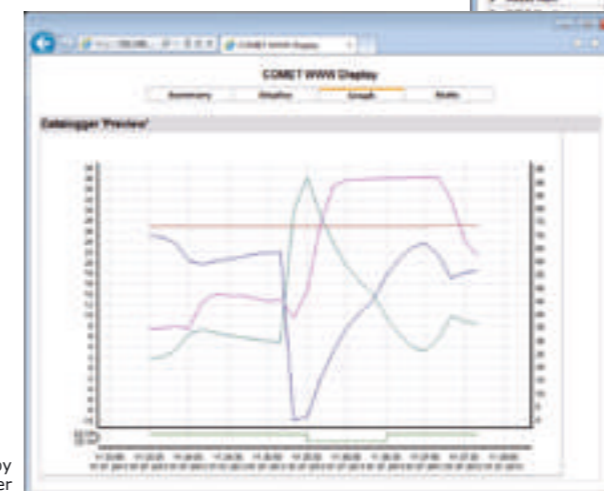

settings of communication

Real time monitoring with software

Monitoring system MS allows to monitor all monitored sites in real time. Charts, tables, alarms can be displayed in „DISPLAY" mode. This mode can be shared on multiple computers.

settings of autodownload

display mode

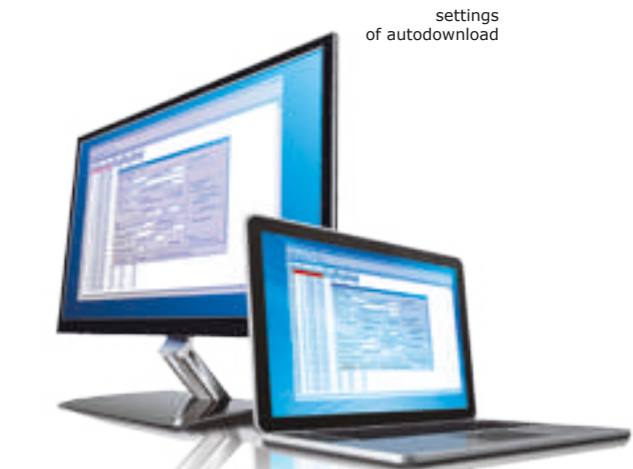### Data processing via web interface

Current data can be displayed in web browser using HTML pages. Process of measuring can be simultaneously monitored by several user groups (techniques, management, etc.). Device must be connected to the Internet/Intranet.

web display mode

data displayed by web browser

11

For users of monitoring system MS is available software solution for data collection to one central database. It is based on MS SQL or MySQL. Software system is suitable for users who want to analyze data from multiple loggers MS or other products of Comet System.

When do you need Comet Database?

» for 24 hours supervision
» as the storage place for your data
» for simple and clear access to your measured values
» as the storage place for all devices Comet System
» for alarm SMS texts and e-mails

Comet Database offers:

- data stored in one place and accessible with Comet Database Viewer
- to present data in table and graph
- to print and export data
- alarms via SMS texts and emails
- acoustic and visual signalization of alarms
- compatibility with all Comet System devices and 3rd party devices

Sensors RS485/232
online

Web Sensors
online

Alarm SMS text
Online
24h supervision

GSM modem

kit-GSM-W

Comet Database Viewer

Each purchased Comet Database already contains one licence of Database Viewer. This low cost browser enables to several clients to view database from different places on network/internet.
Another viewer licences can be purchased separately for other users of Comet Database. It is possible to assign limited rights for either read or write, or even administration rights for configuration.

Comet Database

Comet Database contains many useful tools for data analysis - graphs, tables, statistics etc. Comet database also offers advanced features - secured access to data, accounts administration, remote monitoring, error diagnostic, database backup etc.

Loggers

Optional software for Loggers

Optional software for MS

Analytical software
SWR006 see page 10-11

MS Monitoring system
online

Comet Database Viewer
Remote access to Comet Database

Required software for running Comet Database?

Optional software SWR006 + Comet Database

Sensors / transmitters / probes

Comet System produces wide range of sensors which are compatible with monitoring system MS. There exist two ways of connection and their combination. Analog Sensors with 4-20mA, 0-10V output are wired to datalogger in star-like connection and digital sensors with RS485 output are linked in serial.

Analog sensors 4-20 mA, 0-10 V

Interior transmitter of temperature and CO_2		
Output	4-20 mA	0-10 V
Type	T8148	T8248

Other types of industrial and interior-sensors, including regulators and probes can be found on our website www.cometsystem.cz

Temperature and humidty transmitter		
Output	4-20 mA	0-10 V
Type	T3110	T0210

Temperature and humidty transmitter with external probe		
Output	4-20 mA	0-10 V
Type	T3111	T0211

Digital sensors and regulators with RS485 output

IInterior transmitter of temperature, humidity and CO_2	
Output	RS485
Type	T7418

Temperature transmitter for Pt1000 probes	
Output	RS485
Type	T4411

Temperature and humidity regulator with 0/I state inputs		
Output	RS485	2 x relay
Type	H3430	

Temperature, humidity and CO_2 regulator		
Output	RS485	2 x relay
Type	H6420	

Communication, convertors

RS485IN - Galvanically isolated input for serial RS485 signal (for MS6D).

Input is designed for reading from devices supporting protocol ModBus RTU or Advantech. RS485IN port can be equipped additionaly.

M1061 - RP input module for datalogger MS55D for serial signal RS485

It is necessary to connect to one RP module only devices communicating with the same communication speed and the same communication protocol! Data logger can contain several RP modules. Protocols ModBus RTU or Advantech are supported.

MP030 - RS232 connector with terminals

RS232 connector with terminals for RS232 interface connection by means of terminals, not by D-Sub connector.

MP021 - Converter RS232/RS485

Converter RS485/RS232 for serial port COMx at the PC side, including ac/dc adapter and terminator T485. Using this converter is suitable in the case when the monitoring system MS is away from the computer more than 10 meters.

MP022 - Converter USB/RS485

Converter for USB port at the PC side, including terminator T485. Powered from computer USB interface. Using this converter is suitable in the case when the monitoring system MS is away from the computer more than 10 meters.

MP042 - Ethernet communication port

Ethernet interface expands communication possibilities of measuring system MS. Communication via: SNMP, SOAP, www pages, Modbus TCP. In case of limits exceeding alarm is activated and warning e-mail or SNMP trap are sent to specified addresses.

MP023 – Converter RS485 to Ethernet

Designed for several data loggers connected via RS485 network for connection to the computer via Ethernet. Including ac/dc adapter and terminator T485.
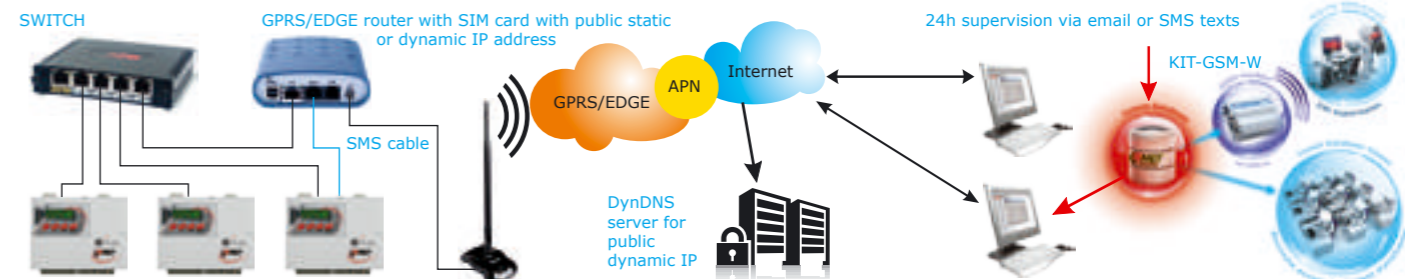
Note: For connection possibilities see page 6 and 7.

GSM/Wi-Fi communication

GPRS/EDGE router - MP052

Router is intended for MS6D, MS6R, MS6-Rack and MS55D which are equipped with an Ethernet interface MP042. Using GPRS / EDGE router can be recommended as a reliable, fast and low operating cost solution compared to using a dial-up connection with a modem GSM-KIT-M.

SWITCH — GPRS/EDGE router with SIM card with public static or dynamic IP address — SMS cable — GPRS/EDGE — APN — Internet — DynDNS server for public dynamic IP — 24h supervision via email or SMS texts — KIT-GSM-W

IP address of router is assigned by your mobile provider and it is related to your SIM card. Address may be private, public dynamic or public static. IP addres is public if router is accessed by it directly from internet. Static IP is fixed allocated to SIM by provider. Dynamic IP address is acquired from provider during connection of router to the GPRS/EDGE network. Dynamic IP is variabled. No everyone provider supports public IP! Open VPN tunnel with a private IP address can be used. This router allows using of SMS messages for one MS monitoring system.

KIT-GSM-M

For data transmission from the data logger MS to Computer must be used two modems. One on the side of logger and second on side of PC. In comparison with the GPRS / EDGE router data transfer is slower. This modem is suitable for users who need to acquire alarm SMS texts from one monitoring system MS. Up to four phone numbers can be set up.

KIT-GSM-W

The hardware of this kit is identical to KIT-GSM-M. However it is preconfigured for use with the software Comet Database. When you connect modem with PC where Comet Database is installed you get a tool for 24-hour surveillance of critical events via SMS texts (see picture above). Unlimited phone numbers can be set up.

Wi-Fi adapter - TP-LINK-TL
Wifi adapter for wireless connection of data logger to Ethernet network.

Switching and controlling
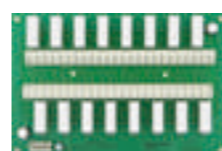
MP018
Relay module contains 16 mains relays 250V/8A with switching-over contacts. Each relay can be controlled based on alarm creation at different input channels accordingly to setting of user program. It is necessary to buy connection cable MP017. We also offer brackets on DIN rail MP019 and MP20.
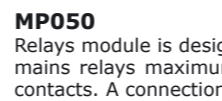
MP050
Relays module is designed for mounting into MS6-Rack. It contains 16 mains relays maximum voltage 50 V AC/75 Vdc with switching-over contacts. A connection cable and blind plug are supplied.

Power and backup adapters

A1940
Universal ac/dc adapter 24 Vdc/1 A for connection to terminals, switch-mode.

A1759
Universal linear ac/dc adapter 230 V-50 Hz/ 21 Vdc/1 A - for connection to terminals.

A5948
Power supply 230V-50Hz/24Vdc/2,5A for DIN rail 35mm, dual terminals 24Vdc, switch-mode, including DIN rail of 100mm length.

A6963
Backup power supply A6963 with battery A7963 - model MINI-BAT/24DC/1.3AH. Power supply is designed for mounting to 35 mm DIN.

A6966
It is necessary to buy two pieces of batteries A7966 12 V/7 Ah for this backup power supply. Not suitable for installation into closed switchboard.

Other accessories for installation and mounting can be found on our website.

A solution for extreme conditions

– up to IP65

MP048
MS6D datalogger in IP54 protection case with connected terminal at the lid.

MP049
MS55D datalogger in IP54 protection case with connected terminal at the lid.

MP033
Case with IP65 protection with wall holders and MS data logger holders - no cutout in the lid.

Note: Dimensions of all cases is 270 x 570 x 140 mm. The relay board MP018 can be placed inside.

External terminal

MP016
Terminal with dual line alphanumerical LCD and control buttons, audio alarm indication and 32 alarm LEDs - for panel mounting or mounting to a case lid. Identical functions as built-in terminal of MS data logger. Maximum cable length to data logger 50m. It is necessary to order the MP017 connection cable to data logger (length of cable 60cm, 5m, 10m).

MP032
Built in a IP54 protection case, including 2m cable with covered terminals.

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General parameters

Material of housing	metal
Operating conditions	0 to 50 °C
Clock	backed-up real-time clock
Protection	IP20
Connectors	standard Wago plug terminals (detachable)
Power	24 Vdc, consumption of data logger itself approximately 80 mA
Dimension of MS6D	215 x 225 x 44 mm
Dimension of MS6 - Rack	483 x 190 x 44 mm
Dimension of MS6R	225 x 230 x 44 mm
Dimension of MS55D	215 x 225 x 60 mm