Universal monitoring system with data logger MS6D, MS6-Rack, MS6R

COMPLETE SOLUTION FOR MONITORING OF TEMPERATURE, HUMIDITY AND OTHER SIGNALS

Main advantage - user configurable inputs from PC program without any need to open the data logger unit. Each data logger contains 16 inputs for measurement and record of both analog and two-state values. Each input is individually configurable from user PC program to one from 17 measuring ranges.
Also signals from sensors working on RS485 bus with ModBus or Advantech protocol can be recorded.
Universal sixteen channel data logger is designed for data acquisition from sensors of variety values, alarm state indication, optionally for control of consecutive processes.
Data is possible to download to the PC via USB, RS232, Ethernet interfaces or GSM modem for processing.

Available models:

MS6D
* for wall mounting or to the switch board
* enables mounting to the optional watertight case MPO33, MPO34
* dual line illuminated alphanumeric display
* four control buttons
* 32 alarm LEDs
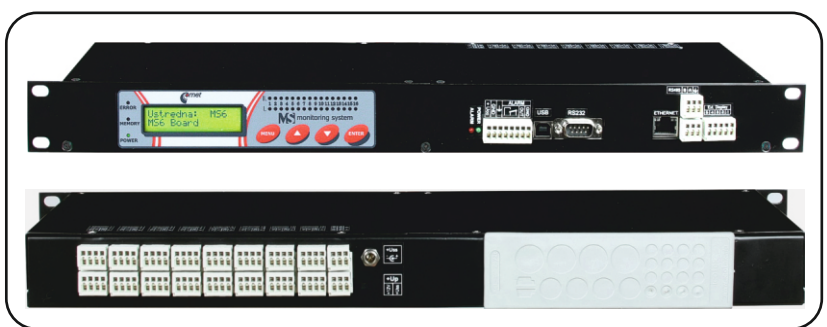
MS6-Rack
* for mounting to 19" rack - one rack unit 1U
* enables to build in the optional MPO18 output relays module with 16 relays
* dual line illuminated alphanumeric display
* four control buttons
* 32 alarm LEDs

MS6R
* for mounting to 19" rack - one rack unit 1U
* for desktop use with rubber feet
* dual line illuminated alphanumeric display
* four control buttons
* 32 alarm LEDs

Data logger enables to:

○ Configure inputs for different input signal types from the PC program without any need to open the data logger unit.
○ Individully configure each input channel for measurement, alarm evaluation and data logging , including individual logging interval for each input.
○ Individually program each input channel for different modes of record (continuous record, time dependent record, record only if specified logic conditions are matched, record triggered by external signal, etc.).
○ Set up to four different logic conditions for each channel to active alarm. Each condition compares measured values from inputs with set limits. It is possible to set hysteresis and delay of condition validity.
○ Indicate alarm state after matching defined combination up to four alarms from any inputs.
○ Activate selected relays depending on alarm states by means of output relays module.
○ Receive information from monitoring system by means of SMS messages via GSM modem - actual values, alarms, memory occupation etc.
○ Assign to each input channel name of actual recorded process to identify monitored object (e.g. type of monitored product). It is enabled to select this name from data logger keyboard during the operation.
○ Connect several data loggers via RS485 bus or Ethernet network.
○ Power external sensors and detectors directly from input terminals **12Vdc or 24Vdc.**

Universal monitoring system with data logger MS6D, MS6-Rack, MS6R

TECHNICAL PARAMETERS

Total memory capacity:	2MB (up to 480 000 values)
Memory type:	internal backed-up SRAM memory
Data logging modes:	noncyclic - logging stops after filling the memory
	cyclic - after filling memory oldest data is overwritten by new
Data logging intervals:	adjustable individually for all input channels from 1 second to 24 hours
Real time clock:	year, leap year, month, day, hour, minute, second, backed-up by Lithium battery
Input signals:	16 user configurable channels - see parameters in the table below
AD converter (analog chanells):	16 bits, conversion duration approximately 60ms/channel
Supported interface for communication with computer:	RS232, cable up to 15 m. Enables direct connection with the PC or via GSM modem, including sending/reception of SMS messages - **included**
	USB interface - **included**
	RS485 - cable up to 1200 m, galvanically isolated, enables to connect several data loggers to one communication line - **included**
	Ethernet interface LAN - communication via: SNMP, SOAP, www pages - **optionally**
Communication speed:	9600, 19200, 57600, 115200 Bd
Outputs for alarm indication:	Red LED at the side of the case, 32 LEDs
	Relay max. 8A/250Vac, switching-over contact
	Voltage signal 0V/4.8V, maximum current 50mA.
	Alarm SMS messages
	E-mails, SNMP traps - see optional accessory
Power:	24Vdc, consumption of data logger itself approximately 80 mA
Power of connected sensors and detectors:	Switchable voltage +12Vdc or +24Vdc available at sixteen input terminals
Operating temperature range:	0 to +50˚C
Dimensions with plugged connectors - MS6D:	215 x 225 x 44 mm (W x H x D)
Dimensions with plugged connectors - MS6-Rack:	483 x 190 x 44 mm (W x H x D) - one rack unit 1U
Dimensions with plugged connectors - MS6R:	483 x 230 x 44 mm (W x H x D) - one rack unit 1U
Dimensions without rack holders - MS6R:	225 x 230 x 44 mm (W x H x D)
Protection:	IP20

PARAMETERS OF CONFIGURABLE INPUTS

MEASURED VALUE	ACCURACY	NOTE
dc current 4 to 20 mA dc voltage -10V to +10V	±0.1% FS (±0.02 mA)	either from active source connected to COM and GND terminals or passive sensor across terminals +24V and COM
dc voltage -1V to +1V	±0.1% FS (±10 mV)	input resistance appr. 10 MOhms, input terminals IN and COM
dc voltage -100mV to +100mV	±0.1% FS (±1 mV)	input resistance appr. 10 MOhms, input terminals IN and COM
dc voltage -18mV to +18mV	±0.1% FS (±100 uV)	input resistance appr. 10 MOhms, input terminals IN and COM
thermocouple K (NiCr-Ni)	±0.1% FS (±18 uV)	input resistance appr. 10 MOhms, input terminals IN and COM
-200 to +1300˚C thermocouple J (Fe-Co)	±0.3% from reading + 1.5˚C	linearized, cold junction compensation, input terminals IN and COM
-200 to +750˚C thermocouple S (Pt10%Rh-Pt)	±0.3% from reading + 1.5˚C	linearized, cold junction compensation, input terminals IN and COM
0 to +1700˚C thermocouple B (Pt30%Rh-Pt)	±0.3% from reading + 1.5˚C	linearized, cold junction compensation, input terminals IN and COM
+100 to +1800˚C thermocouple T (Cu-CuNi)	±0.3% from reading + 1.0˚C from +300 to +1800˚C	linearized, without cold junction compensation, input terminals IN and COM
-200 to +400˚C Platinum RTD sensor Pt100	±0.3% from reading + 1.5˚C	linearized, cold junction compensation, input terminals IN and COM
-200 to +600˚C Platinum RTD sensor Pt1000	±0.2˚C from -200 to +100˚C ±0.2% from +100 to +600˚C	two-wire connection, measuring current appr. 0.8mA in 50ms pulse, input terminals IN and COM
-200 to +600˚C Nickel RTD sensor Ni1000/	±0.2˚C from -200 to +100˚C ±0.2% from +100 to +600˚C	two-wire connection, measuring current appr. 0.5mA in 50ms pulse, input terminals IN and COM
6180ppm -50 to +250˚C two-wire measuring of resistance	±0.2˚C from -50 to +100˚C ±0.2% from +100 to +250˚C	two-wire connection, measuring current appr. 0.5mA in 50ms pulse, input terminals IN and COM
0 to 300 Ohms two-wire measuring of resistance	0.1% FS (±0.3 Ohms)	two-wire connection, measuring current appr. 0.8mA in 50ms pulse, input terminals IN and COM
0 to 3000 Ohms two-wire measuring of resistance	0.1% FS (±3 Ohms)	two-wire connection, measuring current appr. 0.5mA in 50ms pulse, input terminals IN and COM
0 to 10000 Ohms	0.1% FS (±10 Ohms)	two-wire connection, measuring current appr. 0.1mA in 50ms pulse, input terminals IN and COM
Binary input for two-state signal	Input voltage for state "L" (IN-COM) < 0.8 V (Rin < 1 kOhm). resistance of closed contact for state "L" (IN-COM) < 1 kOhm. input voltage for state "H" (IN-COM) > 2 V. resistance of closed contact for state "H" (IN-COM) > 10 kOhm. minimum duration for sensing of change: 200ms.	
RS485IN - input for serial signal RS485 - optionally	E.g. data acquisition from temperature, humidity, pressure sensors Tx41x, Hx43x. 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. Maximum speed 115200Bd. Galvanically isolated.	

Universal monitoring system with data logger MS6D, MS6-Rack, MS6R

Included Accessories:

Traceable calibration certificate from the manufacturer with declared metrological ethalon traceability in accordance with EN ISO/IEC 17025.
Calibration certificate contains calibration of 16 inputs 4-20mA, if it is not defined required configuration of inputs by the user.
If required configuration of inputs is defined by the user, calibration certificate proves calibration of inputs in accordance with this required configuration - maximum one range for each of 16 inputs.
Calibration of other ranges is optional.

Included is also USB communication cable of approximately 1.8 meter length and free program for Windows.
Free program is available to download anytime. Program enables to control all logger functions and view and print the record in numerical format. It is possible to export recorded data to dbf or xls formats for further analysis, e.g. in MS Excel.
For work with graphs and other functions is possible to order optional program SWR006 or
DBM MS Logger Program - database program - see Optional Accessories.
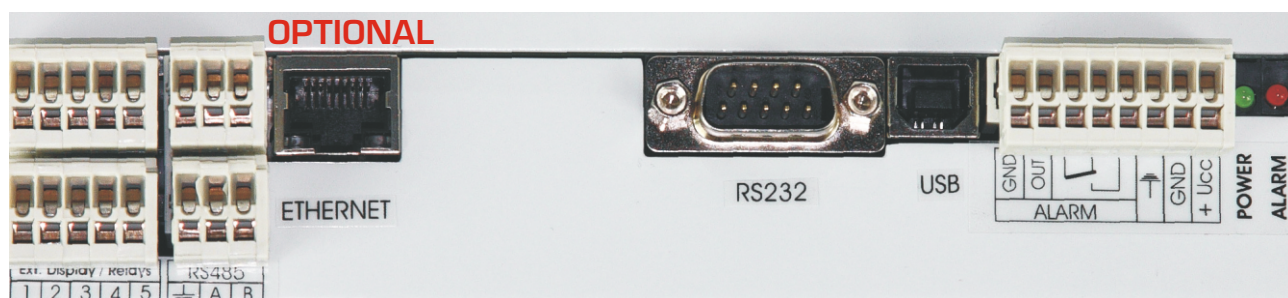

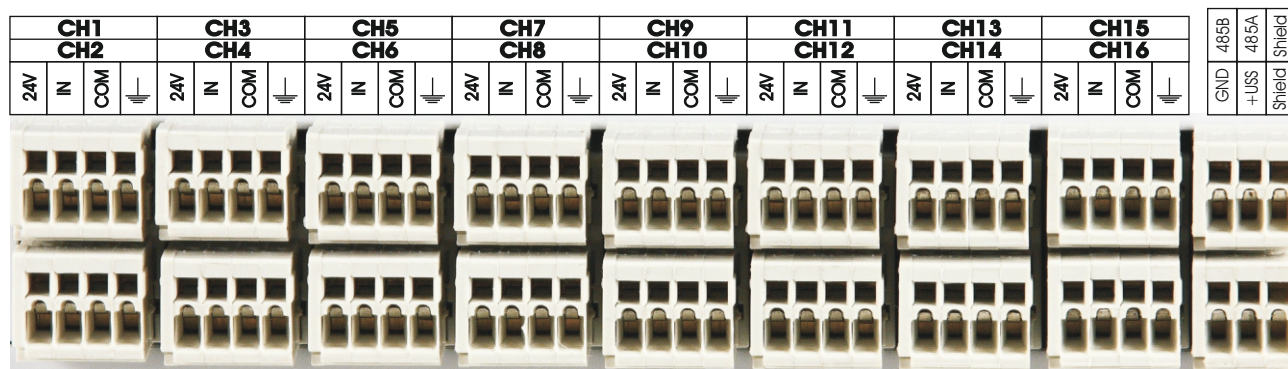Figure: communication interface, alarm outputs, connection of power - Ethernet interface is optional

Figure: data logger inputs.   Serial input RS485IN is optional.   **RS485IN**

Monitoring systems

DIFFERENCES IN FEATURES OF DATA LOGGERS MS6D AND MS5D		
Feature:	**MS6D**	**MS5D**
Character of inputs:	inputs configurable by the user from PC program	fixed - depends of installed HW 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 voltage:	-	50 V ac
Maximum measured ac current:	-	5 A ac
Input for measurement of frequency:	-	0 to 5 kHz
Input for counting of pulses:	-	yes
Possibility of galvanical isolation of inputs:	only serial input RS485IN, analog inputs cannot be isolated	yes
SMS port for sending/reception of SMS:	included	optional
Dimensions including connectors:	215 x 225 x 44 mm	215 x 225 x 60 mm

For more details including accessories see further - together also for data loggers MS5.

Universal monitoring system with data logger MS6D, MS6-Rack, MS6R

Features of Optional Ethernet Interface:

Ethernet interface
Data logger is designed for connection to standard computer network. The 10 and 100Mb/s Ethernet is supported.
No need to build new data lines. Thanks this installation cost are essentially reduced and instant easy start of monitoring system operation is enabled.

Fast data download
Record download speed was increased four-times from previous MS5 data logger generation.

E-mail
Data logger sends warning emails up to three different addresses. E-mail is immediately sent after alarm state of monitored technological process appears. User is also informed on error states of device itself (measuring channel error, fulfilling of internal memory, self-test error). SMTP servers requiring autentization are also supported.

Secured WEB server
WWW server is built in the device. Here it is possible to monitor actual values, alarm states and information on data logger. Also access password for www pages can be entered.
WWW pages are user modifiable. Free SDK description is available to create own www pages.

WWW remote conditions
Control of remote condition and relays is enabled also via www interface.

SOAP protocol
Protocol designed for data logger integration to own www infrastructure. Available actual values can be captured by www server (Apache, IIS) and processed by the user.
Communication protocol SOAP version 1.1. is supported. By means of this protocol data logger sends actual values in preset intervals to specified server.

XML file
Actual values can be downloaded to XML file. This option is suitable for data logger integration to SCADA systems.

SNMP Trap
SNMP Traps are sent after alarm state or device error appears.

SNMPv1 protocol
Actually measured values can be acquired by means of SNMPv1 protocol. MIB tables are available for free. Designed especially for IT applications and use in "managed" computer networks.

Syslog protocol
Syslog message is sent after alarm state or data logger error appears. Syslog is compatible with RFC5424.

Data logger display
Basic network parameters can be set directly from data logger display. It is possible to change IP address, subnetwork mask and initial gate.
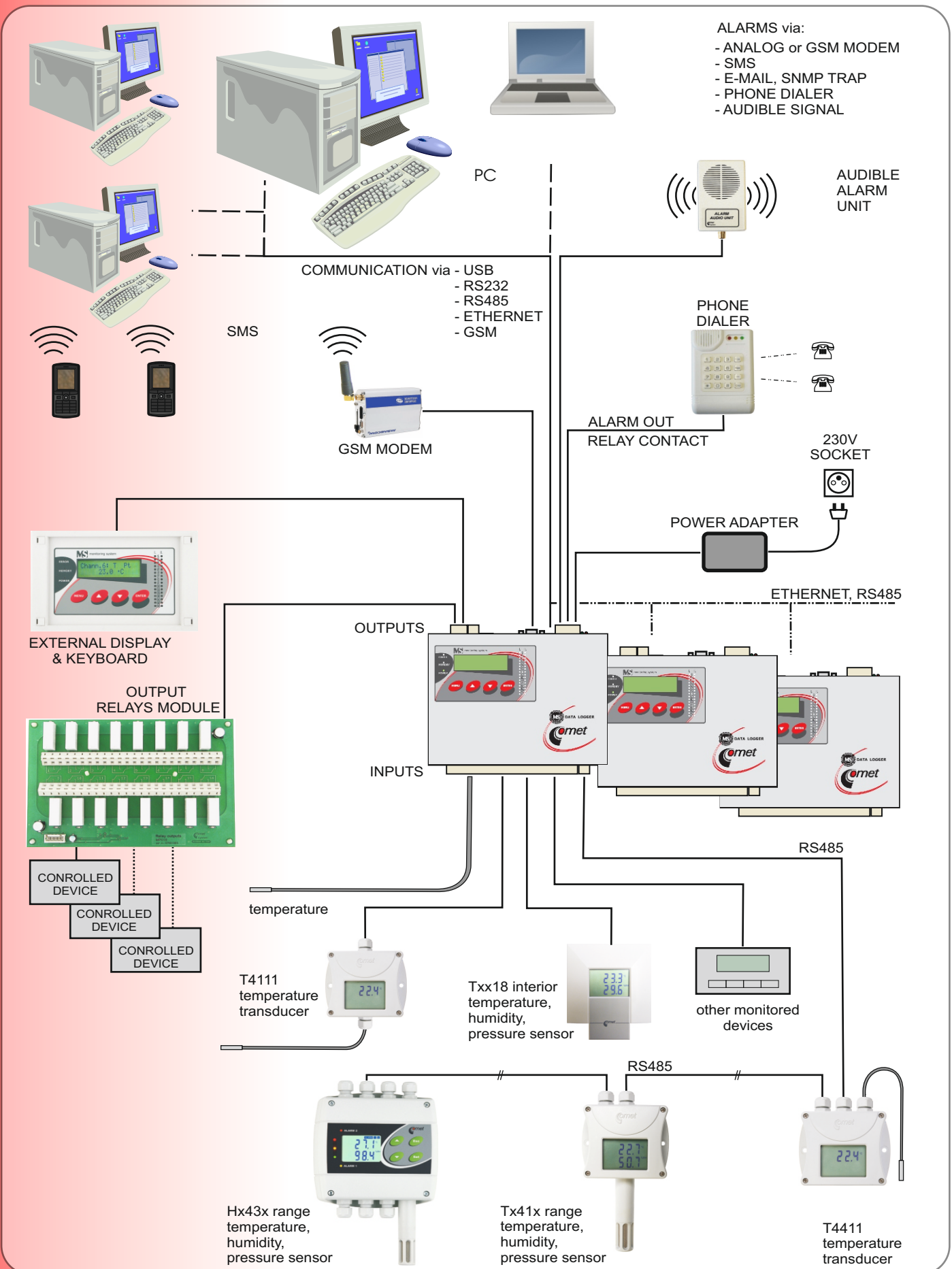
Database system
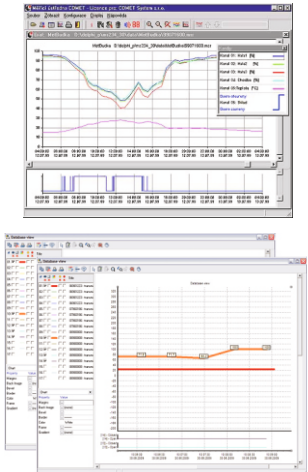Prepared for connection to database system including online values transfer.

Architecture of monitoring system with data loggers MS5D, MS6D

ALARMS via:
- ANALOG or GSM MODEM
- SMS
- E-MAIL, SNMP TRAP
- PHONE DIALER
- AUDIBLE SIGNAL

PC

AUDIBLE ALARM UNIT

COMMUNICATION via - USB
- RS232
- RS485
- ETHERNET
- GSM

SMS

PHONE DIALER

GSM MODEM

ALARM OUT
RELAY CONTACT

230V SOCKET

POWER ADAPTER

EXTERNAL DISPLAY & KEYBOARD

ETHERNET, RS485

OUTPUTS

OUTPUT RELAYS MODULE

INPUTS

RS485

CONROLLED DEVICE

CONROLLED DEVICE

CONROLLED DEVICE

temperature

T4111 temperature transducer

Txx18 interior temperature, humidity, pressure sensor

other monitored devices

RS485

Hx43x range temperature, humidity, pressure sensor

Tx41x range temperature, humidity, pressure sensor

T4411 temperature transducer

Monitoring system MSx
- optional accessories

Common optional accessories for data loggers MS6 and MS5
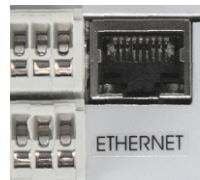
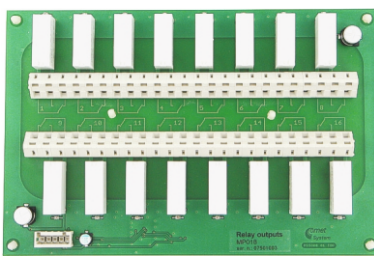|		
Software:	**SWR006**	Optional software for Windows - comfort graphic environment data acquisition, including online graph, automatic data download, remote Display mode on Internet-Ethernet network, storing data on the network, administration of users and passwords and many others ..
	DBM	DBM MS Logger Program for work with data from Comet MSx loggers. This database program enables i.a.: - To view selected channels from any Comet logger together with selected channels of other Comet loggers. - Measurement from different Comet devices is possible to combine in one table or graph. - To choose any time interval for analysis. - Print, export to PDF - table and graph. Other freeware needed for operation: database server MySQL or Microsoft SQL. For database viewing by other users at the network it is necessary to buy proper number of licences of DBV Database Viewer.
Optional input for serial RS485 signal: RS485IN	**RS485IN** only MS6	E.g. data acquisition from temperature humidity pressure sensors Tx41x, Hx43x. Input is designed for reading from devices supporting protocol ModBus RTU or Advantech. Signal is connected to MS6 terminals right from terminals for channel 15 and 16. Input can work wit up to 16 devices. Maximum speed 115200Bd. Galvanically isolated.
Accessories for data logger mounting:	**MP013**	Universal metal wall holders for data logger wall mounting. Package contains a pair of holders and 4 screws.
	MP012	Holder for data logger mounting to DIN 35mm rail. Package contains the holder and 6 screws.
	MP041 only MS6	Only for data logger MS6R. Four rubber feet with screews for desktop use of data logger MS6R.

Monitoring system MSx - optional accessories

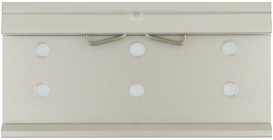**Power supplies:**

	A1759	Universal ac/dc adapter 230V-50Hz/21Vdc/1A.
	A1940	Universal ac/dc adapter 230V-50Hz/24Vdc/1A/24W for socket plug-in, switch-mode.
	A5948	Power supply 230V-50Hz/24Vdc/2,5A for DIN rail 35mm, dual terminals 24Vdc, switch-mode, including DIN rail of 100mm length.

Backup power supplies:

	A6963 supply **A7963 battery**	Backup power supply A6963, model MINI-DC-UPS/24DC/2 with batery A7963, model MINI-BAT/24DC/1.3AH, manufacturer Phoenix Contact. Power supply is designed for mounting to 35mm DIN rail in data logger case MP033 and MP034. It contains two modules - UPS and battery. Power supply is delivered uninstalled in original manufacturer packaging. Backup power supply is able to supply data logger system with 200 mA consumption at least 3 hours, data logger system with 500 mA consumption at least 2 hours, data logger system with 1A consumption at least one hour. Discharged accumulators are recharged to full capacity in approximately 3 hours. System enables to inform user on switch-over to battery operation. More details are in Manual Appendixes. For mounting to MP033 or MP034 case please order: 1pc A6963, 1pc A7963, 1pc MP035 rail.
	MP035	DIN rail 35mm of 226mm length with screws for mounting of A6963 power supply with A7963 batery to MP033 or MP034 case.
	A6966 supply **A7966 battery**	Backup power supply A6966, model AWZ224, manufacturer Pulsar sp.j., Poland. To this power supply it is necessary to buy two lead accumulators A7966 12V/7Ah in hermetical maintenance-free type of construction, e.g. type ELNIKA 12V/7.2Ah. Power supply is designed for mounting to vertical inflammable wall with sufficient air flow. Its protection rate is IP20. It is not designed for mounting to closed switchboard. This backup power supply is able to supply data logger with transmitters of current consumption 200mA for approximately 35 hours. Discharged accumulators are recharged to full capacity in approximately 14 hours. System enables to inform user on switch-over to battery operation. More details are in Manual Appendixes. Please order: 1pc A6966, 2pcs A7966.

Monitoring systems

Monitoring system MSx
- optional accessories

Optional internal equipment: ETHERNET SMS port RS232	**MP024** only **MS5**	Only MS5x, data loggers MS6x have SMS port included. Built-in independent SMS port for GSM modem connection for SMS reception and sending. Enables to receive information from data logger by means of SMS messages - actual values, alarms, memory occupation and others - as a response to SMS query from user or in case of alarm creation at data logger. Not necessary, if data logger is connected to the PC via GSM modem.
ETHERNET	**MP025** only **MS5**	Built-in LAN interface for online MS5x data logger connection to Ethernet (Internet) network. Communication via: SNMP, SOAP, www pages. In case of limits exceeding alarm is activated and warning e-mail or SNMP trap are sent to specified addresses. Only MS5x.
	MP042 only **MS6**	Built-in LAN interface for online MS6D, MS6R data logger connection to Ethernet (Internet) network. In case of limits exceeding alarm is activated and warning e-mail or SNMP trap are sent to specified addresses. Only MS6D, MS6R.
External communication converters:	**MP021**	Converter RS485/RS232 for serial port COMx at the PC side, including ac/dc adapter and terminator T485.
	MP022	Converter USB/RS485 for USB port at the PC side, including terminator T485. Powered from computer USB interface.
	MP023	Converter Ethernet/RS485 including ac/dc adapter and terminator T485. Designed for several data loggers conencted via RS485 network for connection to the computer via Ethernet.
Accessories for ALARM OUT output: ALARM AUDIO UNIT	**MP026**	External audio indication unit. Enables to signal alarm state acoustically at the location up to 50m from data logger. Audio unit is connected to data logger by a cable (not included).
	MP002	Telephone voice dialer for alarm reporting, ac/dc adapter included. Enables in ALARM OUT output activity to send voice report to selected telephone numbers. Voice dialer is connected to land line.
Output relays module:	**MP018**	Output relays module with interconnection cable. It 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. Any relay can be assigned to any alarm at any input. Output relays are designed for external devices control (switching of heating, cooling, ventilation, distant alarm etc.). It is necessary to order connection cable to data logger MP017, optionally other accessories.

Monitoring systems

Monitoring systems

	MP017	Connection cable for terminal with display and output relays module - cable length approximately 60cm. Longer cable lengths available - maximum 2m for relay module, maximum 50m for the terminal with display.
	MP019	Holder for relay module mounting to DIN 35mm rail. Package contains the holder and 6 plastic rivets.
	MP020	DIN rail for relay module with elevated consoles for mounting to the MP033, MP034 case. Rail enables to raise the relay module enables to lead cables to data logger under the module.

Terminals with display:

	MP016	Terminal with dual line alphanumerical LCD and control buttons and 32 alarm LEDs - for panel mounting or mounting to a case lid. Identical functions as built-in terminal of MS5D data logger. It is possible to build in with IP54 protection. Maximum cable length to data logger 50m. It is necessary to order the MP017 connection cable to data logger.
	MP017	Connection cable for terminal with display and output relays module - cable length approximately 60cm. Longer cable lengths available - maximum 2m for relay module, maximum 50m for the terminal with display.
	MP017-5	Connection cable for terminal with display - cable length 5m.
	MP017-10	Connection cable for terminal with display - cable length 10m.
	MP032	External terminal with dual line alphanumerical LCD, control buttons, 32 alarm LEDs and audio alarm indication. Built in a IP54 protection case, including 2m cable with covered terminals. Identical functions as built-in terminal of MS5D data logger. Maximum cable length to data logger 50m.

GSM modem and accessories:

	MP009	GSM modem WaveCom Fastrack Supreme, without accessories.
	MP009/1	Antenna for GSM modem WaveCom Fastrack, right-angled.
	MP009/2	Communication cable for GSM modem Fastrack.
	MP009/3	Ac/dc adapter 230V/12V for GSM modem Fastrack.

Monitoring system MSx
- optional accessories

Covers, cables and other accessories:

|		
	MP027	Covers of data logger terminals (pair). Designed for aesthetic covering of cables connected to terminals and connectors. Magnetic fixing to data logger.
	MP030	RS232 connector with terminals for RS232 interface connection by means of terminals, not by D-Sub connector.
	MP031	Screwdriver for easy connection of cables to WAGO terminals.

Assemblies in case with higher IP protection:
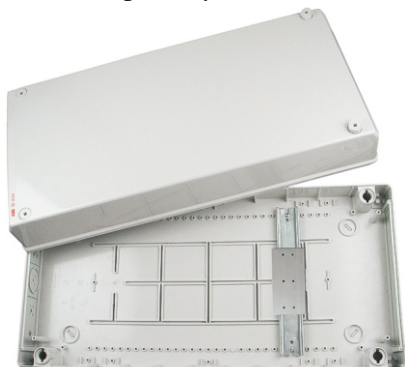
	MP033	Case with IP65 protection with wall holders and data logger holders - no cutout in the lid. Dimensions 270 x 570 x 140 mm.
	MP034	Data logger MS5 in IP54 protection case with connected terminal with display built in the lid. Dimensions 270 x 570 x 140 mm.

Monitoring systems

Comet temperature humidity pressure sensors are directly connectable to MS data loggers. Also complete monitoring systems with data logger and sensors are available.

Monitoring systems

Temperature - humidity transmitters and probes:		
	Px1xx Txxxx Hx43x	Industrial and interior transmitters for monitoring of temperature, humidity atmospheric pressure - see next chapter.
	Pt1000 probes	Temperature probes with Pt1000 RTD sensor without connector - there is a symbol /0 behind probe name. Recommended is watertight probe Pt1000TR160/0 on the shielded PVC cable 2 x 0.14mm2. Specify required cable length 1, 2, 5, 10, 15 or 20 meters. Enclosure diameter 6mm, length 20mm. Diameter of the cable 3.5mm.
	MP047	Universal holder for probes for easy mounting to rack 19" (probes not included)
Two-state detectors connectable to binary inputs:		
	SP008	AC voltage presence sensor, connectable to binary inputs of MS5, MS6.
	SA200A	Magnetic door contact, connectable to binary inputs of MS5, MS6, without cable.
	SA200A-2 SA200A-5 SA200A-10 SA200A-20 SA200A-30	Magnetic door contact, connectable to binary inputs of MS5, MS6 with cable lengths 2, 5, 10, 20, 30 meters.
	LD12 only **MS6**	Water leakage detector, two-state output, connectable to MS6 inputs. With 3 meters cable. Powered from MS6 12Vdc terminals.
	SD280 only **MS6**	Optical smoke detector, relay output, connectable to MS6 inputs, powered from MS6 12Vdc terminals. The SD280 detector combines an optical smoke sensor with a heat sensor. Both sensors have their outgoing signals processed digitally, resulting in higher false alarm immunity.
	JS20 only **MS6**	P.I.R. motion detector is for interior protection. It detects object movement having a human body temperature. The JS-20 distinguishes itself with excellent RF immunity. The signal from the sensor is electronically analyzed. This ensures that the detector provides excellent sensitivity and false alarms are basically eliminated. The detection analysis rate can be adjusted to increase its immunity if the JS20 is installed in a problem location. It can be mounted on a flat wall or in a corner. Connectable to MS6 inputs, powered from MS6 12Vdc terminals.