Medium – Control – Systeme
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MCS

USER GUIDE MCS 2000-8/16/24/32/40

The operation of this instrument requires thorough knowledge of and compliance with this user guide.

Liability for Function or Damage

The liability for the function of this instrument passes on to the owner or operator in so far as the instrument is improperly maintained or repaired by individuals, who do not belong to the service department of the manufacturer or when operation occurs, which does not comply with the proper use.

For damage, which is caused by non-compliance with the remarks above, the manufacturer is not liable.

Maintenance / Service

The instrument must be submitted to a semi-annual inspection, performed by qualified personnel.

It is recommended, that a service contract is made with the service department of the manufacturer.

Intended Purpose

The instrument has the following purpose:

- Measurement and evaluation of toxic and flammable concentrations of gas.
- Issuing/controlling of alarm reports (warning lights, sirens, safety valves, de-aeration, ventilation etc.)

Sensor connection

Depending on the equipment up to 40 sensors can be connected (see table).

Equipment name	Sensing points	Equipment name	Sensing points
MCS 2007 - 8	8	MCS 2007 – 8	8
MCS 2007 - 16	16	MCS 2007 – 16	16
MCS 2007 - 24	24	MCS 2007 – 24	24
MCS 2007 - 32	32	MCS 2007 – 32	32
MCS 2007 - 40	40	MCS 2007 – 40	40

The instrument supplies a direct current of 24V in order to power the sensors.
The sensors can be wired either individually or in a radial manner.

Shielded cable, i.e. JY(St)Y 2x2x0.8mm must be used for supplying the sensors.

The lead colours are assigned as follows:

Red → +24V (terminal 1) Black → GND (terminal 2) White → signal 4-20mA (terminal 3) Yellow → reserve

The drain wire must be twisted with the yellow cable core and connected to terminal PE (earthed conductor PE) of the instrument.

The drain wire in the cable is connected to the shielding.

When using sensor casings made from metal, the drain wire from the sensor must be connected to the metal casing.
During installation ensure that the bare drain wire cannot touch the circuitry.

Relay Outputs

The alarm relay outputs in the basic device are designed with 2 contacts and 3 contacts at the relay modules (optional).
The relays can be programmed with the software as make contacts or break contacts.
The make contact is closed when messages are to be read out, i.e. pending alarms or non-present fault indications.
In total the system can control 255 relays in connection with the relay modules MCS 2000 RM12 (optional). All relays are freely programmable.

PLEASE NOTE! The relays are activated and deactivated after a time delay of 5 seconds.

RWA Operation

The instrument features an RWA input. RWA buttons or smoke detectors can be connected to this input.
It is used for triggering alarm phase 1+2 in all output zones, in order to activate the ventilation in the case of fire.

Timer
In addition to the sensor operation the A1... A2 can be activated via a timer.
Programming of the times is performed with the software.

Alarm Indications

The unit is equipped with 4 alarm switching thresholds.
If a sensor signal or its mean value reaches a switching point, the corresponding alarm is triggered.
The respective alarm LED (L1) lights up and the correspondingly programmed relay will be *activated after a time delay of 5 seconds*. When the alarm is reset it is *deactivated after a time delay of 5 seconds*.

The definition of the measurement parameters and switching thresholds for each sensing point as well as the assignment of alarm indications are programmed.

The set parameters can be taken from the test log.

Individual alarm indication can remain active even if the cause of the alarm is no longer present. This is the case, if a temporary run-on has been programmed for the alarm phase, for instance in order to ensure adequate ventilation or meet minimum ventilation times or if an automatic save has been programmed.
Only by pressing the key

Alarm Reset can these be reset.

A sensor alarm saved by a reset can only be removed after the alarm cause has been removed.

Otherwise the alarm is automatically deleted when the alarm cause has been removed after the signal hysteresis (at least 3 digits) has been exceeded.
If acoustic alarms are connected, these can be reset by pressing the key
Horn Reset.

Instrument Fault Indications

A fault indication for the instrument is displayed under the following conditions:
- Power failure (*)
- In the case of a cold start, 1 minute after return of power
- Loss of fuse
- Equipment failure
- Loss of supply voltage of the sensor (< 18 V) (*)
- Interruption or short-circuit of the sensor supply (*)
- Sensor signal exceeds the maximum measurement range
  (<2.5mA respectively >25mA) (*)
  The monitoring of the sensor for defects also includes this condition.
- Software fault
- Loss of the parameter settings (*)

In the event of malfunctions, the corresponding programmed malfunction relay is activated.

The standby LED goes out and an instrument fault LED flashes.
In the case of power failure the Power LED flashes for several days.
Instrument failures marked with (*) can be programmed in such a manner, that they automatically activate alarm 1... 4 and therefore trigger for instance ventilation systems, warning lights, horns and safety valves.
The other failures can only act on the fault relay via a loop of the alarm relay.

Power Failure Alarm Suppression

The instrument is fitted with a programmable time delay, which is activated after each power failure (cold start) and suppresses alarms, until the sensing unit is operational. During this time the service LED flashes.

With time delay activated, the instrument switches to standby one minute after the power supply is connected, as long as no other faults are present.

Interface RS 232 C

The interface RS 232 C is used for connecting a computer or terminal for programming the central control and the output of test, measurement and alarm logs.
The interface is a 9-pin connector.
The input and output instrument is connected via a serial interface.
The length of the connection cable to the computer or terminal should not exceed 15m when using a direct connection without additional measures.

A standard Null Modem cable should be used as a connection cable.

Programming of the Central Control

The programming of the central control should only be performed by our maintenance technicians or authorised personnel.

The software (TMCS2000) is required for programming.

Controls

Key	**Function**
Service T1	**free**
Service T2	**free**
Testing / Sending	**Relay test, sending for programming via the computer**
Zone display	**Display of the sensors with the programmed zones**
Selection Sensing points	**Selection of the sensing points of which the parameters should be displayed**
Display Sensing points	**Display of the parameters**
Reset Horn	**Acknowledgement of the acoustic signal (relay horn)**
Reset Alarm	**Acknowledgement of the alarm relay after latching**

LED Display

LED	Colour	Status	Description	Miscellaneous
POWER	green	continuous flashing	Power supply connected, power failure	
STANDBY	green	continuous flashing	System without malfunction, processor malfunction	Software fault / processor malfunction
FAULT	yellow	flashing	System malfunction	Fault in the central control, sensor
SERVICE	yellow	continuous flashing	Maintenance cycle, Maintenance / service required	During programming of the system, re-calibration required
A1	red	continuous	Group 1 has been triggered	
A2	red	continuous	Group 2 has been triggered	
A3	red	continuous	Group 3 has been triggered	
A4	red	continuous	Maximum permissible value has been reached	
HORN	red	continuous flashing	Horn triggered, horn reset in the case of pending alarm	

LCD-Display - normal mode

Normal operation
→ System OK

There are no malfunction or alarm reports present.

Contact service

Sensor malfunction Malfunction Mst. 01/01

There is malfunction present on sensor 01 in zone 01.

Contact service. *Phone-No.*

Alarm 1 report Alarm 1 Mst. 02/01

→ There is an alarm 1 present on sensor 02 in zone 01.

Alarm 2 report Alarm 2 Mst. 02/01

→ There is an alarm 2 present on sensor 02 in zone 01

Alarm 3 report Alarm 3 Mst. 02/01

→ There is an alarm 3 present on sensor 02 in zone 01.

Alarm 4 report Alarm 4 Mst. 02/01

→ There is an alarm 4 present on sensor 02 in zone 01.

Service report Service is required

→ Readjustment of the sensors is required.

Contact service

Emergency service MCS Tel. 03447 499313-0

→ Displays the standby service with the telephone number.

LCD-Display - zone parameters

Key Display Explanation
Zone display → Display S / Z 01 / 01

Display of the sensors with the programmed zone
Sensor 01 in zone 01

Zone display → Display S / Z 02 / 02

Display of the sensors with the programmed zone
Sensor 02 in zone 02

Zone display → Display S / Z -- / 02

If no additional sensors were programmed, then
„ -- „ is displayed

Wait for 10 seconds – the system is returned to the normal mode

LCD-Display - status parameters

Key	Display	Explanation
Selection Sensing points	Sensing point 01	

Selection of the sensors for the display of the status parameters.

Selection Sensing points	Sensing point 02	

If the button is pressed again, the next sensor is displayed

Selection Sensing points	Sensing point 01	
Display	OK MST 01/01	

If no additional sensors were programmed, the first sensing points are displayed again or the display jumps to the next programmed sensing point.

Status display of the sensing point.

OK = Sensing point READY
Fault = Sensing point malfunction

Display
Sensing points MST 01 Z 01 CO
IW 20 ppm

Display of sensing point 01 zone 01
Gas type CO
Actual value is displayed (20 ppm)

Display
Sensing points MST 01 Z 01 CO
MW 10 ppm

Display of sensing point 01 zone 01
Gas type CO
Average value is displayed (10 ppm)

Display
Sensing points MST 01 Z 01 CO
7,2 mA

Display of sensing point 01 zone 01
Gas type CO
Signal current is displayed (7.2 mA)

Display
Sensing points MCS GmbH Tel. 03447 861812

Displays the standby service in the event of malfunctions.

Wait for 10 seconds – the system is returned to the normal mode
Other Display

Power Failure Alarm Suppression 1 Minute

If alarm suppression (cold start) has been programmed, the alarm output is locked for 1 minute, when the instrument is turned on. In this time the sensors can stabilise themselves.

Cold start

RWA Operation

RWA contact or timer triggered.
Alarm 1+2 active. The corresponding programmed relay alarm 1 and alarm 2 are activated.

RWA active

LED test

Testing / Sending		All LEDs are activated
Other	→	Returns to the normal mode

Relay test

The relay test can be performed with the software TMCS.
The relay can be activated individually via the keyboard.

Testing / Sending	All LEDs are activated
Testing / Sending	Relays that are programmed for alarm 1 are activated
Testing / Sending	Relays that are programmed for alarm 2 are activated
Testing / Sending	Relays that are programmed for alarm 3 are activated
Testing / Sending	Relays that are programmed for alarm 4 are activated
Testing / Sending	Relays that are programmed for the warning light are activated
Testing / Sending	Relays that are programmed for the horn are activated
Testing / Sending	Relays that are programmed for the malfunction are activated
Testing / Sending	Returns to the normal mode

Set the date / time

The date and time can be set with the software TMCS 2000.

Reset Alarm	press repeatedly

Sensors

In order to supply the sensors an uncontrolled direct voltage of 18-24V is required.

Shielded cable, i.e. JY(St)Y 2x2x0.8mm must be used for supplying the sensors.

The lead colours are assigned as follows:

red +24V (terminal 1) black →GND (terminal 2) white Signal 4-20mA (terminal 3)

The drain wire must be twisted with the yellow cable core and connected to terminal PE (earthed conductor PE) of the instrument.

The drain wire in the cable is connected to the shielding.

When using sensor casings made from metal, the drain wire from the sensor must be connected to the metal casing.
During installation ensure that the bare drain wire cannot touch the circuitry.

Please refer to the data sheet of the sensor for additional information.

Additional modules

Relay module RM 12
Up to 7 relay modules RM 12 can be connected to the central unit/basic device. Please refer to the wiring diagram for the correct electrical connection.
The relay module can be integrated in an additional enclosure or in the central unit/basic device.
The relay module is equipped with 12 relays with potential-free reversing contacts that can be freely programmed for different alarms and zones by means of the programming software.
The relay module is connected and addressed in the system bus RS484. The distance from the central unit to the last relay module may not exceed 1200m.

The IP address must be set on the relay module by means of 2 rotary controls.

The 1st relay module has the address 01

Relay module	Address	Addressing	
		tens	ones
01	01	0	1
02	02	0	2
.....			
07	07	0	7

Please note! **The IP address may only be issued once.**
A jumper plug must be set before the terminating resistor of the last relay module.

Sensor input module

Up to 4 sensor input modules can be connected to the central unit/basic device. Please refer to the wiring diagram for the correct electrical connection.
The sensor input module can be integrated in an additional enclosure or in the central unit/basic device.
The sensor input module has 8 inputs 4-20mA. Each input is freely programmable by means of the programming software.
The sensor input module is connected and addressed in the system bus RS484. The distance from the central unit to the last sensor input module may not exceed 1200m.

The IP address must be set on the sensor input module by means of a rotary control.

The 1st sensor input module has the address 11

Sensor in module	Address	Addressing	
		tens	ones
01	08	Non	0
02	09	Non	1
.....			
04	11	non	3

Please note! **The IP address may only be issued once.**
A jumper plug must be set before the terminating resistor of the last sensor input module.

Warranty

The manufacturer grants a warranty of 4 years when a service contract with its service department or an authorised company has been signed.
If no service contract is drawn up, the warranty expires after 1 year.

Shut-down

Programmed data is not lost during shut-down.
The data in the memory for accumulated messages is also preserved.
If the instrument has been switched off for longer than 4 weeks, the sensors must be checked with calibration gas after switching on and must be recalibrated if necessary.

Service

A semi-annual or annual inspection of gas warning systems must be performed on a regular basis. The service interval is stated on the service decal. It is recommended, that a service contract is made with the service department of the manufacturer.
The following message is presented on the display when servicing is required:

→ Service is required

Additionally, the fault LED flashes.

This message only extinguishes after servicing has been performed.

Technical Data MCS 2000 Subject to technical alterations.

Enclosure	Wall enclosure			
Enclosure Material	Polystyrene			
Dimensions	W x H x D	260 x 250 x 90 mm, incl. PG screws		
Protection Class	IP 58			
Switching Threshold	4	self-extinguishing / saving	freely programmable	
Switch outputs	9 relays potential-free reversing contacts	250V/2.5A	freely programmable	
	Expandable to 255 relays in connection with relay output modules			
Controls	1 push button	Horn Reset		
	1 push button	Alarm Reset		
	1 push button	Test Menu		
	3 push button	control panel		
External connection	Horn off	Alarm Reset	RWA	24 Volt supply
Display elements	LED Display	Red alarm 1... 4	Horn active	Collective alarm output
		Yellow malfunction	Service	
		Green power	Standby	
	LCD-Display screen	2x40 characters illuminated		
System bus	RS 485	Terminal block	4-pin	
Data interface	RS 232	D-sub plug	9-pin	
Connection values	230V/50Hz/60W		24V/DC/60W	
Sensor connection	4-20mA		3-pin terminal block, 24V/DC, GND, signal 4-20mA	
Sensors	8			
	Expandable to 40 sensors in connection with sensor input modules			
Options	Relay output module		12 relays, freely programmable	
	Sensor input module		8 sensor inputs, freely programmable	
	Piezo buzzer		95db	
	Key switch		Locking of the alarm outputs during service	
	Emergency power supply		24V/DC	
	Telephone dialling device		for relaying alarm and malfunction reports	