Planungsbüro + Service:

 Esteraustr. 10, 56379 Holzappel

 Tel.:
 0 64 39 / 90 19 90

 Fax.:
 0 64 39 / 90 19 91

 E-Mail:
 u.ramakers@umsitec.de

Entwicklung + Fertigung + Service: Heerweg 15 D, 73770 Denkendorf Tel.: 07 11 / 34 14 - 159 Fax.: 07 11 / 34 14 - 047 E-Mail: info@umsitec.de



OPERATING INSTRUCTIONS

CO-Control-Center CCZ 401



IMPORTANT!

The device may only be operated if this operating instruction has been understood and is applied. The annex "Safety Instructions for the Installation Company and the User" is to be observed absolutely!

Liability for Function or Damages

The liability for the function of the device is handed over to the owner or operator, if the device is improperly maintained or repaired of people who do not belong to the service of the manufacturer, or if the handling is not conforming to its intended use.

For damage caused by failure to comply with the above instructions, the manufacturer is not liable.

Device Maintenance

The device must be subjected to regular semi-annual or annual inspections by qualified personnel. The maintenance interval depends on the connected measuring sensors and can be taken from the maintenance label.

To comply with the periodic maintenance interval it is recommended to conclude a service contract.

IMPORTANT!

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Application

The device serves

- for the acquisition or measurement and evaluation of carbon monoxide concentration or other gases
- for the control of countermeasures, f. ex. ventilation, disconnection of aggregates
- for the warning in case of dangerous concentrations

The device corresponds to the regulations of VDI 2053 and is suitable for the employment in basement garages.

Device Design

CCZ 401 CO-Control-Center 1..4 sensors, 3 (4) alarm levels, LCD display

Alarm Indication

If a reading or its average reaches a threshold, the corresponding alarm is released. The respective LED lightens and the associated relay will be activated.

The determination of measuring parameters and thresholds for the individual sensors as well as the allocation of output relays for alarm indication are to store via a parameter menu.

The parameters settings can to be taken from the test certificate or they can be printed using a printer with serial interface RS 232.

Individual alarm indication can continue to exist, after discontinuation of released causes. This is the case, if an alarm reset lag time has been programmed for the alarm stage, f. ex. to provide for sufficient ventilation or minimum ventilator running time.

If necessary, individual alarm levels of certain sensors can be programmed self-storing, so that they are reset not until the Alarm-Reset-Key (T1) is pressed.

A reset of stored sensor alarm is only possible after the alarm cause is eliminated.

Pressing the Alarm-Reset-Key (T1) aborts the main alarm levels 3 and 4 in the alarm zone, resp. continues the main alarm)

Otherwise the alarm aborts automatically after passing through a signal hysteresis (at least 3 digits), if the alarm reason is eliminated.

Device Fault Alarm

After 10 seconds a device fault alarm is activated on the following conditions:

- mains failure
- after cold start until 1 minute after mains recuperation
- blown fuse
- device damage
- Sensor power voltage drop down (< 20 V) (*)</p>
- interruption/short circuit of sensor feeder
- sensor signal leaves the maximum measuring range (<2.5mA or >25mA)
 (*)
- If a signal is too low (< 3.3mA) the reading in the display is flashing
- malfunction of the softwareloss of parameter settings
- disconnecting the main alarm manually by pressing the alarm reset key

In case of malfunction, the device fault alarm relay (relay $\mathsf{GSM}(\mathsf{DFA}))$ falls.

The Ready-LED extinguishes and a device malfunction transmitting LED (Failure) flashes regularly, even if the mains failure takes several days. A plain text appears on the LCD display.

Device malfunctions marked with (*) can be programmed in such a way, that the highest ventilator stage is switched on automatically (alarm 2) and/or alarm 3 and 4 (warning lights, horns) are released.

All other malfunctions can only exert influence on the ventilation through looping the ventilation drive via the fault alarm relay (GSM).

Mains Failure – Alarm Suppression

The device possesses a time delay to be activated optionally, that is activated after each failure of the mains voltage (cold start), and the alarms are suppressed until the sensor is ready for operation. During this time the malfunction LED is indicated.

If the time delay is activated, the device is in stand-by operation 1 minute after mains voltage is re-connected, provided no other malfunctions are in existence.

Sensor Connection

In order to supply the sensors, a direct voltage of 20V-28V is provided by the CCZ 401 device.

Up to 4 sensors with output signals 4-20mA can be connected to the CCZ 401.

The shielded cable JY(St)Y2x2x0,8mm can be used as sensor feeder. The wire colours can be allocated as follows:

Red => +24V (Kl 1), White => 4-20mA (Kl 2), Black => 0 V (Kl 3), Yellow => PE (Kl 4)

The supplementary earth wire is only to be cabled with the yellow wire and to be connected on terminal 4 (protective conductor PE) in the device. (The supplementary earth wire is connected with the shielding in the cable.)

If the metal housing of the sensor is mounted on earthed steel supports, the wire connecting the metal housing and the wire for terminal 4 (PE) are not to be connected with the GDZ 401 terminal.

In case of sensor housing made of metal, the supplementary earth wire is to connect with the metal housing. During mounting, it has to be observed, that the uninsulated supplementary earth wire does not get in contact with the circuit.

Relay Outputs

(*)

(*)

All devices possess a relay with 2 separated change-over contacts for the device fault alarm (GSM / DFA).

In Addition, the device possess about 8 alarm relays for ventilation, central building system alarm indication and warning lights and horns.

It is possible to extend them with external zone (alarm) output modules.

The alarm relay outputs are equipped with 3 change-over contacts.

Apart from programmed negated output, the make contact is normally closed with an active alarm resp. malfunction.

Fire Brigade Switch

A potentially free switch can be connected on the terminals 83/84 "VENTILATE". This releases the alarm level 2 in all alarm zones in order to ventilate in case of smoke development.

Operation of Ventilating Fans

It is possible to drive single-stage as well as two-stage ventilating fans via the device.

Please see menu item "Ventilator" in the system menu.

The stage break for two-stage ventilating fans can be programmed between 0-30 seconds.

In order to guarantee the operating safety, the drive of the ventilator stage 1 has to be looped via the alarm relay for stage 2 (root break contact) in case of two-stage ventilating fans, so that in no case both stages can be connected simultaneously, as otherwise the ventilator can be damaged.

The control of two-stage ventilating fans is only possible through zone and collective alarm relays. Sensor alarm relays do not possess a two-stage ventilating fan control. Normally the relays are programmed as zone relays ex works.

Interface RS 232 C

The interface RS 232 C (plug 9 pins) serves to connect a printer or terminal for the output of test certificates, reading, and alarm protocols. Maximum distance: 15 m. For the output over longer distances interface converters are available.

The output of protocols or measuring certificates is an ASCIIstring and can be printed directly via a printer or can be taken over directly into PCs.

The last approximately 1000 device alarms are recorded in the memory and can be printed at a later time. Depending on the printer output format it is also possible with measuring values.

Being able to record substantial measurements, a data logger can be offered recording measurements of any measuring point on site for weeks or months. The readings can be transported and handed over to a stationary computer for visualization in PC programs.

Pin Assignment / Connecting Cable for Serial Interface



a)

PIN3 = TXD, connected to RXD of the printer PIN5 = GND

PIN6 = DSR, connected to DTR of the printer or terminals,

enabling the control of data transmission (hardware certificate)

Connecting Cable for Printer (a, b), Serial/Parallel Converter (b) or PC (Zero Modem c,d):

Device Connection Printer Connection

Socket 9) pin	-	Plug 9 pin		
Shield	1		1	Shield	
RxD	2		2	TxD	
TxD	3		3	RxD	
DTR	4		4	DSR	
Ground	5		5	Ground	
DSR	6		6	DTR	

b)	Socket9 pin - Schirm 1	Plug 25 pin 1 Shield 2 TxD 3 RxD 6 DSR 7 Ground 20 DTR
	Device Connection	PC Connection
c)	Socket 9 pin Shield 1 RxD 2 TxD 3 DTR 4 Ground 5 DSR 6	Socket 9 pin 1 Shield 2 RxD 3 TxD 4 DTR 5 Ground 6 DSR
d)	Socket 9 pin - Shield 1 RxD 2 TxD 3 DTR 4 Ground 5 DSR 6	Socket 25 pin 1 Shield 2 RxD 3 TxD 6 DTR 7 Ground 20 DSR

LCD Display

A double-line LCD display serves for the indication of the current readings and the parameterization of the individual sensors enabling a simultaneous overview about the indications of **all sensors**.

Start-Up

All functions of the device are to be verified by means of a test gas task on start-up. It has to be make out a form certificate of the start-up result.

Maintenance

Maintenance must be processed in certain intervals to maintain the functional safety. Maintenance interval can be taken from the test label, amounting to 1 year, at the most.

Placing out of Service

In case of placing the device out of service the programmed data are not lost. The data of the memory for chronicle continue to remain, too.

If the device is out of service for more than 4 weeks, the sensors have to be verified and calibrated once again, if necessary, after start-up with test gas.

Technical Modifications are subject to change.

Operating the LCD Display in Normal Operation

With the Display Key the next double line is adjusted. Shift

Display Key (T3) Um Next line sch.

If the Shift Key (T5 Umsch.) has been pressed previously it is possible to adjust the preceding display line.

previous line

The gas types and the measuring values are displayed intermittently in normal operation.

If no key is activated, the display illumination is disconnected after a programmed time.

Illumination Key (T4)

With the Illumination Key (T4) the display illumination can be switched-on resp. switched-off.

By activating any other key, the illumination is switched on.

Rea	Reading Display indications in normal operation					
This menu line appears automatically, if a device malfunction						
CNISC	5.					
	GDZ 40	1 No. A	xxxxx n / Monu	facturing number		
	GSM(DI	FA): Sig	nal <2m	A		
	Plain tex	kt of the p	rimary de	evice fault alarm		
	NO 4			0		
	MS 1 70 1	MS 2 70 5	MS 3 70 3	Sensor number		
	201	203	203			
	MS 1	MS 2	MS 3	Sensor number		
	CO	CO	NO2	Gas type		
Ŧ		Display	/ in norm	al operation		
	10	209	0.0	Reading		
	ppm	ppm	ppm	Reading unit		
Display in normal operation						
	10	209	1,0	Reading		
<u> </u>	MS 1	MS 2	MS 3	Sensor number		
	m 15	m 176	m 12	Average (f. ex. balf bours)		
T	ppm	ppm	ppm	reading unit of average		
Т						
	m 15	m 176	m 1,2	Average		
	MS 1	MS 2	MS 3	Sensor number		
	40.0	40.0	OTMA			
	AS 0 MS 1	AS 3 MS 2	SIM1/ MS3	sensor number		
		1110 2	110 5			
AS 0 = no alarm, defective measuring points are flashing						
STM1= parting of a cable STM2 = short circuit of measuring						
reede	1					
_						

to system control (It is possible to jump to the system control from each display line)

Operating the Keys for the System Control

Attention: If the keys are pressed for a longer time, an accelerated repetition of these functions is automatically executed.

Select menu point 1.



shift	
Um 🛉	previous
sch.	menu point

With the assistance of the menu key it is possible to reach the menu of the system control and to obtain the requested menu point. The cursor has to be positioned on the first position on the left on the second display line.

	_		_
ţ†	Cursor Key (T7)		
•	Cursor to the right	shift Um 🕳 Curso	r to the left

In order to place the cursor into a menu point for to reach a value to be modified, the Cursor Key has to be pressed. If the Shift Key previously has been pressed simultaneously, it is possible to move back, if necessary.

Um

sch.

2. Modify settings

╈



Numeric, characters and settings are modified on the current cursor position using the menu key: Press T 6 for to increase the value.

Press the shift key + T6 to decrease the value.

3. Entering Inputs to the System



With the Enter Key inputs are terminated and commands are executed.

Otherwise modifications are ignored.

4. Leaving the system menu



Display Key (T3 long arrow)

With the assistance of the Display Key it is possible to leave the system menu at any time and to switch over to normal operation. The reading display is shown.



Examples for Alarms and Readings in Plain Text:

32:25, B 1, VAL 63, AVE 54 ppm CO Readi 36:40, B 5, VAL 32, AVE 30 ppm CO, ALARM 1 ON Image: Colored colore	ng/Average of Sensor 1 ———— Alarm status
50:10, B 3, SIGNAL <2,5mA MALFUNCTION ON 20:32, B 3, SIGNAL <2,5mA MALFUNCTION OFF	——Malfunction status
06:22, B 4, SIGNAL >25mA MALFUNCTION ON 02:42, B 4, SIGNAL >25mA MALFUNCTION OFF	
32:52, SENSOR-SUPPLY MALFUNCTION ON 32:52, OPERATION OFF 31:33. OPERATION ON	Other messages

Example for a Reading Certificate in Tabular Form and a diagram drawn up using EXCEL 7.0:

DATE	;TIME ; ;	;ALEV ; ; ;	;AVAI ; ;ppm ;	;B 1 ;CO ;ppm ;VAL	;B 1 ;CO ;ppm ;VAL	;B 2 ;CO ;ppm ;AVG	;B ;CO ;ppr ;AV	2 n G	ALEV = Alarm level AVAL = Alarm value VAL = Value; AVG = Average
14.03.97	;13:30:00	;	1; 3	0; 6	53; 5	54;	7;	2	
14.03.97	;13:35:00	,	2; 6	0; 7	'0; 6	61; 28	3;	7	
14.03.97	;13:40:00	,	2; 6	0; 9	95; 6	58; 5	5; 1	6	
14.03.97	;13:45:00	;	2; 6	0; 12	20; 8	33; 4	2; 2		
14.03.97	;13:50:00	;	2; 6	0; 16	50; S	94; 20); 2		
14.03.97	;13:55:00	;	3; 10	0; 13	30; 10	07; 1	2; 2		
14.03.97	;14:00:00	;	3; 10	0; 11	3; 10)7; :	3; 2		
14.03.97	;14:05:00	;	2; 6	0; 9	92; 10)7; 2	2; 2		
14.03.97	;14:10:00	;	1; 3	0; 5	52; 10)7;	1; 1	4	





PROTECTED PARAM --> |↑↓ Adjustment of protected parameters through DECIMAL PLACE: XXXX |↑↓ gualified technical personal It is possible to select four decimal points for readings After the work is done, press the display key. In this moment and printout: xxxx .xxx x.xx With a logarithmic check sums are made for the parameters entered. Otherwise curve the adjustment cannot be changed. a parameter error appears after some time. **REAL MR** 310 ppm |↑↓ PARAM.-ACCESS-CODE **+** 0020 No parameters can be changed here! Enter the code word using numeric, characters, and Displays the real measuring range, f. ex. 0-310 ppm, with reference to the sensor signal from 4 to 20mA special signs. If the correct code word is not entered, the device resulting from an adjustment on the subsequent basic measuring range of the sensor or through a subsequent described test gas adjustment with parameters cannot be changed. It is however possible to read the adjustments. software calibration. **BASIC-RANGE** 300 ppm **↑**↓ **ALARM OUTPUT:** |↑↓| Input of the requested basic measuring range for the OUTPUT Output of occurring alarms during maintenance and inputs 4-20mA of the individual sensors as delivered. menu operation. Locking of the alarm relays for a maximum of 4 LOCK 4 h hours. The maintenance LED is lighting. RMR=BMR adjust |**†**↓ If no key is pressed for a maximum of 4 hours, an automatic change-over to alarm output occurs. The real measuring range is adjusted to the basic measuring range of the respective sensor. Through this a prior executed software adjustment of these sensor(s) is invalidate. Now adjusted sensors are to operate on the inputs **SENSOR ↑**↓ selected. Adjustment of sensor parameters AVERAGE TIME X MIN NUMBER: 4 |**↑**↓ Enter full sensor number Enter a length of time in minutes for which a average value from the readings in this period of time is to be SENSOR x to y |++| formed continuously, f. ex. half-hourly average value. If the adjustment is not 0, the alarm release from Activates the sensor head x to y for adjusting the alarm level 1 to 3 is automatically dependent on the sequential parameters: average value. **|**†**↓**| **OPERATION: VENTILATION OPTIMIZATION: ↑**↓ ACTIVE Sensor is displayed and alarm releases are <u>NO</u> Alarm through average value is shut off by the active. average value also INAKTIVE No display, no alarms or status messages! YES Average value alarms are shut off already by the current reading. For this, a ventilator pulse esponse tail is recommended, f. ex. 5-10 min. |**†**↓ ZONE: Enter an alarm zone to which a sensor is assigned to. ALRES TAIL X MIN **↑**↓ |↑↓ SENSOR: FI-CH If an alarm response tail is entered, the automatic Enter the sensor type reset of alarm 1 and alarm 2 is delayed (f. ex. for longer ventilation) **RUN OF THE CURVE: ↑**↓ LINEAR Sensor with linear measuring curve. GAS TYPE: CO **|**↑↓] NO2 VAL (Emergency) Designation of the gas type to be measured on the measuring point Selection from definite entered gas types (4 characters) or from previous inputs of self created symbols in the menu "TEXTS" DIM UNIT ppm **|**†↓ VAL (Emergency) Enter the dimension unit for the sensor readings (example: ppm)

THRESHOLDS> Input of threshold values for alarm releases	RELAYS > Adjustment of the relay parameters
TH 1: Threshold for alarm 1	Number: n
TH 2: Threshold for alarm 2	Enter the number n of the relays: In case of centrals without extension: 8 relays.
TH 3: Threshold for alarm 3	If extension modules are used which have less than 8 relays (f. ex. zone outputs), 8 relays have to be
TH 4: Threshold for alarm 4 (peak value alarm) Depends direct on reading values!	calculated for each module. The relays not used in a group of eight have to be set out of function "OFF".
A1-Mode:	RELAY r Mode : mmmm
A2-Mode:	Enter a relay number r and the requested operation mode OFF,S,Z,C and N , H , T
A3-Mode:	OFF Relay out of function or not existing
A4-Mode:	<u>SNHC</u> S = sensor relay (controlled by the sensor alarm)
+/LOE Alarm release in case of an increase in gas	\underline{ZNHC} Z = zone relay (controlled by assigned zone)
+/SP Alarm continues to remain even after	$\frac{\text{CNHC}}{\text{CNHC}} \begin{array}{c} \textbf{C} = \text{ collective alarm relay (collective alarm from several zones, see CA)} \end{array}$
cessation of the reason for releasing the alarm until the internal Alarm Reset Key (T1) is pressed.	N=negated relay, active with disconnected alarm
<u>-/LOE</u> Alarm release in case of a decrease in gas	H=resettable relay (horn relay) via Reset Key (T2)
concentration with automatic reset of the alarm.	C=clocked relay (warning light, seconds rhythm)
<u>-/SP</u> Alarm continues to remain even after cessation of the reason for releasing the alarm until	Alarm: a SZC: s/z/c
the Internal Alarm Reset Key (11) is pressed.	Enter the alarm level a , from which the relay is switched on and the sensor, zone, or collective alarm
A4-EFFECT:	number s/z/c , to which the relay is to belong to.
<u>Only A4</u> With alarm 4 only alarm 4 is released. <u>A1-A4</u> Through alarm 4 all alarm levels are	
released (f. ex. as an immediate alarm release at a high concentration with otherwise average depending	
alarm release	
	VENTILATOR>
	Determine ventilator type
Collecting of zone alarms to collective alarms	
->CA: C1 C2 C3 C4	<u>1- stage</u> With a 1-stage ventilator the alarms 1 and 2 are indicated directly, means both
Enter a zone Z and the collective alarm group G.	<u>2-stage</u> With 2-stage ventilator only one alarm is
(It is displayed in 2 groups to 4 collective alarms)	indicated, whereas alarm 2 has priority.
The alarms of the zone Z release the collective alarms	
A zone means a number of sensors assigned to the	STAGE BREAK: n sec
zone alarm.	If the stage break is > 0 an eligible break time without alarm output is inserted when connecting to mains and
corresponds to the number of sensors connected to	when changing the ventilator stages.
alarms results from the number of zones made up due	
to the assignment of sensors to zones.	
L <mark></mark>	1



Wiring Installation

For the connection of the sensors one separate connection cable, respectively, has to be installed from the plant.

If no special requirements are made, it is possible to use the shielded cable JY (ST) Y 2x2x0.8 mm with supplementary earth wire.

The sensor connection is executed according to the instructions stated in the operating instructions:

Terminal 1:	24 V	red
Terminal 2:	4-20mA	white
Terminal 3:	0 V	black
Terminal 4:	PE	yellow (do not connect, if the housing has already been connected to earth on earthed steel support
		or something similar through mounting)
Housing :		supplementary earth wire, if the housing has not already been connected to earth)

It is also possible to install a stub cable from the plant.

The wires of the terminals 1, 3, and 4 are connected parallely to each sensor.

The wires for the terminals 2 are only to connect to the accompanying sensor.

Futhermore, the fine-wire fuse on the connecting position of terminal 1 on the plant has to be increased accordingly.











Connection cable (none-Ex-area) up to 600m: JY(St)Y 2x2x0,8

Sensor connection: Observe absolutely sensor operation instructions!

RELAY OUTPUTS (as a collective alarm and alarm terminal for connecting the Central Building Control System)



RELAY OUTPUTS K1..K4 (as a Zone 1 alarm output)



RELAY OUTPUTS K5..K8 (as a Zone 2 alarm output)



Terminal connection diagram: RELAY OUTPUTS with alarm transmitters 230VAC







