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wall type

Carbon Monoxide Transmitter

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Features

- Replaceable 20mm Round Type Electrochemical Cell
- Estimated operating life 6 years, long term output drift <5% each year
- Zero-Span Calibration & Linear output
- CO ranges, standard: 50ppm, 100ppm, 200ppm and 300ppm
- CO ranges, extended: 100ppm, 300ppm, 500ppm and 1.000ppm
- CO output signal 4-20 mA and 0...10 Vdc
- Operating voltage 24 VAC or 15-35 VDC

Options

- Custom design Display
- Modbus / RS485 port
- Relay, 1 or 2 relays, can be set individually
- Buzzer, can be set individually

Applications

- Vehicle exhaust measuring at garages, auto parks
- Early fire detection
- Air quality applications: measuring CO concentrations as of odors; tobacco smoke, body odor, or material fumes in cinema/theatre halls, exhibition halls, restaurants, canteens, shopping malls and conference rooms etc

Ordering Codes

model	*mounting type*	*output 1*	*output 2*	*options*
SCM	W wall	0 no output 1 0…10 Vdc 2 2…10 Vdc 3 0…5 Vdc 4 1…5 Vdc 5 4…20 mA	0 no output 1 0…10 Vdc 2 2…10 Vdc 3 0…5 Vdc 4 1…5 Vdc 5 4…20 mA	M modbus D display DD display w backlight R relay 1x RR relay 2x B buzzer 2 CO Cell w 2 pins E 1.000ppm range

sample order code: SCM.W51 .MD

options: Modbus and Display

Wall type, out1: 4-20mA, out2: 0…10 Vdc

SENSE CO Transmitter

1. Standard products have the CO cell with 3 pins, choose “2” from options for choosing the CO cell with 2 pins
2. ROOM and DUCT types are available, please check own datasheets
3. Standard CO ranges are field selectable as 50ppm, 100ppm, 200ppm and 300ppm
4. Choose “E” for extended ranges 100ppm, 300ppm, 500ppm and 1.000ppm
5. Relay and Buzzer options should have be ordered with Display option
6. For advanced options and special applications, please contact with us info@senseandcontrol.com

General Notes

1. High density of some other gasses may effect the measurements.
2. Observe maximum permissible cable lengths.
3. If cable runs parallel to the mains cable: Use shielded cables.
4. Test only with certified calibration gasses.
5. The cable entry always should have to be pointing downwards.
6. The data indicated under ‘Technical Data’ apply only to vertically mounted transmitters.
7. Transmitters should have to be mounted in the center of wall but not near to any doors or windows.

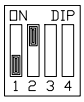
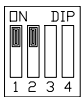
Cross Sensitivity

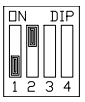
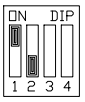
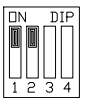
1. The values given are only for information and should not be used as a basis for cross calibration.
2. Cross sensitivities may not be linear and should not be scaled either.
3. Datas based on gassing for 5 minutes using test equipment.

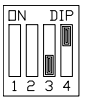
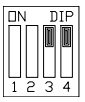
Test Gas	Test Gas Concentration	CO Equivalent (w 3 pins)	CO Equivalent (w 2 pins)
Carbon Monoxide	100 ppm	100 ppm	100 ppm
Hydrogen Sulfide	25 ppm	0 ppm	0 ppm
Sulphur Dioxide	20 ppm	0 ppm	> 0.5 ppm
Hydrogen	100 ppm	< 35 ppm	< 20 ppm
Nitric Oxide	50 ppm	< 10 ppm	< 10 ppm
Ethanol	2000 ppm	< 10 ppm	< 5 ppm
Ammonia	50 ppm	0 ppm	0 ppm
Chlorine	15 ppm	< 1 ppm	< 4 ppm
Acetylene	100 ppm	90 ppm	200 ppm

DIP Switch Settings

1. Please check if there is any special instruction on the enclosure or inside the cover
2. For any calibration, please choose 1 sec. response time for faster measurements

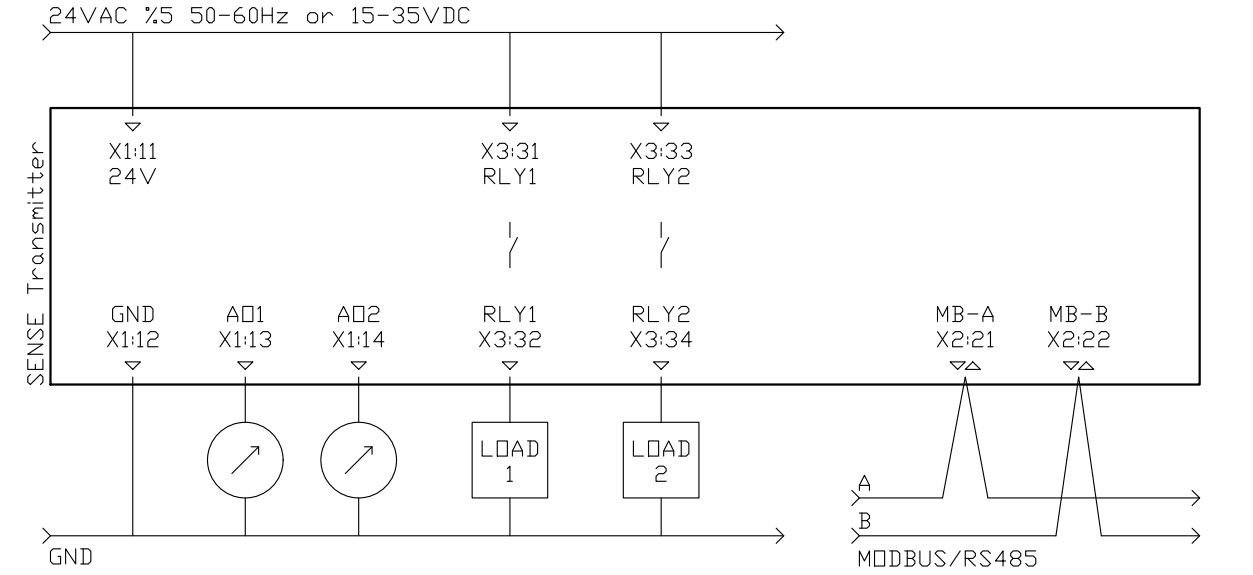
DIP	Standard Ranges
	50 ppm
	100 ppm
	200 ppm
	300 ppm

DIP	Extended Ranges
	100 ppm
	300 ppm
	500 ppm
	1.000 ppm

DIP	Response
	1 sec
	5 sec
	30 sec
	60 sec

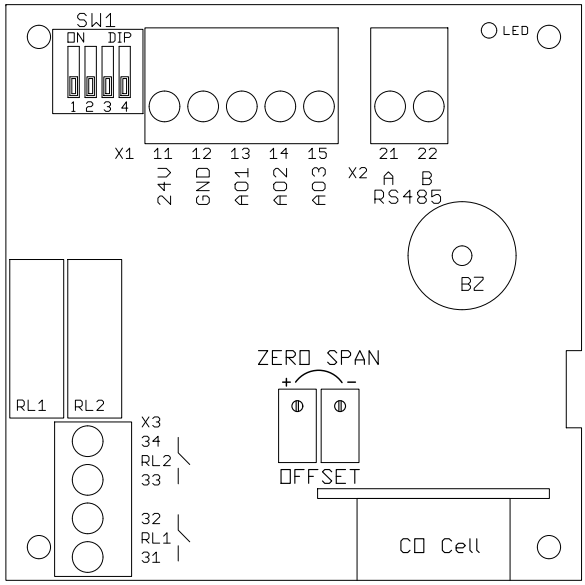
Electrical Connections

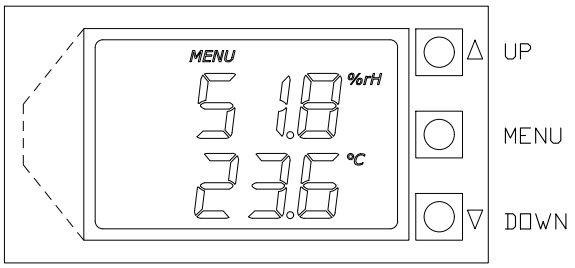
1. Please be sure about current direction for current outputs and polarity for voltage outputs.
2. Relay contact is Normally Open and rating is max. 1A at 230VAC
3. We kindly advise using 24V for avoiding high voltage harmonics and external power relay for bigger loads
4. Please use shielded and twisted paired cables for Modbus connections
5. Please observe RS485 termination rules, max. 32 devices in a single Modbus line



Technical Data

Electrical	Power Supply	AC 24V (± %5), 50-60 Hz DC 15…35 V	
	Power Consumption	< 2.5 W	
Outputs	Current Output	4…20 mA, maximum 500 Ω	
	Voltage Output	0…10 Vdc, minimum 1.000 Ω 0…5 Vdc, minimum 1.000 Ω	
	Relay Output	max. rating 1A @ 220 Vac	
Sensor Comparison		**CO cell w 3 pins**	**CO cell w 2 pins**
	t90	< 50 sec.	< 50 sec.
	expected life time	> 6 years	> 10 years
	drift	< 5% per year	< 5% per year
	resolution	0.5 ppm	1 ppm
	linearity	< ±3 %	< ±5 %
	repeatability	< ±3 %	< ±5 %
	baseline	< 5 ppm	< 2 ppm
	filter capacity per hour	> 20.000 ppm	> 20.000 ppm
	Operating Temperature	-30 …+50°C	-20 …+50°C
	Operating Humidity	15…90 %rH	15…90 %rH
	Operating Pressure	800…1.200 mbar	800…1.200 mbar
	UL2075	Yes	No
General Data	Sensing Element	Electrochemical Cell	
	Media	Air or non-aggressive gasses	
	Storage Temperature	0 …+20°C recommended	
Ranges	CO	0…50-100-200-300 ppm ranges for standard types 0…100-300-500-1.000 ppm ranges for extended types	
Connections	X1-X2 Terminals	Pluggable screw terminal	
	X3 Terminals	Fixed screw terminal	
	Cable	maximum 1.5mm2	
	Cable Gland	M16	
Protection	SCM.W series	IP65	
Standards	EMC Directive	EN 61326-1	
Dimensions	SCM.W series	98.0 x 81.5 x 45.5 mm	
Weight Packed	SCM.W series	229 gr	





SW1 DIP Switch for configuration range and response time

X1 TERMINAL

11	24V	15…35 Vdc or 24 Vac (± %5, 50-60 Hz)
12	GND	ground for power and reference for outputs
13	AO1	analog output 1
14	AO2	analog output 2
15	AO3	analog output 3

X2 TERMINAL

21	A / RS485	modbus communication positive pair
22	B / RS485	modbus communication negative pair

LED bead LED, periodically lights ON and OFF
modbus communication, blinks when there is a communication

ZERO ZERO trimmer

SPAN SPAN trimmer

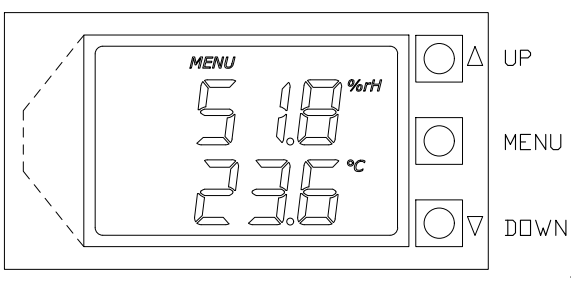
RL1 & RL2 relay 1 and relay 2

BZ buzzer

X3 TERMINAL

31	NO - RL1	relay 1 dry contact max. rating 1A @ 220 Vac
32	NO - RL1	relay 1 dry contact max. rating 1A @ 220 Vac
33	NO - RL2	relay 2 dry contact max. rating 1A @ 220 Vac
34	NO - RL2	relay 2 dry contact max. rating 1A @ 220 Vac

Display & Buttons



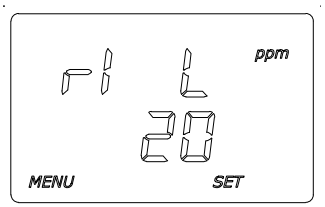
MS: no function
MENU: press for increasing the value or choosing next parameter

MS: keep pressing for entering MENU
MENU: click to navigate between sub menus one by one

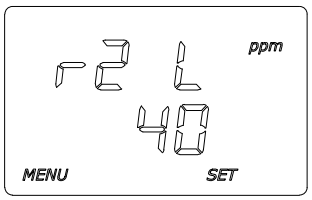
MS: keep pressing for changing the displayed value (raw/calibrated)
MENU: press for decreasing the value or choosing previous parameter

Parameters for Relay & Buzzer

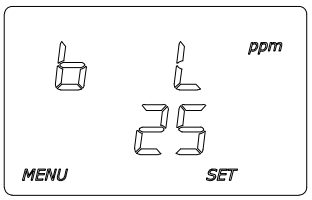
Main Screen >>>>> r1 L > r1 H > r1 A > r2 L > r2 H > r2 A > B L > B H > B A > Main Screen



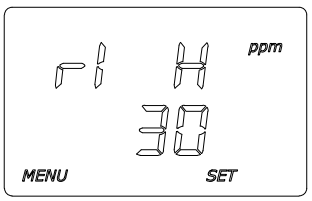
LOW set point for Relay 1



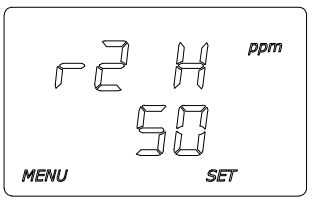
LOW set point for Relay 2



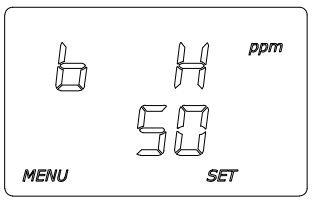
LOW set point for Buzzer



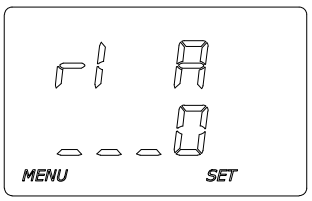
HIGH set point for Relay 1



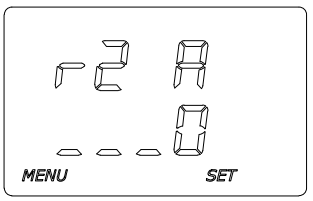
HIGH set point for Relay 2



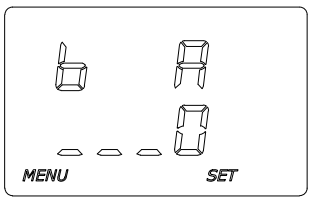
HIGH set point for Buzzer



ACTION selection for Relay 1



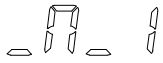
ACTION selection for Relay 2



ACTION selection for Buzzer

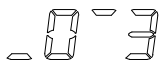
Actions for Relay & Buzzer

action 0, valid for relays and buzzer,
relay contact is always OPEN
buzzer is always SILENCE

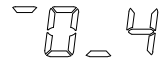


action 1, valid for relays and buzzer,
relay contact is CLOSED between points, OPEN under LOWpoint and OPEN over HIGHpoint
buzzer is WARNING between points, SILENCE under LOWpoint and SILENCE over HIGHpoint

action 2, valid for relays and buzzer,
relay contact is OPEN between points, CLOSED under LOWpoint and OPEN over HIGHpoint
buzzer is SILENCE between points, WARNING under LOWpoint and SILENCE over HIGHpoint



action 3, valid for relays and buzzer,
relay contact is CLOSED over HIGHpoint, OPEN under LOWpoint, hysteresis between points
buzzer is WARNING over HIGHpoint, SILENCE under LOWpoint, hysteresis between points



action 4, valid for relays and buzzer,
relay contact is OPEN over HIGHpoint, CLOSED under LOWpoint, hysteresis between points
buzzer is SILENCE over HIGHpoint, WARNING under LOWpoint, hysteresis between points

action 5, valid only for buzzer,
buzzer is WARNING over HIGHpoint, SILENCE under LOWpoint,
buzzer is WARNING intermittently between points,

action 6, valid only for buzzer,
buzzer is WARNING under LOWpoint, SILENCE over HIGHpoint,
buzzer is WARNING intermittently between points,

action 7, valid only for buzzer,
buzzer is following relay 1 contact,
buzzer is WARNING when relay 1 contact is CLOSED, SILENCE when the contact is OPEN

action 8, valid only for buzzer,
buzzer is following relay 2 contact,
buzzer is WARNING when relay 2 contact is CLOSED, SILENCE when the contact is OPEN

ACTIONS	under LOW	between LOW & HIGH	over HIGH
0 : 0.0.0	Open / Silence	Open / Silence	Open / Silence
1 : 0.I.0	Open / Silence	Closed / Warning	Open / Silence
2 : I.0.I	Closed / Warning	Open / Silence	Closed / Warning
3 : 0.X.I	Open / Silence	Hysteresis	Closed / Warning
4 : I.X.0	Closed / Warning	Hysteresis	Open / Silence
5 : 0.-.I	Silence	Pre Alarm	Warning
6 : I.-.0	Warning	Pre Alarm	Silence
7 : =r1	Silence when RL1 is Open, Warning when RL1 is Closed		
8 : = r2	Silence when RL2 is Open, Warning when RL2 is Closed		

0 : Relay Contact is OPEN, Buzzer is in Silent mode
I : Relay Contact is CLOSED, Buzzer is in Warning mode
X : Relay Contact is at HYSTERESIS position, OPEN if previous position open, CLOSED if previous position closed
: Buzzer is in HYSTERESIS mode, Silent if previous mode is silent, Warning if previous mode is warning
- : Buzzer is in PRE ALARM mode, Buzzer is warning intermittently

Modbus RS485 Protocol

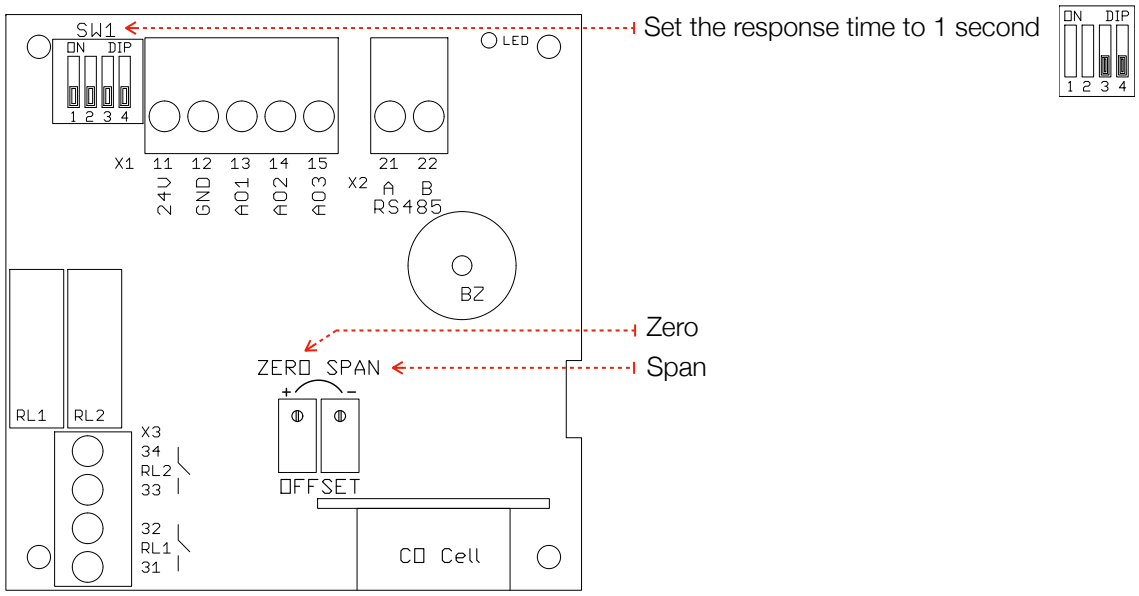
Default Settings: Modbus ID:1, 9600, 8bit, None, 1. Register Table starts from Base 1.

Use Function 3 for Reading and Function 6 for Writing Holding Registers. Whenever writing to any Modbus Parameter, new parameter is activated instantly and you should have to configure master device according to new parameters.

Unlisted registers are for analog output calibrations and some system parameters. Please do not change unlisted registers. Modbus ID:254 is for common address for all units.

Register	R/W	Range	Description
1	R & W	1…254	Modbus Address
2	R & W	0…2	Baudrate, 0: 9.600, 1: 19.200
3	R & W	0…3	Bit_Parity_Stop, 0: 8bit_None_1, 1: 8bit_None_2, 2: 8bit_Even_1, 3: 8bit_Odd_1
4	R	0…10000	CO level as ppm x10, divide by 10 for exact value
5	R	0…1000	CO level as ppm
6	R	0 or 1	Relay 1, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
7	R	0…1000	Relay 1, LOW point
8	R	0…1000	Relay 1, HIGH point
9	R	0…4	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	0…1000	Relay 2, LOW point
12	R	0…1000	Relay 2, HIGH point
13	R	0…4	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	0…1000	Buzzer, LOW point
16	R	0…1000	Buzzer, HIGH point
17	R	0…8	Buzzer, ACTION
18-41	R		Only for service needs
42	R		CO raw value
43	R		Average CO raw value
44	R		CO level as ppm x10, divide by 10 for exact value
45	R		ZERO trimmer value
46	R		SPAN trimmer value
47-50	R		Only for service needs

Calibration Protocol



Before the process;

1. Set the response time to 1 second
2. Keep the unit working for minimum 10 minutes at fresh air for settling the baseline before any calibration

ZERO Calibration with Modbus Option

1. Read average CO raw value from HREG43
2. Read ZERO trimmer value from HREG45 and set it to CO raw value (at HREG43)

ZERO Calibration without Modbus Option

1. Read any analog value with a digital multimeter 0-10V or 4-20mA
2. Turn the SPAN trimmer 5 turns in the "**–**" direction
3. Turn the ZERO trimmer in the "**+**" direction unless you see over 1.0V or 5.0mA from analog output
   If you can't, you can turn the SPAN trimmer 5 more turns in the "**–**" direction
4. Turn the ZERO trimmer in the "**–**" direction slowly unless you have the closest value to 0.0V or 4.0mA

SPAN Calibration with Modbus Option

1. Apply the test gas for min. 1 minute with 0.1 to 0.5 lt/min flow rate
2. Read average CO value as ppm from HREG44 when it is stable, devide by 10 for the exact value
3. Turn the SPAN trimmer in the "**+**" or "**–**" direction unless you have the same values with certified calibration gas and from HREG44

SPAN Calibration without Modbus Option

1. Apply the test gas for min. 1 minute with 0.1 to 0.5 lt/min flow rate
2. Read any analog value with a digital multimeter 0-10V or 4-20mA
3. Turn the SPAN trimmer in the "**+**" or "**–**" direction unless you have the same values with certified calibration gas and from analog output

General Notes

1. Use certified calibration/test CO gasses
2. Applying test gas for 3 minutes is very enough for a standard calibration
3. For best calibration, you can apply the test gas for 5 minutes
4. Applying the test gas for longer and for many times, reduces the CO Sensing Element life

Drawings