C-DIAS Relay Output Module   **CRO 081**

8 relays
Relays 1 and 2 are center zero relays
Relays 3 - 8 are contacts

This module is able to switch eight different electric circuits, each to a voltage of 125V. The maximum allowed current may not exceed 2A! The relays are supplied from controlled +24V via the terminal strip. Supply to the module internal (+5V) takes place via the module carrier.

Technical Data

Relay specifications

Number of relays	8 relays	
Relay types	6 x contacts	2 x center zero relays
Current supply	+24V DC	
Switching time	<10ms	<10ms
Switching range	18 – 30VDC	
Breaking capacity	125V AC / 2A	

Electrical requirements

Supply voltage +24V	18 – 30V DC	
Supply voltage current consumption +24V	Correspond to the number of the switched relays (max. 120mA)	
Supply of the C-DIAS bus	+5V	
Current consumption on the C-DIAS bus (+5V supply)	Typically 20mA	Maximum 40mA

Voltage surveillance

| Supply voltage +24V	Supply voltage <18V (Error-LED illuminates red)

Miscellaneous

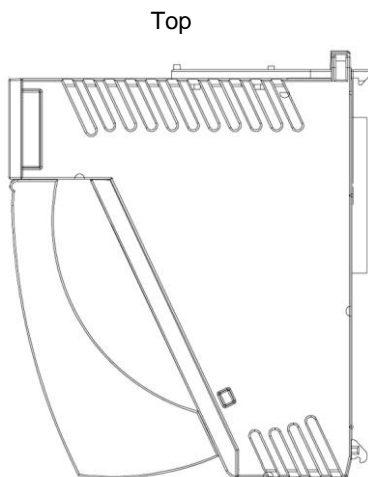| Article number	12-064-081 CRO 081 with status display (LEDs yellow and red)
	12-064-081-O CRO 081 without status display (no LEDs)
Hardware version	1.x
Standardization	UL (E247993)

Environmental conditions

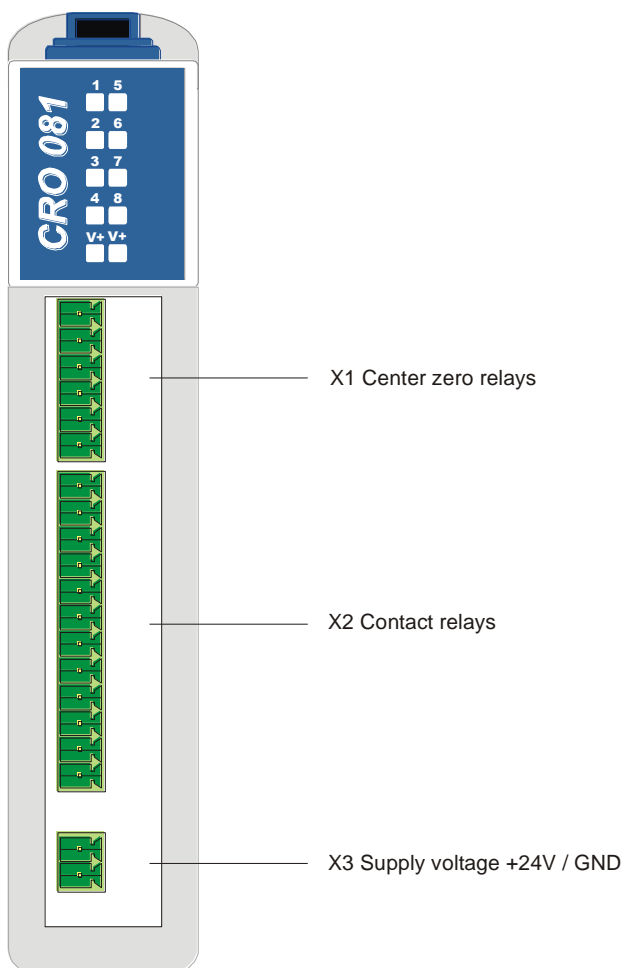| Storage temperature	-20° – +85°C	
Operating temperature	0° – +60°C	
Humidity	0 – 95%, non-condensing	
EMV resistance	In accordance with EN 61000-6-2 (industrial)	
Shock resistance	EN 60068-2-27	150m/s²
Protective system	EN 60529	IP 20

Mechanical dimensions
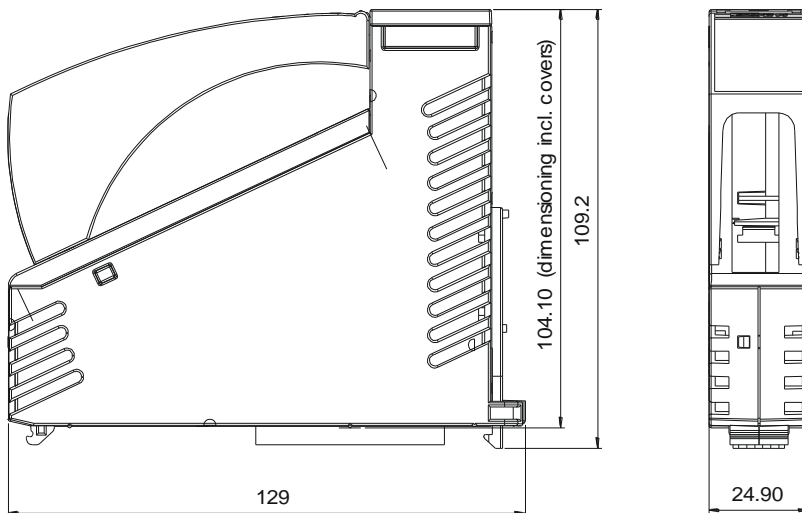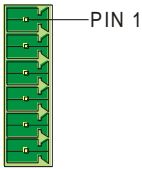
Mounting position

To ensure optimal cooling of the module, the CRO 081 must be mounted as shown (standing). For an angled mounting position, forced convection (cooling fan) must be used.
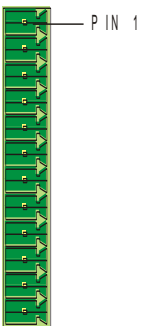
Top

Bottom

Connections

CRO 081

1 5
2 6
3 7
4 8
V+ V+

X1 Center zero relays

X2 Contact relays

X3 Supply voltage +24V / GND

X1: Plug center zero relays

PIN 1

Pin	Function
1	Contact 1
2	Basis 1
3	Opener 1 (= rest position)
4	Contact 2
5	Basis 2
6	Opener 2 (= rest position)

X2: Plug contact relays

P IN 1

Pin	Function
1	Contact 3
2	Basis 3
3	Contact 4
4	Basis 4
5	Contact 5
6	Basis 5
7	Contact 6
8	Basis 6
9	Contact 7
10	Basis 7
11	Contact 8
12	Basis 8

X3: Plug supply voltage

PIN1

Pin	Function
1	+24V
2	Supply ground

Usable connectors

Connectors with spring clamp:
Phoenix Contact: FK-MCP 1.5/ 6-ST-3.5
                   FK-MCP 1.5/ 12-ST-3.5
                   FK-MCP 1.5/ 2-ST-3.5

Connectors with screw clamp technique:
Phoenix Contact: MC 1.5/ 6-ST-3.5
                   MC 1.5/ 12-ST-3.5
                   MC 1.5/ 2-ST-3.5

> The complete C-DIAS plug set CKL 032 with spring clamp is available from Sigmatek
> with the article number 12-600-032.

General information to the relay outputs

All eight relays are supplied from the same +24V. The conductor cross-section of the relay outputs is designed for a permanent load of 2A at 125V. It is to be noted that with higher currents thermal loads have effect on the conductors and with permanent overloading can lead to its destruction! Higher currents can lead to tracking current, respectively, arcing between the various potentials!

It is also to be noted that in switching off, or in the case of failure of the +24V distribution voltage, that the relays 3 to 8 open and the relays 1 and 2 return to their rest positions.

Status displays

LED no.	LED colour	Meaning
1	yellow	Relay 1
2	yellow	Relay 2
3	yellow	Relay 3
4	yellow	Relay 4
5	yellow	Relay 5
6	yellow	Relay 6
7	yellow	Relay 7
8	yellow	Relay 8
V+	red	Voltage surveillance
V+	red	Voltage surveillance

Addressing

Address	Access		Description
16#00	WRITE	BYTE	Relays 1 – 8
16#07	READ	BYTE	D0 Surveillance +24V (0 = Supply voltage <18V, 1 = Supply voltage OK)

Data in EEPROM (organized byte-wise)

Address	Data	Description
$00	$xx	Check sum
$01	123	Identification
$02	3	Module group 3 = RO
$03	1	Variant 1 = CRO081
$04	8	Number of channels
$05	$1x	Hardware version $10 = HW-V1.0, $11 = HW-V1.1,…
$10		Serial number

Check sum calculation of the EEPROM

- The check sum is calculated byte-wise
- It is calculated from the address following the check sum to the last address of the data block (both inclusive)
- This means, the length of the data block of the check sum to be calculated = 5 BYTE fixed.
- Calculation algorithm:

1.	Load pointer with address of the comparison data	L.DI#		HWKENN
	(without check sum)	ADD.DI	1	
2.	Length of data block	L.CX		5
3.	Load check sum with $FF	L.AL		$FF
4.	Rotate check sum 1 bit to the left into Carry	LP	ROL.AL	1
5.	Add up check sum with current WORD and Carry	ADC.AL		(DI)
6.	Increase pointer on next WORD	ADD.DI		1
7.	Finished all addresses? NO ---> 4. YES ---> 8.	LOOP		LP
8.	Check sum is ready			