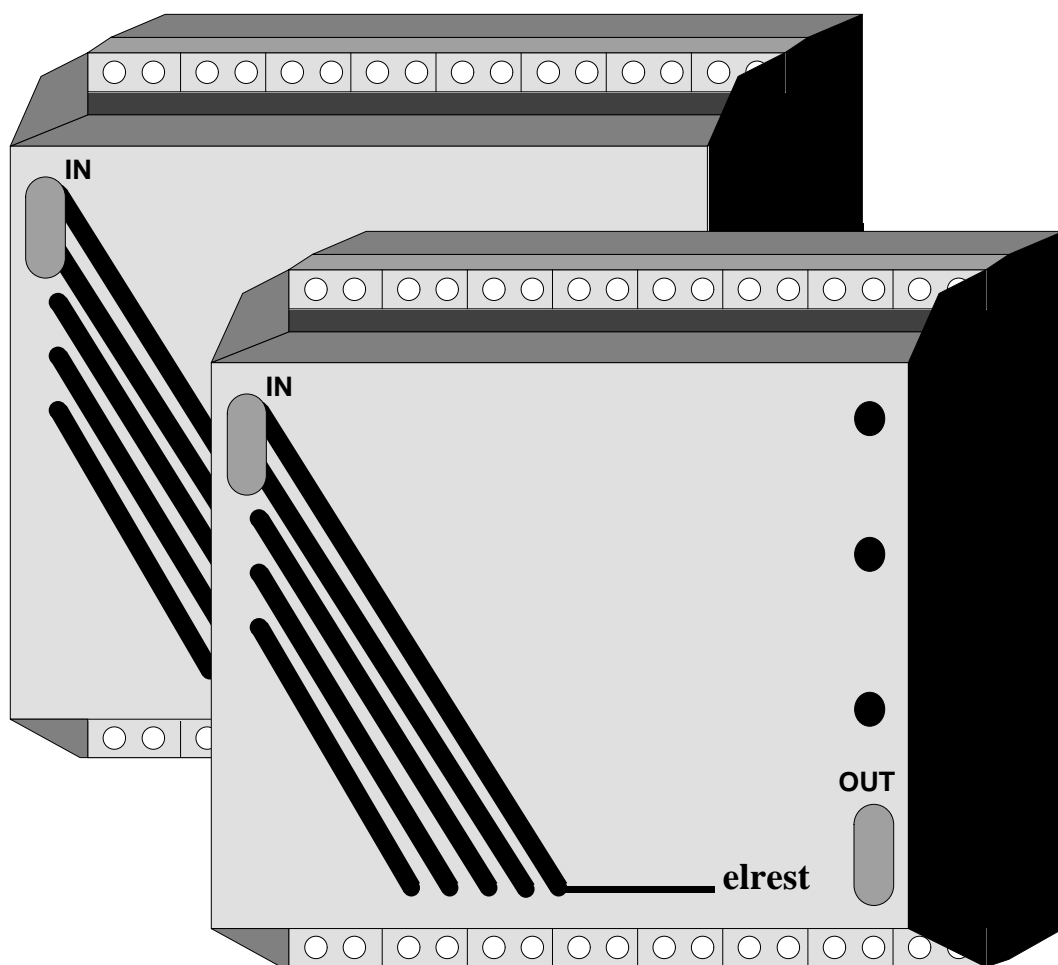


ElaCan I CAN/MCP-2/..

16-channel-controller



elrest
Automationssysteme GmbH
Leibnizstraße 10
73230 Kirchheim/Teck (Germany)

Telefon: (07021) 92025-0
Telefax: (07021)92025-29
Telegramm: ELREST Nürtingen

1. Function description

The 16-channel controller system CAN/MCP-2 can be used for a wide range of applications. The special features are :

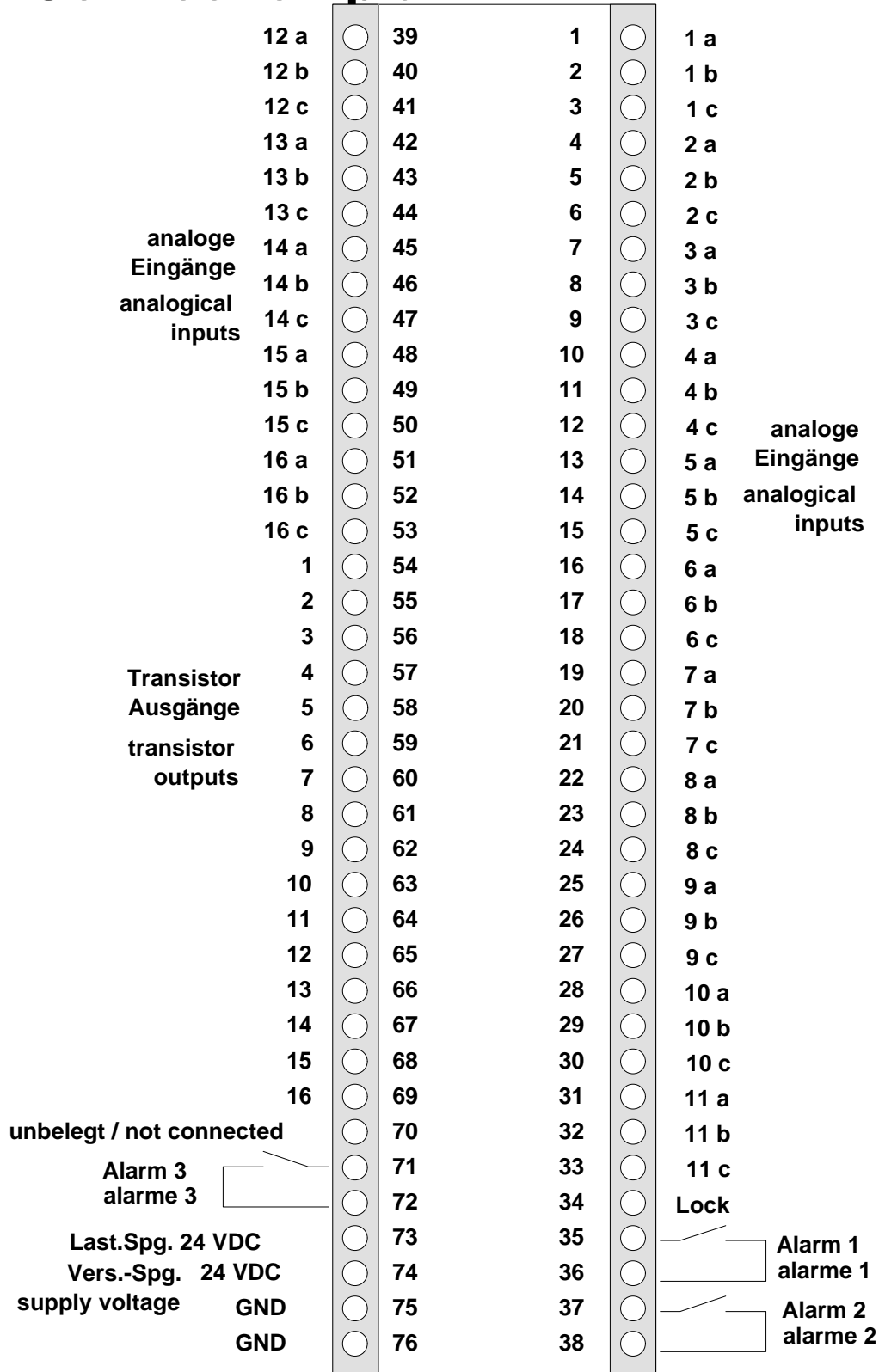
- Power supply 24 V_{DC}
- Sensor adjustment, linearization of characteristic curve, sensor fault indication and electronic monitoring.
- Sensor selection by software (Pt 100, Fe-CuNi, Ni-CrNi, Pt-RhPt, 0-10 V_{DC} or 0-20 mA)
Caution : for the sensor selection 0-10 V_{DC} and 0 - 20 mA must be insert internal jumpers.
- Three integrated alarm relais for relative maximum alarm (A1), relative minimum alarm (A2) and absolute alarm (A3).
- Controller algorithmus selection by software
(PWM, 2-point, 3-point and 3-point-step conform to DIN 19226)
- Power controller output for direct driving of a solid-state-relais or something else.
- Phase shifted controlling the controller outputs PWM (split-range-mode).
- Optical view of the controller outputs and power circuits.
- Controlling and configuration from an host computer.
- Autonom working controller unit, with the last setting from the host controller.
(available above version : 0.50)
- Self controlled processing unit (watchdog).
- Field bus interface CAN (Controller Area Network)

1.1 Devices

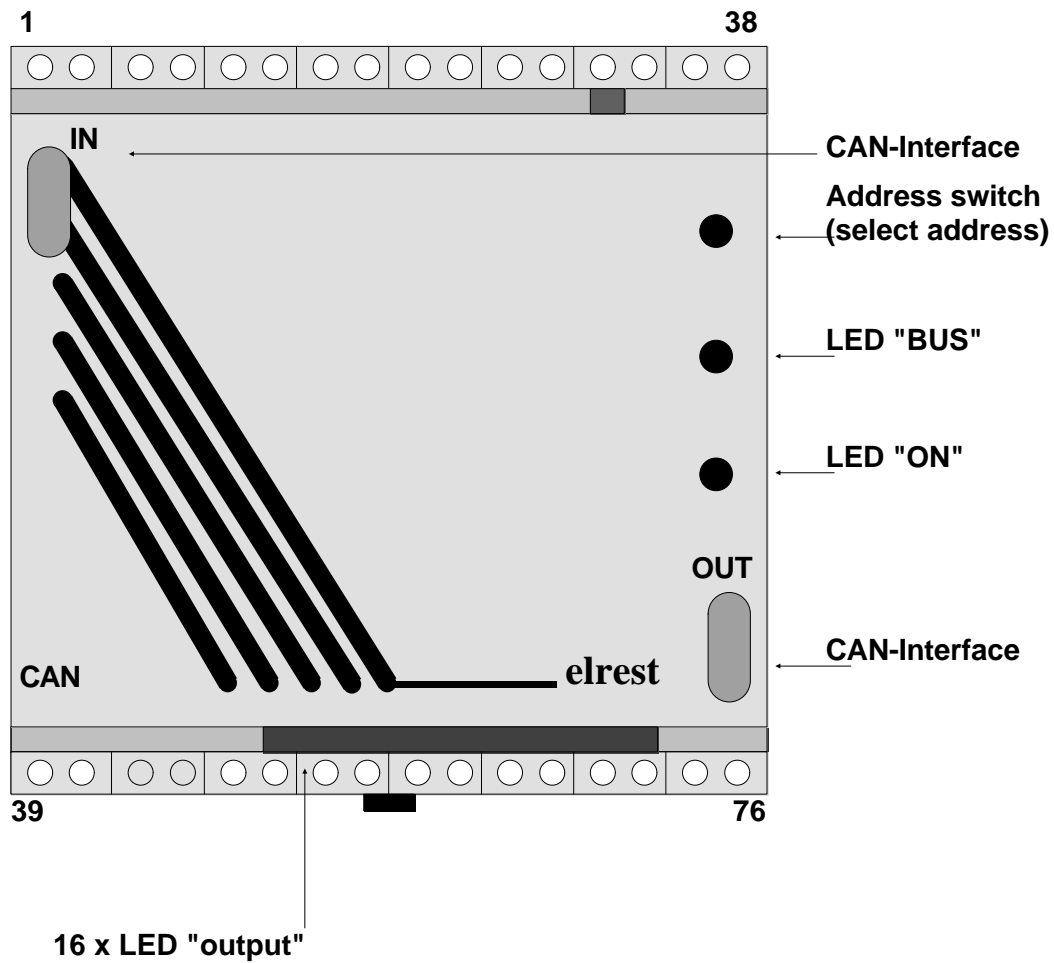
- | | |
|--|------------------|
| • CAN/MCP-2/16xThermo,PT/24VDC | Item.No.: 105009 |
| CAN/MCP-2/16xThermo,PT/12-bit/24VDC | Item.No.: 105021 |
| Hardware configured for the sensor types : FeCuNi,NiCrNi,PtRhPt and Pt 100-2wire | |
| • CAN/MCP-2/16xPt100-3L/24VDC | Item.No.: 105001 |
| CAN/MCP-2/16xPt100-3L/12-bit/24VDC | Item.No.:105020 |
| Hardware configured for the sensor types : Pt 100-3Leiter | |
| • CAN/MCP-2/16x0-10VDC/24VDC | Item.No.: 105019 |
| CAN/MCP-2/16x0-10VDC/12-bit/24VDC | Item.No.:105018 |
| Hardware configured for the sensor type : 0 - 10 V _{DC} | |
| • CAN/MCP-2/16x0-20mA/24VDC | Item.No.: 105026 |
| CAN/MCP-2/16x0-20mA/12-bit/24VDC | Item.No.:105025 |
| Hardware configured for the sensor type : 0 - 20 mA | |

2. Device description

2.1 Connection plan



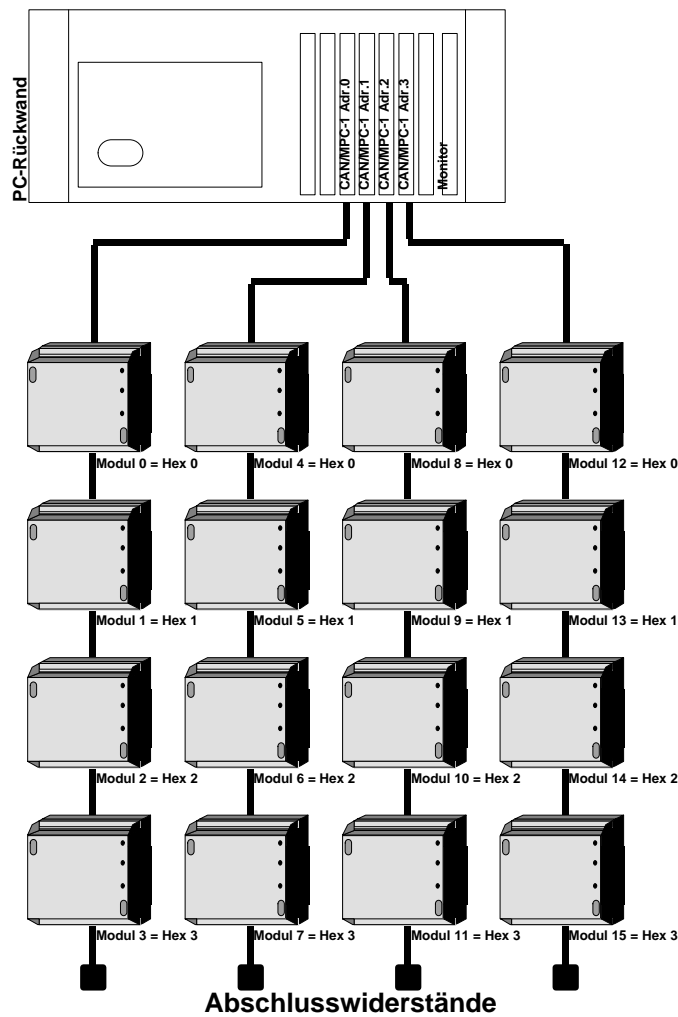
2.2 Front view



At the device front is a green LED called "ON". This is shining if the power supply of 24 V_{DC} is correct connected. There is an other yellow LED called "BUS". This LED is winking if there is a correct connection to the host computer. If an fault occurs in the connection the yellow LED will no more winking.

2.3 Wiring

Vernetzung mit CAN/MPC-1 Karten :



Caution !
The host-computer and all modules have to be connected the same Ground (potential earth).

2.4 Addressing

At the device front is an addressing switch in hexadecimal order. With the aid of the switch the addressing is done. The addressing is necessary for the modules. The hex switch on position "0" is done for the first module and position "3" is done for the fourth module. The numbering is straight forward from "0" to "3".

Attention !
If one or more modules have the same address, the controller can do unexpected things.

2.5 Output

This modul includes 17 transistor- and 3 relais outputs.

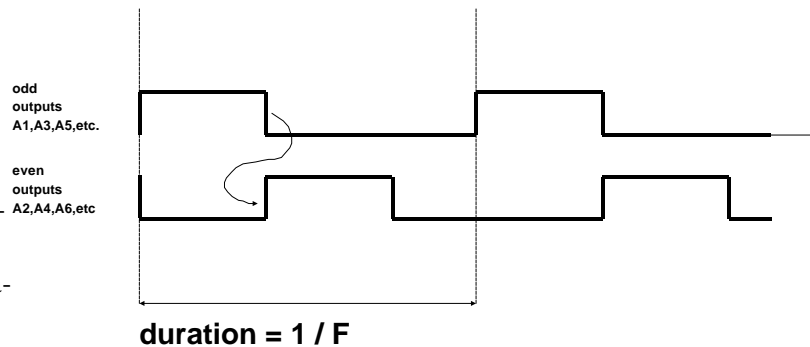
The first 16 transistor outputs are reserved as controller outputs, therefore the relation which controller drives which output is adjustable by software. The controller outputs are numbered from A1 to A16. The outputs A1 to A16 are adjusted with the variable BIT1 and BIT2 to their related output. Normally there is a linear relation, i.e. the controller output 1 refers to transistor output A1, the controller output 2 refers to transistor output A2, etc.

Each output is viewed by a red LED.

The relais outputs are fixed reserved as alarm outputs.

The outputs A1 to A16 switching activ high $24V_{DC}$.

The alarm relais A18-A20 open the contact in the fault case (reverse order), therefore the 3 alarm outputs can be chained together to one common alarm. The red alarm LED is shining if no fault condition is happened (reverse order).



The puls modulated output of the controller includes an split-range-mode.

This means, an output couple A1 with A2, A3 with A4, etc. turn their output on and off in reverse phase. The effect is an continued load on the load circuits L1, L2 and L3. Please keep in mind that an output couple is lying on the same phase, e.g. :

- A1 and A2 on L1
- A3 and A4 on L2
- A5 and A6 on L3

The puls modulated output (PWM) starts with the odd output A1. When e.g. PWM = 40 %, after $T1 = 0.4 * 1 / F$ seconds the output is turned off, the corresponding output A2 will be triggered. This starts its output shifted to the phase.

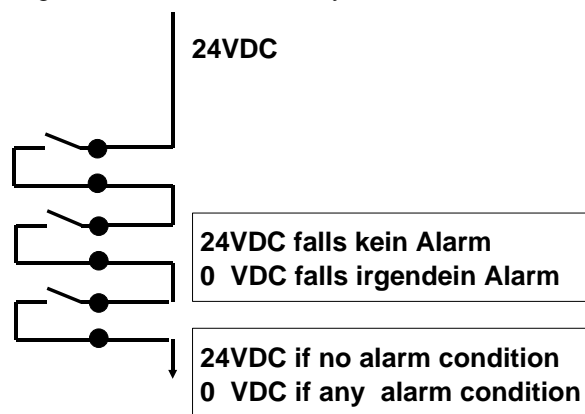
<p style="text-align: center;">Caution ! If you want to use the even outputs A2, A4, etc. you have to configure the odd outputs A1, A3, etc. too.</p>

2.6 Alarm

The controller has 3 alarms.

- Relative maximal alarm (Alarm 1)
if $\text{actual} > \text{reference} + \text{ALARM0}$
- Relative minimal alarm (Alarm 2)
if $\text{actual} < \text{reference} - \text{ALARM1}$
- Absolute Alarm (Alarm 3)
if $\text{actual} > \text{ALARM2}$

These alarm outputs work in reverse order (activ low), if there is no power supply or an alarm condition the relais contact are open. Therefore a logical AND function can easy be done :



2.7 Analog Inputs

The calibration of the modules will be done by software from an PC, with an CAN/MPC-1 card and an special software program.

The manufacturer elrest calibrates for the sensor types Fe-CuNi, Ni-CrNi, Pt-RhPt and Pt 100 with a special equipment. This calibration is for all 16 zones the same in grad celcius. The calibration of the linearization of characteristic curve will be done automatically. For the sensor types "Volt" and "Ampere" the calibration has to be done for each zone individual from the customer. So the customer is able to calibrate like :

- zone 1 calibrate the input from 0.0 to 10.0 V to a display of 0.0 to 150 N/cm² .
- zone 2 calibrate the input from 0.0 to 9.0 V to a display of 3.0 to 12.0 N/cm² .
- zone 3 calibrate the input from 0.0 to 20.0 mA to a display of 1.0 to 40.0 bar.
- etc.

The calibration values will be stored in an E²PROM and they are protected in the case of power off.

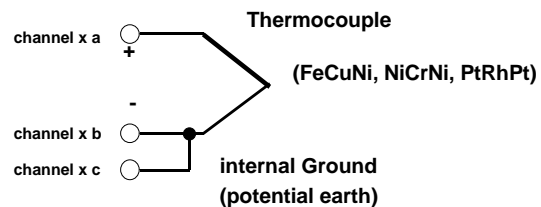
Caution !
You are only be able to use zone 1 to 12 as voltage or current inputs !
The zones 13 to 16 are reserved as thermocouple or Pt 100 inputs.

2.7.1 Measure input FeCuNi, NiCrNi or PtRhPt

The termocouple inputs come over an mutiplexer to the ADU unit.

The inputs work as differential inputs, so the analog input is very stable to potential earth with ground problems.

The correct setting of sensor type must be checked in the software !



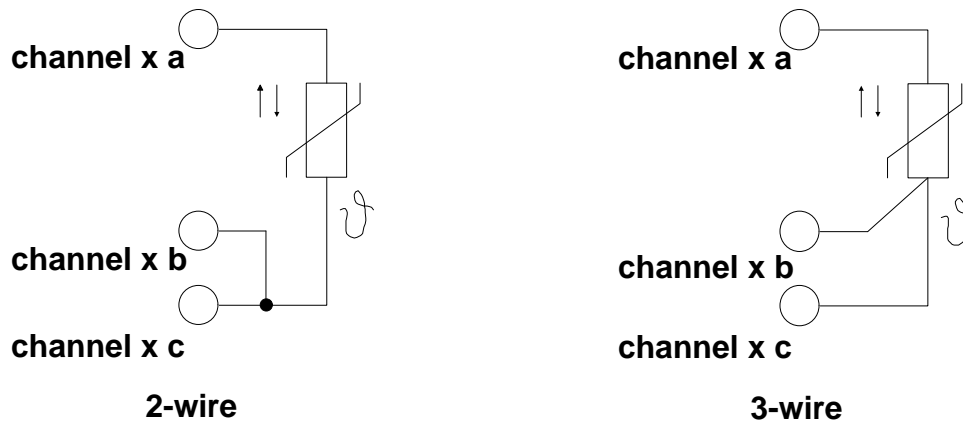
Attention !
At not with potential earth connected sensors you have to make an connection between the terminal insulator "b" and "c"!

Attention !
At with potential earth connected sensors you must not make an connection between the terminal insulator "b" and "c"!
The power supply should be insolated with potential earth.

2.7.2 Measure input Pt 100 sensor (2- or 3-wire)

The input from the temperature sensor in 2- or 3- wire technic is possible. In use of the 2-wire technic you have to make a connection between the terminal insulator "b" and "c".

Refer to the representation below. The correct setting of sensor type must be checked in the software! Normally the CAN/MCP-2 module will be delivered in 2-wire technic. If you want to use the 3-wire technic please order with the correct item-number.

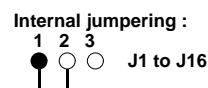
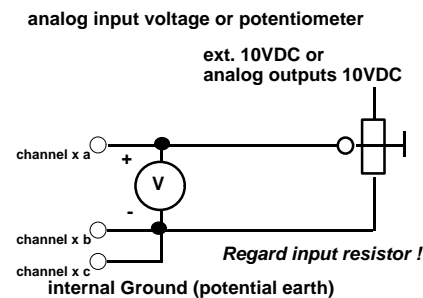


2.7.3 Measure input voltage

At the analog input Voltage the input signal from 0 to 10 V_{DC} is available. It is also possible to connect an external driven potentiometer as input signal.

The correct setting of sensor type must be checked in the software and the correct jumpering!

The input resistor is $R_{in} = 1 \text{ k}\Omega$ and must be regarded for the use of potentiometer as input signal, because through the parallel placed resistor a transversal current flows and makes a wrong measurement. Different input resistor can be delivered as an option if you remark that in your order.

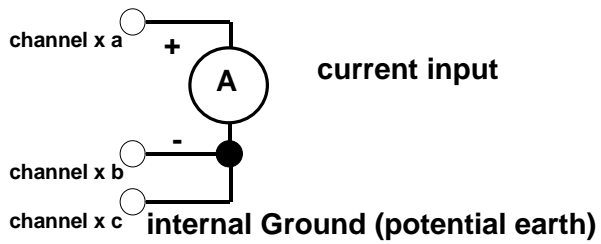


2.7.4 Measure input Ampere

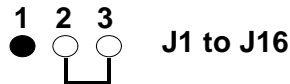
At the analog input Ampere the input signal from 0 to 20 mA is available.

The correct setting of sensor type must be checked in the software and the correct jumpering!

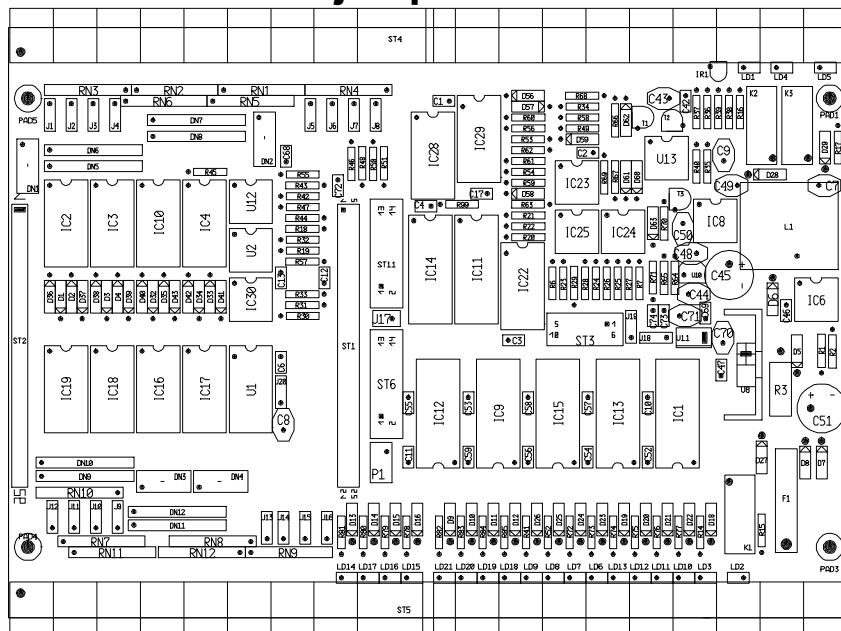
At the use of current input, the input resistor is 20 Ohms.



Internal jumpering :



2.7.5 Position of internal jumper



At the input signals Voltage and Ampere the internal jumper must be placed in order that J1 to J16 correspond to analog input 1 to 16.

2.8 connection-plan

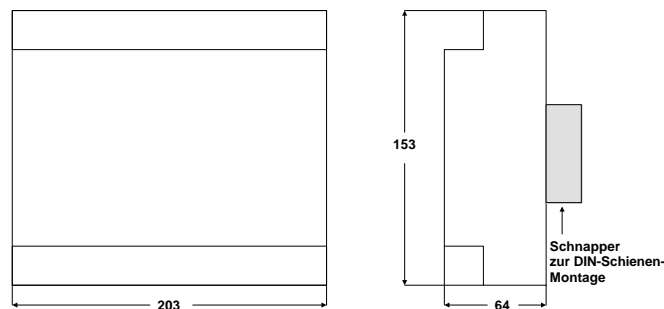
Make a connection plan for the configured sensor types :

channel 1 _____	output Y 1 _____
channel 2 _____	output Y 2 _____
channel 3 _____	output Y 3 _____
channel 4 _____	output Y 4 _____
channel 5 _____	output Y 5 _____
channel 6 _____	output Y 6 _____
channel 7 _____	output Y 7 _____
channel 8 _____	output Y 8 _____
channel 9 _____	output Y 9 _____
channel 10 _____	output Y 10 _____
channel 11 _____	output Y 11 _____
channel 12 _____	output Y 12 _____
channel 13 _____	output Y 13 _____
channel 14 _____	output Y 14 _____
channel 15 _____	output Y 15 _____
channel 16 _____	output Y 16 _____
alarms _____	

3. Technical Data

3.1 Electrical Data

Power supply:	control circuit typical : 24 V _{DC} (18..30 V _{DC}) power circuit typical: 24 V _{DC} (18..30 V _{DC})
Power consumption:	5 VA (control circuit)
Measure inputs:	Fe-CuNi, Ni-CrNi, Pt-RhPt confirm to DIN 43710 PT 100 2- or 3-wire-technic confirm to DIN 43760 at 3-wire-technic maximum resistor of wiring 20 Ohm.
Temperature range	FeCuNi = 0 ...700 °C NiCrNi = 0 ...900 °C PtRhPi = 0 ...1400 °C Pt100 = 0 ...400 °C
Controller outputs:	16 transistor outputs typical 24 VDC, max. 200 mA
Alarme outputs:	3 potential relais outputs typical 30 VAC, 50 VDC, 1 A
Working temperature:	0 ... + 50 °C
Storage temperature:	- 20 ... + 100 °C
Screwing:	Screws for 1,5 mm ² cable



3.2 Mechanical Data

Housing:	metal housing for EMV protection
Fastening:	for mounting on DIN-rail
Colour:	black
Width:	203 mm
Height:	153 mm
Depth:	64 mm