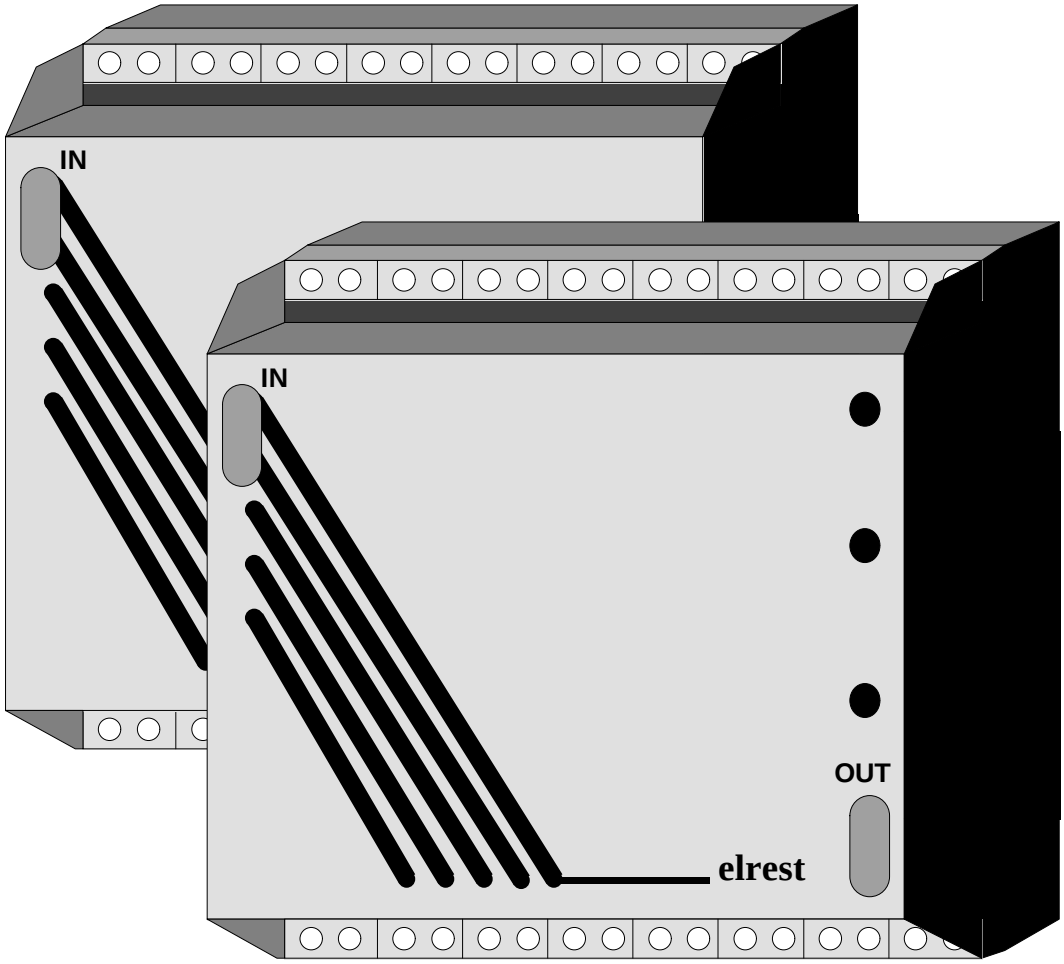
ElaCan I
CAN/MIO-2.2/..

4-channel-controller
with digital In- and Outputs



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1. Function description

The 4-channel controller system CAN/MIO-2 can be used for a wide range of applications.
The special features are :

- Power supply 24 V_{DC}
- 24 digital inputs for state or alarm viewing
- 30 power transistor outputs
- 2 relais outputs
- Sensor adjustment, linearization of charateristic 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.
- Controller algorithmus selection by software
  (PWM, 2-point, 3-point and 3-point-step conform to DIN 19226)
- Phase shifted controlling the controller outputs PWM (split-range-mode).
- Continious controller (controller voltage output for driving a linear system)
- Optical view of the controller outputs and power circuits.
- Controlling and configuration from a 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

- Optional 12-bit analog measurement for a resolution of the input signals about +/- 0.25 promille.
  Default resolution of the input signal is +/- 1.0 promille.
- CAN/MIO-2.2/4x0-10VDC/24VDC Item.No.: 10008-1
  CAN/MIO-2.2/4x0-10VDC/12-bit/24VDC Item.No.: 10011-1
  Hardware configured for the sensor type : 0 - 10 V_{DC}
- CAN/MIO-2.2/4x0-20mA/24VDC Item.Nr.: 10008-2
  CAN/MIO-2.2/4x0-20mA/12-bit/24VDC Item.No.: 10011-2
  Hardware configured for the sensor type : 0 - 20 mA
- CAN/MIO-2.2/4xThermo.PT/24VDC Item.No.: 10008-3
  CAN/MIO-2.2/4xThermo.PT/12-bit/24VDC Item.No.: 10011-3
  Hardware configured for the sensor types : Fe-CuNi,Ni-CrNi,Pt-RhPt and Pt 100-2wire

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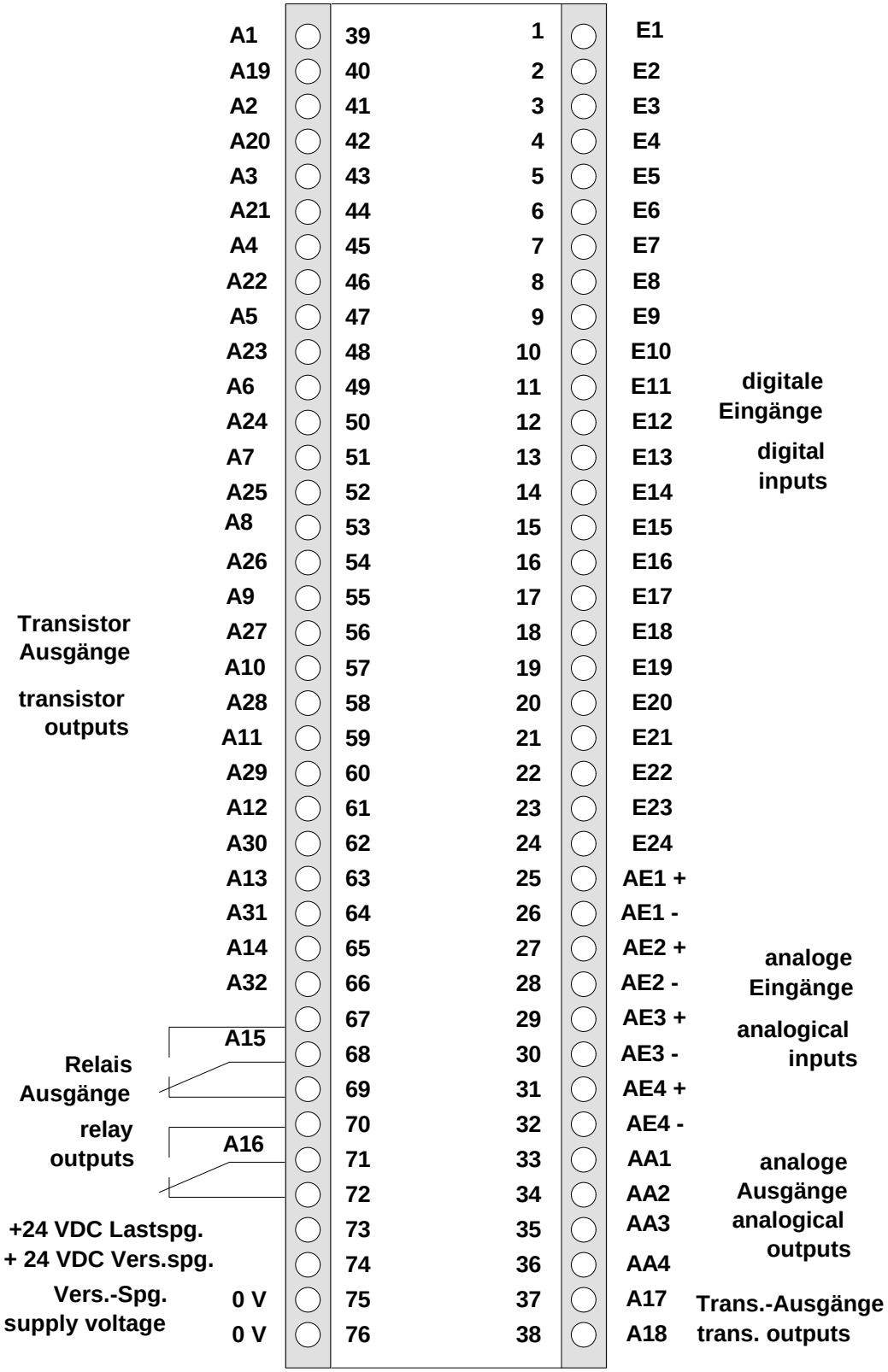
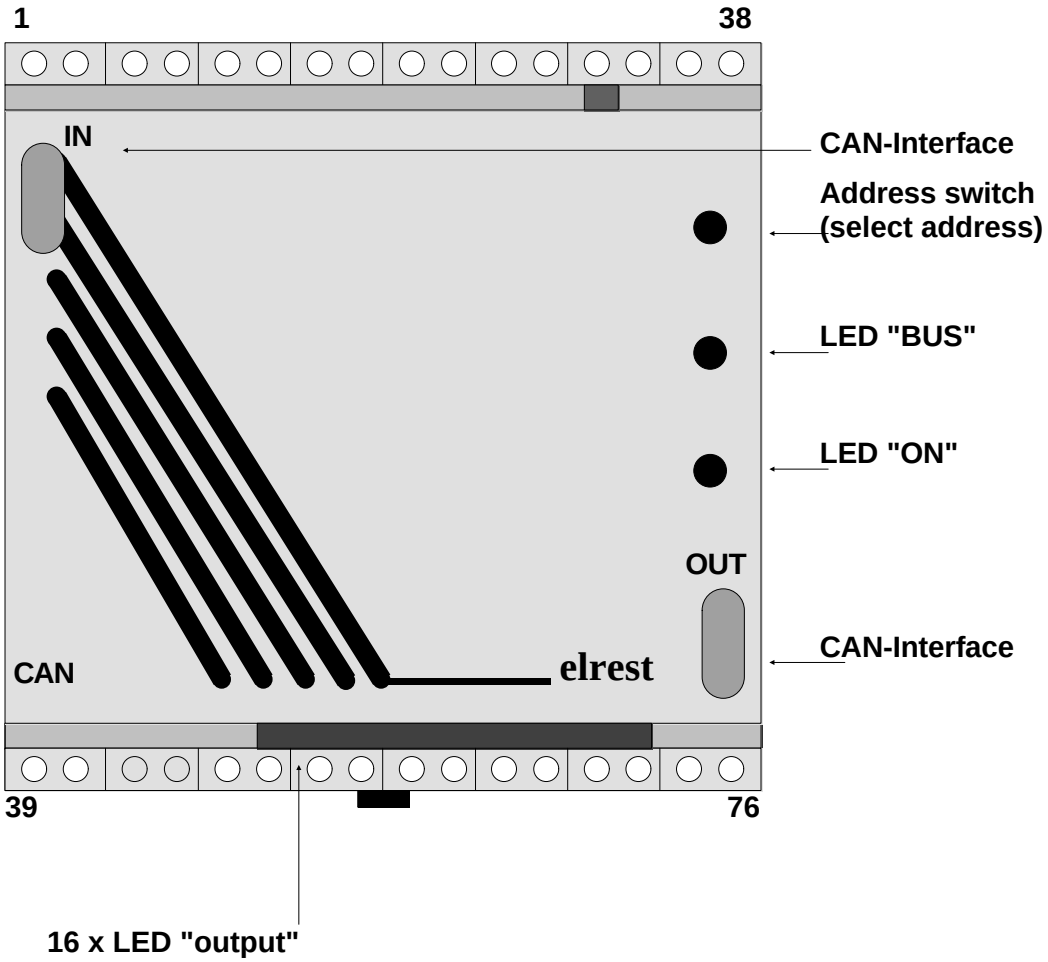
2. Device description

2.1 Connection



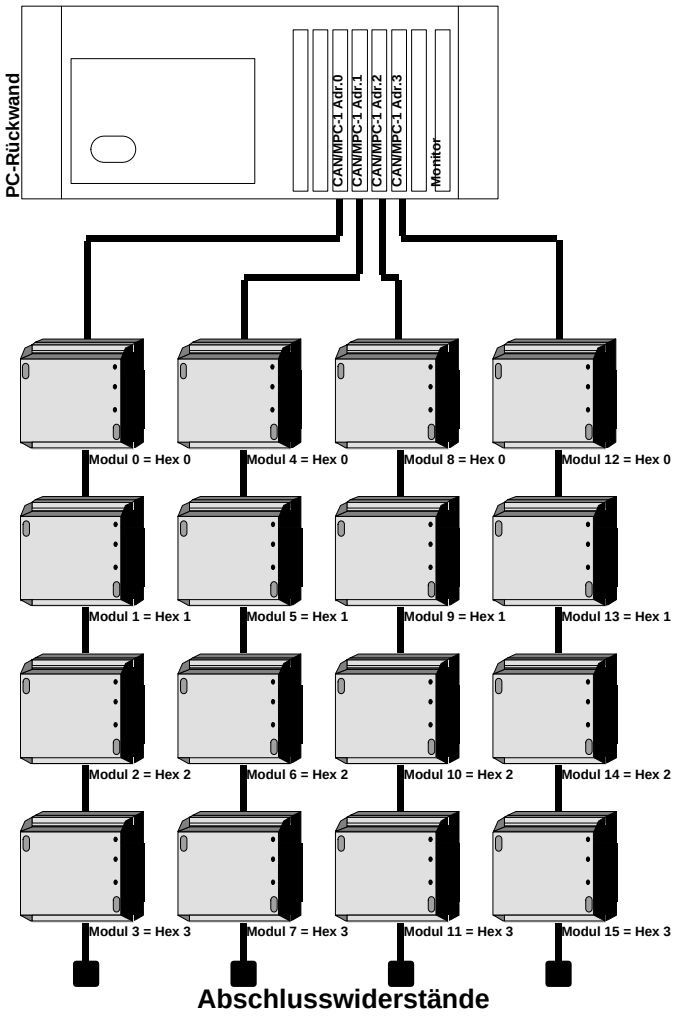
2.2 Front view



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 a fault occures 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 adressing switch in hexadecimal order. With the aid of the switch the adressing is done. The adressing 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".

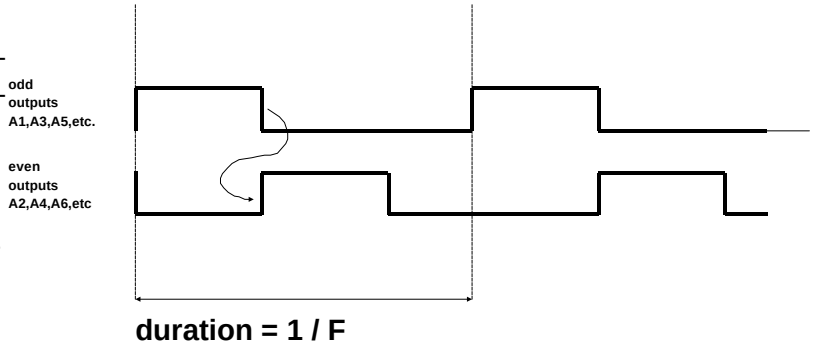
Attention !
If one or more modules have the same adress, the controller can do unexpected things.

2.5 Outputs and Output control

2.5.1 Digital outputs

This module has totally 30 transistor- and 2 relais outputs.

You can use 4 (or 8 at 3-point controller) transistor outputs as controller coutputs, therefore the relation which controller drives which output is adjustable by software. The controller outputs are numbered from A1 to A32. The outputs A1 to A32 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 transitor output A1, the controller output 2 refers to transitor output A2, etc.
Each output is viewed by a red LED.



2.5.2 Analog outputs

The analog outputs AA1 to AA4 are controllable either direct from the host computer or as output channel from one of the integrated controller.
If the variable BIT1 has a value greater than 31, the controller redirect his output directly to one of the analog output AA1 up to AA4.

2.5.3 Split-range output

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 a continuated 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.

Caution !
If you want to use the even outputs A2, A4, etc. you have to configure the odd outputs A1, A3, etc. too.

2.6 Digital inputs

The CAN/MIO-2 module has beside the analog inputs 24 digital inputs.
These inputs can be viewed from a host computer as status or alarme inputs.

2.6.1 Interrupt inputs

We deliver as option 2 interrupt inputs E1 and E2. You are able to controll fast input signals.

2.6.2 Counter inputs

We deliver as option the 2 inputs E1 and E2 as counter inputs. The maximum inputs frequency is about 10 kHz per channel.
These input are used for reading speed with incremental sensors or angle decoder.

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.

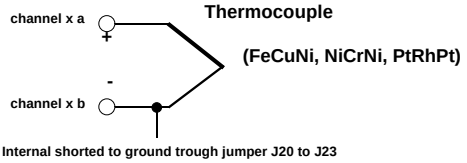
The manufacturer elrest calibrates for the sensor types Fe-CuNi, Ni-CrNi, Pt-RhPt and Pt 100 with a special equipment. This calibration is for all 16 zones the same in grad celcius. The calibration of the linearization of characteristic curve will be done automatically. For the sensor types "Volt" and "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/cm^2 .
- zone 2 calibrate the input from 0.0 to 9.0 V to a display of 3.0 to 12.0 N/cm^2 .
- zone 3 calibrate the input from 0.0 to 20.0 mA to a display of 1.0 to 40.0 bar.
- etc.

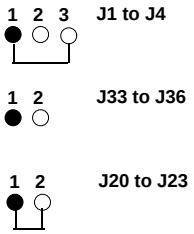
The calibration values will be stored in an E^{2}PROM and they are protected in the case of power off.

2.7.1 Measure input FeCuNi, NiCrNi or PtRhPt

The termocouple inputs come over an mutiple-xer 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 typen must be checked in the software !



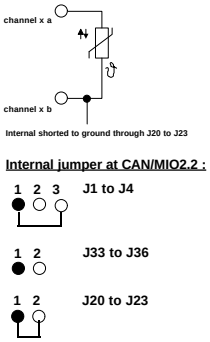
Internal jumper at CAN/MIO-2.2 :



Attention !
At <u>not with potential earth connected</u> sensors <u>you have to</u> make an connecti-on between the terminal insulator "b" and ground with one of the jumper (J20 to J23) !

Attention !
At <u>with potential earth connected</u> sensors <u>you must not</u> make a connection between the terminal insulator "b" and ground with one of the jumper (J20 to J23) !
The power supply should be insolated with potential earth.

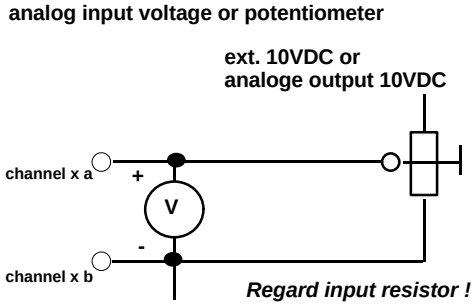
2.7.2 Measure input Pt 100 sensor (2-wire)



The input from the temperature sensor in 2-wire technic is possible. In use of the 2-wire technic you have to make a connection between the terminal insulator "b" and ground with the jumper (J20 to J23).

Refer to the representation below. The correct setting of sensor type must be checked in the software! The CAN/MIO-2 module can only be delivered in 2-wire technic.

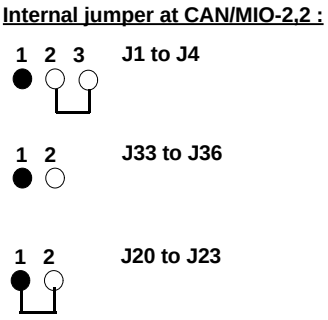
2.7.3 Measure input voltage



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 MOhm and must be regarded for the use of potentiometer as input signal, because through the parallel placed resistor a transversal current flows and make a wrong measurement. Different input resistor can be delivered as an option if you remark that in your order.



The voltage inputs are differential inputs and with the internal jumpers (J20 to J23) they can be connected to ground. If you have a fault measuring at not galvanic shorted sensors please remove the interal jumpers
(J20 to J23).

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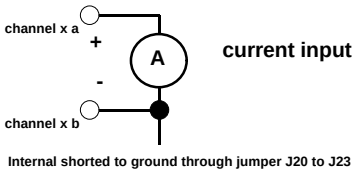
2.7.4 Measure input Ampere

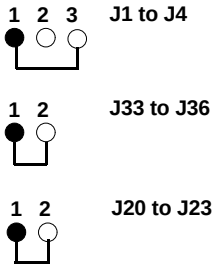
At the analog input Ampere the input signal from 0 to 20 mA is available.

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.



Interal jumper at CAN/MIO-2.2 :



2.7.5 Position of internal jumpers

At the input signals Voltage and Ampere the internal jumper must be placed in order that J1-4,J33-J36,J20-J23 is equal to analog input AE1-AE4.

3. Technical Data

3.1 Electrcial Data

Power supply:	control circuit typical : 24 V_{DC} (18..30 V_{DC})
	power circuit typical: 24 V_{DC} (18..30 V_{DC})
Power consuption:	5 VA (control circuit)
Digital inputs :	24 V_{DC} , typ. 7mA input current
	voltage range "0" : 0...5 V_{DC},
	voltage range "1" : 13..33 V_{DC}.
Measure inputs:	FeCuNi, NiCrNi, PtRhPt confirm to DIN 43710
	PT 100 2-wire-technic confirm to DIN 43760
Temperature range	Fe-CuNi = 0 ...700 °C
	Ni-CrNi = 0 ...900 °C
	Pt-RhPi = 0 ...1400 °C
	Pt 100 = 0 ...400 °C
	resolution default (10-bit) : +/- 0,1 % over measure range.
	resolution optional (12-bit) : +/- 0,04% over measure range.
Analog outputs :	0 - 10 V_{DC} , maximum 20mA current
	with +/- 0,4 % resolution over range.
Digital transistor outputs:	30 transistor output
	typical 24 VDC, max. 200 mA
Digital relais output:	2 potential free relais outputs
	typical 30 VAC / 50 VDC, maximum 3 A
Working temperature:	0 ... +50 °C
Storage temperature:	– 20 ... +100 °C
Screwing:	Screws for 1,5 mm^2 cable

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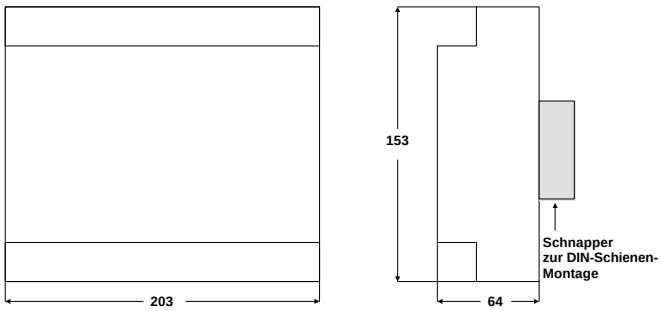
3.2 Mechanical Data



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