CAN Input FAE4 4x Analog Input

Type of Product: DV-CANFAE4-01

Technical Documentation

1 Introduction

Field bus modules FAE4 are analog input modules with four inputs that can be used as temperature or voltage inputs.

The input values are transmitted via the CAN Bus as soon as a value changes.

This module can be combined with one or more output modules of type DV-CANFAA4-01 by connecting them via CAN Bus. The output voltage of the analog output module with the same address will be set according to the input value of this analog input module. No additional control unit is necessary.

Alternatively the CAN Bus modules can act as input extension for computers with CAN Bus. For example a Touchpanel Computer TP1000 can be used to read the input values.

You can use the software libraries from Wilke Technology to shorten the software development time.

2 Applications

- Analog value transmission over long distances via CAN Bus
- Temperature control systems
- Temperature Inputs for Data Logging Systems with CAN Bus Interface
- Additional Analog Inputs for TP1000 Touchpannel Computers
- Temperature Inputs for TP1000 Touchpannel Computers
- Additional Inputs for TDR CPU Modules

3 Features

- 4 Analog Inputs
- Inputs can be used as Voltage Input
- Inputs can be used as Temperature Input
- Direct connection for PT1000 Sensors
- Direct Connection for Ni1000 Sensors
- Selectable Temperature Range
- CAN 2.0B passive Interface
- 20V...28V Supply Voltage
- 2 Status LEDs
- 8 DIP Switches

4 Contents

CAN Input FAE4 4x Analog Input

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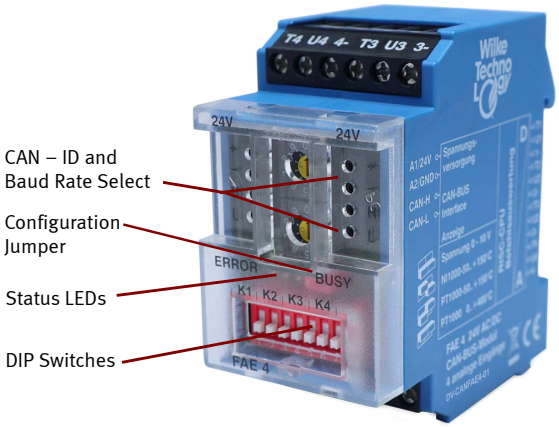


5 Control Elements

5.1 DIP Switches

Each of the four analog inputs can be configured with two DIP Switches as voltage input, as temperature input for Ni1000 or PT1000 Sensors. Using Pt1000 sensors two temperature ranges are selectable.

Channel	DIP Switch Position	Sensor	Temperature Range
1	1: OFF 2: OFF	Voltage Input	-
	1: ON 2: OFF	NI1000	-50°C...+150°C
	1: OFF 2: ON	PT1000	-50°C...+150°C
	1: ON 2: ON	PT1000	0°C...+400°C
2	3: OFF 4: OFF	Voltage Input	-
	3: ON 4: OFF	NI1000	-50°C...+150°C
	3: OFF 4: ON	PT1000	-50°C...+150°C
	3: ON 4: ON	PT1000	0°C...+400°C
3	5: OFF 6: OFF	Voltage Input	-
	5: ON 6: OFF	NI1000	-50°C...+150°C
	5: OFF 6: ON	PT1000	-50°C...+150°C
	5: ON 6: ON	PT1000	0°C...+400°C
4	7: OFF 8: OFF	Voltage Input	-
	7: ON 8: OFF	NI1000	-50°C...+150°C
	7: OFF 8: ON	PT1000	-50°C...+150°C
	7: ON 8: ON	PT1000	0°C...+400°C

5.2 Baud Rate Select

For control and communication via Can all connected devices have to use the same baud rate. The maximum baud rate which can be used depends on the length of the CAN Bus cable. The longer the cable is, the smaller the baud rate can be.

The baud rate off this CAN Bus module can be set by the following steps:

- switch off the power supply of the module
- remove the transparent front panel
- set the configuration jumper to the middle of the 4 pole header connector.
- set the top rotary switch to position 0
- set the bottom rotary switch to one of the positions 2, 3, 4, 5, or 6 according to the desired baud rate

Length of CAN Bus Cable	maximum baud rate	position of bottom rotary switch
2500m	20 kBit/s	2
1000m	50 kBit/s	3
500m	125 kBit/s	4
250m	250 kBit/s	5
100m	500 kBit/s	6

- switch on the power supply of the module. the module will store the selected baud rate into its EEPROM
- switch off the power supply again
- remove the jumper
- mount the transparent front pannel
- select the CAN - ID using the rotary switches (see section below)

5.3 CAN – ID Select

The CAN – IO module uses identifiers which are 11 bits long according to CAN 2.0A.

CAN Massages with 29 bits identifiers which are specified in Specification 2.0B are ignored.

The Identifier contains a constant to select between digital and analog modules (bit 10), a module address (bit 3 to 9) and a number for the message kind (bit 0 to 2)

CAN Messages which are not assigned to this module should have identifiers that differ in bit 10 or in bits 3 to 9 from the selected module address.

	Identifier										
Bit	10	9	8	7	6	5	4	3	2	1	0
		module address							message kind		
used values	0	$1...99_{dec}$ $01...63_{hex}$ selected with rotary switches							0...2		

5.3.1 Module Address

A module address between 1 and 99 can be selected with the rotary switches.

The value of the upper switch will be multiplied with 10 and added to the value of the bottom switch. Do not select module address 0.

The module address will be used in the identifier bits 3 to 9.

Example:
upper switch:5
bottom switch 3

module address = 53 $_{dec.}$ (=35_{hex} = 0110101_{bin})
Identifier: $00110101 0kk_{bin}$

kk: depends on message kind

5.3.2 Other Identifier bits

The value of bit 10 is always 1 for addressing this module type.

With bit 0 to 3 the message kind is selected. This module differs between 3 message kinds:

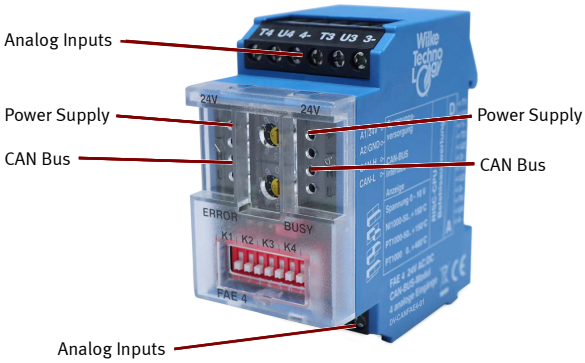
value	message kind
0	process data
1	service data
2	control data
other values	not used

5.4 Status LEDs

The green LED lits if the module is powered on. It flashes each time when a message is received correctly.

The module expects to get CAN messages in regular time intervals. If this messages cannot be received correctly then the red error LED will lit.

If module address 0 is selected, or if you use more than one analog input module with the same module address on the bus then the red error LED will flash.



6 Connectors

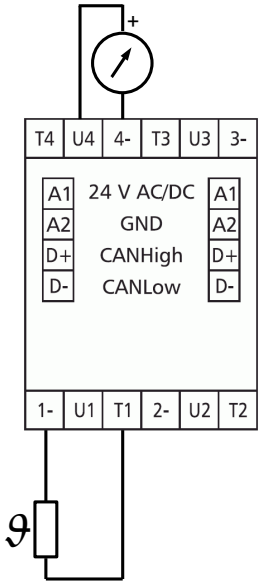
6.1 Analog Inputs

The inputs of this module can used as temperature or as voltage input.

Connect the temperature sensor at the TX and the X- terminal to use the input as temperature input.

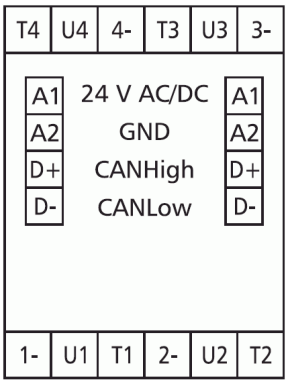
Connect your voltage signal to the UX terminal of this module to use the input as voltage input.

X: selected channel 1, 2, 3 or 4



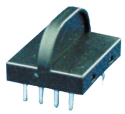
6.2 CAN Bus Connection

The CAN Bus is connected to D+ and D- at the front terminal block. Connect the CAN-High signal to D+ and the CAN Low signal to D-.



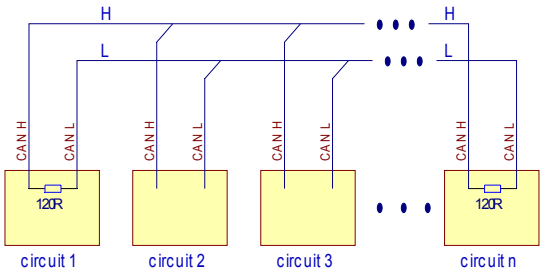
The terminal block at the left side is looped through to the terminal block of the right side.

The Terminal block can be exchanged with a bridge element to connect a second module that is placed next to this module.



bridge element

We recommend to use a bus cable with a characteristic wave impedance of 120Ω.



Note: The line should terminated at both ends in it characteristic impedance. Stub lengths off the main line should be kept as short as possible.
You have to connect GND to each module if a separate power supply is used!

6.3 Power Supply

Connect the +pole of the power supply to A1 and the -pole to A2.

The terminal block at the left side is looped through to the terminal block of the right side.

The Terminal block can be exchanged with a bridge element to connect a second module that is placed next to this module.

7 Technical Specification

7.1 Absolute maximum Ratings

beyond which permanent damage may occur

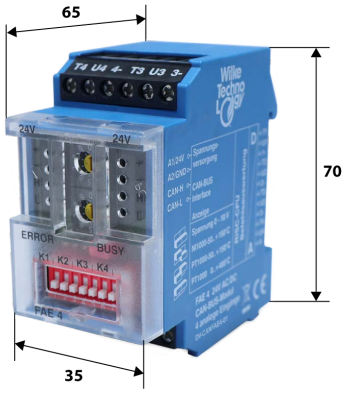
Power Supply Voltage **V+**	28V AC/DC
Input Voltage at Analog Inputs	11V
operation temperature range	-5°C...+55°C
storage temperature range	-20°C...+70°C

7.2 Electrical Specifications

Power Supply Voltage	20V...28V AC/DC
current consumption at AC supply at DC supply	 67mA 24mA
Temperature **Range** Ni1000 PT1000 PT1000 **Resolution** Ni1000 and PT1000 at -50°C...+150°C range Ni1000 and PT1000 at -50°C...+150°C range	 -50°C...+150°C -50°C...+150°C 0°C...+400°C
CAN Bus standard supported baud rates Maximum CAN Bus length at 20k bits/s required bus termination at both ends max. nodes	 2.0B passive 20k bits/s, 50k bits/s 125k bits/s 500k bits/s 2500m 120Ω 112
Terminal Blocks supply and CAN Bus digital inputs	 1.5mm² 2.5mm²

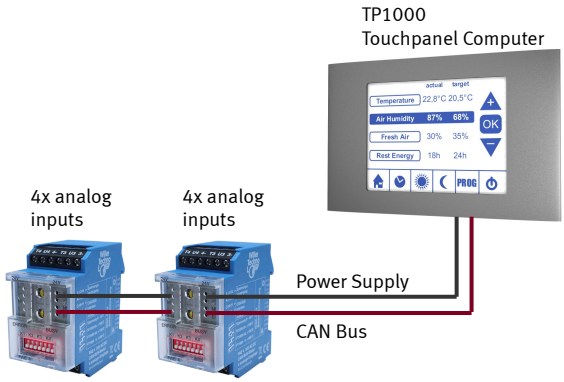
7.3 Mechanical Specifications

dimensions W x H x L	35mm x 70mm x 65mm
weight	84g
housing	IP40
terminal blocks	IP20



8 Application example

Touchpanel Computer TP1000 uses FAE4 as analog inputs



Touchpanel Software?
download software libraries at www.wilke.de or ask our support team: support@wilke.de

9 Document History

Document Version	Description
V001	first version