

# CAN Output FRAS4 4x Relais Out

Type of Product: DV-CANFRAS4-01

## 1 Introduction

Field bus modules FRAS4 are output modules with four relays for universal use and are controlled by CAN BUS.

This module can be combined with an input module of type DV-CANFDE4-01 by connecting them via CAN Bus. The output state of the relays will be set according to the input state of the connected digital input module with the same address. No additional control unit is necessary.

Alternatively the CAN Bus modules can act as output extension for computers with CAN Bus. For example a Touchpanel Computer TP1000 can be used to control the Relay outputs.

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



## 2 Applications

- Transparent IO combinations connected via CAN Bus
- Outputs for TP1000 Touchpanel Computers
- Additional Outputs for TDR CPU Modules
- Switching Motors, Lamps, Valves,..

## 3 Features

- 4 Relays Outputs
- Changeover Contacts AgNi
- Switching Voltage up to 250V~
- Switching Current up to 5A
- CAN 2.0B passive Interface
- 20V...28V Supply Voltage
- 6 Status LEDs



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Technical Documentation

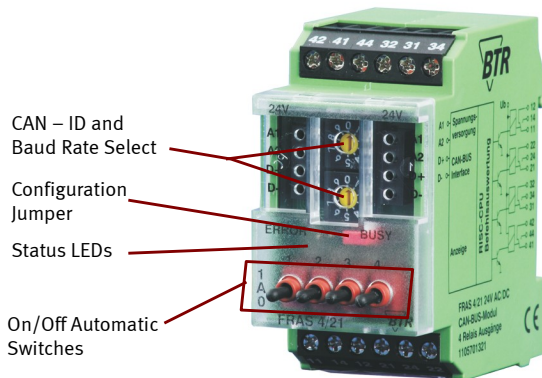
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- remove the transparent front panel
- set the configuration jumper to the middle of the 4 pole header connector.
- set the top rotary switch to position 0
- set the bottom rotary switch to one of the positions 2, 3, 4, 5, or 6 according to the desired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

## 5 Control Elements

### 5.1 On / Off / Automatic switches

With the On / Off / Automatic switches you can switch the relay outputs to on state, off state or automatic state.

In automatic state the relays are controlled via the CAN Bus.

In on or in off state the relays cannot be set by the CAN Bus. They are permanently switched on or off. It's possible to request the setting of the switches via the CAN Bus.

Switch position	Label at the housing	Relay state
Up	1	On
Middle	A	controlled by CAN
Down	0	Off

- 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 panel
- select the CAN - ID using the rotary switches (see section below)

### 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 of this CAN Bus module can be set by the following steps:

- switch off the power supply of the module



## 5.3 CAN – ID Select

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

CAN Messages 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 <sub>dec</sub> 01...63 <sub>hex</sub> 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:4  
bottom switch 2

module address = 42<sub>dec</sub>. (=2A<sub>hex</sub> = 0101010<sub>bin</sub>)

Identifier: 001010100kk<sub>bin</sub>

kk: depends on message kind



### 5.3.2 Other Identifier bits

The value of bit 10 is always 0 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 four yellow status LEDs indicate the state of the four relay outputs: If the relay is switched on then the corresponding LED will lit.

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

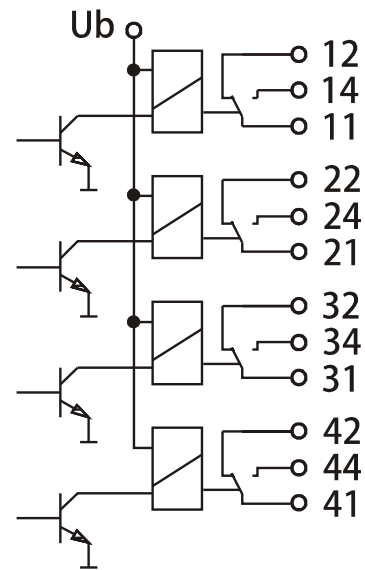
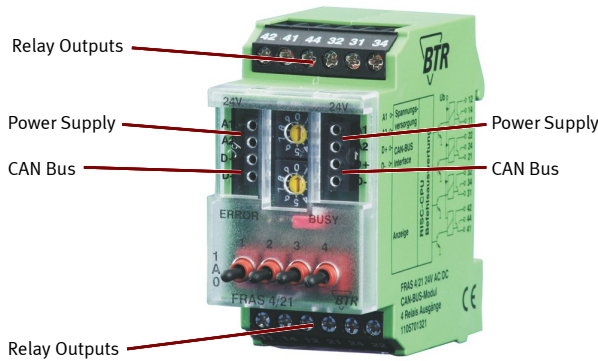
The module expects to get CAN messages in regular time intervals. If this messages cannot be received correctly then the red error LED will lit.

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

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## 6.2 Scheme

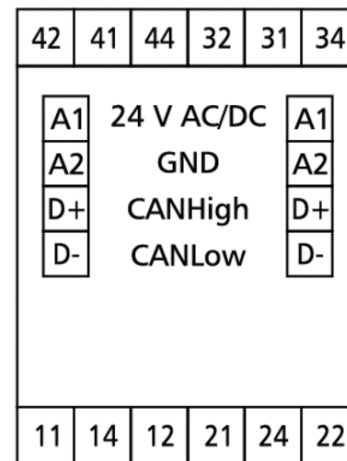


## 6 Connectors

### 6.1 Relay Outputs

Each of the four relays of the module has a switchover contact. The terminals are numbered with two digit numbers. The first digit tags the relay number and the second digit the contact of the relay.

Number	Relay	Contact
11	1	root
12	1	normally closed
14	1	normally open
21	2	root
22	2	normally closed
24	2	normally open
31	3	root
32	3	normally closed
34	3	normally open
41	4	root
42	4	normally closed
44	4	normally open



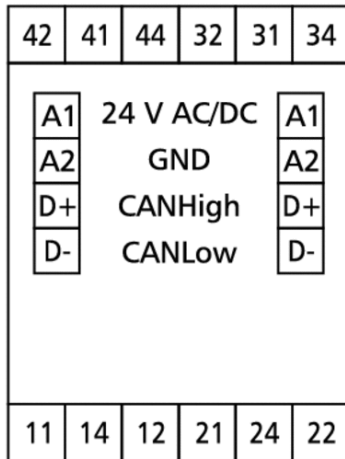
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## 6.3 CAN Bus Connection

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-.



**Note:** The line should be terminated at both ends in its 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!

## 6.4 Power Supply

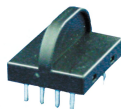
Connect the +pole of the power supply to A1 and the -pole to A2.

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.

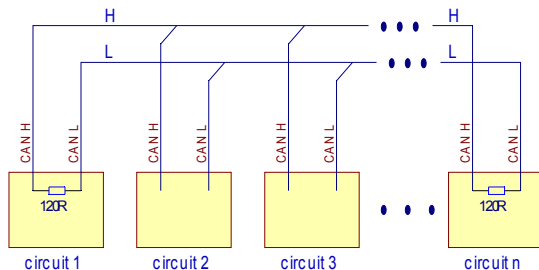
The terminal block at the left side is looped through to the terminal block of the right side.

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.



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## 7 Technical Specification

### 7.1 Absolute maximum Ratings

beyond which permanent damage may occur

Power Supply Voltage	28V AC/DC
Switching Voltage	250V AC
maximum Current at relay contacts	5A
total current for all relay contacts	12A
maximum switching frequency at nominal current	6/min.
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
<b>current consumption</b> at AC supply at DC supply	205mA 67mA
<b>Relay Outputs</b> contact material mechanical endurance electrical endurance	4x changeover AgNi 1.5 x 10 <sup>7</sup> switching cycles 1.5 x 10 <sup>5</sup> switching cycles
<b>CAN Bus</b> 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
<b>Terminal Blocks</b> supply and CAN Bus digital outputs	1.5mm <sup>2</sup> 2.5mm <sup>2</sup>



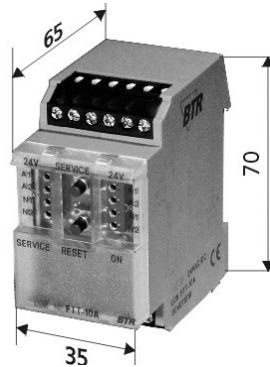


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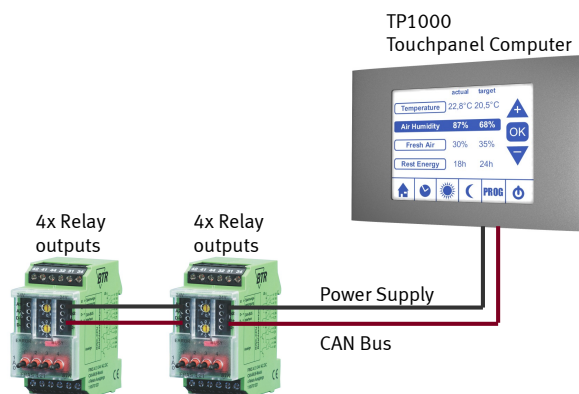
## 7.3 Mechanical Specifications

dimensions W x H x L	35mm x 70mm x 65mm
weight	104g
housing	IP40
terminal blocks	IP20



## 8 Application example

Touchpanel Computer TP1000 controls multiple relay outputs



Touchpanel Software?

download software libraries at [www.wilke.de](http://www.wilke.de) or ask our support team: [support@wilke.de](mailto:support@wilke.de)

## 9 Document History

Document Version	Description
V001	first version

