

# Segment Coupler KFD2-BR-1.MOD

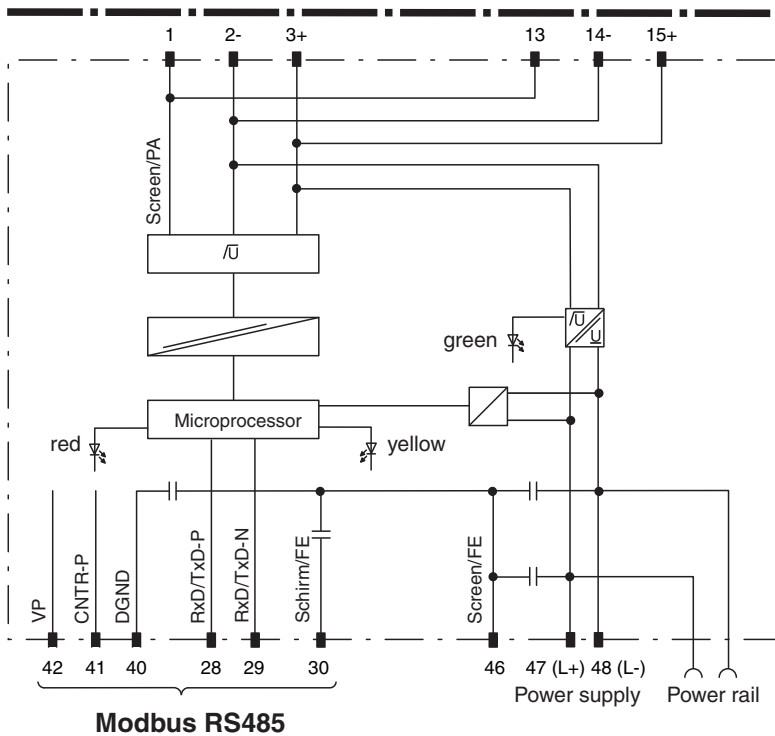
- MODBUS RTU IEC 61158-2; 31.25 kbit/s
- Master independent
- Up to 32 devices can be connected to the MODBUS RTU segment
- 24 V DC rated operating voltage
- Removable terminals and Power Rail
- EMC acc. to NAMUR NE 21

Segment coupler for a non-intrinsically safe MODBUS RTU segment



## Connection

### Modbus RTU



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## Technical Data

| Supply        |  |
|---------------|--|
| Connection    | Power Rail or terminals 47 (L+), 48 (L-) |
| Rated voltage | $U_r$ 20 ... 35 V DC                     |

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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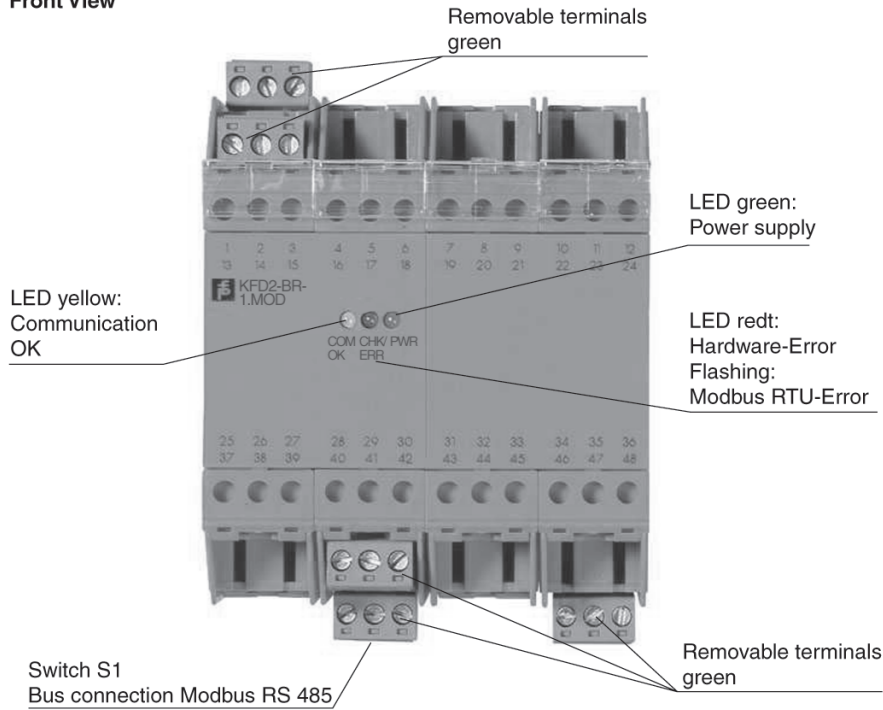


## Technical Data

|  |       |   |
|--|-------|---|
| Ripple   |       | ≤ 10 %  |
| Rated current  | $I_r$ | 790 mA ... 400 mA   |
| <b>Fieldbus interface</b>                                      |       |   |
| MODBUS RTU   |       | according to IEC 61158-2  |
| Connection   |       | terminals 3, 15+; 2, 14-  |
| Rated voltage  |       | 24 ... 26 V DC  |
| Rated current  |       | ≤ 400 mA  |
| Terminating impedance  |       | 100 Ω , integrated  |
| MODBUS RS 485 segment  |       | MODBUS with RS-485 transfer technique   |
| Connection   |       | terminals 28 RxD/TxD-P, 29 RxD/TxD-N, 30 shield/FE, 40 DGND, 41 CNTR-P, 42 VP |
| Baud rate  |       | 4800, 9600, 19200, 38400 bit/s  |
| Terminating impedance  |       | with rotary switch (S1) switchable: 1 = on; 0 = off                           |
| <b>Galvanic isolation</b>                                      |       |   |
| MODBUS RTU/MODBUS RS 485 segment                               |       | functional insulation, rated insulation voltage 50 V <sub>eff</sub>           |
| MODBUS RS 485 segment/Supply                                   |       | functional insulation, rated insulation voltage 50 V <sub>eff</sub>           |
| MODBUS RTU/Supply  |       | functional insulation, rated insulation voltage 50 V <sub>eff</sub>           |
| <b>Directive conformity</b>                                    |       |   |
| Electromagnetic compatibility                                  |       |   |
| Directive 89/336/EEC   |       | EN 61326, EN 50081-2  |
| <b>Standard conformity</b>                                     |       |   |
| Galvanic isolation   |       | EN 50178  |
| Electromagnetic compatibility                                  |       | NAMUR NE 21   |
| Degree of protection   |       | IEC/EN 60529  |
| Fieldbus standard  |       | EN 50170/2  |
| Climatic conditions  |       | DIN IEC 721   |
| <b>Ambient conditions</b>                                      |       |   |
| Classification   |       | 3K3   |
| Ambient temperature  |       | -20 ... 60 °C (-4 ... 140 °F)   |
| Storage temperature  |       | -40 ... 85 °C (-40 ... 185 °F)  |
| Relative humidity  |       | < 75 %  |
| Pollution degree   |       | max. 2, according to IEC 60664  |
| <b>Mechanical specifications</b>                               |       |   |
| Connection type  |       | Terminals   |
| Core cross-section   |       | up to 2.5 mm <sup>2</sup>   |
| Housing  |       | 80 mm x 115 mm x 107 mm   |
| Degree of protection   |       | IP20  |
| Mass   |       | 600 g   |
| Mounting   |       | DIN rail mounting   |
| <b>Data for application in connection with hazardous areas</b> |       |   |
| Statement of conformity  |       | pending   |

**Assembly**

**Front View**



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**Function**

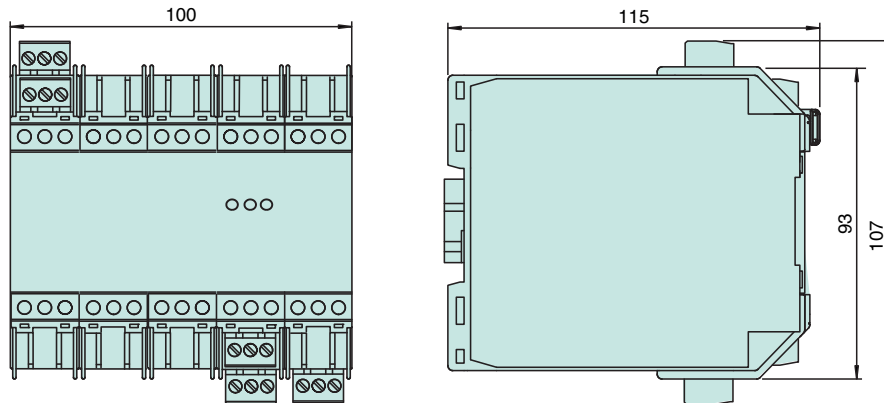
The segment coupler couples a Modbus RTU segment to a Modbus segment with RS 485 transmission technology. The communication behaves transparently. The protocol is unmodified transmitted, thus the segment coupler functions with every Modbus PROFIBUS protocol and is not parameterised. The baud rate of the Modbus RTU segment is 31.25 kbit/s in compliance with IEC 61158-2. The Modbus segment with RS 485 transmission technology has a baud rate of 4800 bit/s ... 38400 bit/s.

**Additional Information**

**Accessories**

|                   |                 |
|-------------------|-----------------|
| Power Rail        | UPR02           |
| Power feed module | KFD2-EB2        |
| Terminal resistor | KMD0-FT-Ex      |
|                   | Fx-FT-Ex1.I.IEC |
|                   | Fx-FT-Ex1.D.IEC |

**Dimensions**



**Operating conditions**

M = Telegram length for request (in Byte)  
 N = Telegram length for reply (in Byte)  
 B = baud rate segment coupler to Modbus master  
 IEC 61158 speed = 31.25 kBit/s

**for B = 9600 bit/s results the following delay in ms:**

|       |       |        |        |        |         |         |
|-------|-------|--------|--------|--------|---------|---------|
| M = 8 | N = 8 | N = 16 | N = 32 | N = 64 | N = 128 | N = 256 |
| 16    | 23.3  | 30.4   | 44.6   | 73.1   | 130.1   | 244.0   |
| 32    | 30.4  | 37.5   | 51.8   | 80.2   | 137.2   | 251.1   |
| 64    | 44.6  | 51.8   | 66.0   | 94.5   | 151.4   | 265.3   |
| 128   | 73.1  | 80.2   | 94.5   | 122.9  | 179.0   | 293.8   |
| 256   | 128   | 137.2  | 151.4  | 179.9  | 236.8   | 350.7   |
|       | 244.0 | 251.1  | 265.3  | 293.8  | 350.7   | 464.6   |

**for B = 19200 bit/s results the following delay in ms:**

|       |       |        |        |        |         |         |
|-------|-------|--------|--------|--------|---------|---------|
| M = 8 | N = 8 | N = 16 | N = 32 | N = 64 | N = 128 | N = 256 |
| 16    | 10.1  | 12.6   | 17.7   | 27.9   | 48.1    | 88.7    |
| 32    | 12.6  | 15.2   | 20.2   | 30.4   | 50.7    | 91.2    |
| 64    | 17.7  | 20.2   | 25.3   | 35.5   | 55.7    | 96.3    |
| 128   | 27.9  | 30.4   | 35.5   | 45.6   | 65.9    | 106.4   |
| 256   | 48.1  | 50.7   | 55.7   | 65.9   | 86.2    | 126.7   |
|       | 88.7  | 91.2   | 96.3   | 106.4  | 126.7   | 167.3   |

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for B = 38400 bit/s results the following delay in ms:

| M = | N = 8 | N = 16 | N = 32 | N = 64 | N = 128 | N = 256 |
|-----|-------|--------|--------|--------|---------|---------|
| 8   | 3.5   | 3.8    | 4.2    | 5.2    | 7.2     | 11.1    |
| 16  | 3.8   | 4.0    | 4.5    | 5.5    | 7.4     | 11.3    |
| 32  | 4.2   | 4.5    | 5.0    | 6.0    | 7.9     | 11.8    |
| 64  | 5.2   | 5.5    | 6.0    | 6.9    | 8.9     | 12.8    |
| 128 | 7.2   | 7.4    | 7.9    | 8.9    | 10.8    | 14.7    |
| 256 | 11.1  | 11.3   | 11.8   | 12.8   | 14.7    | 18.6    |

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