Product Information

FHF Bergbautechnik GmbH & Co. KG

OPBM04 Optical Multiplexer Profibus/RS485

Ordering data

Designation	Type	Item no.
Optical multiplexer Profibus/RS485 (standard optics)	OPBM04	141 100 xx AX
Optical multiplexer Profibus/RS485 (BiDi optics)	OPBM04	141 100 52 AX

- **Conversion of up to 4 electrical Profibus/RS485 interfaces into one or two optical ones and vice versa**
- **Use in existing Profibus fieldbus networks**
- **(Optical) Transmission range up to 15 km**
- **Two optical ports and four electric ports**
- **Optical LED status indication**
- **Insensitivity to EMC**
- **Type of protection: I M1 Ex ia op is I Ma**

Application

The OPBM04 optical multiplexer Profibus/RS485 is designed for use in optical fieldbus networks. It allows conversion of up to 4 electrical Profibus/RS485 interfaces into one or two optical ones and vice versa. The use of an intermediate FSK Profibus modem of type PBM01 even allows connecting the OPBM04 to Profibus FSK networks. Thus, the module can be integrated into existing Profibus fieldbus networks or devices with RS485 interface, offering the advantages of the optical transmission technology such as insensitivity to EMC and high transmission range. Likewise, a complete Profibus/RS485 network can be configured with the modules in a linear, star or ring topology as well as any combination of these topologies. To increase the reliability of the fieldbus network in case of failure, the OPBM04 supports designing redundant rings. The OPBM04 has two optical ports and four electrical (RS485) ports. The electrical (copper) ports are connected to two 6-pin plug-in terminal blocks.

The OPBM04 meets category / degree of protection I M1 Ex ia op is I.

Activation of the integrated terminating resistors for the electrical (RS485) ports is possible through switch-on of DIP switches SW1 (Bus 1, Bus 2) and SW2 (Bus 3, Bus 4) which are accessible in the front panel.

In the standard version, the fibre-optic cables (single-mode, 9/125µm, 1310nm) are connected with plug-in systems of type Diamond E2000 (with 8° angled polished contact).

Also available is an OPBM04 version which uses FOC transceiver modules with BiDi optics. These modules use the same fibre (thus one fibre only) for the transmitting and receiving direction by operation with an optical wave length of 1310mm in one direction, and operation with one of 1550mm in the other direction. The connection is established with an SC plug-in connection. Thus, one fibre less is required versus the standard version (Diamond E2000 transceiver module with RX and TX port). In both cases, the optical transmission range is ≥ 15km.

The OPBM04 automatically detects the data rates 9.6 kbit/s, 19.2 kbit/s, 93.75 kbit/s and 187.5 kbit/s on the copper interfaces. The received data packets are processed in a time frame, thus enabling that the set-up of topologies consisting of any number of OPBM04 modules is possible.
The logical states "1" and "0" of the electrical Profibus/RS485 interfaces are multiplexed and transmitted onto the optical interfaces with a "bi-phase" encoding. This encoding allows clock recovery at the receiving end.
Various error messages are available as a group signal at a signalling contact (potential-free optocoupler contact).
This contact is accessible at terminals K1 and K2. The contact will close, as soon as both optical links function trouble-free and no bus error is detected at the electrical Profibus/RS485 port. The contact will open, if one of the optical links is disrupted or a zero level of excessive duration is detected. The contact will also open, if no 5V supply voltage is applied.

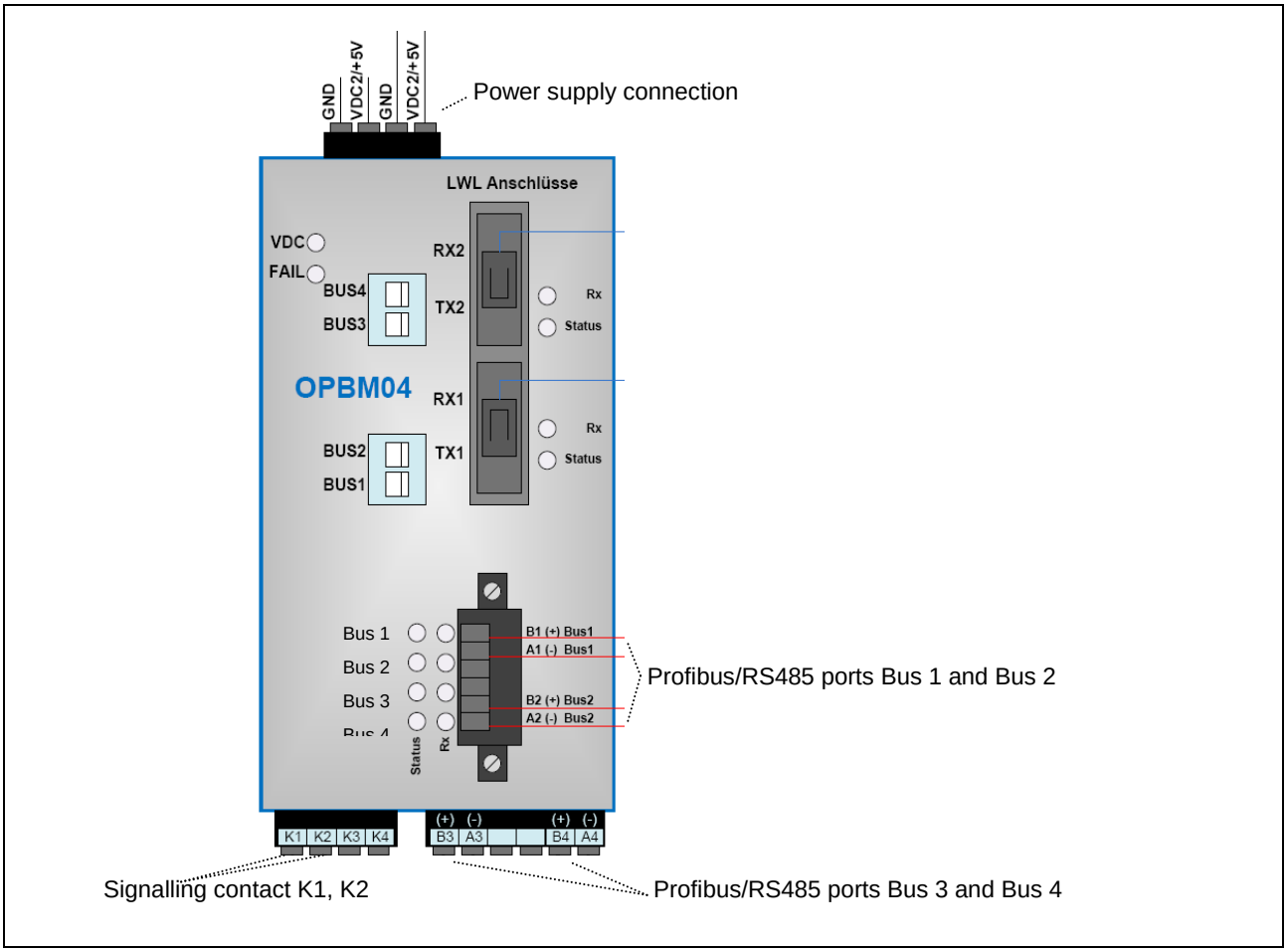
Configuration

The module housing consists of two half shells (material: stainless steel - nrSt) plus one front panel (insulating material) with an adhering printed foil.
The two half shells are provided with recesses for the three plug-in terminal blocks for supply voltage connection, optocoupler output contact and Profibus/RS485 bus ports Bus 3 and Bus 4.
Inside the housing, the "supply" board is screw-mounted on the left half shell on stud bolts, while the "logics" board is fastened likewise on the right half shell.
The two housing half shells are screw-mounted to the front panel by means of 4 bolted joints and connected with each other on the housing rear side by means of another 2 bolted joints.
On the housing rear side an aluminium snap-open mechanism for 35mm top-hat rails is fastened.

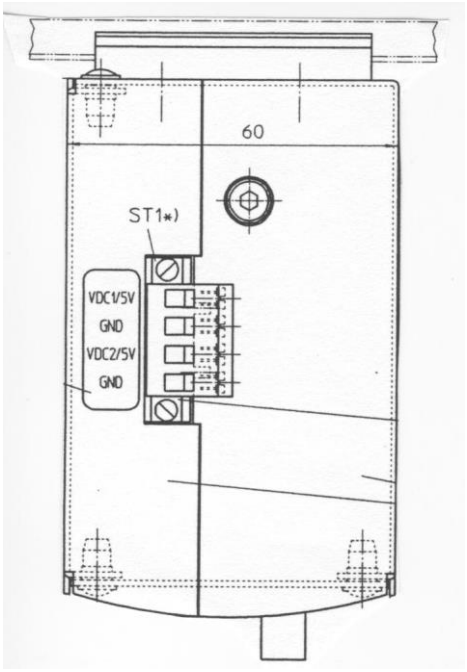
The front panel features an adhering foil with the imprinted markings for fibre-optic cables, Profibus/RS485 connections BUS1 and BUS2, DIP switches (SW1 and SW2 for activation of the RS485 terminating resistors) as well as display LEDs. The front panel is provided with the corresponding recesses for plug connectors, DIP switches and LEDs. The foil in front of the LEDs is transparent.
The 5V power supply shall be connected to the 4-pin plug-in terminal block at the housing top. The two plug-in terminal blocks optocoupler output (4-pin) and Profibus/RS485 BUS 3 and BUS 4 are located at the housing bottom side. They are marked with plastic labels.

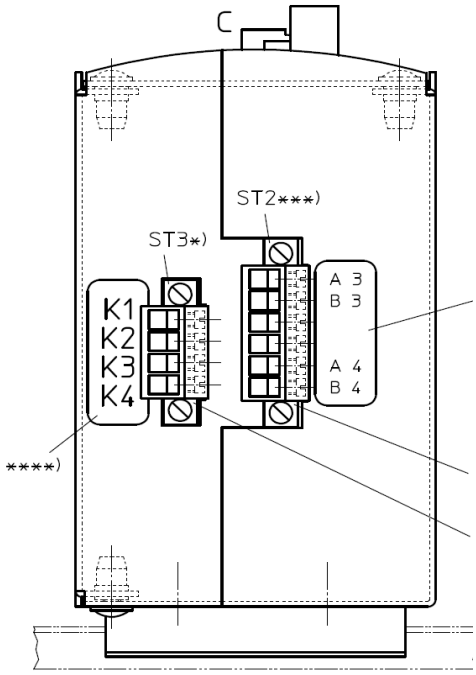
Likewise, the marking of the module with manufacturer logo, type designation, type of protection, approval number and operating temperature range is given on a plastic label on one of the housing side walls.

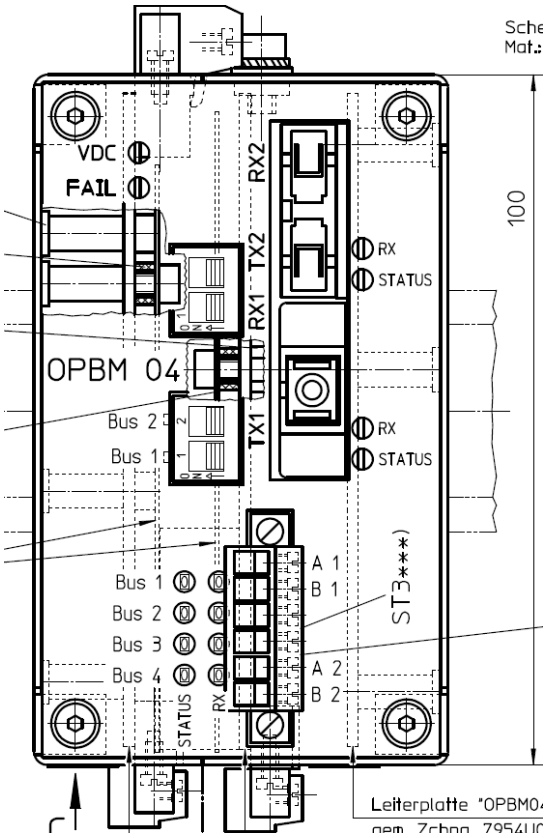
Device overview



Device views







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