



Modular optical fibre Telecontrol System

Point to point data transmission by optical fibre

Performance characteristics:

- Uni or bi-directional point to point data transmission
- Modular configuration for up to 32 I/O modules
- Distance up to 22 km dependent on optical fibre type
- Optical fibre (Multimode 50/125 μ m and 62.5/125 μ m) or monomode (9/125 μ m)
- Simple connection to other transmission media, e.g. radio or two-wire within the framework of the MFW product family
- Cyclic data exchange

Functional description

The **MFW Modular Telecontrol Network** has been specially conceived for the interconnection of widely scattered outdoor installations, such as for example pump, transformer and gas regulating stations, storm-overflow reservoirs, inspection chambers and elevated reservoirs. The MFW can be operated as a fully independent, cost-effective telecontrol system or as an extension to existing telecontrol interface modules. Almost all types of cable (telephone line, three-phase current cable, cable screen, electrically isolated cable, optical fibres etc.) and various radio ranges are suitable as transmission media. This documentation covers only a small section of this: Transmission on optical fibres.

The telecontrol system in the optical fibre variant consists of a central station and an outstation. In each station at least one **basic module** is needed. This includes the following function groups, display and setting elements:

- internal fibre optic modem
- RS 232 parameterising and diagnostics interface or combined RS 232 parameterising, diagnostics and protocol interface
- I/O module with optionally 8 binary inputs or outputs with status LED
- two CAN bus interfaces for connecting the expansion modules
- watchdog LED and fault signalling contact
- DIP switches for setting the station address, module number, etc.

The basic modules can be obtained in two versions:

- A master module, whose type name contains "MF-...", needs to be present in the system, and is usually used in the central station. It co-ordinates the flow of data.
- The outstation module, whose type name contains "UF-...", is used in the outstations.

Each basic module can be fitted with up to a maximum of 15 expansion modules in order to increase the I/O scope. These are connected via the CAN bus interface. You can find more detailed information in the separate datasheet „Expansion modules”.

Each **I/O module** is given a module number. The data is exchanged between modules with the same module number. The physical arrangement of the modules within the system (the station address) is of no significance at all here. The input module with number 5, for instance, transmits its data to all the output modules whose number is 5.

The data exchange is controlled by the master, which cyclically queries the outstations. **Measuring and set values, messages, commands, momentary and counting pulses** are transmitted. In the case of digital I/O modules the inputs/outputs 1-4 can be switched over between the two types of function - static or counting/momentary pulses. Analogue signals can be transmitted both as voltage values 0-10V or as current values 0-20mA.

If the outstation cannot be reached or if the **data transmission is faulty**, the system recognises the faulty communication and signals this by LED and relay contact both to the central station as well as to the outstation. After the cause of the fault has been rectified, normal operation is resumed automatically.

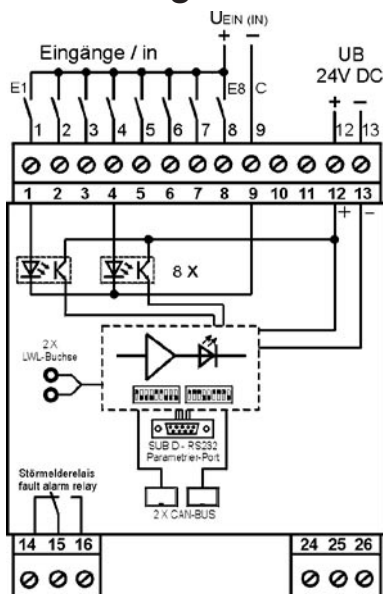
Configuration of the system is simple and easy. On the modules themselves it is only necessary to set the module number (0 ..254), transmit level, static / counter value for digital I/Os as well as current/voltage in the case of analog signals etc.

The use of fibre optics as a transmission medium guarantees a robust high noise-immunity transmission over great distances. For each direction of transmission an individual fibre optic is used. There are three types available for the connection of the different fibre optic types:

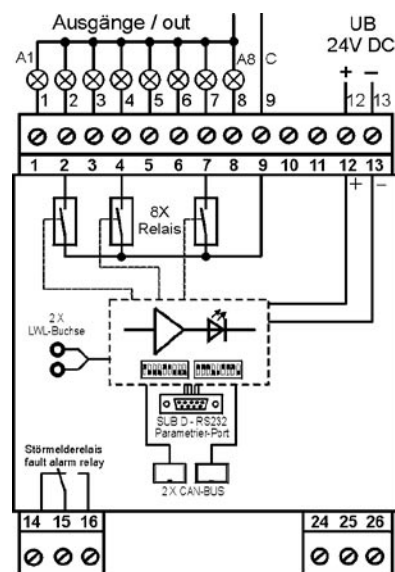
1. Multimode fibre 50/125µm or 62.5/125µm core/cladding diameter, wave length 1300 nm
2. Monomode fibre 9/125µm core/cladding diameter, wave length 1310 nm
3. Multimode fibre 50/125µm or 62.5/125µm core/cladding diameter, wave length 820 nm

The spannable distance depends on the type of fibre optic, loss at plugs and splices and can be of up to 22 km. For the fibre optic connection to the basic module the ST type plug connection is used.

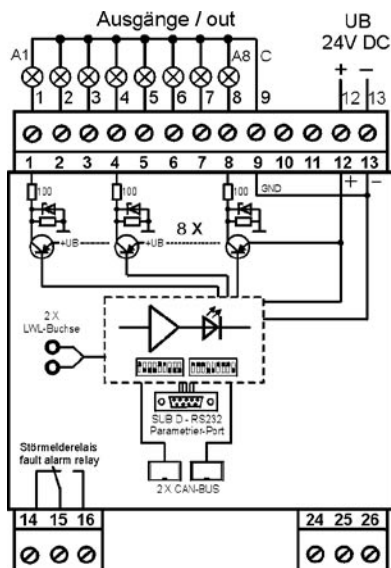
Terminal assignments



Basic module with 8 digital inputs



Basic module with 8 output relays

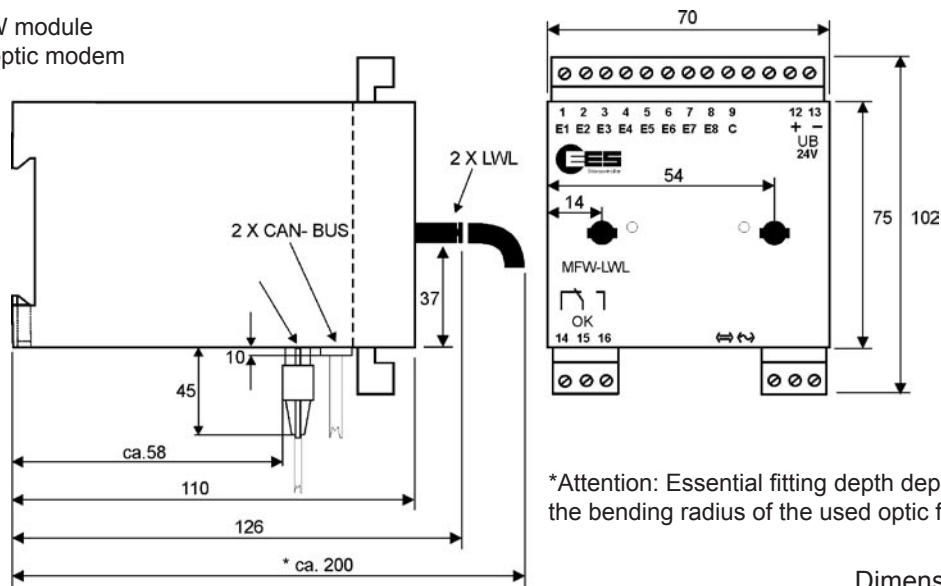


Basic module with 8 transistor outputs

Attention:
positive switched
pnp transistors!

Dimensional drawing

Basic MFW module
with fibre optic modem



Dimensions in mm

Technical data

General data

Rated operating voltage	24V DC
Operating voltage range	20 ... 32V DC
Operating and ambient temperature	-20°C ... +60°C
Air humidity	maximum 95%, non-condensing
Connection terminals	nominal cross section 2.5 mm ²
Housing / protection class	Plastic / IP 40

Version for monomode optic fibre @1310 nm

Budget minimal/typical with 9/125µm fibre optic	12db/18db
Fibre optic connectors	2 ST sockets

Version for monomode optic fibre @1300 nm

Budget minimal/typical with 50/125µm fibre optic	11db/15db
Budget minimal/typical with 62.5/125µm fibre optic	15db/18db
Fibre optic connectors:	2 ST sockets

Version for monomode optic fibre @820 nm

Budget minimal/typical with 50/125µm fibre optic	11db/15db
Budget minimal/typical with 62.5/125µm fibre optic	16db/20db
Fibre optic connectors:	2 ST sockets

Digital input module

Power consumption	approx. 2.5 W
Signal voltage	approx. 16 ... 48V AC/DC*
Input resistance	approx. 10 kOhm
Maximum count rate	10Hz
Minimum pulse width	50ms
Electrical isolation between signal and supply voltage	4kV _{eff}

Digital output module

Power consumption	
with relay outputs	approx. 3.5 W
with transistor outputs	max. 2.5 W logic + load current
Contact loading capacity of the output relays**	
minimum	1.2V / 1mA (suitable for control of LED)
maximum	250V AC / 400 mA 250V AC / 2A (purely ohmic load) 30V DC / 2A 110V DC / 0.2A 220V DC / 0.1A
Total current	max. 8A per group
Load capacity at transistor outputs	max. 50mA per output
Maximum count rate	12Hz *
Pulse width / pause	40ms *
electrical isolation between output and power supply	4kV _{eff} (not with transistor outputs!)

* Other figures on request

** We would be happy to supply you with more precise specifications on request.

The right to make technical changes is reserved

Order identification

Master modules

Multimode 50-62.5/125µm 1300nm ST plug

MF-L1M10-G8DEX-DIA-0-BB-0	8 digital inputs
MF-L1M10-G8DAL-DIA-0-BB-0	8 transistor outputs
MF-L1M10-G8DAR-DIA-0-BX-0	8 relay outputs

Multimode 50-62.5/125µm 820nm ST plug

MF-L1M20-G8DEX-DIA-0-BB-0	8 digital inputs
MF-L1M20-G8DAL-DIA-0-BB-0	8 transistor outputs
MF-L1M20-G8DAR-DIA-0-BX-0	8 relay outputs

Monomode 9/125µm 1310nm ST plug

MF-L1S00-G8DEX-DIA-0-BB-0	8 digital inputs
MF-L1S00-G8DAL-DIA-0-BB-0	8 transistor outputs
MF-L1S00-G8DAR-DIA-0-BX-0	8 relay outputs



... Solutions for complex tasks

from project planning through to commissioning

Outstation modules

Multimode 50-62.5/125µm 1300nm ST plug

UF-L1M10-G8DEX-DIA-0-BB-0	8 digital inputs
UF-L1M10-G8DAL-DIA-0-BB-0	8 transistor outputs
UF-L1M10-G8DAR-DIA-0-BX-0	8 relay outputs

Multimode 50-62.5/125µm 820nm ST plug

UF-L1M20-G8DEX-DIA-0-BB-0	8 digital inputs
UF-L1M20-G8DAL-DIA-0-BB-0	8 transistor outputs
UF-L1M20-G8DAR-DIA-0-BX-0	8 relay outputs

Monomode 9/125µm 1310nm ST plug

UF-L1S00-G8DEX-DIA-0-BB-0	8 digital inputs
UF-L1S00-G8DAL-DIA-0-BB-0	8 transistor outputs
UF-L1S00-G8DAR-DIA-0-BX-0	8 relay outputs

Expansion modules

Please find more information in our special datasheet.

Accessories

Connecting cable to PC or laptop, power supplies, DC/DC converter, battery back-up charging unit, incl. battery packs.

Further accessories and more detailed information may be found in the appropriate product sections in the catalogue.



HOTLINE
+49(0)7191/182-235
-214



INTERNET
www.ees-online.de



Elektra Elektronik GmbH & Co Störcontroller KG

Hummelbühl 7-9 • D-71522 Backnang/Germany • P.O. Box 12 40 • D-71502 Backnang
Phone: +49(0)7191/182-0 • Fax: +49(0)7191/182-200 • e-Mail: info@ees-online.de