



A system from the
MFW product family



Modular optical fibre telecontrol system

Point to point data transmission by optical fibre

- 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 µm and 62.5/125 µm) or Singlemode (9/125 µm)
- Simple connection to other transmission media, e.g. radio or two-wire within the framework of the MFW product family, as well as to 3rd party systems over several interfaces and protocols
- 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 coordinates 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 0-10 V or as current values 0-20 mA.

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.

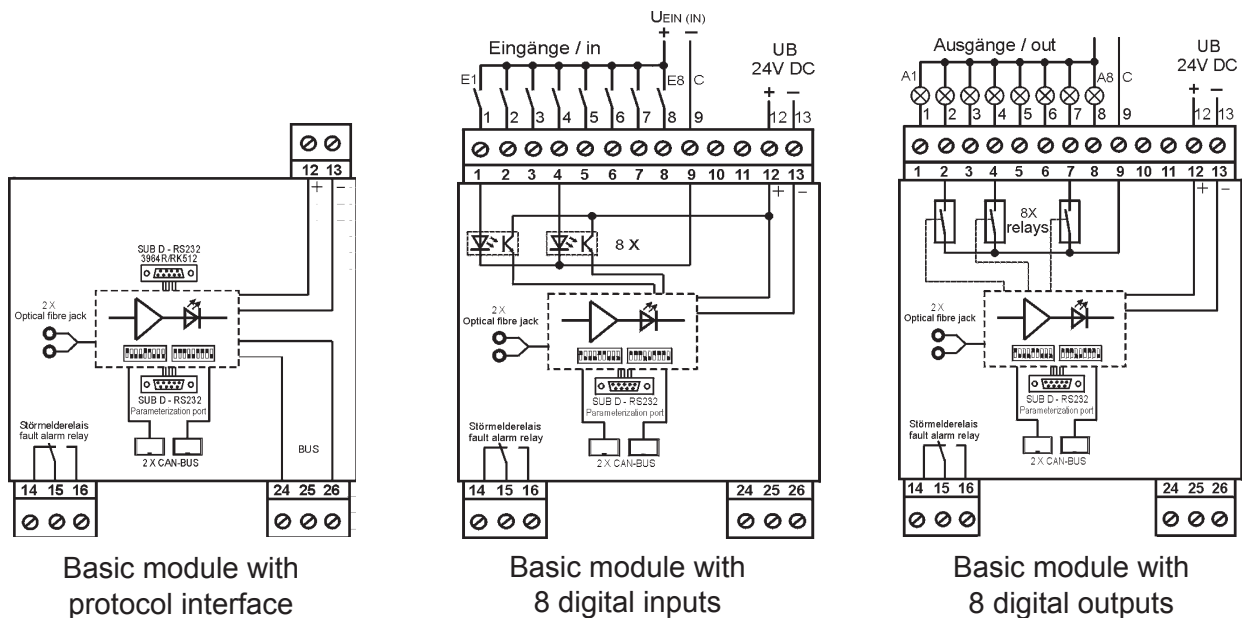
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The use of fibre optics as a transmission medium guarantees a robust high noise-immunity transmission over great distances. For each direction of transmission an individual fibre optic is used. There are three types available for the connection of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

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

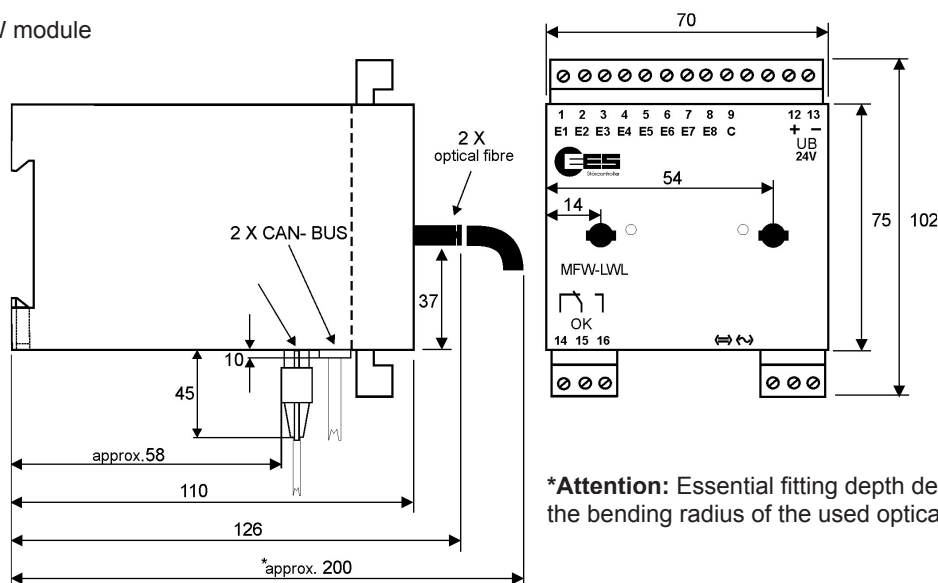
The spannable distance depends on the type of fibre optic, loss at plugs and splices and can be of up to 22 km. For the fibre optic connection to the basic module the ST type plug connection is used.

Terminal assignments



Dimensional drawing

Basic MFW module with I/O



Dimensions in mm

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Technical data

General data

Rated operating voltage	24 V DC
Operating voltage range	20 ... 32 V DC
Operating and ambient temperature	-20°C ... +60°C
Air humidity	maximum 95%, non-condensing
Connection terminals	nominal cross section 2.5 mm ²
Optical fibre connection plug	2 jacks type ST(R) (BFOC/2,5 acc. to standard IEC 60874-10)
Housing / protection class	Plastic / IP 40

Version for singlemode optic fibre @1310 nm

Budget minimal/typical with 9/125 µm fibre optic	12 dB / 18dB
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Version for multimode optic fibre @1300 nm

Budget minimal/typical with 50/125 µm fibre optic	11dB / 15 dB
Budget minimal/typical with 62.5/125 µm fibre optic	15 dB / 18 dB

Version for multimode optic fibre @820 nm

Budget minimal/typical with 50/125 µm fibre optic	11 dB / 15 dB
Budget minimal/typical with 62.5/125 µm fibre optic	16 dB / 20 dB

Digital input module

Power consumption	approx. 2.5 W
Signal voltage	see table
Input resistance	see table
Threshold for 24V nominal voltage *	
Maximum voltage	48 V
Voltage for high-state (DC)	> 10 V respectively < -10 V
Voltage for high-state (AC)	> 15 V
Voltage for low-state (DC)	< 9 V respectively > -9 V
Voltage for low-state (AC)	< 9 V _p
Maximum count rate	10 Hz
Minimum pulse width	50 ms
Electrical isolation between signal and supply voltage	4 kV _{eff}

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Digital output module

Power consumption

with relay outputs approx. 3.5 W

Contact loading capacity of the output relays**

minimum 1.2 V / 1 mA (suitable for control of LED)

maximum 250 V AC / 400 mA

250 V AC / 2 A (purely ohmic load)

30 V DC / 2 A

110 V DC / 0.2 A

220 V DC / 0.1 A

Total current 230 V AC max. 8 A per group (pure ohmic load)

Count rate 12 Hz ***

Pulse width / pause 40 ms ***

electrical isolation between

output and power supply 4 kV_{eff}

Digital input modules are available with various signal voltages. The corresponding voltage is defined by the 23th digit of the type identification.

Type	Rate voltage	Voltage range limit	Input resistance
..-L1...-G8DEX-DIA-0-BA-0	12 V AC/DC	9V – 24 V AC/DC	approx. 5 kΩ
..-L1...-G8DEX-DIA-0-BB-0	24 V AC/DC	16V – 48 V AC/DC	10 kΩ
..-L1...-G8DEX-DIA-0-BE-0	60 V AC/DC	35V – 75 V AC/DC	22 kΩ
..-L1...-G8DEX-DIA-0-BF-0	110 V AC/DC	75V – 130 V AC/DC	68 kΩ
..-L1...-G8DEX-DIA-0-BJ-0	220 V AC/DC	180V – 255 V AC/DC	180 kΩ

* thresholds of other signal voltages on request

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

*** Other figures on request

subject to technical changes without prior notice

Modular optical fibre telecontrol system

Order identification

Multimode 50-62,5/125 µm @1300 nm

Plugs acc. to ST® (BFOC/2,5 nach Norm IEC 60874-10)

Master modules

MF-L1M10-3PPDP-DIA-0-BX-0	Profibus-DP interface
MF-L1M10-G8DEX-DIA-0-BB-0	8 digital inputs 24 V
MF-L1M10-G8DAR-DIA-0-BX-0	8 relays outputs

Outstation modules

UF-L1M10-G8DEX-DIA-0-BB-0	8 digital inputs 24 V
UF-L1M10-G8DAR-DIA-0-BX-0	8 relays outputs

Singlemode 9/125 µm @1310 nm

Plugs acc. to ST® (BFOC/2,5 nach Norm IEC 60874-10)


Master modules

MF-L1S00-3PPDP-DIA-0-BX-0	Profibus-DP interface
MF-L1S00-G8DEX-DIA-0-BB-0	8 digital inputs 24 V
MF-L1S00-G8DAR-DIA-0-BX-0	8 relays outputs

Unterstationsmodule

UF-L1S00-G8DEX-DIA-0-BB-0	8 digital inputs 24 V
UF-L1S00-G8DAR-DIA-0-BX-0	8 relays outputs

On request there are also alternative optical fibres available.

 Please be aware of our speed optimised version. More details can be found in our separate datasheet.

Expansion modules

Please find more information in our special datasheet.

Accessories

Connecting cable to PC or laptop, power supplies, DC/DC converters, battery back-up charging units, 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
Phone: +49(0)7191/182-0 • Fax: +49(0)7191/182-200

e-Mail: info@ees-online.de

