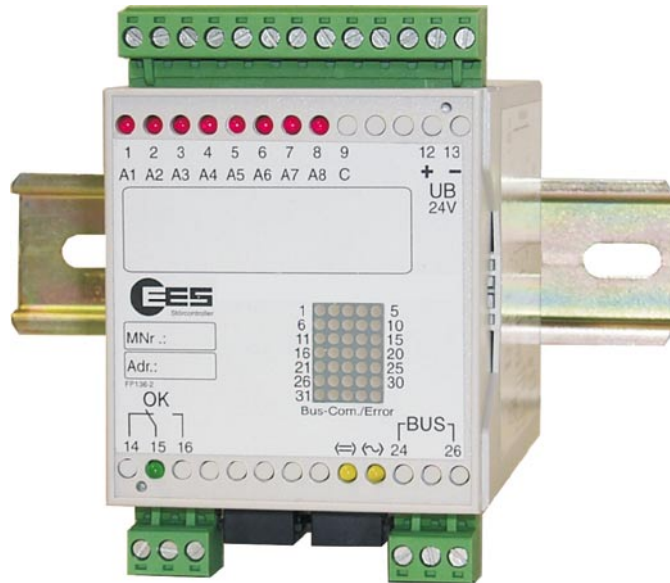


A system of the
MFW telecontrol network

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Modular Two-Wire Telecontrol System

Telecontrol via electrically isolated two-wire cables

Performance data:

- Modular expansion up to 32 outstations and a maximum of 512 I/O modules
- Transmission via electrically isolated cables over distances up to 30km
- Easy parameterization of the modules with DIP switches
- The carrier-frequency system guarantees high interference immunity – hamming distance > 6
- Uncomplicated linking to other transport media such as radio and telephone networks within the framework of the MFW system family as well as connection to third-party-systems over various interfaces and numerous protocols
- Low system cost through modularity

Functional description

The **modular telecontrol-network MFW** has been designed especially for the integration of widely distributed outstations, such as pump stations, transformer plants and gas network control stations, storm overflow basins, inspection shafts and high-level storage tanks. The MFW system operates either autonomous as a low cost remote telecontrol system or in conjunction with existing remote control technique. Practically all types of cable (telephone lines, three-phase cables, cable shield, electrically isolated cables, fibre optic cables etc.) and a variety of radio ranges can be used as transmission media. This brochure covers only a small part of the overall range of applications: namely the transmission by way of electrically isolated cables.

The minimum configuration of the telecontrol system comprises a main station and a substation. Every station has to be equipped with one basic module at least. This module is complete with the below stated functional modules, indication and regulation elements:

- internal two-wire-modem
- RS 232 diagnosis interface
- I/O module with either 8 binary inputs or outputs with status-LED or an additional serial interface providing connection to protocols
- two CAN-Bus ports for connection of expansion modules
- Watch-Dog LED and alarm contact
- DIP-switches to set station address, module number etc.

The basic modules are available in two variants:

- The „master” module, named „MF-...” is only needed once in the system and is intended for use in the main station. It is utilised to coordinate the data transmission.
- The substation module, named „UF...” is used in substations.

For expansion of the number of inputs/outputs each basic module can be completed with a maximum of 15 expansion modules. They are connected over a CAN-bus port. For more information about expansion modules please see our extra data sheet „expansion modules“.

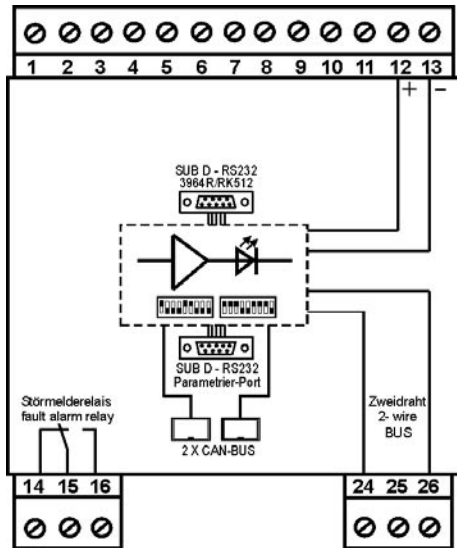
Each **I/O module** is assigned to a module number. The data are exchanged between units with the same module number. The local arrangement of the module within the system (station address) is insignificant. The input module with the number 5, for example, sends it's data to all output modules with the number 5.

The master governs the data communication between the main station and the substation in interrogation cycles. Following data can be transmitted: **measured values, set values, messages, commands, wipe pulses and counts**. The inputs/outputs 1-4 of the digital I/O modules are statical between the two functions or switchable from counting to wipe pulse. Analogue signals can be sent either as voltage value 0-10V or as current value 0-20mA.

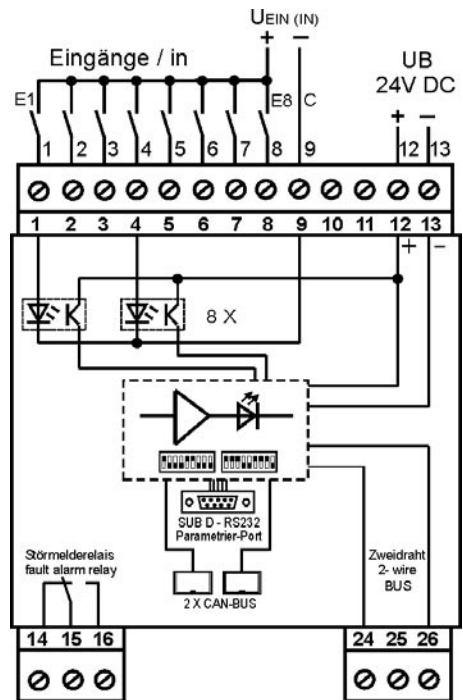
In **case of interference** the system recognizes the faulty communication and informs the main station as well as the disturbed outstation over LED and relay contact. Provided that the additional suitable I/O modules are implemented the ready status of every connected outstation can be signalized by way of a binary contact at every point of the telecontrol system. If a serial interface is used this information can also be evaluated, of course. The system returns automatically to normal operation after the disturbance has been cleared.

The **system configuration** is very uncomplicated. All important set-ups can be made by Dip-switch, for example such as station address (1 – 31), module number (0 ... 254), static value/ counted value with digital I/O and current/voltage with analogue signals etc.

Terminal assignment

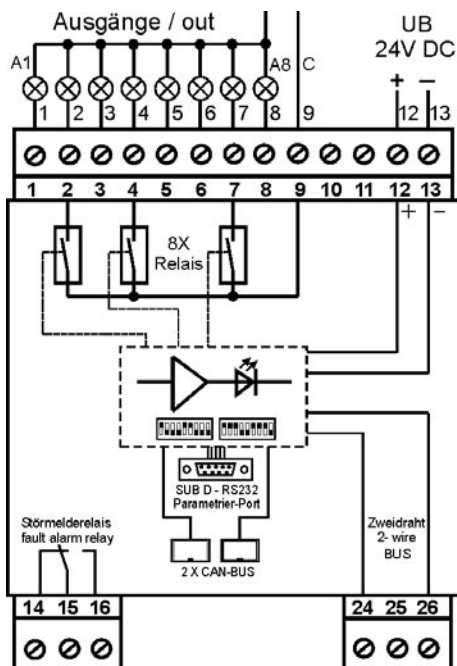


Basic module with additional RS 232 interface

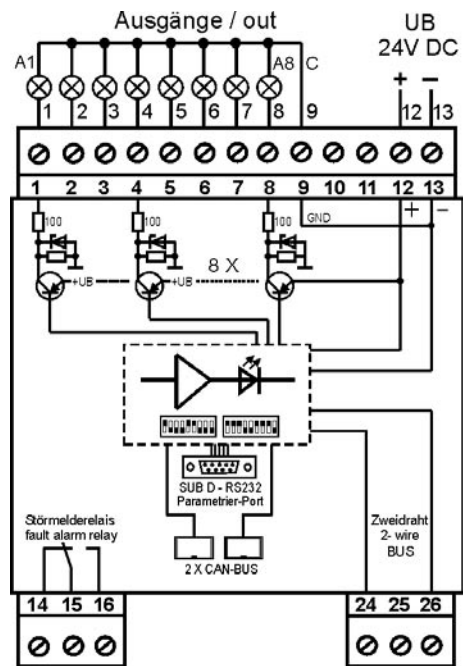


Basic module with 8 digital inputs

Attention:
positive switched pnp transistors!

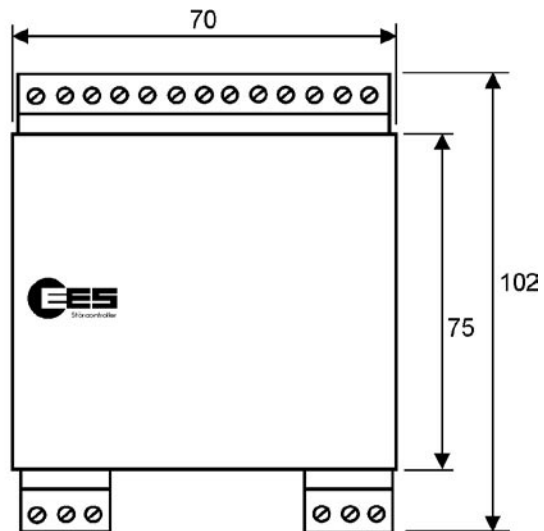
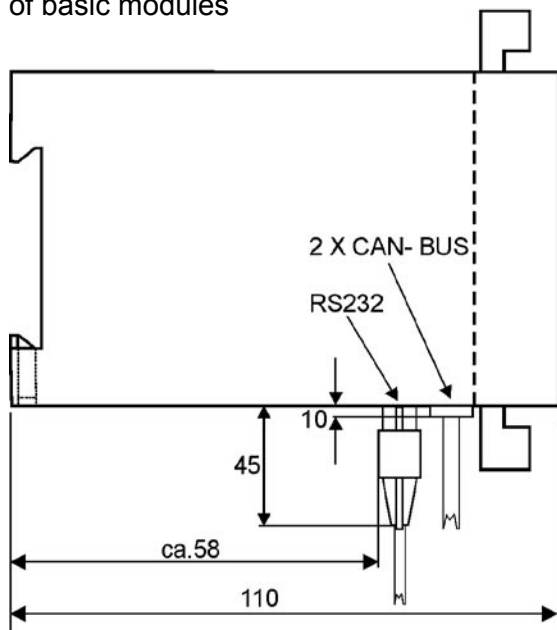


Basic module with 8 output relays



Basic module with 8 logic transistor-type outputs

Dimensions of basic modules



Dimensions in mm

Technical Specification

General data

rated operational voltage	24V DC
operating voltage range	20 ... 32V DC
operating and ambient temperature	-20°C ... + 60°C
humidity	max. 95% without condensation
terminals	nominal cross section 2,5mm ²
housing/protection	plastic / IP 40

Two-wire-modem

attenuation of the two-wire cables	max. 40dB
loop resistance	max. 1MΩ
impedance	600Ω
transmitting voltage	switchable 2V _{SS} / 9,5V _{SS} on 600Ω
electrical isolation between supply voltage and two-wire cables	4kV _{eff}
I/O and two-wire cables	4kV _{eff}

Digital input modules

power consumption	approx. 2,5W
signalling voltage	approx. 16 ... 48V AC/DC*
input resistance	approx. 10kΩ
max. counting frequency	10Hz
minimum pulse width	50ms
electrical isolation between I/O and supply voltage	4kV _{eff}

Digital output modules

power consumption	
with relay outputs	approx. 3,5W
with transistor outputs	approx. 2,5W logic + load current

contact rating of relay outputs**

minimum	1,2V / 1mA
maximum	250V AC / 400mA (only resistive load) 30V DC / 2A 110V DC / 0,2A 220V DC / 0,1A

sum-current 230V AC

(only resistive load)

max. 8A

contact rating of transistor outputs

maximum 50mA per output

maximum counting frequency

12Hz *

pulse width/break

40ms *

electrical isolation between output
and supply voltage

4kV_{eff} (not at transistor outputs!)

*Other values on request.

** More detailed specifications on request

Subject to technical changes

List of model numbers:

Master modules

MF-ZDM12-1PMOD-DIA-0-BX-0

RS 232 interface with MODBUS-RTU protocol

MF-ZDM12-1P512-DIA-0-BX-0

RS 232 Interface with RK 512 protocol

MF-ZDM12-1P101-DIA-0-BX-0

RS 232 Interface with IEC 60870-5-101 protocol

MF-ZDM12-3PPDP-DIA-0-BX-0

Profibus-DP interface

MF-ZDM12-G8DEX-DIA-0-BB-0

8 digital inputs

MF-ZDM12-G8DAL-DIA-0-BB-0

8 transistor outputs

MF-ZDM12-G8DAR-DIA-0-BX-0

8 relay outputs

Substation modules

UF-ZDM12-1P512-DIA-0-BX-0

RS 232 interface with RK512 protocol

UF-ZDM12-G8DEX-DIA-0-BB-0

8 digital inputs, signal voltage 24V DC

UF-ZDM12-G8DEX-DIA-0-BE-0

8 digital inputs, signal voltage 60V DC

UF-ZDM12-G8DAL-DIA-0-BB-0

8 transistor outputs

UF-ZDM12-G8DAR-DIA-0-BX-0

8 relay outputs

Expansion modules

For more information please see our extra data sheet.

Accessories

Cable for connection to PC or Laptop, power supply units, DC/DC converter, buffer charger units incl. accumulator pack

Further accessory and additional information can be found under the product groups in our catalogue.



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