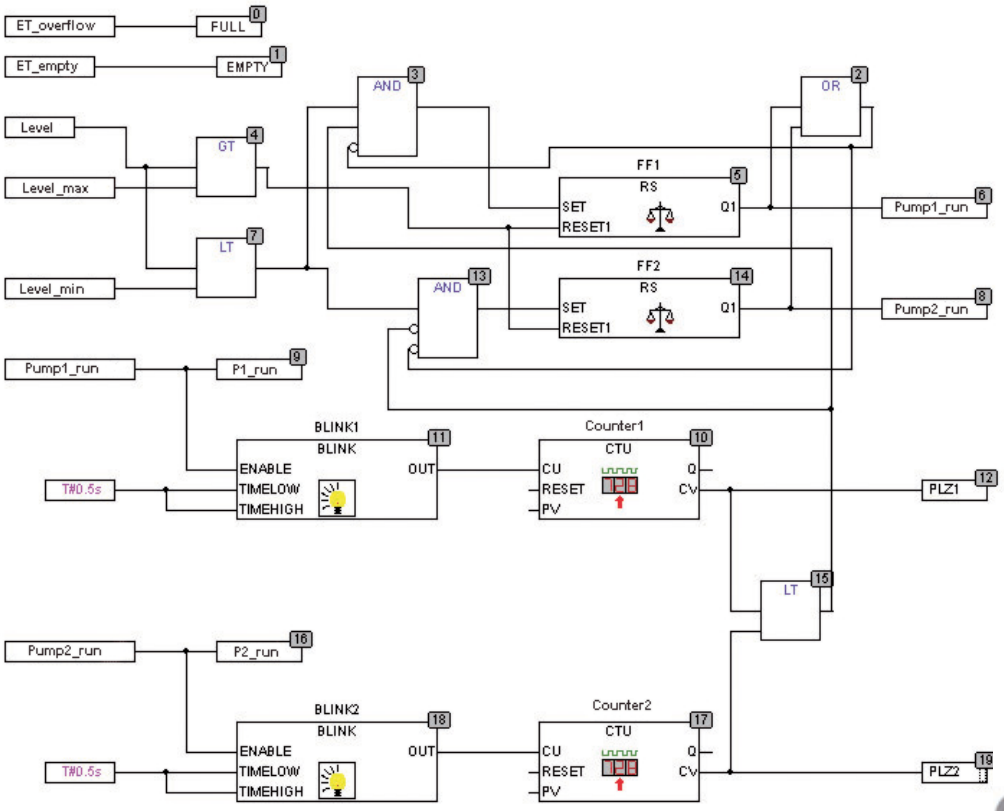
MFW Functional description

Programmable logic controller



Soft-PLC in MFW basic devices

› Compact telecontrol station and Soft-PLC in one device
› Availability of the approved MFW telecontrol data transmission over all different kinds of media
Two wire, data radio and GPRS
› MFW typical easy parameterisation of the telecontrol functions per DIP-switch and PC-Software
› Different process couplings over galvanic I/O or protocol interfaces
e.g. IEC 60870-5-101/104
› Extensive libraries for measuring and control procedures through popular standard
CoDeSys Version 2.3
› Amendment of consisting MFW-systems with Soft-PLC units by use of established data structures
and -connections

Datasheet

Basic functions of the Soft-PLC in MFW basic modules

The approved telecontrol family MFW stands out for its compact measurements, the several useable transmission medias, as well as the easy setting into operation and diagnosis. The consistent device structure with a master and up to a maximum of 31 subtations with integrated modem, process couplings over galvanic I/Os or protocol interfaces enable a flexible set-up of data transmission systems.

A lot of applications demand measuring and controlling functionality in addition to the telecontrol transmission. Some examples are:

- Logic functions
  (Locking mechanism, object protection, emergency operation on transmission brake downs)
- Fill level and pressure measurement
- Gate- and pump controls
- Flow control, emergency operation on breakdown of the transmission link
- Additional alarming functions
- Metered value scaling and data mapping

These tasks can be realised by a separate PLC, which is connected by galvanic or serial coupling with the telecontrol unit. However, more effective and space saving is a plc-functionality integrated in the telecontrol module. The optional Soft-PLC of the MFW is programmed acc. to the international standard IEC 61131-3. By implementing the popular CoDeSys run time system (**Co**ntroller **De**velopment **Sys**tem) extensive libraries for measuring and controlling processes are availabe for the user. The MFW-Implementation supports the possibilities for visualisation and setpoint settings. The use of standardized programming languages simplifies the porting of programs from other systems.
The realised concept enables the Soft-PLC the access to in- and outputs, archives, diagnosis information and system-functions of the MFW. Within the framwork of the MFW-data structure the PLC is able to read or write the available in- or outputs, acc. to the module type:

- Substation - Data of the respective substation to an extend of a maximum of 16 I/O-modules
- Master - Data of the whole MFW system (maximum 255 I/O-modules)

Data structure and transmission procedure of the MFW-Family are being maintained. With it basic modules with PLC functionality can be integrated easily without modification of plant structures from consisting MFW-systems.
Either substations and also master modules are available with Soft-PLC.

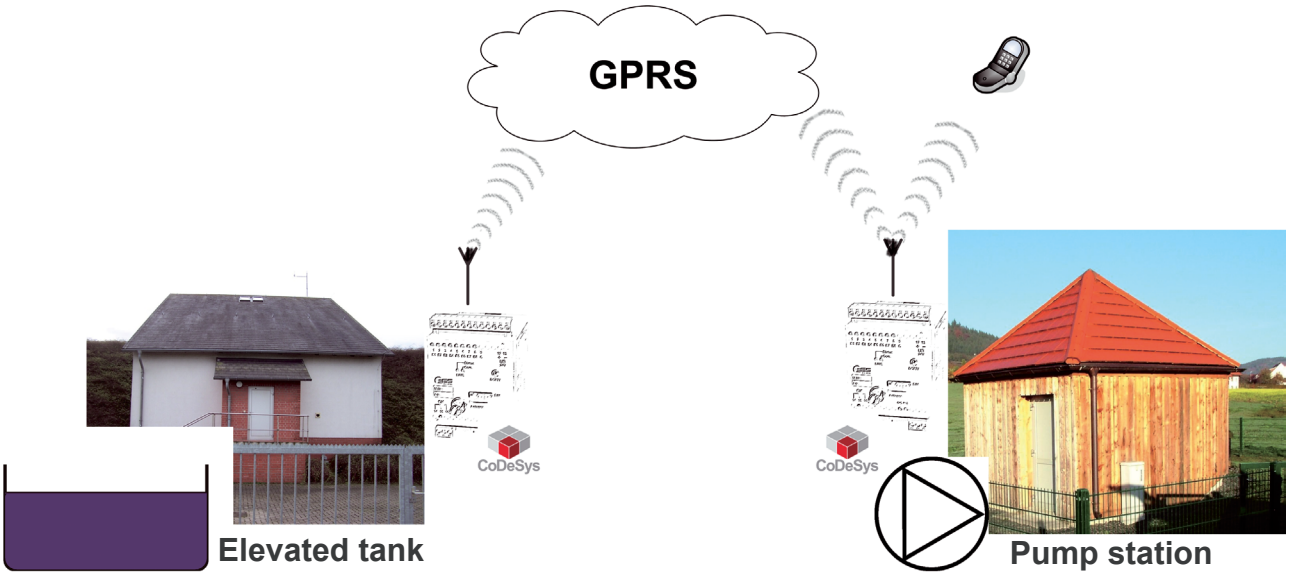
Supplied is the MFW with the CoDeSys programming software version 2.3 of the company 3S-Smart Software Solutions GmbH. The compiler integrated in CoDeSys makes sure, that the PLC programme is saved as compact and high speed executable code in the MFW.

The PLC-Programm can be done in one or more selectable of the IEC 61131-3-standard designated languages.

- Instruction list
- Structured text
- Sequential function chart
- Function block diagram
- Continous function chart
- Ladder diagram

As amendment to the IEC language standard defined modules and extensive libraries the MFW provides additional functions for solutions of typical telecontrol requirements, e.g media dependent diagnosis (e.g. field reception strength) or the dispatch and reception of SMS in modules with GSM/GRPS-modem.

Example



In the shown example above an elevated tank control with the MFW is indicated. In the elevated tank itself the measured values are aquired and event-driven (in dependency of the water level) or cyclically transmitted to the pump station. For this function a PLC functionality is not necessary and a standard MFW substation can be used. However, if additives should be applied to the water, the control of a proportioning pump can be done by a MFW basic module with Soft-PLC. In the pump station the MFW basic module takes over the control of the pump with operating time monitoring and the usual functions, on failure switches to emergency operation and dispatches a SMS with a failure message.

Technical data

Programm memory	64 kByte corresponds approx. IL-commands 11.000 maximum 2.750 minimum 5.500 typical
Data memory	64 kByte; from it 8k Retain from it each 8 kByte for In-and Output data
Minimum cycle time	10 ms
Program execution	circular
Execution times	
Loop with 1000 instructions	Binary 1000 µs Word 1000 µs Float 1860 µs
Real-time clock	battery buffered
SMS-Dispatch / Reception	with GPRS-Modem modules

Data design substation	
In-/Outputs process level	
galvanic or protocol-interface	maximum 16 I/O-Modules
In-/Outputs on MFW-side	
internal MFW-telecontrol link	data extension of a maximum of 16 I/O-Modules

Data design Master	
In-/Outputs process level	
galvanic	maximum 16 I/O-Modules
protocol-interface	data extension of a maximum of 255 I/O-Modules
In-/Outputs on MFW-side	
internal MFW-telecontrol link	maximum of 16 I/O-Modules per substation all together maximum 255
Programming system	acc. to IEC 61131-3; CoDeSys Version 2.3
Programming interfaces	RS232 (Sub-D) MFW-SDP-interface Ethernet (RJ45)

Additional technical data, dimensional drawings and terminal assignments can be taken from the separate data sheetsof the respective transmission media.

Subject to technical changes

Ordering code

Basic modules with two-wire modem and Soft-PLC

Article number	Type	Module type / Process interface
97GZA1HPABX0	MP-ZDM12-1P10X-AKP-A-BX-0	Master / IEC60870-5-101/104
97MZAGANABB0	UP-ZDM12-G8DEX-DIA-A-BB-0	Substation / 8 DI, Nominal voltage 24 V
97MZA1JNABX0	UP-ZDM12-1PMIP-DIA-A-BX-0	Substation / Modbus-RTU/TCP

Basic modules with GPRS modem and Soft-PLC

Article number	Type	Module type / Process interface
97GGG1HPABX0	MP-GGGPR-1P10X-AKP-A-BX-0	Master, IEC60870-5-101/104
97MGGGANABB0	UP-GGGPR-G8DEX-DIA-A-BB-0	Substation / 8 DI, Nominal voltage 24 V
97MGGGPNABX0	UP-GGGPR-G6D2A-DIA-A-BX-0	Substation / 5 DI, 24V; 1 DO, 24V; 2 AI

Basic modules with 70-cm-Band Modem 10 mW and Soft-PLC

Article number	Type	Module type / Process interface
97GFA1HPABX0	MP-F70LP-1P10X-AKP-A-BX-0	Master / IEC60870-5-101/104
97MFAGANABB0	UP-F70LP-G8DEX-DIA-A-BB-0	Substation / 8 DI, Nominal voltage 24 V

Basic modules with 35-cm-Band Modem 500 mW and Soft-PLC

Articlenumber	Type	Module type / Process interface
97GFC1HPABX0	MP-F35HP-1P10X-AKP-A-BX-0	Master / IEC60870-5-101/104
97MFCGANABB0	UP-F35HP-G8DEX-DIA-A-BB-0	Substation / 8 DI, Nominal voltage 24 V

Contact information

Elektra Elektronik GmbH & Co Störcontroller KG | Hummelbühl 7-9 | 71522 Backnang | Germany
Phone +49 (0) 7191.182-0 | Fax. +49 (0) 7191.182-200 | info@ees-online.de | www.ees-online.de