



→ **Product brochure**  
Providing an overview for you.



# The company EES

The history of our family owned mid-sized company is a story of success, combining technological expertise and innovation since more than 30 years. Under the brand Elektra Elektronik GmbH & Co. Störcontroller KG – or in short form EES – we are providing high-value solutions in the range of tele-control and fault monitoring technique.

In the beginning individual fault annunciating systems for monitoring energy generation and distribution facilities led the way. In the course of time we developed a large product portfolio for acquiring, processing and transmitting facility operating data.

In the early nineties EES successfully built up a new field of activity: Lead saving 2-wire-transmission systems for commands and state messages.

Today we are contributing with a comprehensive lineup of telecontrol systems to increase the availability and operation reliability

of countless different plants.

Independent from the transmission media messages, measurements, commands and counter pulses can be safely transmitted, stored and archived.

With the grown economical and technical experience from many years of business activities we achieved continuous turnover and customer growth all over the world. The foreign business is approx. 40 %. Today EES is in a good position to continue expansion in the different national and international market segments in the future.

## → Our principles

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Our centres of work focus upon telecontrol engineering and fault annunciating technology. In these areas we offer a comprehensive supply of different products. Our products are based on recognized market standards and norms. Thus we assure the compatibility of interfaces to other systems. We set a great value on all our products, that they can be adapted to process parameters on-site without difficulties. The modular design of our device families ensures a high flexibility and scalability. Our portfolio is rounded off by an extensive accessory portfolio, including installation material, aerial circuits and suitable power supplies and by providing services, as well. Thus we can offer you solutions from one hand for your individual request. Furthermore we secure the long-standing availability of spare parts for our products.

## → Our innovation power

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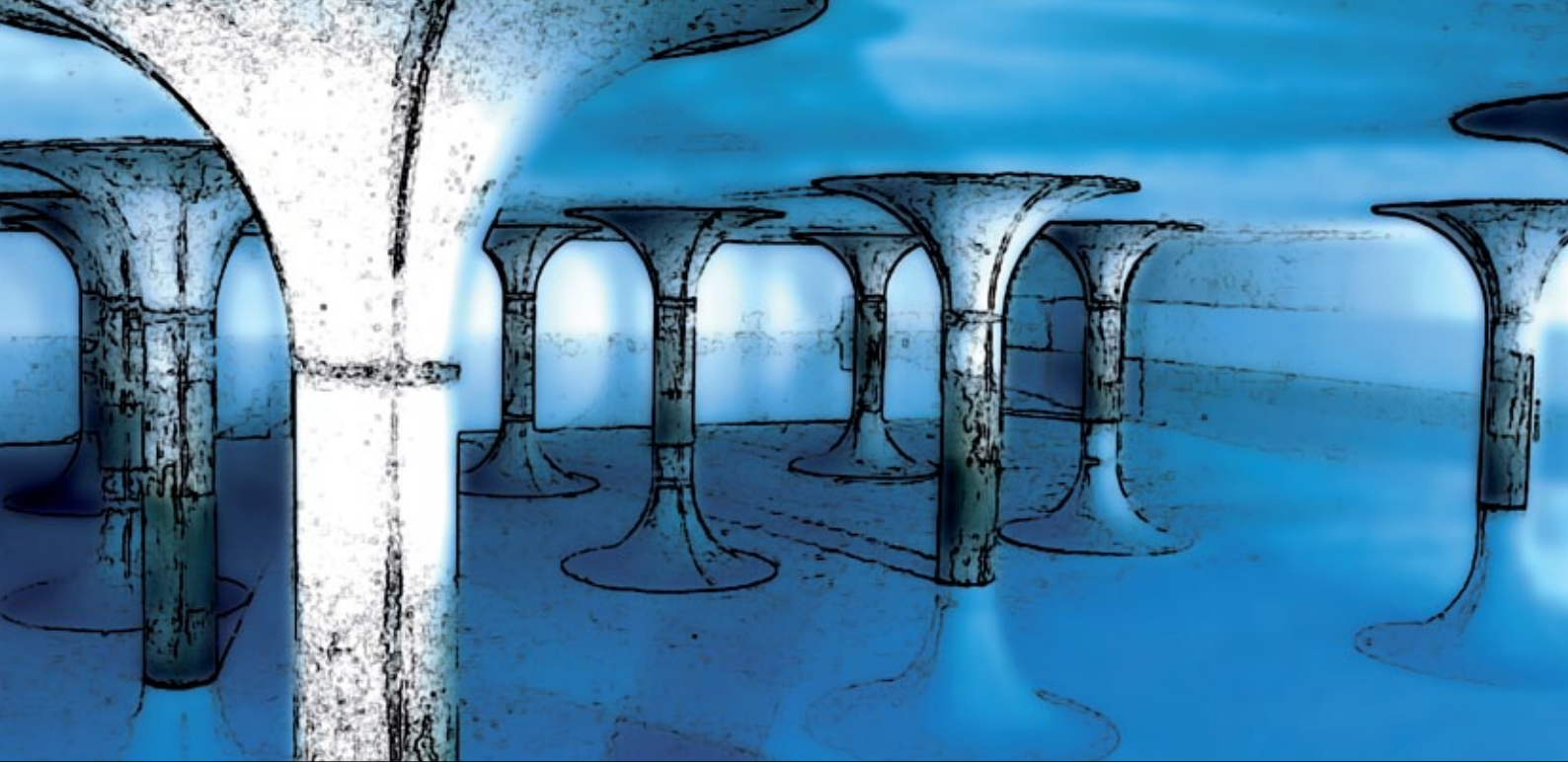
One of the essential advantages of EES lies in the grouping of development, production and sales under one roof. The short paths enable an active internal exchange and a productive cooperation. In this manner we achieve a high degree of effectiveness and can react quickly upon new market requests. In 2007 for example, we were awarded by the 'Initiative of Mid-sized Companies' in regard of the smart technology of our MFW-GPRS telecontrol system.

## → Our markets

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Our products are used in various lines of business all over the world. Important markets are generation and distribution of energy in the focus of gas, power and district heating supply, water- and sewage management as well as other infrastructure applications in the industry and transportation engineering sector. Our products result from a close cooperation with planners, facility constructors and operators in the whole world. Together we are working out efficient and optimal solutions, cut to size on the requests and concepts of our customers.





# The product division Telecontrol technique

The modern communication systems have developed far about the simple signal transmission and contain nowadays also very complex fields of activity. The extremely robust EES telecontrol systems are easy to use, optimised on the respective transmission medium and can be adapted to the individual requirements without problems.

Our portfolio of telecontrol systems offers a wide range from simple, unidirectional two-wire transmission systems up to complex telecontrol networks with data loggers, which can be linked over different media and standardized protocols. Far-reaching and extremely reliable transmission techniques secure the safe data transmission also over great distances – both wireless and over cables or dial-up connections. The data can gal-

vanically be detected and issued as digital messages and counted measurands, as well as analog current or voltage values. From 24 V divergent signal voltages are available as well. The data can be processed alternatively over standardized field buses and process protocols. On request we supply you with factory-set parameterised devices. We suit you with a comprehensive service, from the planning up to the putting into operation.

## → Basic two-wire telecontrol devices



The simple EES telecontrol systems convince by universal applicability, simple handling as well as low installation costs.

The systems are compact and have a high interference resistance for the transmission of analog current or voltage values, as well as digital, static signals and counted measurands.

As transmission medium arbitrary control lines can be used.

The transmission distances can last up to 20 kilometres.

The requirements on the cable quality are low. For the reliable transmission and evaluation of the data telegrams secured protocols are used.

Depending on request the data transmission is carried out uni- or bidirectional.

## → Basic radio telecontrol devices



The parameterisation of the devices is done in general by DIP switches. System overlapping parameters can be configured with a convenient software for certain devices. The serial handing over of the data to superior systems is possible by field bus protocols dependent on the specific device type.

In the radio area also stellate structures can be realized beside point-to-point connections. A radio master can communicate with up to 31 substations in a radio network distributed over several kilometres. With the help of this technology, plant components can be easily connected wireless.

Because of these qualities and their reliability on the signal transmission these device families approved themselves often in different applications.

### HIGHLIGHTS AT A GLANCE:

- › Universal and easy handling
- › Configuration also without parameterisation software
- › Low installation costs
- › Compact design – modular expandable
- › High interference immunity





# The modular telecontrol system MFW

The modular telecontrol system MFW is an universal modular telecontrol platform, which excels in its high modularity and flexibility. The concept of the MFW was designed especially for the connection of far distributed outside facilities to a control centre. The MFW system supports a variety of transmission media and can be extended by a soft PLC for automation tasks.

The MFW system is predestined for example for the supervision and control of stations in power grids. Error conditions can both be acquired and transferred and also circuit breakers can be telecontrolled. Furthermore gas regulator stations, pump stations as well as rain spillway basins, control shafts or high-level tanks are monitored and controlled.

For the connection of a decentralised periphery and the passing on of data to superior systems, numerous standardized protocols and interfaces are available. For data transmission acc. to IEC 60870-5-101 or -104 protocol the possibility of transferring archived

data with time stamps exists.

Besides the wire and line bound systems of the MFW-family also radio and dial-up communication systems are at disposal. The system enables the connection of at most 31 stations per master station with up to 15 respectively digital or analog I/O modules attached. By the same address allocation to in- and output modules data can simply be shunted. When required, several masters can be switched to a telecontrol network in parallel. The MFW substations can alternatively be connected directly to a superior control system via an IEC interface.

## → Line-conducted MFW systems



The line-conducted systems of the MFW-family provide flexible use of available lines.

The transmission parameters can be adapted to the respective conditions on the spot. The transmission mode is particularly robust and ensures a high transmission quality, so that a transmission also on aging cables or in particularly noisy surroundings are possible.

With the power line devices the transmission is carried out via 400-V live lines or on the cable shielding of medium-high voltage lines about up to 5 km. Also modern IP connections can be realized by Ethernet. Not least, a later expansion of the plant is also uncomplicatedly possible through simple couplings on other transmission medias, e.g. radio or telephone networks.

## → Wireless MFW systems



The modules of the MFW telecontrol family with wireless transmission support in the ISM frequency bands, 35 and 70 cm band as well as time slot and 1:24 data radio. The latter are using increased transmission power and other high frequency techniques due to regularities and exclusive use of a radio band.

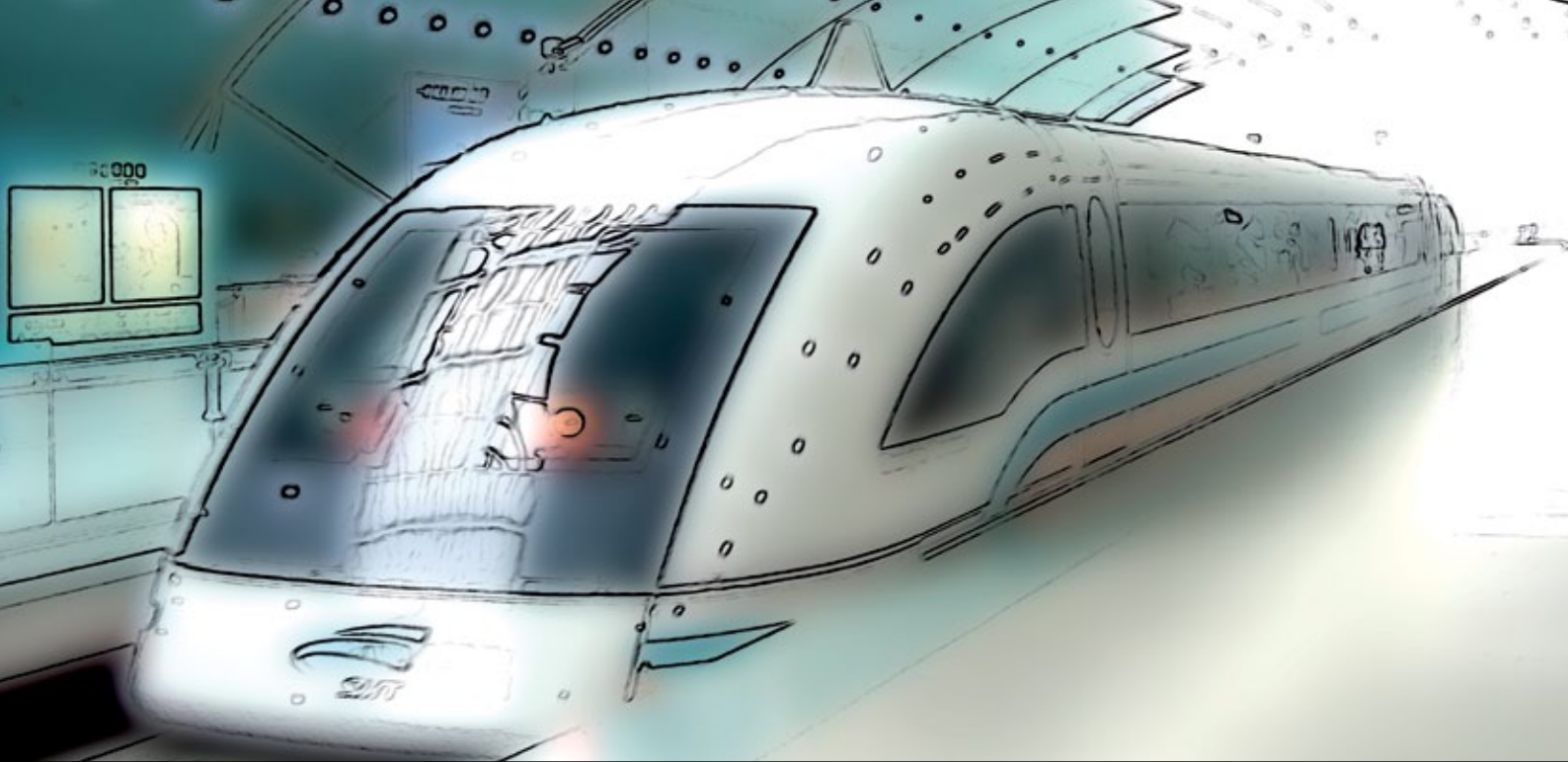
Furthermore GSM dial-up communications and GPRS data connections are available. Although both communication technologies are using the GSM network as a necessary infrastructure, there are differences how the transmission is carried out – which is done circuit-switched with GSM and packet oriented with GPRS respectively.

The feasibility of wireless transmissions is dependent on the required ranges and cycle times as well as the topological conditions. We like to support you determining a technically possible and economically optimal solution. At the implementation we would be pleased assisting you with extensive services and the required tools aside.

### HIGHLIGHTS AT A GLANCE:

- › Many different transmission media
- › Serial connection of decentralised periphery
- › Different standardised protocols
- › Compact, modular expandable design
- › Interference-proof transmission over great distances





# Modular telecontrol system MFW

## Extended functionality

The MFW telecontrol family stands out due to a flexible, modular concept, serving as a basis for different application-oriented variants. Besides speed optimized transmission modes also data logger are available, enabling an operation without connection to a mains supply by means of low power consumption. In this way data can comprehensibly be aquired and archived.

Because of the increased requirements on reliability of supply systems the acquirement, storage and evaluation of measurements, meter readings and plant conditions wins always more to meaning.

Our low power data logger are fulfilling these requirements also in limited infrastructure. With a simple parameterisation program extensive settings can be stored, for example for the pre-processing of measurements. Thus minimal and peak values as well as counter differences can be formed and archived.

Dial-up communications over GSM or analog

telephone networks serve as transmission media, as well as radio or the packet oriented GPRS net. Over dial-up communications or Internet also remote diagnostic and parameter settings can be carried out.

The coupling with different SCADA and visualization systems is for example possible with IEC 60870-5-101/-104 or Modbus RTU/TCP. For point to point applications speed optimized two wire, or fibre optic connections variants are available, which among other things are used in traffic engineering for intertripping of substations.



→ Data logger



For technical and economical reasons it is not always possible to transmit the data via an online connection. The MFW data logger provides the possibility of a remote readout of data over different transmission medias and unites the functions telecontrolling and archiving economically in one device. In the course of automation of far distributed plant components, outstations without connection to the power supply system can be equipped with low- power variants, which are being fed by batteries or small solar power supplies. The remote readout from outstations provides a time and cost saving for the operator and enables an immediate signalling of failures.

→ PLC – Functionality



For the functional extension of the MFW a soft PLC solution acc. to IEC 61131-3 is available for automation tasks.

Hereby one of the leading programming platforms in regard of programmable logic controller and programmable automation components was integrated into the MFW.

The whole in- and output range of the MFW modules can be used for automations tasks and can be integrated either in the master, as well as in the substation. The programming is done via a PC based on Windows.

→ Accessories for telecontrol engineering



You will find an extensive accessories portfolio at EES for all products and applications. All accessories get comprehensively tested and are checked on applicability and suitability for their applications. For radio modules there are various aeriels available, depending on the installation location, as well as assembly and cable material. For power line transmissions we offer different line filters and carrier frequency traps. For the reliable operation of low power systems there are suitable solar panels and accumulators or batteries available.

A great variety of AC/DC power supplies, DC/DC converters and battery buffer chargers with suitable accumulator sets you will find in the section of power supplies.

**HIGHLIGHTS AT A GLANCE:**

- › Data logger for dial-up connections
- › Low-power devices
- › High-speed data transmission
- › Extensive accessories
- › PLC-functionality





# The product division Fault annunciating technique

EES fault annunciating systems serve a variety of different application fields. The portfolio reaches from simple monitoring modules up to complex networkable fault reporting systems with telecontrol interface acc. to IEC 60870-5-standard. This enables solutions which fit smoothly into your structures.

Our fault annunciating systems are available with different supply and signalling voltages of 12 V DC up to 250 V DC and 230 V AC. The bandwidth goes along with devices having fixed settings over devices which can be configured via DIP switches, up to free configurable systems with a parameterisation interface.

Hereby both standardized reporting procedures, such as acc. to DIN 19235 or ISA, as well as individual sequences can be realized.

A parameterisation software allows the group-specific or channel by channel adjustment of the parameters to the individual requests. Operation and alarm states are visu-

alized about different-coloured LED displays. Pluggable terminals and labelling strips for the description of the single signals are part of the basic equipment.

Upon accessories besides installation material and cables you will find necessary elements for extensions and increased protection demand up to IP 65.

Our fault annunciators are available in panel mounting cases with different signal extensions, as modular systems in 19" technique, as compact fault annunciator for engaging on DIN rail and as prewired systems in a wall set-up case.

Our equipment and systems for panel mounting cover a broad spectrum of applications:

- › Simple signalling of operation and fault states
- › Formation of summation signals for the passing on of collective reports
- › Stored alarm sequences with acknowledgement and optical and acoustic signalling
- › Contact multiplication via integrated or attached relays modules
- › Display of information by drop indicator relay, which also indicate the last signal state on power failure

To provide you the overview easier for you, we have subdivided the devices and systems into the following different performance categories:

### → Indication modules for panel mounting



The EES indication modules for panel mounting can either be delivered with or without collective report. The input signals can be acquired and processed in NO or in NC principle depending on the design variant. You get different devices in the voltage ranges of 12 V DC up to 250 V AC/DC.

The single LEDs are mounted on plug-in sockets and can be exchanged without problems. For the individualization numerous LED-colours are available. The devices are easy to handle and due to a low mounting depth integrable nearly everywhere.

### → Standard fault annunciators with fixed sequences for panel mounting



You get the simple EES fault annunciating modules ex works with predefined functions and sequences. Device specific there is the possibility for further configuration via DIP switches.

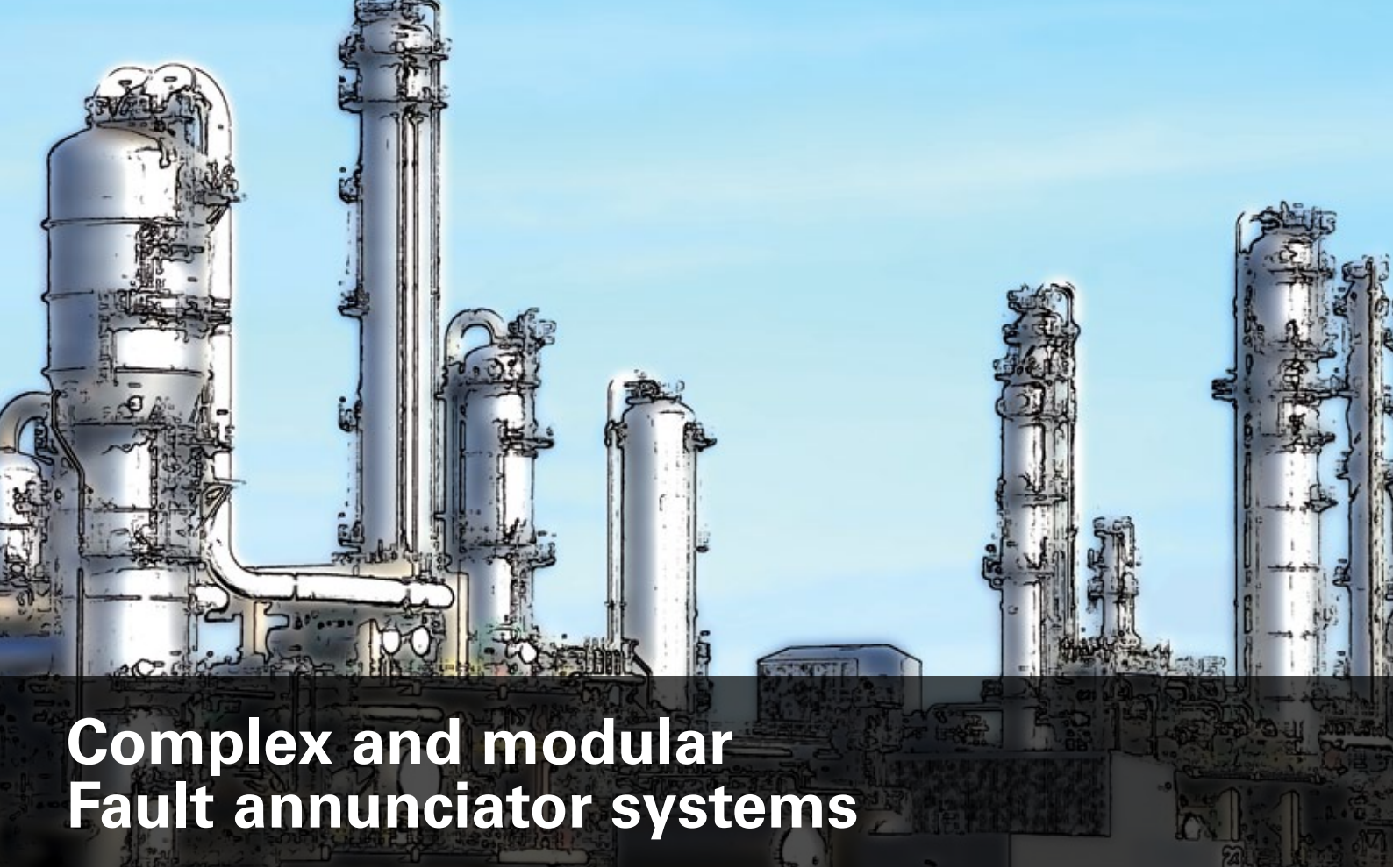
In addition the switchover between first value or new value processing, the group specific normally open or normally closed triggering and the assignment of the collective report is included.

Different LED colours and divergent voltages as well as alarm sequences can be offered optionally.

#### HIGHLIGHTS AT A GLANCE:

- › Highest reliability
- › Voltage ranges from 12 up to 250 V AC/DC
- › Easy setting into operation
- › Individual labelling
- › Comprehensive accessories





# Complex and modular Fault annunciator systems

The modular fault annunciating family MSM contains different fault annunciating systems, which qualify themselves for the solution of complex requirements by their functionality and through the modular design of the devices.

Up to six expansion modules can be connected to the integrated CAN bus interface. Therewith contacts can be duplicated for passing them on to superior systems. The expansion modules are either available with 16 transistor outputs or with 16 output relays. The fault annunciators have a self-monitoring function, which also comprises the connected expansion modules. To increase the numbers of signals and to be able to execute cross-system acknowledgement processes, several devices can be integrated together into a network. Optionally a telecontrol interface appropriate

to IEC 60870-5-101 or -104 can be integrated, making it possible to pass on data to a superior SCADA system. By integration of a dial-up modem the devices can thus being used as second reporting path.

The functions can be configured by the user with the help of a comfortable parameterisation software. The parameterizable EES fault annunciators face the growing demand for plant-specific settings: Buttons and channels can individually be configured and labelled by means of software. Saving the configurations enable the fast putting-into service of several comparable devices.

## → Networked fault annunciator systems



The networked EES-fault annunciator systems process complex reporting procedures in larger installations – per each channel and individually for alarm and operating status signals. Both either alarm states parallel to in- or output and copies parallel to LED display can be visualised. The other features are based on the standard fault annunciators with fixed sequences.

## → Modular fault annunciator systems



In alarm systems of larger installations we use robust and for several 1000 reports designed 19" technique. With plug-in cards installed in subracks, the systems can modularly be extended. The communication is controlled and supervised by a master card between the single in- and outputs. On request standardized or custom-designed alarm sequences can be provided.

## → Drop flap - fault annunciator systems



For special requests – e.g. stations without uninterruptable power supply – intelligent drop flap fault annunciators with archiving function are suitable. The status indicator is carried out optically and is also kept in power failure state. Events are saved with time stamp and can be read-out later via a protocol interface for analysis. When required up to 4 devices can be connected via CAN bus.

### HIGHLIGHTS AT A GLANCE:

- › Suitable for large installations
- › Optional interfaces for control technology
- › Individual alarm processing
- › High interference immunity and protection class
- › Expandable





# Fault annunciators for other installation forms

Fault annunciating systems for DIN rail get primarily used at supervision tasks with a few I/O's. The devices offer different functionalities – from pure operation indication up to alarm processing with first-up or new value formation up to alerting systems, triggering SMS or fax dispatch over dial-up networks.

All systems are device-specifically expandable, simple at setting into operation and have a comfortable handling. For retrofitting in industry and domestic installations we offer completely prewired fault annunciator systems, in an easy to install wall mounting cabinet – e.g. with integrated UPS and a built-in horn. As soon as the signal lines and the supply voltage are connected, this Installation is operational.

SMS fault annunciators put themselves forward for unoccupied plants, alarming the respective maintenance- or alerting supervisory staff on failures or crossing of thresholds. Status signals can also be queried over long distances by mobile phone. The same applies for acknowledging single alarms. As well fax and e-mail notifications can be set as reporting type. By use of two devices of this fault annunciator type controlling functions can be exchanged via SMS, too.

## → For DIN-rail and wall mounting with fixed sequences



These compact fault annunciators are suitable for small installations and simple tasks. They serve primarily for the drive of mimic diagrams or indication panels. The devices are available in the usual for the application used voltages 24 V AC/DC and 220 V DC respectively 230 V AC.

## → Alerting technique



For unoccupied or large installations an on-site fault annunciator equipment is not sufficient. The supervisors must be informed continuously about the operation and failure conditions and if necessary to be able to take action also from the distance. For these requirements cost-effective SMS transmissions have established themselves, which are usable almost everywhere in the GSM net.

The alarm activation is carried out via digital inputs, threshold crossings or gradient monitoring of analog inputs or about an individually parameterizable linking logic. Different reporting lines are available for notifications on different medias. To provide teleservice works, the devices can also be obtained with a transparent interface, which can e.g. be connected with the diagnostic interface of a PLC.

## → Wall mounting cabinets – Complete operational systems

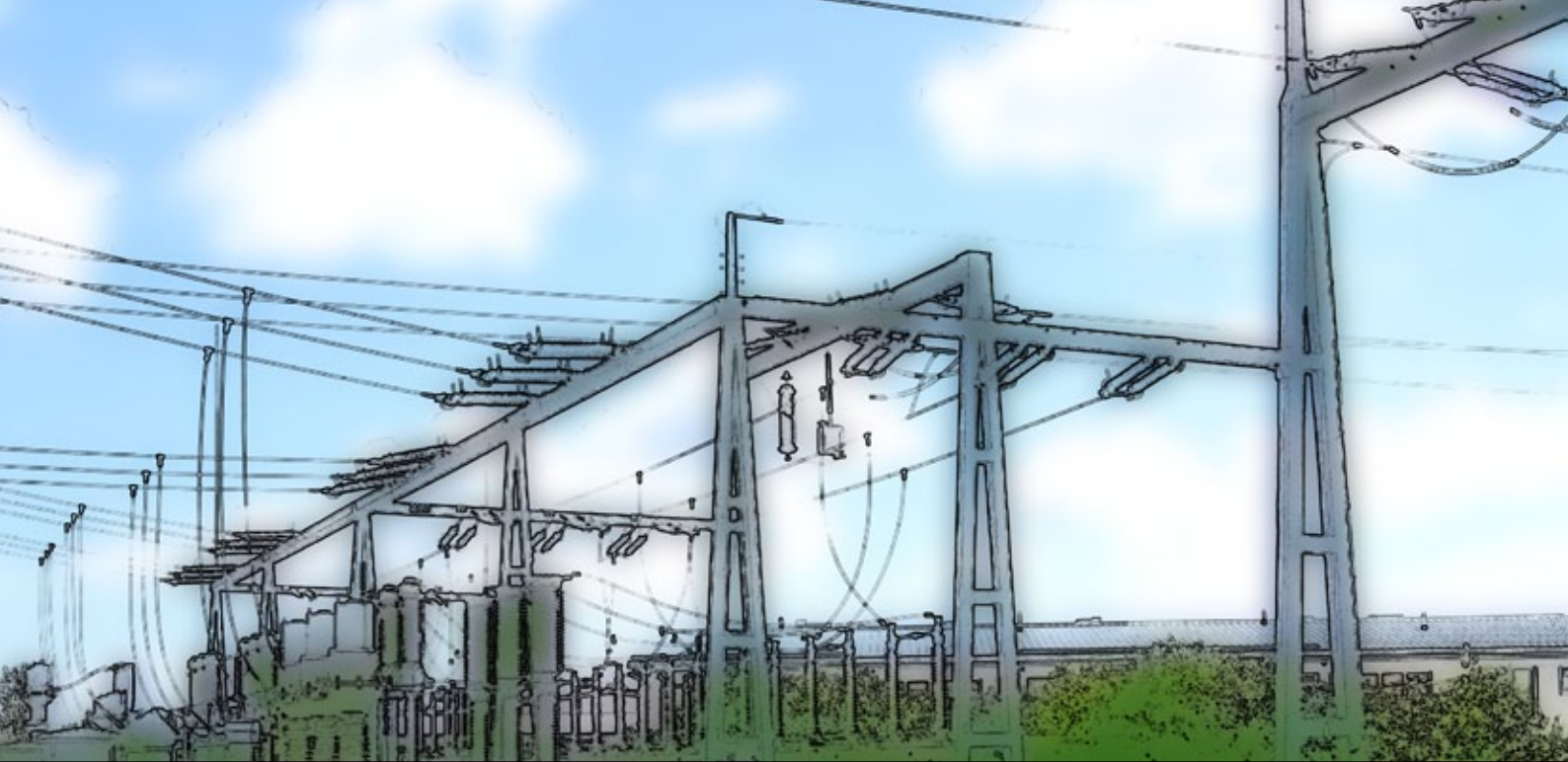


Many applications require an easy and quick mountable fault annunciator installation. Therefore you get the system also completely prewired in a wall-mounting cabinet, where all connectors are placed on modular terminal blocks. For putting into operation you only have to connect the supply voltage and the signalling lines. On request CAD plans are available in DXF file format. Optionally a wide portfolio of accessories suits your needs, for example connected piezo buzzers – ready for operation, accumulator buffer chargers for the mains fail-safe operation or switched mode power supplies and DC/DC-converters for different in-and output voltages.

### HIGHLIGHTS AT A GLANCE:

- › Various installation forms
- › Individual alerting
- › Compact design
- › Remote alerting and control
- › Different voltage ranges





# Industry electronics and power supplies

Besides the fault annunciating and telecontrol technology the EES product portfolio also contains industry electronic components e.g. for voltage supervision or for the conversion of supply voltages. All devices are characterized by compact dimensions, a high degree of effectiveness and long-lasting technology.

At the different process applications of water-supply and energy distribution - as well as at the various traffic and railway engineering applications different power supplies are needed. We produce efficient power supplies and voltage supervision devices. Among other things our range contains power supply units, buffer chargers with accumulators and DC/ DC converters. Our devices

do not only serve the usual standard voltages, but support also the special operating voltages 12 V, 48 V, 60 V, 110 V and 220 V. For Low power data loggers, which are being operated without coverage about the mains supply, there are next to accumulator packs and solar cell panel installations also long time batteries available, providing a stand-alone function of up to 12 months.



## → Voltage supervision



The supervision relays are compactly designed and are suitable for mounting in the distribution cabinet. The voltage supervision is carried out separately for every phase, so not only the mean average value of the voltages, but the actual asymmetry and the individual phase failure is being recognized. In addition the neutral conductor is also supervised on break. Limiting values can be adjusted through potentiometers.

## → AC/DC-power supplies



Our portfolio also contains wide range switched mode power supplies, which are ideal suitable as a power supply for telecontrol engineering or fault annunciating devices. The power supply of the telecontrol modules is done about CAN-Bus cable and is, due to overload and overvoltage resistance, extremely reliable.

## → Buffer chargers



Buffer chargers allow the safe and uninterruptable supply of the connected consumers with an accumulator buffering. An intelligent microprocessor based control ensures the optimal usage of the accumulator capacity and prevents an overload. If a safe transmission of the last state in a facility in the event of a power failure is sufficient, buffered DC power supplies put themselves forward, based on ultracapacitors as energy storage. These ensure a maintenance-free operation of up to 30 years.

## → DC/DC-converters



The compact DC/DC converters to snap on DIN-rail excel themselves through their wide input ranges of up to 370 V DC and the variety of possible output voltages. All DC/DC converters have in common a high degree of effectiveness also at high ambient temperatures and offer a display as operation indication.

### HIGHLIGHTS AT A GLANCE:

- › Perfect for fault annunciators and telecontrols
- › Many voltage ranges and special voltages
- › Compact, microprocessor controlled technique
- › High degree of effectiveness
- › Self monitoring





# Branches and Applications

Our products are used worldwide in the most different lines of business. They are applied in the industry just like in the municipal area. The sectors energy, waters, gas, district heating, chemistry and traffic engineering form the main focus. In the following we have arranged some fields of application of our products for you:

## → Industry plants

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Alarm monitoring of several plant components of the chemical complex Olefins 2 in Kuwait.



- › The order contained the delivery of 18 completely mounted and wired monitoring switchboards for the alarm processing and supervision of different equipments with 128 alarms each. The monitoring switchboards are used in the energy supply, sewage treatment and synthetic material extraction.
- › According to the requests for Olefin 2 an individual triple stepped alarm process with several acknowledgment and alerting stages was developed, on basis of the BSM fault annunciator.
- › From the beginning EES was integrated into the planning and realization process as a partner of the general contractors – from the planning, production and handling until the shipment and the putting into operation.

## → Energy supply

### Monitoring of local transformer stations at the OVAG in Friedberg



- › The OVAG in Friedberg operates in the federal state of Hessen an electrical distribution grid in an area of 2700 km<sup>2</sup> and supplies approx. 220 000 residents with electrical energy.
- › To increase supplying reliability, about 260 local transformer stations will be tele-monitored over GPRS after completion and the data is being transmitted via an IEC 60870-5-101-interface to a SINAUT Spectrum SCADA-system.
- › By acquiring the short-circuit indicators trouble-shooting in the grid is shortened and therewith the availability of the power supply is increased.

## → Wind park plants

### Teletransmission of energy data from the wind park Stötten to the Albwerk in Geislingen



- › The feed-in counters of 3 up to 5 wind power plants are typically acquired by one MFW substation. The MFW master handles data of in summary 13 MFW substations representing more than 50 wind power plants. The data exchange between master and the substations is done via radio.
- › The data exchange between the power plants and the control center is done partly either via radio or on private cable runs. Because of the complicated topological situation repeater stations were set up on the radio trunks.
- › The EES telecontrol technique is synchronised by DCF-77 receivers. The processing of the feed-in data in the control center requires a transmission of all counter values within 10 seconds. The data is transferred over a IEC 60870-5-101-interface to the superior process control system.

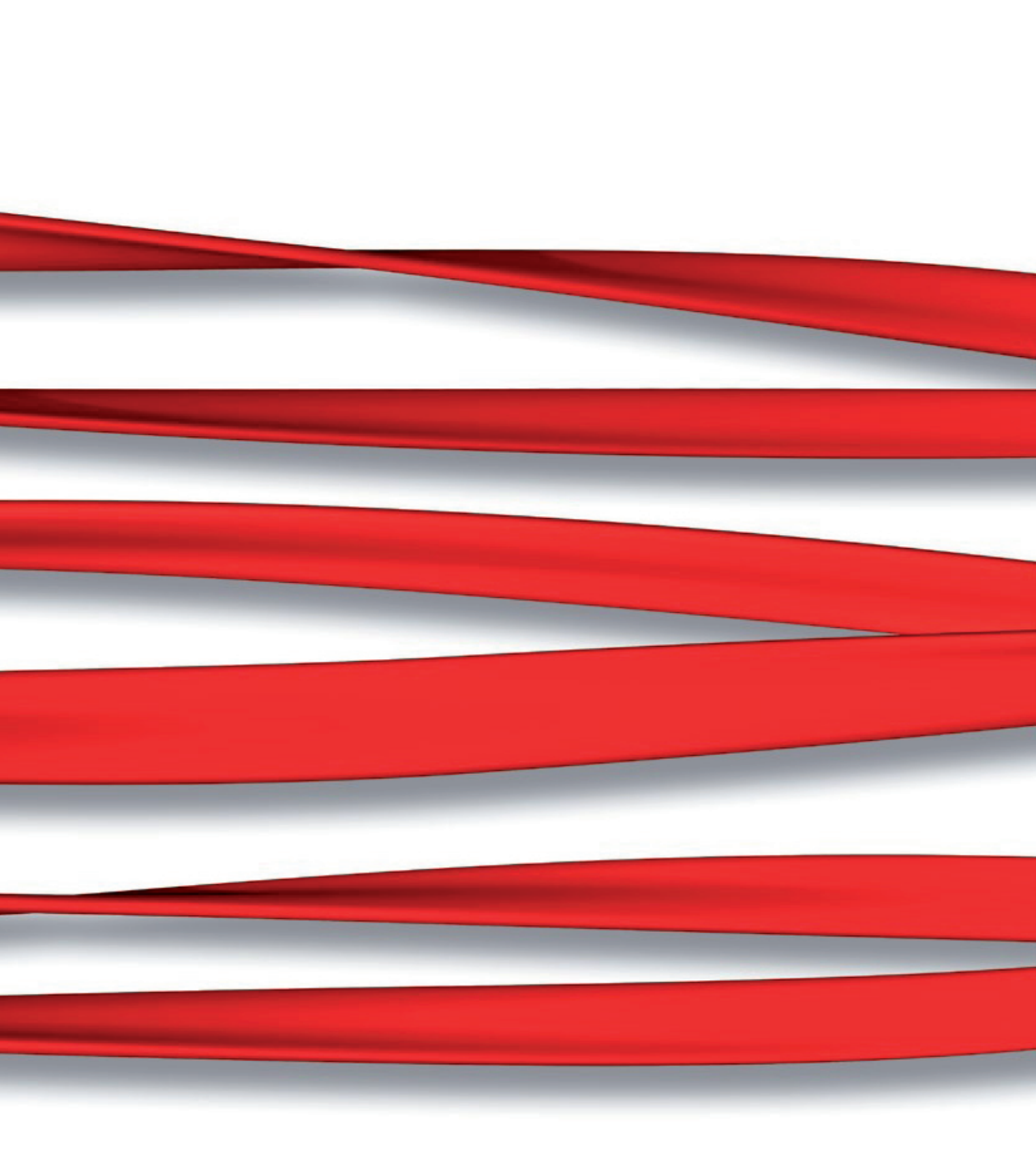
## → Water supply

### Water supply association district and city of Offenbach near Frankfurt a.M.



- › The water supply association district and city of Offenbach (ZWO) supplies more than 340.000 residents with drinking water. The distribution of the drinking water in the individual local networks is done by 75 connection ducts.
- › For providing a central supervision and analysis of the data out of the connection ducts, these were equipped with EES telecontrol technique.
- › Due to the fact that many substations are not supplied with power, devices with low-power design were installed, using solar panels or long-term batteries as power source.
- › The data transmission is done by radio, dial-up connection and W-LAN.





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