m5 base solution
for the smallest applications

Low-cost and compact

The requirements made of system intelligence are becoming ever stricter in almost all fields of supply. Increasingly smaller stations need to be equipped with monitoring and control technology, which dramatically increases the number of units required. It is at this point that needs such as functionality and practicability have to be reconciled with the constantly growing challenges in regard to IT security as well as economic and physical restrictions. In short: Digitalization of the energy revolution requires product innovations that are tailored to these challenges in the future - like the m5. This miniature station with all the necessary basic telecontrol functions offers solutions for numerous application areas, and its particularly compact size and low price are impressive features.

Application areas

- Feed-in management for small feeders
  (e.g. future-oriented substitute for radio ripple control)
- Direct marketing and interconnection of virtual power plants
- Monitoring and control unit for infrastructure applications, pipe-bound media, and for provision of contracting services
- Charging management for battery storage and e-mobility

m5 overview

Compact, miniature station in an electronic housing according to DIN EN 43880 for direct installation. Integrated quantity structure: 6 signals, 5 command outputs, 1 measured value and 1 setpoint.

2 separate Ethernet LAN 10/100BaseTx/Rx, VPN tunnel from the station, RS-485 and RS-232/V.24 interfaces for integration of communication drivers to IEC 60870-5-101/-104, DNP3, Modbus, etc.

Configuration via LAN, USB, and memory stick. Power supply 24V DC, configurable with the intuitive SAE software setIT.

Telecontrol technology undergoing transformation

The framework conditions and legal stipulations in the supply sector have never experienced such rapid changes as those in recent years. Ever greater importance is being attached to decentralised intervention capabilities and the continual availability of up-to-date information. The advances of the energy revolution are however meaning the number of systems and devices to monitor is also increasing. Whilst larger systems have usually required more complex functions and correspondingly powerful telecontrol units, new application sectors and smaller systems need reliable, yet cost-efficient, base telecontrol solutions. A good example is feed-in management as a linchpin of the energy revolution. To be able to continue guaranteeing grid stability with accurate forecasting and responsiveness at short notice, it must also be possible in the future to take into account and monitor the ever 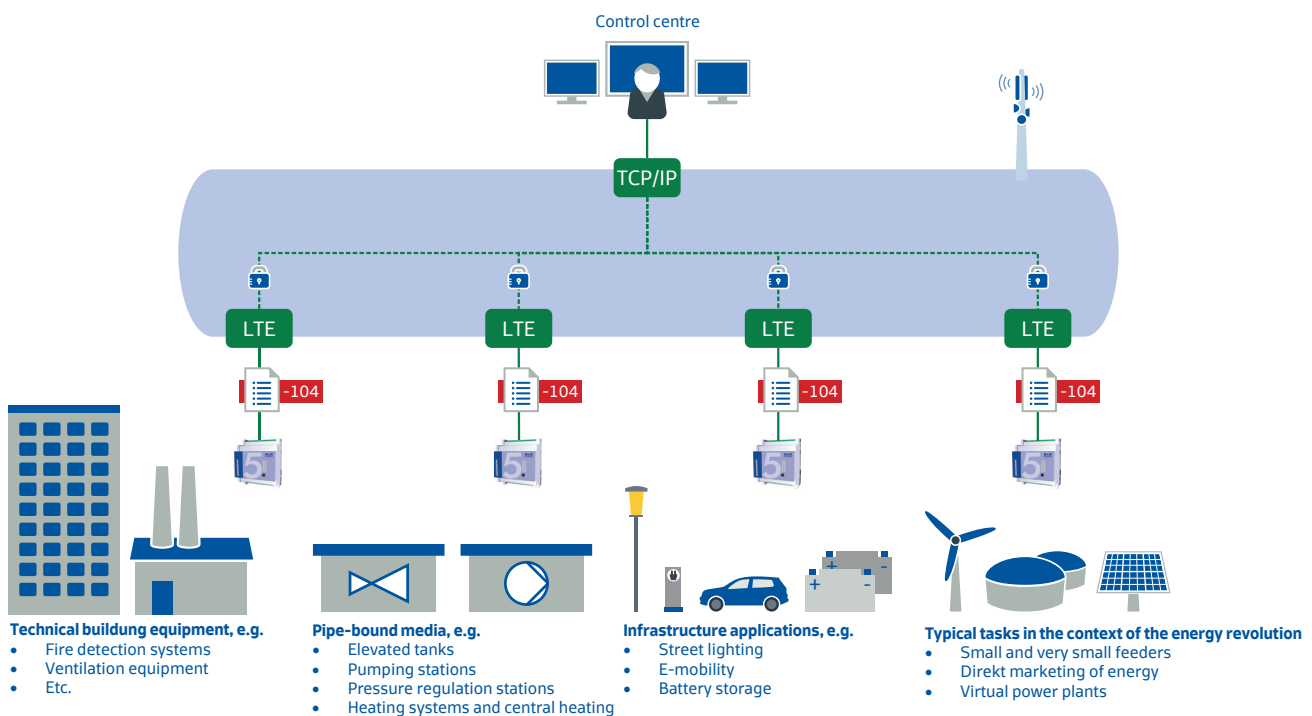growing number of small, decentralised feeders. The m5 is perfectly suited to this application, and furthermore makes available a perfect basis for the interconnection of virtual power plants and the direct marketing of energy. More monitoring is also laid down by legislation for numerous infrastructure applications. With the m5, it is not only possible to satisfy legal stipulations efficiently, e.g. for car parks, fire detection systems, and street lighting applications, but also to exploit additional short and long-term saving potentials.

The continual changes in the supply sector are entailing additional remits, for which particularly compact and low-cost telecontrol units such as the m5 are required - contracting services, battery storage monitoring, e-mobility and the displacement of radio ripple control.

What would you like to monitor?

Applications

Its specially tailored capacity structure means the m5 can be deployed in numerous applications:

Technical buildung equipment, e.g.
- Fire detection systems
- Ventilation equipment
- Etc.

Pipe-bound media, e.g.
- Elevated tanks
- Pumping stations
- Pressure regulation stations
- Heating systems and central heating

Infrastructure applications, e.g.
- Street lighting
- E-mobility
- Battery storage

Typical tasks in the context of the energy revolution
- Small and very small feeders
- Direkt marketing of energy
- Virtual power plants

Outlook: m5 as alternative to intelligent metering system

Electricity consumers and feeders will in future have the right to be connected to the network by their metering point operator via an intelligent metering system defined by the legislator. The m5 is based upon the technical specifications of this system and, on the basis of many years of practical experience of SAE IT-systems, has functions added that, in our opinion, are of relevance to current and new application areas in the sector. The m5 has the potential to become a component of the intelligent metering system with integration of a CLS interface and implementation of the IEC 61850 protocol.

m5 hardware

The m5 features all basic telecontrol functions necessary in a compact format. The quantity structure is the logic consequence of years of practical experience:

- 6 indication inputs
- 5 command outputs
- 1 measurand input
- 1 set point output
- 2 Ethernet LAN connectors (separated)
- RS-485 field interface
- RS-232/V.24 interface
- Configuration via LAN and USB
- Removable screw terminals

m5 software

The innovative and well-established setIT configuration software permits extremely fast startup.

- Intuitive user interface
- Almost complete prevention of input errors
- Fault analysis with link to error source
- Practical copy/paste functions
- Context-sensitive online help functions
- Calculation values and logic functions
- Extensive diagnostic functions
- Integrated project documentation
- The very latest security functions

Secure communication to German Association of Energy and Water Industries (BDEW) whitepaper

Like the series5e telecontrol technology devices, the m5 also features a high level of IT security, and is more than capable of facing up to the complex security and practical requirements of today and tomorrow.

- Secure encryption and hash algorithms, e.g. for encrypting project files with AES-256
- User profile with individual role based access control (RBAC)
- VPN tunnel from the station (end-to-end encryption with IPsec IKEv1/IKEv2 or OpenVPN protocol)
- Secure file transfer with FTPS (File Transfer Protocol over SSL), e.g. for station updating
- Secure web communication with HTTPS (HyperText Transfer Protocol Secure)
- Accesses and services such as USB port, USB Ethernet and web server can be disabled
- Integrated firewall (whitelist concept)
- Syslog for central logging of operational messages and processes

Accessories: LTE modem & PSU

Major significance is attached to the connectivity to control and energy management systems – due specifically to the number of small decentralised systems. For this reason, a powerful LTE modem in a compact format is available for the m5 as an expansion*:

- Dual antenna with MIMO transmission
- Fallback capability to 2G/3G networks
- 3GPP cat3 communication to 100 Mbit/s
- Also available: 450 MHz modem

For applications requiring other supply voltages, compact, external power supply units can be added to the m5:

- 230 V AC
- 18 to 75 V DC (wide-range)

visIT web-based system visualisation

The optional visIT visualisation tool enables, by importing process variables from setIT, tailored user interfaces to be created easily. visIT runs as a web visualisation on the telecontrol station and has access to its process data and archive values. This means all information relevant for service and operation can be shown (such as online values, operation logs and alarm lists). This enables service staff on site to detect and rectify faults speedily and reliably. The software can be displayed on almost all HTML5-enabled terminals, smartphones and tablets.

* Expected to be available from Q3/2019

Technical details: m5

Design	Compact miniature station in the electronic housing according to DIN EN 43880
Communication	2 Ethernet LAN TCP/IP, 10/100BaseTx 1 EIA/RS-485 interface, 2-wire, current isolated 1 EIA/RS-232/V.24 interface, interface with RTS
Digital Inputs/outputs	6 digital inputs 24 V DC, potential isolation 5 digital outputs 60 V DC, relay, (2 changeover contacts, 3 NOs, max. 1 A)
Analogue Inputs/outputs	1 analogue input ± 22 mA, 12-bit, potential isolation 1 analogue output 0 to 20 mA, 12-bit, potential isolation
Temperature sensor	-25° to +100°C, resolution ±2°C
Isolation	1.5 kV, supply for measured values, process I/O, LAN and RS485
CPU	Ultra low power ARM Cortex-A7-Core, 528 MHz
Memory	512 MB memory (256 MB SDRAM, 256 MB SLC NAND Flash, 1 MB NOR) Internal memory expansion 1GB pSLC
Expansions	4G and CDMA 450 communication modules in the planning stage*
Real-time clock	Max. error ±10 ppm over entire temperature range 32,768 kHz quartz, maintenance-free, backed up for 7 days (SuperCap)
Status indicators	LEDs on the front for system, communication, alarms and commands
Operations controls	Button in the front for diagnostics/configuration/service functions
Configuration and diagnostics	Ethernet LAN 10/100BaseTx USB 2.0 OTG interface
Error-signal output	configurable to relay
Supply voltage	24 V DC (±15%), max. 3 W 0.12 A without expansion
Standards	DIN EN 61000-6-2, DIN EN 61000-6-3, DIN EN 55032
Housing	Distribution boxes according to DIN EN 43880 Polycarbonate V0, IP20 Dimensions: 70 × 90 × 60 mm
Installation	DIN top-hat rail, DIN-EN 60715 TH35
Terminals	Removable terminals, MC 1.5 to 3.5 mm²
Ambient conditions	−20° to +70°C, ø 24h max. 50°C, relative humidity <95%, no condensation

Product variants & accessories

LTE modem
Dual antenna with MIMO transmission, compact format,
in preparation*

450 MHz modem
CDMA modem, compact format,
in preparation*

Power supply unit
for voltage supply of 230 V AC in compact format (35 mm width)

Power supply unit
for voltage supply of 18 to 75 V DC (wide-range) in compact format (17 mm width)

* Expected to be available from Q3/2019

SAE
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