

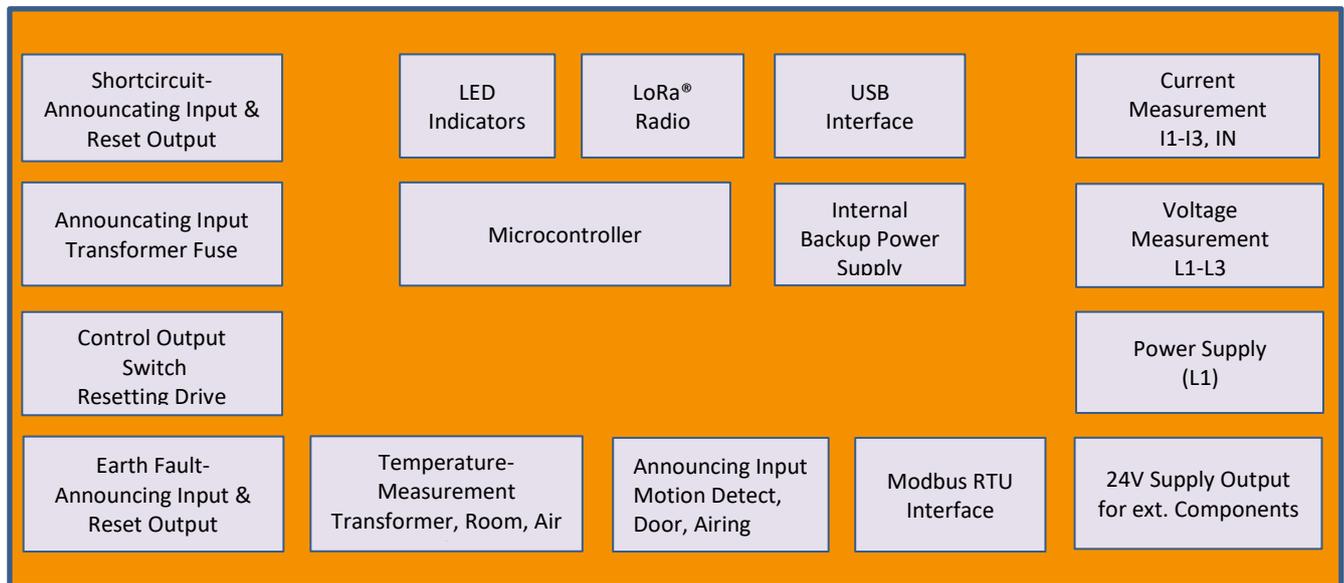
TSM -Transformer Station Monitor

Highlights

- Comprehensive monitoring for medium voltage local network transformer stations
- Backup power supply in case of power failure
- Compact design
- Low installation effort
- Large radio range
- LoRa® radio technology
- External antenna
- Modbus-RTU interface for extensions
- Configurable via USB interface



Functional Block Diagram



Functional Description

Medium voltage side:

- Short circuit detection for two medium voltage lines (#4 inputs) and remote controllable outputs for resetting
- Announcing input for transformer fuse tripping
- remote controllable outputs for switch resetting drive
- Announcing inputs for circuit breaker and earthing switch position
- Announcing inputs for short circuit and earth fault direction indication

Low voltage side:

- Voltage measurement on phases L1, L2, L3
- Limit monitoring for excessive voltage and voltage drops
- Measurement of phase- und neutral currents I1, I2, I3, IN (e.g. via Rogowski coils)
- Limit monitoring of currents
- Measured value logging for analysis in case of limit violation

Station:

- Temperature measurement inputs (PT100) and limit monitoring for e.g. transformer-, room-, airstream (ventilation)
- Announcing input station access (door , motion detector)
- Announcing input transformer monitoring (Buchholz, SF6)
- Announcing input for air stream/ventilation
- Auxiliary announcing inputs for monitoring e.g. of external devices

Modbus-RTU-Interface:

- Modbus RTU Master
- Configurable via USB-Schnittstelle
- For interrogation of external devices such as e.g. low voltage quality measurement (e.g. Janitza UMG..) or medium voltage load flow measurement (e.g. Kies IKI..)

Power supply:

- 230VAC power supply taken from L1-phase
- Internal backup battery for supply in case of power failure (appr. 2h)
- Battery monitoring, low battery alert
- Supply voltage fault indication
- 24VDC-output for supply of external devices

Digital input processing:

- Debouncing of digital inputs
- Configurable announcing delay

Configuration:

- Configuration of all parameters via local USB interface (configuration file)
- Some settings (e.g. limit values) can be changed via the radio interface

Mechanics / housing

- enclosure protection class: IP65
- Weather proof & UV resistant
- Flame retardant
- Dimensions 252mm x 162mm x 90mm
- external antenna for optimum positioning in locations with unfavourable radio conditions
- wall mounting with screws

Radio communication:

- LoRa®-radio technology with secured LoRaWAN®-protocol
- OTAA network join procedure
- 14 dBm transmission power
- -137 dBm receiver sensitivity
- Emitted power and frequencies according EU-Frequency plan
- Interoperable with public LoRa® network providers or on premise/private LoRa® networks
- Synchronisation of internal clock via LoRa®

Communication interface:

- Measured values and alerts with timestamp
- Event triggered transmission (faults, limit violations)
- Cyclic transmission for link monitoring
- Simple integration into IoT platforms
- Payload decoder available
- Interface to scada systems via IEC 60870-4-104 or IEC61850 protocol

Technical data:

Inputs	quantity	Rating / Range	Note
Voltage measurement	3	0 ... 250VAC	UL1, UL2, UL3
Current measurement, Rogowski coils	4	1500 / 3200 Arms	IL1, IL2, IL3, IN
Temperature Measurement	4	-25°C ...+60°C	PT100 4-wire
Earth fault indicator	2	24VDC/ 20mA (6...24VDC)	Dry contact
Short circuit indicator	2	24VDC/ 20mA (6...24VDC)	Dry contact
Transformer fuse	1	24VDC/ 20mA (6...24VDC)	Dry contact
Air flow monitor	1	24VDC/ 20mA (6...24VDC)	Dry contact
Door, motion detector	1	24VDC/ 20mA (6...24VDC)	Dry contact
spare	1	24VDC/ 20mA (6...24VDC)	Dry contact
Outputs			
Supply motion detector	1	24vDC /10mA	
Supply switch reset drive	1	24VDC/ 100mA	
Supply external devices	1	24V /200mA	
Interfaces			
USB 2.0, Micro USB	1	115 200Baud	Service and configuration interface
Indicators			
LED green	1	On: mains power supply Flashing: backup supply	
Led blue	1	Status radio link	LoRa® communication

Remark:

This product continuously is developed further and improved. Information in this document is for guidance only and does not constitute guaranteed properties.

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