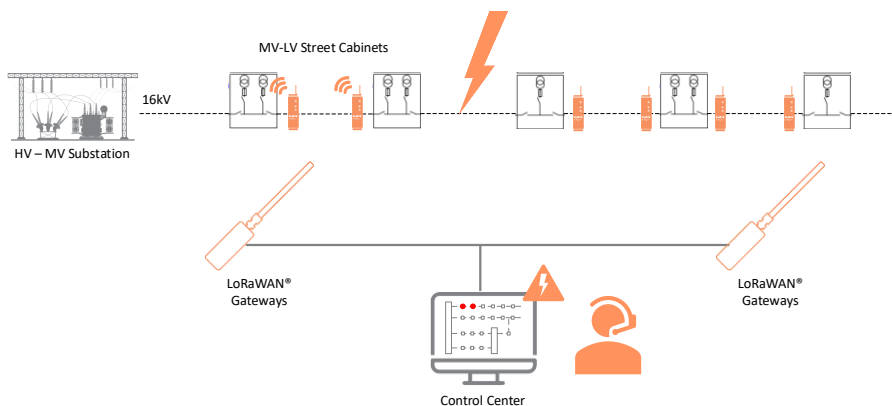# LEM-302
Measurements and fault location detector

LEM-302 is a simple and cost-effective IIoT device that **helps measure field data and identify power interruptions** in the medium-voltage grid effectively.

Fault localisation

Functionality

LEM-302 uses Rogowski Coils to measure the current in 3-phase 4-wire systems at very small intervals in the MV-LV street cabinets. At regular intervals (usually every 15 minutes), the measured data is sent via the LoRaWAN® network to a central database. This data can be used for operational decisions or for the detection of unusual patterns.

If a fault such as a short-circuit is detected, an immediate error message with the over current values is transmitted to the Control Centre within a few seconds. In the Control Centre, an alarm is displayed on the SCADA for each LEM-302 that has detected the fault. The operator can then immediately and precisely guide the service technician to the correct location of the interruption so that the defect can be efficiently repaired. The end customers can thus be restored to electricity much faster than with traditional troubleshooting.


Why install LEM-302?

- ✓ Significant reduction of interruption time
- ✓ Better lifetime of the primary equipment
- ✓ Easy set-up
- ✓ Grid data analytics
- ✓ Installation flexibility
- ✓ Low CAPEX and OPEX

→ Significant reduction of interruption time

| Detection | Travel | Fault localisation | Repair |

The use of LEM-302 in the medium-voltage network significantly reduces the time needed to locate faults in the troubleshooting process. With conventional localisation it takes up to several hours, with the LEM-302 it takes only a few minutes to localise the fault.
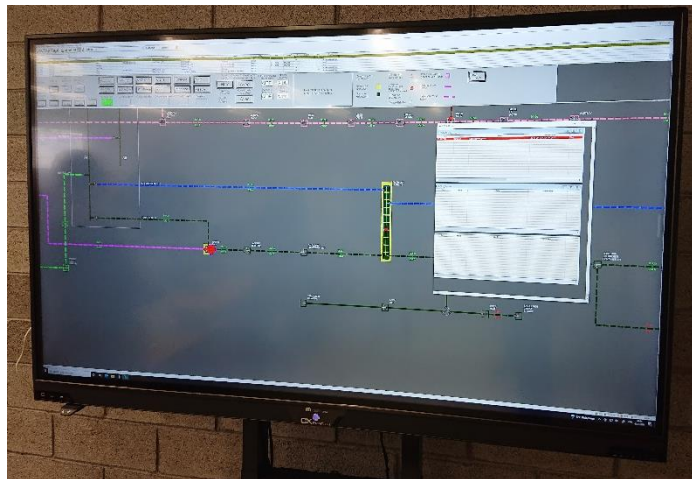

→ Better lifetime of the primary equipment

Since the fault can be precisely located, only those areas of the network that are intact can be connected in a very targeted manner. All other areas remain off the grid until the fault has been repaired. In this way, repeated switching can be avoided, and the installation is not unnecessarily overloaded.

→ Easy set-up

The Elvexys device manager *Manys* enables easy management of the devices in the field, their configuration from remote, such as modify the detection thresholds, and implementation in the communication infrastructure.

The current set-up is optimal and simple for isolated medium voltage networks. The detection algorithms can be adapted and evolved to optimise the operation in compensated networks.
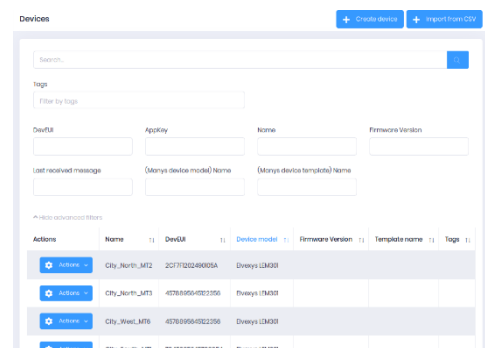
→ Grid data analytics

The data obtained at regular intervals from the field can be used to monitor energy flows, the network load or to detect unusual patterns. Based on this visibility, certain sections can be loaded or unloaded more precisely, or equipment can be maintained at an appropriate time. This reduces the risk of unexpected shutdowns, increases reliability and finally customer satisfaction.
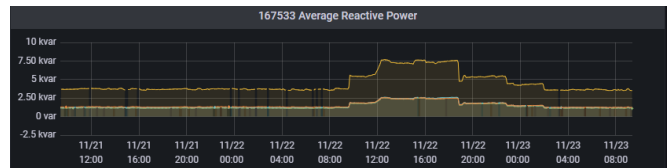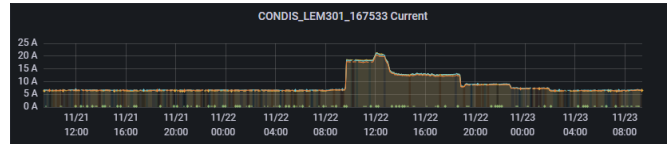
→ Installation flexibility

With its simplicity and small footprint, the LEM-302 is easy to retrofit in the field. The error messages and data can be flexibly displayed where it is needed according to the existing infrastructure. The device is also fitted with power outage resilience through super-capacitors to ensure data collection during events.
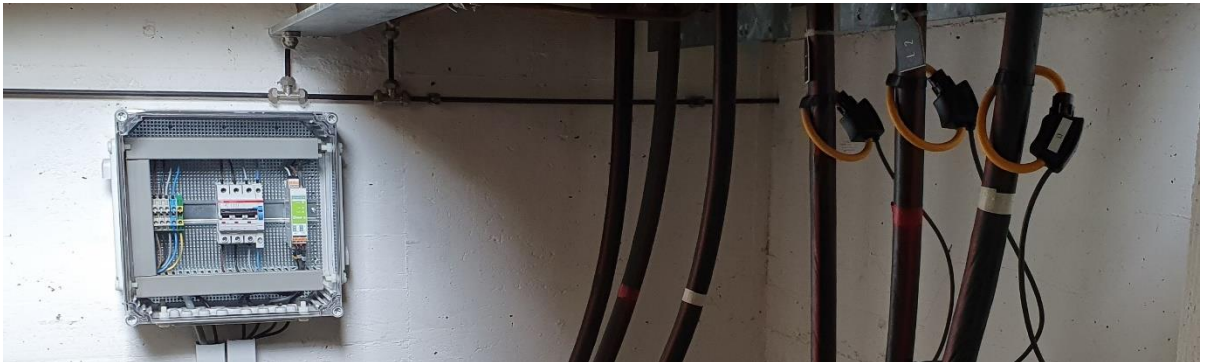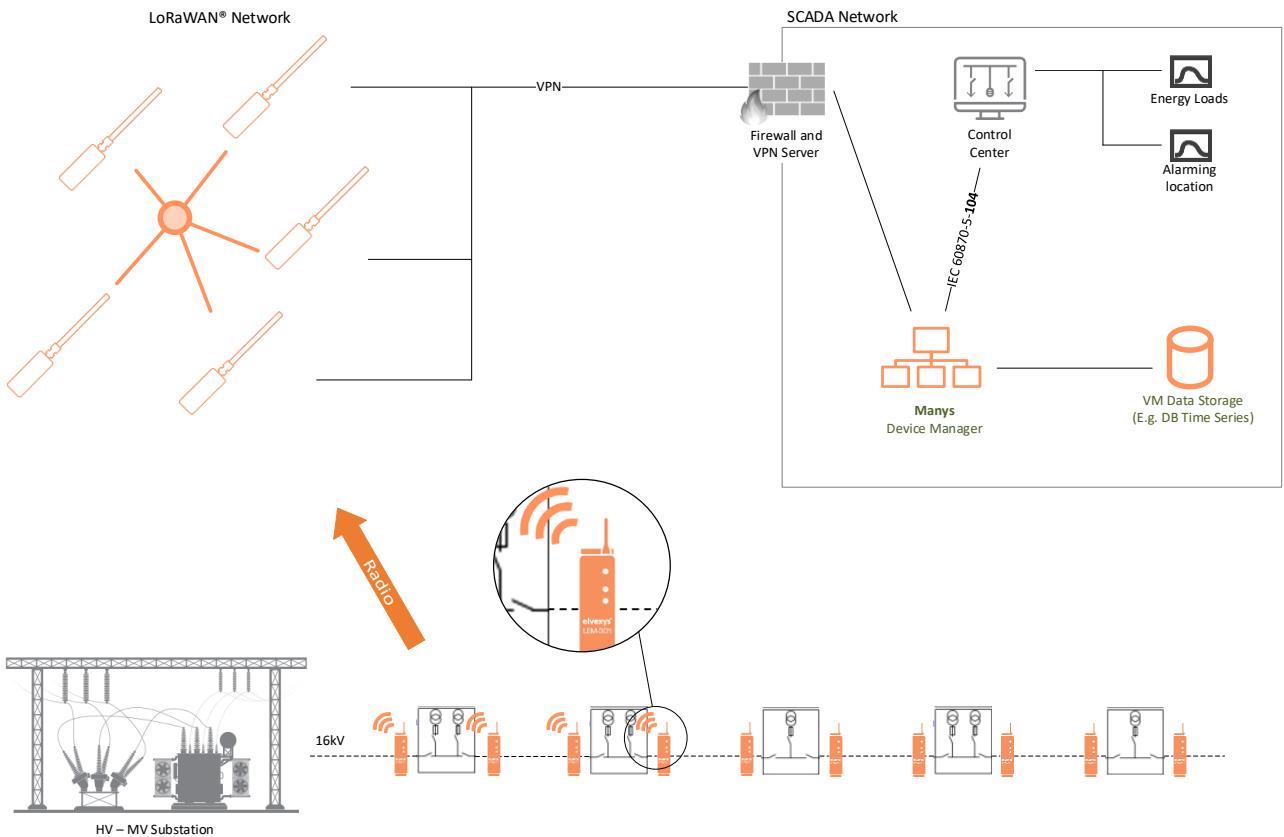

→ Low CAPEX and OPEX

The design and functions of the LEM-302 are optimised to minimise the investment costs (CAPEX). Even so, the LEM-302 is ready for the future and can be extended with new functions if desired. The design is durable and requires no maintenance to ensure very low lifetime costs (OPEX).

Elvexys' services

Elvexys has a large experience and the right tools for processing data from the measurement node to SCADA display. Based on this experience, we can offer you support in the proper deployment of devices in the field, setting up a secure LoRaWAN® communication network and configuring your SCADA inputs so that you get the desired data at the right time and in the right place.

LoRaWAN® Network

SCADA Network

VPN

Firewall and
VPN Server

Control
Center

Energy Loads

Alarming
location

IEC 60870-5-104

Manys
Device Manager

VM Data Storage
(E.g. DB Time Series)

Radio

elvexys
LEM-302

16kV

HV – MV Substation

Registered parameters

- Voltage
- Current
- Peak current during time cycle
- Active Power
- Reactive Power
- Apparent Power
- Power factor
- Active energy

Protocols & Standards

- LoRaWAN®
- IEC 60870-5-104