



## WatchDog pro for energy distribution

### Energy under control

Monitoring transformer stations by logging operational data and transmitting it wirelessly to help prevent system failures.

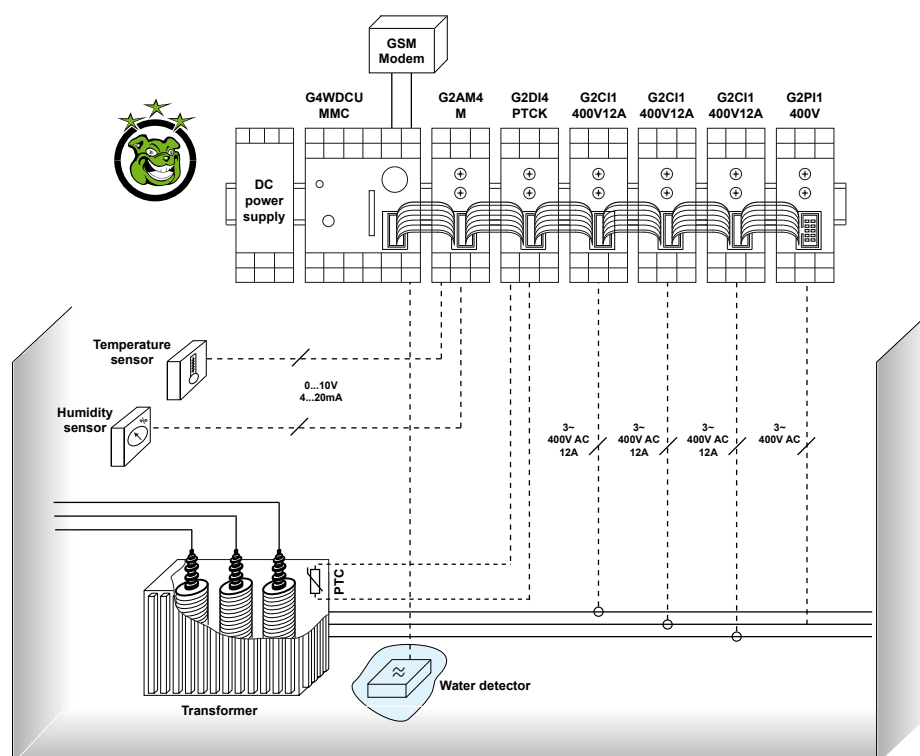
#### Problem

Power utility transformer stations are suffering more and more problems and system failures. Such stations are these days usually only rarely monitored. Without **intelligent monitoring technology** and **related data** logging, transformer station **reliability** starts to drop. Necessary **repairs and downtimes** make running such stations uneconomical. These stations are also frequently situated far away. **So data transfer** from such stations must be ensured by **wireless connections**. Also, **ambient conditions** at such stations are unusually extreme due to **electromagnetic interference** and **temperature fluctuations**.

#### Task

Future system failures need to be prevented by **precisely analysing causes**. **Important operational data** from the transformer stations must be recorded. **Power, voltages, performances, transformer temperatures, room temperatures and humidity** and water penetration must be monitored with the aim of optimizing station reliability. Due to the fact that ambient conditions are unusually extreme, the monitoring system must be insensitive to malfunctions and external influences (electromagnetic interference, supply voltage peaks, temperature range). **Operational data** must be made accessible to the operator via **wireless transmission** with a **malfunction report** being sent in the event of any system **failures**.

#### Basic diagram: transformer station monitoring with WatchDog pro



**WatchDog pro** delivers clear functional benefits over conventional solutions in transformer station monitoring. TELE's system **monitors currents, voltages, performances (effective and idle power)** and, for example, recognizes overloads and unbalanced loads on the low-voltage side. The **transformer, room and outside temperatures along with humidity and water penetration** may also be monitored and recorded. The **WatchDog pro's** integrated **memory card** will locally capture all **operational states** allowing them to be tracked if necessary. This permits the causes of failures to be quickly and simply localized and thus prevented in future through corresponding measures. **Operational data transmission** using the optional **GSM module** will also produce additional benefits. **WatchDog pro's great interference resistance** constitutes an added benefit over other systems employed in such applications.

**Solution**

The **WatchDog pro** monitoring system is also a great cost saver. On the one hand, the **low acquisition price** and, on the other, **simple measuring of electrical and non-electrical properties** mean that its cost compares favourably with that of competitive systems. Downtime and failure costs may also be reduced when **operational data is captured** and **maintenance cycles consequently modified**. Due to its **modular design**, the monitoring system may be **individually adapted** to all applications (for example, current monitoring directly up to 12 A or using shunts).

**Benefits**

- **Monitoring of operational states**
- **Direct measuring of voltages, powers, performances, temperatures – no measuring transducers**
- **Great resistance to interference**
- **Modular design**
- **Wireless transmission of measured data**
- **Remote monitoring**

**Employed WatchDog pro modules**

**G4WDCU MMC**  
art.no.: 2500000

- CPU (central control unit)**
- 4 digital inputs
  - 2 programmable relay outputs
  - optional serial interface connection
  - MMC memory card
  - remote bus connection



**G2DI4 PTCK**  
art.no.: 2500102

- Monitoring of the transformer temperature**
- 4 digital PTC inputs
  - Short circuit monitoring of the sensor circuits
  - Temperature monitoring



**G2CI1 400V12A**  
art.no.: 2500450

- Monitoring of the true power for overload protection**
- Power factor measurement (PF) in 1 or 3-phase mains
  - Recognition of inductive / capacitive consumers and generators
  - Detection of additional measurement parameters (P, S, Q, Ueff, Ieff)
  - 2 measuring ranges 1.2kW and 4.8kW (12A, 400VAC)
  - Suitable for VFI (10-100Hz)



**G2AM4 M**  
art.no.: 2500600

- Monitoring of standard analog signals**
- 2 configurable voltage inputs (0-10V)
  - 2 configurable current inputs (0/4-20mA)
  - 1 programmable output

