Remote transmission of consumption volumes in water supply networks using an energy-self-sufficient GPRS modem

- Secure remote transmission of measuring and diagnostic data such as flow, conductivity, flow speed, pressure, temperature etc.
- Selectable communication protocols for mobile communication applications such as IEC 61131 – 101/104

Water supply networks often cover an extensive geographical area. Buildings such as measuring shafts are therefore usually located in difficult to reach areas. Data/control cables or the power supply lines of the electricity providers have also not always been installed with the construction of the water pipeline. In the past, mechanical water meters were therefore used for measuring the volumes. Due to their technical limitations, these water meters had to be read out manually by operating personnel.

In order to reduce the operating costs of water supply plants, more and more savings are unfortunately being made in the area of personnel. In addition, operators nowadays require highly accurate and innovative water meters, which are wear and maintenance-free and can be read remotely. Existing control and data cables are now often in such poor condition that they cannot be used for modern communication technologies. They also often lack the necessary supply of electricity.

Drinking water is essential to life, which is why the supply of drinking water is one of the most critical infrastructure sectors. Secure data transmission and communication with the control room is therefore essential.

Process solution:
For the high-precision measurement in drinking water distribution networks, operators are nowadays relying more and more on innovative electromagnetic water meters which are wear and maintenance-free. Thanks to a special flow-optimised measuring tube, these water meters can be installed without the need of straight inlet and outlet sections. Measuring data such as flow or even pressure and temperature is transmitted wirelessly using mobile technology. To provide these functions even without a power supply available, the Waterflux 3070 was developed – an electromagnetic water meter which is supplied with internal batteries.

For the transmission of data via wireless technology without an external power supply, the battery powered PSK RTU 50 is available for the customer, which has a modem with integrated SMS/GSM/GPRS technology. In addition, this model has two analogue and four digital inputs, four digital outputs, a serial interface and an Ethernet interface. These send the recorded data of the water meter, and if necessary other analogue (4-20mA) and digital outputs directly to a control system in the central station via the standard remote telecontrol protocols IEC 61131 – 101/104 or Modbus. A commercial standard battery is used for...
Customer benefits:

- Secure data transmission from the field to the control room
- Data logger, gateway and alarm manager in one device
- Complete solution with modem and interfaces in one device
- Quick and easy to configure through intuitive software
- Energy self-sufficient complete solution – from the water meter to remote data transmission
- Integration into all common control systems using standardised remote telecontrol protocols
- Transmission of all data provided by the measuring device such as flow rate, meter reading, flow speed, conductivity, pressure and temperature as well as diagnosis
- Transmission of additional information, such as intrusion detection systems, flood protection etc.

Since communication to the control room is made possible via mobile phone/Internet, a secure connection is essential. This is ensured through the use of VPN technology and the IPSec security protocol as well as modern hardware firewall technology (mGuard). For the configuration of the data logger, easy to use software solutions are available.

Another alternative is the supply of manholes with renewable energy. Ensuring the power supply for the remote data transmission takes place in this case by solar technology. Here, every form of mobile data transmission can be used since the solar installation provides the necessary 24 V DC power supply.

The data logger power supply. For a longer service life, externally connected battery modules are optionally available, as well as connection to the normal power supply (230 V or 24 V). The device can also be used as an alarm manager. With standard batteries, runtimes of up to two years are possible without changing the battery.

Products used:

- **WATERFLUX 3000** with IFC 070 (battery powered), IFC 050, IFC 100 or IFC 300
  - Installation without straight inlet and outlet lengths
  - DN 25 – 600
  - Measurement of flow, conductivity, pressure, temperature, flow speed and other diagnostic parameters (depending on the converter)
  - Pulse, status, analogue or bus communication (depending on the amplifier)

- **Data logger**
  - PSK 50 RTU
  - External expansion battery (optional)

- **Waterwork internet connection**
  - ADSL router/modem

- **Ethernet security**
  - M-Guard