

Remote transmission of consumption volumes in water supply networks using wireless technology

- Secure remote transmission of measuring and diagnostic data such as flow, conductivity, flow speed, pressure, temperature etc.
- High operating range of the wireless system through adjustable data rates

Water supply networks often cover an extensive geographical area. Buildings such as measuring shafts or water towers are therefore usually located in difficult to reach areas. Data and control cables for connecting the buildings have also not always been installed with the construction of the plants. In the past, many plants in the water industry worked independently and were decoupled from the control room. Costly manual inspections were therefore inevitable.

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 the provision of all available process and plant data. Existing control and data cables are now often in such poor condition that they cannot be used for modern communication technologies.

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:

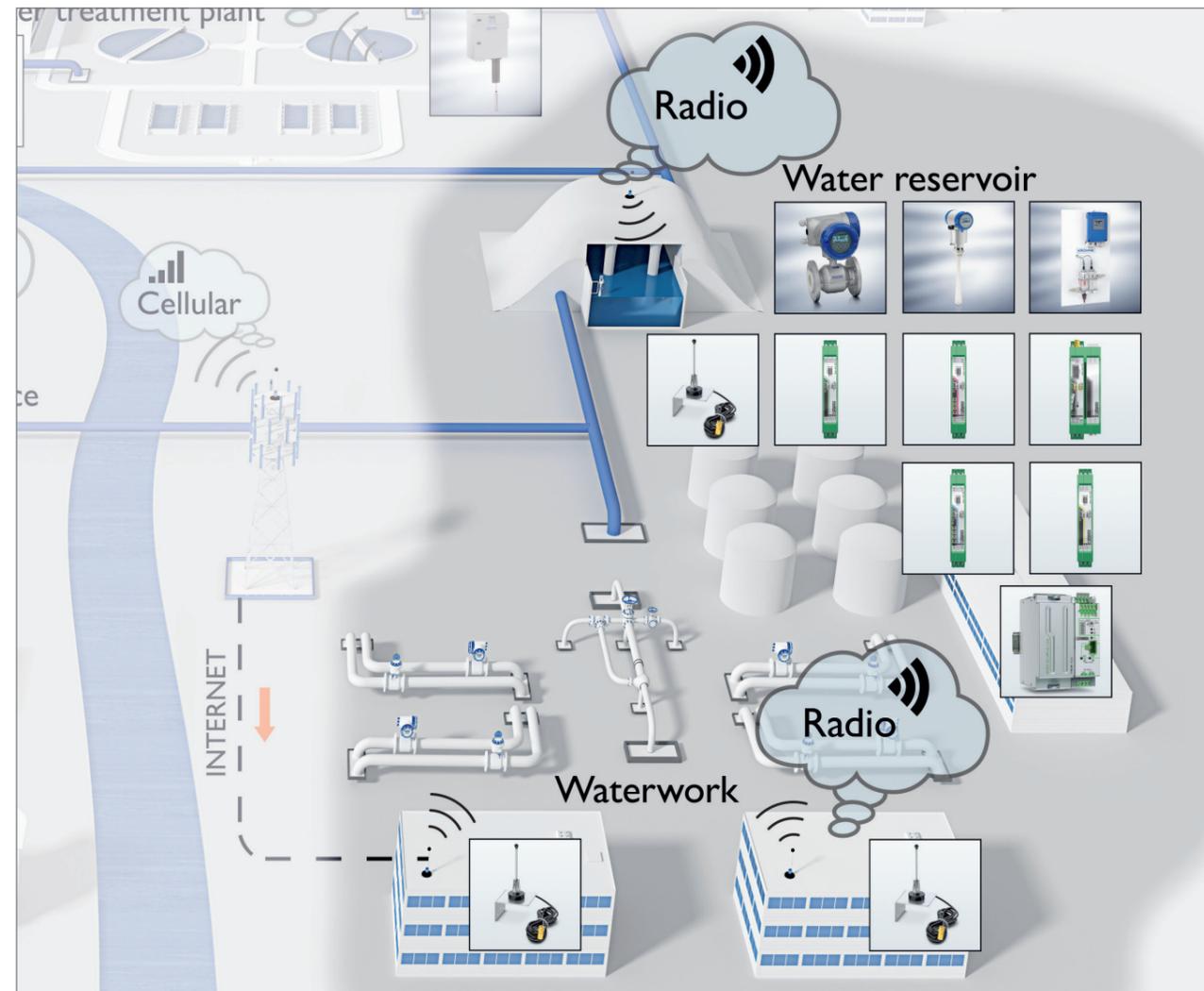
For the high-precision measurement in water towers, operators are nowadays relying more and more on innovative electromagnetic water meters which are wear and maintenance free. Thanks to a special flow-optimised measuring tube, these water meters can be installed without the need of straight inlet and outlet sections. Measuring data such as flow, fill level, conductivity, chlorine or even pressure and temperature is transmitted wirelessly using radio and mobile technology.

With wireless transmission, serial data such as Modbus communication as well as I/O mapping such as analogue or digital signals can be transmitted. With I/O mapping, each respective input is assigned to an output using direct addressing. This is performed simply by turning the thumbwheel on the radio module. This type of radio system can also be used to network multiple controllers or serial I/O devices via RS 232/RS 485 serial interfaces.

I/O mapping is used, for example, to transmit both the digital pulse output as well as the analogue 4-20 mA output of the water meter. Measuring devices with Modbus communication are transmitted via the RS 232/485 serial interfaces. Thanks to the modular expandability of the radio module, an endless number of water meters can be connected from the field to one radio module. Ranges of up to 20 km

and through difficult terrain can be extended significantly through the use of repeater slave stations. Data security is guaranteed through the latest encryption methods. A diagnosis of the system is also possible using the provided software.

With this wireless system, different network structures such as point-to-point connections or complex mesh networks of up to 250 wireless stations can be mapped. In manholes without power supply, self-powered water meters with battery supply can also be used. Ensuring the power supply for the remote data transmission takes place in this case by solar technology.



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)

- OPTIWAVE 5200, two-wire FMCW radar
 - PP or PTFE Wave Horn antennas for the measurement of corrosive products
 - Modular design: horizontal or vertical position of housing is suitable for almost all installations
 - Optional local display with an integrated 4-button keypad.
 - Quick coupling system permits removal of the housing under process conditions and rotation of the housing through 360°
 - Bayonet housing cover permits easy opening and closing of the housing, even after years in service
 - Measuring range up to 30 m / 98.4 feet

- OPTISYS CL 1100, chlorine measurement system
 - ASR - Automatic Sensor Cleaning feature for reliable measurement
 - Ready to use measuring system
 - Unique combination of a membrane-free sensor with 2 gold electrodes for long-term stability and easy maintenance
 - Suitable for measuring free chlorine, chlorine dioxide or ozone

- Control technology:
 - Inline/Axioline

- Waterworx function block library

- Radioline wireless transmission technology
 - 868/900 MHz for connection in the field over distances up to 20km

Customer benefits:

- Secure data transmission from the field to the control room
- Easy configuration of wireless technology
- Modular control technology for different requirements
- Energy self-sufficient complete solution – from the water meter to remote data transmission
- Transmission of all data provided by the measuring device such as flow rate, meter reading, flow speed, conductivity, pressure and temperature as well as diagnostic values
- Transmission of additional information, such as intrusion detection systems, flood protection etc.