

Remote Monitoring Solution for water industry



IIoT – Industrial Internet of Things

The Internet of Things

- The **Internet of Things (IoT)** is the network of physical devices, vehicles, home appliances, and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these things to connect and exchange data, creating opportunities for more direct integration of the physical world into computer-based systems, resulting in efficiency improvements, economic benefits, and reduced human exertions.

(Source : Wikipedia)

- IIoT – Industrial Internet of Things. The “**Things**” – our **E+H instruments**.

IIoT and Instrumentation



Measure in
the field



Transmit
data



Store and
process



Make information
visible

- Combination of **instrumentation** and **IIoT Services**
- Transmission of **process information** into the Cloud based storage
- Provide functionality beyond process data with **visualizations, evaluations and additional functions**
- All information always at the hand with the **Smart App via smartphone or tablet**
- **Highest security** for control command with **authorized user** only allowed to change the process remotely, eg stop the pump, divert the distribution network flow

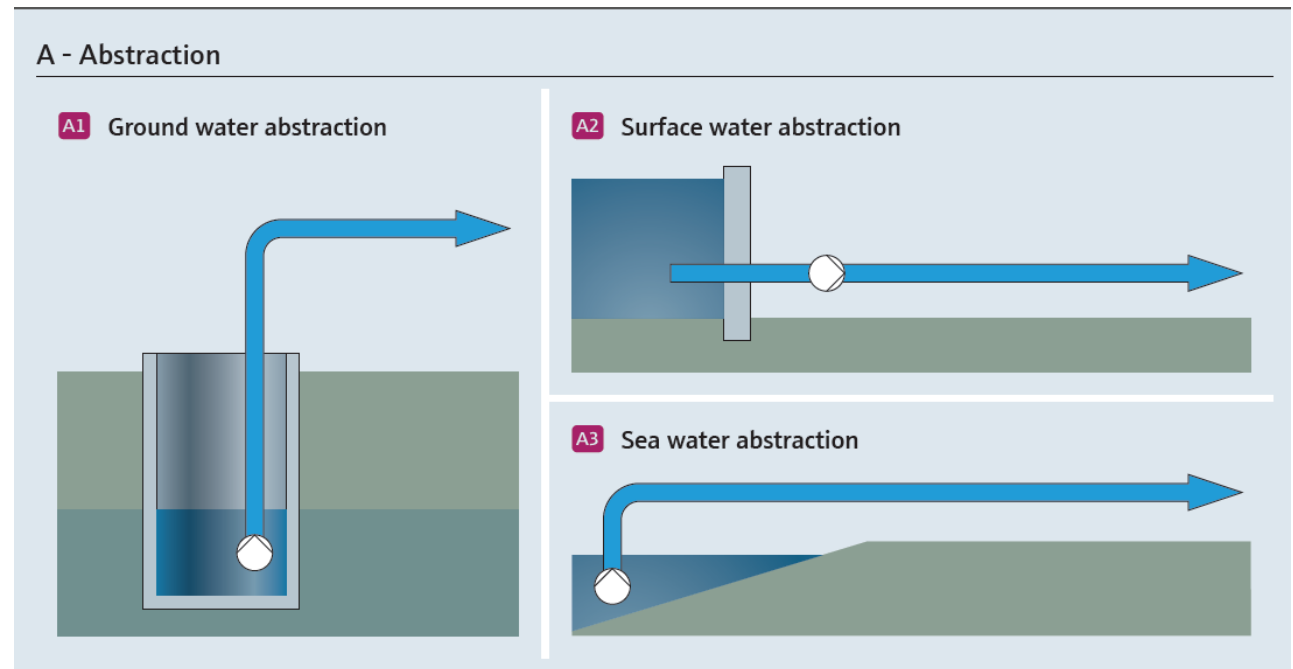
Application in water industry



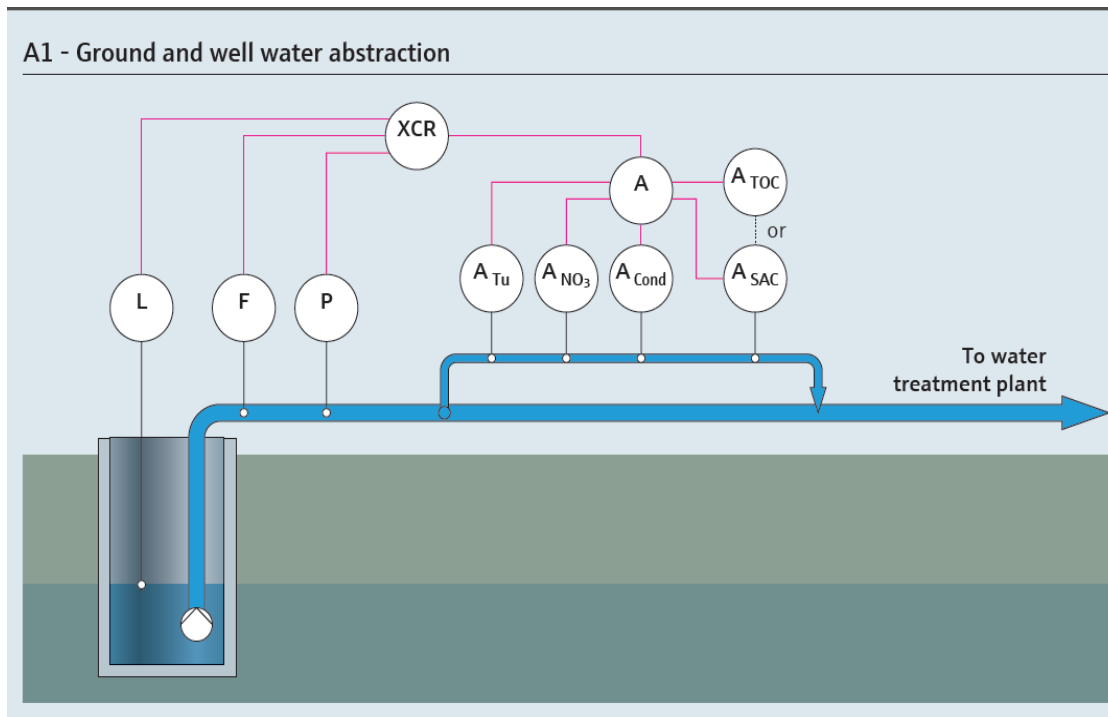
- Surface water monitoring
- Dam level, reservoir level or pressure
- Booster station or pumping station
- Water Treatment Plant
- Distribution network

Surface water monitoring

- **The quality of the available raw water** influences the water treatment process.



Ground water abstraction



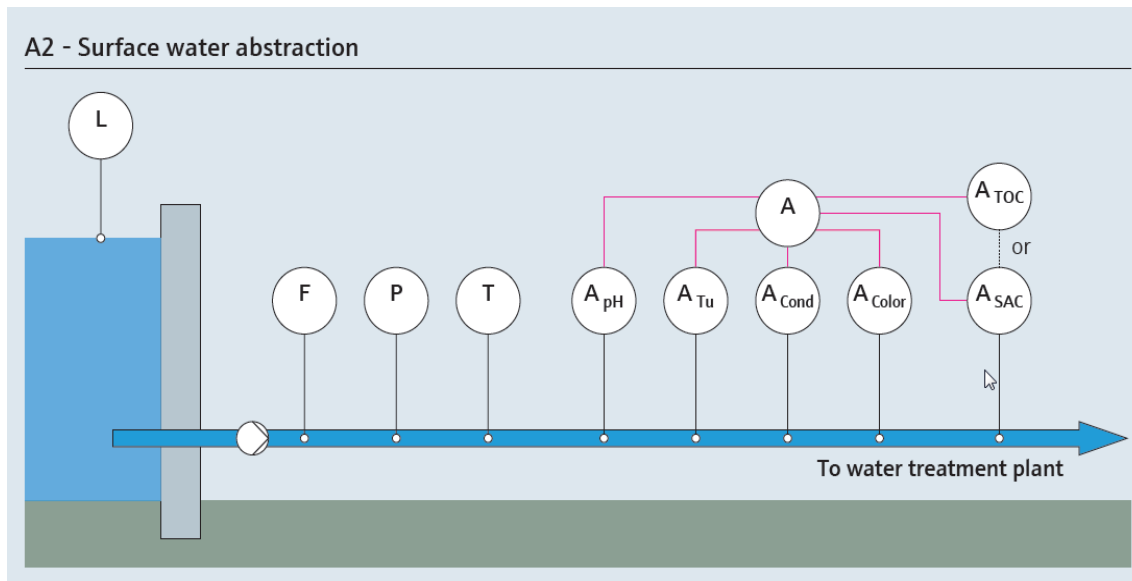
Obligatory parameters

- **Flow:** intake amount (L400/10L)
- **Pressure:** pump performance
- **Level:** legislation compliance (FMX21)

Additional parameters

- **Turbidity:** higher values can be caused by rainfall (CUS51D).
- **Nitrate:** Indicates agriculture pollution (CAS51D).
- **Conductivity:** Indicates increasing salt concentration (CLS50D/CLS21D).
- **TOC, COD or SAC**
Indicates organic pollution from contaminated fields, waste water infiltration, landfills , etc. (CAS51D SAC)

Surface water abstraction



Obligatory parameters

- **Flow:** Intake amount (L400/W400/10L).
- **Turbidity & Temperature:** important in deciding point of water intake (CUS51D, TR10).

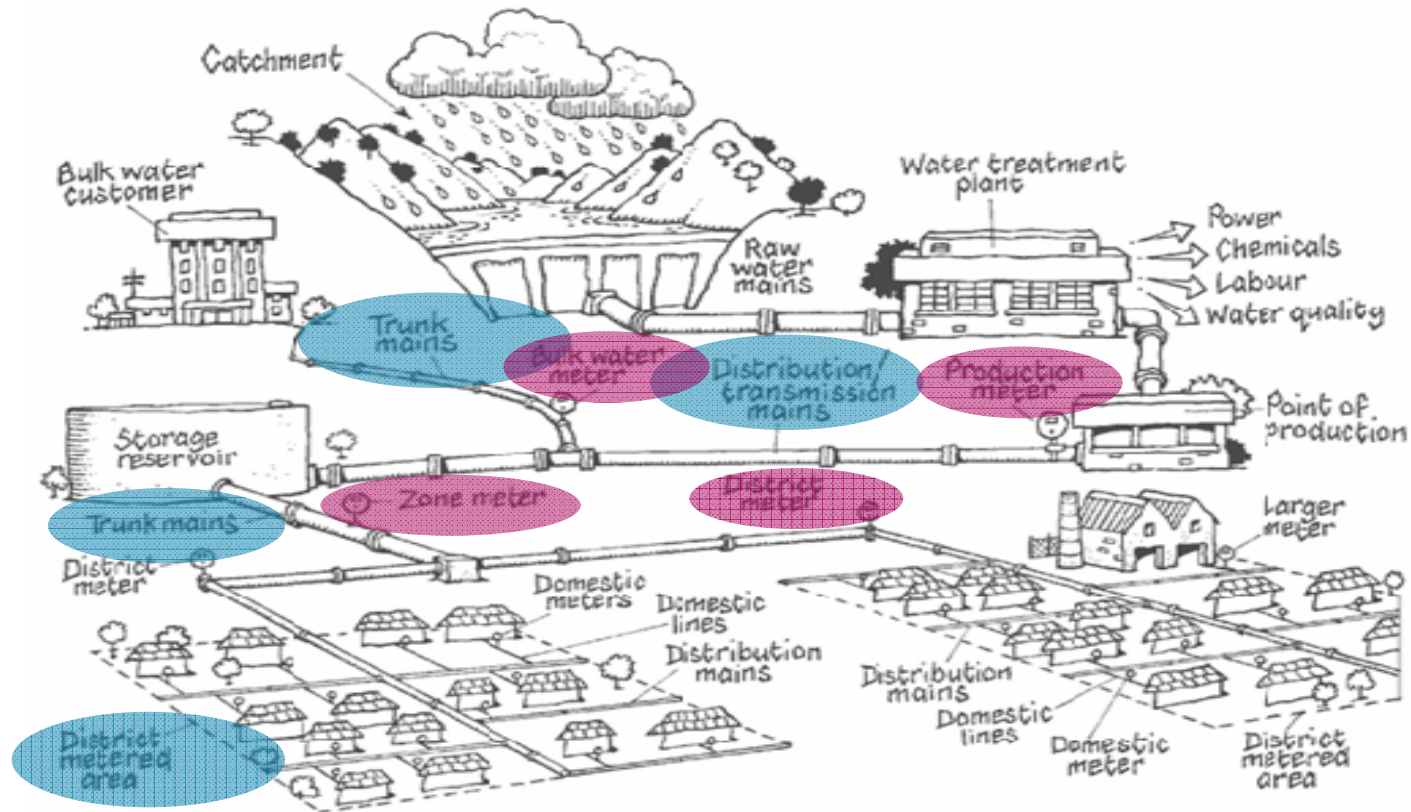
Additional parameters

- **Conductivity:** indication of illegal discharges (CLS50D).
- **Oxygen:** indication of bacteria load (COS51D/61D).
- **SAC (COD, TOC, BOD):** indicator of oxygen consumption → pollution (CAS51D SAC).
- **Level (dams):** minimum level of water to be sustained to preserve water body (FMX21).

Water Distribution Networks



Distribution Schematic



Typical instrumentation in distribution networks

Level

(storage tanks)

Pressure

(Plant Outlet, Net)

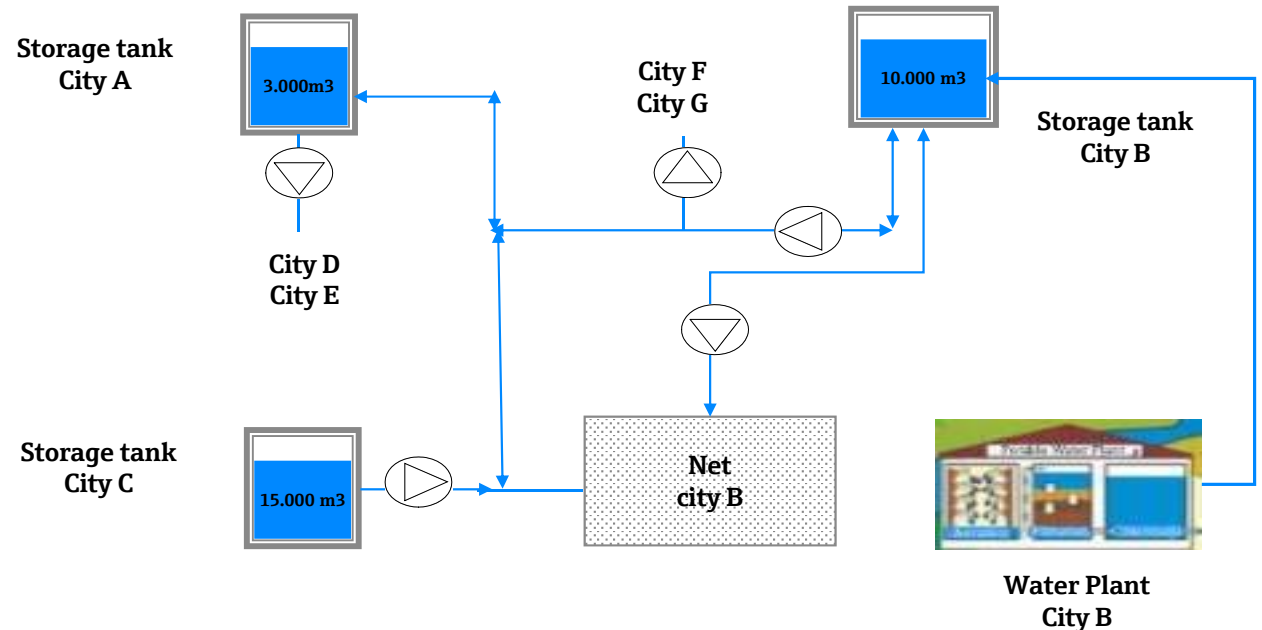
Flow

(plant outlet, in- and/or outlet of storage tanks, pressure stations)

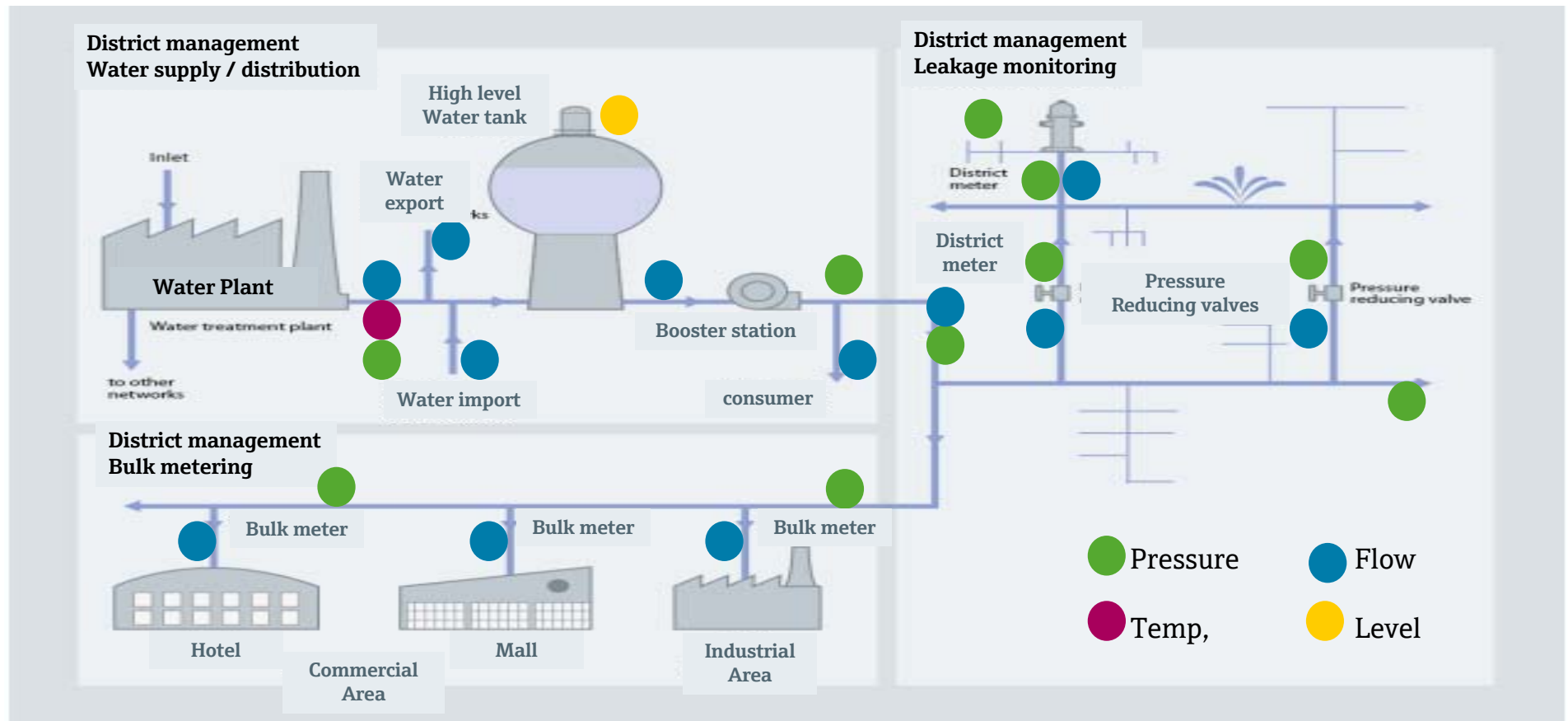
pH-adjustment

Disinfection

Pump control



Hydraulic Management of Distribution Sub-Networks

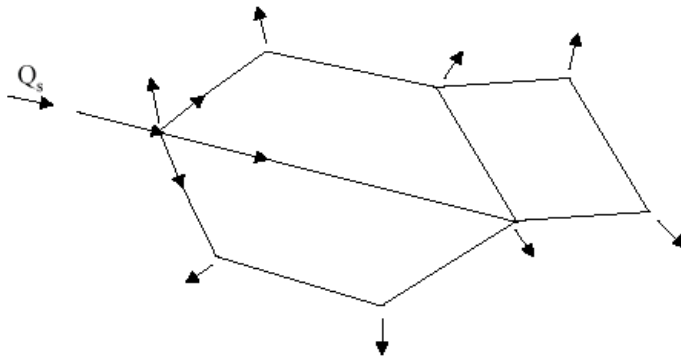


Water distribution networks

- Water losses → detection
- Water quality → quality gates



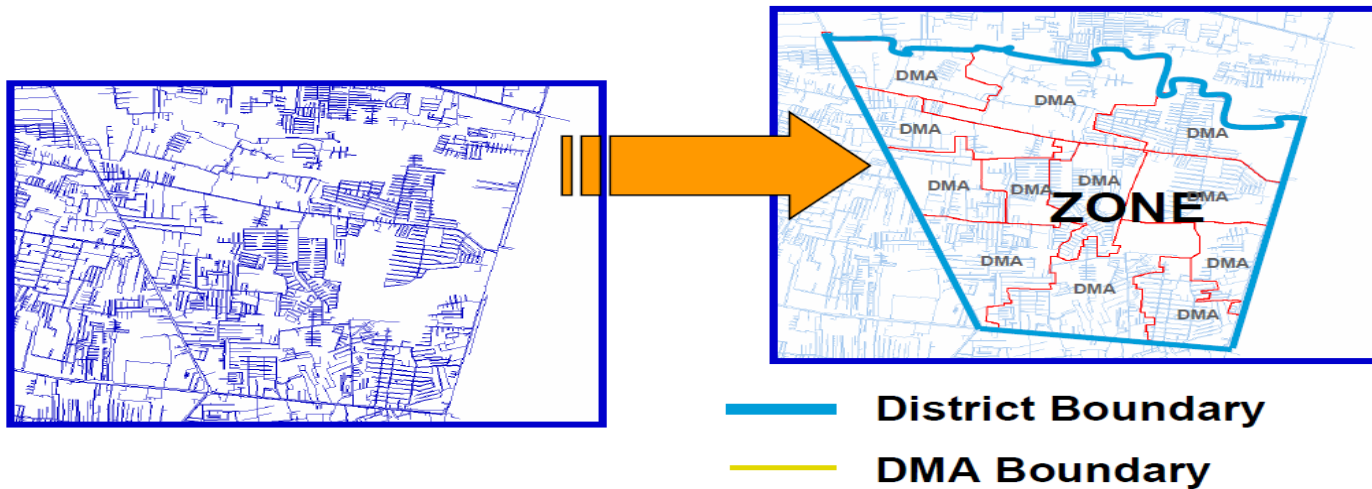
Leakage Detection – Statistic check via district metering



- Flow measurement (night time when consumption is assumed 0)
- Evaluation of flows (speed, direction) and pressure loss on the junctions
- Mathematic correlation between pipe trunk to establish where the leakage could be
- Afterwards: active check

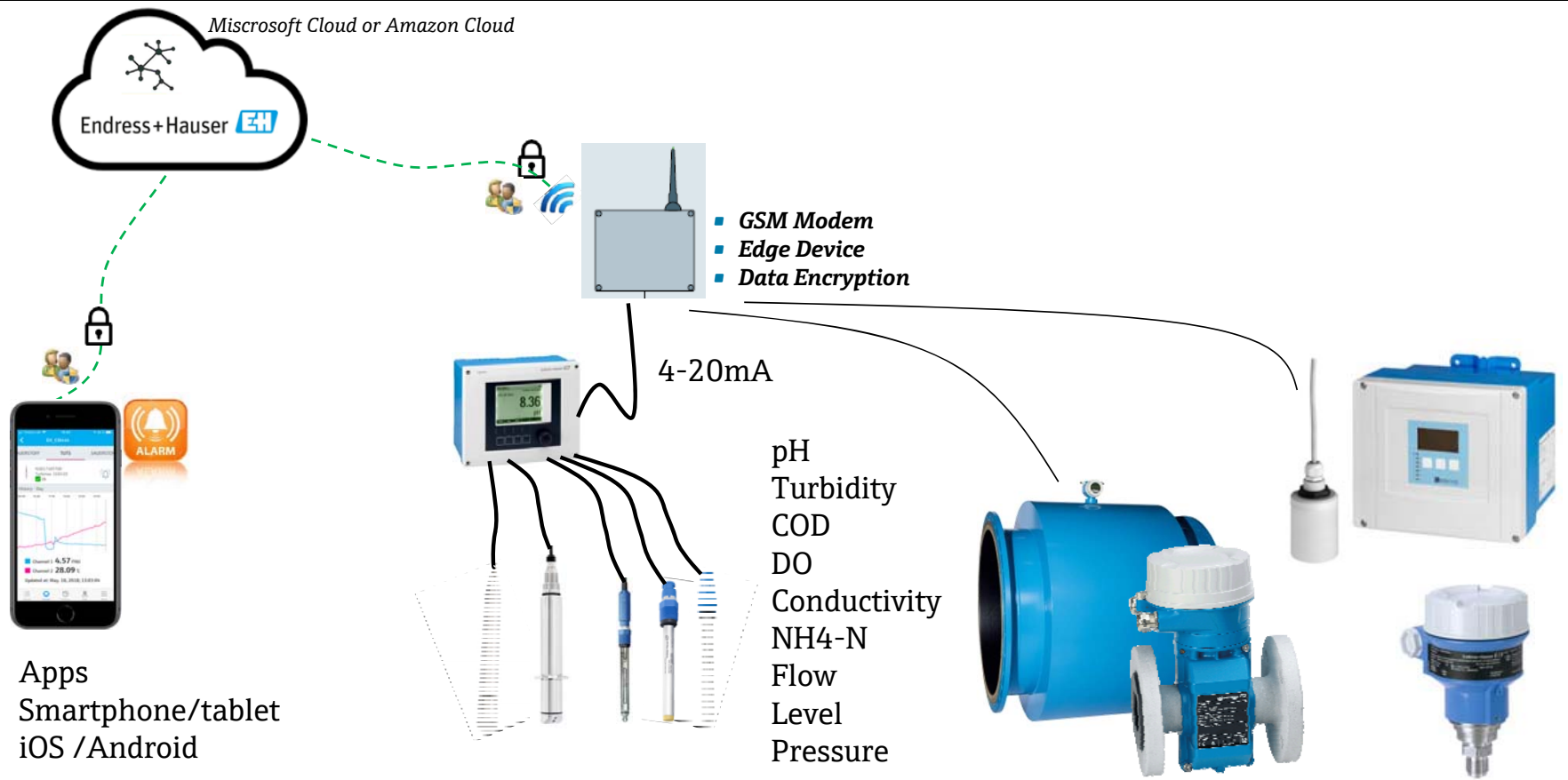


Solution: District metering

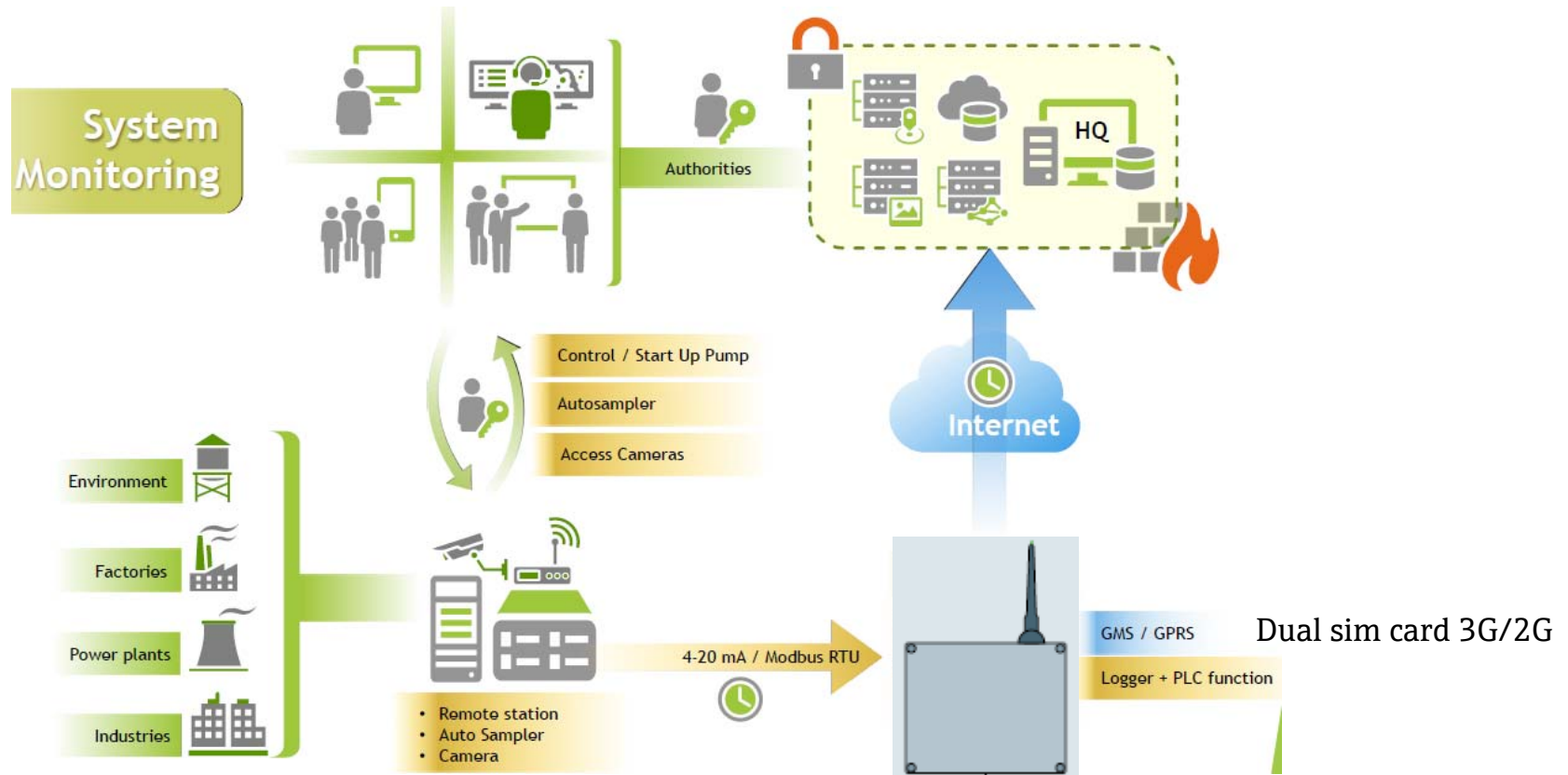


- This concept **divides a drinking water network into homogeneous segments**. A study of these different segments allows a network status diagnosis to be drawn up.
- The volumes relating to the different areas are measured, recorded, then transmitted to a SCADA central station.
- District metering management reduces leakage, thus providing a strong contribution to network efficiency.

Remote Monitoring – quality monitoring

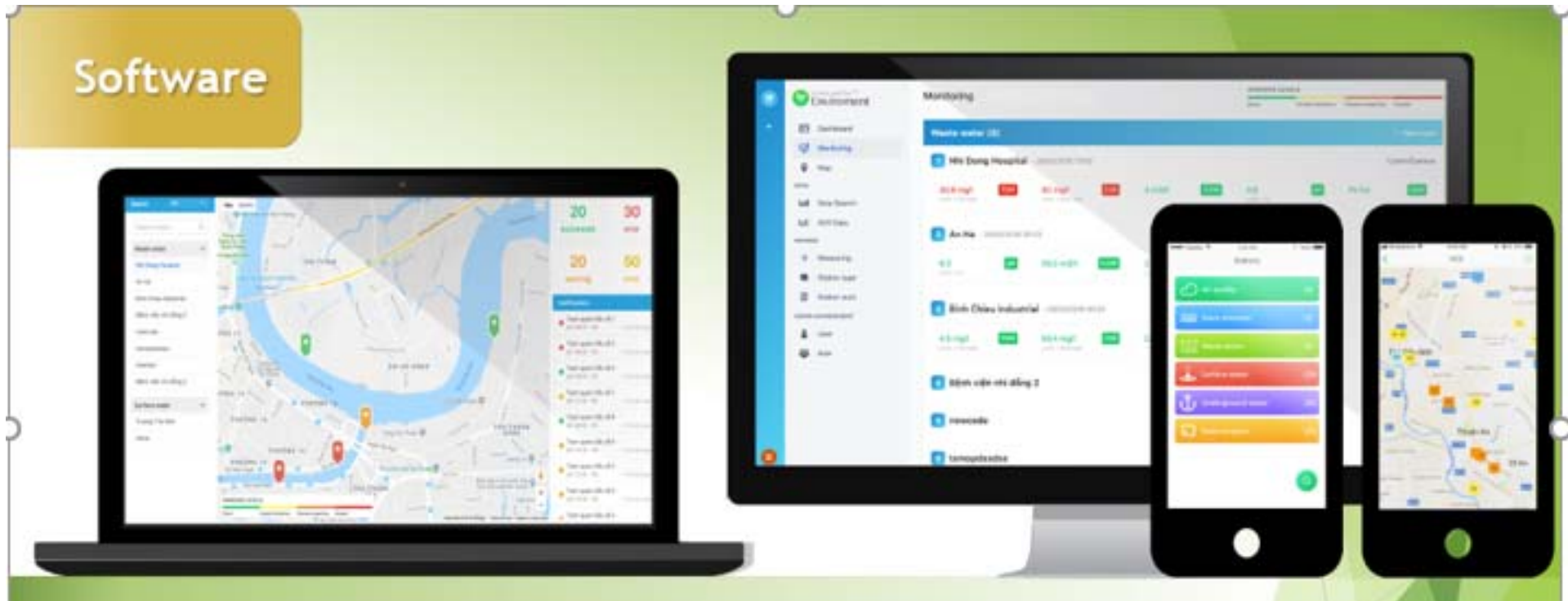


System Overview



Remote Monitoring Solution for water industry

Water Quality Monitoring



Remote Monitoring Solution for water industry

Water Distribution Monitoring



Demonstration

Questions?

