Masinotek

High technology environmental data collection and management

Industry Water Utilities Research

Masinotek

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Groundwater monitoring for water quality and sustainability

Drinking Water Treatment webinar Iran – Finland
February 14, 2022

1. Masinotek introduction
2. Customer case
3. IoT sensors and water
4. Technical concepts
5. Groundwater solution
6. Data analysis

Masinotek introduction

- Finnish ICT company: integrator of software and environment sensor solutions, propietary environmental monitoring/mapping software - EMMI
- Customer base: water utilities, waste landfills, research institutes, environmental authorities

Central Finland Environmental Authority-winter salting of roads

- Laboratory analysis- high levels of salinity in groundwater
- Groundwater levels and conductivity monitored by Masinotek
- Basic formula adapted to local conditions used to calculate salinity levels in the water

Traditional laboratory measurements

- Widest scale of parameters available
- Logistics of gathering, transporting samples within short time frame
- Human error factor in sample taking and analysis

In-situ online measurements

- Real time physical/chemical parameters
- Much higher statistical power due to frequent measurements
- Complement laboratory analysis and reduce needed sampling frequency

IoT sensors and water

Numerous sensor/logger manufacturers

- Require own software subscription to read data
- Offer some but not all types of sensors
- No ability to edit data points, add manual measurements, integrate other data
- Not many have the ability to integrate with customer software such as FRIM

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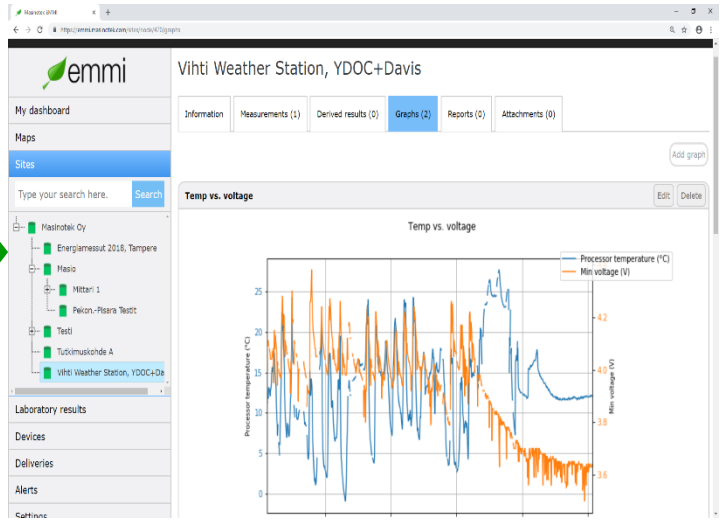
- Unlike sensor manufacturers: software, data expertise
- Software ideal for integrating data and sensor data from different manufacturers
- Comprehensive picture of environment conditions

Three component system

1. Measurement sensors communicate with data loggers
2. Data logger/modem:
   saves/sends measurements from sensors
3. Internet servers receive data:
   data visualization and analysis on EMMI software platform

M2M

GSM/LoRa



Application Program Interfaces (APIs): the means by which software programs transfer data

- Open data: public weather station data
- Laboratory water sample analysis data
- Data transfer between EMMI environment software and customer software such as Field Remote Infrastructure Management (FRIM)

API

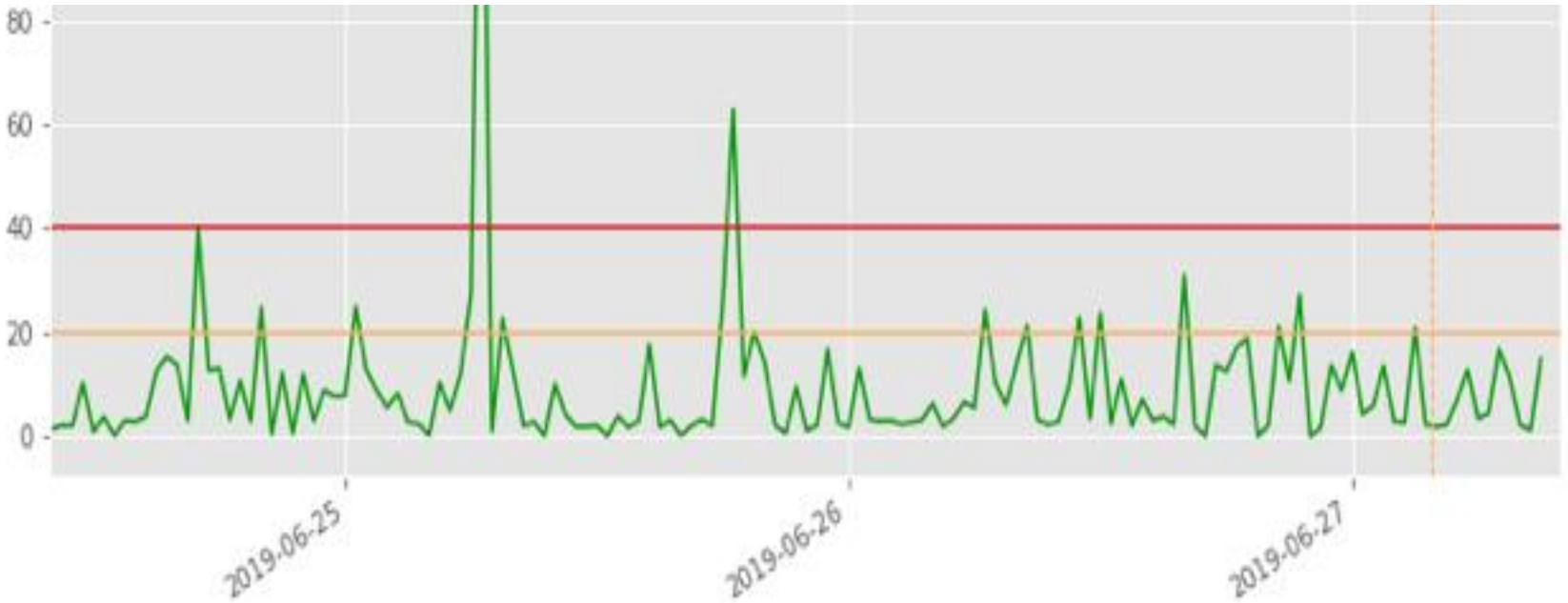
IoT

emmi

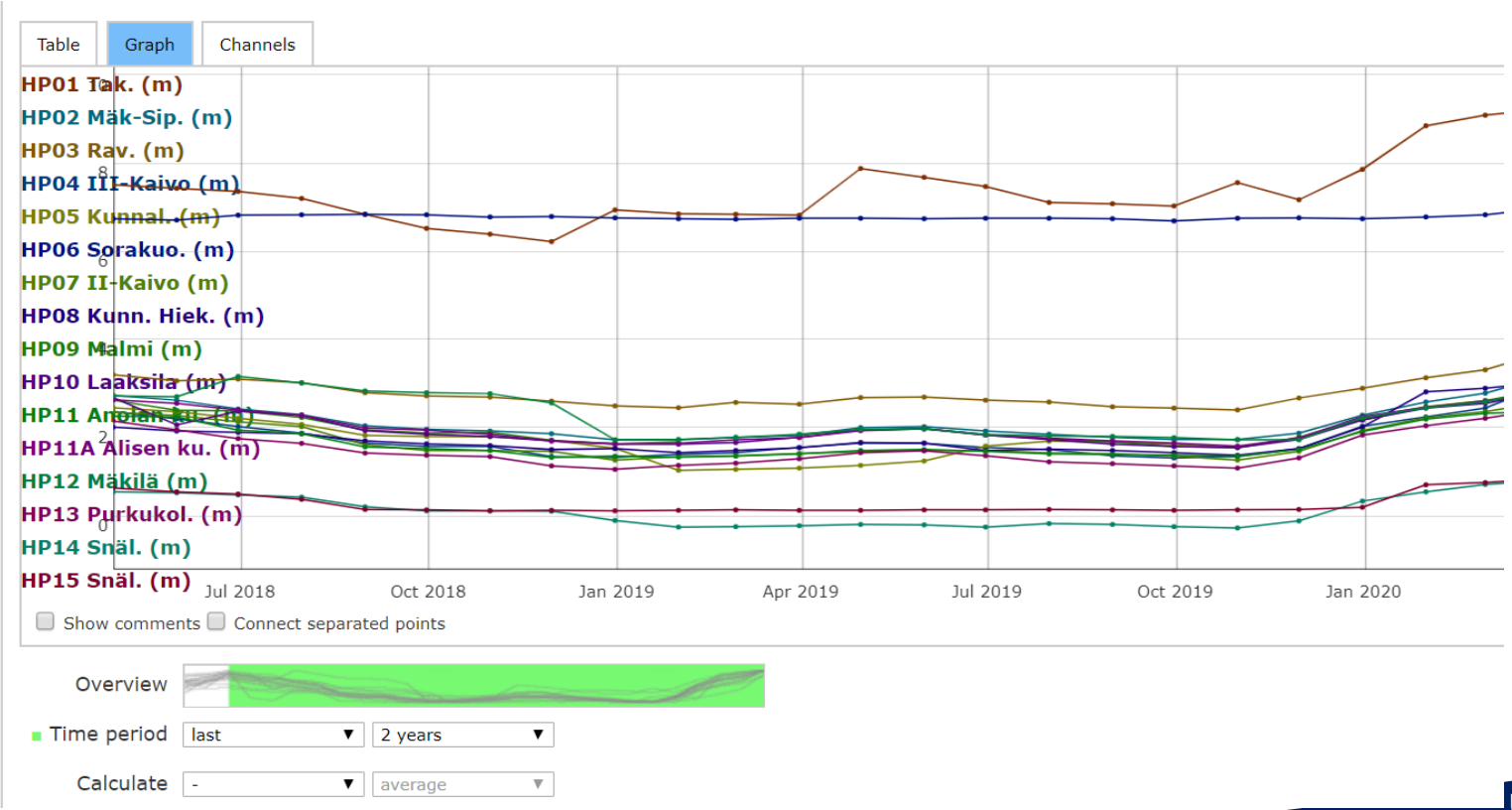
API

FRIM

- Alarms alerting reduction in water levels or higher conductivity
- Alarms also show historical levels and inform when levels return to normal
- **Application:** Trigger for water conservation measures, pollution investigation



- Comparison of abstracted water to groundwater levels and rainfall to monitor replenishment rate
- Multiple groundwater surface level measurements can show if flow of groundwater direction is changing bringing change in water quality
- Monitoring of conductivity as indicator for salinity, pollutants, bacterial activity



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Thank you!

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