

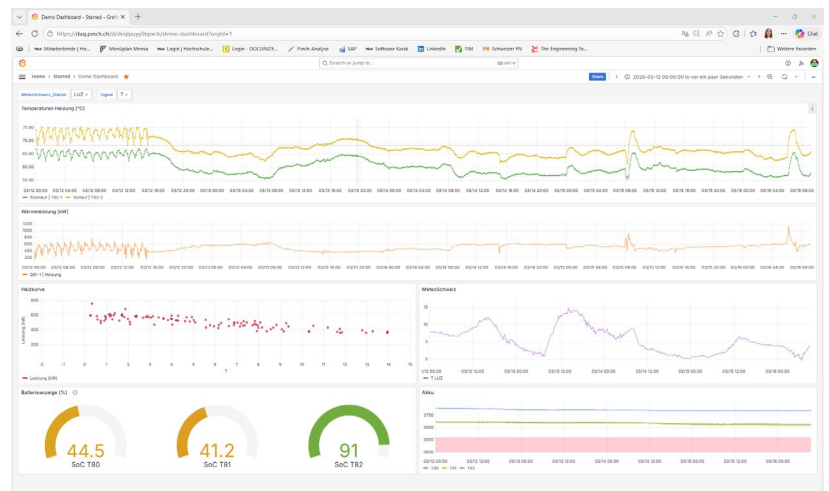
## Pinch-Messkoffer

Measuring equipment for thermal power to support pinch analyses with the following key benefits:

- Simplified measurement processes that reduce costs and installation time
- Wireless modules for flexible and convenient data acquisition
- Cloud connectivity for seamless monitoring and evaluation
- Accurate surface temperature measurement with user-friendly operation to determine the fluid temperature inside the pipe (possible deviation  $\pm 0.3^{\circ}\text{C}$ )
- Precise liquid flow measurement using industrial measuring device (Flexim FLUXUS F601)  $\pm 1\%$

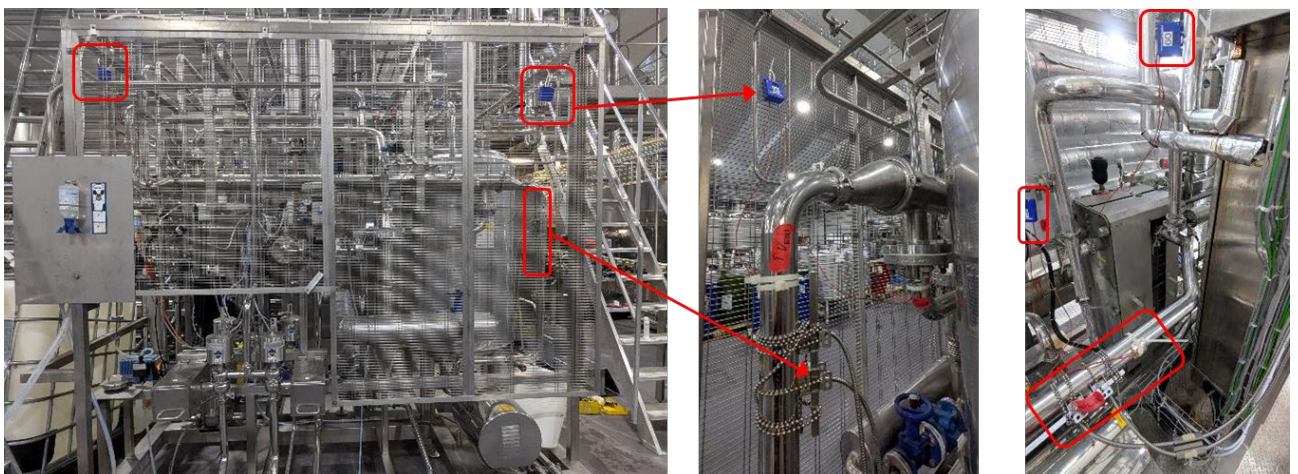
### Cloud Based Data Access

- Real time online visualization
- Interfaces compatible with most analysis software
- Control & documentation of settings
- Individual customer access
- SSL encryption for secure data transmission
- Hosting on SWITCH (CH) for compliance with high data protection standards
- Offline mode possible
- Demo: [daq.pinch.ch](http://daq.pinch.ch)  
Login: [daqdemo](http://daqdemo) | HSLU2025



### Application Example in a Food Factory

Measurement on two floors with 2 flow sensors, 10 PT100 sensors, 1 gateway & 1 mobile router



## Specifications

### Sensors

Temperature

- 2 PT100 sensors per transducer  $\pm 0.3^{\circ}\text{C}$
- Deviation from core temperature  $-0.4\text{ K}$  at  $80^{\circ}\text{C}$  due to small mass and direct contact
- Easy & flexible installation with aluminium tape
- Standard:  $-40^{\circ}\text{C}$  to  $180^{\circ}\text{C}$
- With possible destruction: up to  $250^{\circ}\text{C}$

Volumetric Flow with Flexim FLUXUS F601

- RS232 communication
- Records device settings
- External power supply needed

### Measuring Transducer

- Display to check
  - Measurement values
  - Batterie level
  - Wifi connection status to gateway
- Measuring interval 10 s, send interval 30 s
- Wifi (ESPnow) connection to gateway for reliable data transmission (5 – 20 m)
- NiMh batteries for temperature measurement
  - Lasting for 3 – 4 months depending on ambient temperature & Wifi connection
  - Non-flammable
- USB-C power adapter for flow measurement
- $-20^{\circ}\text{C}$  to  $50^{\circ}\text{C}$
- Simple splash water protection, interior usage

### Gateway

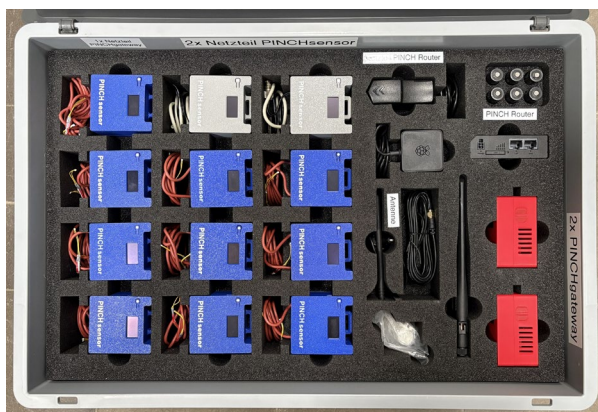
- Independent local InfluxDB v2
- Collect all sensor data
- Replication to cloud every 5 minutes in case of internet connection
- Data storage local and offline mode possible
- $-10^{\circ}\text{C}$  to  $40^{\circ}\text{C}$
- No water protection, interior usage
- External power supply needed

### Web-GUI

- Connect to gateway via web browser with PC or mobile phone
- Hotspot mode for configuration for 5 minutes after start-up
- Define measurement
  - Measurement ID
  - Signal names
  - Heat power calculation using data from CoolProp
  - Chose internet connection with Mobile Router or local Wifi for internet connection
- Monitor signals in real time during setup
- Download measurement as Excel-File
- Clock of the gateway is synchronized for offline operation

### Mobile Router

- IoT-SIM chooses the strongest of the 3 available Swiss LTE networks
- Independent device & external antenna to provide flexibility in positioning for optimal Wifi & Mobile connections



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