

# Endress+Hauser: Thickener Optimisation Solutions

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21 Jul 22



# GoToWebinar Interface

The screenshot displays the GoToWebinar interface during a presentation. The main content area shows a slide titled "Example Presentation" with a navigation menu (Products, Solutions, Services) and a video player showing two workers on a platform. The interface includes a top navigation bar, a right-hand control panel, and a bottom status bar. Annotations with blue arrows point to specific features: "Download the presentation and other files here" points to the top right; "Increase/decrease webcam window here" points to the navigation menu; and "Enter your questions here" points to the question input field in the control panel.

Download the presentation and other files here

Example Presentation

Increase/decrease webcam window here

Enter your questions here

GoToWebinar

## Presenter

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**Taylor McKertich**  
Regional Industry Manager  
*Mining, Minerals & Metals*

## Agenda

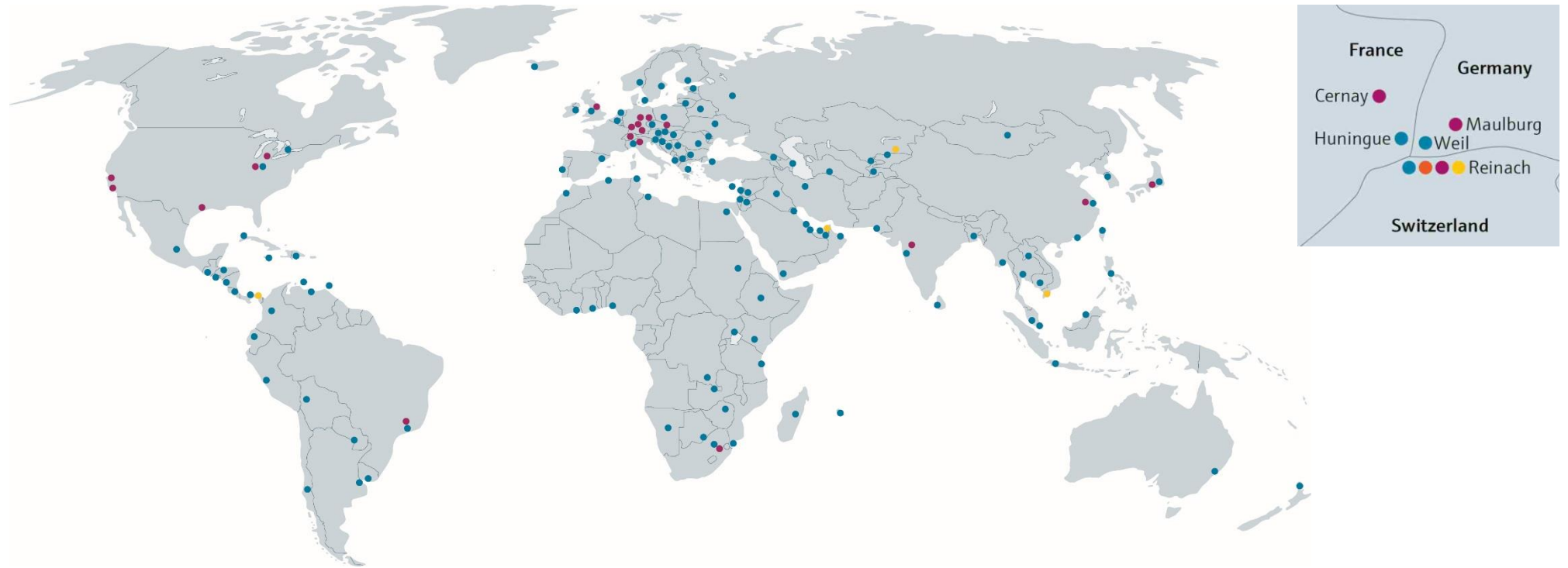
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- An overview of the parameters you can measure for your thickener
- The benefits of utilizing the recommended devices for each measuring point, including case studies
- Innovations in instrumentation for thickeners
- Questions and conclusions

## Facts and figures 2021



## Endress+Hauser: an introduction



- Holding company in Reinach, Switzerland
- 24 production facilities in 12 countries
- Sales centres and representatives in more than 120 countries
- Regional sales support centres

## Endress+Hauser International Asia Pacific – facts and figures 2022



Regional head quarter in  
Ho Chi Minh City, Vietnam

Supporting  
**15** countries

Regional workforce of  
**50+**

Founded on  
01.12.2011

Offices  
**4**

**12**  
Sales channel  
partners (SCPs)

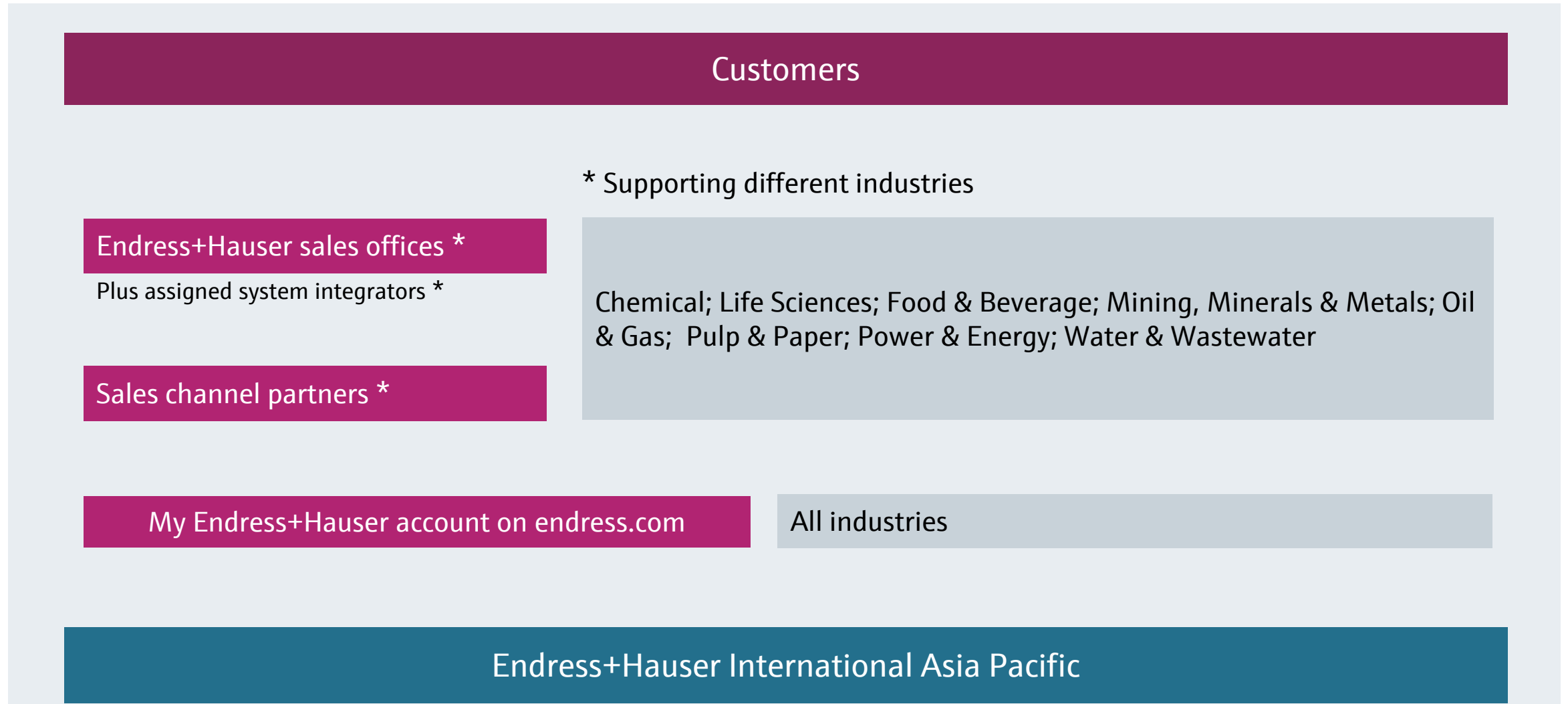
## Endress+Hauser International Asia Pacific - mission



- Supporting and developing sales offices, representative offices and sales channel partners of Endress+Hauser around Asia Pacific region
- By annually conducting a Partner Quality Audit we ensure that our customers have the best experience dealing with our local sales channel partners
- Helping our customers to improve their processes regarding quality, efficiency, cost savings, plant safety and sustainability



# Endress+Hauser International Asia Pacific - organization's structure



# Our commitment to net zero emissions



We are committed and support decarbonization and climate goal initiatives.



We are investing in people, products, solutions and services to support the development of the hydrogen industry.

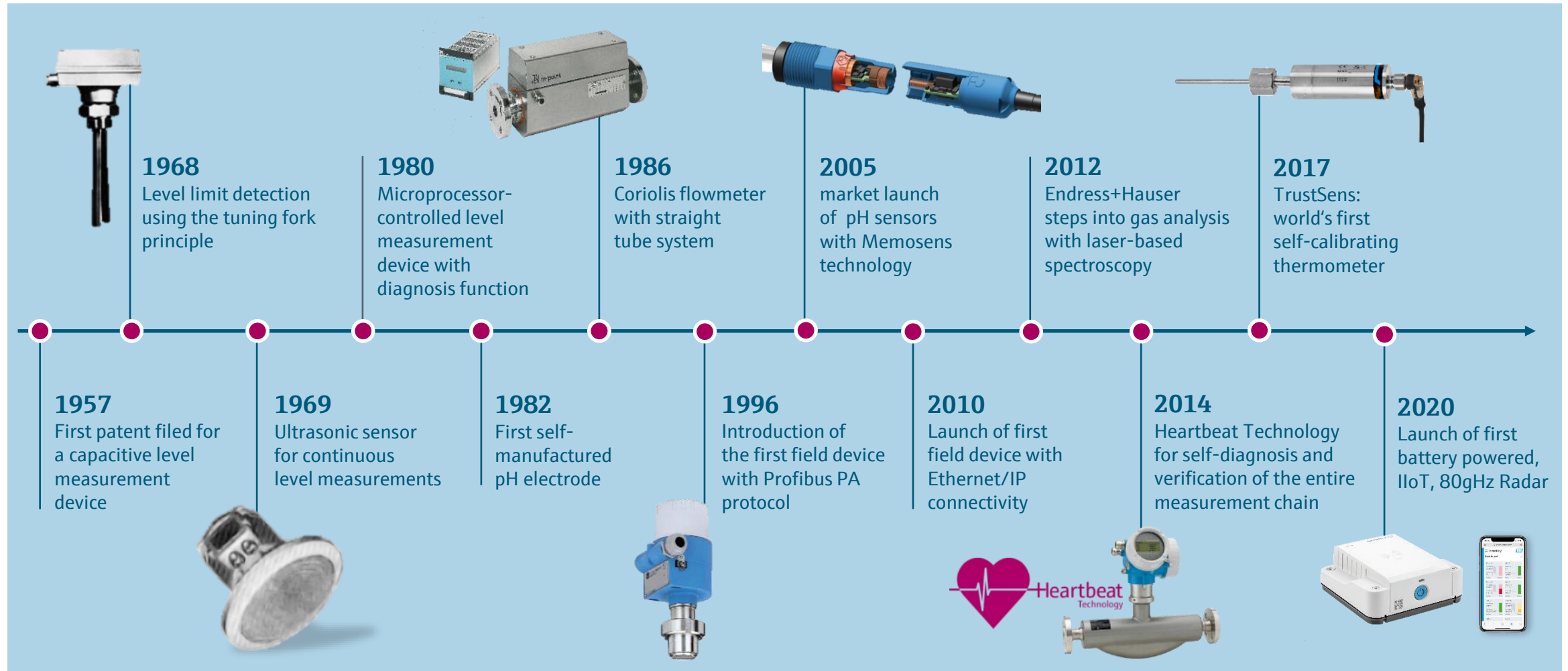


Our products are developed with the highest standards of process and environmental safety.

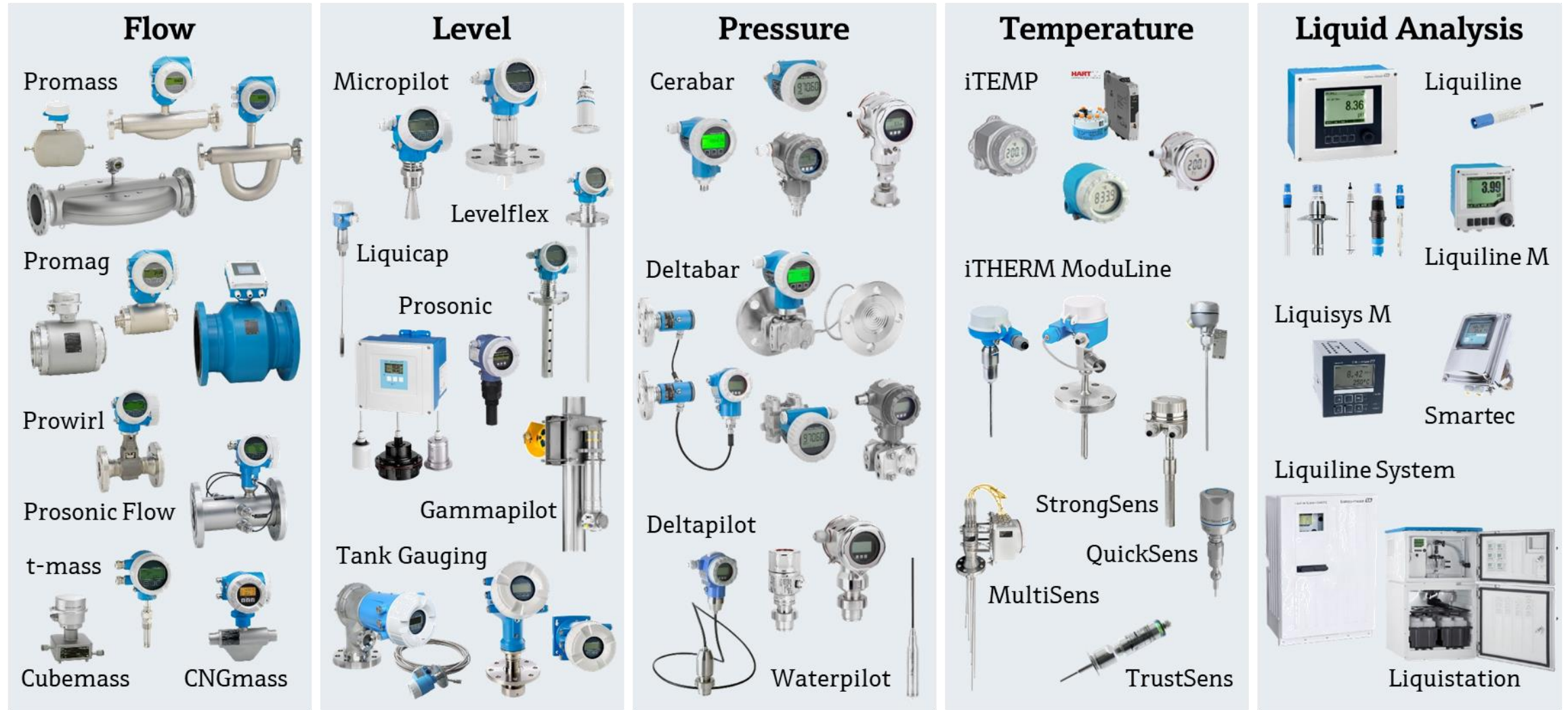


Our product portfolio supports online measurement of quantity and quality parameters in the hydrogen production, storage, transportation and end use processes.

# Innovative from the start



# A comprehensive product portfolio; a reliable MIV partner



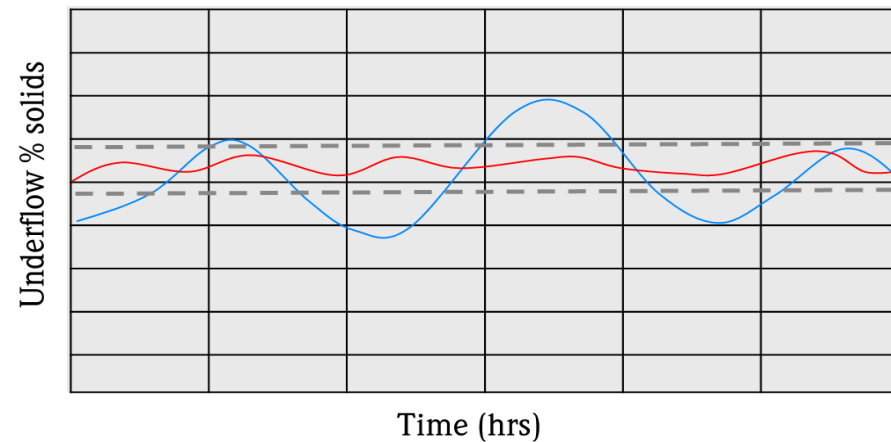
# Optimised Process Measurement



## Benefits

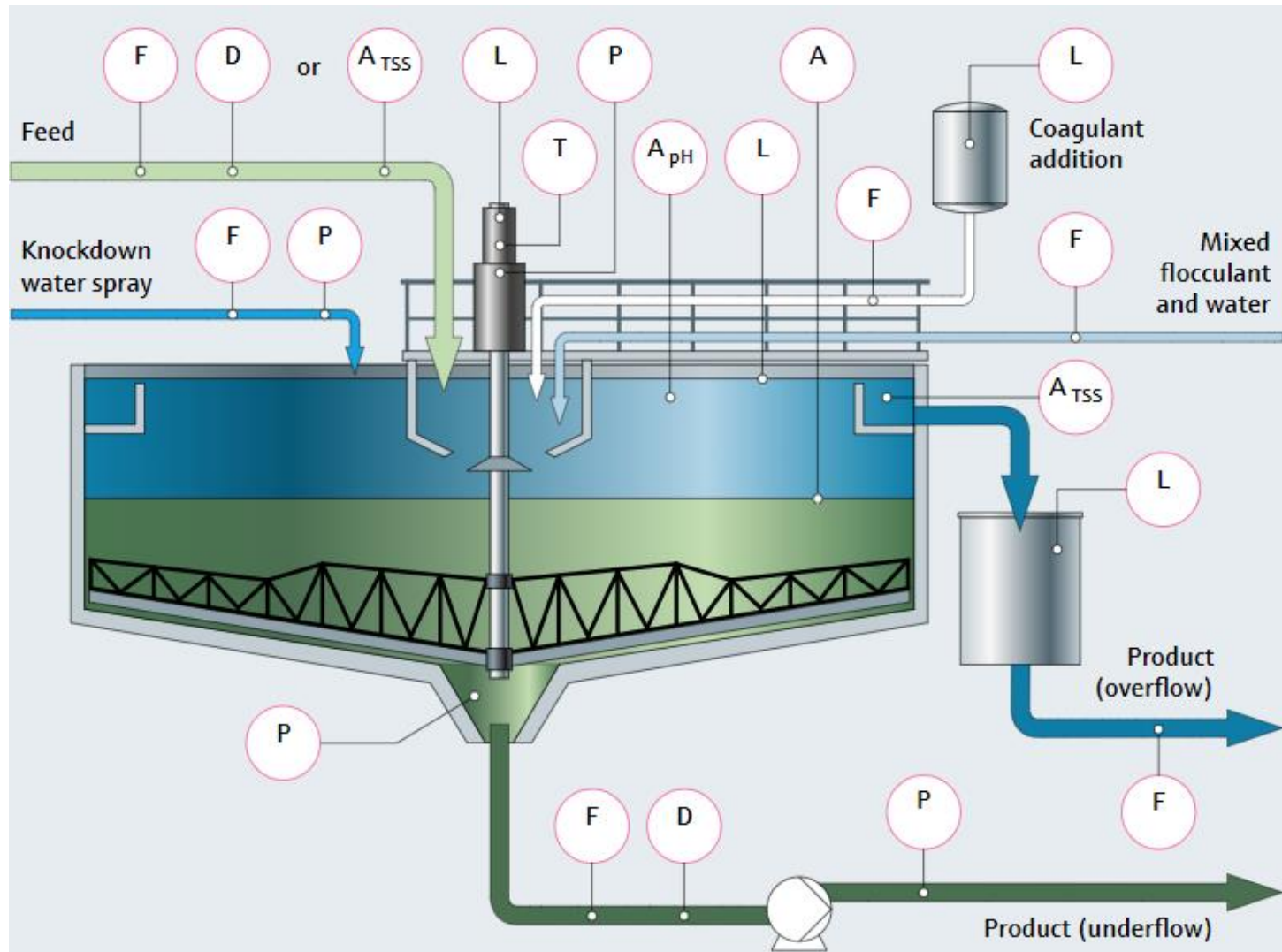
- Improved underflow density that can:
  - Reduce power consumption from recycled water from return dam
  - Optimise tailings beaching angles and significantly enhance tailings storage capacity, or improving dewatering capacity downstream
  - Improved water utilization and optimize the water balance in your plant
- Maximising available capacity in the thickener and allow throughput increases in the future
- Improve overflow clarity and quality, potentially improving yield in related fines circuits

One of the main performance characteristics of a thickener: underflow solids %



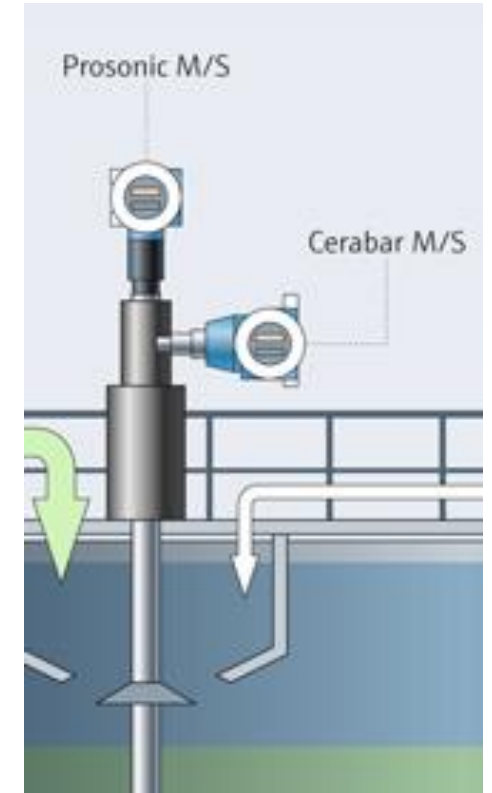
■ With appropriate sensing technology and effective process control philosophy  
■ Without appropriate sensing technology or effective process control philosophy

# Total Solution Partner in Thickeners



## Rake Performance Monitoring

- Rake performance monitoring is critical in integrating an effective underflow pumping control philosophy
- Monitor rake height by utilizing a reliable ultrasonic level sensor
- Monitor rake torque by measuring the pressure of the hydraulic fluid
- Rake torque is critical in protecting the rake from damage
- Temperature monitoring of bearings and hydraulics can assist in preventative maintenance



Typical instrument deployment for rake performance and protection monitoring



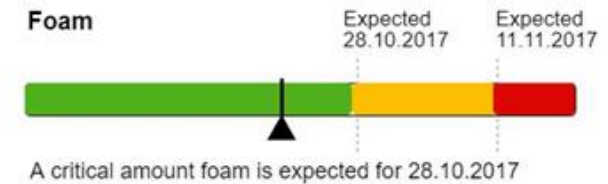
## Level and froth detection and suppression

- Utilising advanced level device for thickener level with the FMR52 with Heartbeat Technology and a switch output

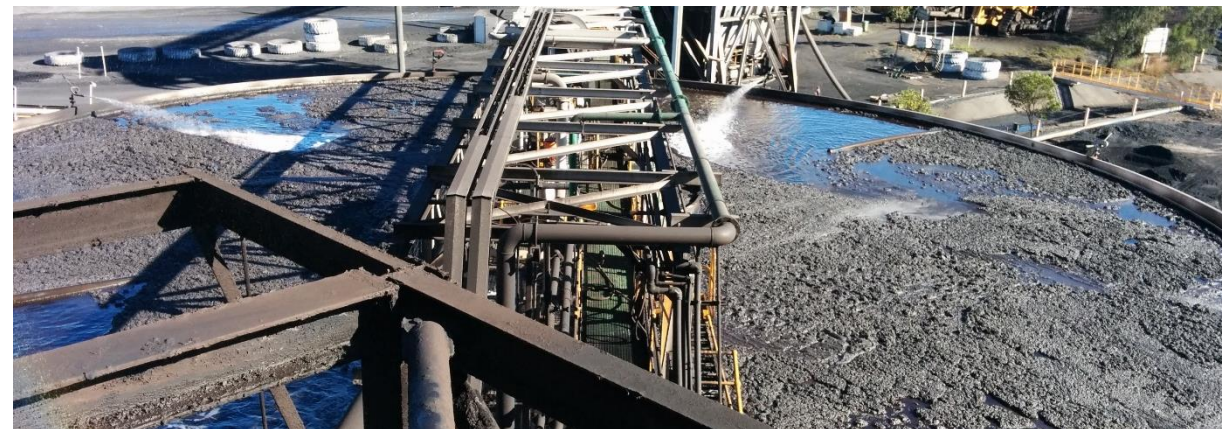
Example of utilizing secondary variable from Heartbeat Technology to optimise thickener performance



TAG: TANK1\_Bottom\_S1  
Serial Number: F3005201124  
Device: FMR52-BAALBBOAFK



Details



Connecting the level device for the thickener to a switch output for froth knockdown sprays can assist with providing a clear overflow or an early warning sign for a problem upstream in the process

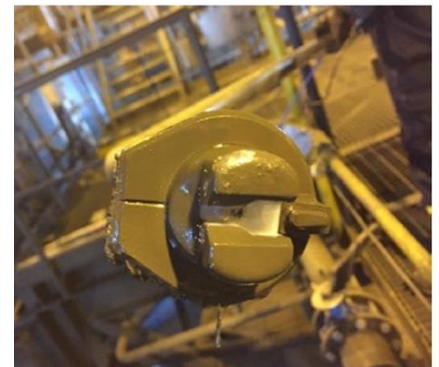
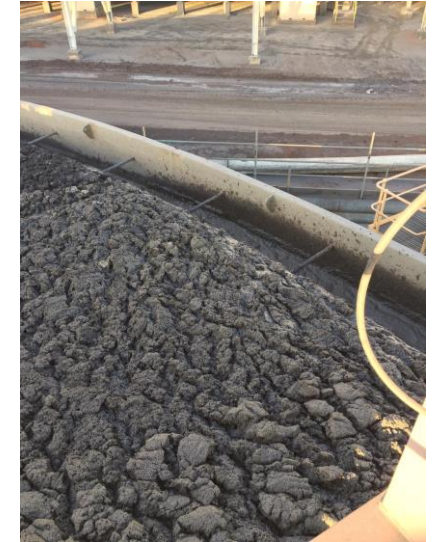
## Overflow quality

- CUS50D has been specifically designed for challenging process conditions, benefits include:
  - Highly absorptive media such as coal is measured with attenuation principle → single point calibration sufficient
  - Easy commissioning
  - Temperature resistant
  - Chemical resistant
  - Low maintenance: cleaning assemblies available



Typical installation points in difficult process conditions

The CUS50D is particularly suited for applications where other TSS devices fail



## Tailings underflow measurements

- Noncontact nucleonic density meter is best practice
- Choice of 2 wire or 4 wire device
- **Heartbeat** functionality
- Easy commissioning
  - HART/**Bluetooth**
  - Service interface (CDI)
  - **Wizards**
  - Remote display
- Modulator available
- Empty pipe safety shutter available

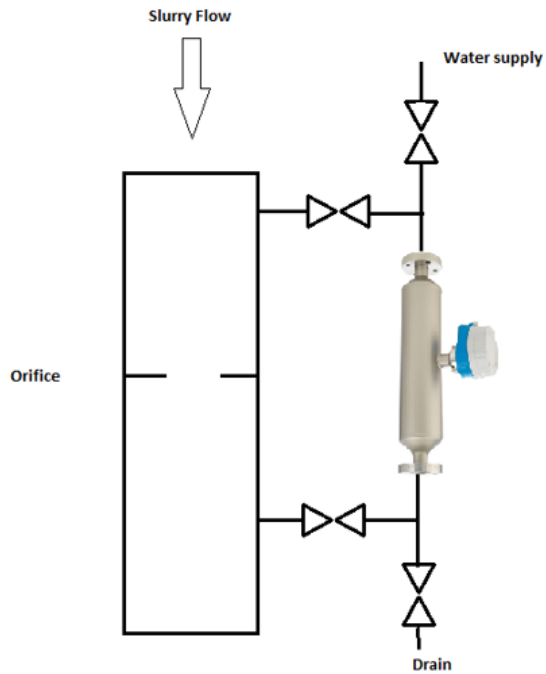


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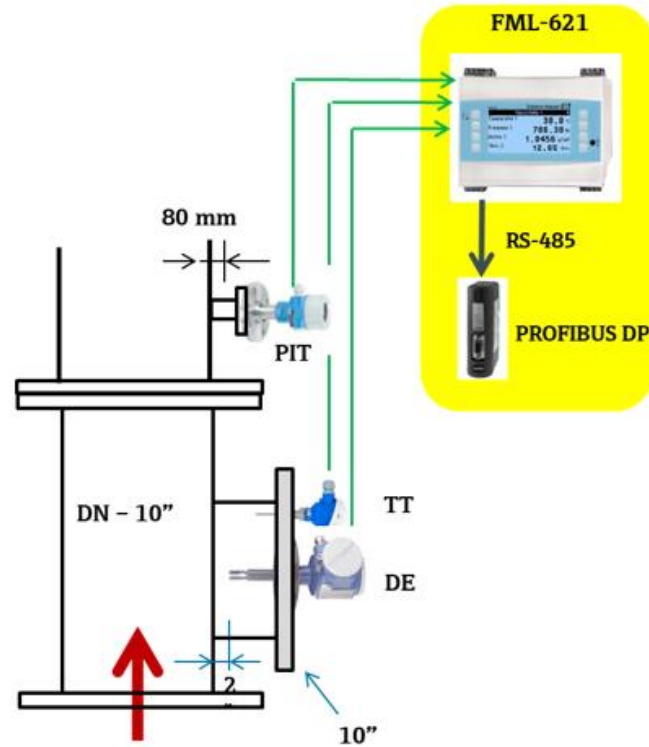


# Non-nuclear options for slurry density measurements

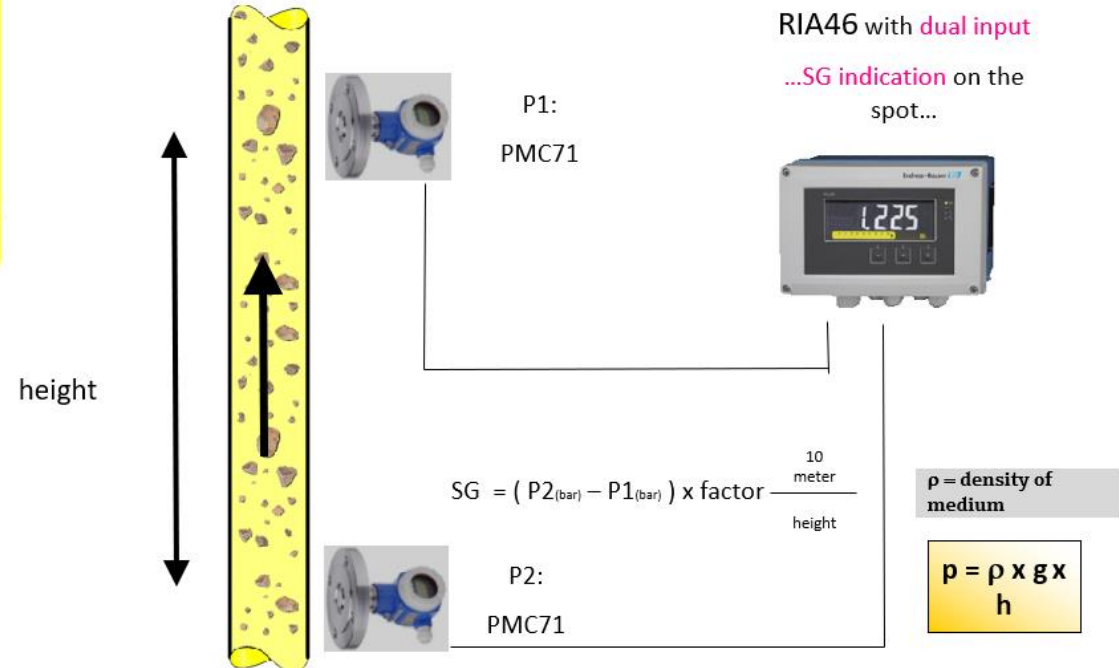
## Coriolis Promass I



## Vibronic Fork Liquiphant Density



## Differential Pressure Cerabar Evo 2.0



## Tailings Underflow Measurements

- Electromagnetic flowmeter: Promag 55S
  - Variety of liner and electrode options to suit abrasive slurries such as those found in thickeners
- Pressure: PMC51B



Promag 55S with the ceramic liner option



Measurement of solids up to 85% possible



Modulator

Source container

Detector

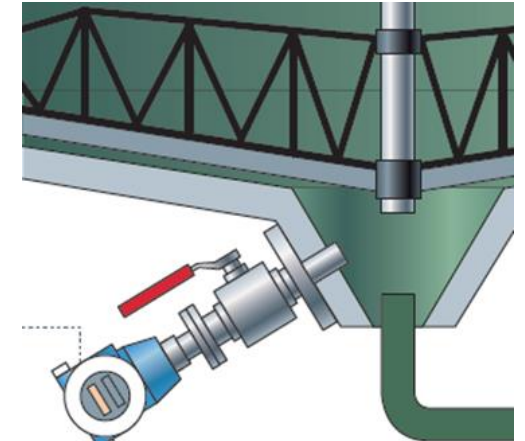
Flow meter

## Bed Mass Measurement

- Reliable bed mass calculation and visibility of the bed height is needed to further optimize the thickener process. Underflow pumping rates can be adjusted based on the bed mass and height for optimal thickener performance.
- PMC51 with Retractable Assembly
  - Ceramic measuring cell is resistant to corrosion, abrasion, process and vacuum overloads
  - Dry measuring cell with no fill fluid eliminates ambient temperature drifts
  - Retractable assembly allows for sensor cleaning without interrupting the process
  - Hot tap insertion with water purge assembly available



Overview of the retractable assembly



Typical arrangement of bed mass sensor located in thickener cone

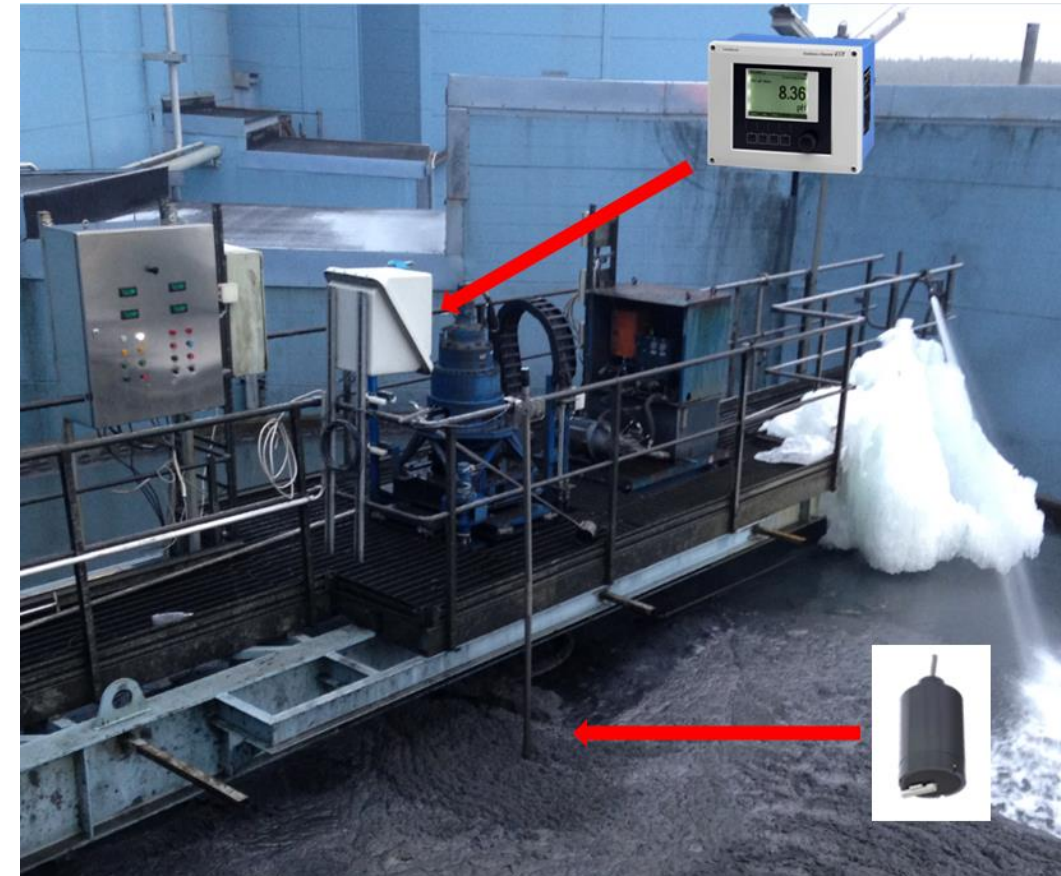
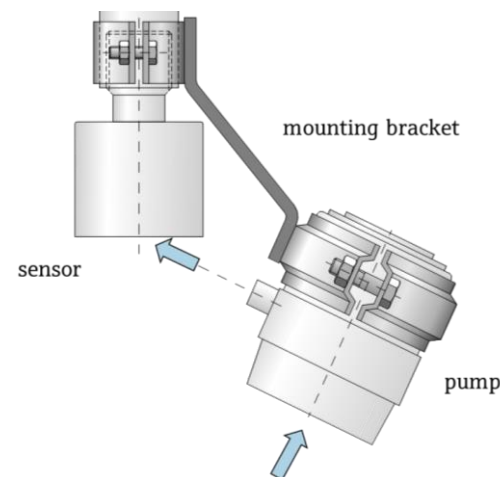


Hot tap assembly with water purge attachment shown

## Bed Level Measurement

- Bed level measurement is the most challenging application to measure accurately in a thickener
- Best practice includes supplementary information from all other process measurements “fact checking” the bed level sensor measurement in SCADA
- CUS71D features various cleaning options to maximise success of a reliable measurement

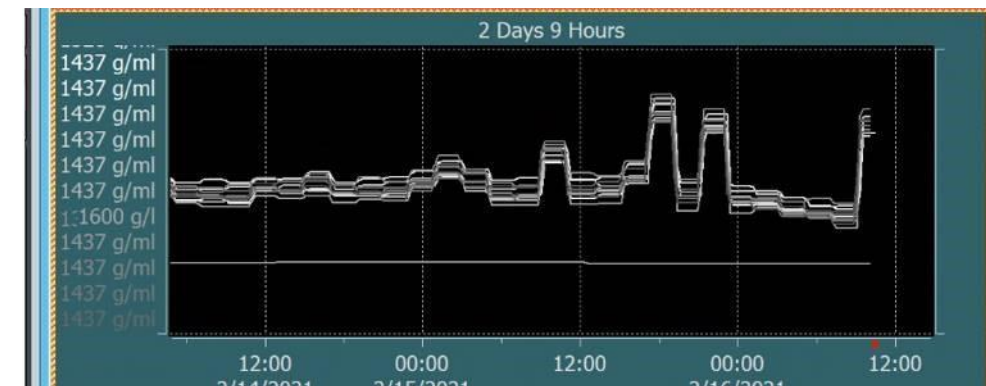
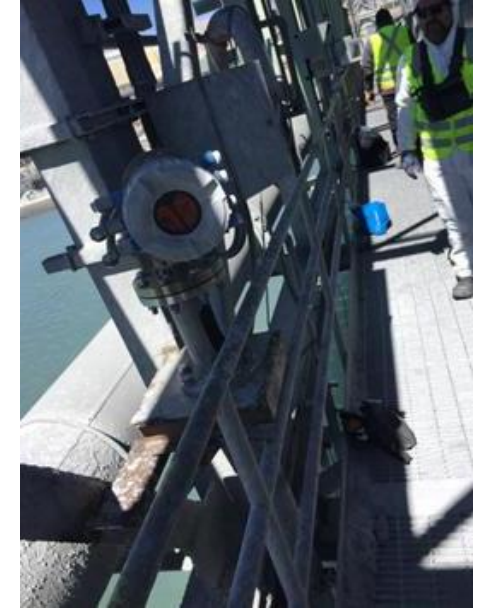
Pump attached to CUS71D to clean the sensor, just one of the options available



Installed arrangement of a Bed Level sensor in a thickener

## Bed density profiling

- Higher amount of realtime information using a “diving” profile system, the Proservo
- Provides an accurate profile of the clarified water, hindered bed level and thickened bed level all inside the thickener
- Can be installed in open or closed thickener systems
- Allows optimisation of:
  - Chemical usage
  - Rake torque control
  - Solids capacity loading information
  - Reduced calibration intervals for the system means whole of thickener sensing availability is increased



Density values in  
DCS



## Feed Measurements

- Mass flow requires Promag 55S (flowmeter) and FMG60 (radiometric density)
- CUS50D (turbidity) is optional for solids suspended and can be used alternatively



CUS50D is best suited for heavy industrial applications as fouling is minimized as can be seen here

Promag 55S flowmeter with an FMG60 nucleonic detector in series to measure mass flow, volumetric flow and density of the feed line

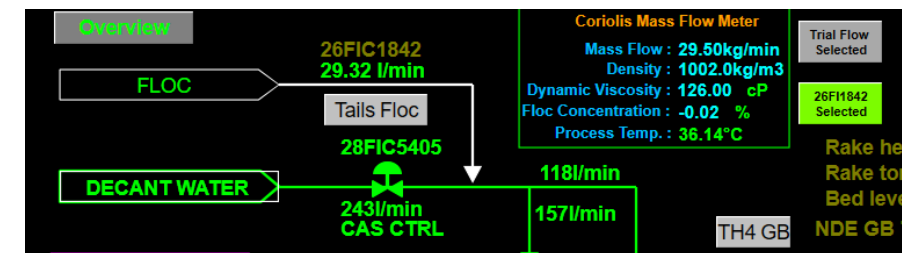


## Flocculant Dosing

- Integration of flocculant dosing control, feed-forward control models are optimum.
- Due to most flocculants being batched onsite from powder, quality of batched flocculant is required to be monitored
- Benefits of using Coriolis meter, the Promass I for quality monitoring:
  - Single device for all your required measuring points:
    - Viscosity
    - Flow
- Self verification and monitoring with Heartbeat Technology
- One copper site has already saved over \$200,000 AUD by implementing a Coriolis meter to measure floc quality



Promass I 300 installed in the field



SCADA view of the data from the field

## Coagulant and pH Modifier Dosing

- Optimise your consumable usage by improving your inventory accounting
  - Consider implementing inventory control
- Utilise reliable pH measurement solution with the CPF81E with Memosens Technology
  - Automated cleaning solutions available
  - Time saving and accurate by the use of offline calibration

An effective pH monitoring system is critical for thickeners

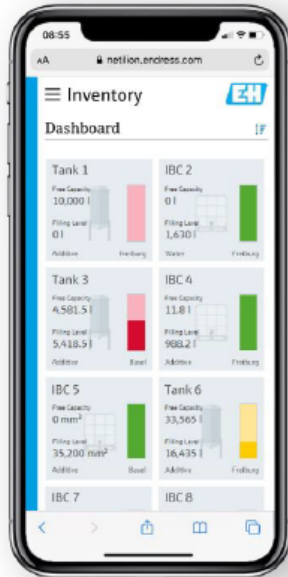


Coagulant and other consumable dosing is an important variable to monitor



## Smart packages...

... for basic inventory management of mobile and stationary plastic container.



**Netilion Inventory**  
Web Application for basic  
inventory management



**Micropilot FWR30**  
Battery powered level sensor  
with integrated mobile communication

## Various solutions for inventory and vendor-managed inventory systems



**Netilion Value** is an easy-to-use, generic monitoring service that meets the standard monitoring functionalities required by our customers.

Easy Generic Monitoring  
All measurements



**Netilion Inventory** is an inventory management service that offers additional functions for a clear and accurate overview of tanks and containers.

Specific Inventory Tank  
Additional Features Container

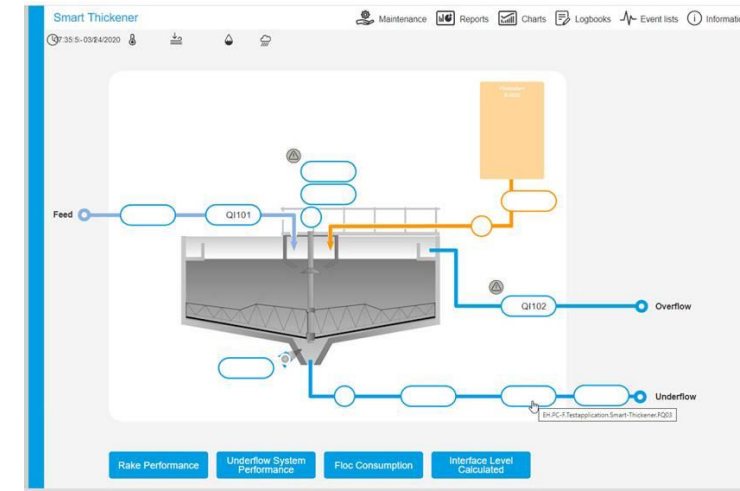


**SupplyCare Hosting** is an advanced and customizable software as a service for Inventory Monitoring and Supply Chain Management.

Advanced Customizable Tank  
Inventory Supply Chain Silo

## Where to from here?

- Our experts can guide you through the instrumentation selection process in your optimization project
- We work with many partners, including those who utilise MPC
- We can even develop IIoT solutions to help you with your project
- All inclusive service contracts available to maximise availability



IIoT optimization dashboard example



Optimise your thickener



**Thank you very much for your interest! Any questions?**

