Know today what to expect tomorrow

CAHP 2025

Intelligent maintenance solution with CytroConnect
“Predictive maintenance for fluid systems”

Marcello Miceli

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Agenda | CAHP 2025

01 **Framing the challenge of today’s maintenance**
Costs of inefficiency

02 **CytroConnect Solutions**
Accelerating the journey with Rexroth AIoT

03 **Case studies**
References and success stories

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The Cost of Inefficiency

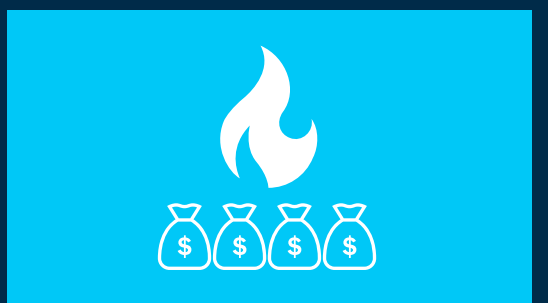
Root cause detection

60 %
Run to fail

30 %
Planned Maintenance

10 %
Condition Based Maintenance

50 %
Of downtime is spend for identifying the root cause



85 %
Of repair cost are caused by to late maintenance

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The Cost of Inefficiency

Unplanned Downtime in production

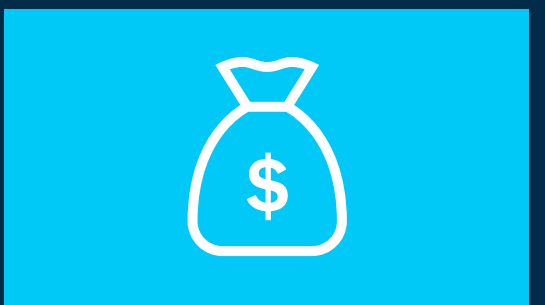
"Frequent incidents that require swift recovery to minimize disruption."

20 x

Downtime incidents per facility a month

4 h

Average downtime for moderate issues



147 k€

Average downtime cost for moderate issues

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The Cost of Inefficiency

Unplanned Downtime at critical infrastructure

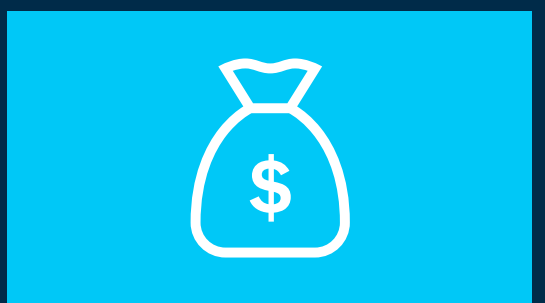
"Rare but critical failures with high costs and significant safety risks."

5 x

Downtime incidents per facility a year

24 h

Possible downtime for critical issues



500 k€

Possible downtime cost for critical issues

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02	**CytroConnect Solutions** Accelerating the journey with Rexroth AIoT
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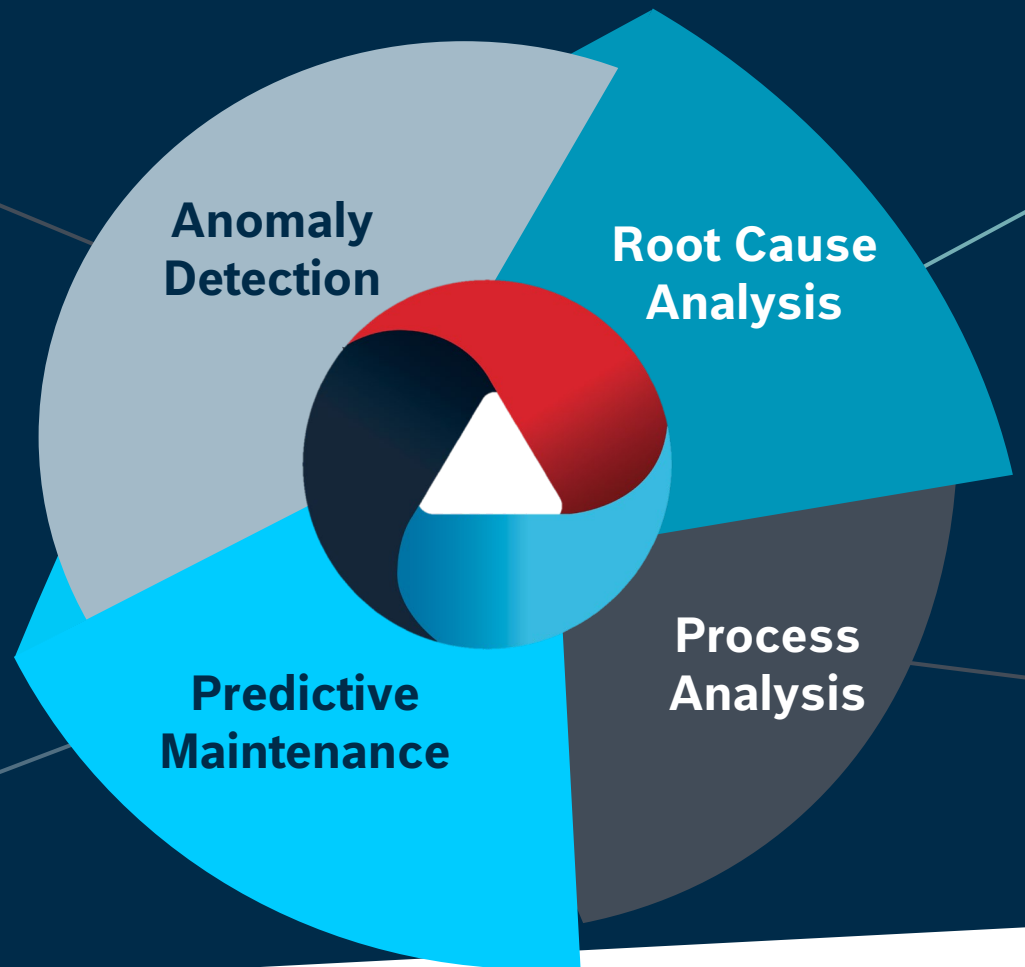
Know today what to expect tomorrow
Unlocking the potential of AIoT



Automatically detect unknown behaviour

Find out when and why an anomaly or failure occurs

Identify improvements for process and energy consumption

Determining the damage even if is still relatively low

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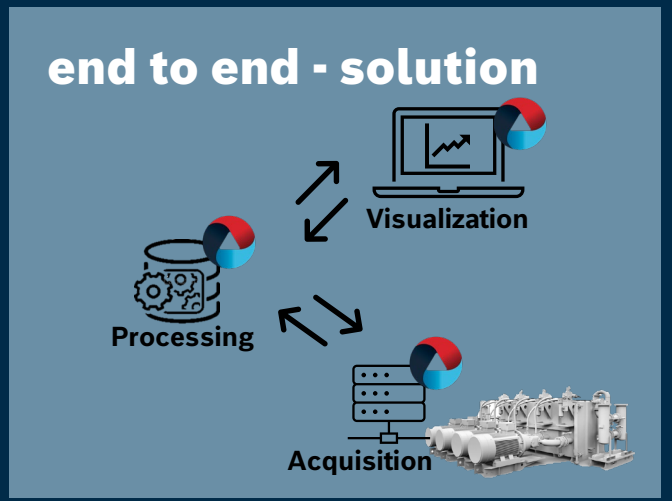
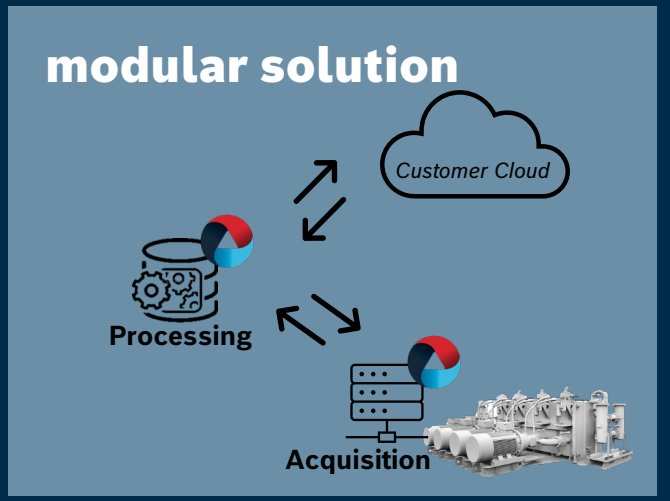
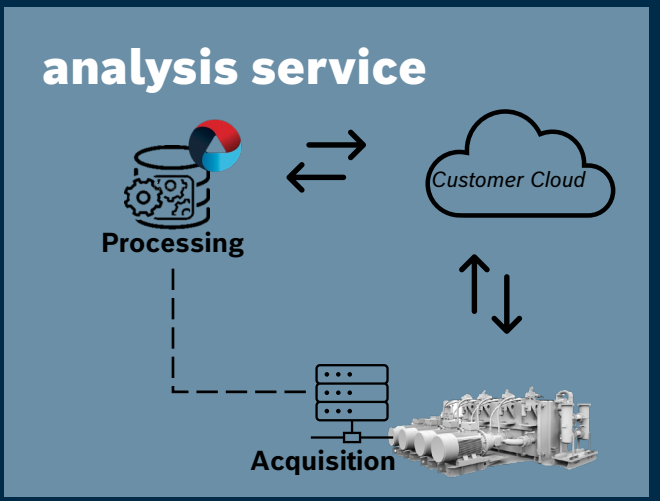
To be flexible, we are easy to adapt







AIoT Starter Kit

CytroConnect as a connectivity, backend and frontend service

AIoT as a Service

CytroConnect as a connectivity and backend service

AIoT Diagnostics

CytroConnect as backend analytics Service

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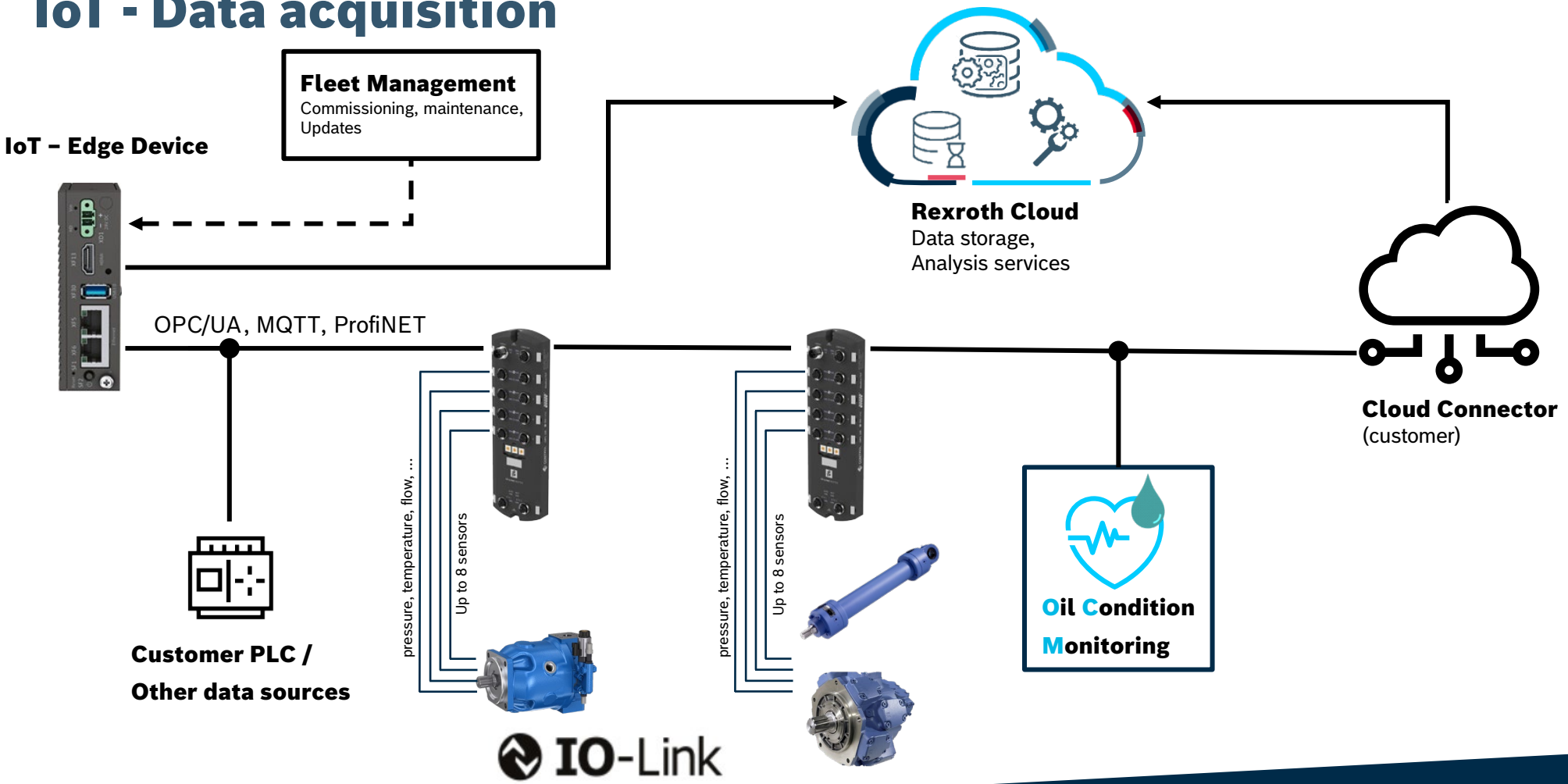
IoT - Data acquisition



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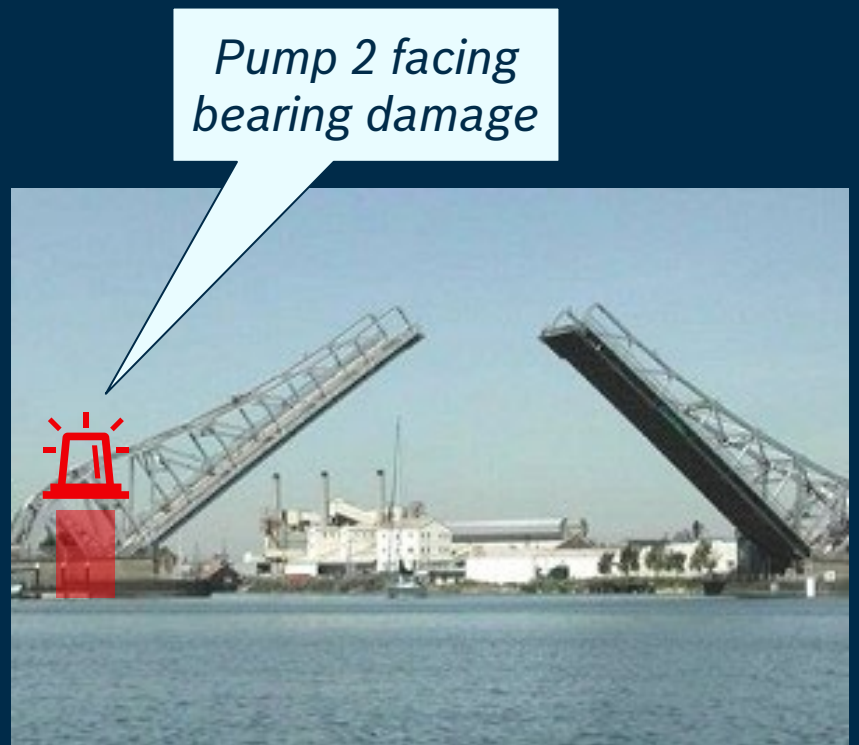
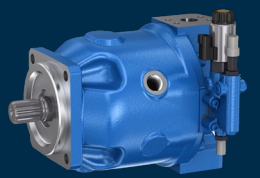
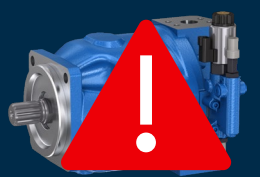
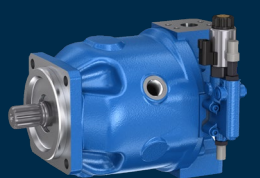
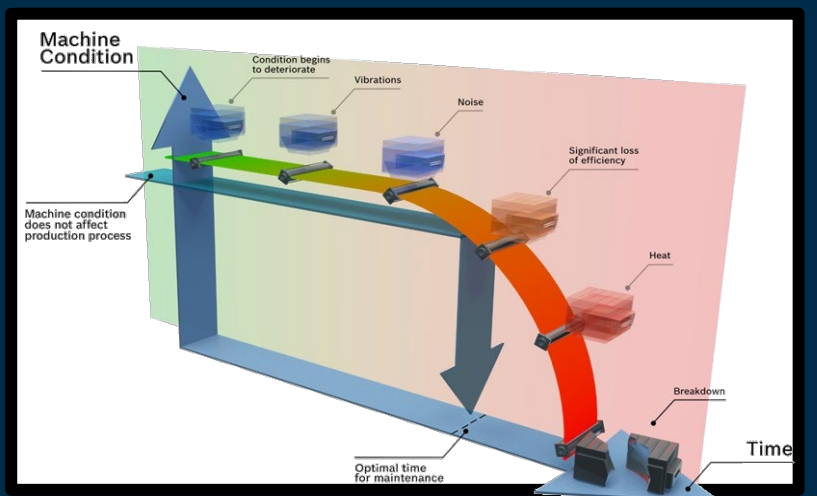
Identify root cause











P , p_{in} , p_{out} , Q , T_{in} , T_{out} , ..

Predictive maintenance uses condition monitoring to schedule cost-effective repair of equipment before functional failure occurs

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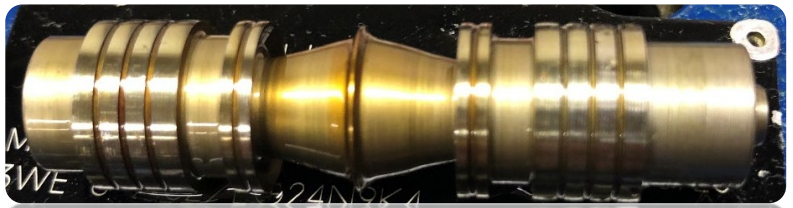
OCM – Oil Condition Monitoring

Challenge

- Particles damage the component surface
- Oil degradation reduces the lubricating properties
- Reliable equipment required to ensure operation



Varnish

Symptoms & Problems

- Varnish & sludge → Clogged valves, clogged filters
- Particle → Abnormal wear
- Ageing of the fluid → Foam, abnormal wear, corrosion

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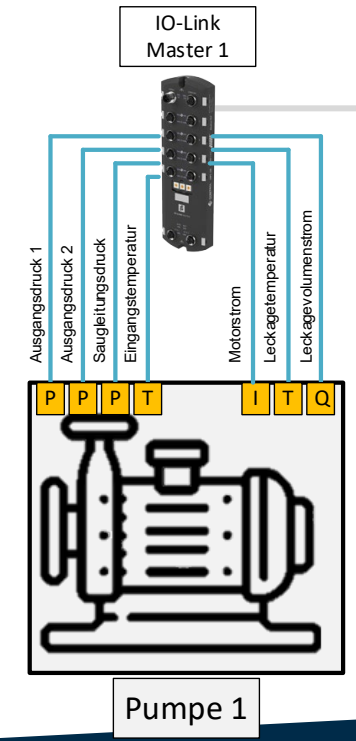
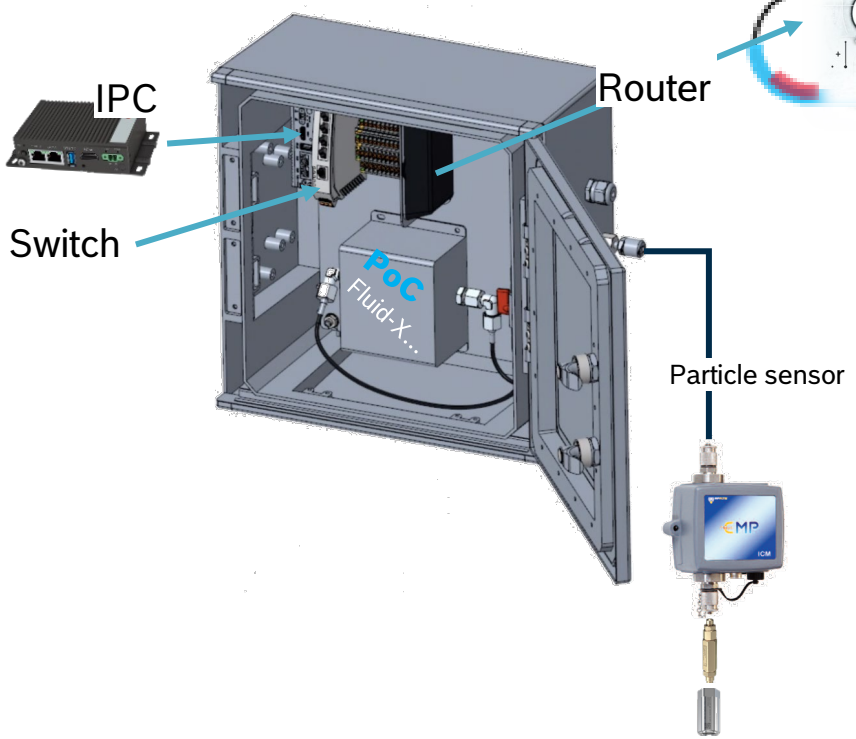
CytroConnect Solutions
Oil Condition Monitoring Solution – 24/7





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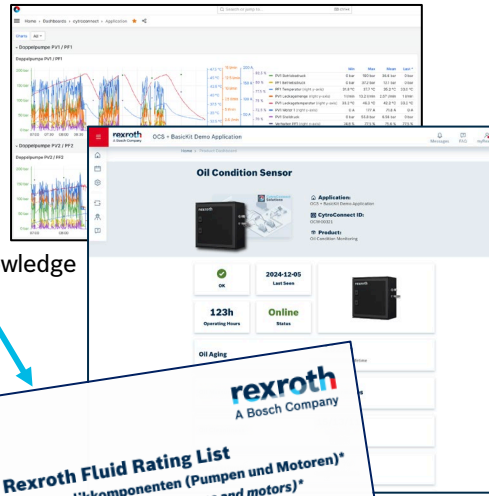
Oil database knowledge



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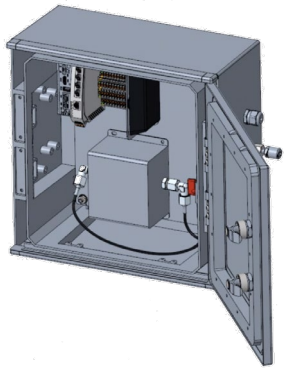
CytroConnect Solutions
Increased availability and reliability

OilConditionSensor



What is tested?

- *Oil additives*
  - *Anti-wear additives*
  - *VI-Improver (HVLP)*
- *Oxidation*
- *Nitration*
- *Water*

OilParticleSensor

What is tested?

- *Particle*
  - *> 4m = 350 particles*
  - *> 6m = 100 particles*
  - *>14m = 25 particles*
- *Water saturation*
- *Temperature*

OilCareUnit

Operating modes?

- *Emptying, filtering, degassing and monitoring in a single process*
- *Vacuum, working range 40 - 600 mbar*
- *Even highly viscous mineral oils up to 500 cSt*

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Case Studies: Rexroth AIoT in Action

Predict potential failure

Anomaly detected in control pump while the system was still fully operating

17 k€

Avoided maintenance cost

Root cause analysis

Detection of delays in production due to loss of efficiency of the vacuum pump

54 k€

Avoided loss of production

Optimize energy consumption

Detection of wear-based energy losses and determination of root cause

20 %

Less energy consumption

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Case Studies: Rexroth AIoT in Action

Predict potential failure

System leackage detected in control pump while the system was still fully operating

13 k€

Avoided loss of sales

Predict potential failure

Anomaly detected in cylinder, which would have caused major damage

32 k€

Avoided maintenance cost

Availability

Access to ferry terminals at different locations

24/7

Operational readiness

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Key Take aways

- Downtime, inefficient energy use and root cause analyses are critical pain points
- AIoT offers powerful solutions to these challenges to unlock business outcomes
- Rexroth is driving the adoption of AIoT by providing scalable solutions
- You can benefit today – Think Big. Start Small. Move Fast.

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Ready to start today?

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