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From Smart Tuning to Process Optimization

Dr. Francesco Crivelli

6. F&E-Konferenz zu Industrie 4.0
03.02.2021

CSEM - TECHNOLOGY ORGANIZATION IN SWITZERLAND

Technology Transfer to Industry

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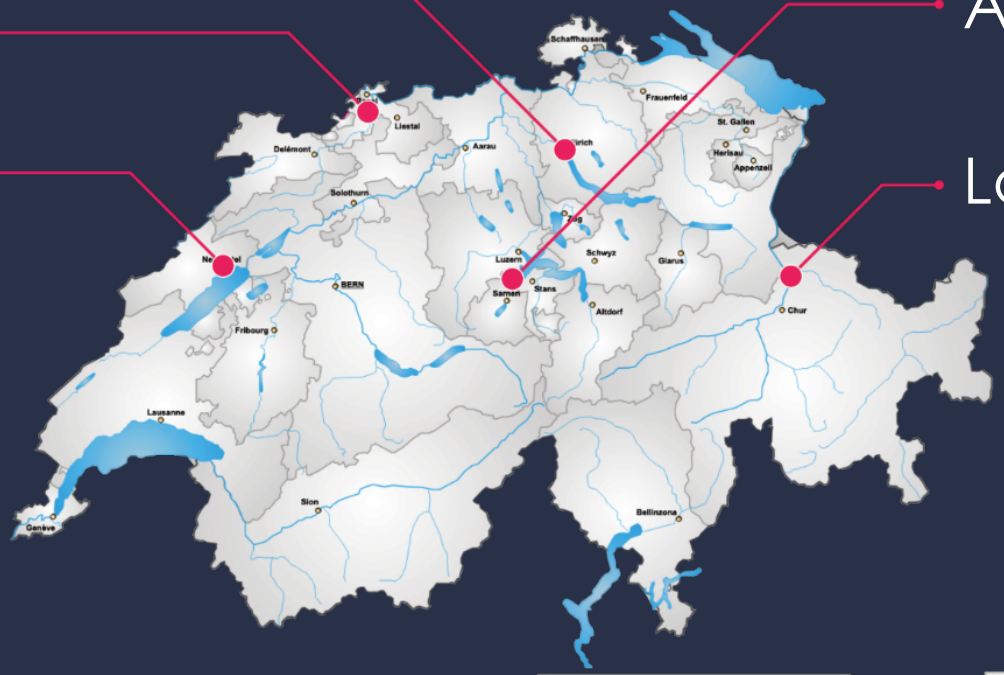
Close to **industry**

Zürich

Muttenz

Neuchâtel



Alpnach

Landquart

87.6
Turnover (mio CHF)

530+
Persons

212
Industrial clients

80
European projects

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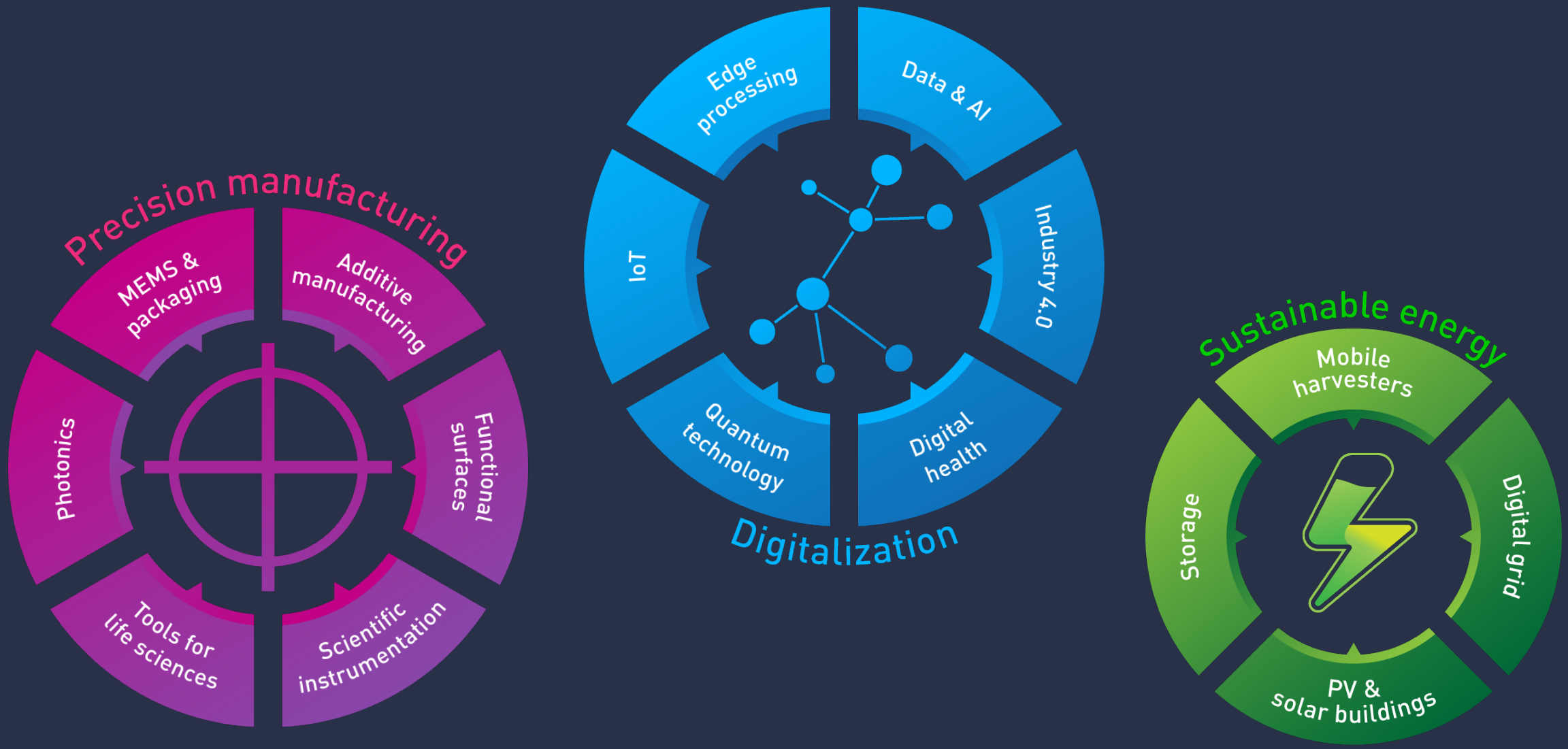
Technologies **in focus** at CSEM



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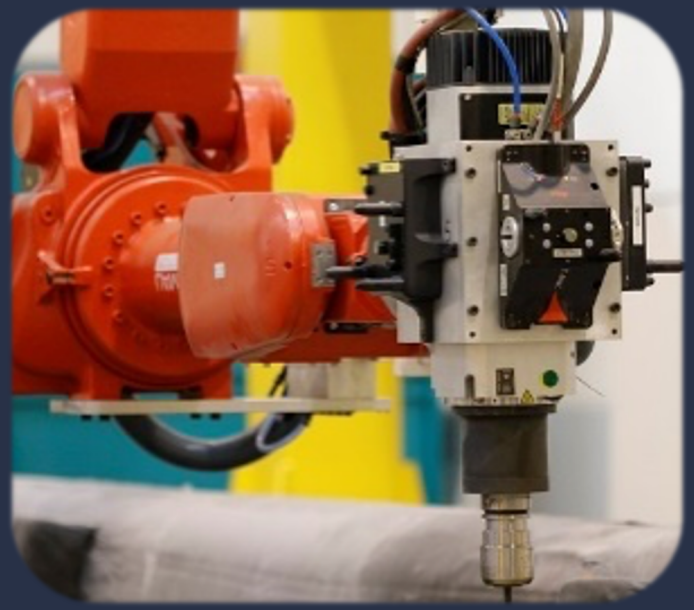
Industry 4.0 & Machine Learning

Quality and Process Control

Predictive Maintenance

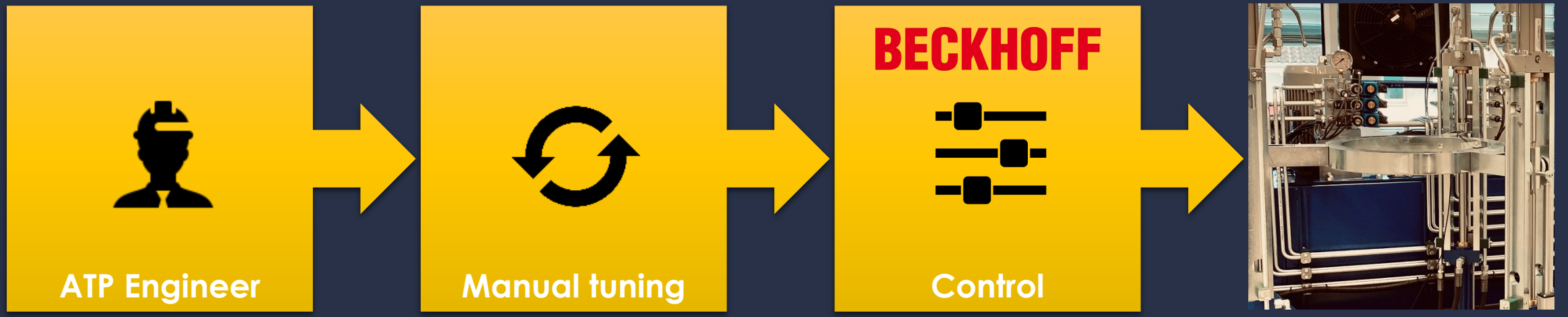
Digital Manufacturing



ATP HYDRAULIK

Smart tuning of control parameters

ATP HYDRAULIK



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Smart tuning of control parameters

ATP HYDRAULIK

Automated

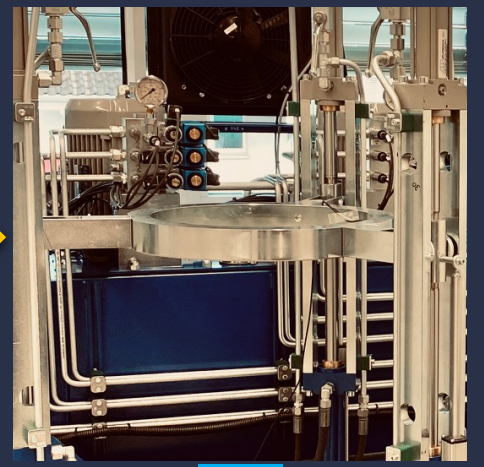
VISORD csem

ATP Engineer

Parameter optimization

BECKHOFF

Control



Motion signals

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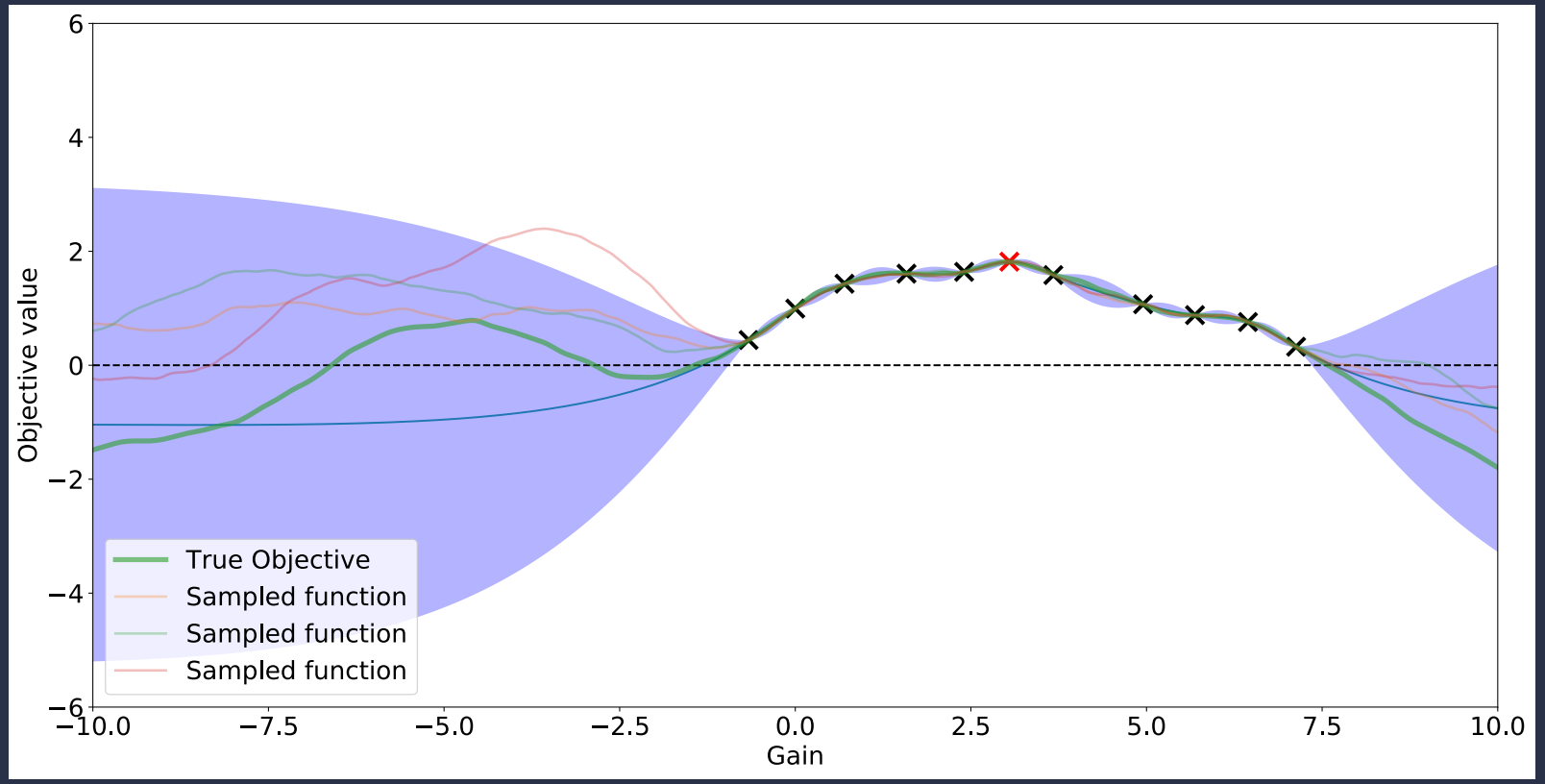
Statistical modelling and safe optimization (SafeOpt)

Prior knowledge (data & models)

Design Gaussian model

Safe exploration & fast convergence to optimum

Optimal parameters



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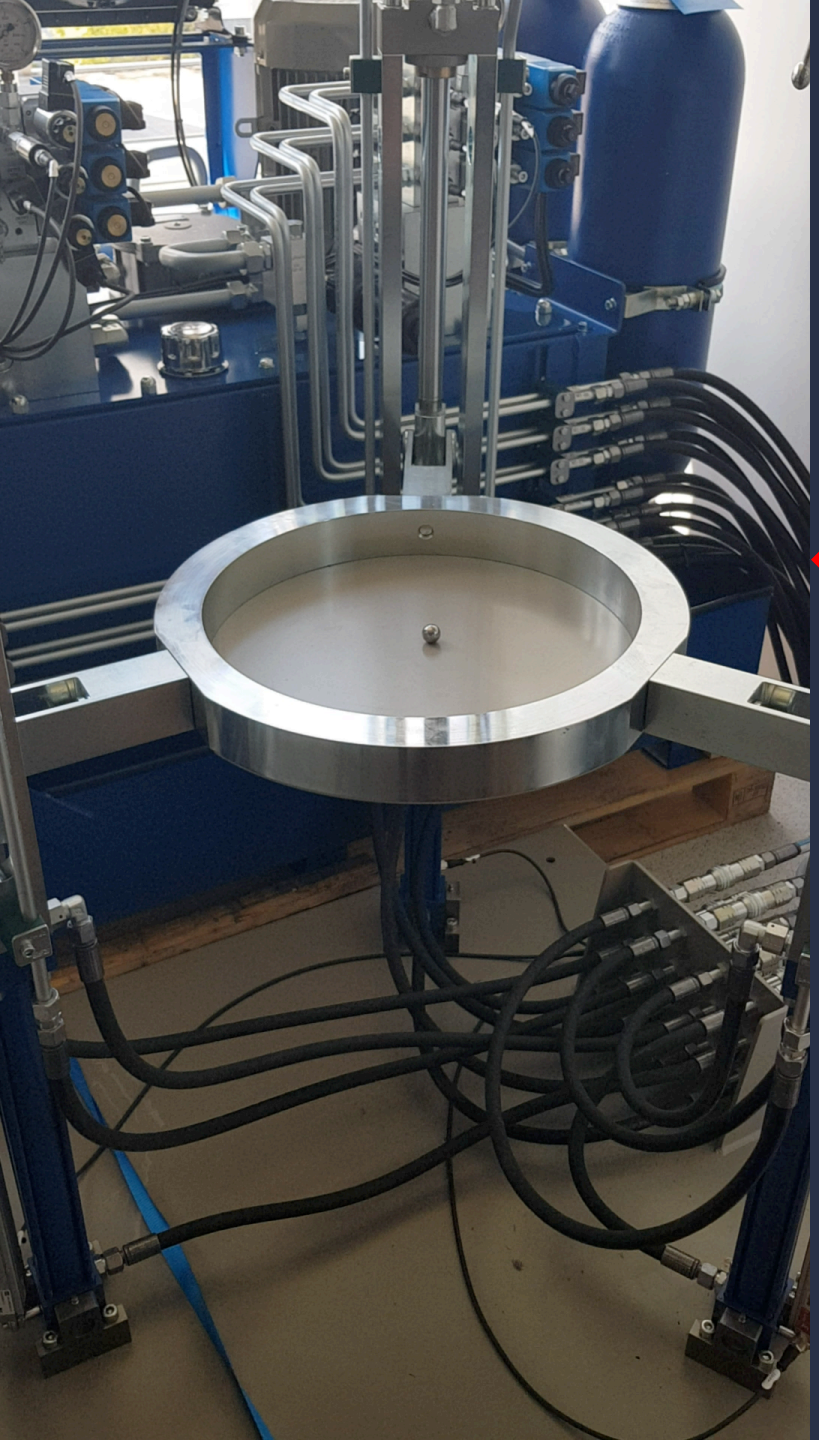

Performance

Manual tuning

Automated “smart” tuning + synchro

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ATP HYDRAULIK
100x reduced time
Increased motion performance

HALAG
SWITZERLAND

Cleaning filtration process optimization

Operator

Conservative & Standard settings

Process control

Cleaning filtration process optimization

HALAG SWITZERLAND

Automated

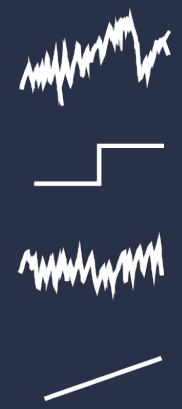
Operator

Parameter optimization

Adaptive process control

Self-learning monitoring

50 sensors



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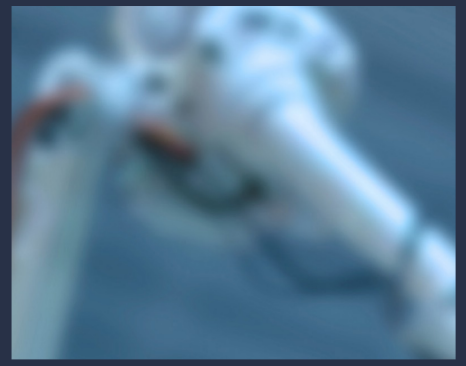
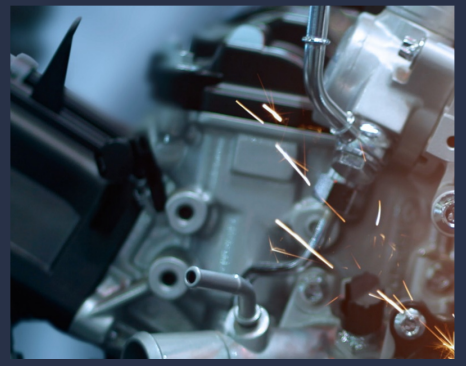
HALAG
SWITZERLAND
Minimized cleaning time
Minimized cleaning product
Minimized environmental impact





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Thank you for your attention!

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