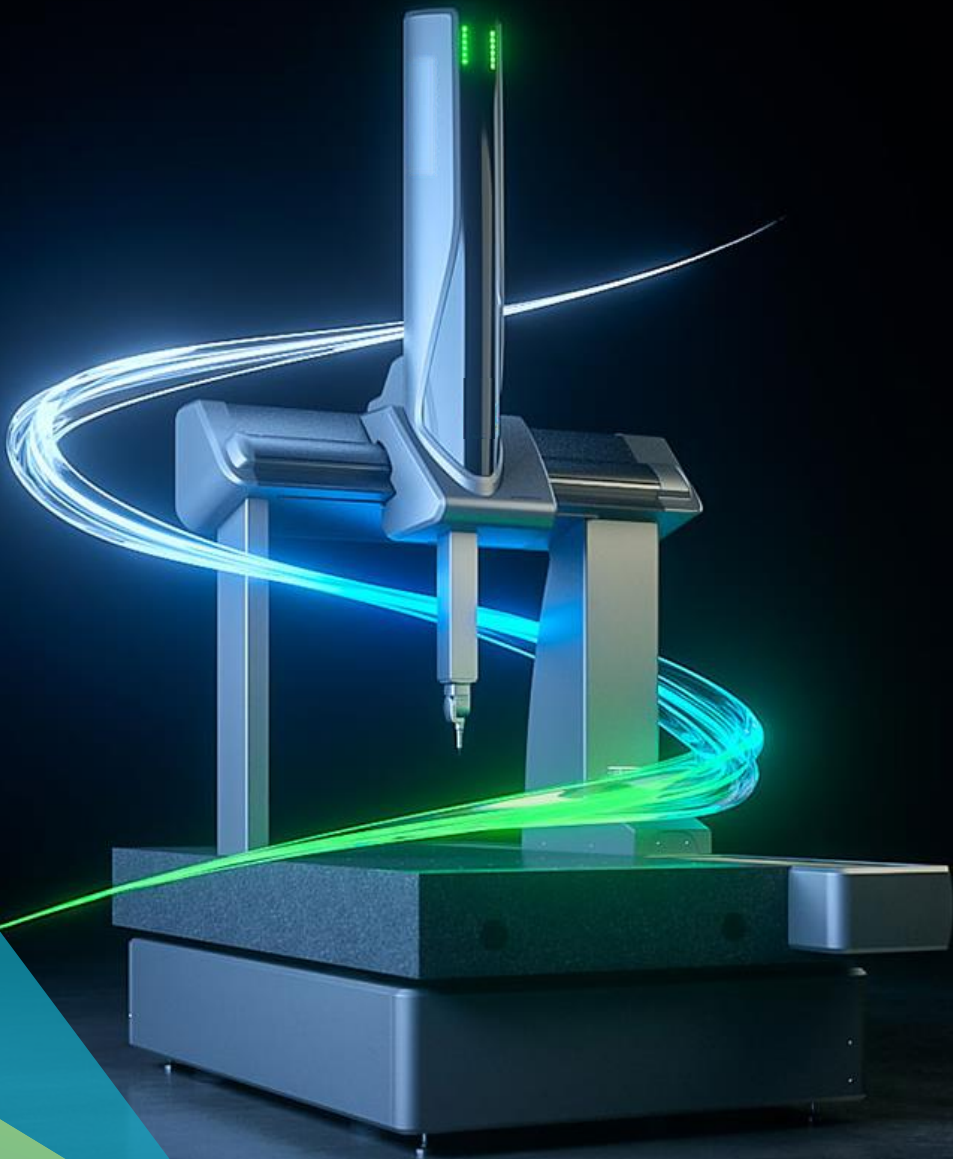


## **Condition Monitoring & Predictive Maintenance for Measurement Machines. In-Cloud or On-Premise.**

More operator efficiency. More measurement reliability.  
Less machine downtime. Less equipment management efforts.

Compatibilities with HEXAGON, LEITZ, OGP, WENZEL, ZEISS + MQTT & OPC-UA (umati)



# FOR LESS OPERATOR EFFORTS, ERROR TIMES & INVALID MEASUREMENTS

Less TIME EFFORT for operators per measurement and machine,  
Reduced ERROR TIMES & INVALID MEASUREMENTS thanks to condition monitoring.

**Problem:** Operators find it hard to keep track of the progress and errors of multiple machines that may be in different locations, which takes a lot of time.

**Solution:** With APOLLO, operators can monitor the progress, errors, and other conditions of all machines in one place, either for specific groups or all machines, from anywhere.

**Value:** With remote monitoring, operators can save time, reduce machine downtime through real-time error messages, avoid invalid measurements caused by factors like temperature, vibration, and touch probe deviations, and minimize idle time.



# FOR TIMELY PROBE CHANGES & RELIABLE MEASUREMENTS

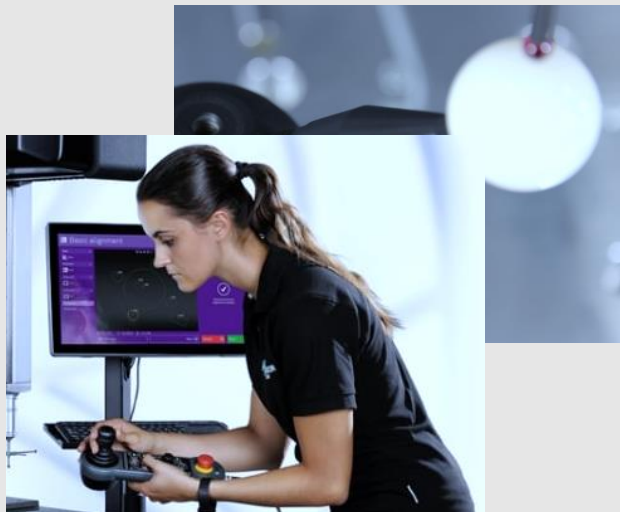
Ensured MEASUREMENT STABILITY,  
Timely & Cost-Optimized TOUCH PROBE CHANGES.

**Problem:** Despite probe calibration, wear and possibly unnoticed contamination of the probes can lead to unreliable measurements if probes are not changed in time or cleaned.

**Solution A:** APOLLO stores data from regular probe measurements and notifies the operator when a limit is crossed, a trend changes or a critical prediction occurs.

**Solution B:** APOLLO notifies the operator to replace the probe after a certain operating time, number of probing points or travelled distance during scanning mode.

**Value:** Fewer or no unreliable measurements due to unnoticed probe ball deviations. Operators replace stylus balls in a timely and cost-optimized manner.



## Solution A

## Solution B



**HIC | TIGO SF**  
TIGO SF  
HIC\_Shop-Floor

Probe Name	Probe ID	Number Touches	Total Rutime	Distance travelled
RTP20	75	87.755	521 h	7128 m
MH20i	74	3.870	17 h	1480 m

# FOR CONTINUOUS MEASUREMENT STABILITY & PREDICTIVE CALIBRATION

Ensured MEASUREMENT STABILITY,  
Timely & cost-optimized CALIBRATION.



**Problem:** Between calibration dates, wear, environmental conditions & collisions can affect the machine geometry critically. Calibrations are time-consuming and costly.

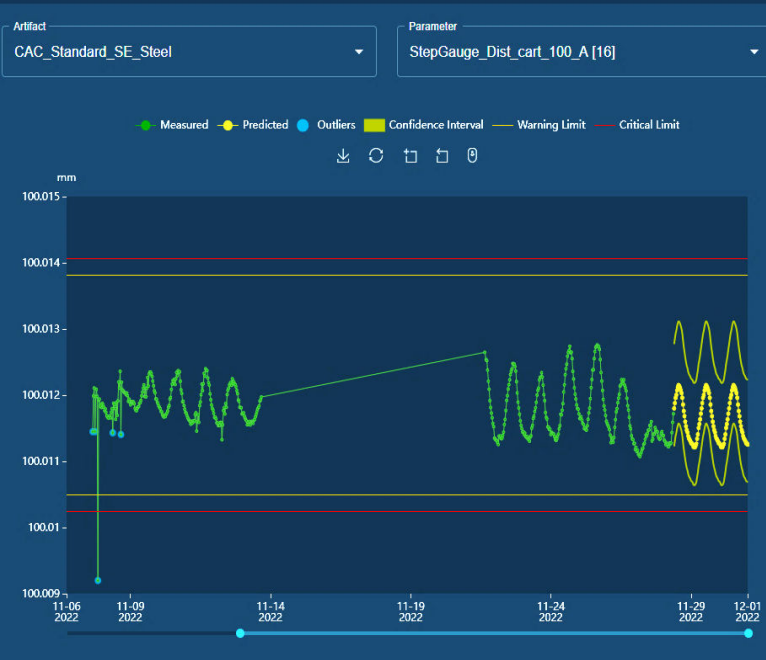
**Solution A:** Regular measurement of a reference part and storage of the values in APOLLO. Notification when there is a limit crossed, a trend change or critical prediction.

**Solution B:** Calibration and maintenance not according to static time periods, but according to operating time or distances travelled that are monitored in APOLLO.

**Value:** Continuously ensured measurement stability between maintenance and calibration dates. Timely & cost-optimized calibration and maintenance.

## Solution A

## Solution B



📍 IcPr | SF 454 [2]

Total Execution Time

111 days 19:09:07

Overall Distance travelled in m

x-Axis y-Axis z-Axis

23216.4 12964.9 6801.0

# FOR OPTIMIZED MAINTENANCE, & RELIABILITY AFTER COLLISIONS

Continuous COLLISION MONITORING,  
Assessment of COLLISION CRITICALITY.

**Problem:** Collisions occur and may go unnoticed, or it is unclear if the collision was critical and requires maintenance.

**Solution A:** Monitoring of the measurement stability in APOLLO by regular and renewed measurement of a master part. Assessment with regards to trend change or limit overrun.

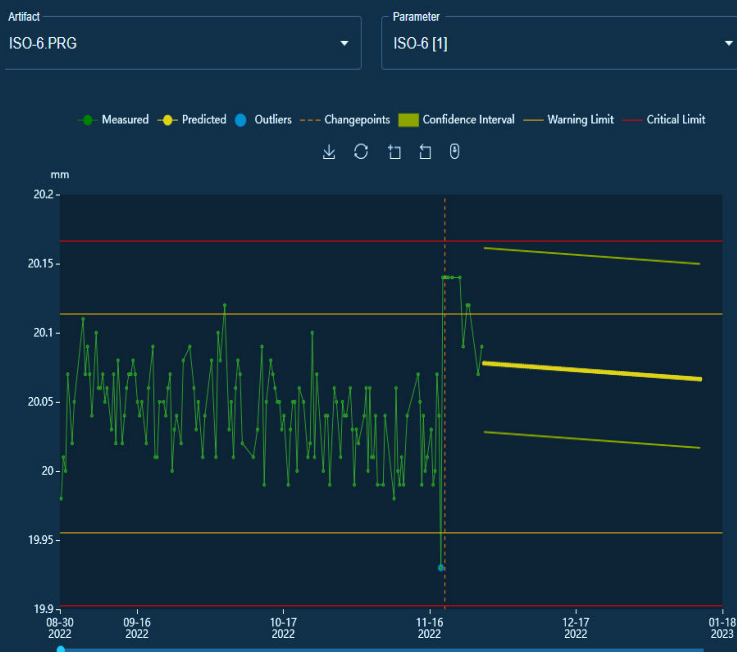
**Solution B:** Automatic notification by APOLLO in case of collision. Assessment of collision severity in APOLLO via deflection / speed / acceleration info.

**Value:** No incorrect measurement due to unnoticed or underestimated collision. No unnecessary maintenance or calibration costs due to overestimated collision severity.



## Solution A

## Solution B



## Event Log

## Service Activities (0)



### Collision

ERROR DECO BUE, S%1, TR\_PH1MM, Probehead deflected more than 1 mm  
2022-11-17 07:28:17

Sensor Type

Crash

Sensor Identifier

Environment...

Granularity

Auto: 5 ...

Legend: Measured (green dot), Warning Limit (yellow line), Critical Limit (red line)

AccelLMH



# FOR TRANSPARENT EFFECTIVENESS & PROFITABILITY ENHANCEMENTS

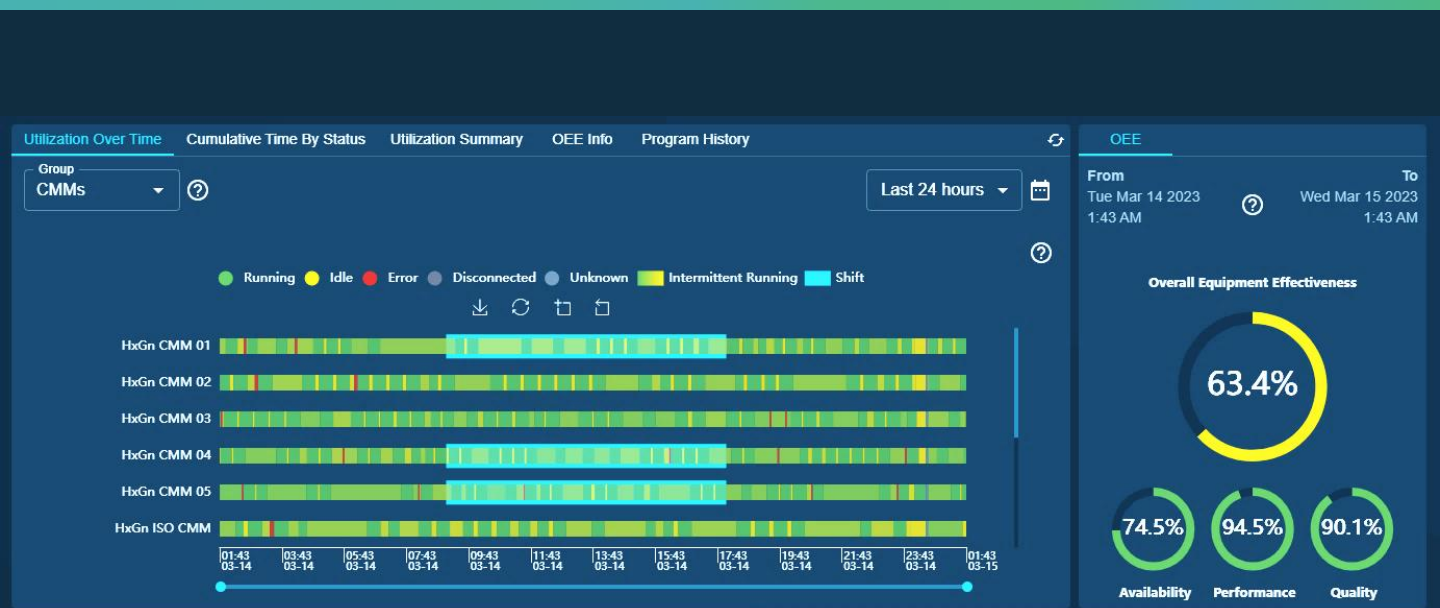
Monitoring OVERALL EFFECTIVENESS,  
Identification & implementation of IMPROVEMENT POTENTIALS.



**Problem:** The effectiveness or profitability of machines is unclear. Improvement potentials regarding error times, idle times and performance are unknown.

**Solution:** Condition monitoring & automatic evaluation of OEE parameters with APOLLO for multiple or individual machines. Visualization of error times, idle times & performance per machine or time range to find hidden problems.

**Value:** Continuous knowledge of the overall equipment effectiveness of the machinery becomes possible. Improvement potentials for increasing effectiveness get known. Increased machine profitability.



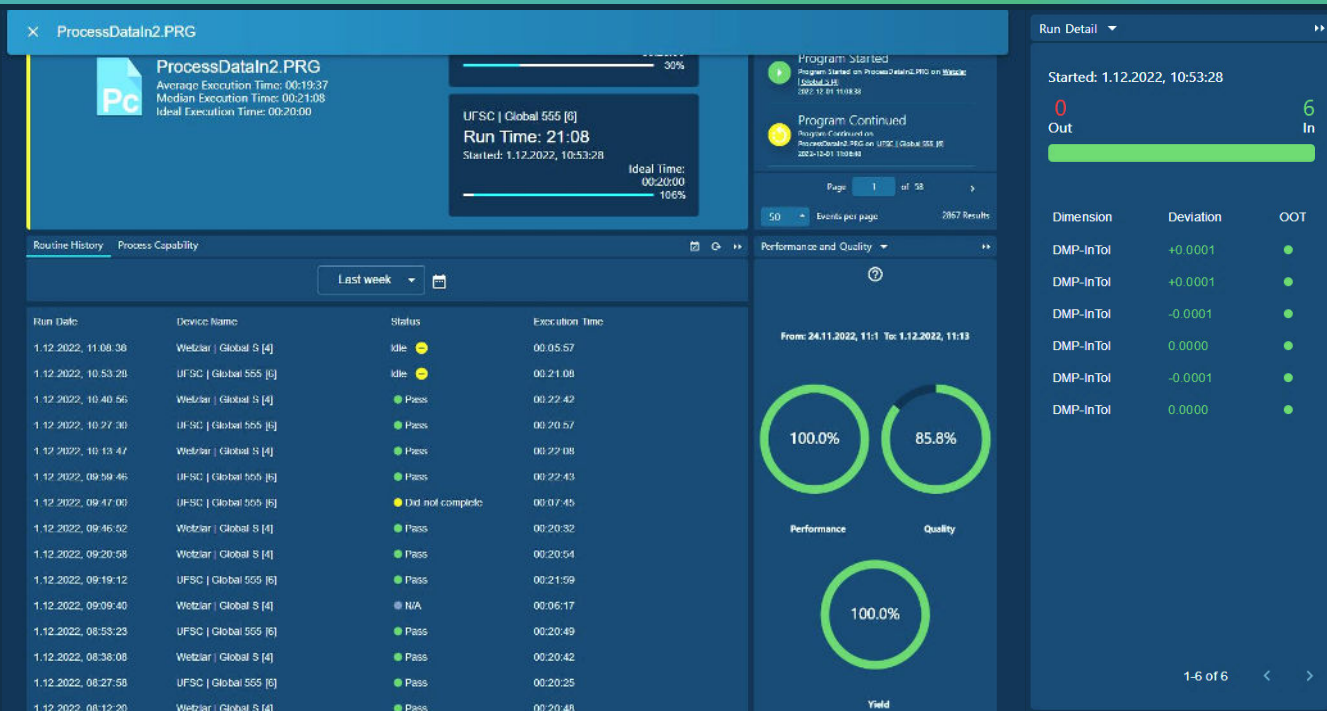
# FOR EFFICIENT QUALITY CONTROL ACROSS PROGRAMS & MACHINES

Centrally stored MEASUREMENT & INSPECTION RESULTS,  
Visualized YIELD RATES per program across machines.

**Problem:** Historical measurement & inspection results across machines are not stored centrally or only in individual files. Accessing specific measurement results or automated yield rate evaluation is difficult.

**Solution:** All measurement results of all programs across all machines are automatically stored centrally. Results of individual routines can be accessed via APOLLO directly and for all machines. Yield rates are evaluated continuously.

**Value:** No further efforts needed to centrally store measurement data across machines. Access to arbitrary results or general yield rate/s immediately, continuously, anywhere.



# FOR FASTER AUDITS, RECLAMATIONS & SERVICES

Minimum effort for EQUIPMENT MANAGEMENT,  
Uniform, immediate & detailed DATA AVAILABILITY.


**Problem:** Audits must be prepared or followed up and require the time-consuming compilation of system / service / calibration / capability / system data.

**Solution:** Continuously structured, systematic and immediate access to all relevant data in APOLLO for all machines and from anywhere.

**Value:** Significantly reduced effort for the preparation and follow-up of audits. Efficient management of measurement equipment.



IcPr | SF 454 [2]  
454SF  
Aachen



SYSTEM CONTROLLER SOFTWARE

**System**

Construction Year	2018
Controller Version	2
Group	IconPro
Location	Aachen
Model	454SF
Planned Service Date	N/A
Schedule (E)	No Schedule
Scheduled Service Date	N/A
SFA Connector Version	6.2.0.23
Serial Number	DM1700
UUID	c890930c-2c2b-4995-921c-80d69e90304f

Device Overview Service Overview Programs

Name	Model	Last General Calibration
<b>No Group</b>		
PMMC108	PMMC	2021-05-19
JJHC   TIGO SF	TIGO SF	2021-11-04
HKC   SF-7107	/7107/SF-	2021-09-16
Zross WZL	Non Hexagon	2020-11-29
<b>IconPro</b>		
IcPr   Mszak01 [1]	MPVPM600U	2020-01-09
IcPr   SF 454 [2]	454SF	2020-04-15
IcPr   Irmob [3]	H-Arm	2020-07-16
<b>UFSC</b>		
UFSC   PMMC [5]	PMMC	2020-11-04
UFSC   Global 555 [6]	Global 555	2020-12-09
<b>Wetzlar</b>		
Wetzlar   VIM4711	Leitz Reference	2021-04-14
Wetzlar   Global S [4]	Global SHTA	2021-11-18

**Service Activity History of IcPr | SF 454 [2]**

Predicted Out-of-Specification: 09/11/2022

Service Activity	Execution Date	Reminder Date	Comment	Report
Change of Bearings	08/11/2022	09/12/2022	No comment.	
Adjust buttons	03/10/2022	09/02/2023	Ordered extra keycaps.	
General Calibration	01/09/2022	09/11/2023	Schedule appointment.	
General Calibration	03/01/2022			



# FOR SIMPLE & INTUITIVE STATISTICAL PROCESS CONTROL

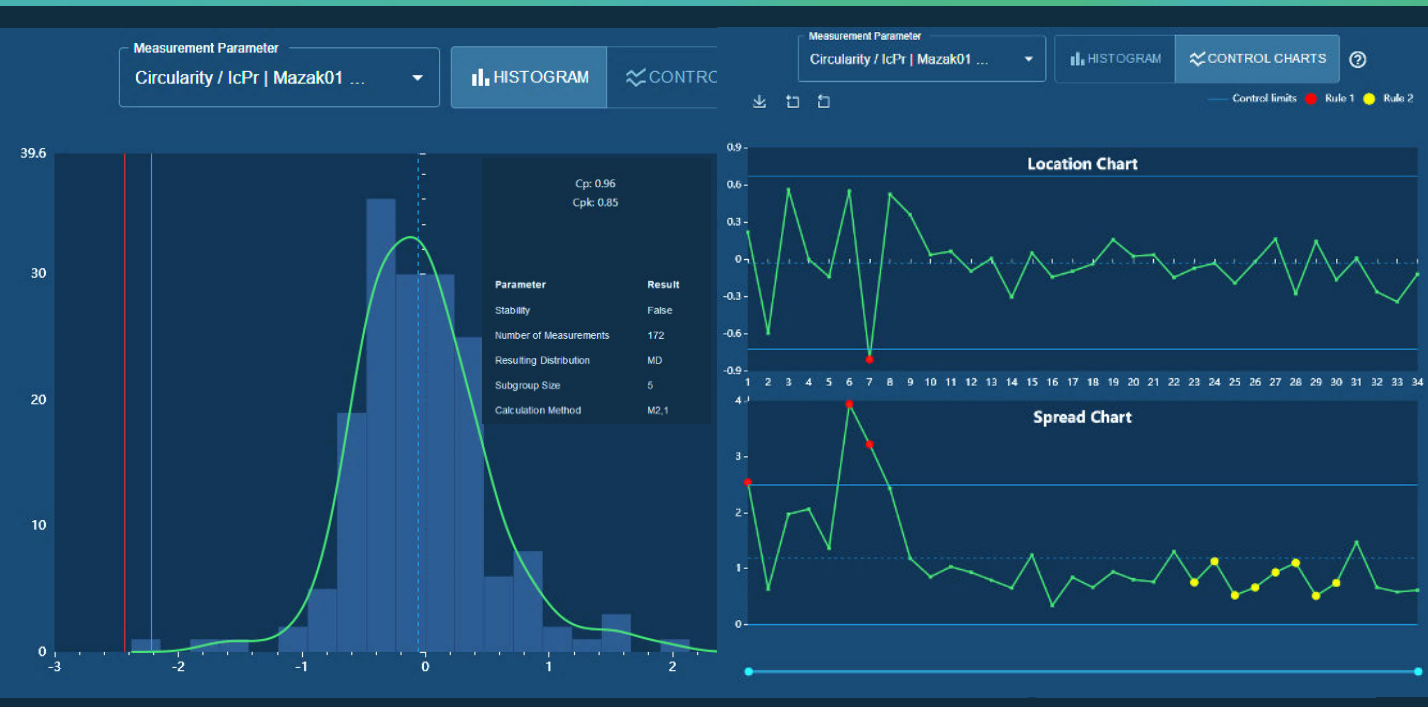
Integrated PROCESS CAPABILITY EVALUATION,  
Intuitive QUALITY CONTROL CHARTS.



**Problem:** Determining measurement & machine capabilities, or process capabilities is important, but is complex or requires statistical process control (SPC) software.
















**Solution:** Automated determination of characteristic values in APOLLO, intuitive operation without the need for training to retrieve results evaluated according to ISO.

**Value:** Very easy & cost-efficient determination of statistical parameters for reporting, audits or customers without expensive training and statistical software



# Which machines can be connected to APOLLO?

With our guaranteed connection within 30 days, we connect any machine to APOLLO. APOLLO offers a variety of existing interfaces with standard protocols or common manufacturers.

Machines / Controllers	 Fanuc Oi FOCAS Fanuc 30i / 31 / 32 Fanuc 15 / 16 / 18 / 21	 Classic / Next Gen	 530 / 640 w/DNC option OPC-UA (640)	 840/828 (OPC-UA)	 ...
Generic Protocols					
Metrology Devices	 Via PC-DMIS	 Via QUINDOS	 Via SMART SCS	 Via SMART SCS	 Via DFQ Files
Industrial Robots					

**Figure:** Existing interfaces with standard protocols and common machine & control manufacturers



## How can I test IconPro APOLLO?

We would be happy to provide you with a cloud-based demo access to our software, where sample machines are included.

In order to test APOLLO for your application, we would be glad to include a pilot machine from your machine park.

Contact us to test the software or discuss it in more detail for your use case. We are happy to take the time for you: [info@iconpro.com](mailto:info@iconpro.com)



IconPro is a leading technical provider of software solutions for predictive quality & predictive maintenance as well as process & energy optimization in production.

IconPro software helps manufacturing companies of all sizes to achieve more efficient and sustainable processes and machines. Our customers produce more competitively with less costs and resource usage.

Originating from the Machine Tool Laboratory of RWTH Aachen University, the largest institute for production research in Europe, we offer in-depth production expertise and software tailored to the shopfloor.

Learn more about IconPro at [iconpro.com](https://iconpro.com) and follow us on [LinkedIn](#).  
Feel free to write to us to [info@iconpro.com](mailto:info@iconpro.com).