



intelligent Digital Production Support

iDPS

Digital system solutions made by ELHA

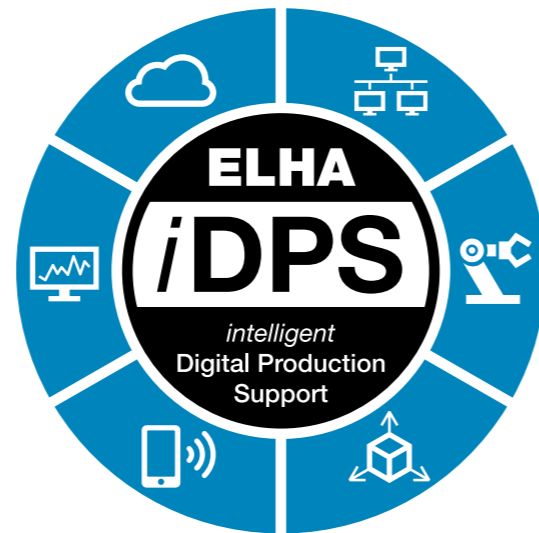
iDPS is the ELHA system solution for more productivity, efficiency and transparency.

The applications are available via workstations in the company network or with customer approval also worldwide via the ELHA machine service portal. As an option, dashboards for mobile devices can be offered.

Basis for all applications is a machine-installed industrial PC with a database, dashboards and an innovative remote access solution. Customer-specific add-ons are possible.

Your benefits

- ✓ Very high process / machine transparency
- ✓ Extensive analysis / diagnosis options
- ✓ Basic information for preventive maintenance
- ✓ Fast service support
- ✓ Applications are at the machine, in the company network and worldwide available
- ✓ Secure, client-controlled remote access



User groups

The iDPS system solution is suitable for result-oriented persons and users from the following areas:



Maintenance / Installation support

Process planning / Production planning





Manufacturing control / Production management

Service

Maximum transparency and effective service are the main objectives of ELHA iDPS. Therefore, the basic package already contains many useful functions and information to support the customer and ELHA in case of analysis.

BASIC

Free services during the warranty period!

 Machine Service Portal <ul style="list-style-type: none"> ■ Secure network ■ Service ticket ■ Online conferences ■ Asset file ■ Remote access 	 Machine Productivity Monitoring <ul style="list-style-type: none"> ■ Production status ■ Production output ■ Production times ■ Machining status 	 Machine Process Analyzer <ul style="list-style-type: none"> ■ Process data 	 Machine Health Inspector <ul style="list-style-type: none"> ■ Alarm history ■ Components operating hours
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ADD-ON


Machine Digital Simulation

- Virtual process commissioning
- Training at the virtual model

Digital twin for a realistic, virtual process environment based on the real machine data of the machine-tool.

ADVANCED

 Machine Process Analyzer <ul style="list-style-type: none"> ■ Trend analysis process (vibration, torque) ■ Tool monitoring 	 Machine Health Inspector <ul style="list-style-type: none"> ■ Trend analysis ■ Collision report ■ Detailed analysis
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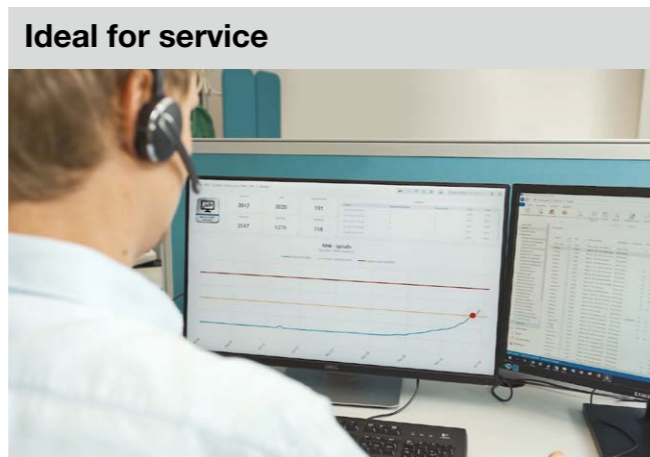
The advanced package allows more sensor-based transparency in process and condition of the wear-prone components such as ball screws, bearings and guided lines. Damages will be minimized or avoided by shutting down as quickly as possible in the event of a collision.



With the MSP-application, ELHA guarantees fast worldwide diagnostic support. Basis is a service ticket which is created by the customer.

Your benefits

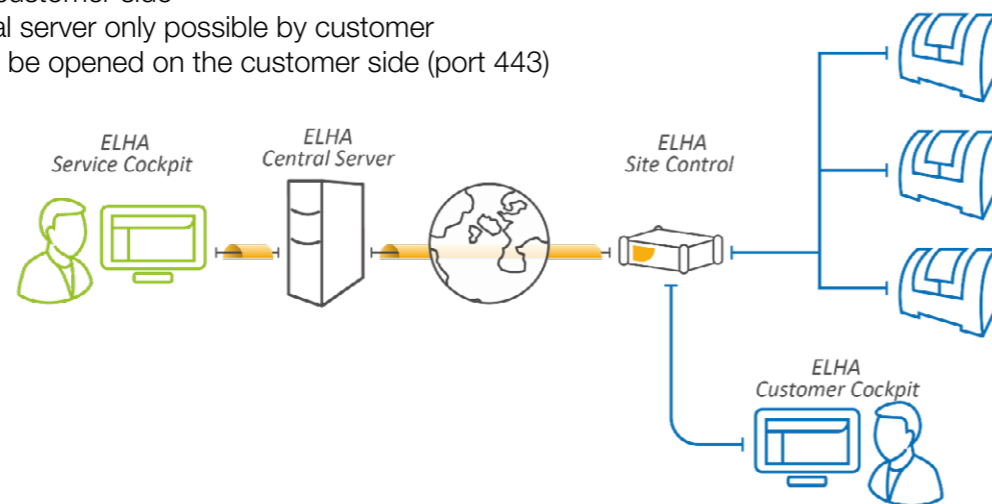
- ✓ Explicit, standardised communication channels
- ✓ Transparent communication history
- ✓ Worldwide diagnostic support
- ✓ Detailed remote diagnosis
- ✓ Optimal „on-site service“ scheduling



Ideal for service

Secure network technology

- Secure VPN-connection to the machine
- Full connection control on customer side
- Connection to ELHA central server only possible by customer
- Only one port which has to be opened on the customer side (port 443)



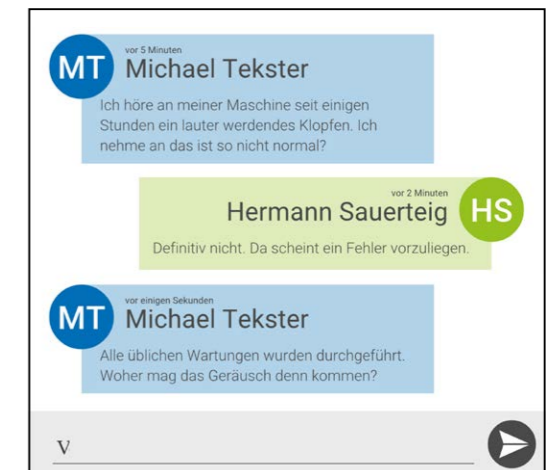
Service ticket

In case of service, the machine operator decides whether and when to grant access to the machine. The machine operator can be certain at all times that no one can establish a connection without his permission. A ticket is automatically created by a service request.

When a connection with the machine is established by a service technician, his presence is registered. The processing times of all employees involved in a service request are recorded and logged. The list of online times will be saved and available for evaluation.

Online conferences

The conference center is a multifunctional communication tool. It contains a text conference module, a webcam module and a whiteboard module. These components allow users who are logged in on the same ELHA site control or central server to exchange text, video, audio and images in real time. Mobile participation is possible with a smartphone, a windows tablet or data glasses.

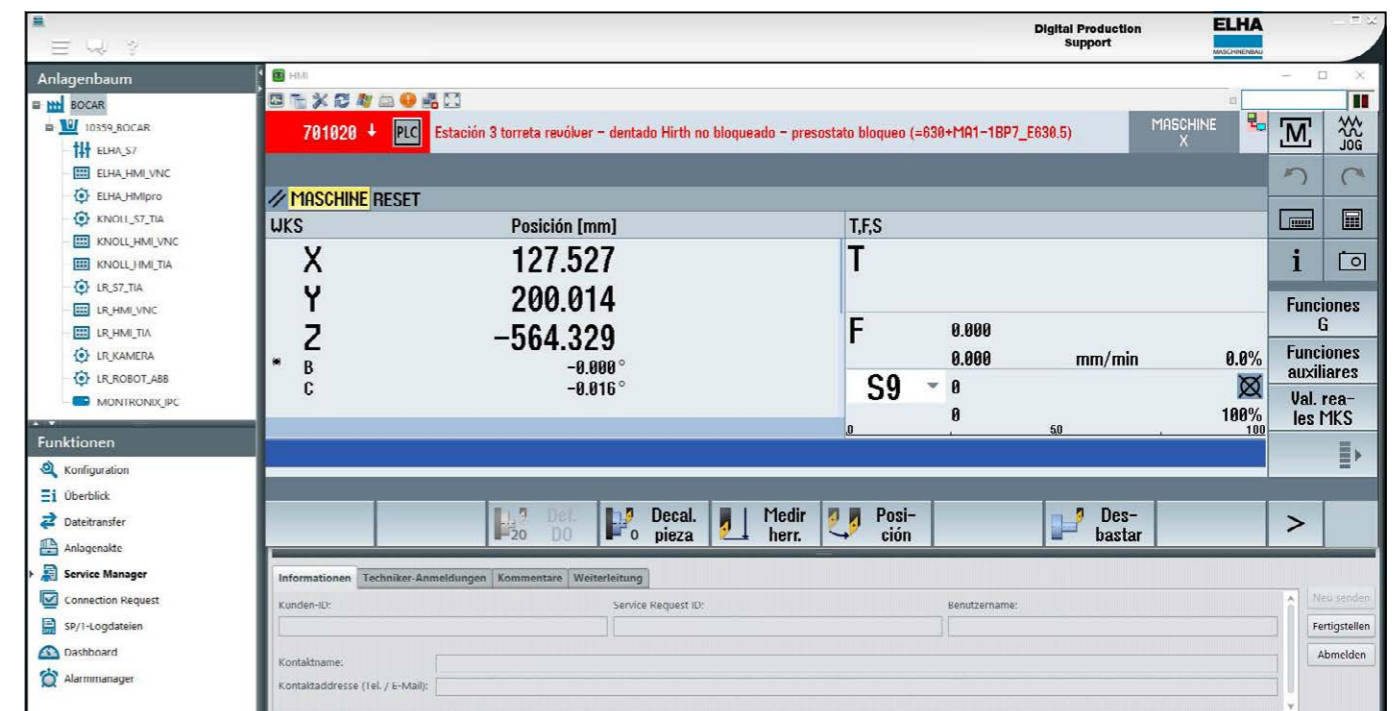


Asset file

ELHA MSP offers comprehensive management functions: customer and machine data, service information, documents and contracts are stored clearly and can be accessed at any time. A service archive and logging of all service activities are included functions.

Remote access

In case of service, access to all released components which include an IP-address, is possible. The machine operator determines which components are released: CNC control, CNC HMI, PLC control, mobile panels, camera, robot controller, robot HMI, etc.





With MPM-application a fast and clear overview of all relevant information regarding productivity in form of tables or diagrams is possible. Production-relevant data are stored locally on an industrial PC.

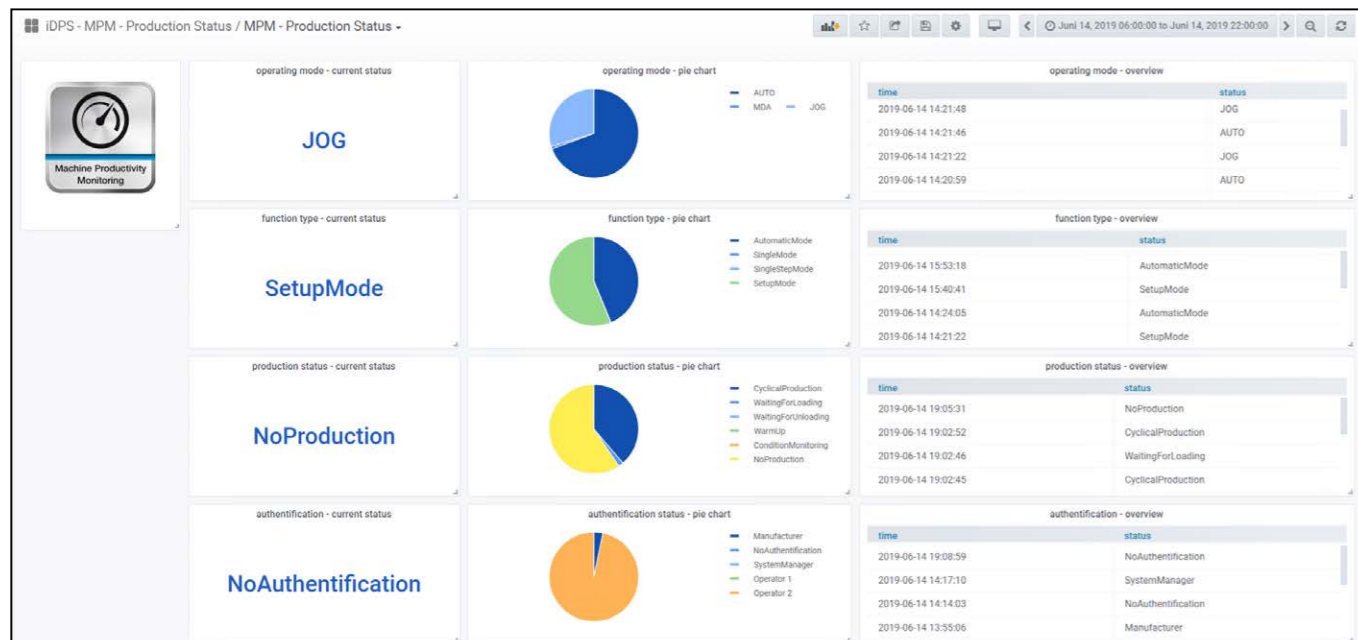
Your benefits

- ✓ Transparency regarding output and productivity
- ✓ Problem identification / analysis of causes of the discrepancies
- ✓ Available at any time, stationary and mobile



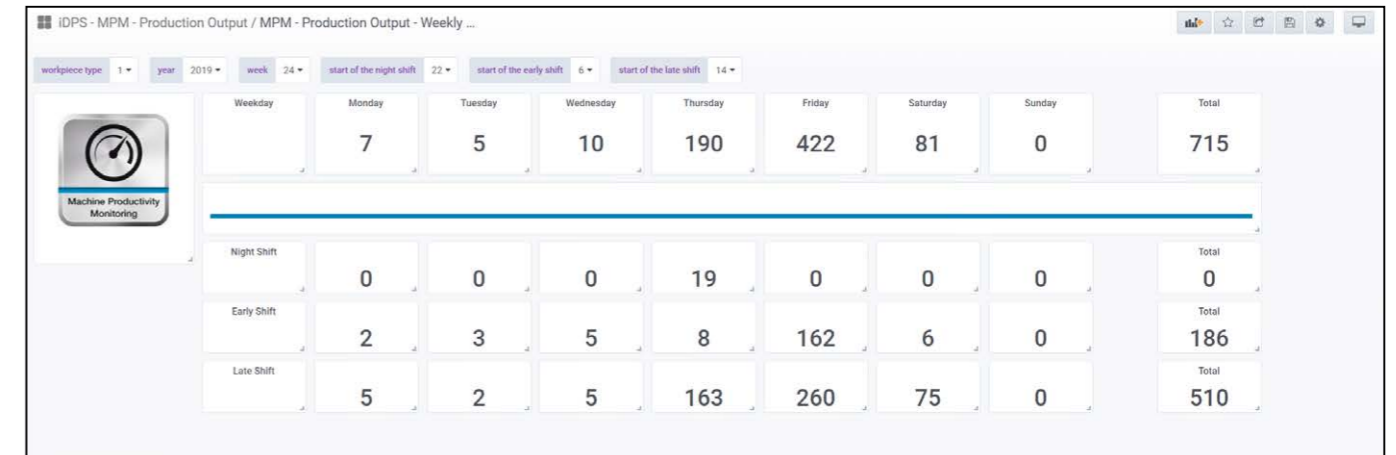
Production status

- CNC operating mode
- function type
- production status
- authentication



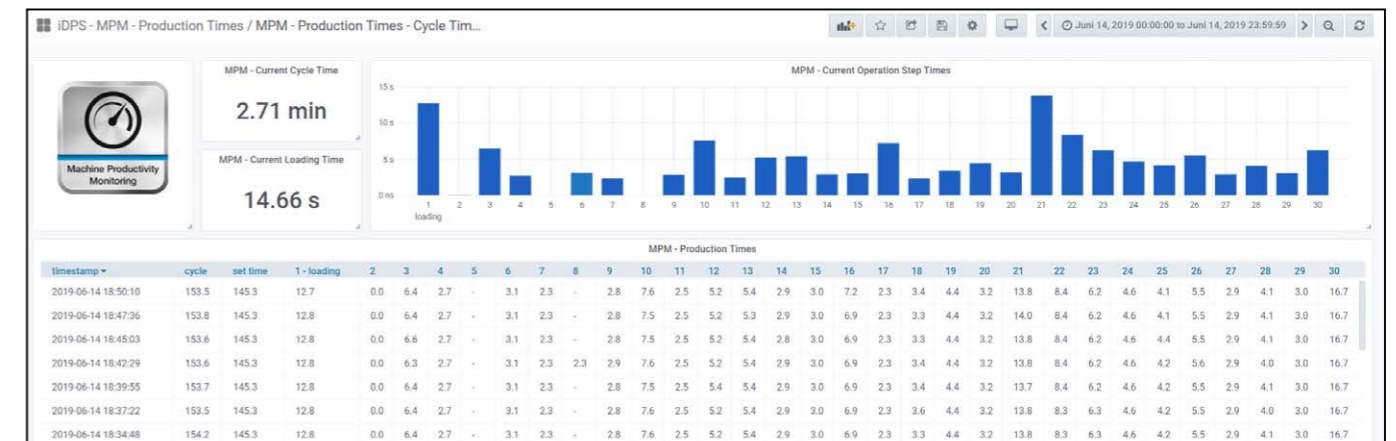
Production output

- workpiece-specific
- shift-specific
- week-specific



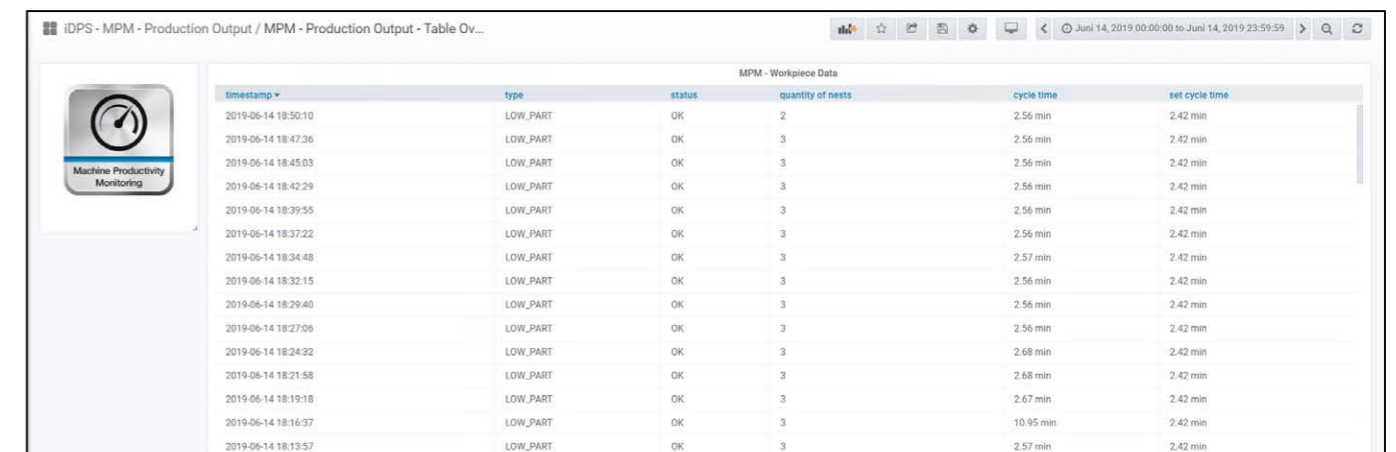
Production times

- workpiece code
- time stamp
- machining time
- machining step times
- workpiece change time



Processing status

- workpiece code
- time stamp
- workpiece type
- planned machining time
- real machining time





The MPA-application provides detailed information about the machining process. Process-relevant data for workpiece and step-specific machining are stored with a time stamp.

Your benefits

- ✓ Potentials for development of further productivity and cost optimisation
- ✓ Workpiece-specific analysis of the machining situation
- ✓ Identification and analysis of abnormal machining conditions



Process data

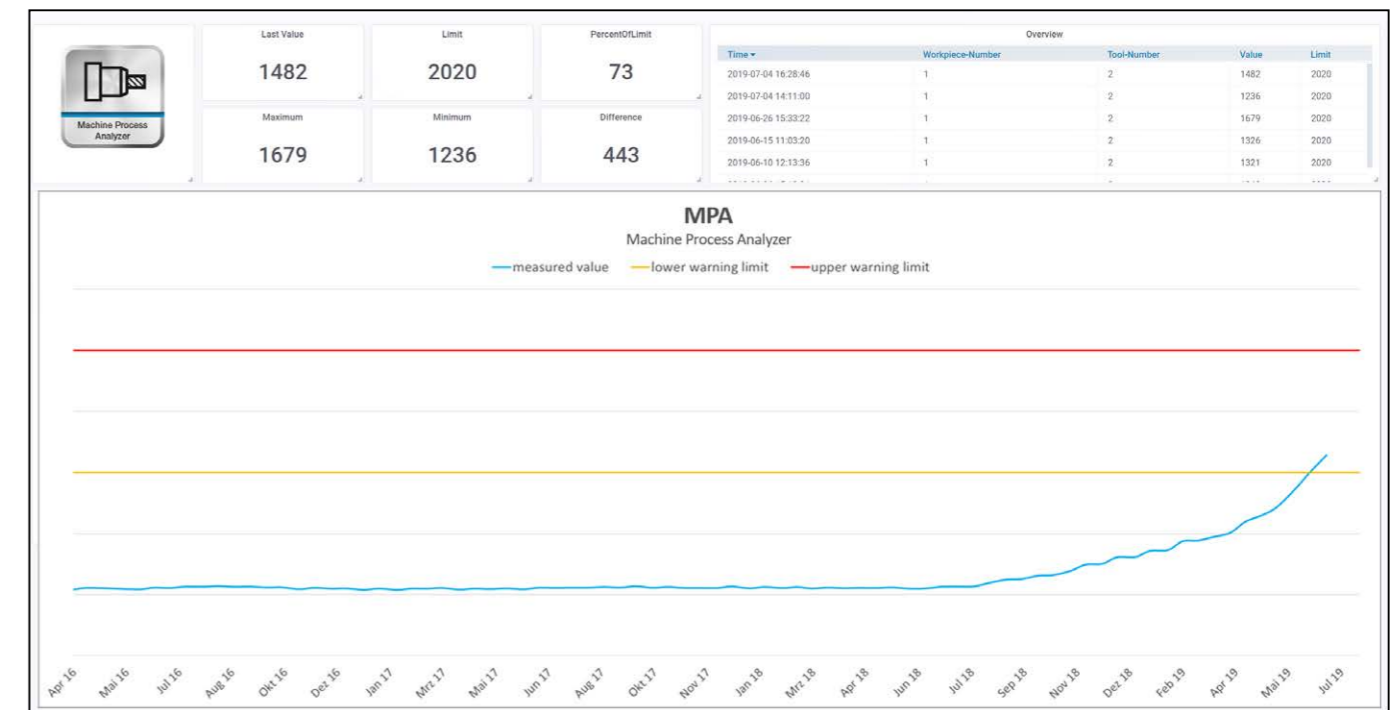
Workpiece-specific logging of process-relevant machining parameters. Including nominal values for spindle speed, feed rate, tool number, tool status, tool length, tool radius, machining step times, main machining time, non-productive times and temperatures.

timestamp	step	duration	G0	G1	feed	speed	temp.
2019-06-14 18:35:46	14	2.88 s	606.00 ms	0 ns	1	9646	29
2019-06-14 18:33:13	14	2.86 s	598.00 ms	0 ns	1	9646	29
2019-06-14 18:30:39	14	2.87 s	607.00 ms	0 ns	1	11937	29
2019-06-14 18:28:05	14	2.88 s	596.00 ms	0 ns	1	9646	29
2019-06-14 18:25:31	14	3.13 s	598.00 ms	12.00 ms	1	9646	29

tool id	length	radius	tool life	life set	life warn	mtx active	tool no.	wpc no.
TR171_COMBITOOL	100	142,000	0	0	0	true	31	11
TR171_COMBITOOL	100	142,000	0	0	0	true	31	11
TR171_COMBITOOL	100	142,000	0	0	0	true	31	11
TR171_COMBITOOL	100	142,000	0	0	0	true	31	11
TR171_COMBITOOL	100	142,000	0	0	0	true	31	11

Trend analysis **ADVANCED**

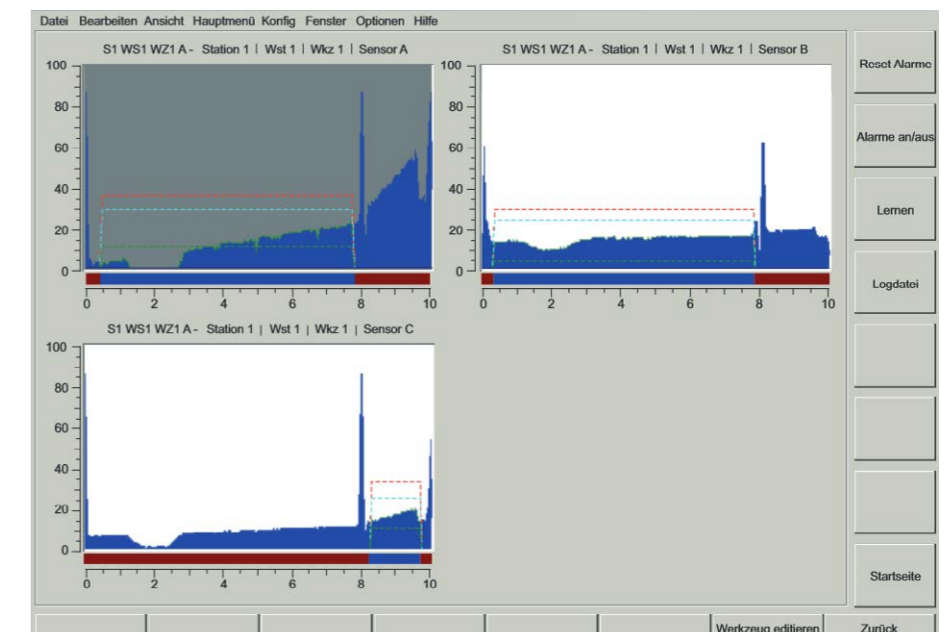
Processing step-specific current and vibration values from the tool and workpiece sides are integrated and displayed on a trend graph. Based on this information imminent and past quality problems can be identified. Component diagnosis via the machine health inspector is recommended in case of trend-discrepancies.



ADVANCED

Tool-monitoring

Monitoring of the machining process via motor current of the axes or spindles which are involved in the process. The acceleration sensors, mounted at the tool carrier (main spindle) or work-piece carrier (feed axes) can also be used for monitoring.





The MHI-application provides information for the operator about the condition of the wear-prone components which are installed in the machine and shows alarm messages that have occurred.

Your benefits

- ✓ Prevention of unplanned machine down-times
- ✓ Significant increase of machine availability
- ✓ Optimization of maintenance tasks and spare parts management
- ✓ Transparency for condition of machine components due to irregularities



Alarm history

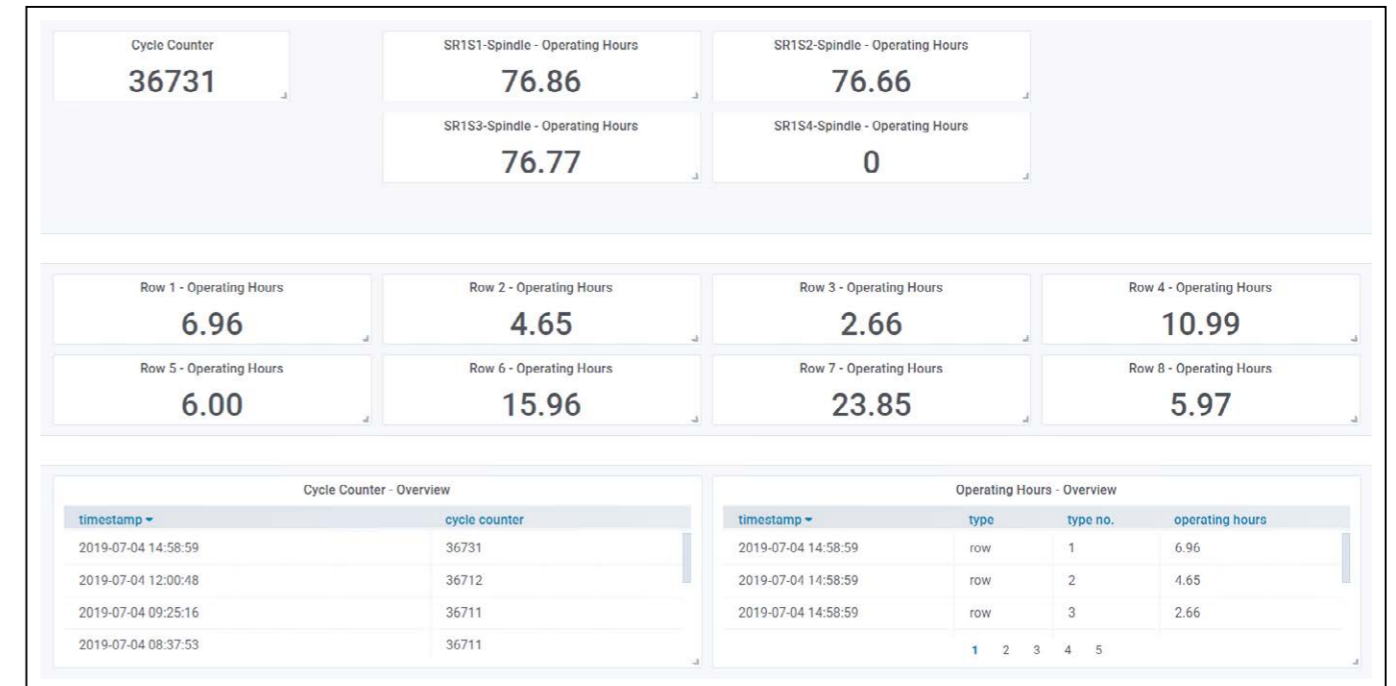
- alarm messages
- chronological with date / time of the event
- alarm specific with frequency

MHI - Alarms - Error-Overview ordered by timestamp			
Time	Number	Source	Message
2019-06-14 20:16:08	701020	PLC	Station 3 Revolver - Hirthverzahnung nicht verriegelt - Druckschalter Verriegeln (=630+MA1-1BP7_E630.5)
2019-06-14 20:16:08	701020	PLC	Station 3 Revolver - Hirthverzahnung nicht verriegelt - Druckschalter Verriegeln (=630+MA1-1BP7_E630.5)
2019-06-14 19:06:18	701301	PLC	Safety - NOT-HALT Bedienpult betätigt (=070+BP1-5SF4, =074+HS1-1KF2.1:DI1/DI5)
2019-06-14 19:06:18	701301	PLC	Safety - NOT-HALT Bedienpult betätigt (=070+BP1-5SF4, =074+HS1-1KF2.1:DI1/DI5)
2019-06-14 19:00:30	701020	PLC	Station 3 Revolver - Hirthverzahnung nicht verriegelt - Druckschalter Verriegeln (=630+MA1-1BP7_E630.5)
2019-06-14 19:00:30	701020	PLC	Station 3 Revolver - Hirthverzahnung nicht verriegelt - Druckschalter Verriegeln (=630+MA1-1BP7_E630.5)

MHI - Alarms - Error-Overview ordered by frequency			
frequency	Number	Source	Message
4	701020	PLC	Station 3 Revolver - Hirthverzahnung nicht verriegelt - Druckschalter Verriegeln (=630+MA1-1BP7_E630.5)
2	701301	PLC	Safety - NOT-HALT Bedienpult betätigt (=070+BP1-5SF4, =074+HS1-1KF2.1:DI1/DI5)

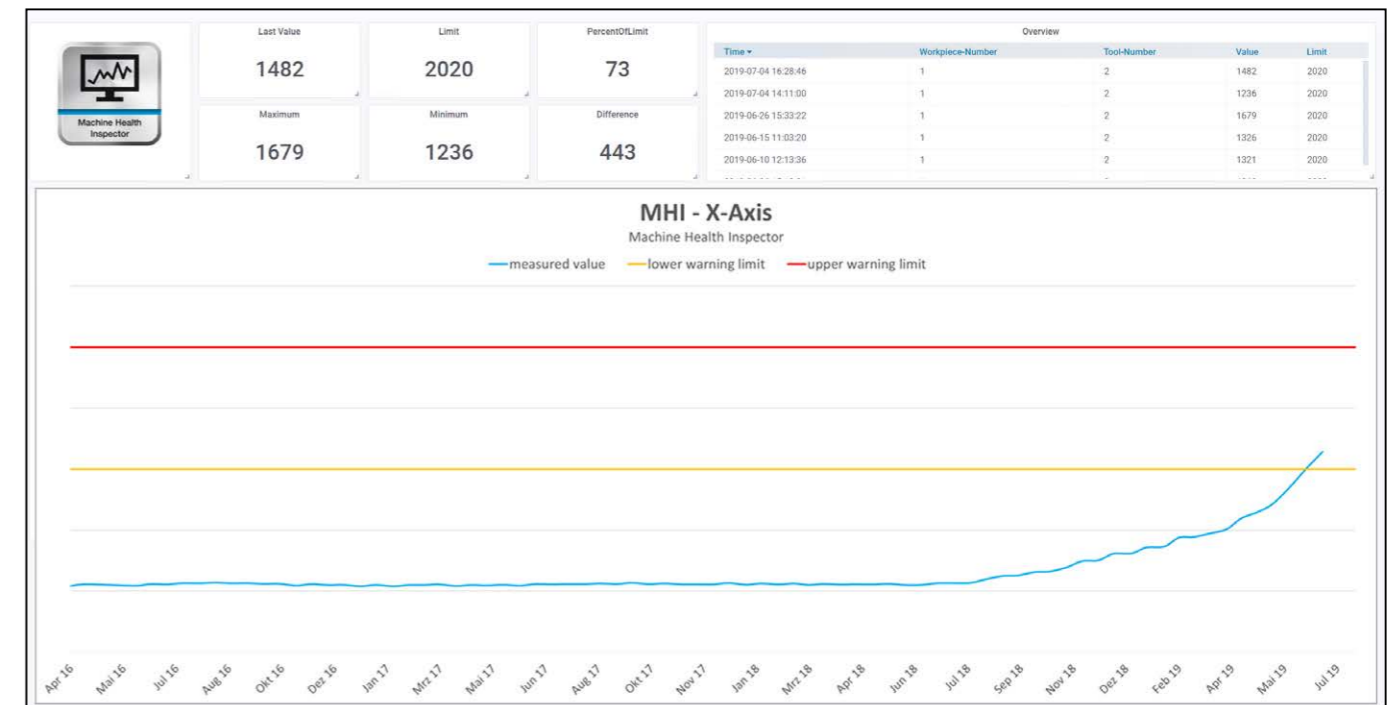
Components operating hours

Operating times of the machine, the machining spindles and the spindle bearings



Trend analysis (condition monitoring) ADVANCED

For diagnosis, axes and spindles are moved via a part program. Vibrations during the movement are integrated and displayed in a trend graph. Defined limit values exist for pre-warning and alarms. In case of reaching or exceeding a limit, a component-specific and detailed analysis is available.



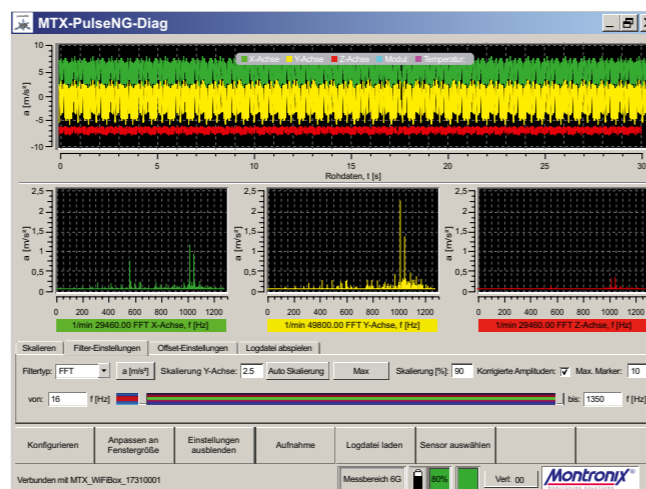
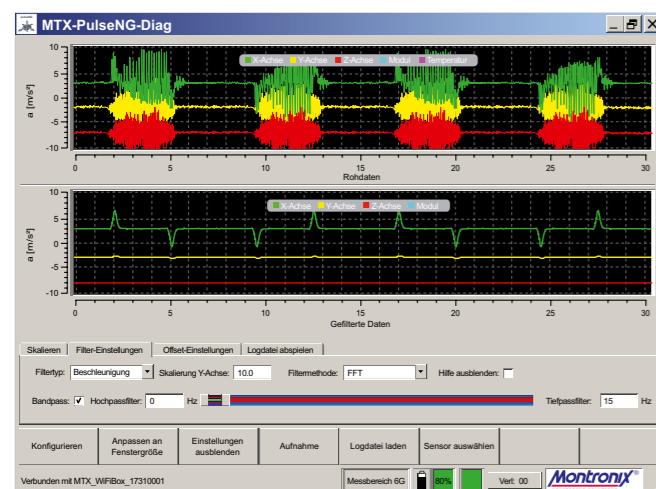
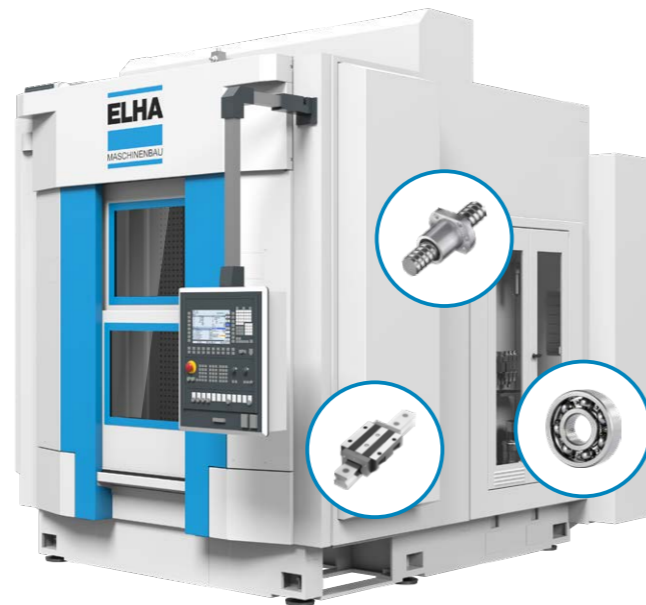
Collision report **ADVANCED**

In case of a collision, all movements are stopped as quick as possible. Collision-relevant information such as program number, program block, tool data, active coordinate system, active G-codes, etc. are stored with time stamp in a database. This information can be evaluated by using a dashboard.



Detailed analysis **ADVANCED** (Condition monitoring)

- Component-specific analysis after warning in axis / spindle trend
- Recording of vibrations directly at the bearing, ballscrew, guide-carriage of the affected axis / spindle with mobile 3-axis acceleration sensor
- Comparison with new condition state
- Analysis based on bearing-specific characteristics (FFT-analysis)
- Analysis of the vibration pattern



ADD-ON

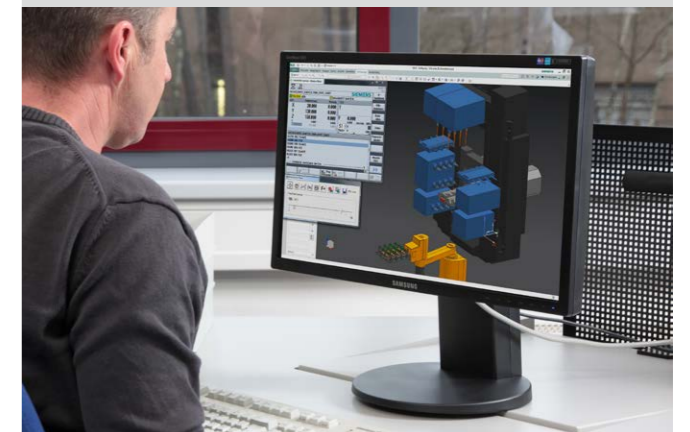
The MDS-application offers comprehensive and realistic process simulations in a virtual environment. Basis is a virtual machine which is linked to the kinematic model of the real machine and other machine parameters. The user is able to simulate the machining process via virtual NC control in a highly accurate accordance to the real process.

- Digital machine twin
- Realistic simulation of the machining process including cycle times
- Consideration of real technological machine properties for the simulation

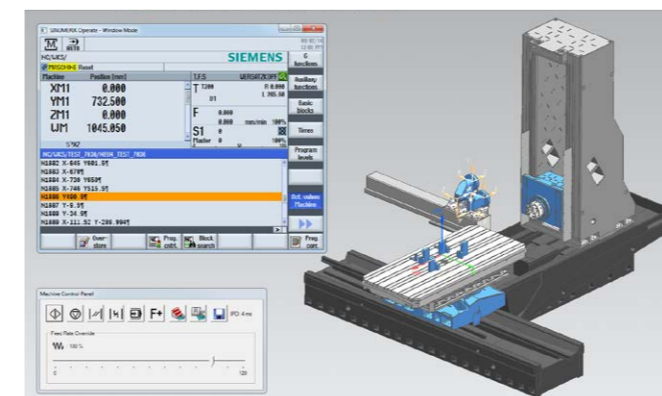
Your benefits

- ✓ Highly precise machining process simulation
- ✓ Early detection of required improvements and corrections for workpiece design and machining process technology
- ✓ Identification of ratio potentials for specific machining processes
- ✓ Collision avoidance in the early planning / programming phase

Ideal for process / production planning



Virtual machine



- Virtual Siemens control system
- Motion simulation
- Collision check
- Running-in of processes and process optimization
- Training of machine operators

Real machine



After simulation and testing in the virtual environment, the CNC program can be used directly

Industries & Products



Automotive



FM
Production Modules

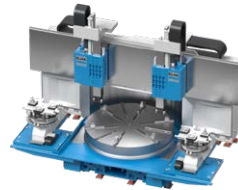


FM SMART
Transfer Centers



Energy

Large bearings



VTM
Vertical Turn-Milling Centers

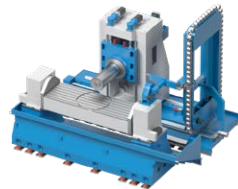


RTX
Rotary Table Machining Centers

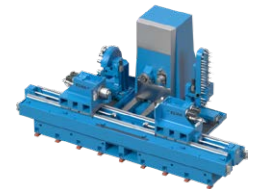


Aerospace

General machining



SMX
Special Machining Centers



SPX
Special Purpose Machines



Die and mold



Xpert-K
Horizontal Machining Centers



Xpert-V
Vertical Machining Centers

ELHA-MASCHINENBAU Liemke KG

ELHA is a family-owned company known for customized machine tools and process solutions. Many industries in the metalworking industry trust ELHA's experience and competence in the development and realisation of highly productive machining processes as well as the design and manufacture of cutting machine tools and turn-key solutions.

Plant 1

Allee 16
D-33161 Hövelhof

Phone: +49 5257 / 508-0

Fax plant 1: +49 5257 / 508-28

Fax plant 2: +49 5257 / 508-208

Plant 2

Otto-Hahn-Straße 27
D-33161 Hövelhof

E-Mail: info@elha.de

