EN

DIGITAL SOLUTIONS THAT MAKE YOUR MACHINES WORK MORE EFFICIENTLY

RECON PRODUCT PLATFORM



TAJMAC – ZPS

ZPS

ReCON

RECON PLATFORM BY TAJMAC-ZPS

RECON CONNECT



MACHINE DATA EXTRACTION

Why ReCON CONNECT?

A product that makes it easy to collect data from your machine using the standardized and encrypted OPC UA protocol.

ReCON CONNECT is designed with a deep understanding of machines, because we have many years of experience as their manufacturer. Thanks to this experience, we can effectively identify and extract key data. We offer not only a competitive pricing policy, but also long-term support and continued feature development. Our department is a new, dynamic team within a company with more than 120 years of history.

The machine is connected via an Ethernet connection to the CNC system. For conventional machines, we use PLC installation and data collection using current load or a 24 V signal.

The OPC UA server can be operated on hardware supplied by TAJMAC-ZPS, a.s., or it can be virtualized on the customer's company server. The customer can specify which machine data can be read or written. They can choose from three discounted packages depending on how much data you want to collect.

Third-party programs can access the OPC UA server and read data if they are equipped with an OPC UA client. If any of your existing systems do not support OPC UA (Industry 4.0 standard), we will supply an OPC UA client that supports reading from OPC UA and MTConnect and create a programming database (MS SQL/MariaDB).
This greatly simplifies the integration of data into your systems.

We have also expanded this service to include connectivity with Power BI, where you can create your own reports based on this data.

MAIN ADVANTAGES OF RECON CONNECT

- **Standardized and encrypted protocol**
- **Supported in Industry 4.0 and subsidy titles**
- **Connectivity for other devices/systems**
- **Option to add MS SQL and MariaDB databases**
- **Currently supported systems:**

Fanuc
- Supports two-way secure communication

Siemens NC, PLC
- Supports two-way secure communication

Heidenhain
- without DNC 18, one-way secure communication
- with DNC 18, it supports two-way secure communication.

Mitsubishi
- supports two-way secure communication

Conventional machines
- one-way secure communication based on load measurement and 24V signal

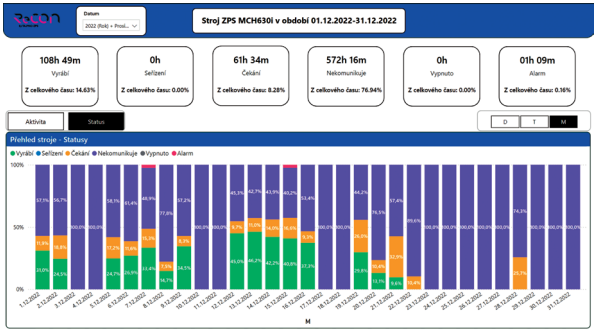
ReCON API
- information on demand

MTConnect
- supports one-way communication with MTConnect, or we can translate this protocol into the OPC UA standard

ReCON Client
- allows data to be stored in MS SQL, MariaDB

- **Option to connect to Power BI**

- reporting using Power BI



- example of reading CONNECT data

Display Name	Value	Datatype	Source Timestamp	Server Timestamp	Statuscode
MACHINE	KMX432VV104L0120	String	6:15:03.102	9:21:55.705	Good
FEED_OVR	100	UInt32	9:21:59.431	9:21:59.609	Good
SPEED_OVR	100	UInt32	9:22:13.474	9:22:14.277	Good
PIECE_PROGRAM	TRNO_K1	String	9:22:20.480	9:22:21.432	Good
PIECES_COUNTER_...	1915	UInt32	9:35:44.021	9:35:44.021	Good
OP_MODE	2	UInt32	9:22:29.500	9:22:30.459	Good
MODE TMDB	3	UInt32	9:22:40.521	9:22:40.818	Good
MACHINE	MCFV1060V280C1081	String	6:15:12.264	9:23:04.934	Good
FEED_OVR	0	UInt32	9:23:09.605	9:23:10.509	Good
SPEED_OVR	0	UInt32	9:23:20.629	9:23:20.913	Good
PIECE_PROGRAM	V-VIKO.H	String	9:23:32.655	9:23:33.566	Good
PIECES_COUNTER	0	UInt32	9:23:45.682	9:23:46.308	Good
OP_MODE	2	UInt32	9:24:08.729	9:24:09.011	Good
MODE TMDB	0	UInt32	9:24:11.748	9:24:11.927	Good
MACHINE	MCFV1260V290C0526	String	6:15:17.108	9:24:47.370	Good
FEED_OVR	100	UInt32	9:24:58.520	9:24:59.321	Good
SPEED_OVR	99	UInt32	9:25:02.539	9:25:03.473	Good
PIECE_PROGRAM	V-UCHYT.H	String	9:25:07.550	9:25:08.134	Good
PIECES_COUNTER	0	UInt32	9:25:16.573	9:25:16.934	Good
OP_MODE	2	UInt32	9:25:21.585	9:25:22.326	Good
MODE TMDB	3	UInt32	9:26:28.878	9:26:28.879	Good
ALARM_LIST	44040417#1#Křížová kontrola MC - zad...	String	9:35:08.390	9:35:08.390	Good
MACHINE	MCFV1260V290C0362	String	6:15:22.140	9:26:16.221	Good
FEED_OVR	100	UInt32	9:26:26.104	9:26:26.350	Good
SPEED_OVR	100	UInt32	9:26:29.110	9:26:29.529	Good
PIECE_PROGRAM	V.H	String	9:26:35.149	9:26:35.921	Good
PIECES_COUNTER	0	UInt32	9:26:41.157	9:26:41.908	Good
OP_MODE	2	UInt32	9:26:55.255	9:26:56.133	Good
MODE TMDB	3	UInt32	9:33:36.060	9:33:36.060	Good
MACHINE	MCFV1260V290C0546	String	6:15:28.310	9:27:40.072	Good
FEED_OVR	0	UInt32	9:27:45.091	9:27:45.609	Good
SPEED_OVR	0	UInt32	9:27:53.118	9:27:53.434	Good
PIECE_PROGRAM		String	9:28:03.162	9:28:04.060	Good
OP_MODE	0	UInt32	9:28:08.172	9:28:08.945	Good
MODE TMDB	0	UInt32	9:28:19.191	9:28:19.285	Good
MACHINE	DMGCLX450	String	6:15:32.189	9:31:15.262	Good
FEED_OVR	100	UInt32	9:31:17.842	9:31:18.690	Good
SPEED_OVR	100	UInt32	9:31:25.875	9:31:26.736	Good
PIECE_PROGRAM	R_306PRIRUBARAVEO2STR	String	4:45:56.275	9:31:34.759	Good
PIECES_COUNTER_...	97	UInt32	9:35:15.862	9:35:15.862	Good
OP_MODE	2	UInt32	9:32:06.003	9:32:06.281	Good
MODE TMDB	3	UInt32	9:32:07.005	9:32:07.513	Good
MACHINE	DMGCTX510	String	6:15:37.218	9:32:27.513	Good
FEED_OVR	100	UInt32	9:32:31.131	9:32:31.476	Good
SPEED_OVR	100	UInt32	9:32:40.149	9:32:40.613	Good
PIECE_PROGRAM	348ROLNAZADNI	String	9:32:46.181	9:32:46.756	Good
PIECES_COUNTER_...	6	UInt32	9:32:47.194	9:32:48.049	Good
OP_MODE	2	UInt32	9:32:58.210	9:32:59.055	Good
MODE TMDB	4	UInt32	9:33:00.213	9:33:01.068	Good
MACHINE	OkumaGENOSL2000-e	String	6:15:42.184	9:33:25.270	Good
FEED_OVR	100	UInt32	9:33:30.274	9:33:30.885	Good
SPEED_OVR	100	UInt32	9:33:34.286	9:33:35.260	Good
PIECE_PROGRAM	OK029-Vlozka.MIN	String	9:33:40.306	9:33:41.077	Good
PIECES_COUNTER_...	1595	UInt32	9:33:43.319	9:33:44.293	Good
OP_MODE	2	UInt32	9:33:52.338	9:33:52.464	Good
MODE TMDB	3	UInt32	9:34:00.367	9:34:00.486	Good
MACHINE	OkumaL250	String	6:15:47.154	9:34:20.612	Good
FEED_OVR	100	UInt32	9:34:27.394	9:34:27.745	Good
SPEED_OVR	100	UInt32	9:34:32.406	9:34:33.188	Good

RECON MES



OPTIMIZATION OF THE MANUFACTURING PROCESS

Why ReCON MES?

ReCON MES is the next step towards optimizing your manufacturing process.

ReCON MES is a visualization and reporting platform that works with data obtained from ReCON CONNECT software. It effectively processes and compares this data to provide clear information for production management.

Thanks to our extensive experience with our own production, we are fully familiar with the demands placed on MES systems, and our goal is to offer a simple and functional solution.

We provide you with an effective solution for clearly visualizing data within an MES system.

Our ReCON MES platform includes a clear reporting tool that enables online and retrospective report generation with automatic and manual data collection and the option to integrate data from other systems. The system includes monitoring of assembly operations, an APS planning module for workshop planning, and a CMMS service module for preventive maintenance. Reporting can be expanded and linked to Power BI. The solution is available as a fully CLOUD-based subscription service. It includes all maintenance services, including further development of the module's functionality.

MAIN ADVANTAGES OF RECON MES

- **Reporting tool for streamlining production processes**
- **Clear display of data** (online reports or retrospective generation)
- **Multiple report types + Power BI option**
- **Automatic and manual data collection**
- **Option to integrate data from other systems**
- **Monitoring of assembly operations**
- **APS planning module for workshop planning**
- **CMMS service module for maintenance management**

The basic package provides you with an overview of production, a planning calendar, and a service module, giving you a comprehensive view of the entire production process.

ReCON APS

- Workshop production planning + work queue
- Planning calendar for machines and operators
- Production traceability, data visualization in the calendar for machines or operations

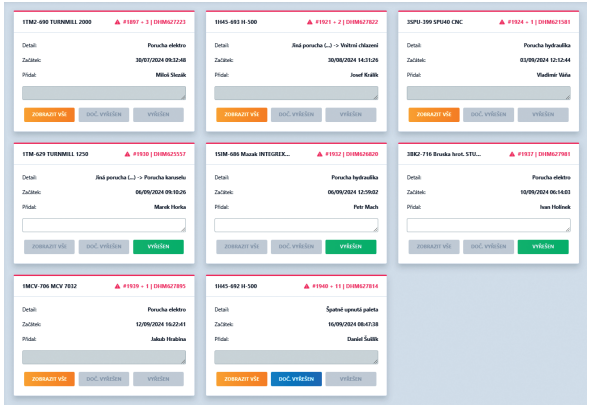
ReCON CMMS – preventive maintenance management

- Records of machine failures and repair costs
- Planning of preventive inspections and repairs
- Machine documentation management
- Condition monitoring of key machine components

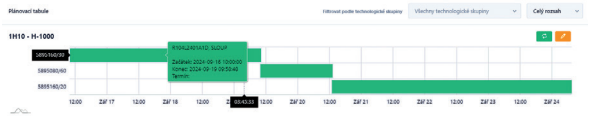
ReCON REP - analyses, reports

- Integrated standard reports
- Power BI customized reports according to client specifications

- Example of a CMMS ticketing system



- example of an APS planning board



- preview of MES system evaluation for a specific machine



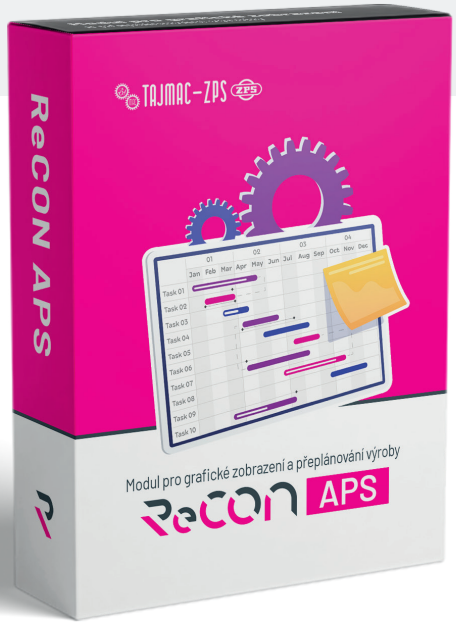
RECON MES


ReCON MES
TAJMAC-ZPS
Monitorovací systém pro výrobu a montáže
ReCON MES
ReCON APS
TAJMAC-ZPS
Modul pro grafické zobrazení a přeplánování výroby
ReCON APS
ReCON CMMS
TAJMAC-ZPS
INSTRUCTION MANUAL
Servisní modul pro stroje
ReCON CMMS
ReCON REP
TAJMAC-ZPS
Modul pro reportování pomocí MES a PowerBI
ReCON REP

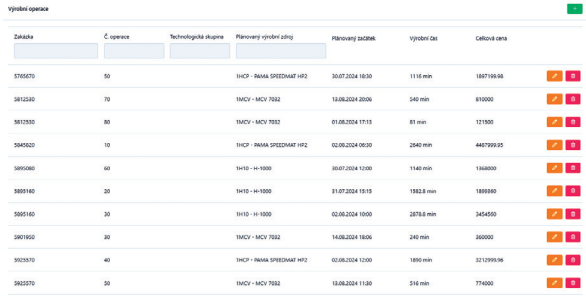
ReCON APS

ReCON APS offers workshop production planning with a work queue and planning calendar for machines and operators.

It enables production traceability monitoring and visualization of production data directly in the calendar, which provides an overview of the progress of individual operations.



- **example of a manufacturing operation**



- **example of production resources**



- **example of shift work**



- **example non-working hours**



- **example of a planning board**

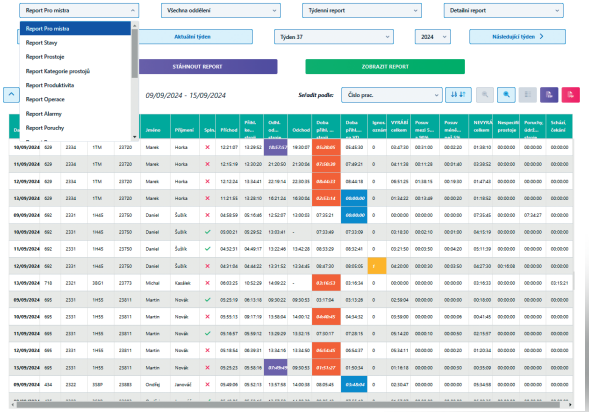


RECON REP

- **Customized reporting using Power BI**



- **standard reporting**



ReCON REP

Choose from our preset reports in the ReCON REP section.

If you need to create a special customized report, please contact us and we will be happy to help you create it using the Power BI application, which is a free part of our ReCON REP module. You will receive login details for your account, which will allow you to create your own reports or use one of the predefined reports.



ReCON CMMS

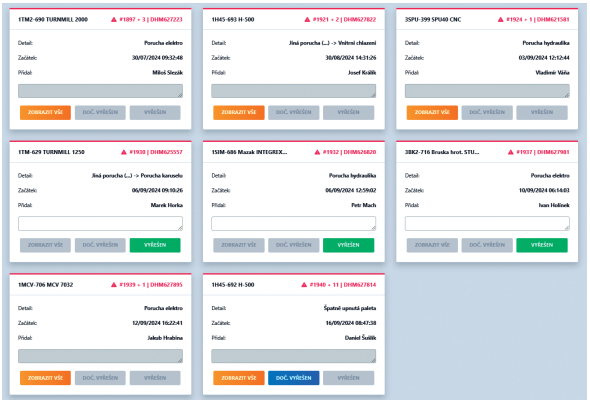
Keep track of regular maintenance for your machine.

Plan interventions that are in line with the APS planning module, and find out the costs of machine downtime through maintenance tickets.

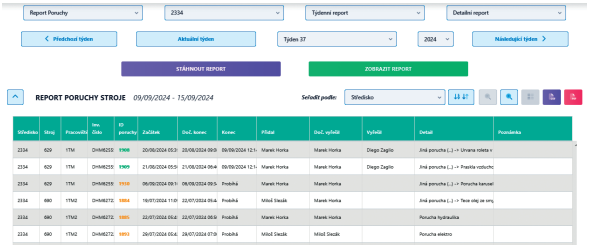
Keep all machine information in one place: documentation, service log with the option to add notes, regular maintenance notifications, and confirmation of task completion from the technician..



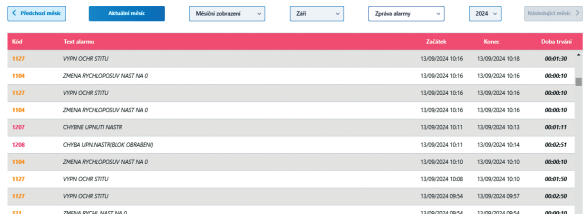
- example of a ticketing system



- example of a machine failure report



- example of a report of alarms occurring on a machine



RECON PLATFORM BY TAJMAC-ZPS

OPTIONAL PACKAGE



OPTIONAL PACKAGE

Why ReCON extension modules?

The basic ReCON MES package includes APS for workshop planning, CMMS for preventive maintenance, and REP for reporting, which provide comprehensive tools for effective management and control of production processes.

For those looking for more advanced features, we offer extension modules, such as:

ReCON SQC

- Used for entering in-process corrections into the machine based on the measured piece and also provides statistical quality control, which helps increase production accuracy.

ReCON JOB

- Focuses on effective tool management, including monitoring and controlling tools in the production process.

ReCON ESG

- Evaluates the consumption of electricity and compressed air by the machine and provides reporting at the level of a single manufactured piece, which contributes to consumption optimization and ecological management.

ReCON AI

- Enables compensation for thermal expansion on the machine using artificial intelligence, ensuring stable production quality even when ambient conditions change.

ReCON TWM

- Monitors tool wear during cutting, enabling timely tool replacement and minimizing the risk of production interruptions.

We will gradually introduce these optional modules to you and show you how they can further improve the efficiency and accuracy of your production.

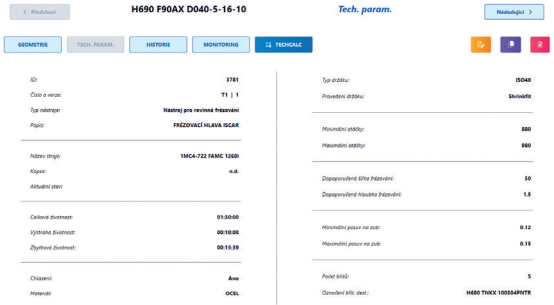
ReCON JOB

Keep your tool management under control.

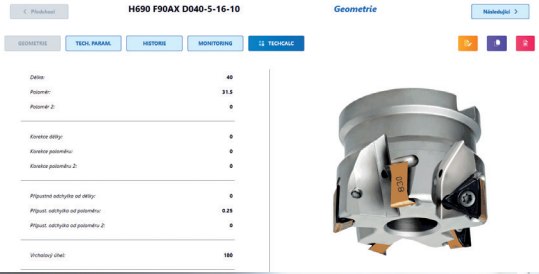
This module ensures the management of tool sets and the transfer of measured corrections directly to the machine control system. Measured values can be transferred directly from the measuring station or using a standard protocol generated by the station.

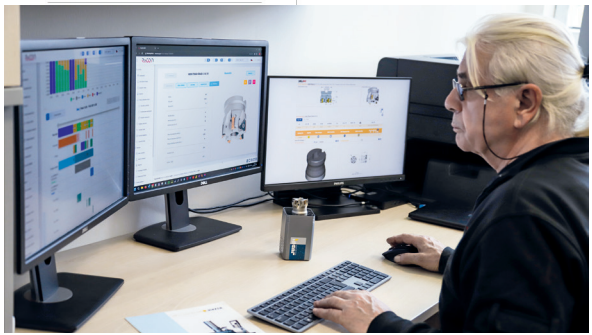


- **Example of tool life transfer**



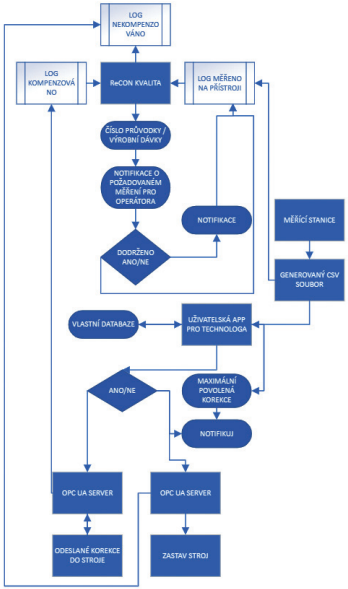
- **example of transferred tool dimensional parameters**



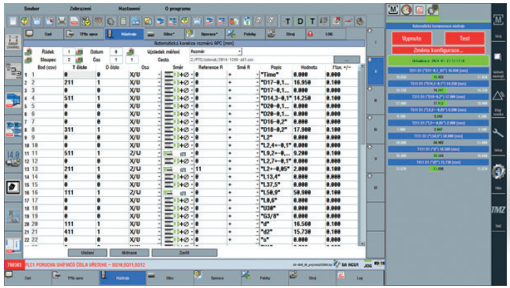


RECON SQC

- functional diagram



- preview of the user environment



ReCON SQC

ReCON SQC software specializes in in-process measurement and entering corrections into the machine.

As part of workpiece measurement, it allows online corrections to be sent, recorded, and stored in a production process stability graph. The system supports effective quality control, ensures precise management and optimization of production processes, thereby contributing to high product quality and minimizing production errors.

To determine the required dimensions, we use an external measuring station, which generates an XLS output to a network drive. We identify this output, record the corrections, and send them directly to the machine. How this process works is shown in the attached graph.



ReCON ESG

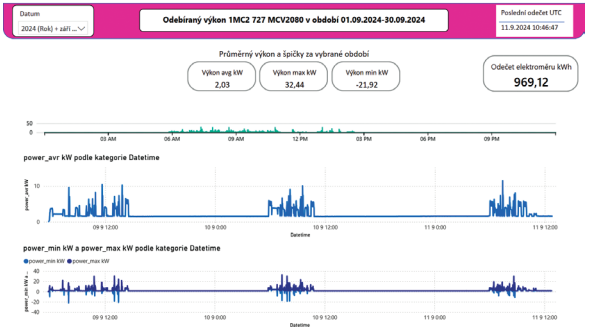
If you operate energy-intensive equipment, you are certainly interested in the consumption of electricity or compressed air.

With the help of ReCON ESG, we can report this data and read it directly from the machine's control system (if this function is supported), or the machine can be retrofitted with a measuring PLC to collect the required variables.

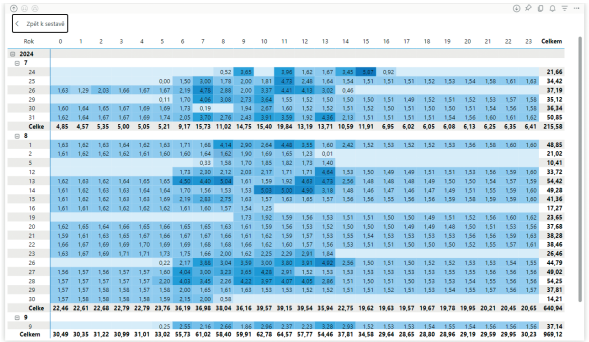
The best results are achieved by combining ReCON MES and ReCON ESG, which allows you to calculate the energy consumption per unit produced based on the reported production batch.



- **average power and peaks of electrical energy in the selected period**

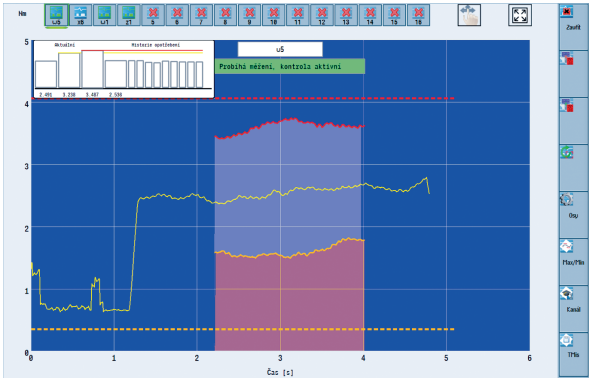


- **monthly overview of consumption day by day**



RECON TWM

- preview of measurement and calculation of cutting area for a specific tool



ReCON TWM

ReCON TWM offers real-time monitoring of tool breakage and wear. The system uses a sensor to measure the position of the tool in real time and compares it with the tool's nominal position.

The system allows you to monitor up to 16 tools simultaneously, detect broken or missing tools, and track their wear and tear. Thanks to intuitive visualization, setting up the system is very easy.



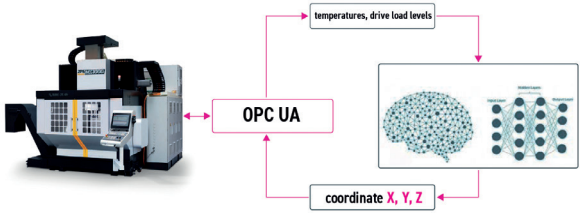
ReCON AI

ReCON AI uses artificial intelligence to compensate for machine thermal expansion, regardless of the type of control system (available only for TAJMAC-ZPS machines).

The system does not require the machine to be placed in an air-conditioned room and allows for continuous learning and improvement of accuracy directly at the customer's site. Installation has low hardware and financial requirements.
Thanks to this technology, we have been able to improve the accuracy of the TAJMAC-ZPS MCV1260i milling center from 0.26 mm to 0.005 mm.



- functional preview

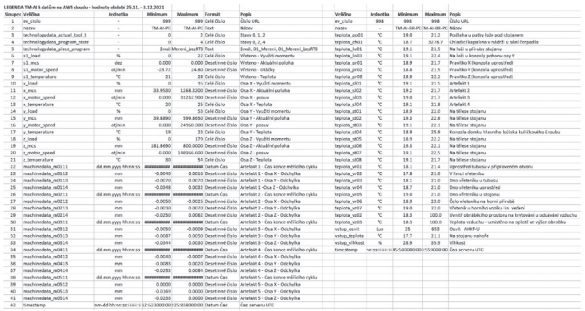


- Comparison with and without the use of ReCON AI

Comparison of the resulting accuracy of the manufactured part with/without compensation

		RMSE (mm)	min (mm)	max (mm)	range of selection (mm)
with compensation	Y	0,006	-0,002	0,027	0,029
	Z	0,004	-0,006	0,017	0,023
without compensation	Y	0,021	-0,012	0,051	0,063
	Z	0,047	-0,06	0	0,06
theoretical/ unloaded	Y	0,003	-0,005	0,011	0,016
	Z	0,005	-0,004	0,010	0,014

- evaluated data



TAJMAC–ZPS

ReCON

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9/2024 *Specifications, illustrations, and numerical data may not correspond to the latest update.*