



# Zyfra digital manufacturing

[mdc-plus.com](https://mdc-plus.com)

# MDCplus at a glance

Real-time monitoring and machine data collection (MDC) system that is designed to track machine operation, personnel productivity and part manufacturing progress. Its tailored reports and charts can be used to eliminate unreasonable downtime, evaluate overall equipment efficiency (OEE) and reduce production costs.

Over 8,000 CNC machines are connected!

FROST & SULLIVAN  
**BEST PRACTICES**  
AWARDS

**MTconnect**<sup>®</sup>



| 2





# OEE

**OEE (Overall Equipment Effectiveness)** is a globally accepted standard for measuring manufacturing productivity.

In short: it identifies the share of the total manufacturing time that is truly productive.

## OEE factors

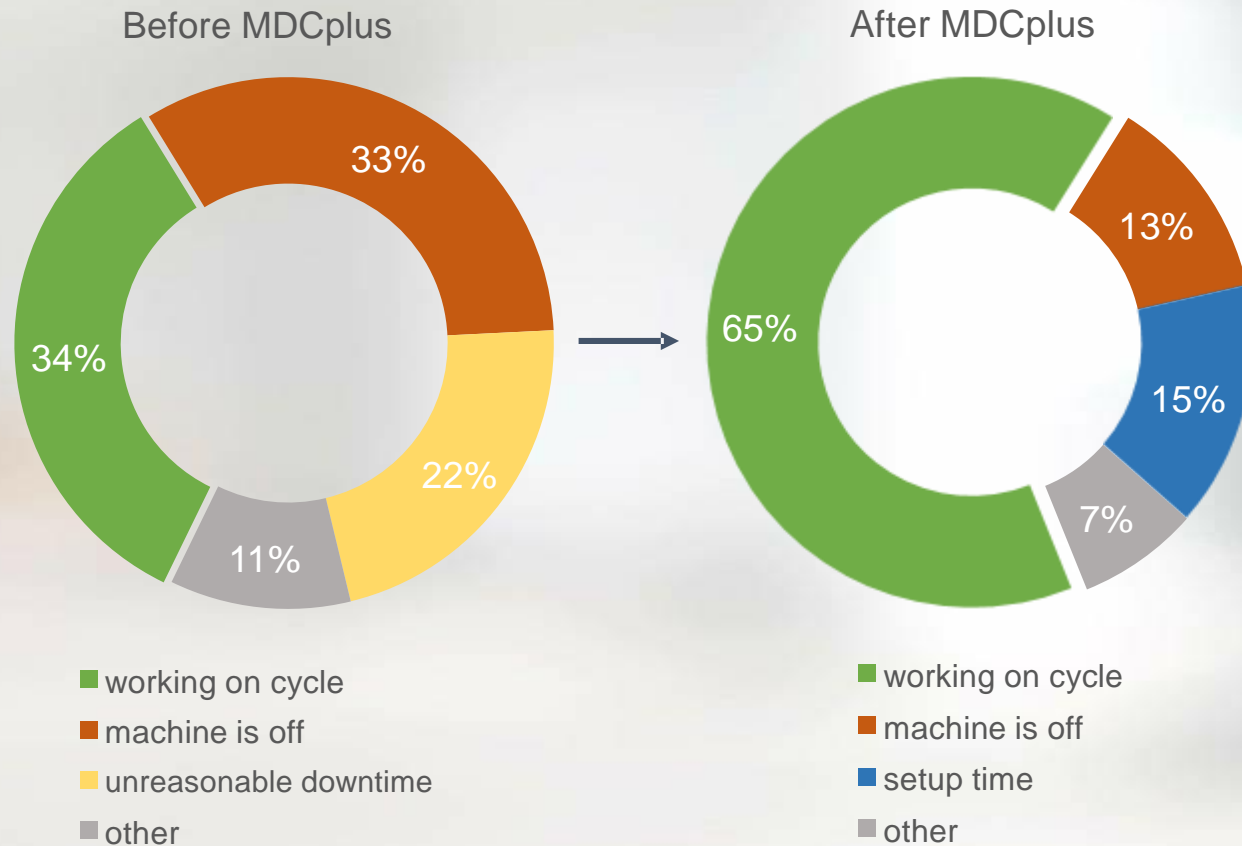
A  
availability

P  
performance

Q  
quality

$$\text{OEE} = A \times P \times Q$$

# Zyfra MDCplus improves overall machine utilization



Implementation of MDCplus allows to:

- Increase machine utilization from 10 to 30 %
- Improve job planning and quoting accuracy
- Reduce Energy Consumption
- Calculate OEE with accordance to ISO22400.



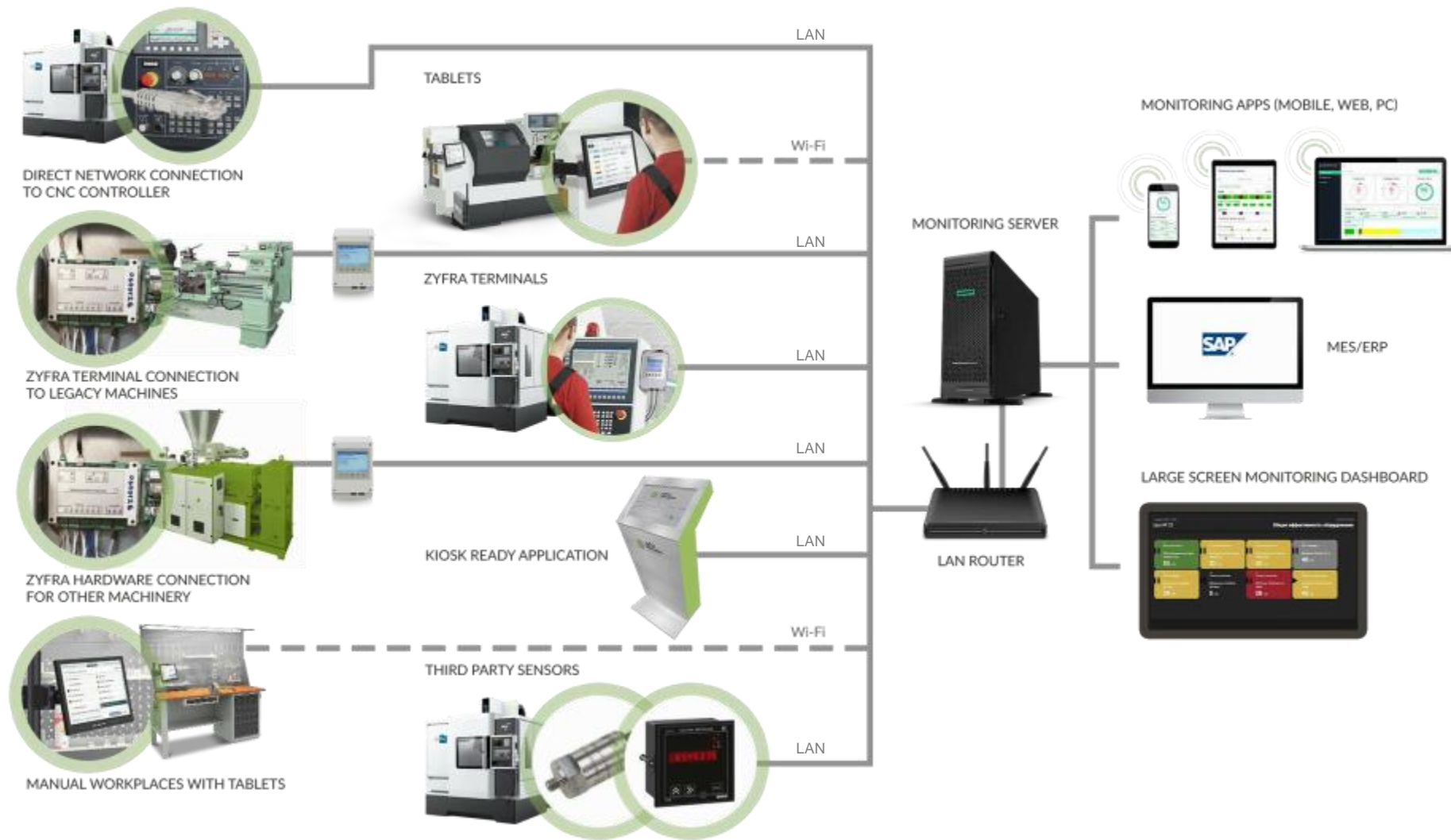
The Return Of Investment (ROI) period on average is

**3 months**

Calculate ROI here:

<https://mdc-plus.com/roi-calculator/>

# How MDCplus works





# Zyfra MDCplus hardware



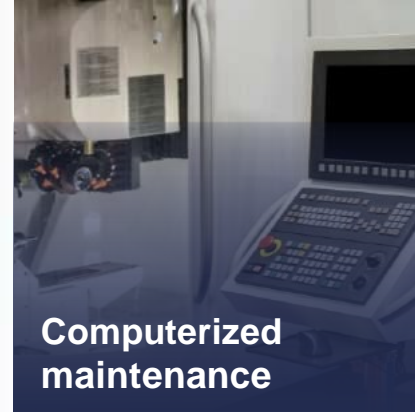
## MDCplus hardware kit:

- MDCplus data adapter
- TVV-10
- Barcode scanner
- Current sensor
- Power Unit Controller
- Bracket & wires

## Collective monitoring panel

## Vibration controllers and sensors

# Zyfra MDCplus features



# Analytical features

- 100+ report and graph templates
- Report generator
- Overall Equipment Effectiveness (OEE)
- Cycle time per part
- Number of parts per shift/operator
- Number of defective parts
- Scheduled maintenance
- Unscheduled maintenance
- Setup time per part
- Machine Operator Efficiency

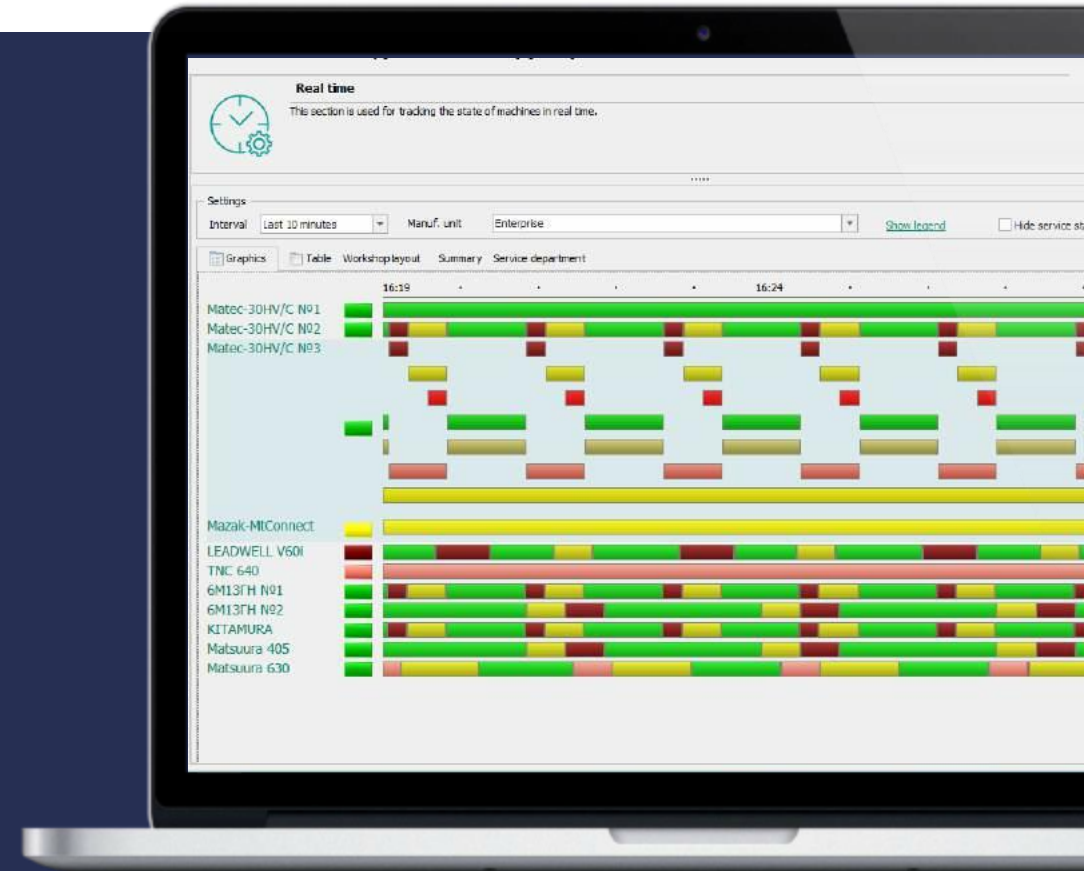




# Real-time machine monitoring

## Features

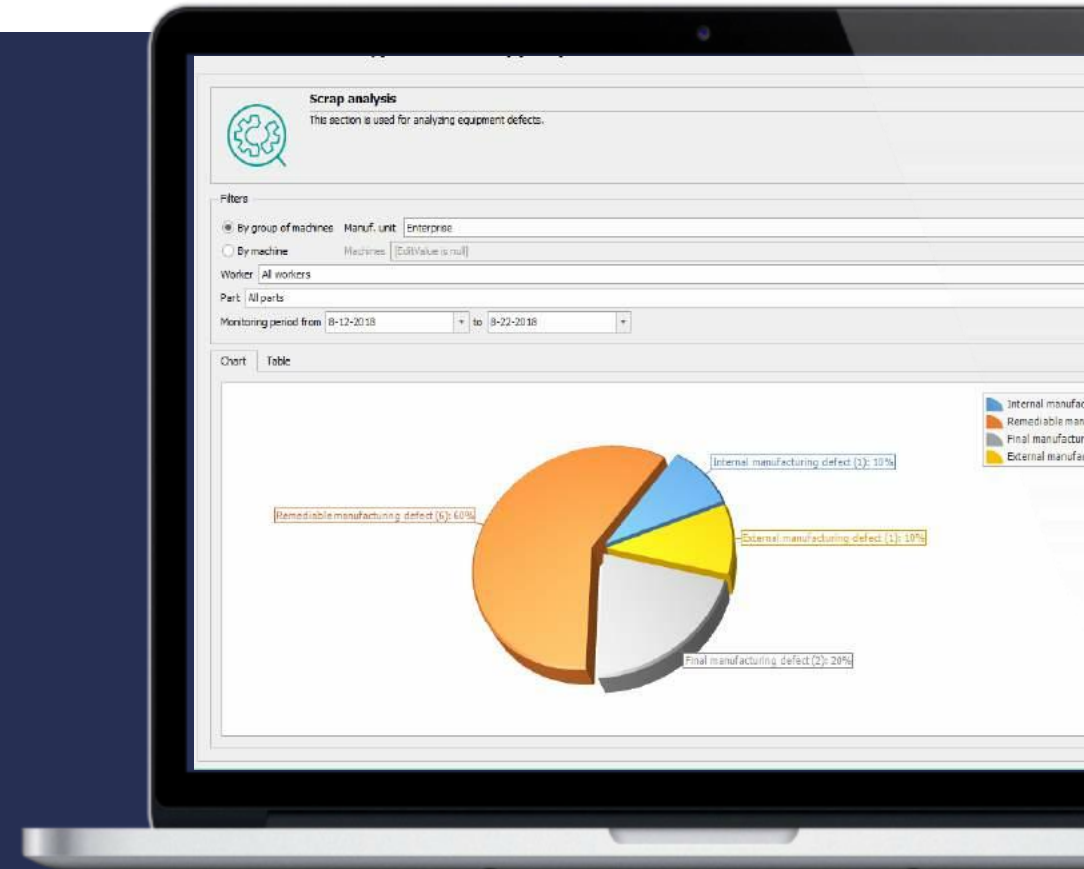
1. Monitor equipment states and downtime reasons in real time on a linear chart, in a table, or on a facility floor plan.
2. Monitor equipment operation parameters & details for each machine (event log, error log, list of measurable parameters for the machine, process information, etc).
3. Set up controlled events and notifications for appropriate company units (e-mail, SMS).
4. Analyze trends in equipment and staff performance.
5. Calculate key performance indicators (KPIs) of the equipment and staff, including OEE, as per ISO 22400-2 2014.



# Production control

## Features

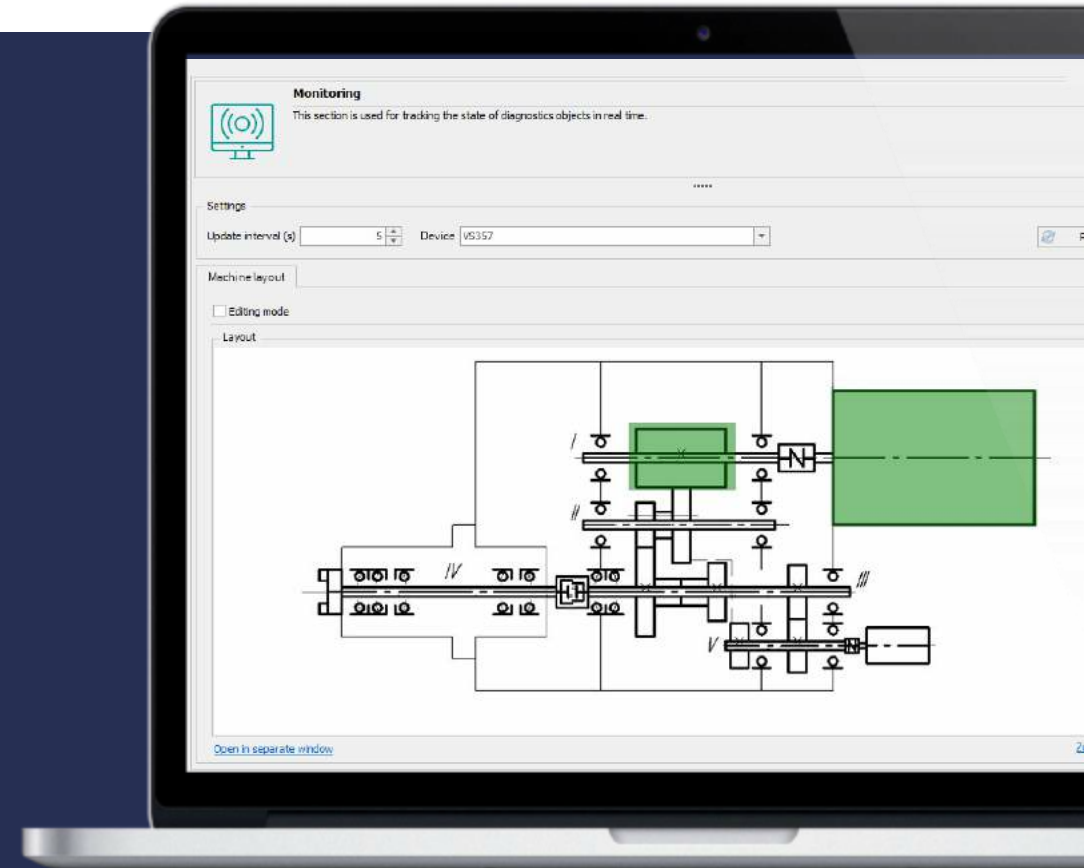
1. Monitoring of manufactured output and scrap.
2. Monitoring of the time standards for the execution of technological operations.
3. Control telemetry parameters during manufacturing output in order to reduce spoilage.
4. Generate shift tasks, routing sheets, and orders.
5. Generate reports on manufactured output and rated time and calculate KPIs, including OEE.



# Vibration Monitoring and Diagnostics

## Features

1. Measure key parameters characterizing the technical state of key machine components.
2. Compare parameter values with permissible levels and generate alerts when permissible levels are exceeded.
3. Send data on the actual state of equipment components to the CMMS system.
4. Detect crashes and impacts and issue machine shutdown signals.

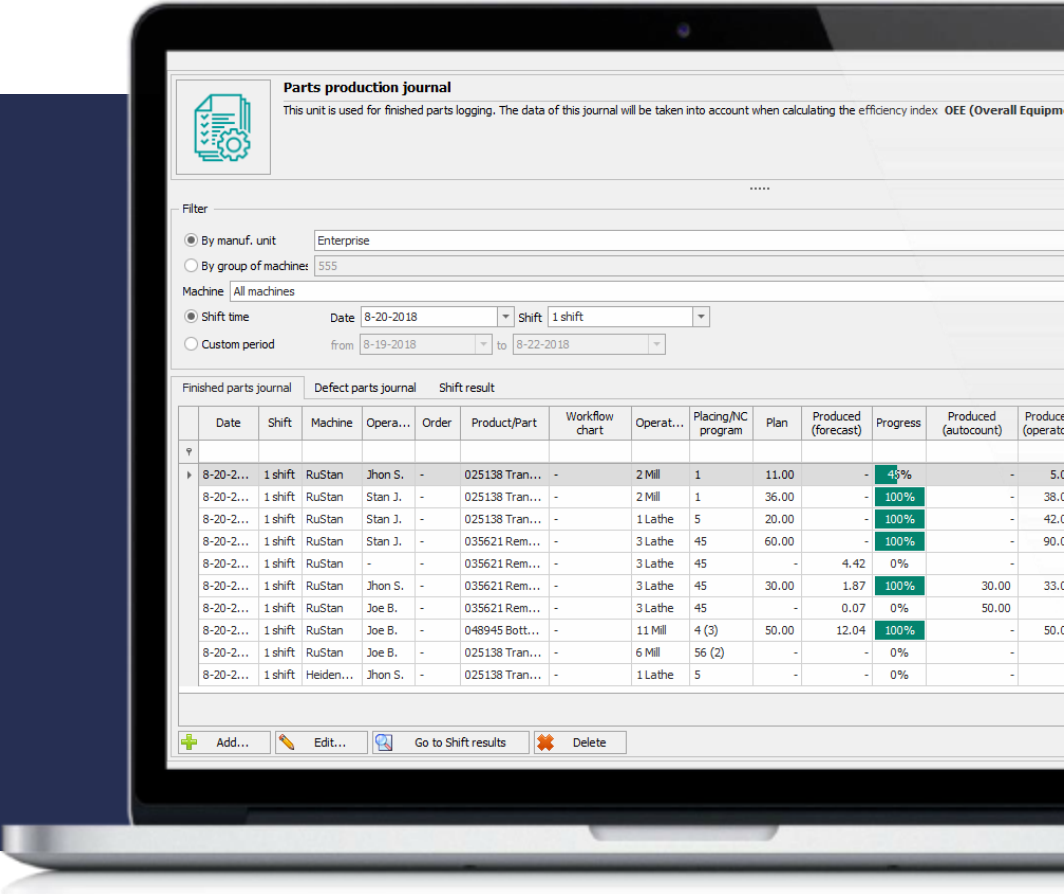




# API connection for external ERP, CAD/CAM/PDM, MES and BI systems

## Features

1. Synchronize reference data.
2. Send documents (order, shift task, routing sheet).
3. Obtain actual data (order/operation/machine operation/equipment/employee).
4. Obtain any CNC machine operation data.



**Parts production journal**  
This unit is used for finished parts logging. The data of this journal will be taken into account when calculating the efficiency index: OEE (Overall Equipment Effectiveness).

Filter

☒ By manuf. unit: Enterprise

☐ By group of machines: 555

Machine: All machines

☒ Shift time: Date: 8-20-2018, Shift: 1 shift

☐ Custom period: from 8-19-2018 to 8-22-2018

Finished parts journal | Defect parts journal | Shift result

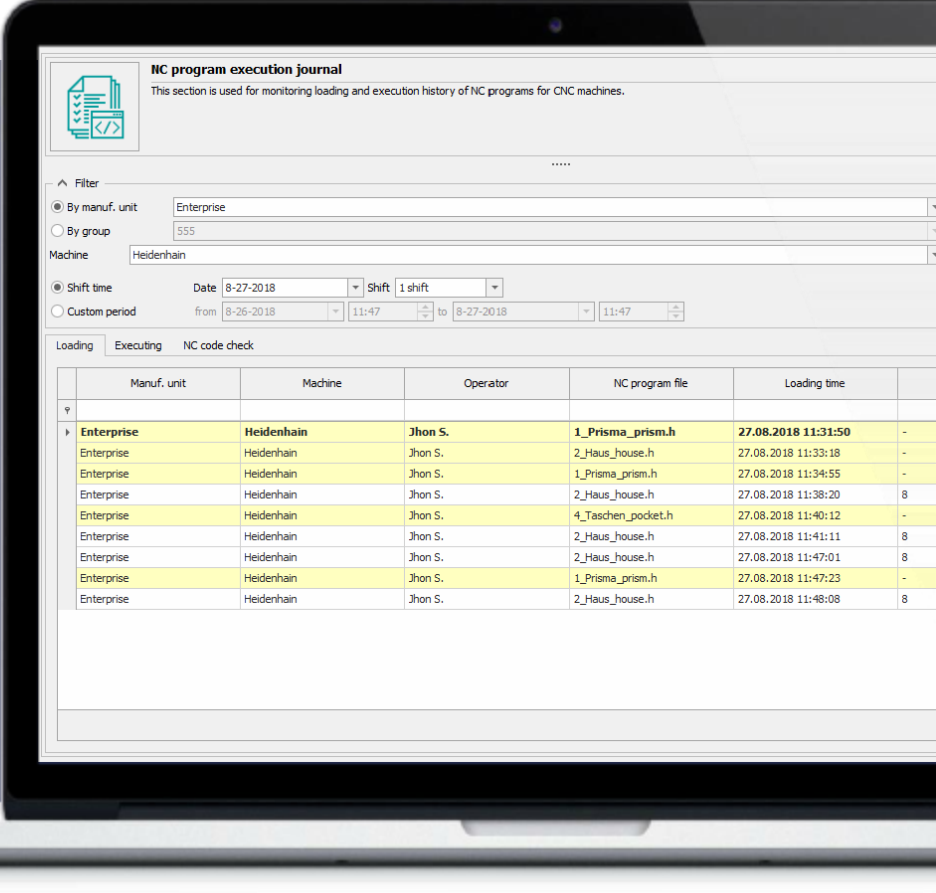
	Date	Shift	Machine	Opera...	Order	Product/Part	Workflow chart	Operat...	Placing/NC program	Plan	Produced (forecast)	Progress	Produced (autocount)	Produce (operat...
▼														
▶	8-20-2...	1 shift	RuStan	Jhon S.	-	025138 Tran...	-	2 Mill	1	11.00	-	48%	-	5.0
	8-20-2...	1 shift	RuStan	Stan J.	-	025138 Tran...	-	2 Mill	1	36.00	-	100%	-	38.0
	8-20-2...	1 shift	RuStan	Stan J.	-	025138 Tran...	-	1 Lathe	5	20.00	-	100%	-	42.0
	8-20-2...	1 shift	RuStan	Stan J.	-	035621 Rem...	-	3 Lathe	45	60.00	-	100%	-	90.0
	8-20-2...	1 shift	RuStan	-	-	035621 Rem...	-	3 Lathe	45	-	4.42	0%	-	-
	8-20-2...	1 shift	RuStan	Jhon S.	-	035621 Rem...	-	3 Lathe	45	30.00	1.87	100%	30.00	33.0
	8-20-2...	1 shift	RuStan	Joe B.	-	035621 Rem...	-	3 Lathe	45	-	0.07	0%	50.00	-
	8-20-2...	1 shift	RuStan	Joe B.	-	048945 Bott...	-	11 Mill	4 (3)	50.00	12.04	100%	-	50.0
	8-20-2...	1 shift	RuStan	Joe B.	-	025138 Tran...	-	6 Mill	56 (2)	-	-	0%	-	-
	8-20-2...	1 shift	Heiden...	Jhon S.	-	025138 Tran...	-	1 Lathe	5	-	-	0%	-	-

+ Add... | Edit... | Go to Shift results | Delete

# DNC Communication & NC Program Management

## Features

1. Storage of NC programs.
2. DNC Communication (ETHERNET, USB, RS232, IFSP).
3. Analyze NC program usage and compare the code with the standard.



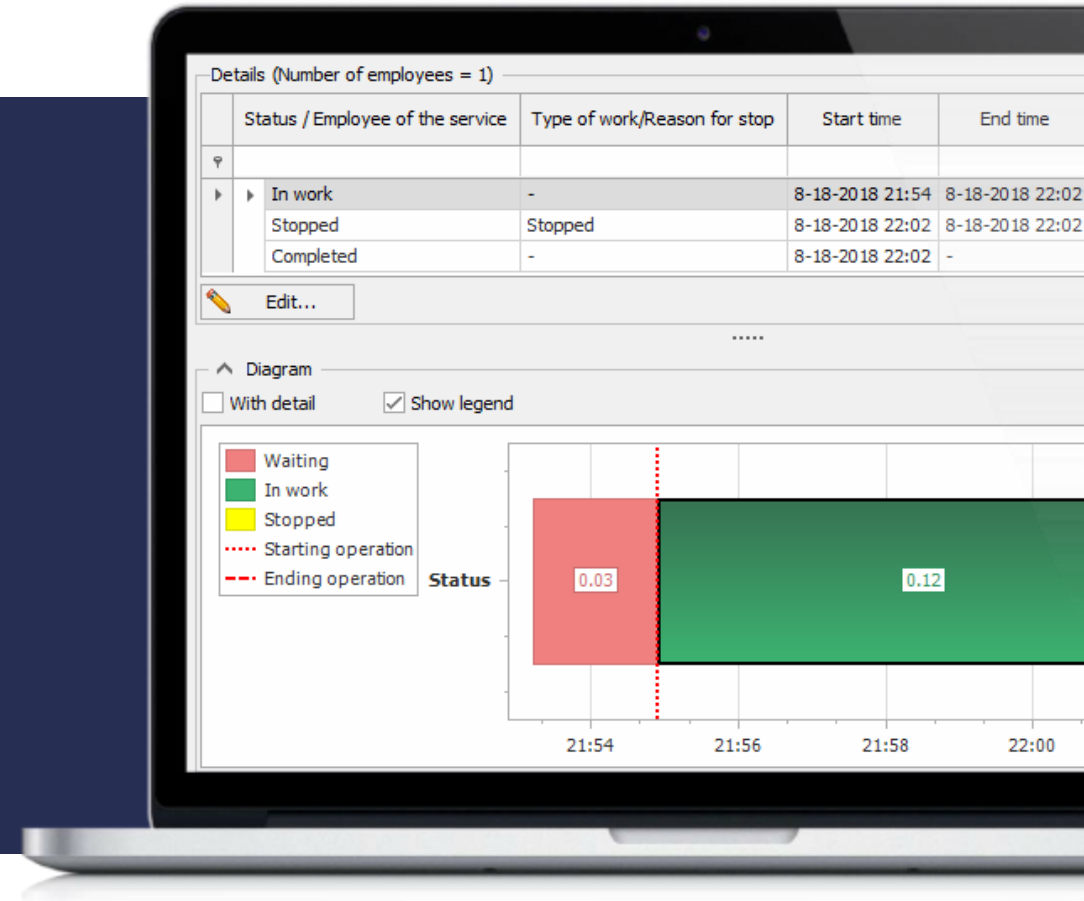
The screenshot shows the 'NC program execution journal' interface. It includes a title bar with a document icon and the text 'NC program execution journal'. Below the title bar is a subtitle: 'This section is used for monitoring loading and execution history of NC programs for CNC machines.' The interface features a filter section with radio buttons for 'By manuf. unit' (selected), 'By group', and 'By shift time'. The 'By manuf. unit' filter is set to 'Enterprise', and the 'Machine' dropdown is set to 'Heidenhain'. The 'Shift time' filter is set to '1 shift'. The 'Date' is set to '8-27-2018'. The 'Custom period' filter shows a range from '8-26-2018 11:47' to '8-27-2018 11:47'. Below the filter section are three tabs: 'Loading', 'Executing', and 'NC code check'. The 'Loading' tab is active, displaying a table with the following columns: 'Manuf. unit', 'Machine', 'Operator', 'NC program file', 'Loading time', and an empty column. The table contains 10 rows of data, with the first row highlighted in yellow.

Manuf. unit	Machine	Operator	NC program file	Loading time	
Enterprise	Heidenhain	Jhon S.	1_Prisma_prism.h	27.08.2018 11:31:50	-
Enterprise	Heidenhain	Jhon S.	2_Haus_house.h	27.08.2018 11:33:18	-
Enterprise	Heidenhain	Jhon S.	1_Prisma_prism.h	27.08.2018 11:34:55	-
Enterprise	Heidenhain	Jhon S.	2_Haus_house.h	27.08.2018 11:38:20	8
Enterprise	Heidenhain	Jhon S.	4_Taschen_pocket.h	27.08.2018 11:40:12	-
Enterprise	Heidenhain	Jhon S.	2_Haus_house.h	27.08.2018 11:41:11	8
Enterprise	Heidenhain	Jhon S.	2_Haus_house.h	27.08.2018 11:47:01	8
Enterprise	Heidenhain	Jhon S.	1_Prisma_prism.h	27.08.2018 11:47:23	-
Enterprise	Heidenhain	Jhon S.	2_Haus_house.h	27.08.2018 11:48:08	8

# Computerized maintenance

## Features

1. Dispatch non-scheduled (emergency) repairs and maintenance.
2. Schedule MRO operations based on work hours and actual states of the CNC machine.
3. Control execution of scheduled repairs.
4. Manage and record the work of maintenance and repair staff.
5. Manage procurement for maintenance and repair services.
6. Documentation support of maintenance and repair operations.
7. Interaction with external service providers.

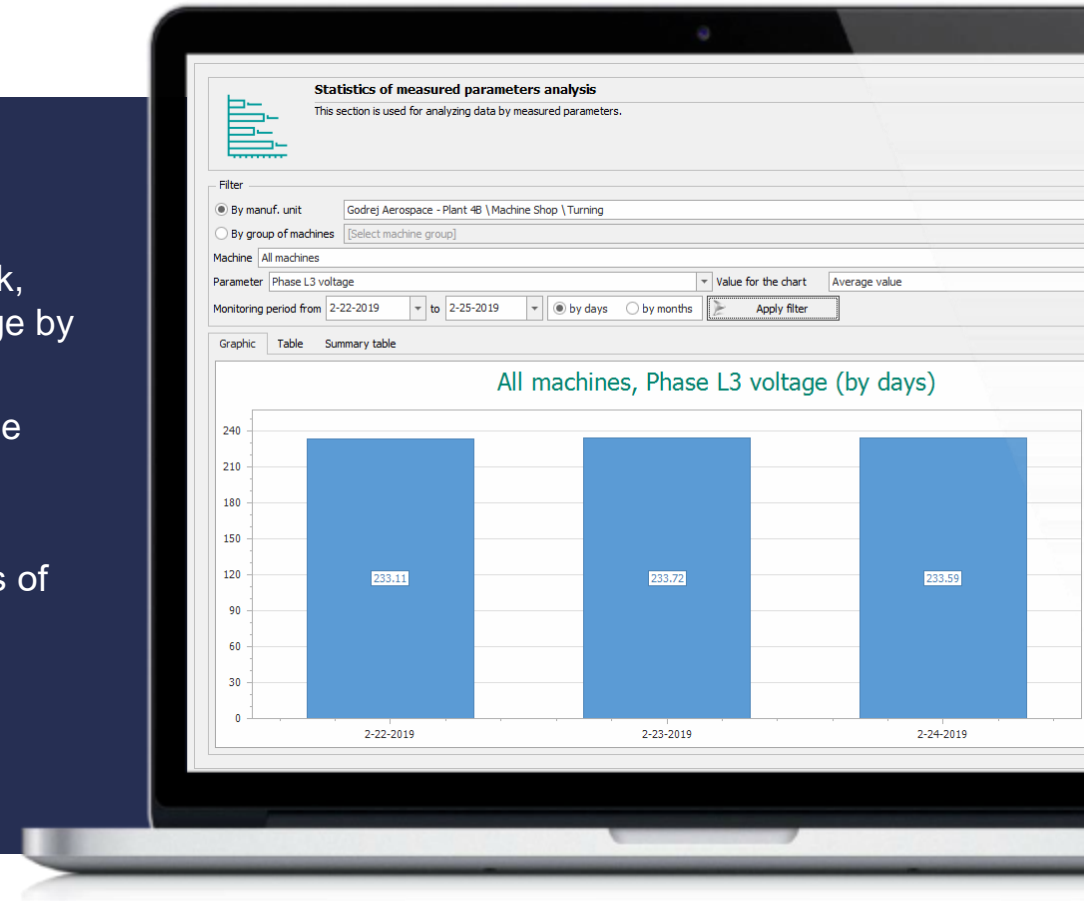




# Power consumption monitoring

## Features

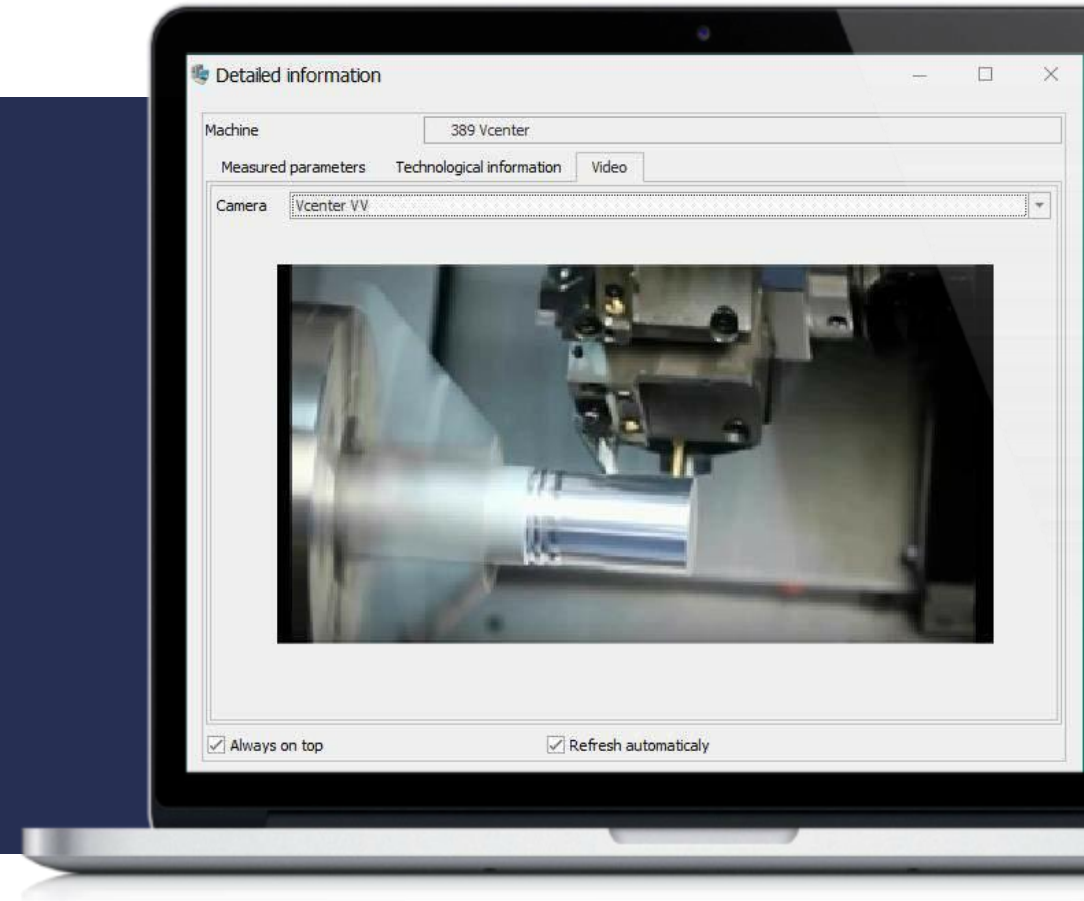
1. Monitor the consumed active and total power of a three-phase electric network, the values of phase voltages and currents, and the quality of the supply voltage by fixing time of surges, breaks and voltage breaks.
2. Calculate all the indicators for the selected time period: shift, day, month for the whole enterprise, and for any unit, equipment, employee.
3. Monitor and classify power consumption by the main equipment states: "Production" and "Downtime"; groups of downtime reasons; downtime reasons of each group.
4. Check the energy parameters average, maximum and minimum values for a specified period



# Video Monitoring

## Features

1. Video recording of the workpiece, the operator's actions on the machine, the situation at the work site.
2. Binding video sequence to the machine's state, performed technical operations, etc.
3. Video recording of individual events, for example: machine's setting up or its repairing.
4. The possibility of a detailed investigation of emergency situations.



# Discover the unrealized production potential

## Reducing or eliminating

- Setup time
- Downtime
- Scrap
- Energy costs

## Improving

- Job planning and quoting accuracy
- Employee productivity
- Machine and resource efficiency
- Maintenance planning
- Reaction time for failures

WE'VE GOT THE PRODUCTION DATA COVERED!





**MORE THAN 286 COMPANIES  
ALREADY USE ZYFRA SOLUTIONS**

**USE CASES**



# Streamlining Spare Parts Manufacturing

## Task

To raise equipment productiveness to observe order schedules

## Solution

- ✓ Machine pool has been integrated into a single information space.
- ✓ Monitoring Terminals TVV-10 for downtime cause determination have been installed.
- ✓ Machine drives energy consumption is controlled.

## Result

- ✓ 3,300 machine-hours per month — identified reserves of machine time
- ✓ 4,2 thousand euro — monthly net profit from sales of additionally manufactured products
- ✓ 31% — higher machine loading
- ✓ EUR 1,2 million — growth in enterprise annual revenue

**31%**

equipment load  
increase

**EUR 1,2 million**

increase in annual  
profit



Machines connected:

Equipment type:

# Streamlining Helicopter Appliances Production

## Task

- ✓ To raise the productiveness.
- ✓ To evaluate effectiveness of investments in equipment.

## Solution

- ✓ Machine pool has been integrated into a single network.
- ✓ Monitoring Terminals TVV-10 for downtime cause determination have been installed.
- ✓ Critical events alert system has been set up.
- ✓ “Efficiency Display Panel” information monitors have been installed for rapid production control.

## Result

- ✓ 126,642 hours per year — identified machine time reserve
- ✓ 107 000 Euro — the decrease in production cost of one knock-down kit.
- ✓ 160 000 Euro — saving on reduction of the tools consumption.
- ✓ 4.7 mln Euro— amount of reallocated investments

**27%**

equipment load  
increase

**EUR 1,9 million  
per year**

economic effect

Machines connected:

79

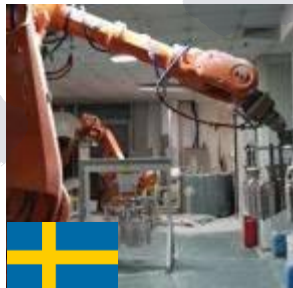
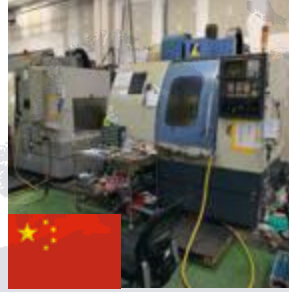
Equipment type:

Machines with CNC: Siemens, Fanuc, Heidenhain





# World Installations



# Support Center

## Software Updates



Version updates

At least 4 new releases per year

## Professional Support



Global technical support

In-person training hosted by Partners

Personal account for Partners with all the updated materials

## System Customization



Customizable Reports and Charts

Development of specific functions to fulfill customer requirements

Technical support: [support@mdc-plus.com](mailto:support@mdc-plus.com)



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