

Tool wear and breakage monitoring system **WattPilote**

Evolution

www.digitalwaygroup.com

Automatic lathe and turning center

WattPilote Turning is a tool wear and breakage monitoring system specially designed for all turning machines.

Decrease machine downtime

This system has been developed to optimize tool management on turning machines and to prevent tool breakage by detecting wear and damaged inserts. The machine stops when a problem occurs and before it, the tool holder, or the part is seriously damaged.



Maintain production quality

WattPilote Turning stops the machine as soon as worn or chipped inserts are detected. This ensures that all parts are machined with tools that are in good condition. WattPilote Turning helps maintain good production quality.



Measure spindle power and axes power

Now, lathes and turning centers have access to a simple and efficient machining monitoring system. To control machining operations efficiently, WattPilote Turning performs three measurements: two measurements from the axes and one from the spindle. For each machining operation, several measurements are used (sometimes in combination) to determine tool condition.

Power measurement Spindle

The measurement of the main spindle is very effective for monitoring external machining for roughing operations and for finishing operations.

Torque measurement X and Z axis

Monitoring of the axes is the best solution when small tools work at the center of the part, but also for the slicing / cut-off operations with a constant surface feed rate.

Power measurement Driven tool

On turning centers, the measurement of the driven / rotating tool allows monitoring of drilling, tapping and all milling operations.



Compact installation within the electrical cabinet

WattPilote Turning combines three independent measurements of power in the same box. The connection to the PLC is the only thing in common with the three channels: so the system is compact and wiring it is easy. WattPilote is mounted in the electric cabinet, far away from the machining area and its abusive conditions.

Diagnosis and supervision functions available on the CNC screen

Visu-CN-C software is an effective diagnostic and supervision tool that can be integrated directly into the CNC.

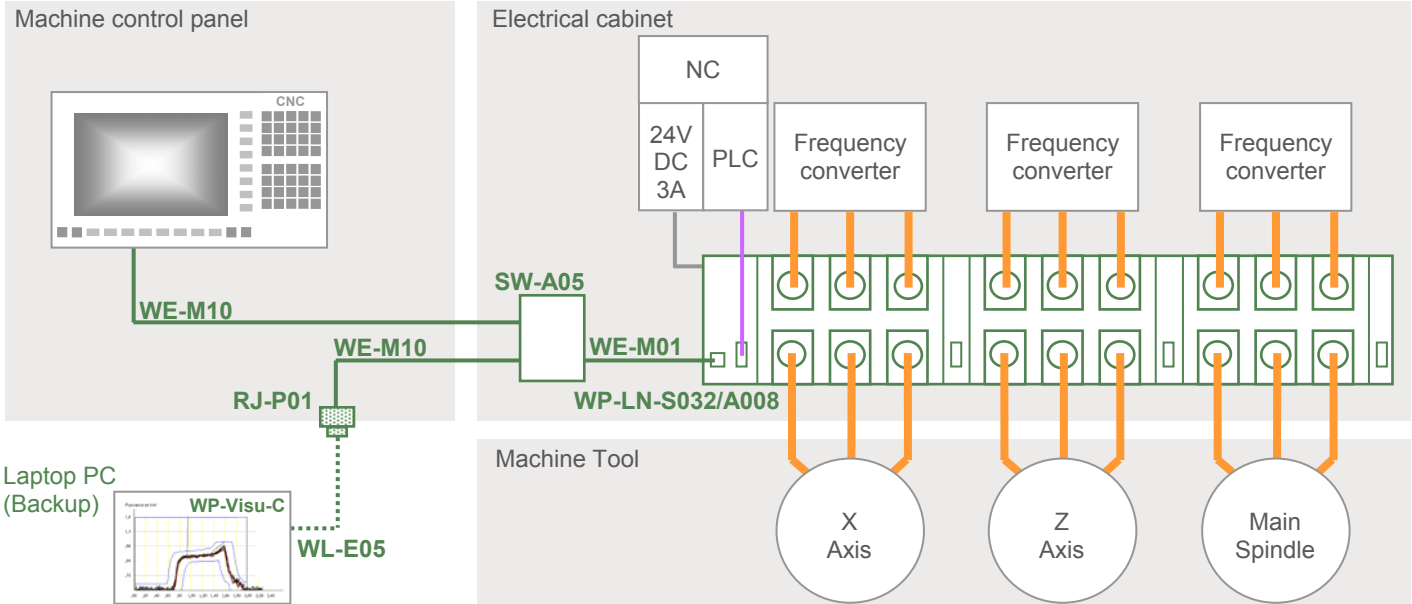
The operator can display machining cycles, tool wear condition and fault curves. He can also modify the control tolerances, and acknowledge faults and tool changes.



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Turning

Evolution Model range



Turning center with 30kW spindle and 10A axis motors.

General characteristics Evolution

Max number of different machining cycles	120
Minimum machining cycle time	0.07 sec.
Maximum machining cycle time	50 minutes
Reaction speed	0.005 sec.
Saved machining cycle curves	last 30
Saved faults	last 30
Saved wear rate	last 65,000
Power, derivative, energy control	Simultaneous
Measurement accuracy	0.01 ‰

Technical characteristics Turning

Power supply	24 VDC ± 10%, 1.3 A
PLC Protocol - Fieldbus	ProfiNet IO-RT Profibus-DP I/O Slave DeviceNet Slave Ethernet/IP EtherCat Smart (Digital I/O)
Supervision interface	Ethernet - 10/100 Base TX
Fast Inputs	24 VDC type II, 15 mA
Fast Outputs	Work contact static relay 24VDC
Ambient temperature	0 ... 50°C
Assembly	4 x screw M5
Dimensions	L 292 mm, W 105 mm, H 135 mm
Protection rating	IP 20
Weight	2kg 560

WattPilote Turning Evolution reference Part Nr.

WP-LX-S 000 / A000 / S000

ProfiNet IO-RT :	N	000	Optional driven tool Power rating in kW
Profibus DP Slave :	B		
DeviceNet Slave :	D	000	X and Z Axis Power rating in kW
Ethernet TCP/IP :	E		
Smart Interface :	S	000	Main spindle Power rating in kW

Example - WP-LN-S032/A008 : WattPilote Turning Evolution - 32 kW Main Spindle / 12 A axis - ProfiNet interface

Slide-turning

- Tool wear
- Insert chipping
- Insert breakage
- Missing tool

Raising

- Tool wear
- Insert chipping
- Insert breakage
- Missing tool

Slicing/Cut-off

- Tool wear
- Insert chipping
- Insert breakage
- Missing tool

Drilling

- Tool wear
- Drill breakage
- Missing tool

Boring

- Tool wear
- Insert chipping
- Insert breakage
- Missing tool

Threading

- Tool wear
- Insert chip
- Insert breakage
- Missing tool