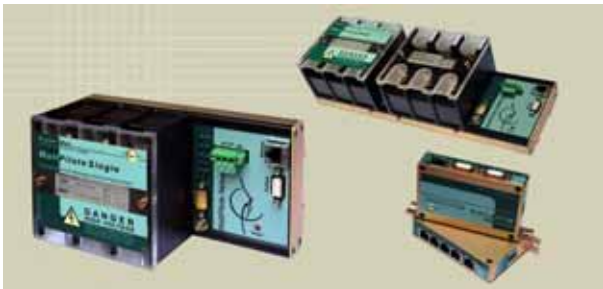


*For each type of machine,
one WattPilote solution*

WattPilote is the generic name of the power monitoring system product line developed by the company **Digital Way**. They are used to measure tool wear and to avoid tool breakage on all cutting machines.

**Compact, installation
in the electric cabinet**

WattPilote combines measurement and processing in the same box. Its installation is very simple as all wiring is done in the electric cabinet.



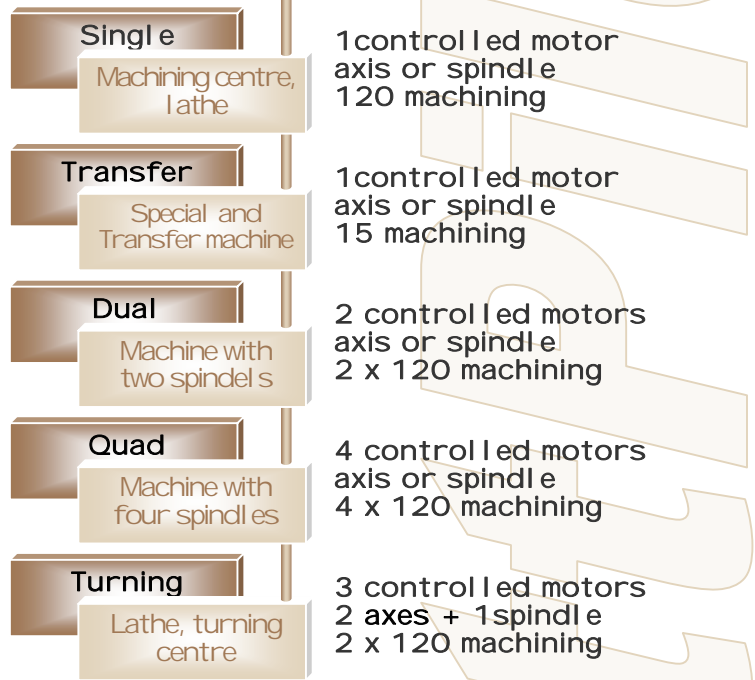
**User-friendliness
and easy to adjust**

A PC or a numeric control connected to WattPilote gives the possibility to display and to analyse graphically machining curves, faults and tool wear.



**Most notably:
an excellent measurement**

The measurement accuracy of power (0.1%) associated with sampling frequency (40 kHz) makes possible fitting with all electric motors, quasi all types of frequency converter and independent from speed rotation (axis brushless motor, asynchronous spindle or electro-spindle motor). A complete range of monitoring systems, fitted to AC/DC, is available from 250 Watts to 100 kilowatts.



**Easy to find trace
of data and to interpret**

The WattPilote memory is able to store, for each of the last 65000 machining, a report with: machining date and time, control mode used (learning, re-machining, collision control ...), control result (power fault, energy...) and the value of the tool wear rate. Moreover, WattPilote memorizes the complete curves of the last 30 machining and the last 30 faults.

**Adaptable to all
types of machine**

To fit to the high-speed machine as well as classic machine, WattPilote has a programmable sampling. So it is possible to control machining cycles duration from 0,07 second up to 50 minutes. It is very easy to install WattPilote on an existing machine already producing, because there is no mechanical extra to do.

Tool wear and breakage monitoring system

www.digitalway.eu

WattPilote

WattPilote controls and prevents tool breakages on machines carrying out repetitive operations.

WattPilote analyses electric power absorbed by the spindle motor to know about tool condition.

Energy control

Detection at the end of cycle

By monitoring wear, the tool is changed at the right time. This is the best way to increase parts number machined by the tool and to avoid breakage. The tool wear is function of energy: two machining performed in the same conditions with similar tools absorb the same amount of energy. When the tools begin to be worn, the energy increases.

Using this principle at the end of each machining cycle, WattPilote checks that energy doesn't overshoot the threshold programmed by the user.

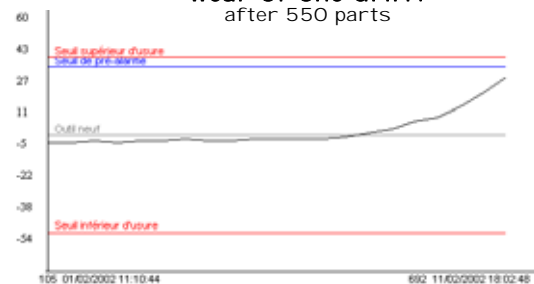
During process adjustment, energy can be used to compare and to select the tool and sharpening method.

WORN TOOL

MISSING TOOL

MISSING PART

Wear of one drill: after 550 parts



Power control

Instantaneous detection

When the tool breakage occurs, reaction time must be short to protect the machine, tool- holders and to limit wrong parts. Only a real time control, as power monitoring, responds to this requirement. WattPilote works by comparing: at the first machining, with a new tool, it memorises the power curve, which combined with a set of parameters gives limits of maximum and minimum power.

At each following machining cycle, the new power curve is compared with the first one.

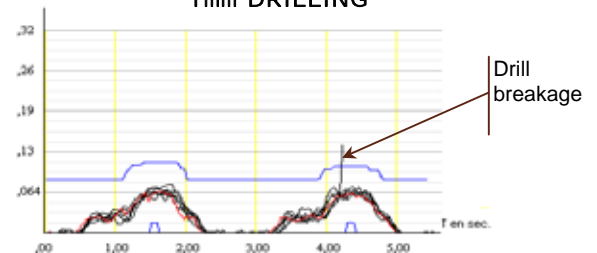
Breakage, missing tool and double machining are immediately detected when limits are exceeded.

TOOL BREAKAGE

MISSING TOOL

DOUBLE MACHINING

SPINDLE 20 kW: 1mm DRILLING



Derivative control (international patent)

Instantaneous detection

When a breakage occurs during reaming operation with complex tools or drilling and tapping operation with multi-spindle head, the variation in power is very small. In case of milling and turning operations on rough parts, the absorbed power range is varying a lot from a part to another.

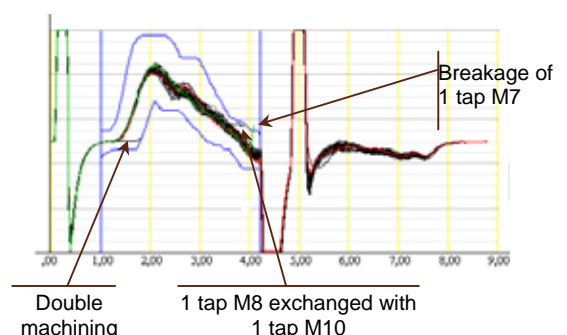
The derivative control used by WattPilote increases small and fast variations of power (breakage of one milling cutter insert) and removes variations due to rough parts differences: so tool and insert breakages on multi-spindle heads and rough parts machining are detected easily.

TOOL BREAKAGE

INSERT BREAKAGE

PART IN WRONG POSITION

Multi-spindle head with 15 taps: 3 taps M7, 3 taps M8, 9 taps M10



Applications

For each type of machine, one WattPilote solution

