EyeOnMachine

Contents

T.P.A. S.r.l. Tecnologie e Prodotti per l'Automazione
Via Carducci, 221 – 20099 Sesto S. Giovanni
Phone +390236527550 – fax: +39022481008
e-mail: info@tpaspa.it – www.tpaspa.com
P.I.: IT02016240968 C.F.: 06658040156

Overview

Monitoring application designed to present the product manager or directly the machine operator with statistics that can be used to better understand how to exploit the machine by clearly briefing on its overall use, and, in general, to monitor its work.

It is right to specify that, as the application is a viewer, it cannot work without Albatros and WSCM. The former will send statistical data towards WSCM, which will forward the data to the local network, allowing the app use even on platforms different from the machine PC. For instance, an office PC, even far, yet part of the same subnet – at least for what concerns the data that are strictly referred to its use (tabs 2.1: General & 2.2: Use). Differently, in order to view the report & error files (see chapters 2.4: Report & 2.5: Errors) just indicate the location of files, which can also be in shared network folders (SkyDrive, DropBox, OneDrive…), so that they can be accessible even "from home".
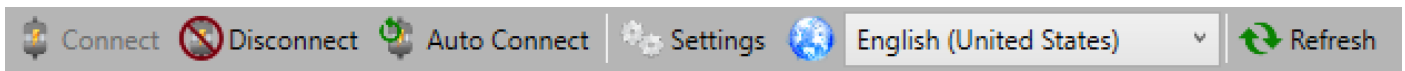
The application main page looks as follows:

Img. 1

1: ToolBar

On the top toolbar, marked by number 1 in Img. 1, we find some useful functions to set up the application.

Img. 2

Connection: Allows the connection to the IP address declared in **Settings**.

Disconnection: Disconnects the software from its current connection.

Automatic connection: Enables the automatic connection function when the application starts, so that it automatically connects to the IP address set in **Settings** every time it is started.

Settings: Opens the setting configuration window, shown below in Img. 3

Img. 3

IP Address: IP address of the supervisor PC where the machine and WSCM are installed.

Port: reference port of the chosen address.

Slave number: identifier of the specific machine.

Report location: location of the report files generated by WSCM.

Error location: location of the report files generated by Albatros.

Module Errors: allows deciding for which machine modules, if any, to show the errors in the designated tab.

Device Rows: allows setting the size of the data exchange array with Albatros. This setting must be settled with the machine PLC developer.

Language: allows selecting the language requested for the application.

Refresh: manual refreshing of the Report & Error files.

2: Tabs

The central part of the application – marked with number 2 in Img. 1 – is divided into tabs that, when selected, show the requested page. Without considering any additional custom tabs resulting from direct requests, the basic version is as follows:

2.1: General

[Data received from Albatros] Main tab, where the basic statistics on statuses, conditions, and axis data are shown.
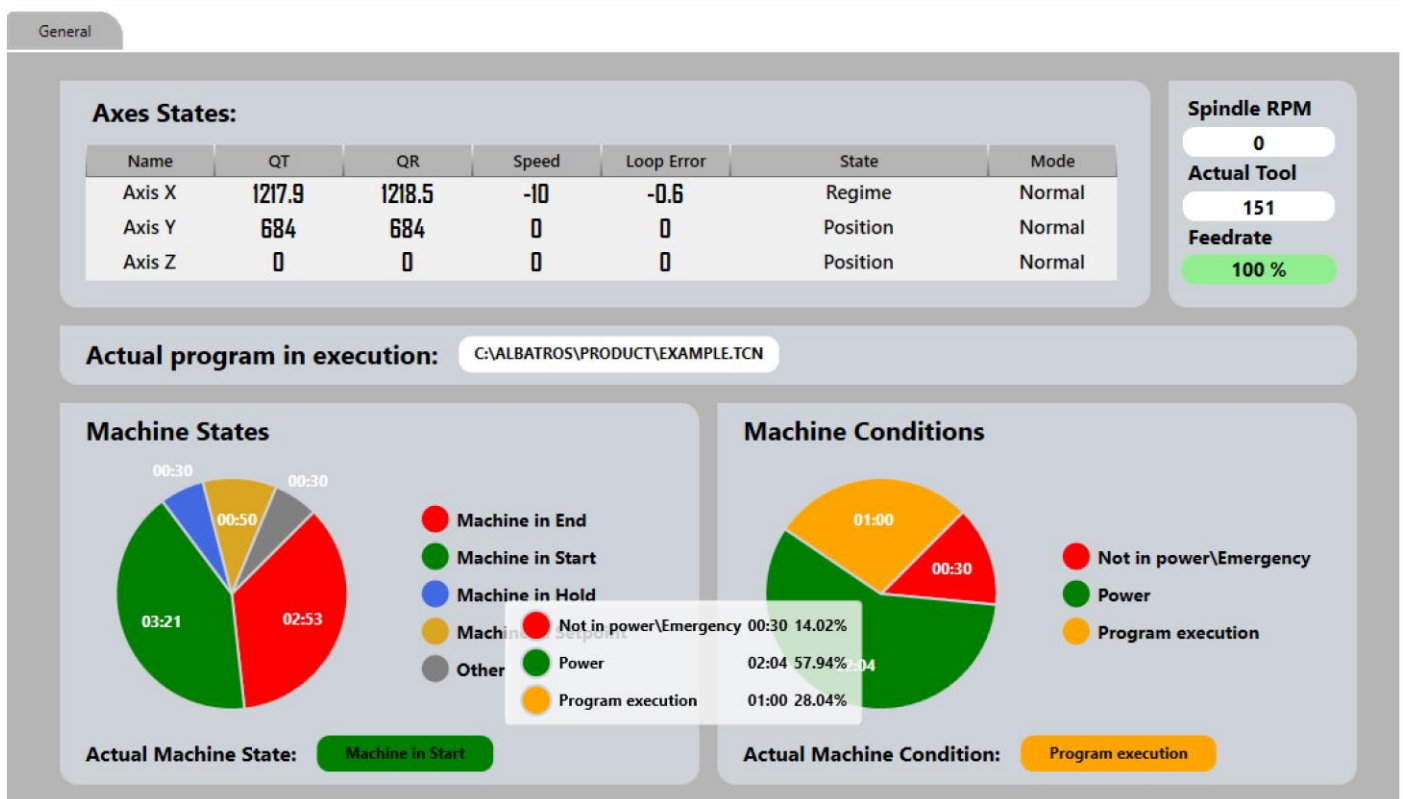
Img. 4

Axis Statuses

It shows a table describing the data referring to the machine axes; below a more specific description of each column:

Name: name of the axis represented in the row.

TP: target position.

RP: real position.

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Speed: current speed.

Loop Error

Status: axis status. It can accept the following values: Acceleration, Regime, Deceleration, Position, Wait higher threshold, Wait axis stop, Wait lower threshold, Start.

Mode: axis mode. It can accept the following values: Normal, Free, Interpolation, Coordin.

Spindle RPM

Current spindle rotation RPM.

Current Tool

Tool currently set in the spindle.

Feedrate

Feedrate currently set in the machine.

Machine Statuses

It shows a pie chart representing the elapsed time for each machine status. Hovering the mouse over the chart, a tooltip will show the details, as in the picture. These times are not daily but stand for the total since when the machine was made operational. This feature is also shared by the other pie charts in the application. Reminding that the displayed data is passed from Albatros, as declared by the initial tag [Data received from Albatros], and that, therefore, it can be autonomously managed by the manufacturer as far as it concerns the start or the interruption of several timers, generally speaking the allowed machine statuses can be described as follows:

Machine in End: it means that the machine is on but is not running any kind of operation.

Machine in Start: it represents the machine status when this is operating and is running programs.

Machine in Hold: this is the on-hold status, that is, when the in-start operations are momentarily interrupted to be resumed later.

Machine in Setpoint: status representing the time elapsed for the resetting procedures.

Other: container of all the other machine statuses present in the machine logics that cannot be grouped in the above categories.

In the bottom part, on the right of the writing "**Current Machine Status**", the current status will be displayed.

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Machine Conditions

It shows a pie chart with the times regarding the machine conditions. Hovering the mouse over the chart, a tooltip will show the details, as in the picture. The accepted conditions can be described as follows:

Not powered \\ Emergency: defines the condition of machine not powered or in emergency. It means that the drives are not enabled and, in general, that the machine is not ready.

Power: defines the condition of machine in power. It means that the drives are enabled and so that the machine is ready to move and execute the production requested.

Program execution: timer active when the machine is running programs.

In the bottom part, on the right of the writing "**Current Machine Condition**" the current condition will be displayed.

2.2: Use

[Data received from Albatros] Tab concerning information about various parts of the use of the machine.
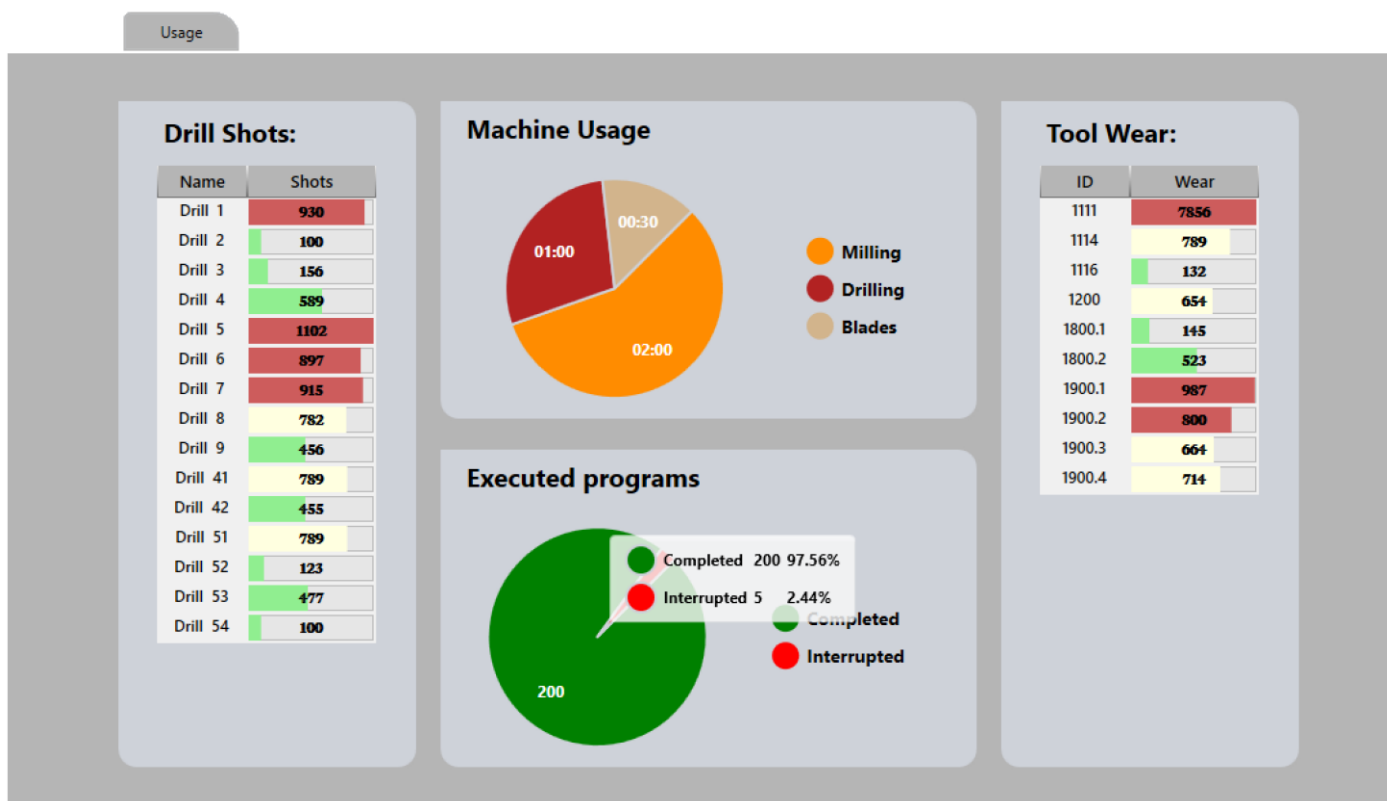
Img. 5

Drill bit strokes

List representing the number of strokes executed for the different drill bits.

Machine Use

Chart representing what the machine use mostly consists of. Hovering the mouse over the chart, a tooltip will show the details. The chart shows the use of Milling, Drilling, and Sawing.

Executed programs

Chart showing how many workpieces out of all the executed ones were completed with no interruption and instead how many were interrupted before their correct completion. Hovering the mouse over the chart, a tooltip will show the details, as in the picture.

Tool wear

List representing the wear of the various tools used.

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2.3: Summary

[Data read from report files] Description tab on the machine general productivity. Once the report file path has been selected (see Img. 3), it is possible to select a date range for which we want to view the number of executed workpieces and, more specifically, which of these were executed, through a chart that with a gradient can immediately display the most stressful periods at a production level. The aim is being able to carry out a diagnosis suitable for improving production performance.
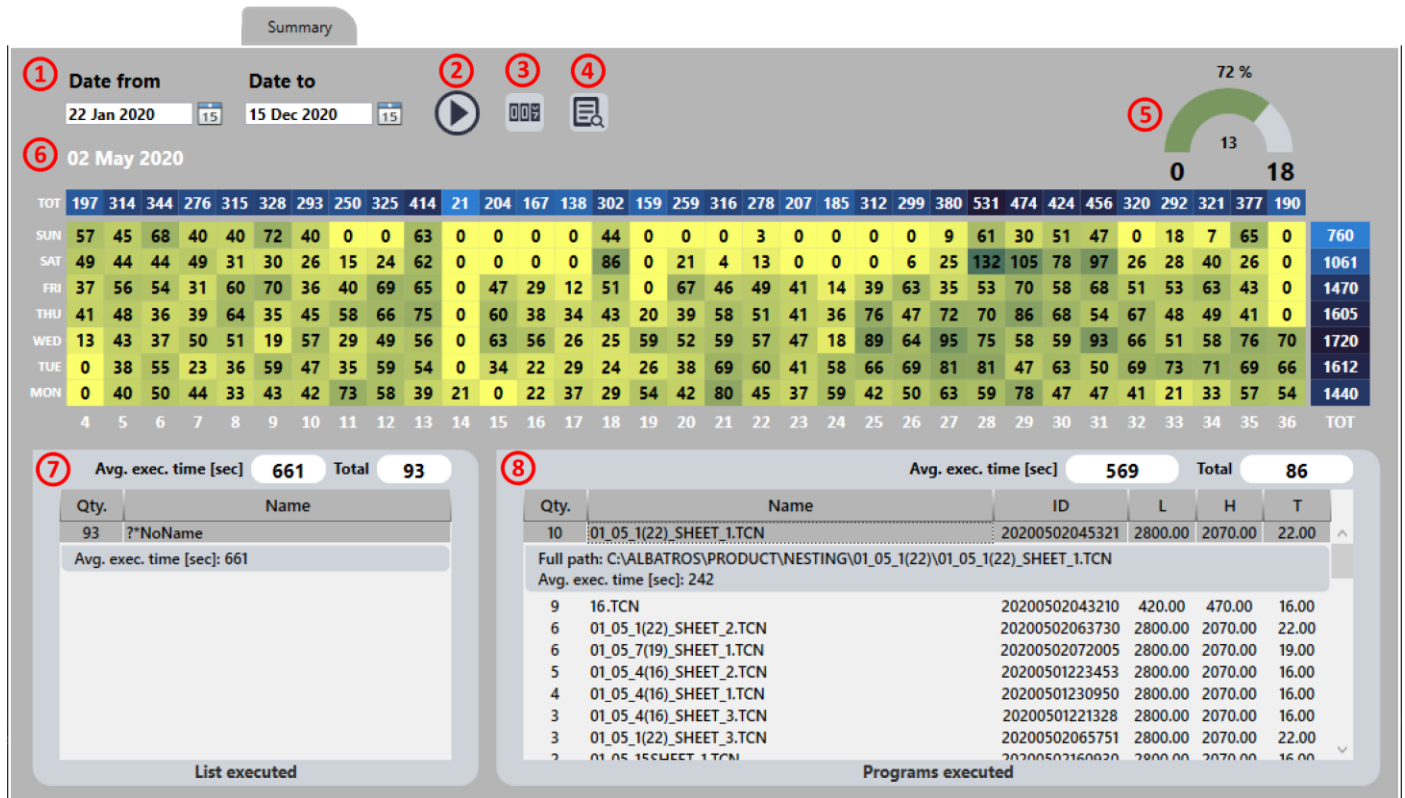
Img. 6

Below a description of how to operate on this page, with reference to the points highlighted in Img. 6:

1. Definition of the date range: you can select the date range, during which we want to run a productivity check.

2. Start button: once the date range is selected, you need to press this button to start filling the chart.

3. Count/Times: here is a switch that allows selecting the type of value in the chart. In case the switch is set on "Count", the chart will show day by day the total number of executed programs;

in case the switch is set on "Times", the chart will show the number of hours that the machine has spent running programs.

4. Attention! This button is visible only if a cell – that is, a day – has been clicked on the chart. It allows moving to the following tab, 2.4: Report, to delve into the functioning details of that particular day.

5. This meter allows checking at first glance the time the machine has been running programs over the total time the machine has spent powered on.

6. The mouse hovering over the chart will be translated into a date shown on this point, to help recognizing the single days. The chart below will have the days of the week as characteristics of the Y axis, and the weeks of the year included in the selected range as those of the X axis. The total sum of the whole chart dimension is also available, both for the single weeks (above) and for the single weekdays (right).

7. View table of the details regarding the executed lists. On top you can see two values, the average run time of the lists and the total count of the executed lists. The table will contain all the lists executed in the selected time range, with the counter showing how many times that specific list has been executed. Clicking on the row requested, more details will be reported, such as: the full path of the file (if available, it should be reminded that a list can also be temporary and so not saved and without name) and the average execution time of that specific list.

8. View table of the details regarding the executed programs: on top you can see two values, the average run time of the programs and the total count of the executed programs. The table will contain all the programs executed in the selected time range, with the counter showing how many times that specific program has been executed. Clicking on the row requested, more details will be reported, such as: the full path of the file and the average execution time of that specific program.

It should be also noted that if you click on a cell of the chart, so on a particular day, the program & list view tables will be updated to show the details regarding only that specific day.

2.4: Report

[Data read from report files] Report file view tab. Once the report file path is selected – see Img. 3 – this tab will display their graphic representation. On the left we can see a calendar, where the days with a report file will be outlined in a lighter colour. If on that day any system error has occurred, there will be a red dot. It will be possible to move to the next tab with a mouse right-click, in order to check the error occurred in detail. It is also possible to select more days by holding down the mouse left key during the selection. Once the day, or days, requested are selected the **WSCM Started** table will be filled with the data collected every time the WSCM was started on that specific day. Below a description of all the tables.

Img. 7

WSCM Started

As mentioned before, this is a list of the times when WSCM started on the selected day; in addition to the columns briefing on the starting and closing date and hour, there is also a column with the total hours of elapsed time.

Powered machine

It indicates the number of times that the machine was powered on, for the previous selected node. The **Total** column represents the total hours the machine was powered, with a progress bar below whose highest value is adjusted on the total time referring to the previous selected node.

Executed lists

It indicates the times the WSCM has run a list for the previous selected node. The **Total** column represents the total of hours the list has been run, with a progress bar below whose highest value is adjusted on the total time of the previous selected node. In addition to the start and end columns, there is also a **Name** column, that will represent the name of the list sent to run.

Executed programs

It indicates the times the WSCM has run a program for the previous selected node. The **Total** column represents the total hours the program has run, with a progress bar below whose highest value is adjusted on the total time of the previous selected node. In addition to the start and end columns, there are also the following columns:
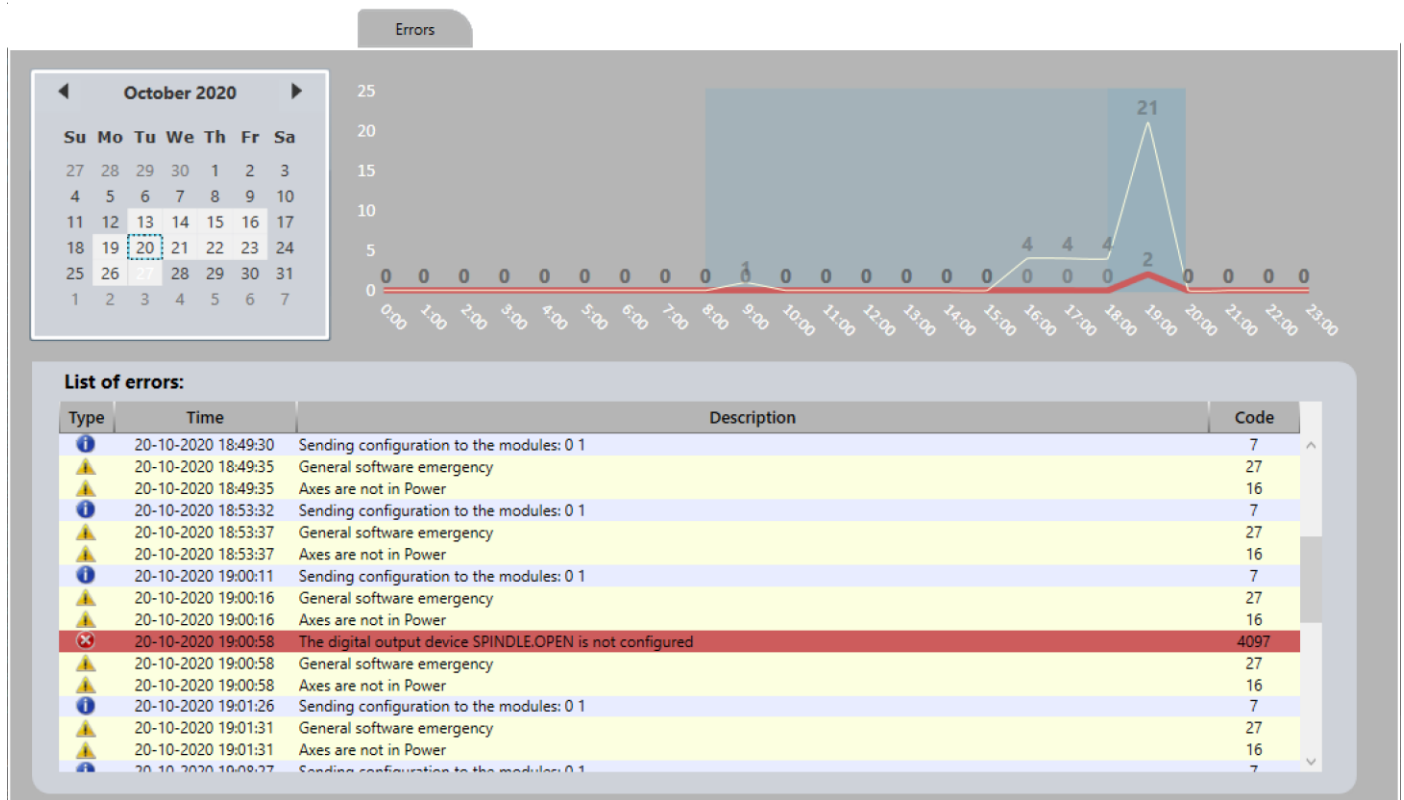
Name: It shows the name of the program sent to run.

ID: Assigned univocally to ensure program traceability along a possible installation.

L/H/T: In order, Length/Height/Thickness of the executed workpiece.

2.5: Errors

[Data read from error files] Albatros error file view tab. Once the error file path is selected (see Img. 3) this tab will display their graphic representation. On the left we can see a calendar, where the days with an error file will be displayed with a light background colour. It is also possible to select more days by holding down the left button of the mouse during the selection. Once the day, or days, requested are selected, a table will be filled with the related error list, and a graph representing the number of errors on the Y axis and the hour when these occurred on the X axis, highlighting in the background the time range of error occurrence.

Img. 8