



Global Supervision for production improvement.

Production efficiency depends on highly reliant data collection and supervision processes. The supervision solutions offered by the new generation Movicon™ 11 software consent complete data integration, real-time information and statistical analysis to reduce downtimes and increase productivity.

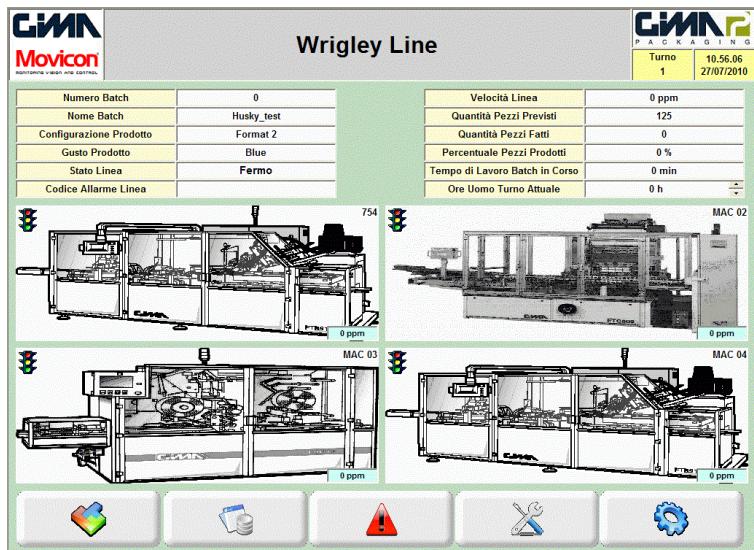
Production line and machine manufacturers need, in addition to an adequate local HMI operator interface operator, a production supervision system, capable of monitoring production processes in real time, controlling production, improving efficiency and reducing machine downtimes.

These needs are well known to GIMA Spa, a pioneering company among system manufacturers in the “Packaging Valley” in the Bologna region home to world leaders in machine automation: Bologna got the Italian “Packaging Valley” nickname due to the fact that it represents 27% of the packaging machine automation world

market industry, second only to Germany. This percentage is based on 214 packaging machine automation companies operating in this industry in Bologna alone (equal to 22% of the 27% in Italy) employing over 6,200 personnel (36% of the Italian workforce), where 70% are white collar workers operating in the after-sales support services. About 80% of production, valuing 2 million euro, is exported all over the globe satisfying over 5% of world demands. These Bolognese companies are capable of guaranteeing a sophisticated level of product customization, offering a capillary of after sales technical support,

top professional taskforce with constant research and developing in product innovation. One of the 'Packaging Valley' manufactures is GIMA Spa, a major company in the multimedia, food and beverage packaging machine manufacturing sectors. Founded in 1977 and

company not only satisfied their Wrigley client needs they are now able to provide the standardized system they engineered to other clients commissioned with product lines including those from completely different sectors. This allowed GIMA to propose their own product lines with 'added value' providing greater advantages over their competitors while reinforcing their image as an innovative company hard to beat.



One of the screens used in the Gima Spa production machine line supervision.

based in Zola Predosa , GIMA today operates in USA, UK and Germany. More and more end users are now asking for supervisory systems for their product line machines. There is no one more qualified than GIMA Spa to provide solutions to user requests globally and who are also responsible for satisfying demands put forward by Wrigley, the famous multinational confectionary and chewing-gum manufacturers, to design a standardized solution to supervise all their different client production lines. This challenge required designing an auto-configurable system, capable of connecting to machines independently from their structure and configuration. This meant that a modular and flexible software platform was needed capable of managing an all-in-one standard project, designed to connect to any product line machine, no matter how many, to obtain the necessary information on production status and analysis on productivity efficiency. The choice fell upon the Movicon Scada/HMI platform, proven to be the ideal solution for reaching pre-planned goals quickly and safely. Based on a limited budget, the software engineering

"Zero" Maintenance Supervision

The production line supervision and analysis system based on Movicon has been designed to connect to a number of machine variables in the production line i.e. the production line in question, product process type, which usually do not exceed 10 units. The machines can either be fitted out with a Siemens or Elau control unit with project auto-configuring immediately to machine production requirements without needing additional modification.

In addition to control type, the supervisor can be configured to set activations, type and relating graphics of each one of the product line's machines along with a series of other additional configuration parameters by using the purposely designed system setup pages, leaving the installer to configure the supervisor without modifying the project.

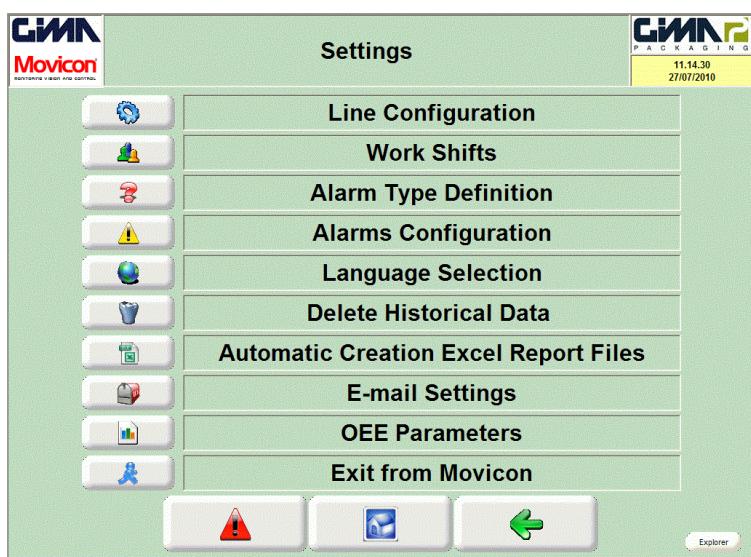
OEE and Downtime Statistical Analysis

The system's task , usually installed at the end of the production line or inserted into the company network by end user, collocated in the production manager offices, is to connect to the machines and highlight working statuses, display alarms defined as 'blockers' and store all significant data, construed as alarms and production data.

Data is collected and displayed in the appropriate graphical summary screen pages, providing a clear overall picture of ongoing situations in real-time enabling managers to keep everything under control.

The main supervisor page informs users about the production, by representing the production line machine images graphically and supplying value on:

- Batch number IDs
- Product Settings
- Product type
- Batch name assigned by customer
- Set quantity of units



Project configuration access. Project completely auto-configures without needing any modifications by communicating with the parameters for OEE efficiency calculation formulae.

- Produced quantity of units
- Produced unit percentage
- Production line working time of batch being run
- Production line speed
- Time set for persons working current shift

A screen page appears for each machine when clicked on showing all its details and information. The production line graphics automatically appears in function with the number of machines enabled and present in the production line at that moment.

The setup pages can be used to configure the production line as previously described.

A purposely designed page has been provided to manage production line batches and work shifts, and the machines have been programmed to begin working only when assigned with a production batch. Amongst the system features and batch settings, a production batch data import/export to MsExcel formats option has also been included.

The main objective is to record all data in database archives (Ms SQL Server 2000 was chosen from the various formats provided by Movicon) for performing statistical analysis that allow the end user, and builder, to obtain historical information in order to evaluate critical areas and intervene appropriately to improve

production, reduce machine downtimes and increase their overall productivity index.

The supervisor performs statistical analysis on recorded data by managing:

- Alarm statistics (frequencies, durations) displayable both in table and graph format.
- Statistical graphics on line productivity (pie chart based on 100% time=shift, a general product line pie chart and one for each machine, together with machine MTBF, MTTR, MDT indexes)
- Tables for displaying production counters for selected time range
- Tables for displaying alarm list history

This data is managed in reports where data on productions, alarms and work settings can be displayed in table or graph format (Pie charts or histograms). This data is selectable using filters to retrieve data by:

- Time period (from date/time to date/time)
- Batch number
- Production batch

The data displayed in tables can be exported in Excel files using the command provided.

In the section dedicated to reporting, the system will calculate and display performance efficiency indexes according to the OEE standard. At the end of each shift, the system will automatically create an Excel file containing production line information and send it to the predefined recipients by email (function can be enabled/disabled as desired). The "Target" OEE value can be customized, without modifying the project, in order to get coefficient calculations for each specific production requirement. All information or settings are subject to security management and user Logons according to the most recent security regulations. The User archives, in addition to the GIMA users inserted in the project, can be configured directly by the end user. Thanks to statistical information provided by the system, the end user and builder will be able to get all the information they need for analyzing effective productions by confronting real data with theoretical data to obtain crucial information in order to remove any possible causes slowing down production, improve

production line productivity overall and safeguard investments.
Furthermore, the machine downtime analysis,



The resulting analysis and graphics for downtime reasons.

with parameters for subsequent analysis, consent to quick intervention and, above all, to analyze the most frequent downtime causes in order to intervene only where and when necessary by organizing scheduled prevention maintenance to avoid production loss costs.

Remote Analysis via Web

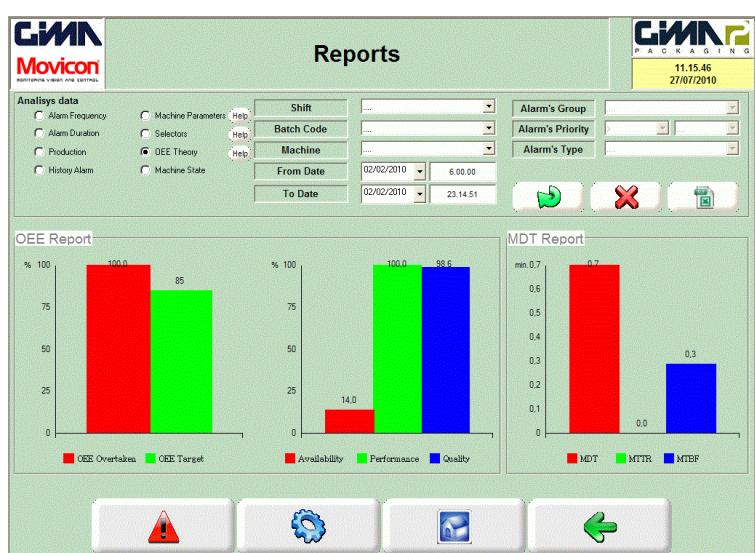
All statistical information is available to eventual remote users, whether end users (production line maintenance personnel), maintenance technicians or GIMA design engineers. Thanks to the Movicon Web Client technology, the supervisor system is accessible with any browser connecting remotely (internet, intranet). The Web Client users, assigned with authorized access passwords, can view any information they need in real-time or statistical analysis by accessing from any point with any normal browser or mobile device (i.e. Smartphone).

Conclusion

Ultimately, the GIMA project concluded with success. Thanks to the Progea support services working alongside to design the project, the GIMA technicians were able to meet all their client's requirements in less time than expected, by creating a "zero maintenance" project, a standard solution that can be implemented in any type of production line.

This solution comes with a license which permits users to purchase only what they need, therefore optimizing costs and Movicon license size in function with the size and number of plant production lines.

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The main performance indexes (OEE) presentation. All data managed by the supervisor can be accessed via Web Client.