Movicon Pro.Lean©

The solution for Production efficiency: OEE, KPI and Downtime

INDUSTRIAL AUTOMATION SOFTWARE
progea

Movicon Pro.Lean©

Getting full access to real-time production data enables you to detect and anticipate weak spots in your production system and make the right decisions to increase productivity and efficiency.

Technology and Solutions for Plant Intelligence

Progea offers Lean Manufacturing and Plant Intelligence software solutions to improve productivity, reduce losses and increase profits.

Every modern company embracing Industry 4.0, needs specific tools that are simple and efficient to use. Tools that can ensure connectivity, data collection, aggregation and transparent analysis with rapid returns on minimum investments (ROI). The production reality today, in an increasingly competitive world demands efficiency and quality with continuous and improved processes according to the Lean Manufacturing concept while embracing the Industry 4.0 principles. Automation systems that manage production processes can only be optimized if provided the right information in real-time. The Movicon.NExT Pro. Lean© module offers maximum efficiency by making full use of Progea's twenty years of experience in industrial automation software. Often production lines are subject to various causes that weaken performance: malfunction, downtime, scrap and rejects reduce production efficiency, causing economical loss to the company who at most times are inadequately equipped to intervene.

The automatic real-time knowledge of the performance indicators (KPI) enables Overall Equipment Effectiveness (OEE) values to be calculated in order to indicate the real plant production efficiency rate. On average, a well-established manufacturing company performs up to 60% of its full potential performance capacity. This means that for every 100 approved goods produced in an ideal situation, only 60 are actually produced. Considering that the 100% value is purely theoretical, an 'excellent' value of a true lean production would be around 85%. It is easy to imagine how improved production efficiency and an increase in the OEE value would create a noticeable increase in returns for any company, without investing large amounts. For example, it is quite easy to imagine how a mass production manufacturing company can increase profits and reduce loss by just by making a slight improvement to their performances.

Information flows enterprise-wide from production plant system sensors across to the managerial offices, efficiently managing real-time production process. Pro.Lean© is the solution for improving productivity efficiency, reducing loss and increasing profits.

Pro.Lean© is a simple and efficient solution

Pro.Lean© will make plant system more efficient by highlighting those key indicators that enable reduced loss and increased profits.

The Key Performance Indicators (KPI), the Overall Equipment Effectivenss (OEE) value and the production Downtime analysis calculated by Pro.Lean©, will enable you to maximize business by increasing productivity in the three areas relating to the Availability, Performance and Quality parameters.

Increase Efficiency

Improving local and global production efficiency will enable users to improve the productivity of existing existing machines by reducing rejects and downtimes. As a consequence this will reduce plant operational costs to satisfy production plans without needing to rely on overtime work and the threat of delayed delivery deadlines.

Reduce Machine Downtimes

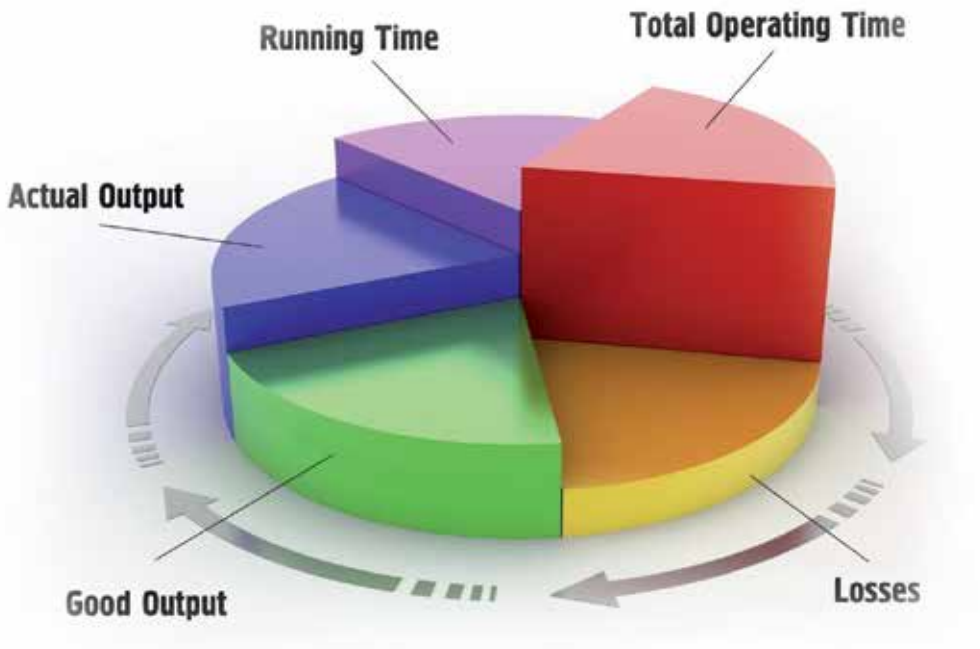
The downtime analysis will enable you to eliminate anticipated and repetitive problems relating to production. This will enable a reduction in plant downtime events, resulting in a significant reduction in costs and more efficient allocation of human resources.

Increase Production

By increasing efficiency and decreasing downtime events caused by production inactivity or malfunctioning, users can increase the effective production rate of the plant capacity value.

Quality Improvement

By analyzing production data and the quantity of defective items produced, it will be easier to to detect the causes and eliminate them. As a result by reducing production waste and rejects, product quality and client satisfaction will increase.



How can the OEE be increased?

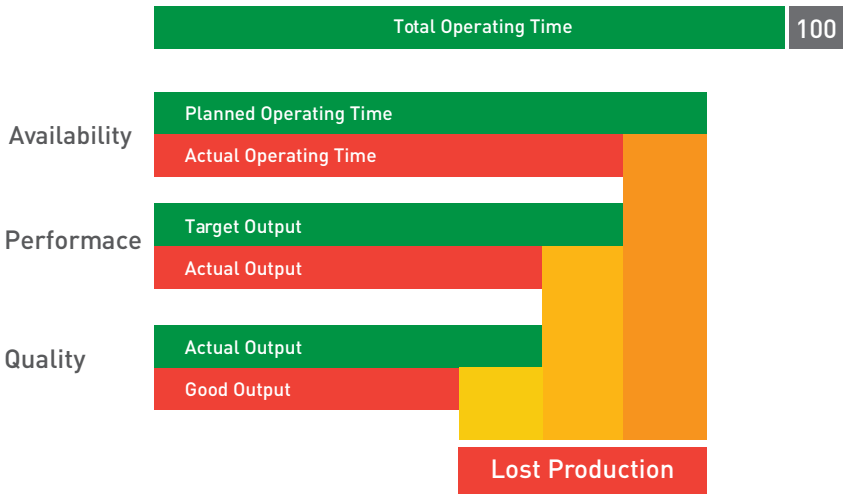
Measure your productivity performances and regain competitiveness using Industry 4.0-ready connectivity and data analysis.

The OEE is an essential reference point for analyzing production process efficiency and productivity by calculating the overall performance of the plant and classifying the different production losses according to the three following factors:

- Availability
- Efficiency
- Quality

The accuracy of the OEE values depends on consistent production data collected automatically in real-time mode. Without accurate measurements and access to production data it would be impossible to identify the right interventions for making the production process more efficient. This is why Progea has designed Pro.Lean© to be the most simple and cost effective solution to use. Production line information can be aggregated and placed at the disposal of company managers with great clarity and simplicity. This tool is essential for closing the gap that is often created between the field production processes, company management and planning. Pro.Lean© is based on Industrial Connectivity and Data Collection technology and has been tested with Movicon for many years by Progea. The Pro.Lean© module provides automatic and intuitive management of the Historian component for collecting and recording data, the Dashboard component for displaying the key indicators KPI, OEE) in real-time and Reports for analyzing data collected and archived by date, shift, operator, machine, product and batch. With Pro.Lean© each company will be able to discover the real production capacity of their systems, production lines and machinery. Pro.Lean© facilitates the detection of critical weaknesses and imperfections by providing the information needed to eliminate them and improve overall efficiency. This will give production plants the opportunity to increase their value, improve productivity and increase profits while reducing investment recovery time and strengthening the company's competitive presence.

In today's global economy, manufacturing companies cannot risk becoming inefficient and non-competitive. It is critical to reduce production costs, improve production line and machine use and flexibility to improve not only product quality but service as well. Pro.Lean© offers cost containing tools for collecting real-time information from production flows and analyzing the coefficients of efficiency using tables and graphs in an open and integrated web-enabled architecture that also enables direct connection to the company IT tools (ERP, SAP).



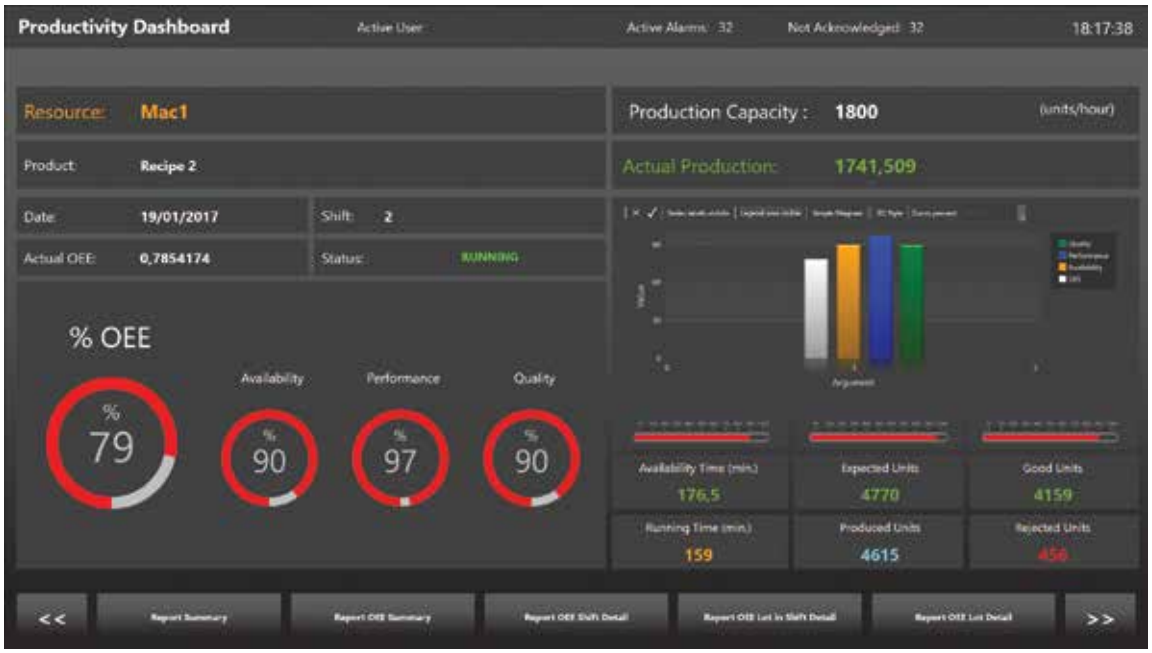
Dashboards

Pro.Lean© offers complete, fast, effective and transparent performance and downtime visualization.

Pro.Lean© has been designed to guarantee perfect visualization of all the performance parameters and indicators collected by the production system using the real-time data dashboard displays and analytical reports. These tools offer transparent and accurate data containing all the information needed to achieve reduced production loss and increased business activity. By using the Movicon technology combined with the Pro.Lean© module, you can view your company's performance indicators on local video screen monitors with dashboard displays as well as over the Internet by using a simple browser. This will drastically cut management, maintenance and licensing costs more than any other OEE system on the market, allowing you to minimize company investments.

Dashboard Data

The collected data is represented by the Pro.Lean© module in real-time using attractive graphical dashboards to display indicators and operating statuses with great clarity. Operators will be able to supervise and control all productivity processes anywhere, anytime, by using the web interface graphics. The dashboard interface has been designed with the latest ergonomic requirements in mind. It can also be customized and integrated with advanced supervision and control features to enable the module to function as a supervisor.
This technology is open to all types of additional data visualization and therefore accepts display screens of any type to visualize production plant data as required.



Complete and efficient production data analysis

Pro.Lean© offers integrated and ready-to-use analysis tools based on production and downtime data reports, charts and tables.

The OEE indicators (Overall Equipment Effectiveness) are recognized as the most effective key indicators for measuring overall plant system efficiency. The OEE is aimed at assisting enterprises with maximizing market output by increasing productivity in the three key areas: availability, performances and quality.
Real-time data acquisition combined with the OEE analysis allow managers to get a better understanding of the production performances of each of their assets and identify the factors restricting opportunities to improve efficiency. This is done by providing an overall vision covering the productive and functional aspects, production rate and quality using common metrics to provide unique calculated performance measurements.
The OEE calculations take three factors in to account:

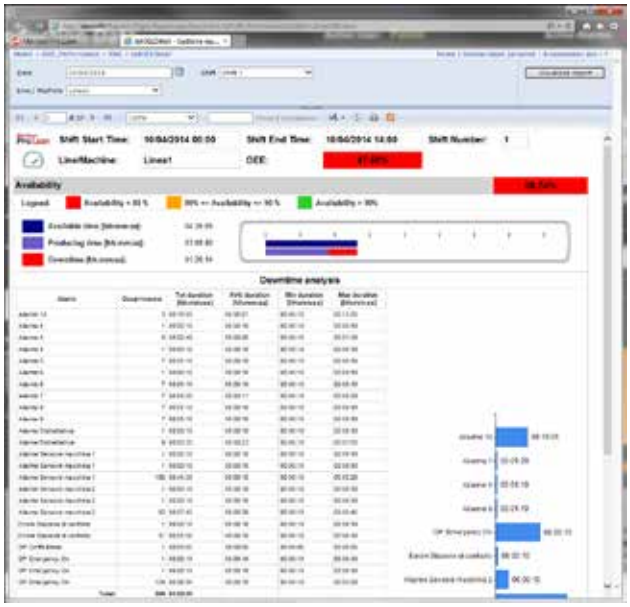
OEE = Availability* Performance* Quality

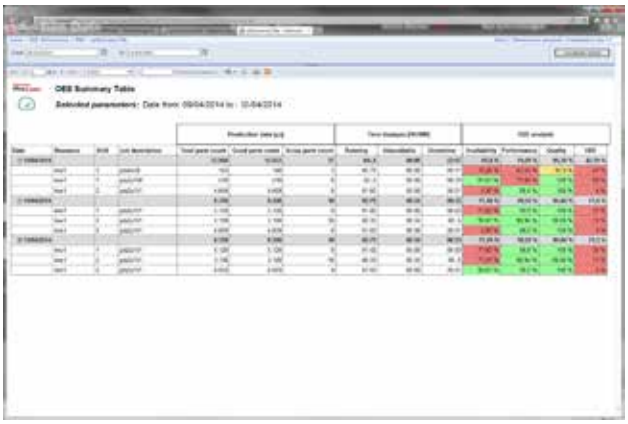
Where:

1. Availability: takes into account Down Time loss and is calculated on the percentage of effective operating time in respect to planned production time.
2. Performances: takes into account Speed Loss and is calculated on the percentage of pieces effectively produced in respect to programmed target total and ideal run time.
3. Quality: takes into account quality loss and is calculated on good pieces produced and total number of pieces produced.

These indicators are applicable using Time Range,Production Line, Machine, Shift, Batch and Operator filters.

All collected and recorded data are calculated and displayed in integrated Reports that are created by the Wizard automatically. These reports provide efficient analysis fully detailing production data. Those areas experiencing inefficiencies are highlighted giving details on where and when production downtime occurred and the causes. These integrated reports can be completely customized with the Report Designer to integrate any other production data type needed analysing or cross referenced with other produtction assets' data.
All reports are Web-enabled thanks to the Movicon.NExT HTML5 Web Client technology.





Downtime Analysis

Accurate Analysis essential for productivity improvement.

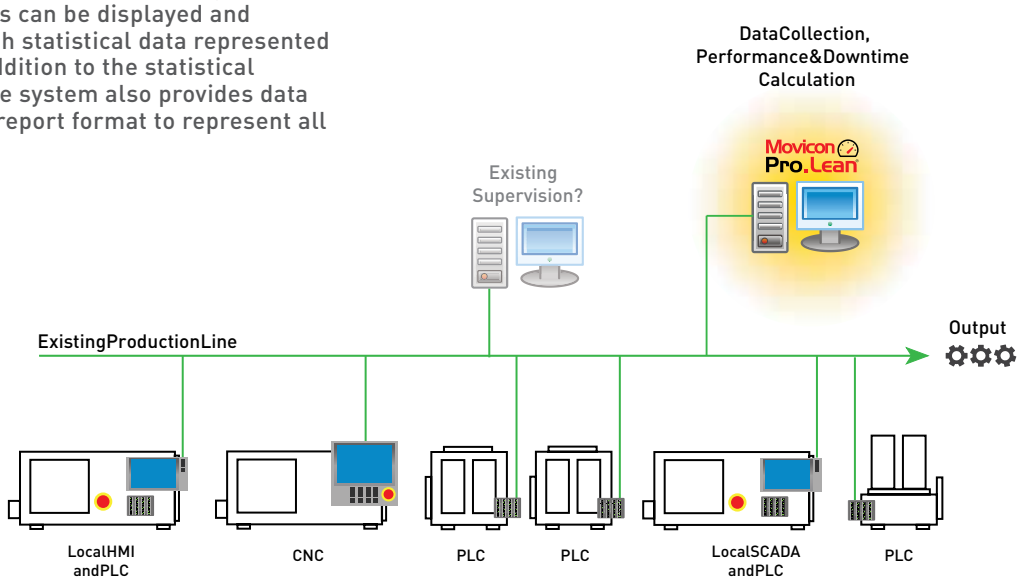
Downtime Analysis

The performance indicators alone are not enough to detect the causes of inefficiencies. Data collection systems need to be evaluated for their capacity to provide the right information that enables detection of the macro causes that drive productivity loss and diminish performance. This information is essential to ascertain what and where the causes of inefficiency are in order to eliminate them. This requires the full cooperation of the operators to not just control alarm events, automatically triggered by the system, but to establish the reasons why production downtime events occur in the actual machinery being used (e.g. format change, setup, raw material shortage, scheduled maintenance, meetings and work breaks).
Pro.Lean© includes analysis modules for DownTime event causes that generate a statistical analysis of the downtime causes based on various and configurable reason options. Production managers can refer to this analysis to obtain the vital information they need to recover efficiency, implement corrective intervention and improve production management.

Statistical Analysis

The DownTime Analysis Module is used for visualizing statistical data relating to production downtimes. This is done by graphically representing data in classification of date order, total duration or event frequency. The values displayed in these classifications are extracted from historicals and represented in graphs that offer a selection of different data filters that include by time range, batch, shift or operator. The graphs can be displayed and printed as histograms or with statistical data represented by overlapping curves. In addition to the statistical calculations and graphics the system also provides data summary tables in detailed report format to represent all the data filtered.

The information managed by Pro.Lean is essental for any production manager to improve the productivity performance of their assets by making machines more efficient, optimizing production time and reducing waste. A calculated low OEE value will inevitably cause the company an increase in production costs and consequently a reduction in profits and opportunities. This would mean that a production line running 24/7 would lose 4% of its productivity potential for every hour lost in a production downtime event. By analyzing production data to detect the bottlenecks and downtime causes, the company is able to take immediate action to reduce loss. For instance, by recovering just 2% loss means that the weekly production rate will retrieve 3.5 hours of productivity time. On an annual basis this will mean an additional 168 hours of productivity. A simple 2% production recovery translates into a significant increase in profits. Today, based on a theoretical OEE value of 100%, most efficient companies with a high productivity rate can generally reach 80-85% of this value. However, this is not always the case as most companies do not implement any control procedures and therefore operate at an average of 60% of their estimated OEE value potential. Such companies would greatly benefit if they considered the great opportunities offered by using the OEE indicators to reduce waste and increase profit as a consequence.



Connectivity and IIoT

Open data collection for total connectivity.

Pro.Lean© is based on open architecture that integrated with any machine and production line control and management device. In fact an integrated system should be capable of collecting any type of value from the field, whether deriving from PLCs, CNCs, PACs, Inverters, fieldbus or I/O instrumentation.

I/O Drivers

The I/O Driver library contains a vast selection of native and integrated I/O Drivers for communicating with control system communication protocols (e.g.Modbus, Siemens, Schneider, Rockwell, Omron, Saia, Mitsubishi, Profibus, Profinet, EtherCAT and other).

OPC

Native and integrated OPC UA technology as Client and Server.

Networking and DB

Vast network connectivity with Networking applications based on database table sharing among distributed station networks, comprised of both HMI panels and third party managerial systems, that connect to any managerial system (ERP) or company SAP system. Movicon Pro.Energy© is the best connectivity system to use for monitoring and control at both field and managerial levels where energy consumption and production data intersect for cross referencing.

Industrial IoT

Communication Drivers for IoT system integrtion (e.g. reading tools on public networks). Includes PubNub, OPC UA Azure, MQTT and many other protocols.

Data Archiviation on relational SQL Server™ database.

All process data collected by Movicon Pro.Lean© are recorded and archived for subsequent analysis using the Data Logger objeect that are automatically created by the Pro.Lean© Wizard.
It is the Wizard's task to aggregate data and define the recording and archiving modes. This important job is performed in conformance with the simplicity, reliability and openness concepts. Pro.Lean© does not need to have a Microsoft SQL Server™ license in order to function in the simplest architectures. he data tabled are structured automatically and the calculation database provides dashboard viewers and analytical reports with all the information required for rapid and efficient analysis.
The Pro.Lean© is a functional module of the Movicon. NExt platform designed with a simple object-oriented configuration that also allows users to customize how they want to mange, display and record real-time data.

Data Collection Openness

Collecting measures, operation statuses and alarms, that are not already available as digital information from the PLC, requires the production unit to be installed with a local HMI interface. The Pro.Lean© architecture is ideal for this as it can connect any data display screen whether local HMI, network or Web-based. It has been specifically designed with integrated features to directly manage a wide range of distributed data collection or vizualization points for those systems requiring it. Not only is the user's investment safeguarded, it is also reduced in cost. This is because there is no need to install and deploy any additional software that would otherwise incur additional costs as well as time spent on invasive interventions.

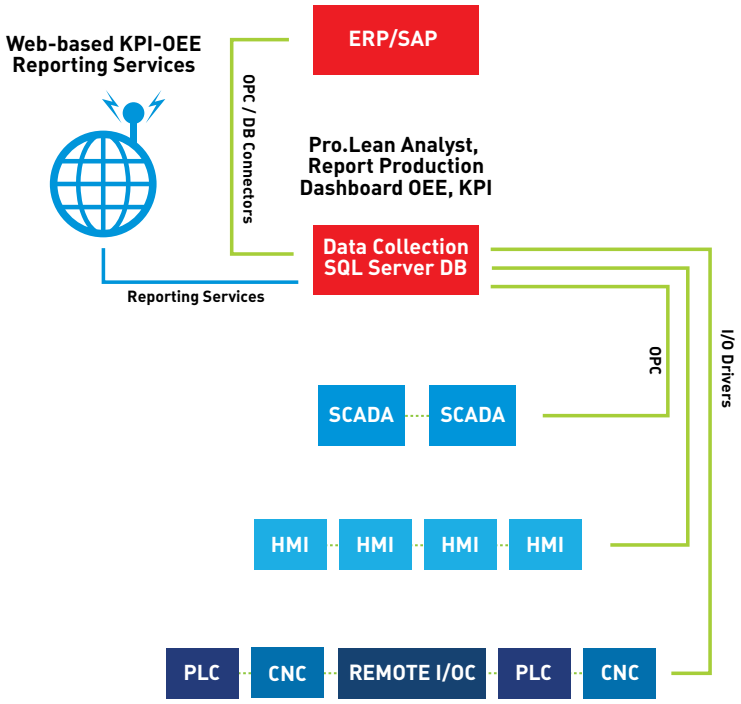
Data Redundancy

Movicon Pro.Lean© provides an option to use the data Redundancy function that automatically sychronizes historical data in PC systems with redundant hardware and communications. This option enables the Pro.Lean application to be deployed in "Mission Critical" data collection systems.

Rapid and safe investment

By investing little Pro.Lean© can be applied anywhere, in any production context, including those already with automation infrastructures, with a minimum level of invasiveness.

Pro.Lean© is a "standard" solution that can be used in all production data and analysis applications. It can be applied as an onboard machine module or as a production line supervisory module combined with the Movicon SCADA/HMI supervision projects, or in independent or stand-alone architectures applied in already existing systems. Pro.Lean© can connect to existing PLCs or SCADA/HMI by collecting production information in its databases. Existing PCs can be used by the local machine operator to track downtime event entries by using a simple web browser (without modifying the local application) if the PC is connected to a network or simple operator panels that are connectable to Pro.Lean© . Pro. Lean© also offers a solution for those without a main Supervisor, whereby display screens can be integrated to manage all production line information. This has all been designed with the best technology available for collecting, managing and analyzing production data along with the purpose to keep investments reduced to a minimum without having to modify existing situations unless absolutely required.



Much more than just an Efficient Production Analysis system.

Thanks to Movicon.NExT, integrating all the functions needed to create true and powerful supervision architecture is very simple. Control Logic can be integrated to manage for example, operation commands, parameter or recipe settings, maintenance schedulers; for example to mange control and alarm thresholds with subsequent diagnostics, signalling, on call duty personnel notification and statistics. Dynamic geographical maps can also be implemented to represent a series of systems distributed over different geographical areas, each one integrated with a corresponding data display window. Furthermore, all information relating to a Supervision and HMI context can also be added to the system.

The Key Features

Openness
Pro.Energy© is a Movicon functional module and therefore inherits the platform's .NET, XAML, SQL Server™ and HTML5 technology.

Simplicity and Wiizards
The Pro.Energy© configuration wizard simplifies the task of selecting field variables and creates data collection databases automatically. Real-time Dashboards, caculation databases and analytical reports are created automatically with just a few clicks. Applications are easy to create within minutes.

Standards
Pro.Lean© is completely based on standard technologies to safeguard your investment.

Performance.
Pro.Lean© ensures real-time data management and offers a structured analysis of data even in those databases containing Big Data.

Powerful Historian
Collected data are recorded by the Historian objects and archived in SQL Server tables with automatic data recycling.

Connectivity.
Pro.Lean© ntegrates a vast communication driver library ready to connect to all measuring and meter devices (Modbus, Bacnet, Konnex, LON, Siemens, Schneider, Rockwell, Profibus, Profinet, Ethernet/IP and many others). The drivers include functionalities such as automatic Tag import, remote telemetry system and IIoT connectivity. Furthermore, it offers total connectivity via OPC UA as Client and Server.

Ready-to-use and Custom Reports
Pro.Lean© offers integrated, ready-to-use and Web-enabled Analysis Reports based on historical data. This solution also offers the option to integrate and customize your own reports using the Report Designer

HTML5 Web architecture
Pro.Lean© offers local and web- enabled dashboards with real-time measurements and reports. Data can be accesses on the Server by using Internet browsers. Performances along with the security of the HTML5 standard ensure reductions in cost and maintenance.

OEE, KPI and Downtime Analysis Modules open and customizable
The OEE, KPI and Downtime Analysis Modules offer simple and effective solutions to obtain and display all production data measures in a fast and transparent way. Ready-to-use Reports, Tables and Charts for complete production analysis with the option to print and export the represented data. All data are managed in customizable architecture.

Integrated Connectivity with Movicon™
In addition to interfacing with any supervisor system, Pro. Energy© also offers integration and connectivity with the Movicon.NExT SCADA/HMI systems.

Progea is at your full disposal to help and support you with your every analysis, Supervision or Consumption Monitoring project need. Please contact us for a demo or any further information:

info@progea.com - +39 059 451060

INDUSTRIAL AUTOMATION SOFTWARE
progea

For further information:
www.progea.com

English Ed.
March 2017

Progea Srl
Via D'Annunzio, 295
I-41123 Modena
info@progea.com
Tel +39 059 451060

Progea International SA
via Sottobisio, 28
6828 Balerna (CH)
international@progea.com
Tel +41 91 96 76 610

Progea Deutschland GmbH
Marie-Curie Str., 12
D-78048 VS Villingen
info@progea.de
Tel +49 (0)7721 99838 0

Progea USA LLC
2380 State Road 44, Suite C
Oshkosh, WI 54904
info@progea.us
Tel. +1 (888) 305-2999