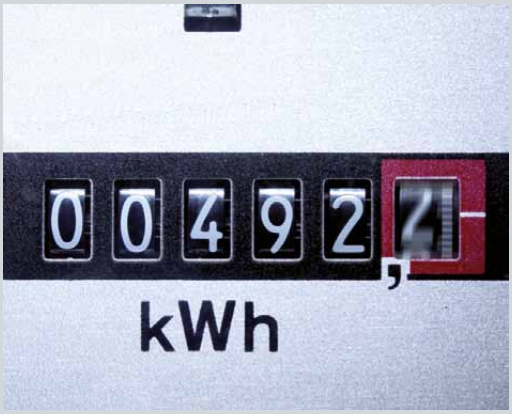
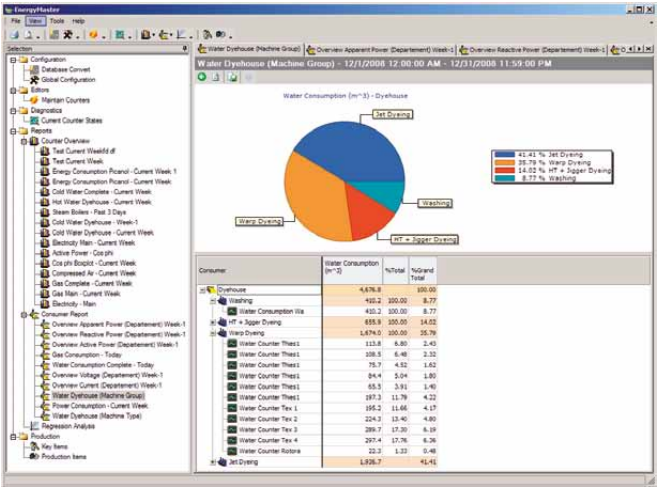
Energy monitoring: reduce carbon footprint - save costs





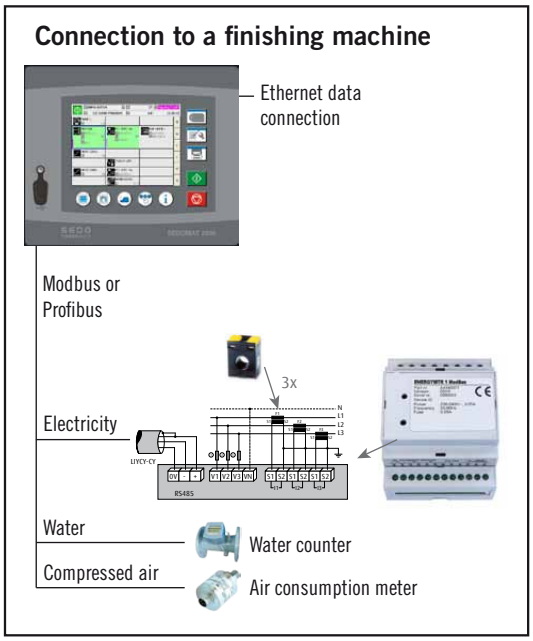
Water consumption by department over a selected period of time. This type of reports helps to identify the largest consumers in the plant per type of energy and utility resource

Today, in textile finishing, beside material and labor costs, energy costs are normally the third important cost factor. For controlling and post production analysis it is difficult to calculate the exact energy cost for a production step or an article. A sudden increase in energy consumption of a production run can push an order easily into the red.

With ever rising energy prices and increasing environmental legislation, efficient energy management has become a very critical success factor to run a profitable business in today's global economy. To monitor, control and cut costs, EnergyMaster is the perfect tool.

Following the principle of Monitoring and Targeting (M&T), it maps the different energy consumptions (electricity, gas, compressed air, water, steam, effluent, CO2 emission) for further analysis and optimization. The integration of these energy parameters with the production data of SedoMaster provides a perfect insight into the relationship between energy consumption and production.

1. Step: Measure energy consumption



Connection to a batch dyeing machine or continuous finishing range. Sedomat controllers extended with meters for power, compressed air and water consumption.

Steam consumption is also monitored

Finishing machines equipped with Sedomat controllers can not only connect to SedoMaster to monitor in real time production, quality, speed, stop levels, downtimes and production efficiency but also to EnergyMaster.

Which objectives are targeted with EnergyMaster?

By monitoring the energy consumption the company gets answers on important questions such as:

- Which machines or departments are the largest energy users?
- What is causing our peak consumption?
- What about the power factor (cos phi) of our company?
- What about the energy consumption fluctuation of a machine or department over time?
- What is the energy consumption by style and product?
- What is the remnant energy consumption when production is shut down?
- What abnormal consumptions occur and when?

Automatic alerts to managers on exceptional energy consumption via e-mail or text messages, allows for a quick reaction and to realize immediate savings.

The use of energy monitoring creates an “energy awareness culture” within the company for all employees.

EnergyMaster is the perfect tool for a company to achieve its Energy Efficiency Plan goals.

In order to achieve energy management, consumption meters need to be installed in the power switch panel to measure the consumption of machines.

These simple meters allow measurement of the active energy consumption. Such a meter typically consists of three coils, one per phase, clamped on each electrical supply cable. The meter then converts the signals of the three coils into consumption pulses. These pulses are counted by the Sedomat controller and passed on in real time to SedoMaster, exactly like stop times and production and quality data are transmitted.

In many cases, Sedomat controllers are already present at the machine to control the machine and to collect production data for the SedoMaster system. As such, energy data can be transmitted via the existing network to the PC server of the system.

Basic energy measurement

- Active energy (kWh)

Advanced energy analysis

- Active power (kW)
- Apparent power (kVA)
- Reactive power (kVAr)
- Power factor
- Phase current (mA)
- Neutral current (mA)
- Phase voltage (V)
- Frequency (Hz)
- Active energy (kWh)
- Apparent energy (kVAh)
- Reactive energy (kVArh)
- Time (hours)

Reporting

The EnergyMaster system comes with a set of predefined reports, such as:

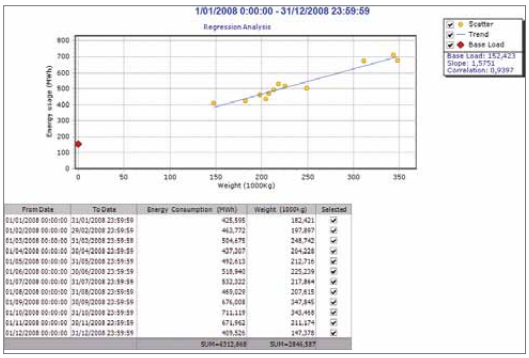
Counter reports

These are graphs which map the measured data from e.g. water counters. With such a report the main measurements of the plant can be monitored.

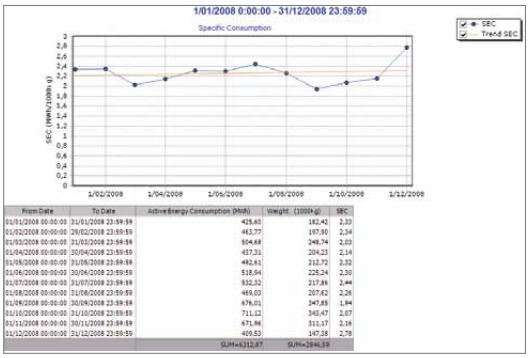
Reduce CO_2

2. Step: Control (Reporting) and target energy consumption

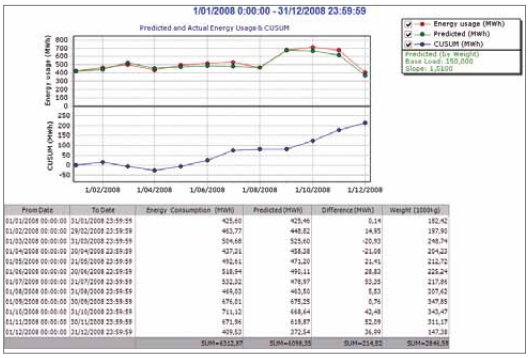
Counter report: The electricity consumption (active power) and the according power factor (cos phi) are reported in 15 min. interval. During weekend fewer machines are in production. As a result the active power decreases and the power factor improves. The graph shows that the power factor always remains above 0.9, which indicates an acceptable situation. This graph also allows to evaluate the functioning of the condenser battery for improvement of the power factor.



Performance Characteristic Linie (PCL)



Specific Energy Consumption (SEC)



Cumulative Sum chart (CUSUM) (actual/target).

Consumer reports

Several consumption measurements can be grouped together into one department. As such, dyeing, finishing, weaving, knitting and administration can be defined as a specific consumer. The consumer reports are graphic reports which show the consumption of a certain department. The user can also select the time period for each group of machines. Line or bar charts can be selected. These reports can be used to trace abnormal peak consumption, to eliminate abnormal consumption and for example to evaluate if reduced night or weekend shifts makes sense, considering the higher energy consumption per unit of production.

History reports

This set of reports shows the energy consumption for a specific machine, for a machine type, for a style or product, for a department or for the whole plant over a longer time period. These reports allow evaluating the energy component in the overall production cost of each product. Does the energy consumption remain constant when a certain style is produced or are there large fluctuations, which require further analysis?

Combination reports

In these reports, energy consumption is related to effective production. For example, in the dye house, energy consumption is reported by batch; in weaving, energy consumption is reported per million picks and in spinning per 10,000 lbs produced. By analyzing this data by type of machine and by type of product, one can determine easily which machine is most energy efficient to produce a specific product or style.

Energy monitoring standards

The reporting for energy consumption is well documented by the industry in many countries. For example in the UK, companies receive government subsidies if the installed energy monitoring software package includes a well defined set of reports. The EnergyMaster reporting package includes these industry standard reports, such as the PCL, SEC and CUSUM charts.

Performance Characteristic Line (PCL)

The PCL is the result of a regression analysis between energy consumption and production output, as registered by the monitoring system. The PCL can be plotted for a machine, machine group or a complete department or plant and for energy resource monitored by the system. Based on this regression analysis, the base load is calculated, which is the energy consumption when there is no production at all. The slope of the line indicates the amount of energy needed to produce one unit of product. The PCL can also be used for targeting future energy consumptions based on production budgets.

Specific Energy Consumption (SEC)

The Specific Energy Consumption report is also important and relates the kWh per unit of production. A typical graph is the monthly evolution of the SEC, which shows whether the plant is gaining or losing energy efficiency.

Cumulative Sum of deviations (CUSUM)

A special type of report is the CUSUM trend. This report allows comparison of the real consumption versus budget. The gradient line in the trend graph allows immediate detection of a rising or decreasing trend in energy consumption. Such reports really help promote the energy awareness culture.

Reduce CO_2

3. Step: Save costs and reduce carbon footprint

Conclusion

With the addition of the module, the Sedo Treepoint MES systems are extended with the monitoring of an important cost factor. By taking advantage of the already present data collection network, data base and server configuration, the investment cost can be kept to the minimum while the monthly energy bill savings can be substantial by using the EnergyMaster module.

By defining an Energy Efficiency Plan with clear objectives, significant energy savings can be realized. EnergyMaster is the right software package to provide analysis and decision support for quick energy saving actions. It is the right tool to meet government rules for carbon reduction, environmental legislation and last but not least, it will help to protect our enviroment and leave a better world for future generations.

Head office:
Sedo Treepoint GmbH, Germany
Neuwies 1, D-35794 Mengerskirchen
Phone: + 49 6476 31-0, Fax: +49 6476 31-31
sedo@sedo-treepoint.com

Sedo Treepoint, Switzerland
Phone: + 41 43 488 11 88, Fax: +41 43 488 11 89
switzerland@sedo-treepoint.com

Sedo Treepoint, Belgium
belgium@sedo-treepoint.com

Sedo Treepoint, Brazil
brazil@sedo-treepoint.com

Sedo Treepoint, China
china@sedo-treepoint.com

Sedo Treepoint, India
india@sedo-treepoint.com

Sedo Treepoint, Italy
italy@sedo-treepoint.com

Sedo Treepoint, Singapore
singapore@sedo-treepoint.com

Sedo Treepoint, USA
usa@sedo-treepoint.com