SpinMaster

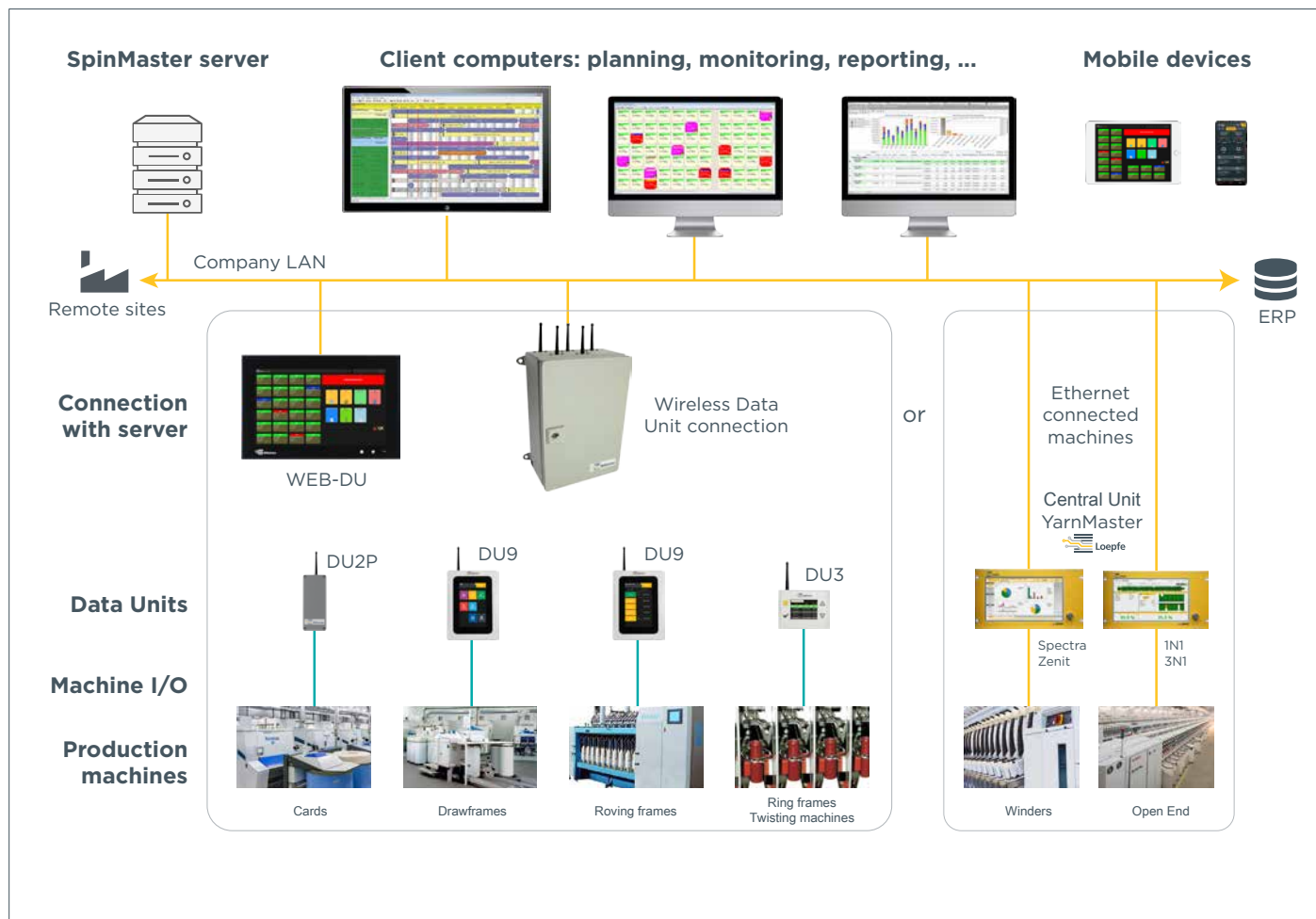## Real time production and quality monitoring from fiber to yarn

To be successful in today's demanding yarn market, modern spinning mills need to be fully focused on performance and quality. Only spinning mills having real time production and quality data for the entire production process can achieve an optimum relationship between quality and efficiency.

With the SpinMaster system, BMSvision offers a solution for production and quality monitoring covering the complete spinning mill.

Through a graphical user interface, SpinMaster users are constantly informed about the actual situation in the spinning mill. Powerful analysis tools allow instant identification of poor performing machines and spindles, resulting in a faster reaction to problems and an increased efficiency and quality level.

SpinMaster: concept

SpinMaster server
Client computers: planning, monitoring, reporting, …
Mobile devices

Company LAN

Remote sites

ERP

Connection with server

WEB-DU

Wireless Data Unit connection

or

Ethernet connected machines

Central Unit YarnMaster

Loepfe

Data Units

DU2P

DU9

DU9

DU3

Spectra Zenit

1N1 3N1

Machine I/O

Production machines

Cards

Drawframes

Roving frames

Ring frames Twisting machines

Winders

Open End

Networking the machines

SpinMaster supports both cabled (Ethernet) and wireless networks to connect the machines to the central server. Machines are equipped with one of BMSvision's Data Units (see next page) for automatic as well as manual data collection or linked directly to the server through their Ethernet interface.

Connecting remote sites

SpinMaster supports the connection of multiple plants to one central server. On remote sites the BMSvision Data Units are connected to the SpinMaster system via the company's WAN (Wide Area Network). A dedicated "multi-site consolidation module" on the central SpinMaster server allows integrated reporting for all sites into one single reporting environment.

System requirements

SpinMaster is Windows based and can be installed both on physical systems and in a virtualized environment. Application and database can run on separate servers. The database is Oracle driven. Also Terminal Services like Citrix are supported.

ERP system integration

SpinMaster is easily integrated with the customer's ERP system. Through a standard interface, order and product data is transferred from the ERP system and imported in the SpinMaster database.

The integrated export functionality allows a straightforward upload of production data, calculated production schedules, work in progress and performance indicators from SpinMaster to the ERP system.

Microsoft Dynamics AX

Microsoft Dynamics NAV

Microsoft Dynamics 365

intex

ORACLE

SAP

update

infor

JOMAR

datatex
we make IT work for you

Connecting machines to SpinMaster

Touch screen IoT ready Data Units

In case only machine based monitoring is required, the machines are equipped with one of the BMSvision Data Units: **DU11**, **DU9**, **DU3** or **DU2P**. These units monitor the production speed, production and stop time and automatic stops such as doffing, sliver breakage, ... If stop time recorded as manual stop needs further analysis, the operator can enter the exact stop reason.

The **DU11** and **DU9** are high end IoT ready members of the BMSvision data collection terminals. The **DU9** features a 5" touch screen. The **DU11** features a 7" touch screen and allows displaying various types of production documents. The **DU3** is a cost-effective Data Unit with 2.8" color screen and membrane keyboard. This compact, pre-wired unit allows a quick and straightforward connection of any textile production machine type.

All Data Units have a web based graphical intuitive user interface. On screen language selection allows to switch between several western and Asian languages on the spot. **DU11** and **DU9** come with wired Ethernet as well as a wireless network interface.

All Data Units except **DU2P** can be extended with Backup & Recovery, allowing a minimum of 24 hours local data storage in case of server or network breakdown.

DU11   DU9   DU3

WEB-DU: HMI for multiple machines

The **WEB-DU** application is used as HMI for a group of machines that are equipped either with **DU2P** or **DU7** headless devices for automatic data collection (production count and automatic stops) or that are connected via Ethernet. **WEB-DU** can be implemented on any browser enabled touch screen device such as PC, tablet and smartphone. BMSvision offers the **WEB-DU** including a Touch Panel PC with a 15.6" display.

DU7   DU2P

Monitoring spinning equipment

Automatic data collection

Depending on the type of machine, various signals are available for automatic detection of production and machine status information. The table below shows an overview of automatic detections for various types of machines in the spinning process.

		Card	Drawframe	Comber	Roving frame	Ring spinning	Twister
Machine status (run/stop)		•	•	•	•	•	•
Delivery speed (m/min)		•	•	•	•	•	•
Spindle speed						•	
Production (kg or m)		•	•	•	•	•	•
Automatic stops	sliver break out	•	•				
	sliver break in right		•				
	sliver break in left		•				
	doffing	•	•	•	•	•	

Available information

Depending on the type of machines, SᴘɪɴMᴀsᴛᴇʀ offers both tabular and graphical reports about the information as listed in the table below.

		Card	Draw-frame	Comber	Roving frame	Ring spinning	Twister	Winding Open end spinning
Real time information	Graphical plant overview (PʟᴀɴᴛVɪᴇw)	•	•	•	•	•	•	•
	Machine status (run/stop)	•	•	•	•	•	•	•
	Production (kg or m)	•	•	•	•	•	•	•
Stop information (by stop reason)	Number of stops	•	•	•	•	•	•	•
	Stop time	•	•	•	•	•	•	•
	Time/stop	•	•	•	•	•	•	•
Machine efficiency		•	•	•	•	•	•	•
Production efficiency		•	•	•	•	•	•	•
Efficiency alarms and warnings		•	•	•	•	•	•	•
Chronological events (stop cause map)		•	•	•	•	•	•	•
History reports (shift, day, week, month) (tabular, graphs, trend reports)		•	•	•	•	•	•	•

Spinning preparation and ring spinning
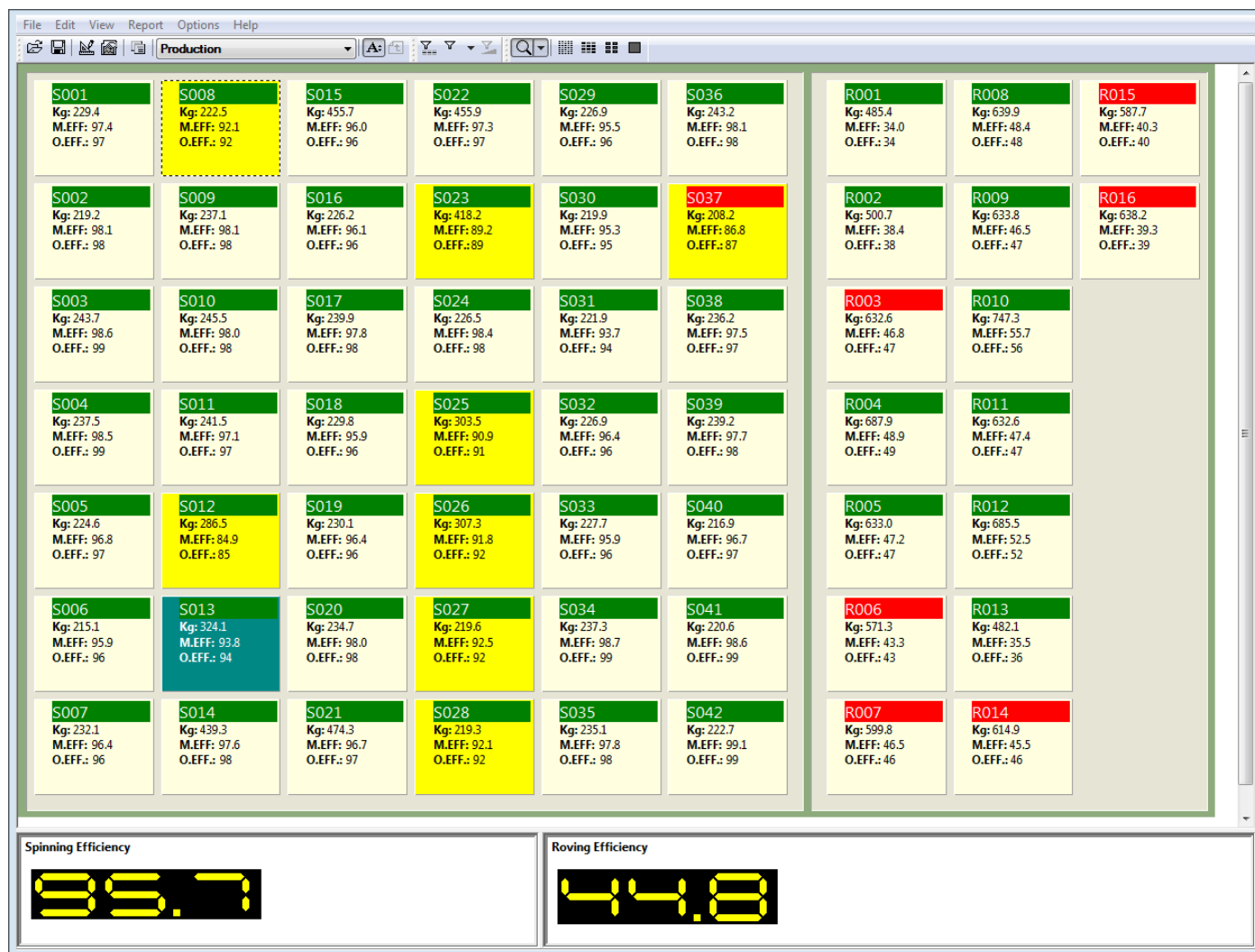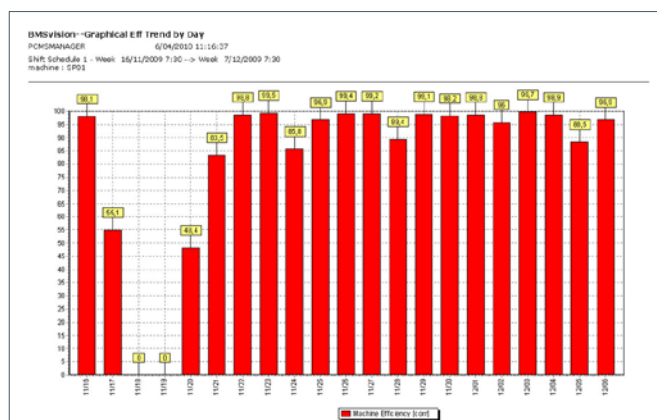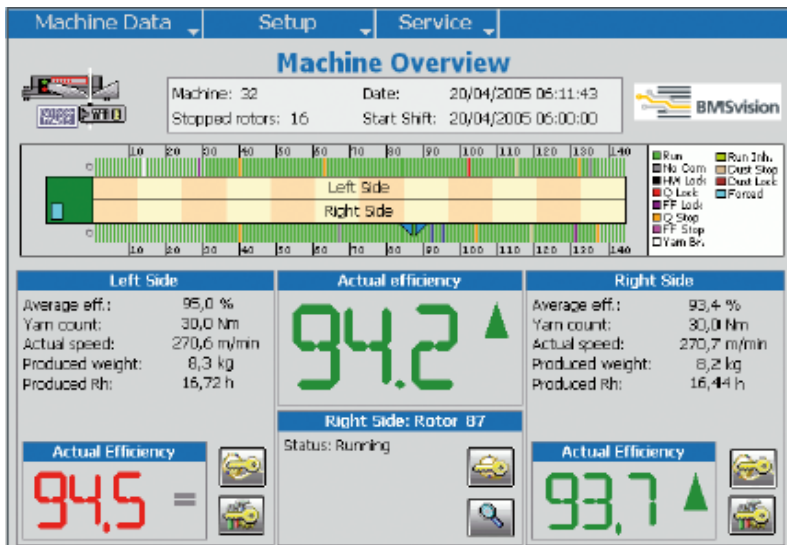
Machine monitoring

The Data Unit on the machine detects delivery speed and automatic stops such as doffing and hand stops. Additional information, such as manual stop declarations, operator log on/ off and other administrative data is entered via the Data Unit.

On the color coded layout of the mill, the frames are pictured in certain colors, each color indicating the current machine status. The user selects the type of information to be displayed: production data, speeds, stop rates, efficiencies, … User definable "filter sets" allow the user to display only these machines that correspond with a certain condition, for example all machines with an efficiency less than 90%, all machines waiting for an intervention, …

Every user, even without having any programming knowl- edge, can define his own calculations and reports both in tabular and graphic format by means of a built in report and formula generator.

OE spinning: OEMaster
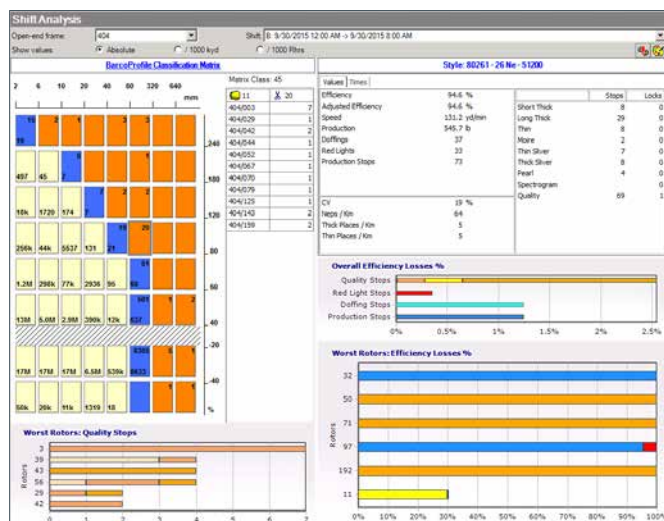
Production monitoring

OE machines require monitoring of the individual production points. From each rotor, the following information is of importance to the OE plant manager:

- Run time and stop time
- Number of yarn breakages
- Number of yarn clearer cuts
- Number of red lights and red light time
- Number of doffings and doffing time

OE machines equipped with Corolab or Loepfe 1N1 and 3N1 yarn clearers can be connected to OEMASTER without any hardware cost involved.

For machines with another clearer, OEMASTER offers a special interface, called 3x4K, which is installed between the machine information system and the yarn clearer system.

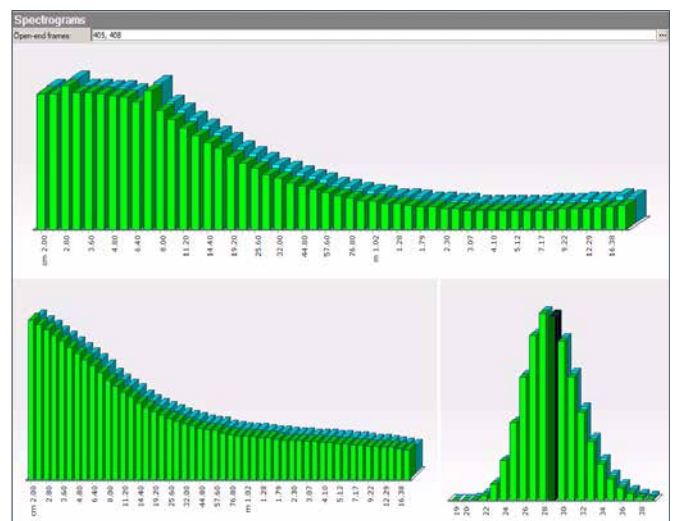▶ Spectrogram, CVL curve and histogram
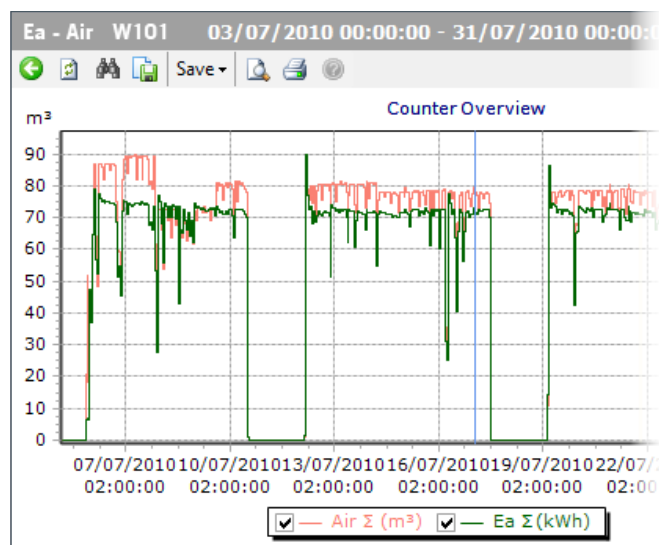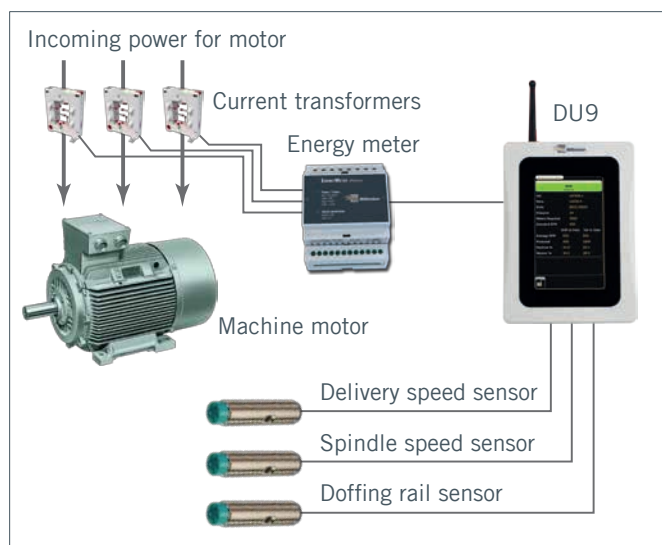▼ Shift overview report

Quality monitoring

Beside the production and stop information, OEMASTER also provides all quality related information, such as:

- Defect classification
- CV% analysis
- Spectrogram analysis
- Sliver alarms and locks
- IPI values and statistics
- Moiré and pearl defects
- CVL curves

Also the clearer settings can easily be up-and down loaded between the central system and the yarn clearer system on the machine.

For machines equipped with ABS foreign fiber or Loepfe 3N1 clearers, foreign fiber related information such as number of foreign fiber cuts per rotor and foreign fiber classification, are also available in OEMASTER.

Options

- Incoming power for motor
- Current transformers
- Energy meter
- DU9
- Machine motor
- Delivery speed sensor
- Spindle speed sensor
- Doffing rail sensor

▲ Trend of electricity and compressed air consumption for a selected machine

◀ Monitoring power consumption

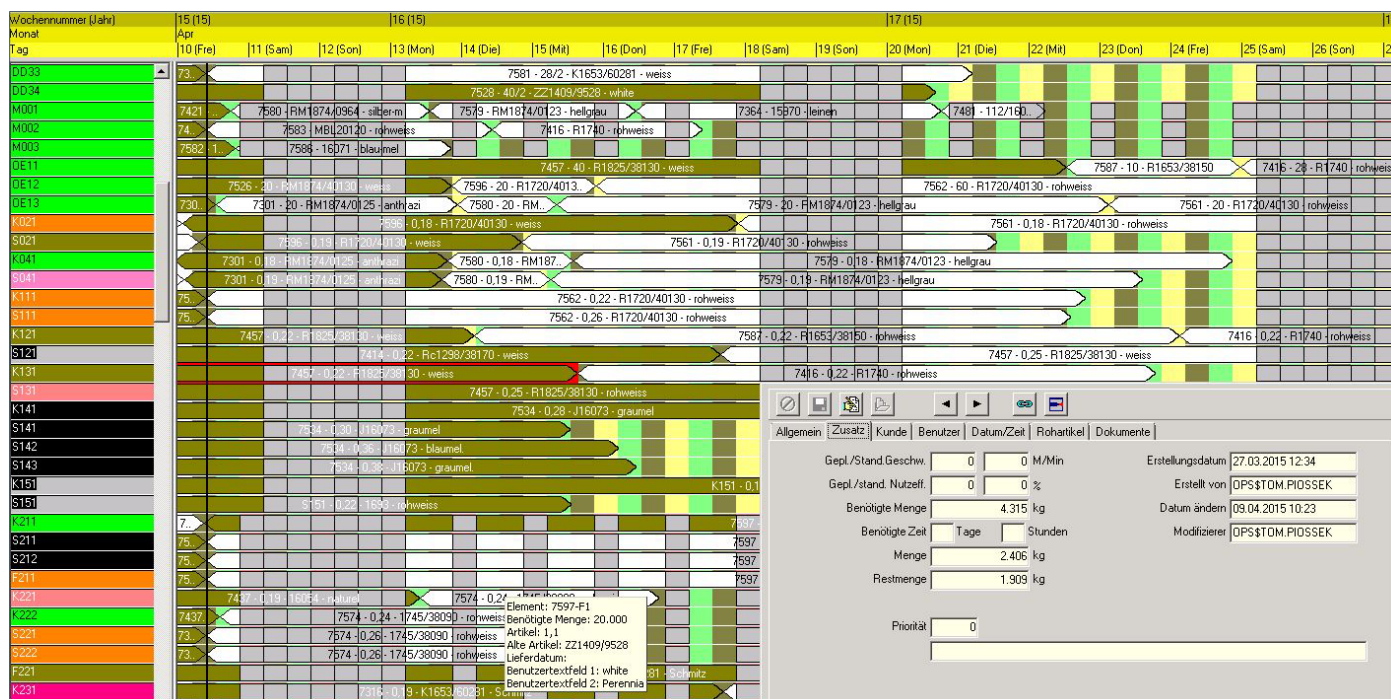## Energy monitoring

With the EnergyMaster module, the SpinMaster system is extended with a powerful tool to optimize the use of energy in the plant. Both power meters and compressed air sensors on the machines can be connected to the Data Units on the machines and consumption data is passed on to the server using the SpinMaster data collection network. Correlating the production data (kg of yarn produced) with energy consumption data allows the evaluation of the energy component in the overall production cost of the order or product.
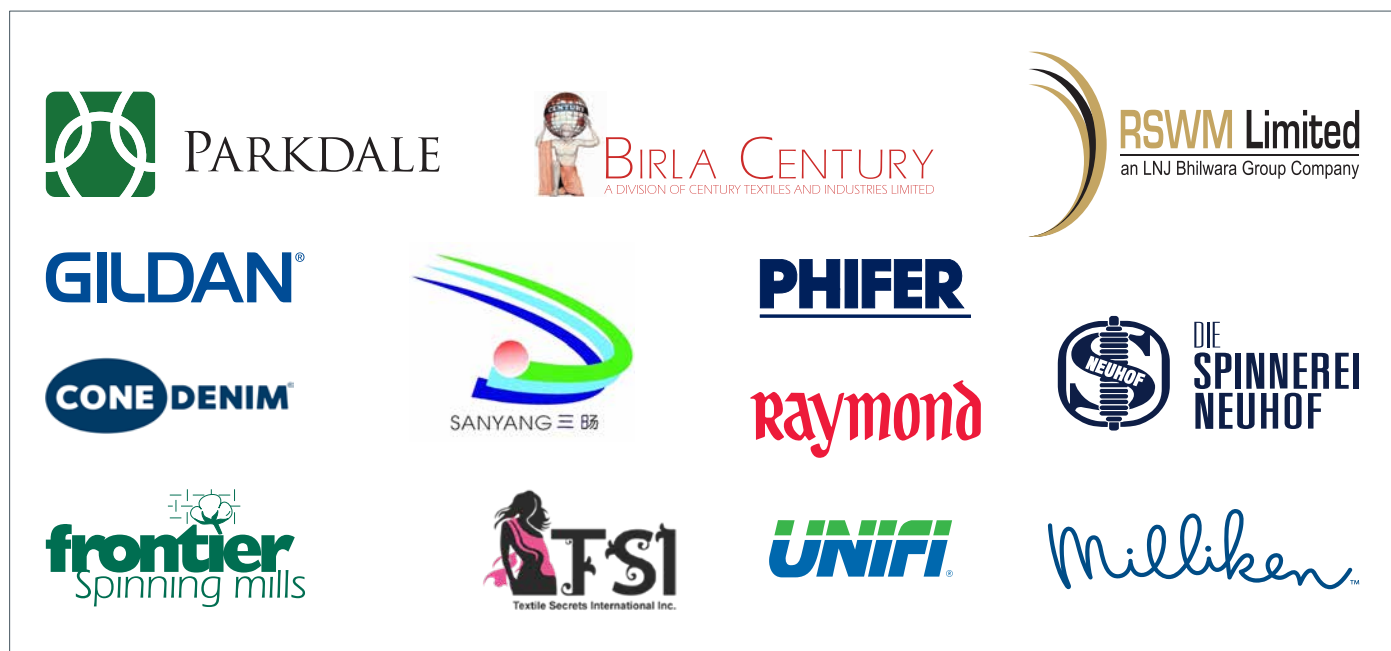
Production scheduling

The SpinMaster monitoring and reporting system can be extended with a module for real time production scheduling. Yarn lots to be produced are down loaded from the ERP system into the SpinMaster database. By means of simple "drag & drop" the planner assigns the production orders to the individual machines, using the electronic planboard.
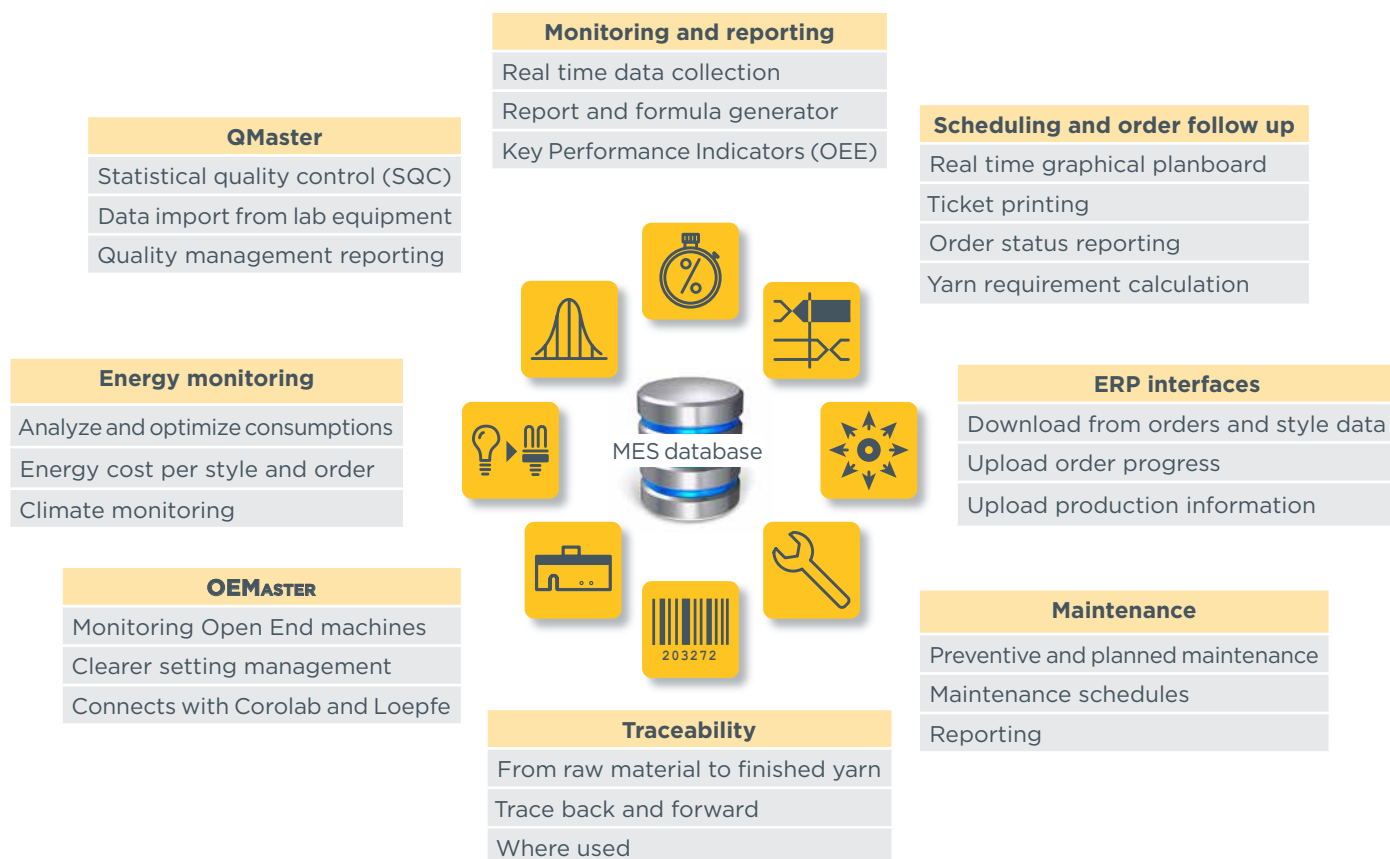
The Planboard is updated in real time according to the information passed on by the monitoring system. Jobs which are too late are automatically highlighted allowing the planner to take the necessary actions to get the situation back under control.

For more information, read the EnergyMaster brochures on our website.

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References

SpinMaster modular concept

Monitoring and reporting
Real time data collection
Report and formula generator
Key Performance Indicators (OEE)

QMaster
Statistical quality control (SQC)
Data import from lab equipment
Quality management reporting

Scheduling and order follow up
Real time graphical planboard
Ticket printing
Order status reporting
Yarn requirement calculation

Energy monitoring
Analyze and optimize consumptions
Energy cost per style and order
Climate monitoring

MES database

ERP interfaces
Download from orders and style data
Upload order progress
Upload production information

OEMaster
Monitoring Open End machines
Clearer setting management
Connects with Corolab and Loepfe

Maintenance
Preventive and planned maintenance
Maintenance schedules
Reporting

Traceability
From raw material to finished yarn
Trace back and forward
Where used

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