REVOLUTION IN PAPERMILL

News... News... News...

NOW, MORE THAN EVER BEFORE **HEAD AND SHOULDERS ABOVE THE OTHERS**...; AFTER 6 MONTHS OF TESTING, IS FINALLY AVAILABLE AND OPARATIVE, THE **NEW DCS** DRIVE MANAGEMENT WITH THE **CO.EL.ME.** MMI-SCADA, THE REVOLUTIONARY AND UNIQUE SYSTEM HAS REACHED OUTSTANDING PERFORMANCE AND ALSO INCLUDES OUR TELESERVICE IWSA

new DCS in papermill drive... SAEL

by: **Paolo Andrighetti SAEL s.r.l.**

Sael from more than three years was trying to give a push to renew the current supervision system to integrate it also in the ability to manage global facilities for paper mill machine supervisor, rewinder, calendar, cutter and dough preparation to dialogue together in a single platform stable and efficient. During the difficult past year, SAEL instead of using the state social support instruments given to companies for the sudden decline in the market, has invested all available personnel in this project, for some time kept in the drawer, and now at last completed, has already been applied in paper mill. We invested all the available man-hours in growing our systems to face once again direct comparison with the only European multinationals in the sector directly connected to the parent company to be able to manufacture advanced controls, impossible to achieve purchasing commercial products for they are made proprietary hardware and software. The investment made and tested for about six months in PKarton while rebuilding the drives of machine 2 (**which can now replace the previous existing paper mill versions)** was tackled after a very careful and long selection on different MMI-SCADA software available on the market. After a thorough and careful analysis of all the most famed market products also used by our direct competitors for the new system upgrade **"intelligent drive SAEL"**, we stated that with their use, and depending on the tested SCADA, many features that we had already built on our previous paper machine supervisor were to be missed. These characteristics that only the parent companies of multinationals offer (surely not the System Integrator, ie those companies that purchase products for trade and then manage them with a PLC and MMI of commerce), have always been our **technological strength in comparison** with others, and could not be lost just to use a commercial
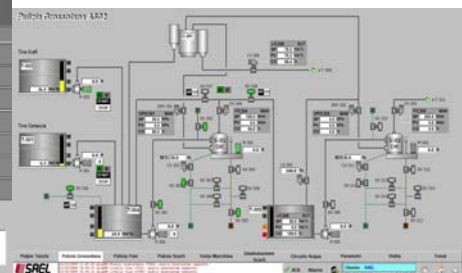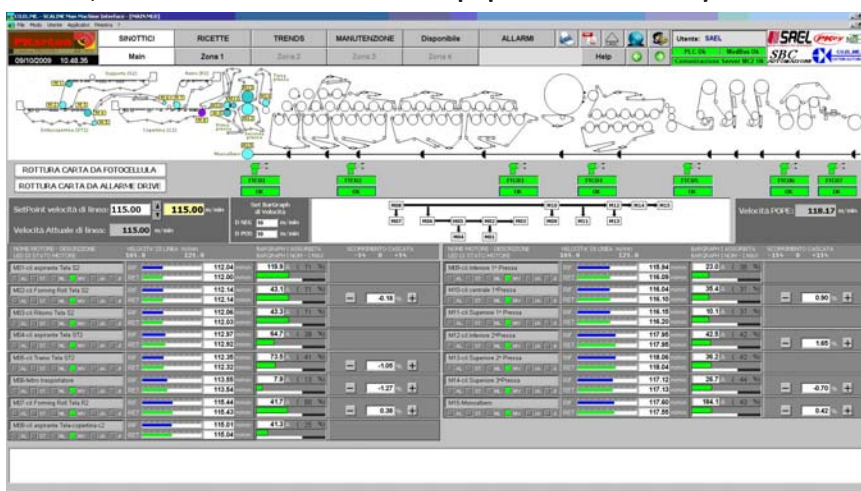
From today, the drives are integrated into a single software platform that manages the stock preparation, sectional control, rewinder, calander and cutter controlled by a single station with HMI-SCADA SCALINK

Plant TISSEN-Krupp plant, 27,000 I/O controlled by 18 operator stations

advertised product. We were therefore obliged to seek an MMI-SCADA system with the features of a DCS and the flexibility of a Typewriter. By choosing to SCALINK Co.el.me. Genoa, we have achieved sensational goals unthinkable until now. The high flexibility of the product handled and modified in its firmware in order to meet SAEL communication philosophy adopted for PLC and drive (which is impossible with other products), allowed us to make a high quality UPGRADE worthy of our tradition of constantly pushing innovation. The

first application was performed in PKarton last August, which agreed to test the new system in the reconstruction of the machine 2. With more than 7000 spent man-hours and, thanks to strong collaboration with Co.el.me. Genoa, producing SCADA, mainly used in the preparation of the dough runs out, in steel, shipbuilding and energy industry, it was possible to obtain a high performance product that has no boundaries in realization and future expandability. Just think of the application made to Duisburg in

Germany at the Thyssen-Krupp Steel AG, where the supervision of management of blast furnaces 1 and 2 (with an annual production of 9.7 million tons of pig iron) is actually from 2 control rooms with 18 operator stations connected to the network, managing a total of approximately 27,000 I/O. In this case the automation is based on ABB DCS systems INFI90 and Harmony. The loading of blast furnaces is performed by SCALINK redundant positions, managing from the coordination level to implementation and the communication with the upper level where the optimization models and the final accounting of consumption for administrative purposes are made. The strength of SCALINK lies in the modular structure of software that allows massive scalability (from simple applications with a few hundred I/O to the more complex ones) and an amazing flexibility in the implementation of application-specific functions. Are part of the package all the basic functions required of a SCADA system, such as alarms treatment and filtering, historical archiving, the creation of reports on event or scheduled and the different privileges

**View of Pkarton 2 machine, dryer area, coating and pope.**

Pulpits modifyed implementing the SAEL Digital Operator Pannel

user management. The data integration from any existing system is ensured by the presence of acquisition modules for the most popular industry standards such as OPC, Modbus master and slave (serial and TCP / IP), as well as automation modules optimized for the main starting Siemens (serial, MPI, PPI, Industrial Ethernet) and ABB (serial SCSI) to Klockner-Moeller. SCALINK is also born on an architecture client/server TCP/IP, which allows easy remote installation of the operator stations, allowing also to differentiate stations easy viewing from actual plant control stations. The work done in

PKarton involved the reconstruction of MC2 through the system now known REBORN in which he was engaged for the first time a CPU VIPA PLC Siemens S7 CPU in place of 315 (choice to give the possibility of having, through the 'use of lending Vipa CPU, a CPU that works as a replacement for the car 3 using a Siemens 319) el'Mmi\Scada SCALINK. The architecture used allowed us to work faster Ethernet platform in an important way every single communication. Through this platform and can integrate within our previous SCALINK any role in monitoring and supervision, communication drivers to the drives

and to all our HW, we have reached the maximum integration between systems. Within the new platform and then integrated hardware and software, we allowed ourselves to think "beyond" and we then allowed to venture in the implementation of functions and operations in addition to the previous version, operating directly from the station supervisor. The new functions implemented and now operational are:

- Programming of PLC and drives in a transparent way directly from the master machine

- Historicized-trends up to 45 days (extendable) of all motor variables divided into three different types of sampling time (1 second-5sec-15sec). Many new variables were included in motor trends such as drive I/O, alarm status permitting to analyze commands sent and motors behavior. The trend shows for each motor, directly without any other operation, all the variables (no research is needed of the tracks) and you can see up to three motor at a time selected by a simple drop-down menu.
- Paper-break photocell sensor: automatic storage of all motor
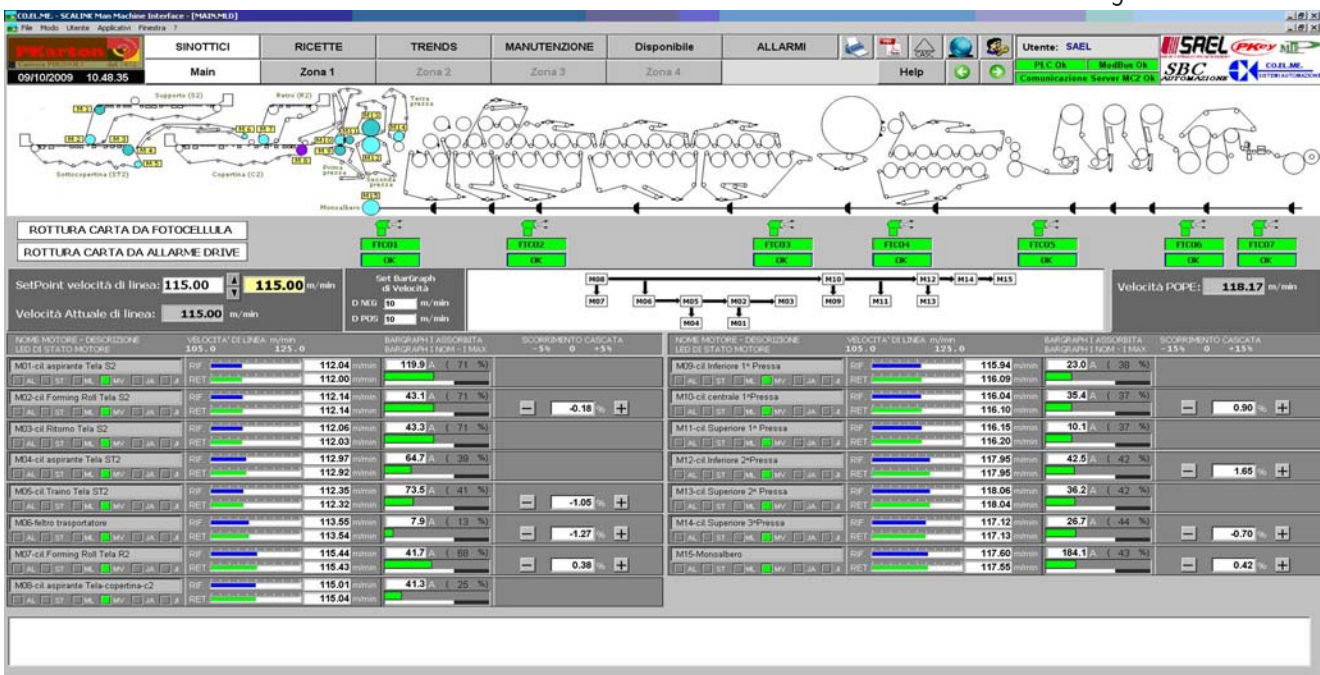
Home page of the supervisor in a single display that allows you to have control of all drives
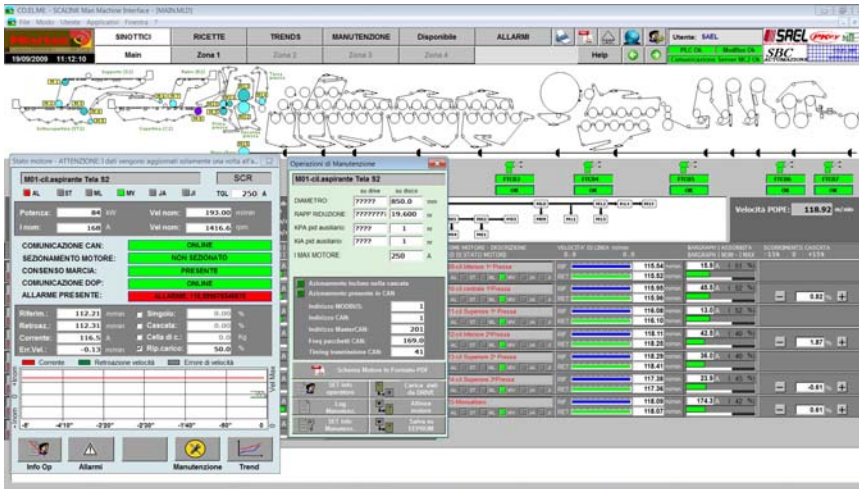
Through motor pop-up, motor maintenance and alignment, you can set and check the settings on each drive interaction in real time. Therefore it becomes simple and intuitive each calibration adjustment to be made on each motor to have everything under control.
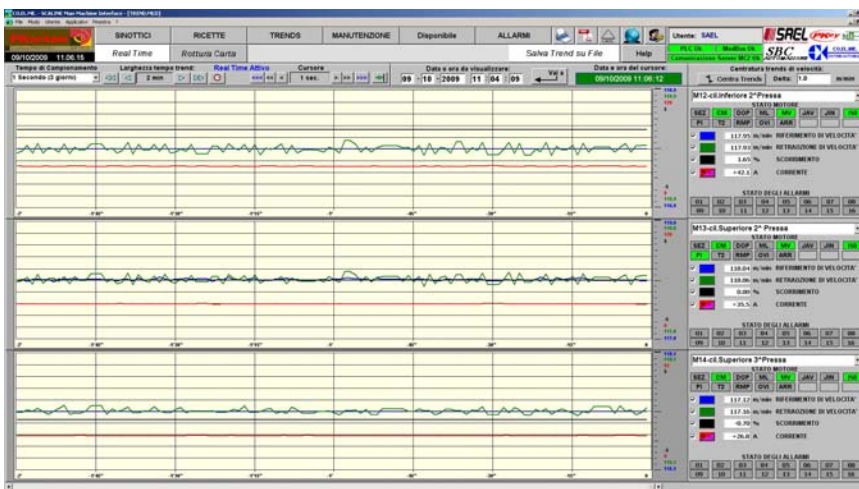
Motor trends, with no set-up and just by a mouse click, show recordings of up to three motors, each of which has all the salient variables recorded, you have the opportunity seek back up to 45 days every adjustment made by the plant operators , all the alarm log and drive controls generated by the PLC and sent to and from each drive.
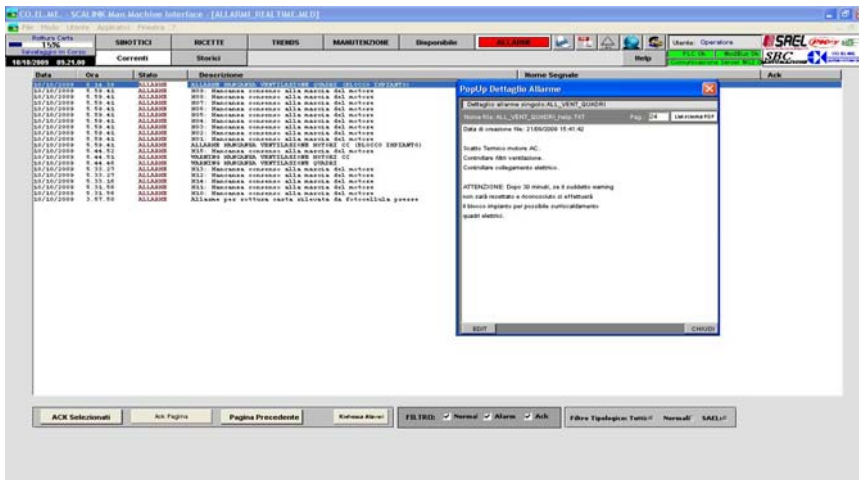
Editable Help on each alarm with possibility to record directly by the paper mill staff, comments on transactions so directing the less experienced staff to restart quickly the system after a common fault.

variables three minutes before and after the break is triggered by photocells on the drive. Data are stored on file carrying the name of the alarmed motor, date and time of the break.

- motor management POPUP: all the variables set point and highlights of selected motor control that can be set from here (parameters of diameter ratio, cell regulation, load sharing, etc.. etc.)

- Motor alignment POPUP: to allow very precise control initial start-up activities speeding them up.

- Motor maintenance POPUP: with display and set-up of drive motors and control variables.

- Advanced Diagnostics including Help file for each alarm directly editable by paper mill staff in order to have a report of electrical maintenance activities (separately described for each alarm) and make it extremely easy to resolve anomalies even by less experienced who in this way can stand-alone document.

- Electric diagrams automatic opening: with a click on the occurred alarm, the video opens on a page where the component in alarm function is shown, facilitating the maintenance personnel in electrical troubleshooting.

The opening of the supervisor to Windows operating system and to dialogue with any hardware today existing we will, if requested, integrate with any other system without major foreclosures; standard features included in the package SCALINK of OPC server and DDE server exchange data with existing DCS so integrating all of our application in existing paper mill computer system.

All work done in PKarton was done in two working weeks during which we installed a new control panel for the motor shaft with its connections to the motor, were recovered the old drive
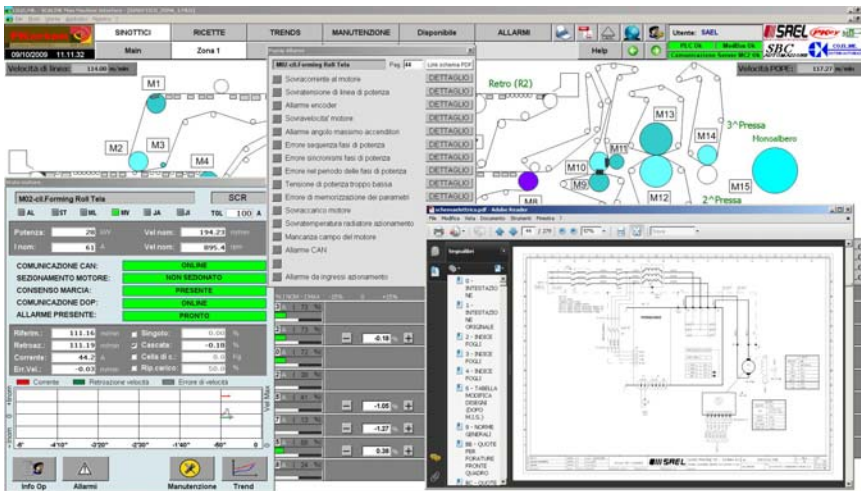
Clicking on the alarm the electric diagrams opens automatically at the point where the magnetic, proximity, contact, or encoder device intervened is drawn. It becomes extremely rapid troubleshooting by electricians with an indication of where to watch and pointed how to intervene in case of failure.
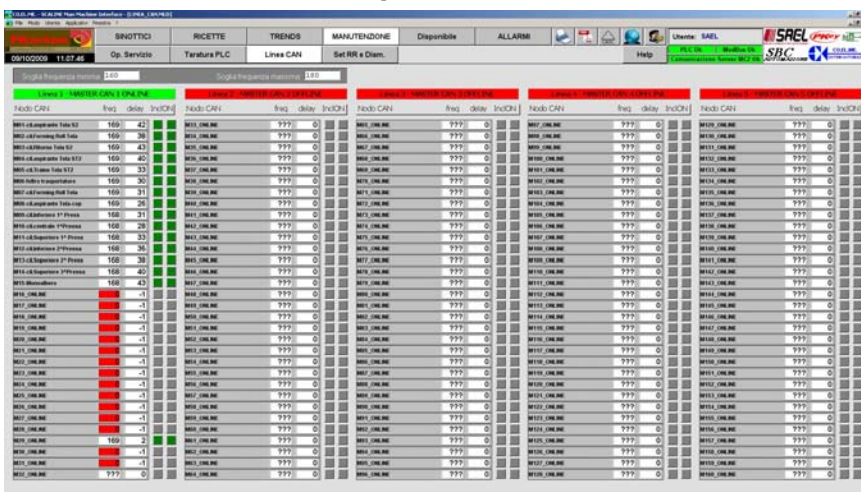
Rapid and direct drive display of each participant to the network with a pointer to the network of communication time and any delay in the talks, the control limits allow to understand immediately what, if any, drive is having trouble processing the network.

with REBORN and reconfigured existing machine PLC according to our latest standards to provide the paper mill the same method of operation of machine 3, made in 2008.

Based on our experience made over years, the work was fluid and the paper mill has faced a restart of the system without any major inconvenience. Just with the "performance" that emerged during the start-up, the "team" SAEL-PKEY-SBC-SCALINK convinced the management responsible and electro-instrumental department of PKarton, of the SCALINK power, it was

possible to create a base of joint management between the DCS INFI90 existing drives and CSF SAEL so that you can automatically manage the recipe setting in all the key process parameters, based on the speed of the MC and through the setups of rolls of paper for each section, going to the settings of flow valve weight and fan-pump ending to the dosages of chemical pumps and to the steam flow control.

The automation system will reduce to minimum the operations needed to control the machine (now operators have to deal with separate systems)

gaining points in efficiency optimizing the set-up management. This new control of the entire "System Paper Machine" in addition to integrating all into a single oversight thereby reducing costs, will carry out and implement management functions directly from the production. "REBORN" is the SAEL system to reuse an old existing control saving over 50% of costs. The aging of existing sectional controls, inherited in maintenance for our customers plants, has provided a strong push in the research & development for a solution to offer our customers in order to modernize the old drives equaling the operational reliability of modern controls. With the target to ensure this reliability, we have studied this control rack that replaces any marketplace drive (solutions already tested on all kind of drives) the old control board with our "intelligent drive" providing reuse of any part of existing power circuitry (SCR bridge, remote control switch, ballast and fuses). Our system, based on the "sectional control" digital drive is the first on the marketplace today without a MASTER cascade processor, in for machine intelligence is solely based on AC or DC drive CPUs. The system is receiving wide interest from all the technicians to whom it has been subjected, as it fully complies with all requirements related to the conduction of a modern paper mill, rewinder or calendar. It uses a references regulation diffusely processed by the AC or DC converters and controlled via a MULTIMASTER 1Mbit/sec high-speed CAN BUS network. This leads to a qualitative difference compared to other systems that normally choose SLAVE MASTER networks such as PROFIBUS where, being so many the participants in the network, communication speed decreases exponentially..