

WINDER DRIVES - SUPERVISOR - Technical Deepening

SOFTWARE ARCHITECTURE

The system is based on a multiple bunch of data built in modules. The graphic interface dynamically accesses to them in real-time.

The choice of the modules for the supervisor is accordingly settled with the customer on each specific job-line. This means a huge benefit in term of getting a common platform for all the applications fulfilling multiple needs: from the simple one, to the "cost effective", up to the most complex "high profile" - one to one to the DCS -.

Nevertheless this philosophy has another value selling implication: based on customer needs at a time every line can be upgraded in further steps eventually, maintaining the same system.

This allows a "tailor made" solution at the best cost.

Moreover the supervisor encloses several graphic pages with the plant zones on. This is a replacement of the typical mimics and/or syno control drives.

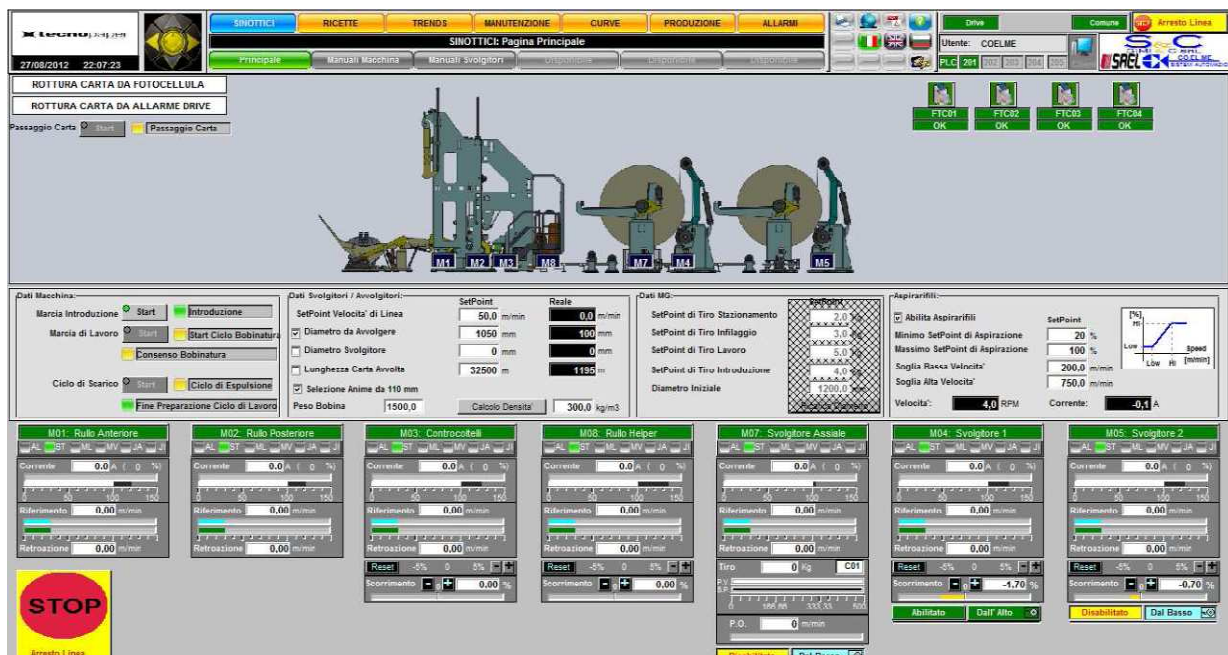
The pages are structured on hierarchy-functional base, having a basic page with ascending details.

The Graphic interface complete module is as following:

- Machine **Main Synoptic** (Pic. 1)
- **Machine Manual Synoptic Drive** Page/Pages (**Opt.** - Pic. 2)
- **Winders Group Manual Synoptic Drive** Page/Pages (Pic. 3)
- **Menu** Generation/Management Page/Pages (Pic. 4)
- **Real Trends and Coil Ready** Page/Pages (Pic. 5)
- **Historical Trends** Page/Pages (Pic. 6)
- **Maintenance** Page/Pages (Pic. 7-8-9-10)
- **Working Curves Display** Page/Pages (Pic. 11-12-13)
- **Coil Curves Display** Page/Pages (12)
- **Production Report** Page/Pages (Pic. 13)
- **Working Curves Display** Page/Pages (Pic. 11-12-13)
- **Current/Historical Alarms** Page/Pages (Pic. 14)
- **System Alarms** Page/Pages (Pic. 15)
- **Safety Alarms** Page/Pages (**Opt.** - Pic. 16)

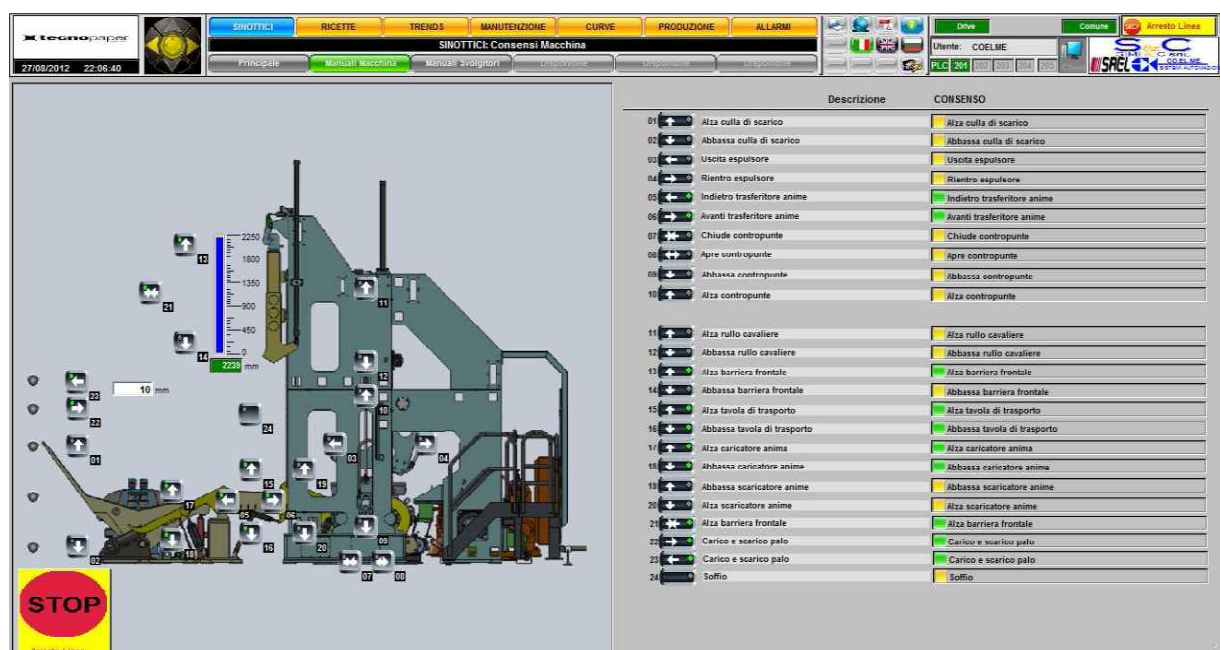
Following are the related pictures and short descriptions:

Pic. 1) MAIN SYNOPTIC



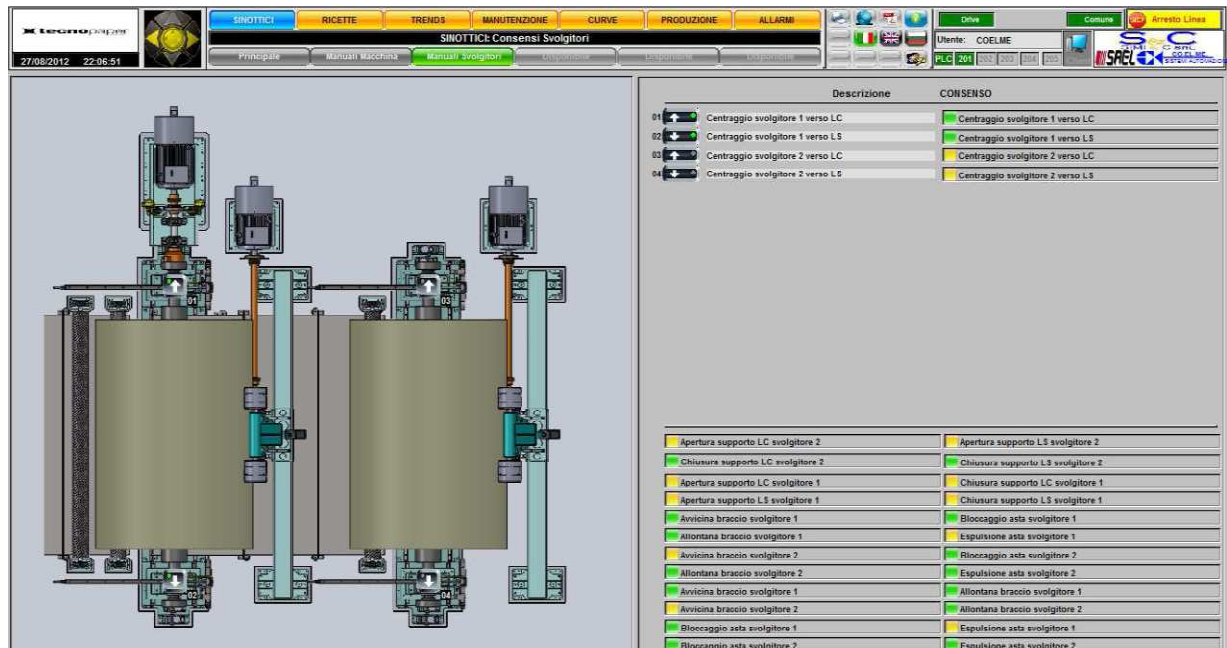
In the **Main Synoptic** are displayed all the AC/DC motors in the line. Each of them has proper values and data. Under password it is possible to modify all the set-points line. Moreover all the currents and the speeds are displayed, as much as the line speed, the pull, the real diameter coil - on winding and unwinding mode - (ref to the pic. above)

Pic. 2) MACHINE MANUAL SYNOPTIC DRIVE



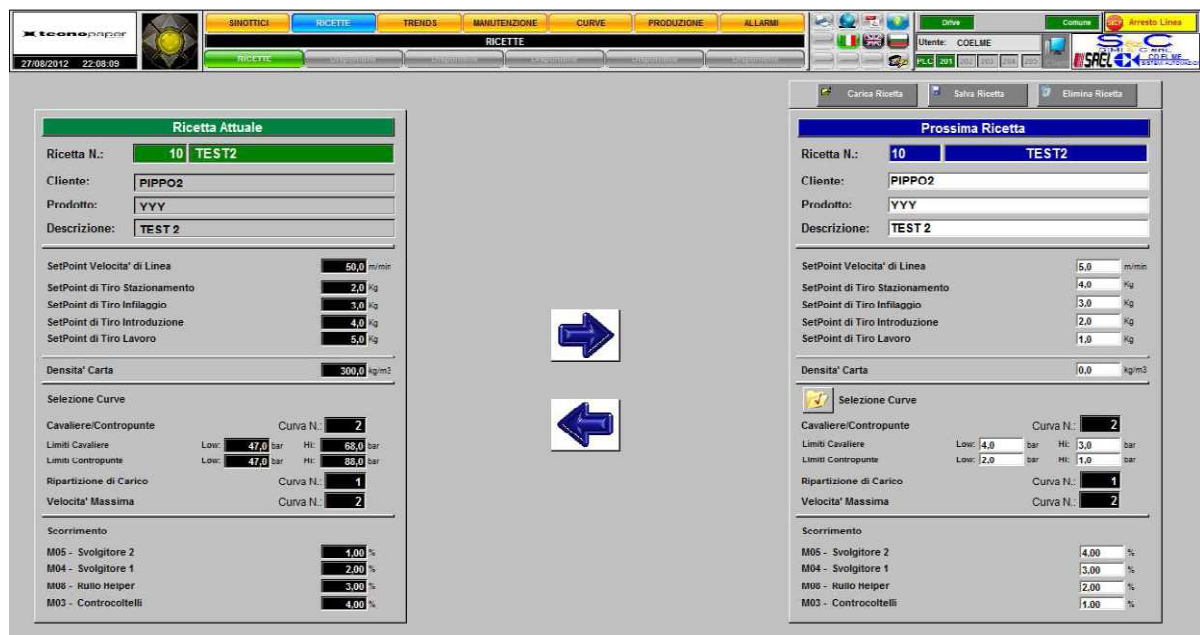
Those pages allow to manage the manual command on the machine: the commands are progressively numbered and it is possible to enable either to the right or to the left side of the section.

Pic .3) WINDERS GROUP MANUAL SYNOPTIC DRIVE



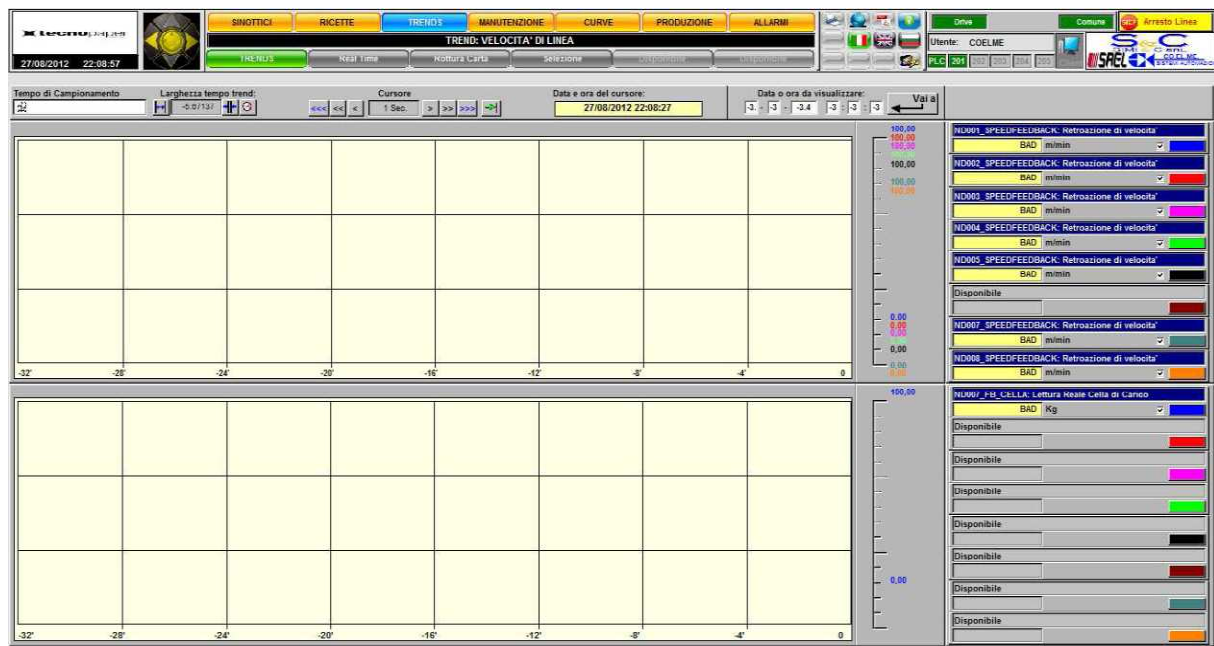
Those pages allow to enable the manual commands on board. All the functions are managed as mentioned above.

Pic .4) MENU GENERATION/MANAGEMENT



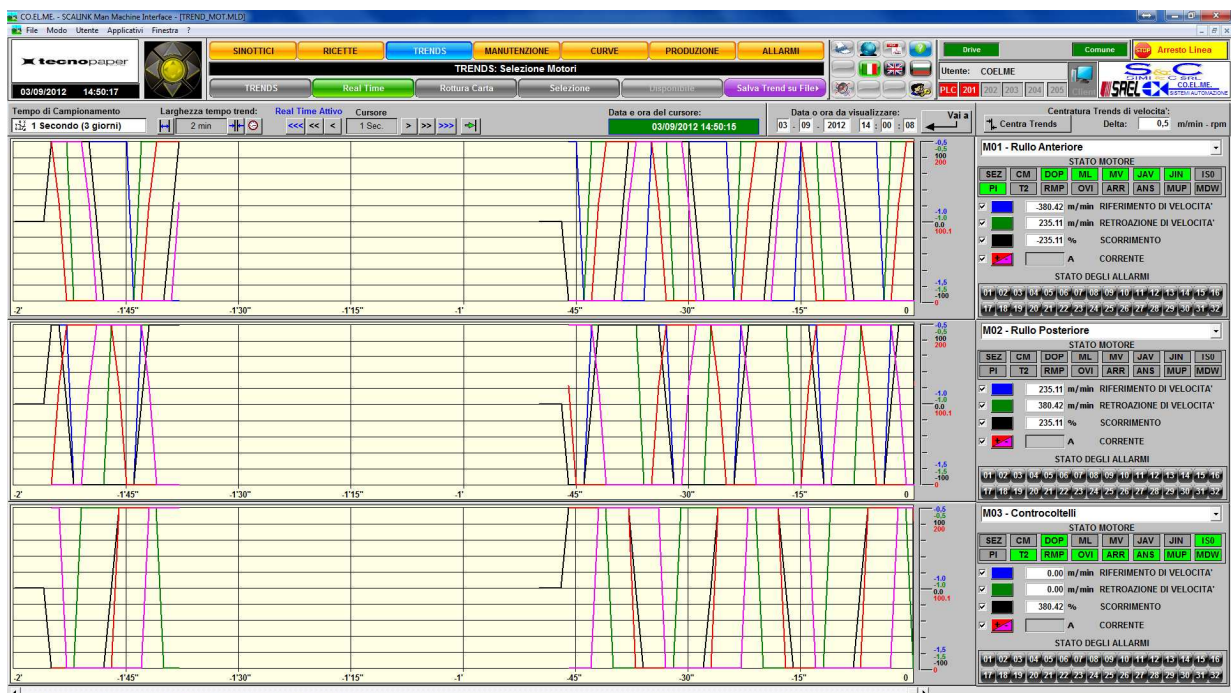
This page displays and sets the working curves as much as the set-points. The overall functions is named "Menu". It is possible the store the data into the hard disk, to load and cancel as well.

Pic. 5) REAL TRENDS AND COIL READY



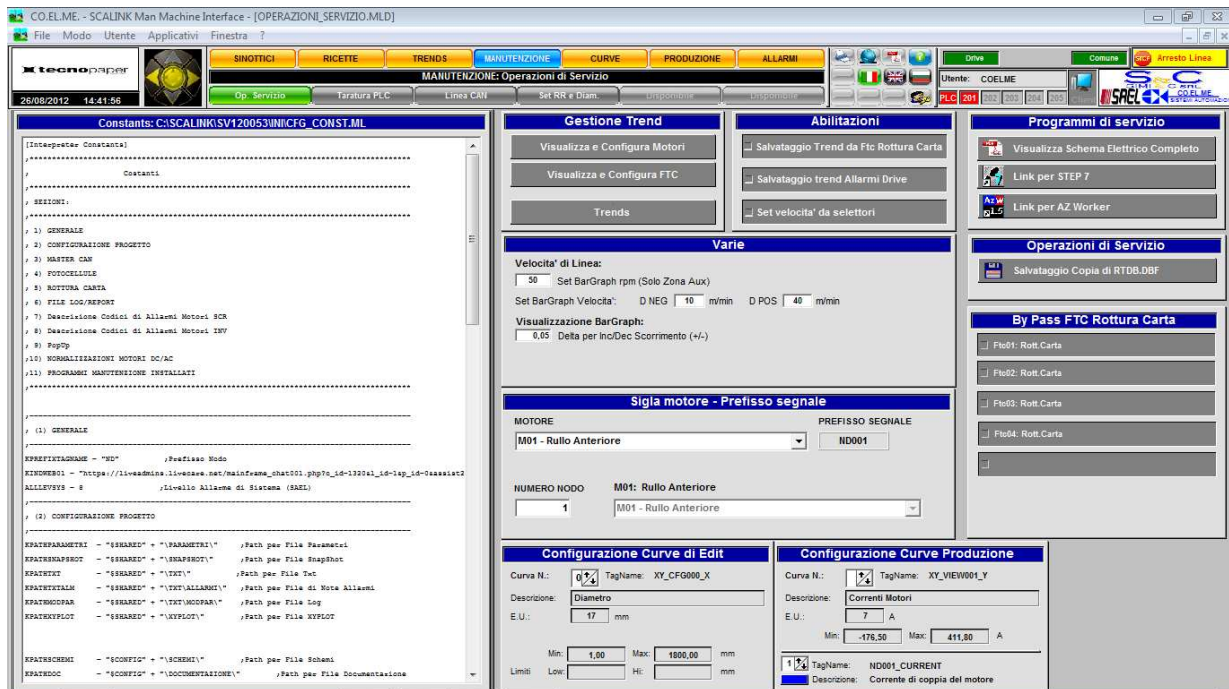
The page shows the trends. It means the curves with the stored values: Here are a bunch of main values displayed. It is not possible to add or remove curves.

Pic .6) HISTORICAL TRENDS



This page shows the historical trends: Three motors or two motors and one load cell - available on the centre trend only -. The motors or the motors + load cell is made via three catalogues.

Pic. 7) MAINTENANCE PAGES: DUTY OPERATIONS



Operations must be handled by skilled operators only. In this page are settled the supervisor main parameters. As long as it is a "one shot" job, some modifications required are not "on line". Due that a supervisor restart is necessary.

Pic .8) MAINTENANCE PAGES: PARAMETERS AND PLC SETTINGS

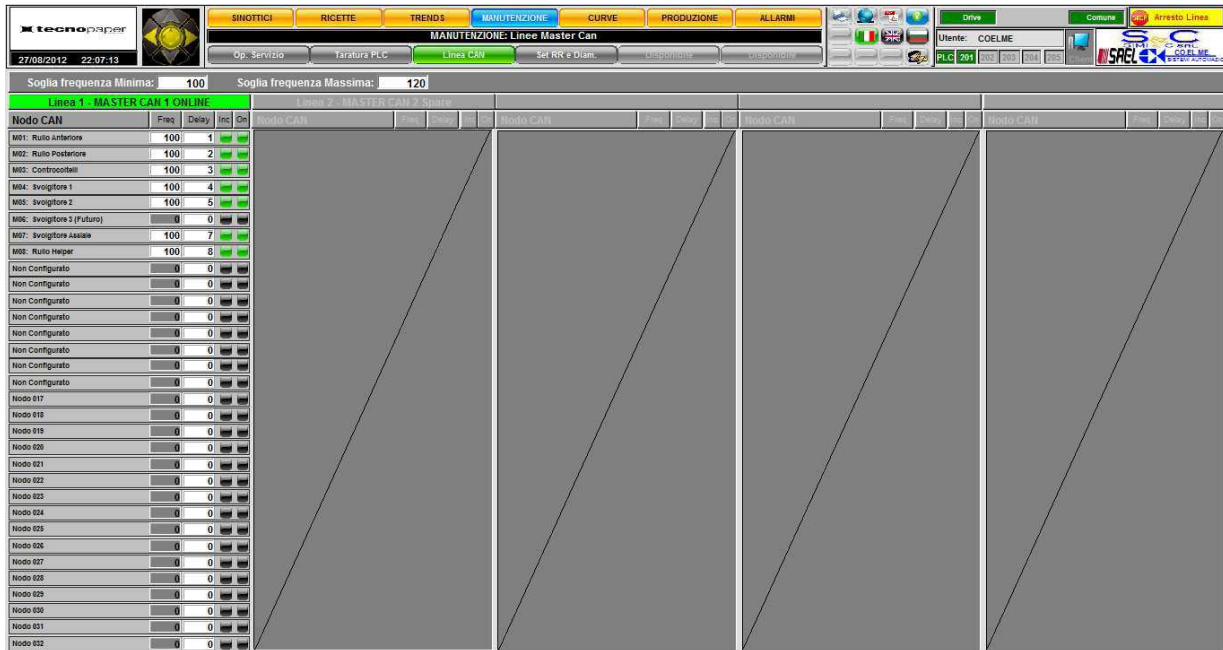
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Operations must be handled by skilled operators only. In this page manages the PLC parameters and handles the information exchange with the supervisor.

Pic. 9) MAINTENANCE PAGES: CAN-BUS COMMUNICATION LINES MANAGEMENT



This is the page for the CAN-Bus lines analysis. All the lines used to the speed ref as much as the data exchange. There is a maximum of 5 CAN lines with a maximum of 32 nodes each.

Mode "ON" shows the ON LINE / OFF LINE node. In case of non included node this cannot be ON LINE. Vice versa, in case of "OFF LINE", there is a node fault.

Pic. 10) MAINTENANCE PAGES: REDUCTION RATIO SET AND DIAMETER



Operations must be handled by skilled operators only. It is possible to display and set the motor gearboxes and the cylinder diameter Reduction Ratio .

Pic. 11) WORKING CURVES DISPLAY



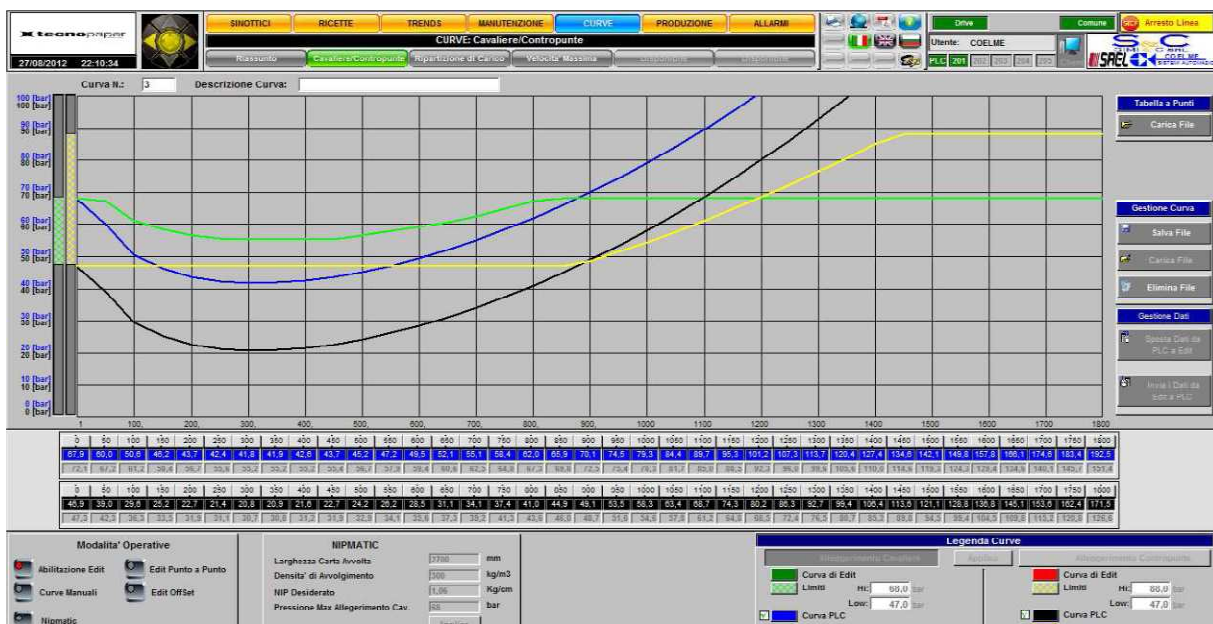
From this page it is possible to follow up the production: here are the PLC set-pint curves and the limits applications.

The set-pint curves are four. These are prepared as below:

- Rider Roll and Tail Stock lightening
- Load Distribution
- Maximum Speed

During the working process a vertical bar proportionally moves to the diameter. In the upper left angle there are all the actual vs. settled values.

Pic. 12) RIDER ROLL and TAIL STOCK CURVES



It is possible the curve editing related to the diameter.

For each curve there are three tracks: to the top "the curve nr." - with a storable/loadable description -. To the bottom the different modes.

Pic. 13) PRODUCTION REPORT



The page allows to get displayed two production report at the same time - stored during the production, of course -.

To select the production record from its own folder, highlight the file and click on "OPEN"

The reports enclose all the different data and the buttons allow the selection of the carves between:

- Motor Current
- Production Diameters
- Speed
- Pressures
- Unwinder Pull
- Correnti motori

It is possible to get a cursor - vertical black line -: In this case the curve values are be displayed beside the measurement description.

Pic. 14) CURRENT/HISTORICAL ALARMS



The "Current Alarms" and the "Historical Alarms" pages provide the following areas:

- HEAD - See the General Architecture chapter -.

- ACKNOWLEDGMENT and FILTERS
- ALARM DISPLAY

The following list shows the "Current Alarms" events:

- Active Alarms - not acknowledged yet
- Active Alarms - acknowledged
- Alarm Back not acknowledged yet

In case an event does not fit the condition above it is automatically deleted: when the active acknowledged alarm backs it is deleted.

The "Historical Alarm" is a file with the daily events list. It is possible to set the length - nr. of days - as much as the maximum dimension.

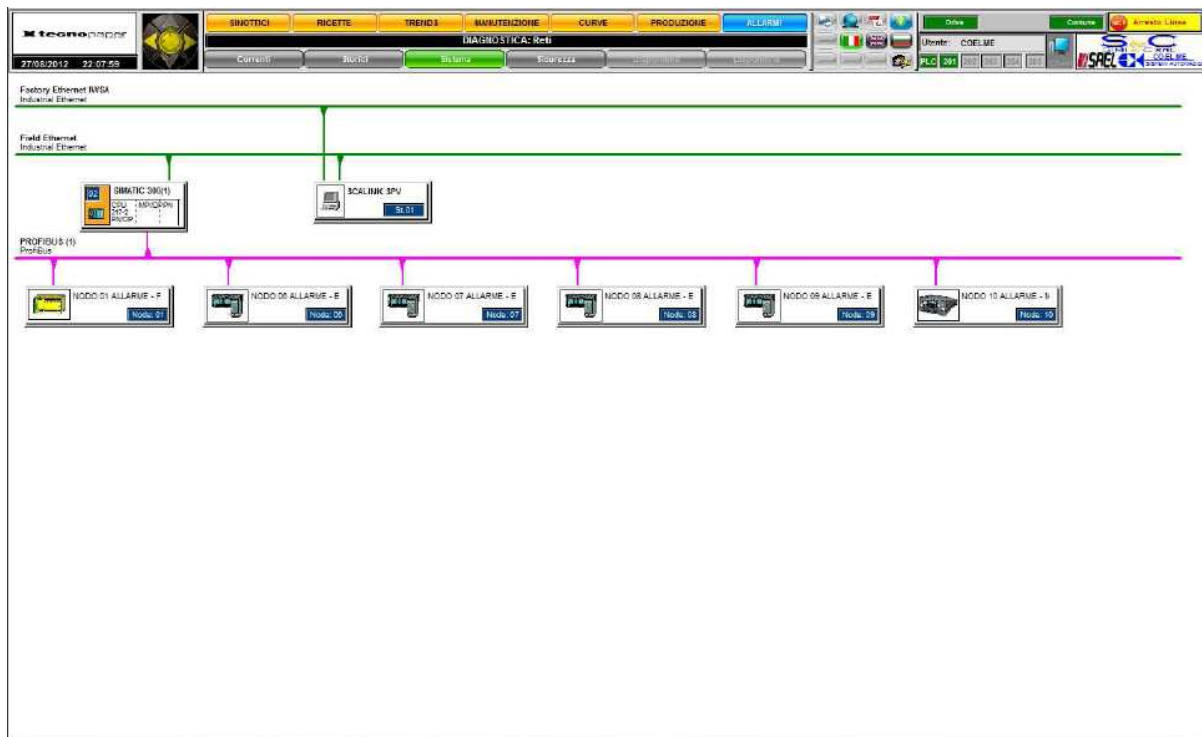
All the transactions and the acknowledged alarms are stored.

By double clicking an alarm row you access the alarm details popup - ref to the Popup chapter -.

Hereafter the main enabling functions:

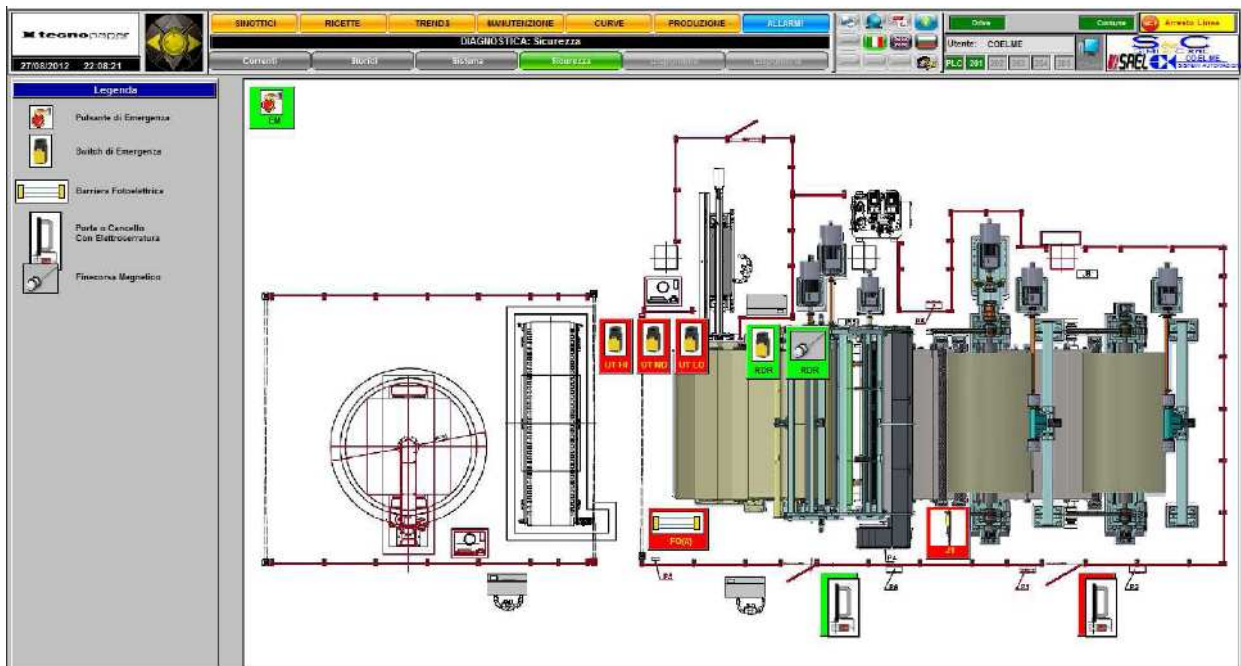
- Comments to the Alarms
- Electrical Diagrams link
- Movie link

Pic. 15) SYSTEM ALARMS



Display page only. It shows the network state linked to the PLC and the PC.

Pic. 16) SAFETY ALARMS



Display page only. It shows the safety devices to the operators
To the left all the symbols used

N.B.

On all the pages mentioned above there are common functions available through a repetitive head to the upper part of the page.

All the functions accessible are:

1. Data and local time
2. Logos and Brands
3. Navigation compass - to scroll and move within the supervisor pages by the arrows -
4. Navigation Bar - to scroll and move within the supervisor pages by the buttons -
5. Page title - descriptive to each page
6. Common function buttons - as "win" mode; "Print"; "IWSA Web access"; "Help"; "Pdf manual and diagrams"; ""dynamic" language exchange; operator log in -
7. Current user - With different administrator steps -
8. Alarm and Diagnostic area - Real-time / Historical alarm analysis; Comments; Selectable and custom audio POPUP; etc. -
9. Dynamic POPUP for Help message; Alarms: Motors data; Maintenance tables; ect. - Those are automatic and non automatic: it means it is possible to pre-set and link to a specific "object" recall -

Other Optional Functions:

Licencing S7 and MPI/ETHERNET converter it is possible to run on-line PLC modifications via the PC supervisor. It will be a "work station" like. The system - which is based on a company internet networking node - can be maintained or modified by a SAEL technicians wherever he is: from SAEL factory up to the customer site.

On a real-time base it is possible to get any data, to run any diagnosis as much as solve problems eventually got.

