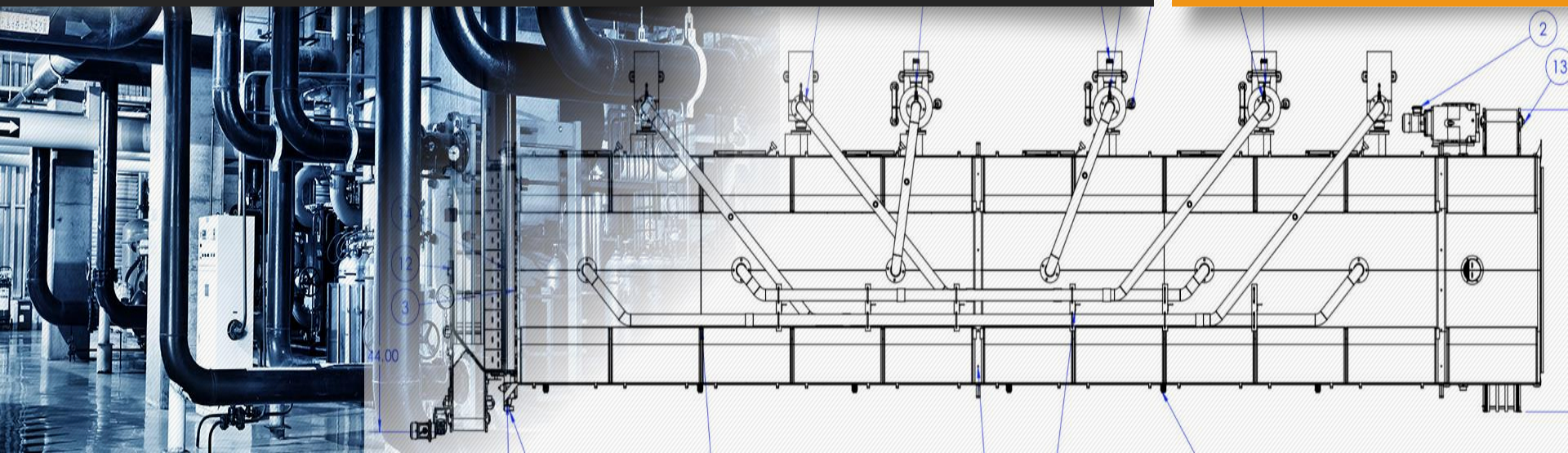# Tunnel Pasteurizer

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Tunnel Pasteurizer

Conversion of hardware and control software for all common types of Tunnel Pasteurizers.

When the control hardware is changed, a focus must also be placed on the software. Optimized software with Intelligent control contributes to improving and stabilizing product quality.
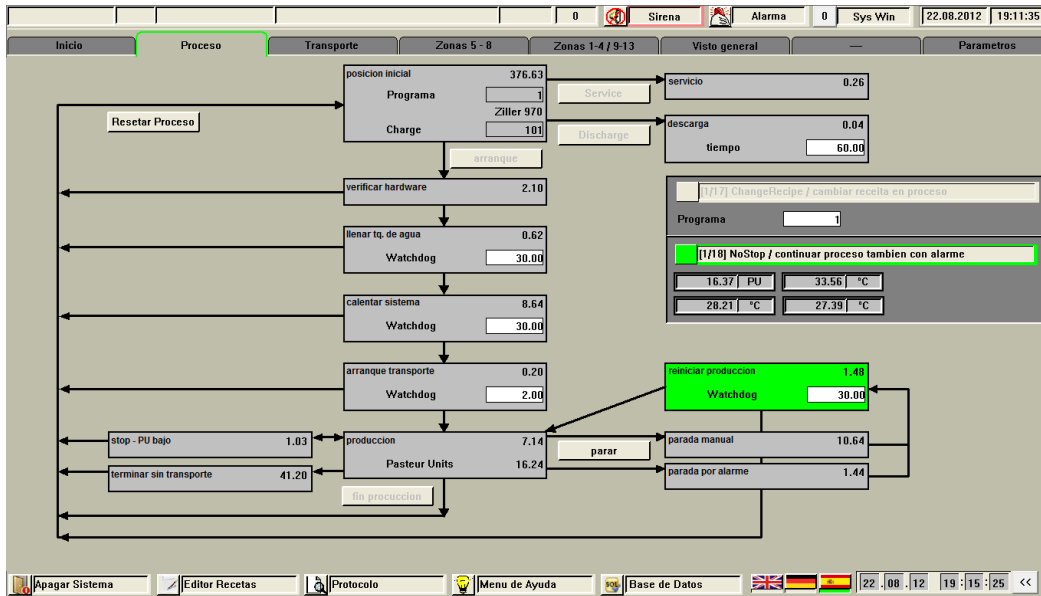
The system can be **implement in all existing types of systems** of automation and replace these completely.

It can also be done **"Upgrades" of obsolete systems** to modernize them with a modern control and new hardware

The System uses drivers and equipment compatible with **Simatic S7**
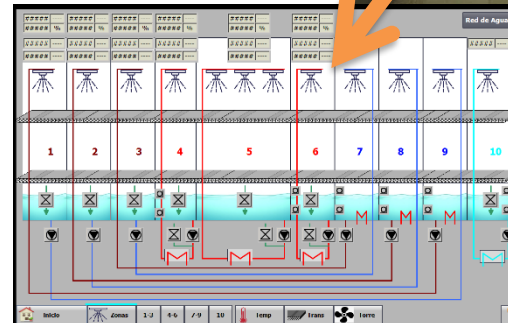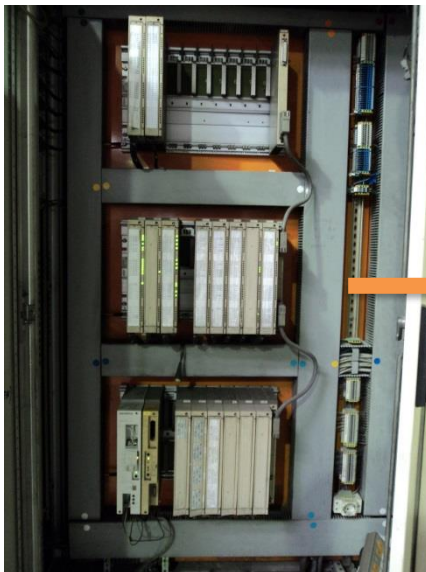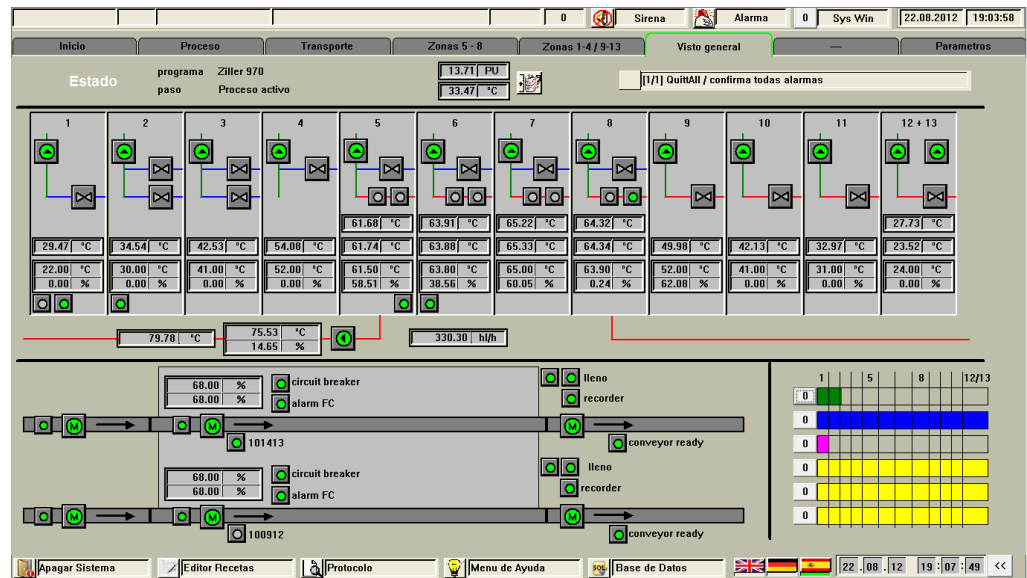
Management and Visualization (HMI)

Simple and clear operation, the visualization system gives the operator a friendly and easy-to-use operating interface for controlling and monitoring product pasteurization.

- reduce training time for new staff

The system also incorporates **detailed views** for experienced operators.

- optimizations and maintenance

Difficulties of tunnel pasteurization control

The tunnel pasteurization process is a highly complex process and requires sophisticated control to obtain optimal results. What makes tunnel pasteurization especially complex, among others, are the following points:

1. **Only one transport for all bottles**
2. **Only one temperature within a zone**

Example

Bottle X, the latest zone 3 bottle at 40°C
Bottle Y, the first zone 4 bottle with 50 °C
10 Minute Accumulation
So the temperature after 10 Minutes is 40°C for bottle X and 50°C for bottle Y.

After Transport Accumulation, when the process continues, bottle X and bottle Y are in the same zone, side by side with a temperature difference of 10°C

The pasteurization control has to control the process in such a way that neither bottle X nor bottle Y will be outside their UP limits.

A common control, through a simple temperature control, cannot solve these difficulties. An advanced system is required to calculate and control Pasteur Units continuously and intelligently.

Intelligent Control of Pasteur Units
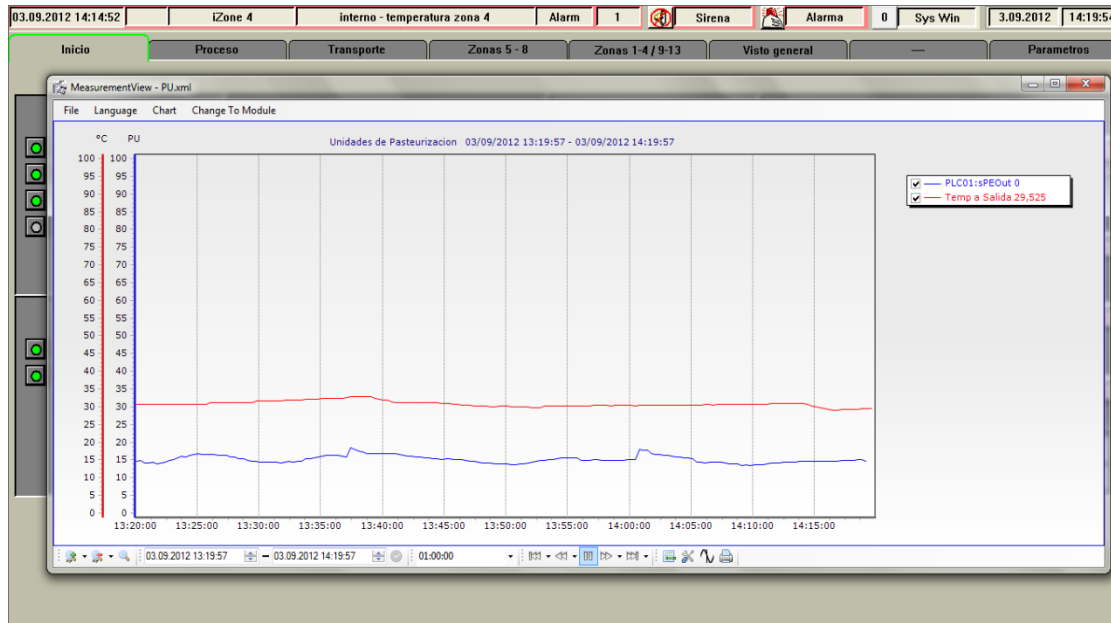
The complex "Fuzzy Logic" control, which also incorporates the UP, temperature, speed and current position of the bottles into the calculation, means that the product results remain within the tolerance limits even when there are alarms and interruptions of production. production (jam at the outlet, problems in the steam supply, …)

The system reacts intelligently to process variables:

- **Continuous temperature and PU calculation**for each bottle inside the Pasteurizer
- **Automatic temperature adjustment**of the zones to avoid process fluctuations
- **Intelligent Stop/Start of transport** to avoid Unpasteurized product

This way you get the following advantages:

- **Better UP stability**
- **Intelligent reaction when there are arrests**, avoiding PU fluctuations
- **Better PU control.**The system prevents under-pasteurized product from coming out, and if under-pasteurized product comes out, it notifies the operators.

Intelligent Control of Pasteur Units

In addition to the control of the Pasteur Units, our control system also incorporates the following features:

Lack of power (power outage)

If the power returns, we execute the following routines:

1. Measure time without power

2. Mathematical process synchronization:temperature and pasteurization units

3. Physical synchronization:circulation with water for a minimum time to ensure the bottle temperature

This way you can calculate the Pasteur units of the bottles that increased during the stoppage and avoid product lost due to ignorance of the Pasteur units.

Lower temperature during stops

When there are accumulations at the outlet of the pasteurizer and the process stops, the temperature is lowered gradually, always taking into account the UP limits of the bottles for each Zone.

This can reduce restart time during short stops and also save energy.

Flexible parameterization

- can be entered **several formulas for calculating the UP** (Pasteur Units). Each of the drinks has its own calculation formula (Beer, Juice,...).
- can be entered **Characteristics and properties for different types of bottles** and cans

- Later in the recipe you can make it **reference to the calculation formula** and the corresponding bottle type.
- With each recipe adjustment, the operator **you can immediately see the expected results** (Pasteur units, the maximum temperature in the bottle,…).
- Parameters and recipe are saved **in the PLC**. Thus it is possible to operate the system without the computer turned on (only with the touch screen).
- can be entered **new types of bottles** and recipes by the operator. **Without the need for a programmer**

Registration of virtual reference bottles

Several reference bottles in the pasteurizer can be recorded and displayed graphically. In the trend curves you can see the position of the bottle, the temperature curve and the Pasteur units. These values can then be compared to values from a reference bottle measurement to:
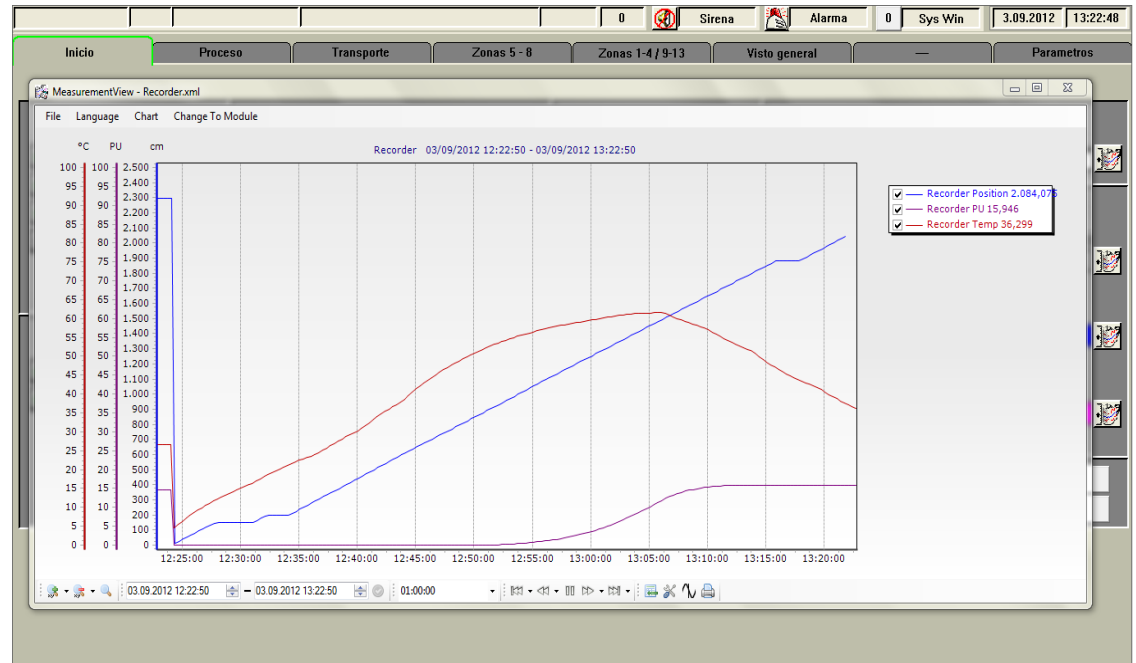
- **Check the correct operation of the pasteurizer**. A too high difference between the reference bottle values and the trend may be the result of a PT100 (Temperature sensor), which is in a faulty state.
- **Check bottle characteristics**. If the bottle supplier is changed, it is possible that characteristics such as the thickness of the bottle glass may be changed, for example, this would be reflected in inaccurate technological values of the pasteurizer.
- **Optimize the process**
- Under normal circumstances you can reach a **accuracy up to +/-1UP** of the calculation with respect to a real reference bottle.
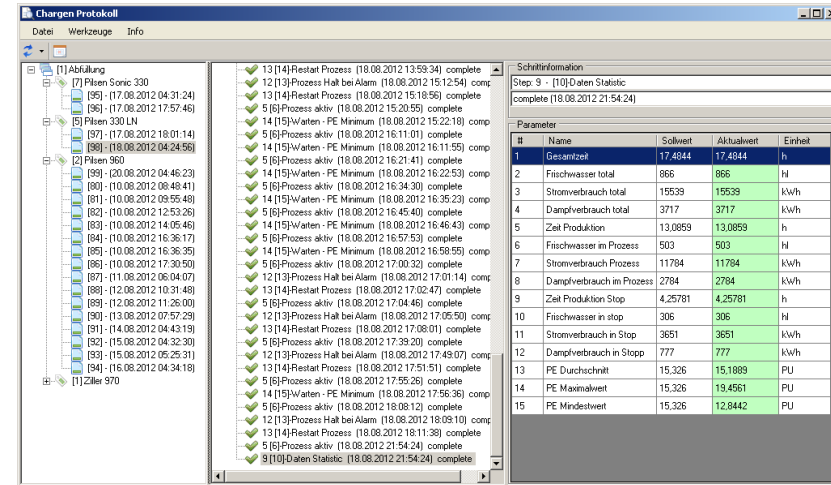
Registration System

The registry system uses the "BatchXpert" system, which provides data security on up to 8 parallel servers. Data logging is designed to not lose data even when the computers are not working (the PLC continues logging until its memory is full).

Production detail

Each step of the process is recorded, the process data and statistical data such as:
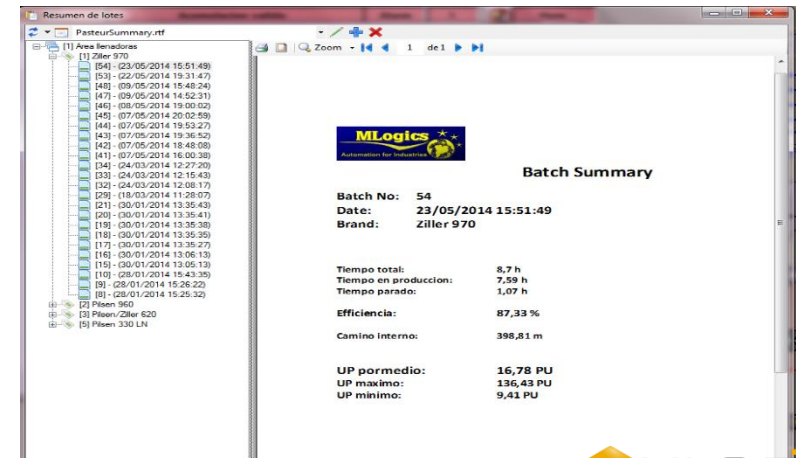
- Time
- * Water consumption
- * Steam Consumption
- * Energy consumption

(*If the corresponding measurement is installed)

Production Summary

At the end of production, a complete report with statistical values is generated.

- Total time
- Time in production
- Average value of Pasteur units
- Minimum value of Pasteur units
- Maximum value of Pasteur units
- ....

Registration System

Manual Interventions

The registration system also provides the possibility of recording all manual works and interventions that were carried out during the process.

- start
- Reset
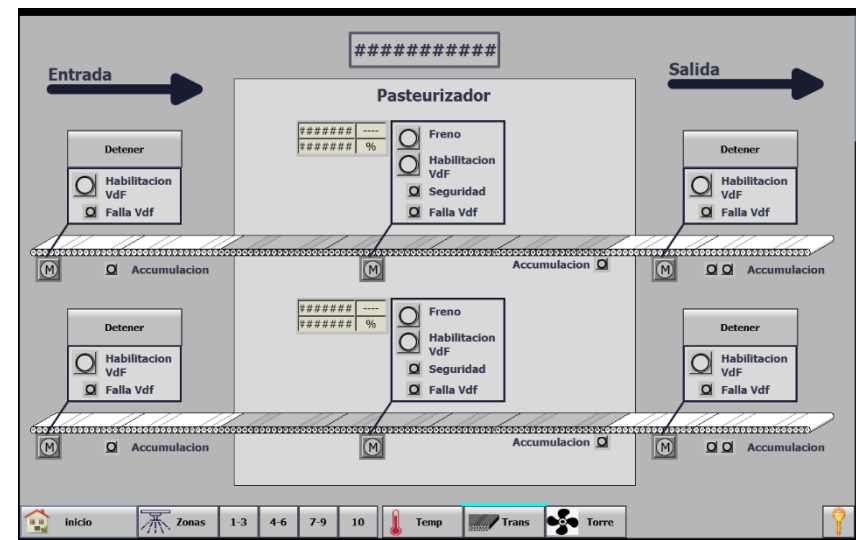- Manual valve openings
- Bombs
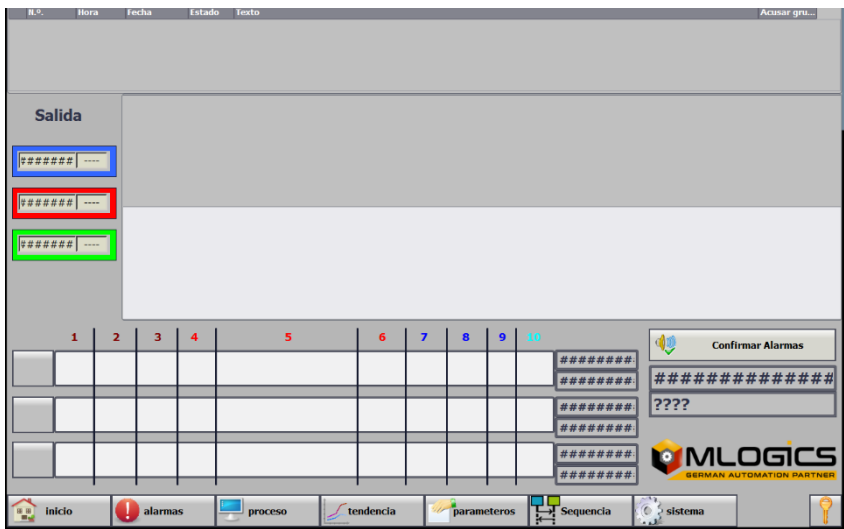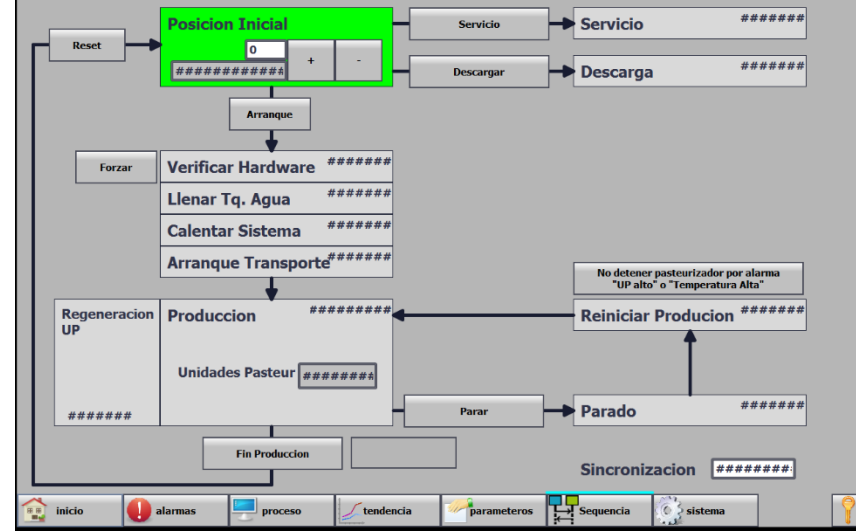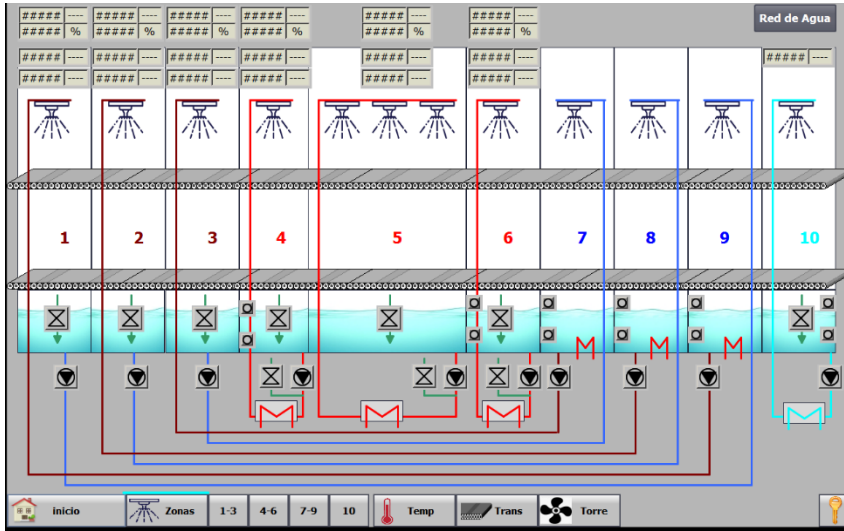- Control by external buttons
- …

Trends

The system records all analog sensors and values derived from these in trends
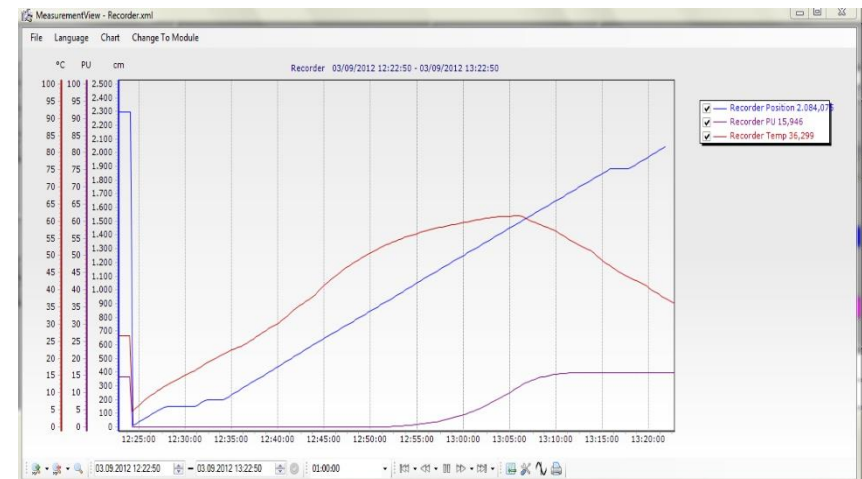
Touch screen

Standardized with clear and intuitive interface

System references

South America

- **Munich Brewery**, Asuncion, Paraguay:
"Krones" bottle tunnel pasteurizer reautomated from Siemens S5 to Simatic S7

- **Munich Brewery**, Asuncion, Paraguay:
"Krones" can tunnel pasteurizer reautomated from Siemens S5 to Simatic S7

- **Munich Brewery**, Asuncion, Paraguay:
Bottle Tunnel Pasteurizer from Ortman & Herbst" reautomated from Siemens S200 to Simatic S7

- **FNC Brewery**, Montevideo, Uruguay:
"Sander Hansen" bottle tunnel pasteurizer from an industrial computer to Simatic S7

- **FNC Brewery**, Minas, Uruguay:
"Sander Hansen" bottle tunnel pasteurizer from an industrial computer to Simatic S7

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System references

South America

- **AmBevHuachipa plant**, Lima Peru:
Allen Bradley "Ziemann Liess" Bottle Tunnel Pasteurizer to Simatic S7

- **Quilmes**,Acheral, Argentina:
"Sander Hansen" bottle tunnel pasteurizer from an industrial computer to Simatic S7

- **Quilmes**, Quilmes, Argentina:
"Sander Hansen" bottle tunnel pasteurizer from an industrial computer to Simatic S7

- **Chile Brewery**, Santiago, Chile:
"Krones" bottle tunnel pasteurizer from a Simatic S5 to
Simatic S7

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