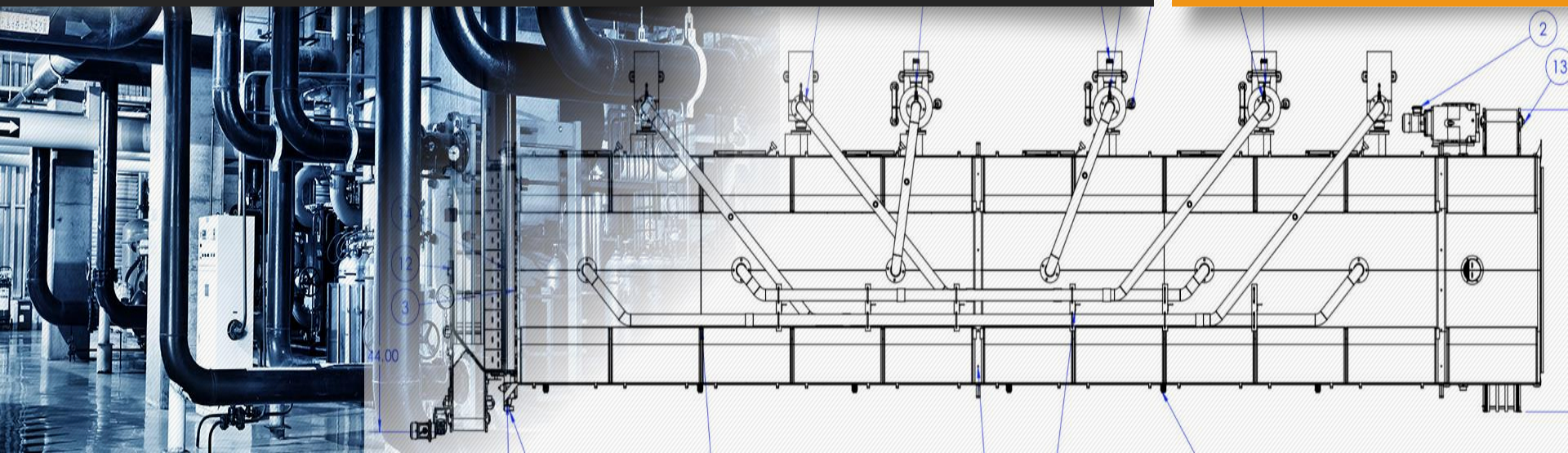


Tunnel Pasteurizer



Tunnel Pasteurizer

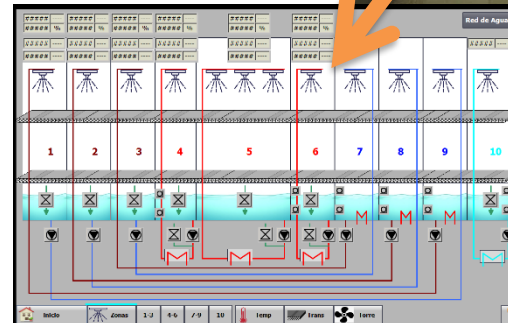
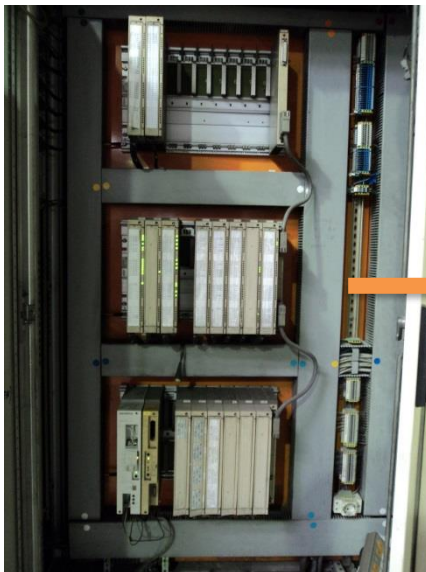
Conversion of hardware and control software for all common types of Tunnel Pasteurizers.

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.

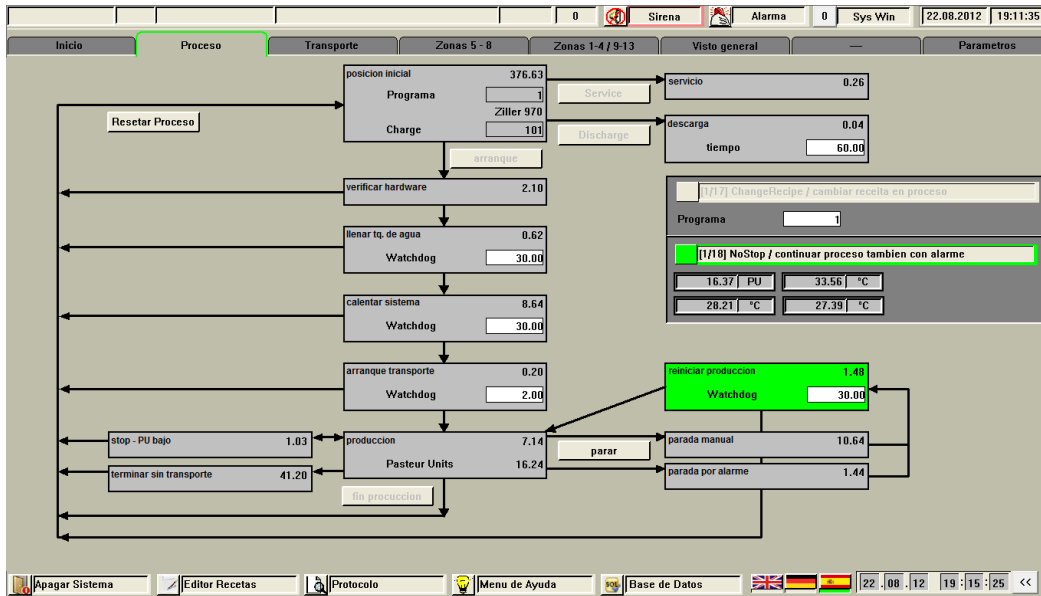
The system can be **implement in all existing types of systems** of automation and replace these completely.

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)

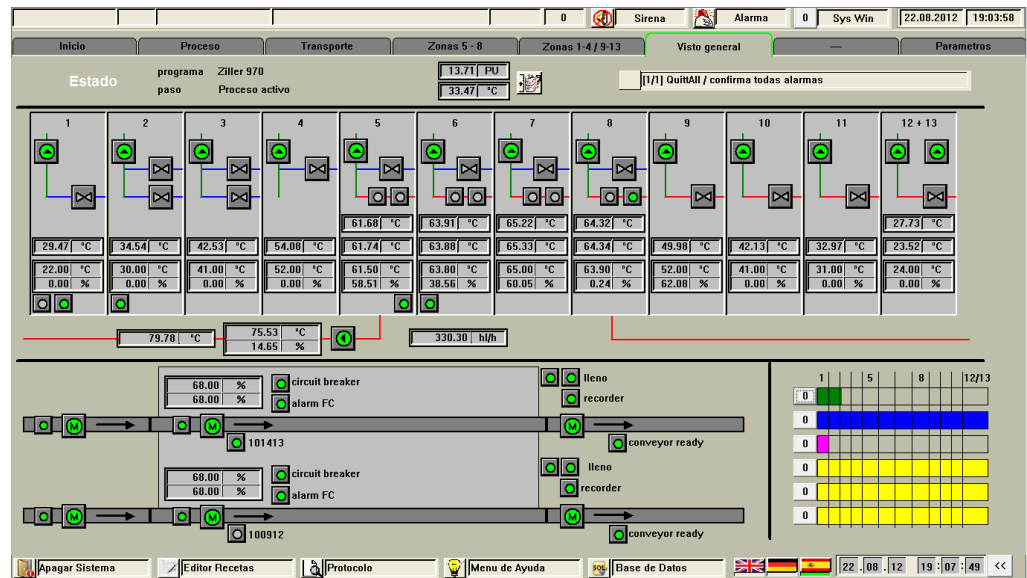


Simple and clear operation, the visualization system gives the operator a friendly and easy-to-use operating interface for controlling and monitoring product pasteurization.

- 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.

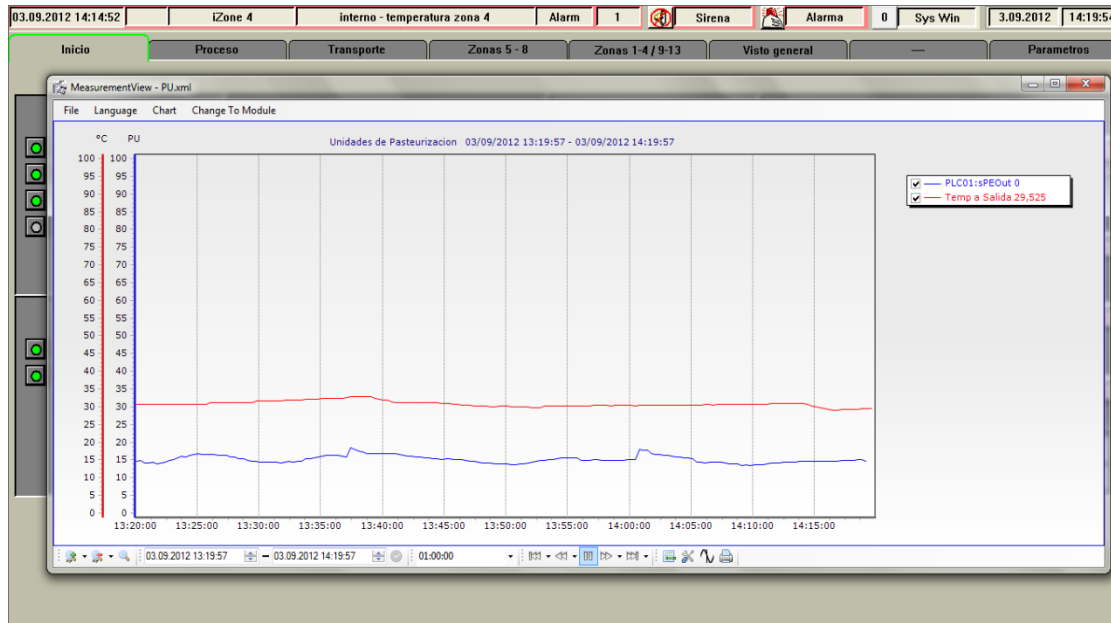
After Transport Accumulation, when the process continues, bottle X and bottle Y are in the same zone, side by side with a temperature difference of 10°C

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 (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

The screenshot displays a software interface for parameterizing a PLC. The top bar shows system status: 0 Sirena, Alarma, 0 Sys Win, 22.08.2012, 19:10:11. The main menu includes Inicio, Proceso, Transporte, Zonas 5-8, Zonas 1-4 / 9-13, Visto general, and Parametros. The 'Parametros' window is open, showing 'Parametros generales' on the left and 'Recipe' configuration on the right. The 'Recipe' configuration includes fields for 'Calculatet PU', 'Calc. Temp max / °C', 'CalcTemp exit / °C', 'Bottle Type', 'Formula', 'Error limit control', 'Alarm limit absolute', 'Transport speed', 'Temperature setpoints', 'Temperature limits', and 'Info'.

Velocidad maxima	65.40	cm/min
Temperatura entrada	4.00	°C
Offset temp agua caliente	10.00	°C
arranque despues alarme	0.00	min
Temp corte PU	53.00	°C
Temp offset paste	-0.40	°C

Calculatet PU:	15.16
Calc. Temp max / °C:	61.97
CalcTemp exit / °C:	33.73
Bottle Type:	1
Formula:	1
Maximum / PU:	6.00
Minimum / PU:	-3.00
Alarm Maximum / PU:	45.00
Alarm Minimum / PU:	8.00
Setpoint / %:	65.00
Maximum / %:	68.00

Temperature zone 1 / °C:	22.00
Temperature zone 2 / °C:	30.00
Temperature zone 3 / °C:	41.00
Temperature zone 4 / °C:	52.00
Temperature zone 5 / °C:	65.50
Temperature zone 6 / °C:	65.80
Temperature zone 7 / °C:	65.80
Temperature zone 8 / °C:	65.50
Temperature zone 9 / °C:	53.00
Temperature zone10 / °C:	42.00
Temperature zone11 / °C:	31.00
Temperature zone12 / °C:	24.00

Temperature max / °C:	91.00
Temperature exit / °C:	90.00

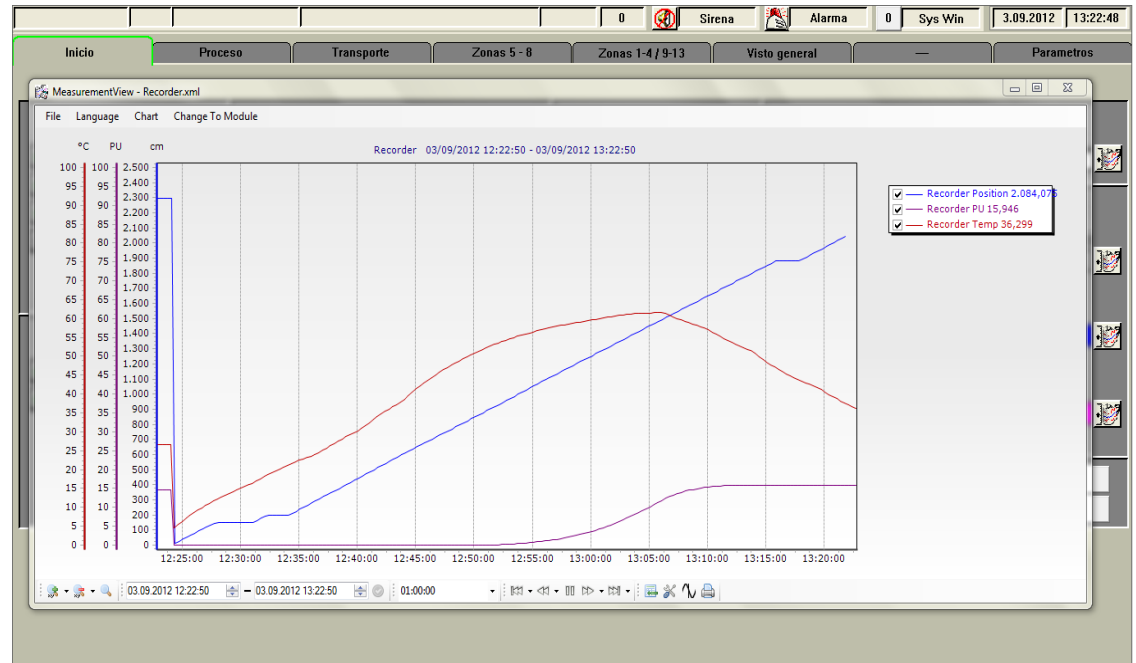
Info:
1 = Ziller 970
2 = Pilsen 960
3 = Pilsen/Ziller 620
4 = Pilsen 330
5 = Pilsen 330 LN
6 = Pilsen 300
7 = Pilsen Sonic 330
8 = Prog 8
9 = Prog 9
10 = Prog 10
11 = Malta 960
12 = Malta 300
13 = Prog 13
14 = Prog 14
15 = Prog 15
16 = Prog 16
17 = Prog 17
18 = Prog 18
19 = Prog 19
20 = Prog 20
21 = Prog 21
45 = Calentar
46 = Prod. Quimico

- 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 **accuracy up to +/-1UP** of the calculation with respect to a real reference bottle.

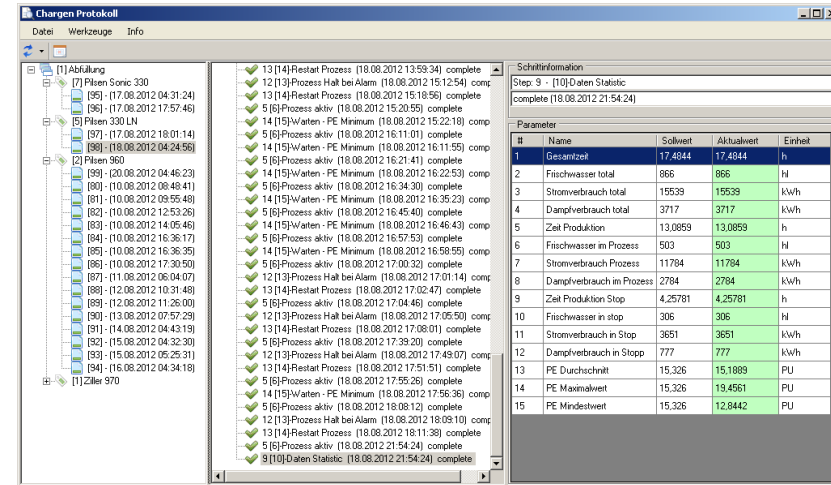
Registration System

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:

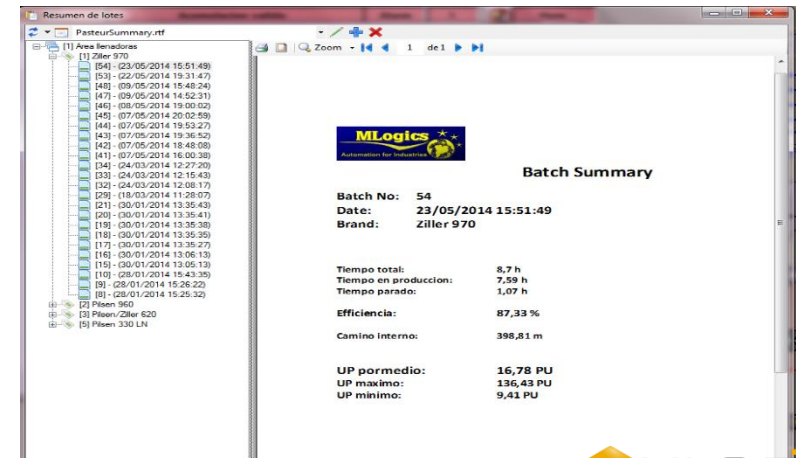
- Time
 - * Water consumption
 - * Steam Consumption
 - * Energy consumption
- (*If the corresponding measurement is installed)



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

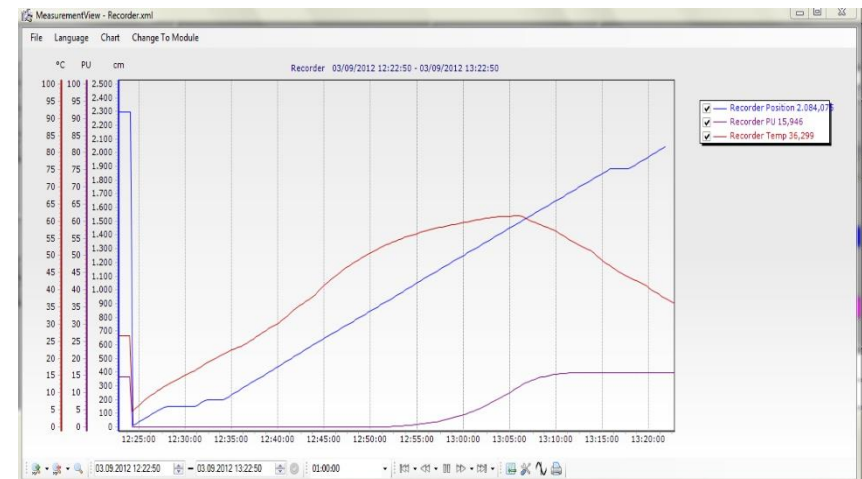
The registration system also provides the possibility of recording all manual works and interventions that were carried out during the process.

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

ALL	Time	PLC	Type of Obj.	Numero de Obj.	Simbolo	descripcion	Evento	Datos del evento	Valor
mayo 2014	27/05/2014 17:18:33	1	Dln	64	39_B02	Acomulacion salida	Manual apagado		
abril 2014	26/05/2014 14:30:11	1	Aln	25	BottlePU	UP botella a salida	Confirmar Alarma		
marzo 2014	26/05/2014 13:46:32	1	Aln	17	91_B01	Temperatura zona 1/6	Simulacion apagado		
enero 2014	26/05/2014 13:46:31	1	Aln	17	91_B01	Temperatura zona 1/6	Valor de Proceso		14.9389 =>
julio 2013	26/05/2014 13:46:28	1	Aln	17	91_B01	Temperatura zona 1/6	Simulacion encendido		
	26/05/2014 13:46:25	1	Aln	19	93_B01	Temperatura zona 3	Simulacion apagado		
	26/05/2014 13:46:24	1	Aln	19	93_B01	Temperatura zona 3	Valor de Proceso		51.0379 =>
	26/05/2014 13:46:20	1	Aln	19	93_B01	Temperatura zona 3	Simulacion encendido		
	26/05/2014 13:46:14	1	Aln	20	94_B01	Temperatura zona 4	Simulacion apagado		
	26/05/2014 13:46:13	1	Aln	20	94_B01	Temperatura zona 4	Valor de Proceso		23.7884 =>
	26/05/2014 13:46:11	1	Aln	20	94_B01	Temperatura zona 4	Simulacion encendido		
	26/05/2014 13:46:07	1	Aln	18	92_B01	Temperatura zona 2/5	Simulacion apagado		
	26/05/2014 13:46:05	1	Aln	18	92_B01	Temperatura zona 2/5	Valor de Proceso		22.748 => 4
	26/05/2014 13:46:04	1	Aln	18	92_B01	Temperatura zona 2/5	Simulacion encendido		
	26/05/2014 13:46:01	1	Aln	19	93_B01	Temperatura zona 3	Simulacion apagado		
	26/05/2014 13:45:59	1	Aln	19	93_B01	Temperatura zona 3	Valor de Proceso		19.5 => 50
	26/05/2014 13:45:57	1	Aln	19	93_B01	Temperatura zona 3	Valor de Proceso		19.4983 =>
	26/05/2014 13:45:54	1	Aln	19	93_B01	Temperatura zona 3	Simulacion encendido		
	26/05/2014 13:43:26	1	Switch	1	QuitAl	confirma todas alarmas	Manual apagado		
	26/05/2014 13:43:25	1	Switch	1	QuitAl	confirma todas alarmas	Manual encendido		
	24/05/2014 14:15:51	1	Switch	15	Reset	reset	Manual encendido		
	24/05/2014 13:55:33	1	ACT	1	20_K11M	Transport de entrada	Setpoint retraso apagado		0 => 4
	24/05/2014 13:51:43	1	Dln	63	39_B01	Acomulacion salida	Manual encendido		
	24/05/2014 13:49:34	1	Dln	63	39_B01	Acomulacion salida	Manual apagado		
	24/05/2014 13:43:10	1	Dln	63	39_B01	Acomulacion salida	Manual encendido		
	24/05/2014 13:40:03	1	Dln	63	39_B01	Acomulacion salida	Manual apagado		
	24/05/2014 13:15:09	1	Aln	19	93_B01	Temperatura zona 3	Simulacion apagado		
	24/05/2014 13:15:09	1	Aln	19	93_B01	Temperatura zona 3	Simulacion encendido		
	24/05/2014 13:11:38	1	ACT	4	31_K01Y	Transport principal freno	Tiempo esclavo		5 => 7

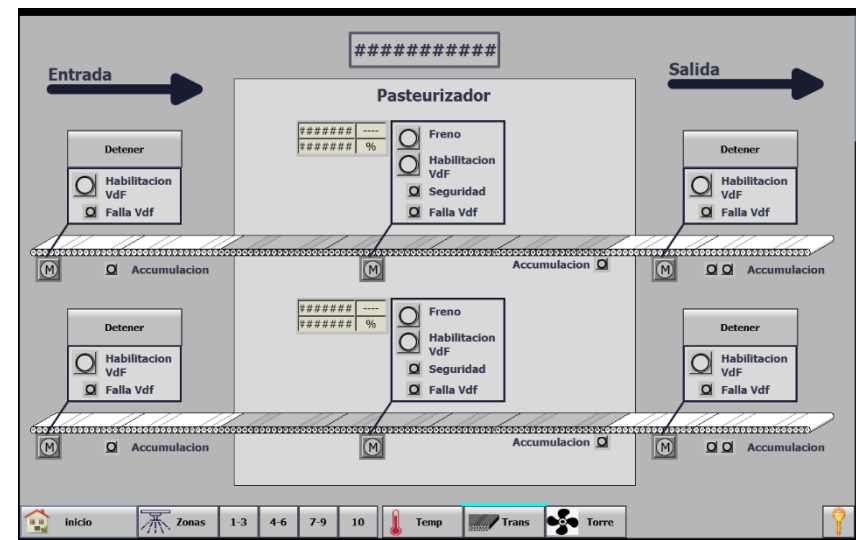
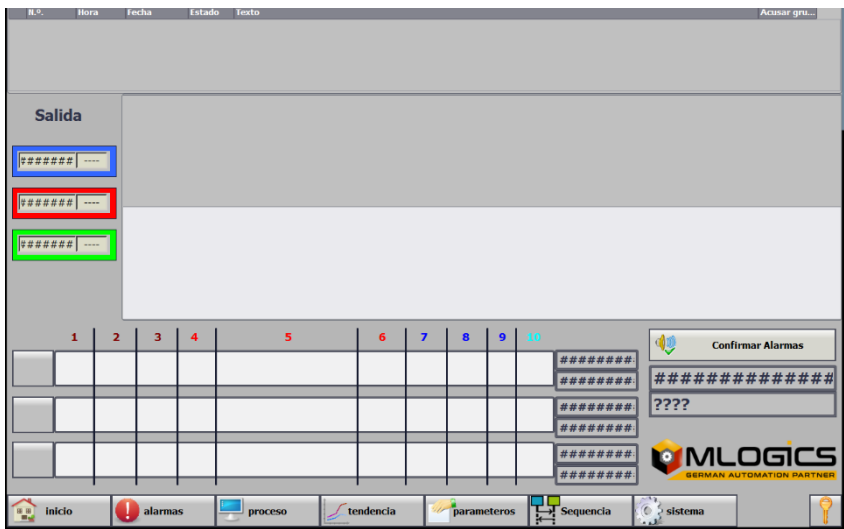
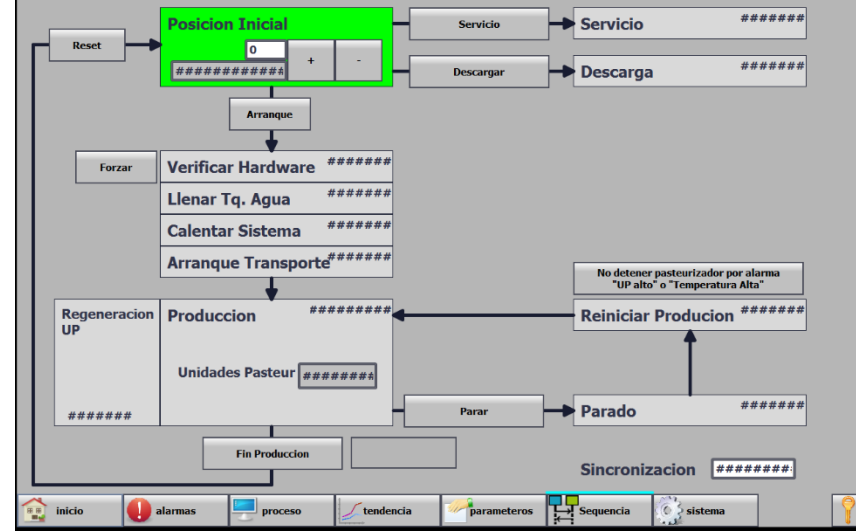
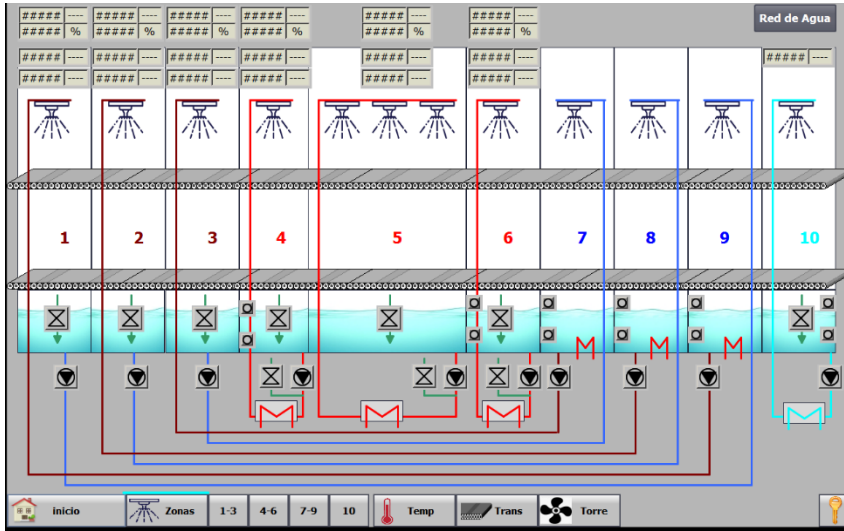
Trends

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



Touch screen

Standardized with clear and intuitive interface



System references

Updated 11/28/2022

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

System references

Updated 11/28/2011

South America

- **AmBevHuachipa plant**, Lima Peru:
Allen Bradley “Ziemann Liess” Bottle Tunnel Pasteurizer to Simatic S7
- **Quilmes**, Acherai, 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