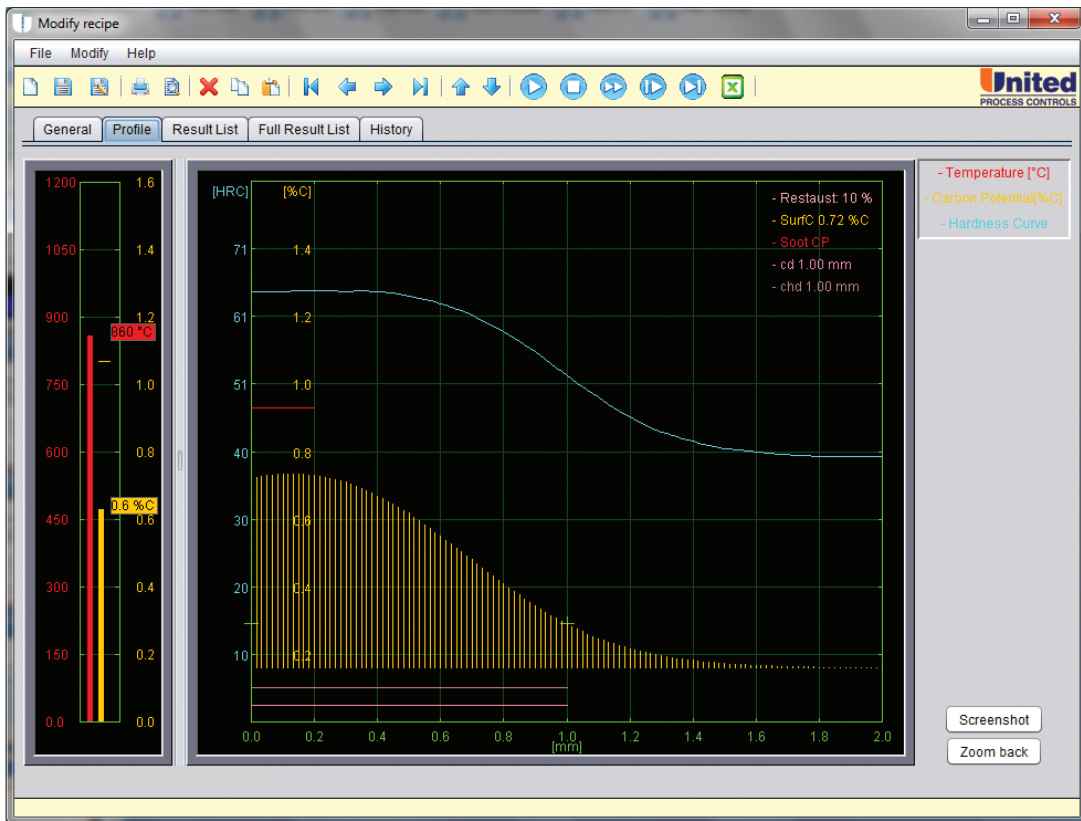
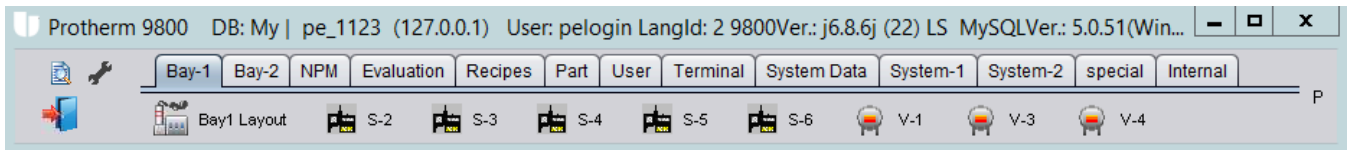


INTEGRATED PRODUCTION MANAGEMENT SOFTWARE PACKAGE



PROTHERM 9800 SOFTWARE PACKAGE

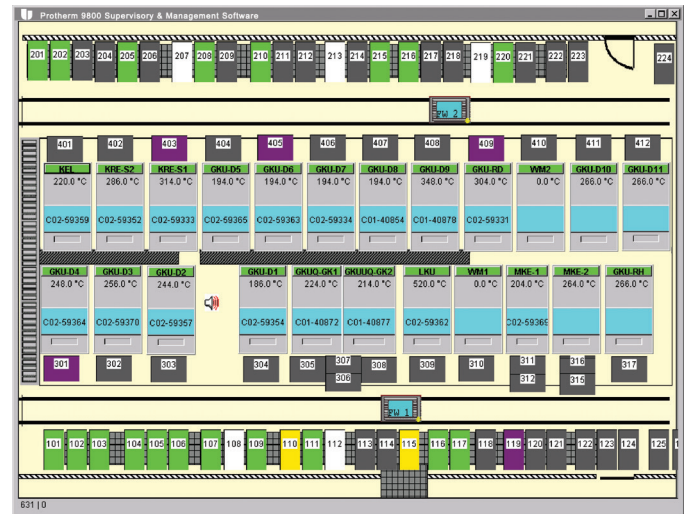
FEATURES & CHARACTERISTICS

INTEGRATION OF HEAT TREATING

The Protherm 9800 delivers everything to optimize the performance and efficiency of a heat treatment plant operating with a wide variety of furnaces as well as automatic handling machinery. By combining process control, equipment integration, and automation capabilities, the Protherm 9800 provides a comprehensive approach to plant wide supervisory control and management.

SCALABLE SYSTEM

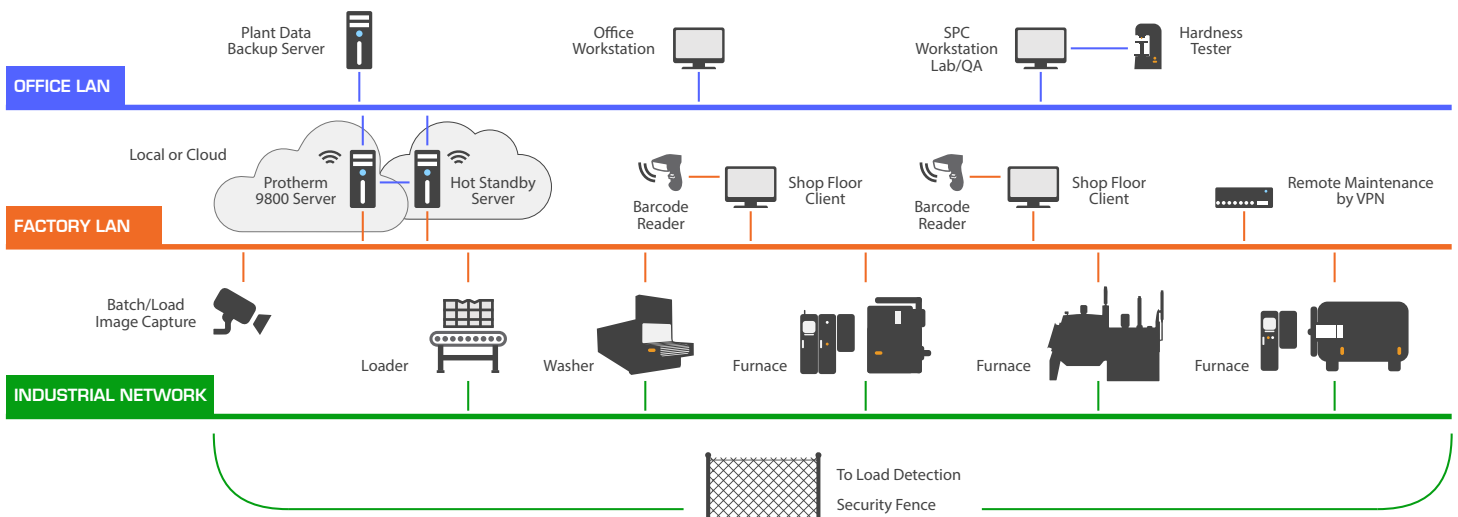
The system structure is based on three scalable tiers with add-on modules for specific requirements. The Protherm 9800 Chart Recorder basically offers batch based production logs, alarm and event logging. It can be upgraded to the full Protherm 9800 SCADA & Process Control System (PCS), which includes the chart recorder features plus recipe interface for various furnaces, internal programmer functions, the Process-Electronic Diffusion Simulation Model, lab reports, maintenance scheduler and more. The SCADA & PCS tier can be further upscaled to the Protherm Manufacturing Execution System (MES) with such modules as Equipment Usage Calculation, Outage Documentation, Consumption Evaluation, Part Serial Number Tracking, Load Planning & Tracking System, Lights-out Automation and Statistical Process Control.



Overview screen of fully automated lights-out production cell

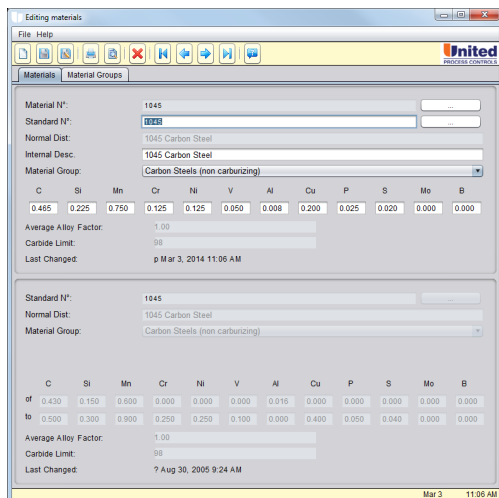
FEATURES

- Highly detailed visualization of all furnaces and other connected devices. The possibility of animated pictures provides a colorful and highly configurable graphical display
- Scalable set of functions
- Module for fully automated production system/cell (lights-out)
- Easily implementable interface to existing planning and production systems
- Possibility of simulating heat treatments
- The system can be easily operated by anyone with a basic knowledge of Windows® type of programs



Example of a Network Layout for a Protherm 9800 Lights-Out Operation

MODULAR STRUCTURE



Materials Database

BASIC MODULES

- Materials, treated parts and treatments database
- Process control through the use of treatments and controllers
- Real-time monitoring of jobs being processed
- Alarm configuration, processing and statistical analysis (option)
- Furnace load capacity analysis
- Load sequence / Job planning
- Archiving of heat treatments (furnace log book)
- Reporting of heat treatment processes
- User access management (password protection, etc.)

OPTIONAL PROCESS MODULES

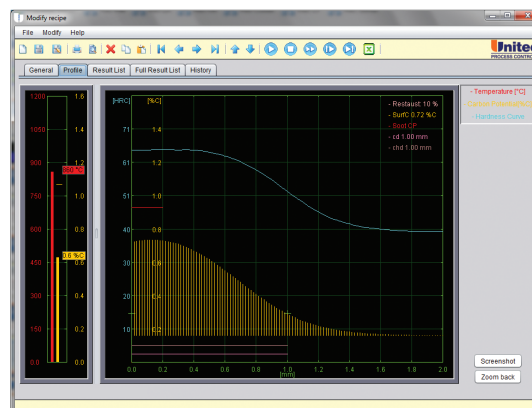
- Process specific extension modules for nitriding, carburizing and vacuum processes

OPTIONAL SPECIAL SOFTWARE

- Calculation of furnace utilization, including statistics on tonnage, down times, occupancy and utilization for a single furnace, group of furnaces, a treatment, a part or a group of parts.
- Alarm configuration and notification that automatically transmits a disruption to a phone, pager, cell-phone or email.
- Remote maintenance of the system using a modem, ISDN-router or internet tunneling.
- Comprehensive quality control system. Fully configurable.
- Optimization of the process scheduling with a graphical display of the planned and measured values, the furnace downtime and warnings and errors.
- Integration of customer specific extensions and modifications
- Possibility of incorporating additional equipment such as a PLC and controlling and recording their values.

PROCESS SIMULATION

- It is possible to test treatments before putting them into production. A practical interface helps to quickly and simply optimize treatments to obtain the best possible results.
- Complex mathematical functions enable the simulation of carburizing and case-depth processes. The calculated carbon diffusion and hardness profiles, as well as the process set points and predicted values are displayed in a graphical form.
- A simulation module is also available for nitriding and nitrocarburizing processes.



Simulation Software

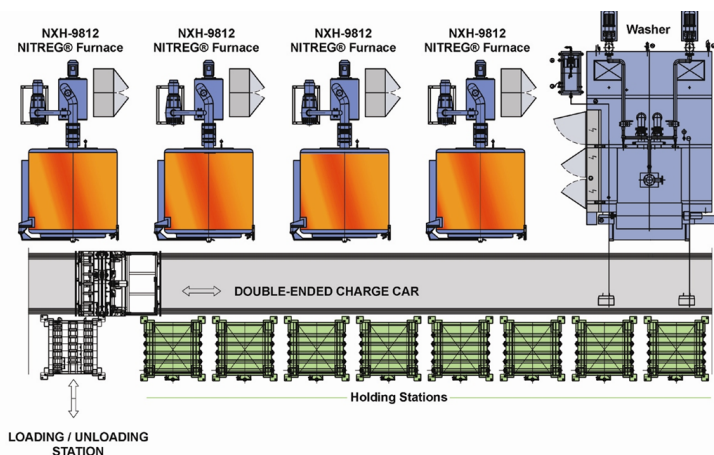
CONNECTING DEVICES

- Drivers to connect all United Process Controls devices are integrated in the system.
- Special drivers to connect to the devices and controllers of other makes are also available.
- PLCs can be connected directly to the system.
- Appropriate drivers are available for connecting hardness testing stations and analyzing devices.

PLANT MANAGEMENT & AUTOMATION CONTROL SOLUTIONS



With the plant management module it is possible to program the sequence of operations (work process) of the charges throughout the production cell.



- Database of parts/charges trajectories
- Visualization of the cell and the handling steps
- Collision supervision
- Interference- and operating report of all equipment
- Manual/Auto and “scheduled” operation

- Programming of work flow for the charges
- Priority control for optimum production cell usage
- Automatic sequence-optimization with different priorities
- Reservation of equipment for priority charges
- Query capability – parts and charges information

ALSO AVAILABLE

Analyzers	Hydrogen, oxygen and ammonia analyzers available either as portable or fixed-mount
Atmosphere Sensors	Oxygen, hydrogen and insitu carbon diffusion sensors used in various processes
Measuring Devices	Intelligent hydrogen sampling system, Portable infrared gas analyzer, direct reading dew point analyzer and more
HT-Tools Pro	Powerful simulation tool for designing and optimizing recipes for carburizing including low-pressure carburizing, carbonitriding, as well as nitriding and nitrocarburizing processes
Protherm 10	Cost-effective temperature and industrial controller with expanded functionality, including a programmer and a datalogger
AE25	1/4 DIN multi-loop universal process controller pre-configured for application
AE06L	1/16 DIN controller. Over temperature limit protection
Protherm 455	Multi-loop process controller. Direct drop-in replacement for Marathon’s CarbPro, DualPro, MultiPro, and Carb PC
Protherm 470	Universal digital control system for regulating and controlling heat treatment processes
Protherm 500/600/700	Universal programmable controllers designed to monitor, control and record heat treatment processes running in various types of furnaces

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