INTEGRATED PRODUCTION MANAGEMENT SOFTWARE PACKAGE
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.

**FEATURES & CHARACTERISTICS**

**INTEGRATION OF HEAT TREATING**

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**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
**PROTHERM 9800 SOFTWARE PACKAGE**

**MODULAR STRUCTURE**

- **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.)**

**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
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- 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.

**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.

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

**PLANT MANAGEMENT & AUTOMATION CONTROL SOLUTIONS**

- 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**

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