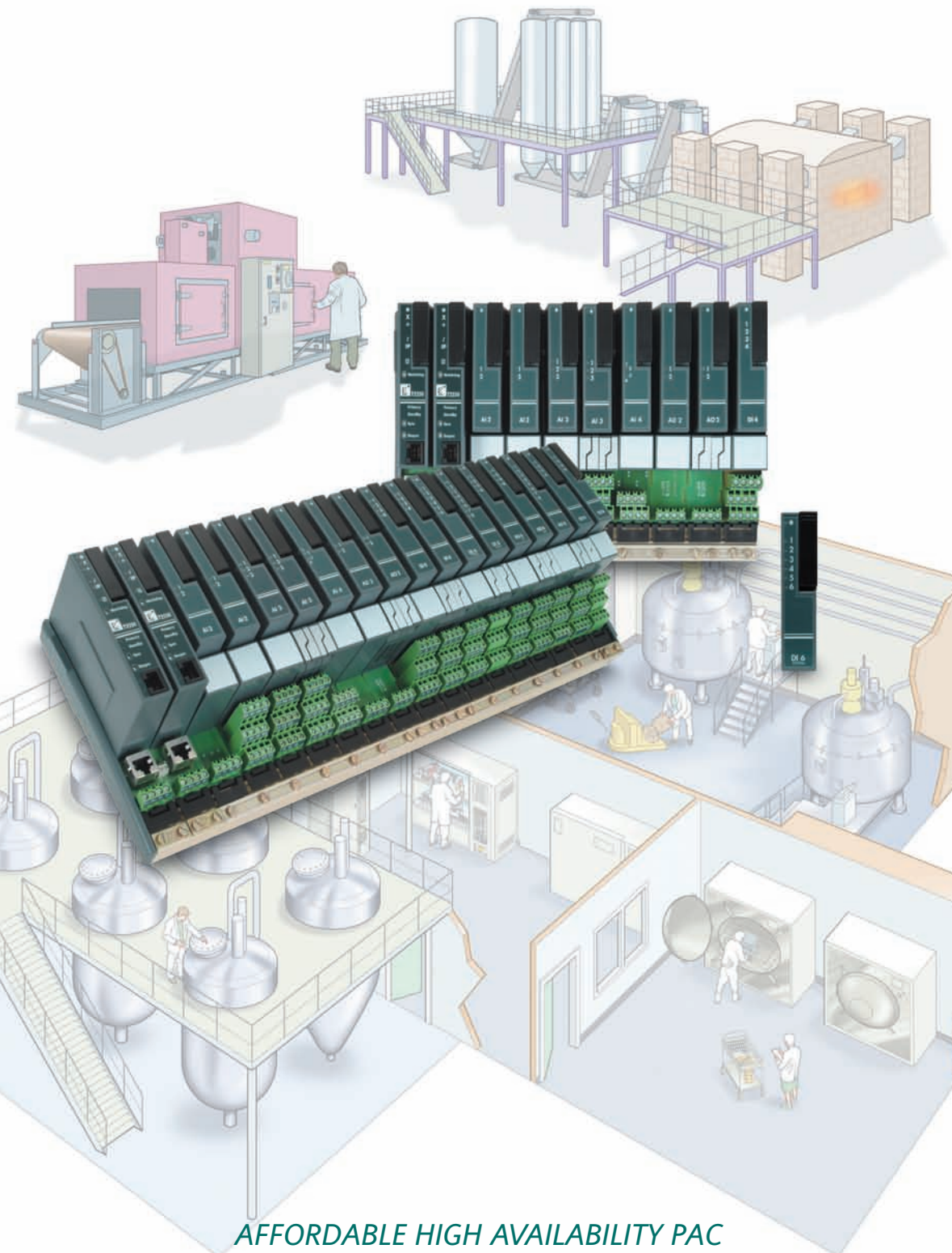EUROTHERM® FLEXIBLE SOLUTIONS

T2550

PROGRAMMABLE AUTOMATION CONTROLLER

*AFFORDABLE HIGH AVAILABILITY PAC
WITH SECURE DATA RECORDING*

invensys®
EUROTHERM®

Technology so powerful it's simple

- Instant Redundant capability
- Advanced control algorithms with Autotune
- Secure Redundant recording at point of measurement
- Setpoint programming
- Extensive features – for example Zirconia probe and frequency inputs

The T2550 PAC is a high performance solution from Eurotherm® offering extremely cost effective redundancy options with integral recording capability – capturing the vast control and recording expertise and reputation that Eurotherm has built over the last 40 years. This powerful instrument is capable of logic and sequential control, recording and set point programming, combined with its powerful array of specialist features is designed to maximise the return on investment (ROI), and ensure the maximum availability of, your process.

Eurotherm has brought innovation in simplicity to this latest automation product, the T2550 PAC. Hot swap modules, auto I/O build functionality, a personality flash card, clear status indication and an intuitive toolset all make the T2550 simple to use, install, engineer and upgrade. Fitted with E-Sync technology (Eurotherm's easy synchronisation functionality), engineering a high availability solution with redundant processors and networking couldn't be simpler.

PAC

Online Reconfiguration

Secure, Redundant

E-Sy

Maximise process uptime with redundant capabilities

- Dual redundant processors at the touch of a button

- Redundant recording

- Redundant logic and sequential control

- Hot start capability

- Personality flashcard – reduce MTTR and simplify application updates

The T2550 PAC brings high availability with affordability and, utilising E-Sync technology, minimises engineering costs, shortens time to implement and simplifies lifetime maintenance.
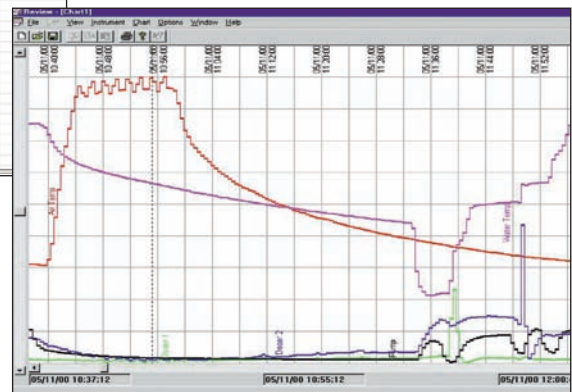
Using T2550 reduces engineering costs and its high availability maximises your process uptime. In its duplex mode it offers redundancy of processors, power supply, recording and network at a price performance level that has never been seen before. The controller/recorder redundancy is automatically commissioned – simply plug the additional processor module into the redundant base and initiate the E-Sync technology with a single button press on the front of the unit. During this process all files from the primary processor are copied to the secondary to allow the secondary processor to mirror and monitor the primary. *No special cabling or engineering is required to configure a secondary processor.*

Changeover to a secondary controller is automatic with uninterrupted control and bumpless transfer of communications and process I/O. Replacement of a processor or I/O module can be done with the power on and initialisation is automatic. These powerful features combine with the very high MTBF of the system's I/O and passive backplanes to provide extremely high system availability.

T2550 also supports online reconfiguration for modifying or enhancing the existing configuration while still controlling and monitoring the process plant. With support for adding and hot swapping the I/O modules, active strategy components can be modified to support system enhancements and improve the lifetime availability of the plant.

Recording

nc High Availability

T2550 PAC designed for simplicity

- Plug in, hot swap modules
- "Try before you buy" mode
- Personality Flash card
- Windows graphical configuration
- Advanced PID control with auto tune
- Online re-configuration

Simple toolset

Multiple T2550 PACs can be viewed and configured via a set of easy-to-use PC tools. Context sensitive help, graphical configuration, auto generation of I/O database and an Explorer style network are all designed to make engineering of this advanced product quick and simple to implement.

Cost Effective I/O System

Universal modules reduce spares requirements
No need for signal conditioners – TC, PRT, mV, mA, V all supported

- Hot swap modules
- Auto I/O configuration
- High resolution and accuracy
- Simplify cubicle construction with direct connection of field devices

T2550 PAC offers a variety of base sizes supporting a wide selection of I/O modules. This versatility ensures that you get the closest and most cost effective match to your application requirements.

Instruments are available supporting 4, 6, 8 or 16 modules. The modules available include:

- Universal Analogue Inputs including Transmitter Power Supply – TC/RTD/mA/Volts/Resistance
- Analogue Output – Volts/mA
- Digital Input (contact and logic) and AC – Volts
- Digital Outputs – Logic and Relay

Database auto
Plug
Personality Flash card
Windows graphical
Choice of IEC 61131

"Try before you buy"

It is sometimes difficult to know the boundaries of what is needed for all of the functionality required when engineering a solution. "Try before you buy" gives the user flexibility to build a solution to exactly the requirements and select the software options used when the solution is working. The process can be enhanced and added to throughout its life time.

Online reconfiguration

Online reconfiguration provides a useful foundation for enhancement of the deployed control system and allows modification of the systems application software when it is running. You can add and delete function blocks and wires to create a new or improved control strategy for your application while the process is running. You can then *try* and *untry* the strategy to ensure it is correct for your application before finally *applying*.
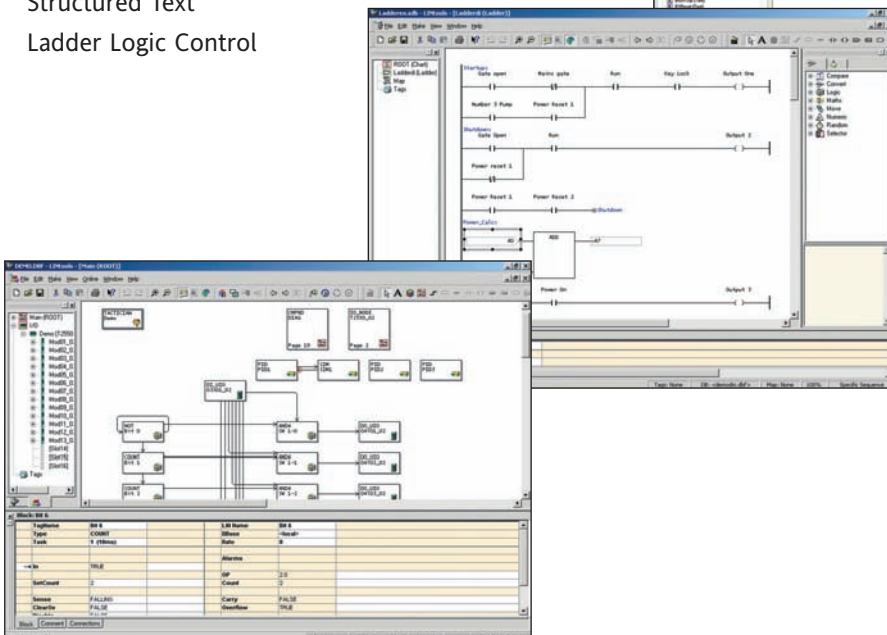
build
in, hot swap modules
Try-Untry-Apply
configuration
configuration languages
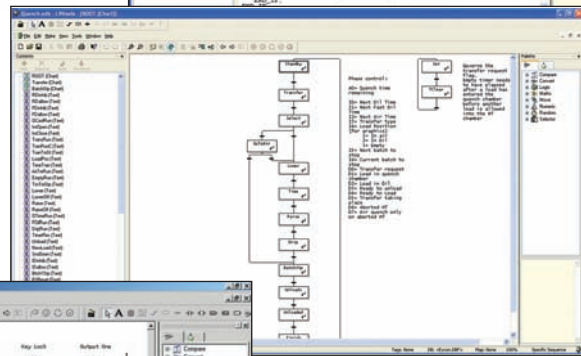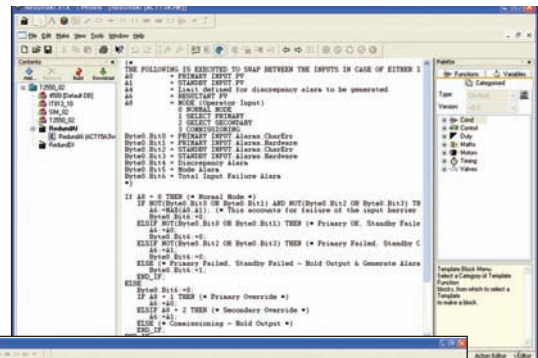
A choice of IEC 61131 languages gives the user the ability to select the most appropriate method of programming for the I/O type or application required:

- Function Block diagram
- Sequence Function Chart
- Structured Text
- Ladder Logic Control

www.eurotherm.com/T2550

Flexible, Creative Solutions

## Secure acquisition for business critical data

- ■ "Store" with Redundant data recording
- ■ "Forward" over Ethernet communications
- ■ Electronic logging of process values
- ■ Designed for 21CFR Part 11 electronic records
- ■ FTP push to up to three servers
- ■ Time synchronisation across the network

A unique feature of the T2550 PAC is secure redundant data recording. This allows data, alarm information and messages to be recorded at the point of measurement, with all data being time stamped as it is recorded, satisfying regulations such as the FDA 21CFR Part 11 or Nadcap.

Secure data recording is always important, and in many processes is vital to the end product. Using the redundant processor and power supply capabilities of the T2550 PAC not only records data but can mirror it into a secondary processor. This ensures that as long as the process is running secure data is maintained and is available over the communications network.

If communications is lost for any reason the data is still available for forwarding when communications is restored ensuring that any holes in the supervisory visualisation software are closed to provide a complete picture of the process.

With up to several months of data stored in the internal flash memory Data can either be pushed over FTP to primary, secondary or tertiary servers – effectively providing a secure infinite archiving capacity.
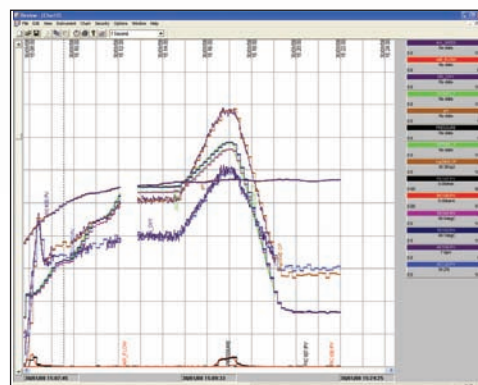

Lost Communications
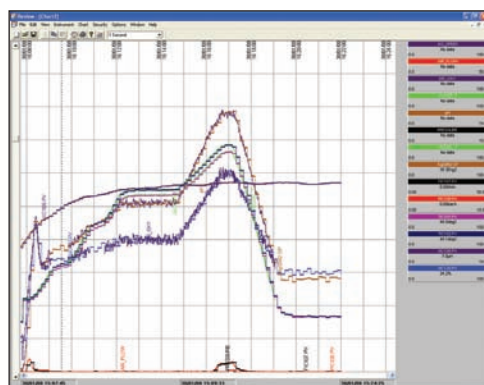
Self-healing on Repair of Network
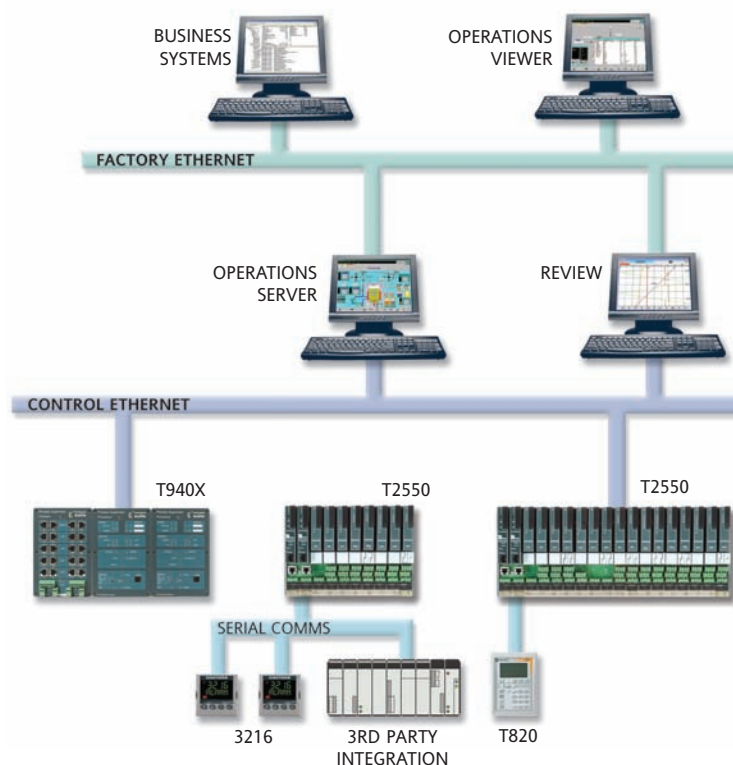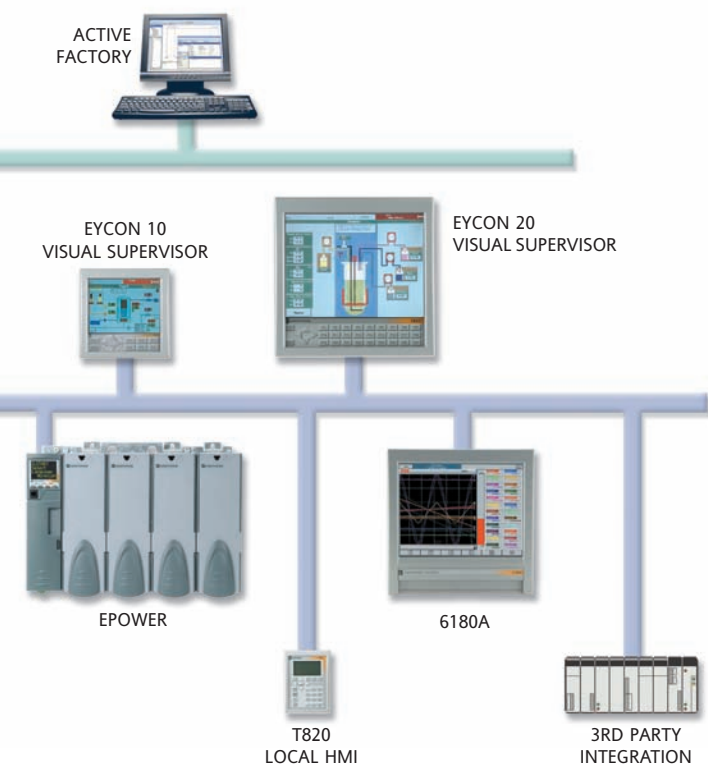
Data can also be pulled into multiple sources where it is needed for batch, process and analysis reporting, and forms the primary source of data archive for the FDA or similar. When the T2550 is used with the Eurotherm DCS solution any loss in communication causing gaps in data at the top end system will automatically be filled in from the secure files at the instrument when communications is restored.

Software such as "Eurotherm Review" can acquire the data for back up and inclusion in a database, viewing, printing or for report preparation and publication, with packages such as "Dream Report™" from Eurotherm.

ACTIVE
FACTORY

EYCON 10
VISUAL SUPERVISOR

EYCON 20
VISUAL SUPERVISOR

EPOWER

6180A

T820
LOCAL HMI

3RD PARTY
INTEGRATION

ORWARD
ctronic Logging
Time Synchronisation

Distributed and Integrated solutions

Whether a standalone or a plant wide solution, the T2550 PAC offers high performance with flexibility of scale, distribution and integration to suit the requirement. It provides peer-to-peer communications and units can be distributed throughout the plant with simple configuration from a single database. A wider, integrated solution can be provided using Modbus RTU, TCP or Profibus communication to other products and systems.

- Standalone, unit solution

- Plant wide, distributed solution with reduced engineering

- Plant wide, Integrated solution with powerful communications

Eycon™ 10 and Eycon 20 Visual Supervisors

Eycon 10 and Eycon 20 visual supervisors are advanced HMI panels, each offering an integrated, colour, touchscreen display. They both offer accurate continuous and sequential control and have an open network architecture providing connection to the T2550 PAC and other 3rd party devices.

The Eycon 10 and Eycon 20 are easy to use yet have many advanced functions including:

- Data recording with advanced online and historical data trending

- Electronic Records and Electronic Signatures in accordance with FDA 21 CFR Part 11

- Comprehensive Batch Control

- Recipe Management

- Multi-Setpoint Programming

- Alarm and event management

- USB port for data archiving to USB memory device

- Standard and custom displays to match the process

- Comprehensive security features for user-based controlled access

T820 HMI

The T820 is a graphic display unit with integrated keypad for operator data entry. It is ideal for use with the T2550 (in simplex or duplex mode) to provide a cost effective local HMI.

www.eurotherm.com/T2550

Advanced Feature Set

Wide range of standard and advanced function blocks

Alongside the wide range of standard function blocks such as system blocks, I/O blocks, Timers, Counters, and maths blocks, there exist others, such as a powerful suite of diagnostic blocks that can be used to commission fault T2550 and analyse network performance.

Standard blocks such as the PID control block with advanced control algorithms capable of Heat / Cool and Valve positioning control, in harmony with advanced control and application blocks such as "Pump Duty / Standby" make engineering complex control systems simple to configure yet powerful, robust and reliable.

Function Block Libraries (Continuous Database Function Categories)

- I/O – Analogue and Digital Input/Output, manual Override
- Conditioning – Dymanic Signal-Processing
- Control – Analogue Control, Simulation and Communications
- Timing – Timing, Sequencing, Totalisation and Events
- Selector – Selection, Switching, and and Alarm collection
- Logic – Boolean, Latching, Counting and Comparison
- Maths – Mathematical Functions and Free-format expression
- Configuration – Instrument Identity Blocks
- Diagnostics – Diagnostic Blocks
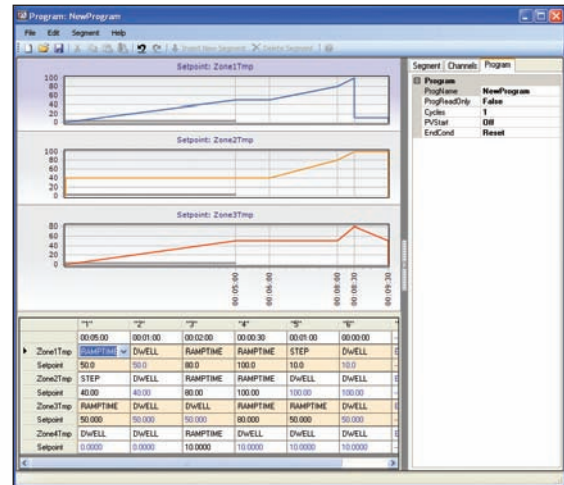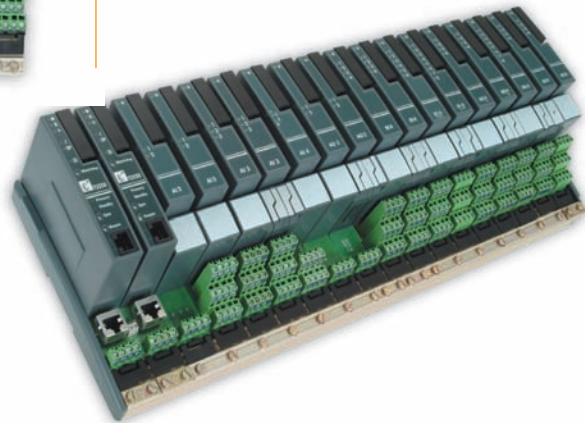

Setpoint Programmer

Many applications have a need to vary the process value over time. One in particular, temperature control, often needs to ramp the process from one level to another and perhaps maintain that value for a set period using a set point program. The T2550 PAC has the ability to run multiple set point programs, up to 32 segments in each, following pre programmed values for up to 8 analogue values and 128 digital.

Configured using either a PC based setpoint programmer wizard, or the Setpoint program editor software within LINTools configuration software or integrated into a system with Eycon 10 or Eycon 20 Visual supervisors, the setpoint programmer.

Flash Card
SWAP
High Availability

Easy replacements and upgrades
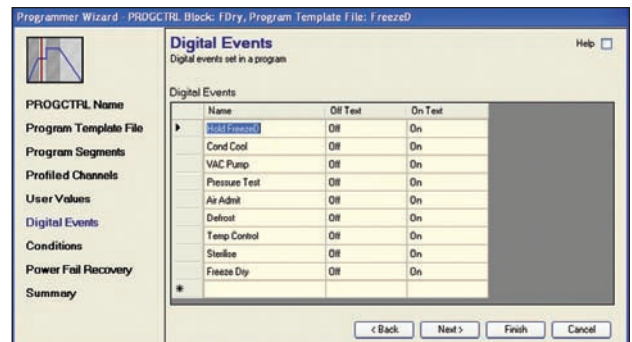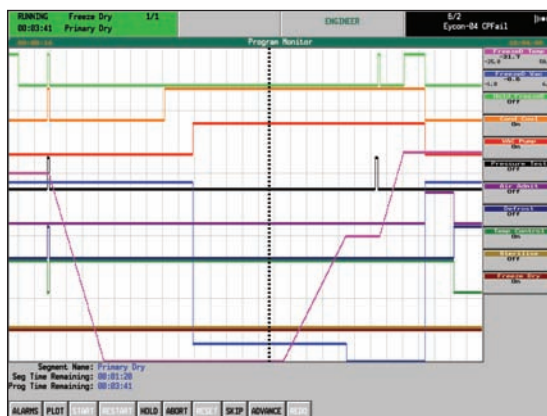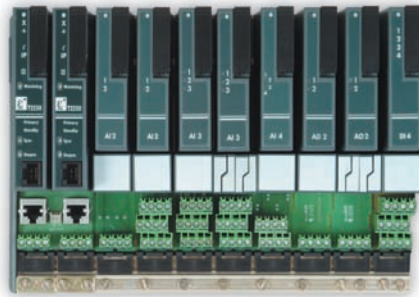
During the life time of a process there will be times when modules need to be replaced or added to the system. The ability to hot swap I/O and processor modules on the T2550 PAC makes this process fast and simple. If the processors are in duplex mode, one can be replaced without the need to stop the process and, utilising E-Sync Technology, is synchronised back with the system by a single button press. If the T2550 is in simplex mode a second processor can be added at any time with simple engineering the system can quickly be upgraded and continue to run now with the added assurance of being in duplex mode.

Each processor contains a compact flash card that holds its firmware, application and configuration files – its "personality". If a processor needs to be replaced in simplex mode the user can simply take a standard spare processor and insert the personality flash card. There is no need to hold pre-configured spares and any downtime is minimised with this simple process.

www.eurotherm.com/T2550

Real-world applications

T2550 PAC is modular and very cost effective. It is ideal for small and large applications.

It's reliability and high availability brings security to critical processes - ensuring they keep running when you need them to. This powerful technology and Eurotherm's expertise in key application areas brings clear benefit to many process areas. A few examples are shown here.

ZIRCONIA INPUT FUNCTIONALITY

- Zirconia Probe Input
- Carbon, Dewpoint and Oxygen
- Probe Cleaning
- Probe Diagnostics
- Sooting Alarm
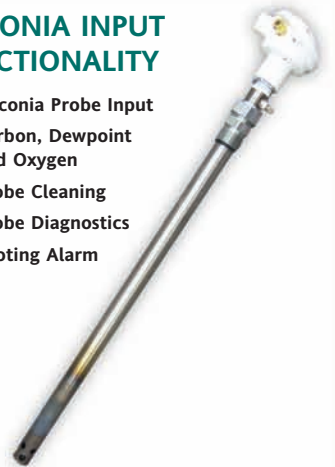
The T2550 PAC is suitable for precision control of temperature, carbon potential, dewpoint and oxygen in Atmosphere heat treatment applications. Providing support for a wide variety of Carbon Probes the Zirconia function block derives Oxygen, Carbon and Dewpoint values from a Probe connected to the I/O subsystem, and can be used to control the carbon potential, dewpoint or oxygen in a furnace or as an integrated furnace controller where any or all of these variables are controlled in conjunction with the temperature. Standard features include an automatic probe cleaning routine, a sooting alarm and probe diagnostics, providing information on the health of the probe.

RETORT FURNACE

- Modularity provides local control, interlocking and I/O connection
- Multi-tasking environment
- 10ms rapid tasks for controlling position
- Multi-tasking and rapid digital input
- Keep the process running with cost effective control redundancy
- System enhancements without interruption with Online Reconfiguration
- Calibration block facilitates simple calibration with step-by-step instructions
- Reduce process time and save energy using steady state algorithms with step-by-step instructions
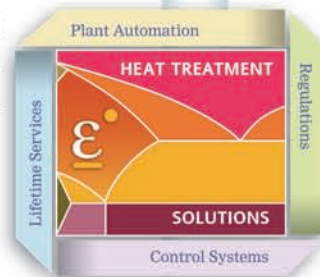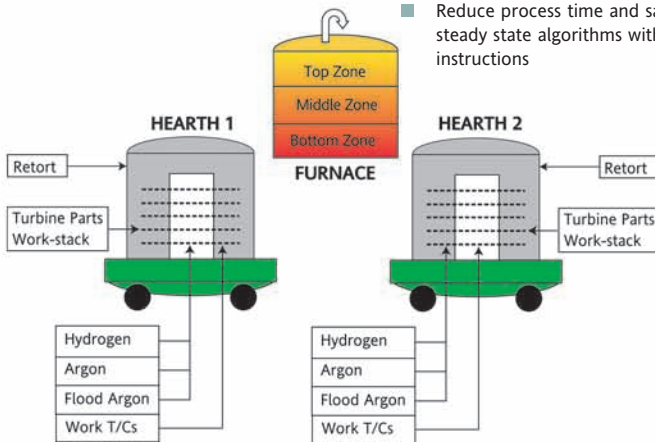
GLASS FURNACE

- Improve plant throughput with system redundancy options
- Rapid installation during critical cold rebuilds
- Online Reconfiguration facilitates system enhancements without stopping the process
- Calibration and maintenance modules to ensure the process is performing as it should
- Distributed architecture with local cabinets to reduce cabling costs
- No need for additional marshalling
- Local and central HMIs
- Easy integration to plant wide systems

From simple loop control to information integration and plant wide DCS systems, Eurotherm can offer scalable, modular solutions to match your requirements. T2550 PAC brings added security to the critical process of the glass furnace, as high availability is integral in its design.

www.eurotherm.com/T2550
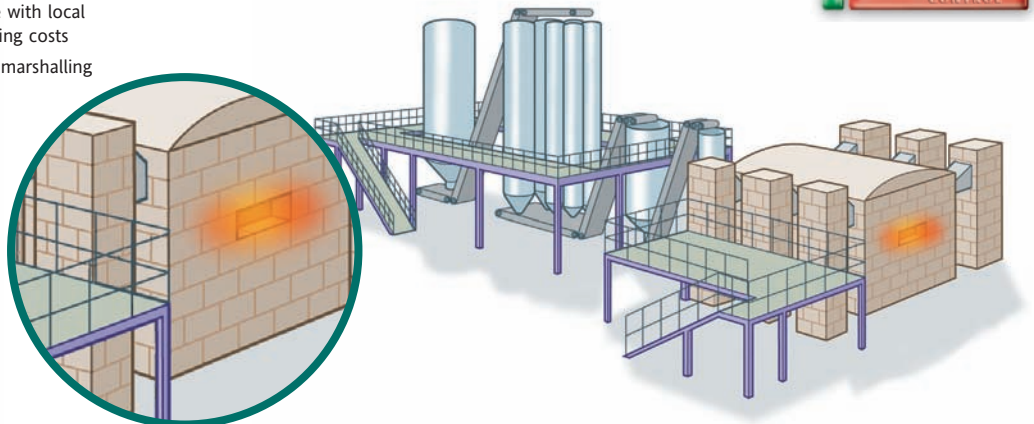
BMS/EMS

- Solutions based on expertise in secure data recording combined with accurate control functionality
- High availability
- Easy compliance
- Standard validation templates
- Scalable and distributed

Eurotherm offers easy compliance solutions to Building Management Systems/Environmental Monitoring Systems (BMS/EMS). The modularity of the T2550 PAC enables distribution around the plant to control each room, group of rooms or complete processes (e.g. main HVAC system). If a fault condition occurs with the primary processor the changeover to the secondary is bumpless and the HVAC and other systems are uninterrupted.
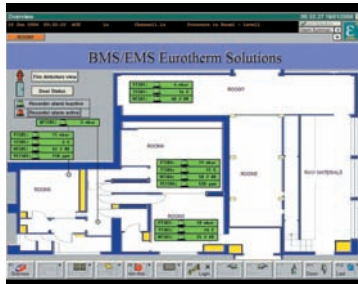
Using online reconfiguration and hot swap modules, existing systems can be enhanced without disturbing running processes. Eurotherm's solution provides easy calibration & maintenance management; multiple alarming solutions; secure data recording, and remote visualisation – all as scalable options from a single room to a plant wide package.
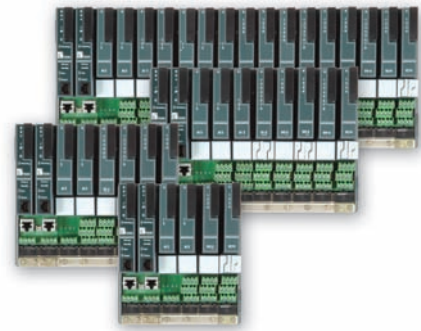
FERMENTATION PROCESS

Incubation control necessitates the precise control of a number of parameters – including temperature, pH, DO_2, agitation, pressure, foam control and auxiliary feed. The batch in the fermenter is often of high value and continual control of the process during a batch is vital. T2550 offers high availability along with accurate control – quickly bringing a return on investment to the business.

- High availability, precise loop control
- Sequential control for vessel sterilisation and more complex control strategies
- Minimise risk to the process with redundant processors, network and power supply
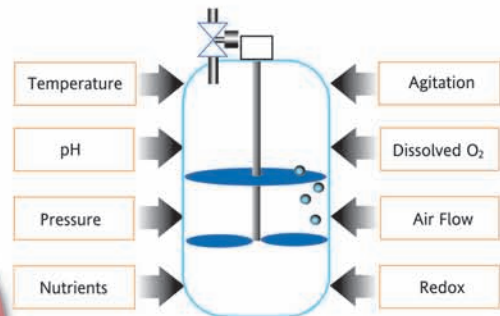
FREEZE DRYER

- Precise temperature control with ramping
- Customised displays
- Clear indication to the local operator of key process parameters and states
- Sequential control of the temperature, vacuum and refrigeration plant
- 21 CFR Part 11
- Safety strategies to ensure product is not damaged as a result of plant failure

Freeze drying is a slow batch process and, in the pharmaceutical and biochemical industries, the value of the product is high. T2550 PAC can control this critical process with high accuracy and reliability. Combined with other Eurotherm products, our Freeze Dryer solutions include secure data recording, electronic signatures and audit trails in accordance with 21 CFR Part 11; a range of local and central HMIs with flexible graphics; batch control and reporting, and alarm management.
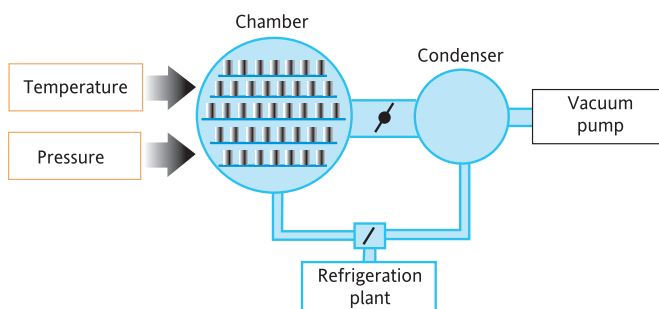
STERILISATION

- Autoclave control
- Local, custom graphic displays
- Accurate and repeatable control
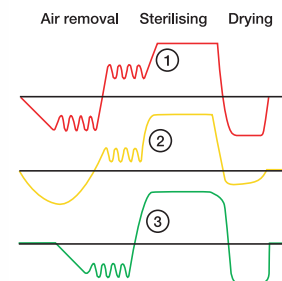
Periodic calibration facility

Typical pressure cycles used in autoclaves:

1. Cycle for fabrics, assembled filter units and discard loads.
2. Cycle for laboratory.
3. Cycle mainly used for discard loads.

Eurotherm: International sales and service

Understanding and providing local support is a key part of Eurotherm business. Complementing worldwide Eurotherm offices are a whole range of partners and a comprehensive technical support team, to ensure you get a service you will want to go back to.
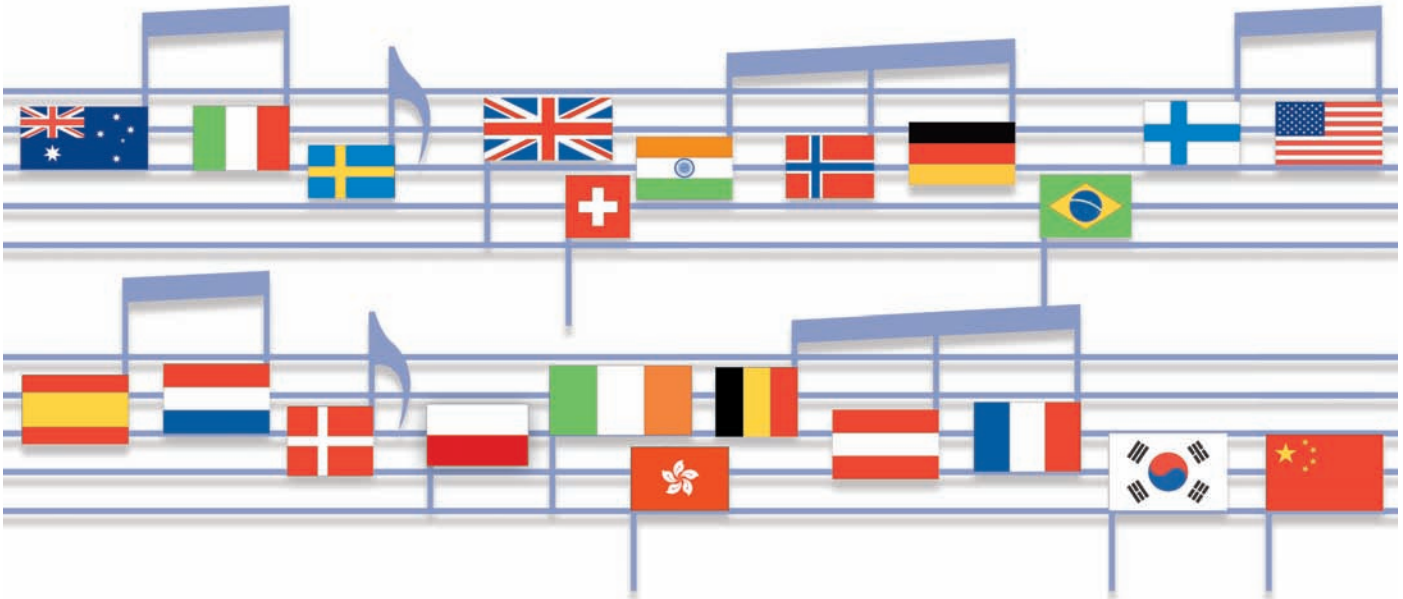
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ED56

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