



Optimizing Control, Operations and Regulatory Compliance

Eurotherm®

Eurotherm PAC System

High performance redundant control and data management in a versatile modular system.



eurotherm.com/pac

 **WATLOW®**
Powered by Possibility

Eurotherm PAC System

The Eurotherm® Programmable Automation Controller (PAC) System consists of a high-availability T2750 automation controller and I/O subsystem combined with a third party HMI extended by Eurotherm for optimum integration.

The Eurotherm T2750 controllers provide cost-effective process control redundancy options and a highly distributed control and monitoring architecture with tamper-resistant data recording at point of measurement. These characteristics enable the Eurotherm PAC to optimize control performance and system availability, helping to maximize your return on investment.

Eurotherm PAC provides a highly scalable solution using the same hardware for small applications up to plant-wide solutions, combining the performance of a Distributed Control System (DCS) with the price point of a Programmable Logic Controller (PLC).

The Eurotherm PAC System includes our highly developed control with auto tuning algorithms and regulatory compliant data recording capabilities. The Eurotherm PAC solution also facilitates data integration and production efficiencies that span both your production operations and your business systems.

The Eurotherm commitment to backward compatibility of the PAC platform allows system engineering to be easily migrated to the latest generation Eurotherm platform. This protects your investment in engineering changes and performance enhancements over the lifetime of the system, resulting in considerable cost savings for your company as plant operation evolves.

Eurotherm PAC System is comprised of a combination of control and visualization components.

For control:

- Eurotherm T2750 PAC Controller and I/O Modules

For visualization:

- Operations Server and Viewer (OPSS) Software

Or

- Eurotherm Wonderware® PAC software

And/Or

- Localized Eycon™10 or Eycon 20 Visual Supervisors



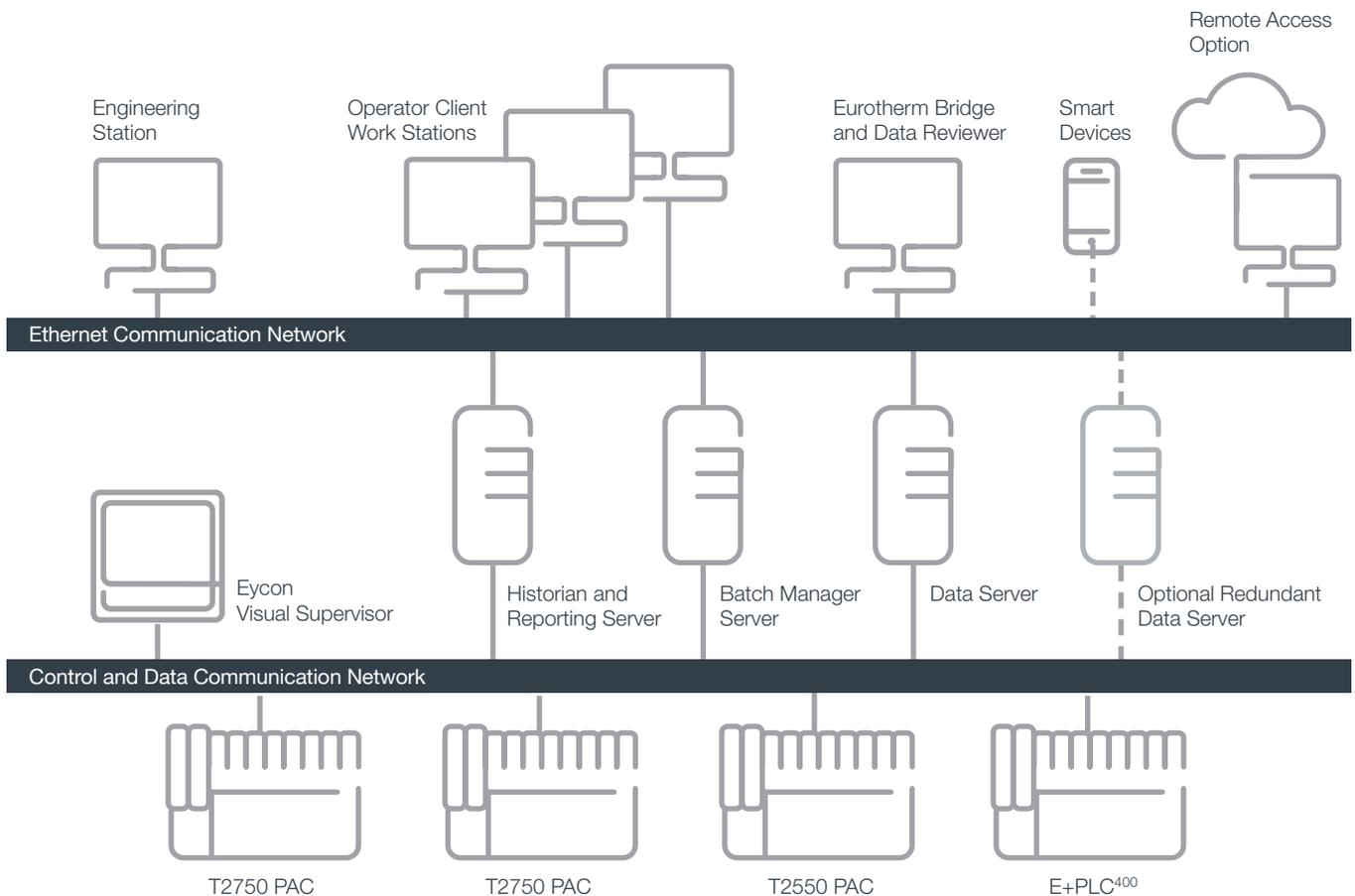
System Architectural Options

Operations Server and Viewer (OPSS)

- Using HMI visualization software
- Eurotherm extension for seamless controller data and alarm integration
- Visualization framework providing alarm and point details integration out of the box
- Advanced Plant Graphics & Tag Database for ease of engineering

Wonderware PAC Software

- Based upon Wonderware System Platform
- Eurotherm extension for seamless controller data and alarm integration
- Library of PAC Based Objects for effective display generation
- Enterprise Level Integration options



Eurotherm PAC Eycon Visual Supervisors

- Eycon 10 & Eycon 20 Intelligent Local Displays
- Batch & Recipe Management at Visualization Level
- Plant Visualization including Live & Historic Data
- Seamless Data and Alarm Integration

Eurotherm PAC Controller Hardware

- T2750 Control Processor
- Processor Redundancy and I/O Redundancy Options
- Data Recording at Point of Measurement
- Hot Swap of Redundant Processors and all I/O Modules
- Batch & Recipe Management at controller level

Eurotherm PAC Hardware



Eurotherm PAC T2750 Controller

The T2750 PAC is a high performance controller with cost effective redundancy options. The control unit and I/O system form the basis of a complete distributed control and recording environment capable of continuous analog, logic, sequential and batch control, combined with tamper resistant data recording at point of measurement – all designed to maximize your return on investment through:

Cost Effective Controller Redundancy

- Automatic commissioning
- Bumpless changeover
- Redundant communications
- Redundant power supplies

High System Availability

- Redundant CPUs with automatic takeover
- Online reconfiguration
- Extensive health monitoring and diagnostics
- Hot swap I/O Modules with very high, field-proven MTBF
- Passive I/O backplane

T2750 processor redundancy, and the ability to have processing capability in every I/O rack, enable the T2750 PAC system to overcome common limitations experienced with PLC systems. As the system evolves and expands, additional processing capability is provided to the application, enabling high performance to be maintained regardless of system size. The redundancy option reduces the risk of system downtime, thereby maintaining production and profitability of your operation.

Eycon Visual Supervisor

The Eycon 10 and Eycon 20 Visual Supervisors offer a highly integrated HMI for the Eurotherm PAC system. These units are capable of the following:

- Plant visualization including live and historic data display
- Peer-to-peer communications
- Batch management and recipe capability
- Regulatory compliant, tamper resistant data recording with full audit trail
- Setpoint programming for time dependent applications

Utilized as optional building blocks within a Eurotherm PAC System, the Eycon Visual Supervisors provide peer-to-peer communications over Ethernet, enabling process information and an interface to be readily available where required by the operators.



Control and Logic

The T2750 PAC is capable of analog, logic and sequence control and is self-contained up to a capacity of 256 I/O points per rack. Larger systems can be easily implemented by interconnecting multiple PAC units to form a distributed system, utilizing in-built peer-to-peer communications.

The T2750 PAC supports the level of block structuring normally only found in advanced Distributed Control Systems. The continuous strategy is built up by the interconnection of function blocks from a rich library of analog, logic, and advanced elements.

Advanced PID Control Algorithms

- Single loop
- Cascade control
- Ratio control
- Override control
- Auto-tune

IEC 61131-3 Based Programming

- Ladder Logic
- Sequential Function Chart (SFC)
- Function Block Diagram (FBD)
- Structured Text (ST)

Alarm Monitoring

Multi-setpoint Programmer

Controller based Batch & Recipe Management

Eurotherm PAC Visualization

Operations Server and Viewer (OPSS)

The Eurotherm OPSS software provides advanced graphic visualization for process control applications. OPSS offers the following capabilities and benefits:

Key Capabilities

- Resolution-independent graphics and intelligent symbols that visually bring your facility to life
- Real-time distributed alarming with historical views for analysis
- Integrated real-time and historical trending
- Extensive library of graphic and object symbols plus sophisticated scripting capabilities



Key Benefits

- OPSS ease of use enables developers and operators to increase productivity quickly and efficiently
- Unequaled device integration and connectivity to virtually every device and system
- Outstanding graphics and integration brings the right information to the right people at the right time
- Built in technologies to help meet regulatory requirements such as 21 CFR Part 11 and AMS2750
- History of an uninterrupted software version migration path providing long term benefit to your investment

Wonderware PAC Software

Eurotherm extensions provide tight integration with the T2750 PAC controllers in an open HMI environment architected for the future. This solution particularly suits applications where there is repetition in the process plant or where there are demands for higher level business functions such as Manufacturing Execution Systems (MES) or Enterprise Resource Planning (ERP) systems. The template based architecture minimizes your initial and future engineering costs with simplified maintenance, delivered through a single database structure.

This System Platform based solution provides an industrialized application server, a powerful historian server, and easy-to-use web displays, with extensive connectivity; all specifically built for real-time industrial environments.

Key Benefits

- Reduced engineering effort with auto-build and single project environment
- Powerful graphic tools
- Instant access to data from your plant with online monitoring from any node
- OPC standards inbuilt to I/O drivers
- Built in Security Managers – Focusing on cyber security without making operation and procedures cumbersome
- Built in technologies to meet requirements such as 21 CFR Part 11 and AMS2750



Tamper Resistant Data Recording for Business Critical Data

Compliance with Regulatory and Quality Standards

Regulated industries typically require data recording formats that are resistant to tampering, and available for quality control and auditing at a later date. Eurotherm PAC utilizes several data management strategies that aid data integrity and file security.

Data, alarm information, and messages are recorded at the point of measurement, with all data being UTC time stamped as it is recorded, satisfying regulations such as FDA 21CFR Part 11 for Life Science and Nadcap AMS2750 for heat treatment industries. Real Time Clocks (RTC) are synchronized over the network.

Store and Forward Capability

Process critical data is stored at the point of measurement. This data is recorded within a dedicated high availability file system on the redundant processors, reducing dependence upon communications to a historian on a remote server. Local data storage within the controllers is typically measured in weeks or months. Data archiving is automatically restarted when communications are restored. The 'Highly Reliable File System' (HRFS) helps to prevent possible loss or corruption of data due to power interruptions.

Key Benefits

- High integrity of process and batch data
- Continued process operation in the event of a data network outage
- Archiving push up to 3 servers
- Local data storage capability to back fill following loss of communication event
- Tolerance to network interruptions maintains profitability

Smart Efficient Data Management

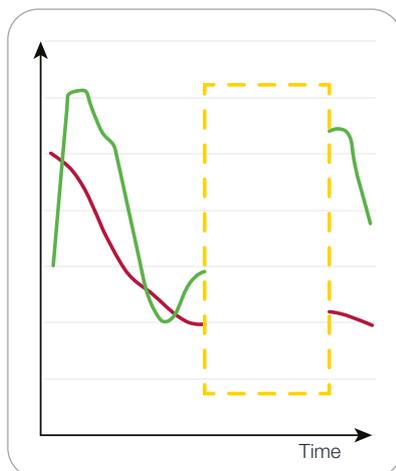
Data files are stored in Eurotherm proprietary tamper resistant file format (.UHH), a better alternative compared to commonly used editable .CSV files. Process data such as operator logins, messages, alarms and other events can also be recorded for traceability.

Reporting

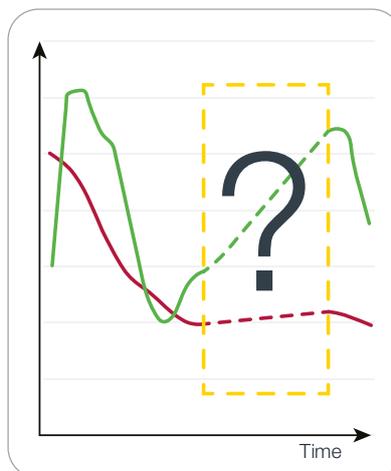
Eurotherm Data Reviewer software is available for generating reports from this data to satisfy the requirements of regulatory bodies such as the Food & Drug Administration (FDA) and the Environmental Protection Agency (EPA).

Store & Forward

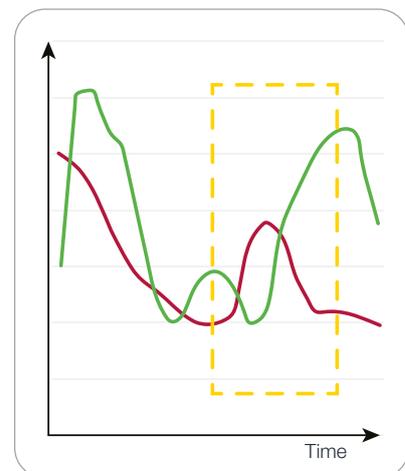
Lost data can cost you production time and money. When data is not recorded within a historian, attempting to infer the missing data is not an acceptable resolution. The Eurotherm 'Store & Forward' functionality mitigates the loss of data, giving you confidence in your control or monitoring data.



Missing data creates a problem



This data cannot be inferred



Store & Forward provides the data

Store and Forward technology mitigates the risk of data loss by back-filling available data recorded at the point of measurement.

Global Turnkey Capability

In addition to Eurotherm expertise in process and machine control products, we also have a broad range of experience in engineering services to implement a complete life-cycle solution for your application. These services include:

Engineering Services

- Custom engineered solutions
 - discrete instrumentation to medium sized DCS systems
- Creating collaborative specifications
- System design and engineering
- Panel & cabinet building
- Factory Acceptance Testing (FAT)
- On-site installation & wiring services
- Site Acceptance Testing (SAT)
- System commissioning & startup services
- Validation IQ & OQ; support for customer PQ
- Comprehensive project management (including GAMP® & 21 CFR Part 11 Methodologies)
- Complete project documentation
- Network analysis
- Custom reports
- Analytics and Asset Management

Validation Services (GAMP)

- Auditing and consultation
- Validation to GAMP® guidelines & 21 CFR Part 11 requirements
- Documentation services for validation include:
 - User requirements, functional specification and design specifications
 - System build
 - Installation, operational and performance qualifications
- Services to maintain the validated state including:
 - Calibration
 - Like-for-like parts management to minimize revalidation effort— System build
 - Controlled installation of patches and upgrades
 - System operation and administration
 - Training for system operators and administrators

Accredited Services

- Calibration: electrical, pressure, time, temperature and humidity
- Thermal Uniformity Surveys (TUS): ovens, furnaces, freezers, chambers and System Accuracy Tests (SAT)

Commissioning and Troubleshooting

Our commissioning services include everything from configuring an instrument before it is shipped, through to on-site installation, startup support and process optimization. During this process your staff can be trained on the configuration and operator routine. Our engineers can work alone, or alongside your plant engineering staff to reduce training costs and enable valuable knowledge transfer.

Refurbishing existing panels to upgrade the control and acquisition equipment is becoming increasingly popular. The Eurotherm engineer will take control of the complete project including panel and wiring modifications. This can provide a cost efficient method of gaining compliance to regulatory standards from ANSI, NADCAP and FDA.



Technical Support Services and Training

- Customized Service Level Agreements, including:
 - Breakdown: 24hr cover 7 days a week including response to site
 - Parts management, including bonded spares placed on site
 - Preventative maintenance and health checks
 - Remote diagnostic support
 - Backups and recovery
 - Software and application support
 - Global Support
- Free telephone and web based support via a dedicated help desk
- Extended warranties available
- Loop tuning and optimization
- Business continuity plans
- Repair option
 - Premium: 24hr from receipt of module
 - Express: 3 working days from receipt of module
 - Standard: 5 Working days from receipt of module
 - Upgrades, calibration, refurbished equipment for sale

Process Optimization

Most businesses are driving down hard on costs and striving to improve performance. We can play a role in this process by bringing experienced engineers to your site, auditing your processes and identifying possible improvements. Monitoring equipment can be installed to benchmark performance and costs, to create a baseline upon which the improvements can be measured. Solutions can range from simple enhancements, re-commissioning or possibly taking a completely fresh approach to the control solution. Typically, this work is completed when new projects are undertaken, but applying the experience of our engineers has the potential to improve the plant productivity at any time.

Eurotherm PAC Application Domains

Glass | Chemical | Life Sciences | Semiconductor | Metals processing
Oil & Gas | Water & Waste Water Treatment | Power Generation
Scientific Research Applications | Food & Beverage | Industrial Boilers
Mining | Aerospace & Automotive Heat Treatment



Reactors • Ovens • Melting and Refining • Petrochemicals • Smelting and Milling • Filtration
Batch processing • Steam Generation • Annealing • Environmental Monitoring Systems
Sterilization • Clean in Place • Incubation • Boilers • Climatic Chambers • Autoclaves
Separators • Industrial Distillation • Extrusion • Industrial Furnaces • Disinfection Processes
Purification • Specialist Machines and Test Equipment • Mixers and Agitators • Drying

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