EUROTHERM FLEXIBLE SOLUTIONS

2500

UNIT CONTROLLER

*FOR INTELLIGENT DATA ACQUISITION
AND PRECISION CONTROL APPLICATIONS*

invensys
EUROTHERM

The 2500 modular control concept from Eurotherm offers expanded system functionality

The 2500 is a unique concept combining the integrity of Eurotherm's discrete control range with easy access to fully integrated systems functionality. Scalability in size and capability, plus distribution of control and acquisition are all available in this behind the panel, cost effective package.

The 2500 easily combines with modern PLCs, SCADA displays and control systems.

Intelligent Data Acquisition

■ Channel to channel isolation for reliable operation in industrial environments

■ Standard and custom linearisations for measurement flexibility

The modularity of the 2500 makes it easier to create a system with just the correct mix of inputs and outputs. This enables the distribution of the data acquisition equipment physically and saves the cost of expensive multi-core or compensation cables. Up to sixteen 2500 base units may be interconnected on a single communications line, to provide sophisticated, distributed, multi-loop control or data acquisition capabilities.

Signal Conditioning

■ Custom linearisation

■ High/Low signal select

■ First Order Filter

■ Combinational Logic

■ Mathematical functions

As a signal conditioning unit, the 2500 can be configured to solve complex signal conditioning problems, such as selecting and averaging inputs before retransmitting the result. The 2500 gives programmable linking of analogue and digital inputs and outputs while offering high-speed, industrial standard, serial communications to suit your data acquisition requirements.

Alarm Monitoring

■ Eight alarms per input module

■ Assignable user alarm functions

■ Absolute, deviation and rate of change types

■ Diagnostic alarms and local error indication

In this comprehensive package, alarm outputs (contact trips) may be triggered by process or calculated variables. Calculated variables can be derived from a comprehensive library of maths and boolean functions. Alarms can be triggered by crossing a high or low threshold, deviation from another input or from a calculated value. Alarms may also be triggered on a rate of change basis.

A uniquely flexible concept . . .

- and outstanding user benefits

- **Modular concept ensures optimum flexibility**
- **Add advanced PID control to PLC installations**
- **Reduced wiring costs, simpler control panels**
- **Easy to configure, quick to install**
- **Suitable for simple and complex applications**
- **A stand-alone system or in conjunction with dedicated SCADA**

Enhanced Control Outputs

- Continuous analogue
- Time proportioned
- Motor valve control - VP bounded and unbounded
- Combinational heat cool

Advanced combinational PID algorithms provide a choice of analogue, time proportioned or advanced motor drive outputs, providing a solution to all your control problems.

Advanced Multi-loop Control

- Proven Eurotherm Control performance
- 2 ,4, 8 loop versions
- Simple, Cascade, Ratio and Override loop types
- Automatic PID tuning removing the need for control expertise

The 2500 brings you scalable, distributed control with proven performance you can rely on. Control algorithm design is based on more than 40 years of temperature and process control market leadership.

Life Sciences

Heat Treatment

Glass

Plastics

Water

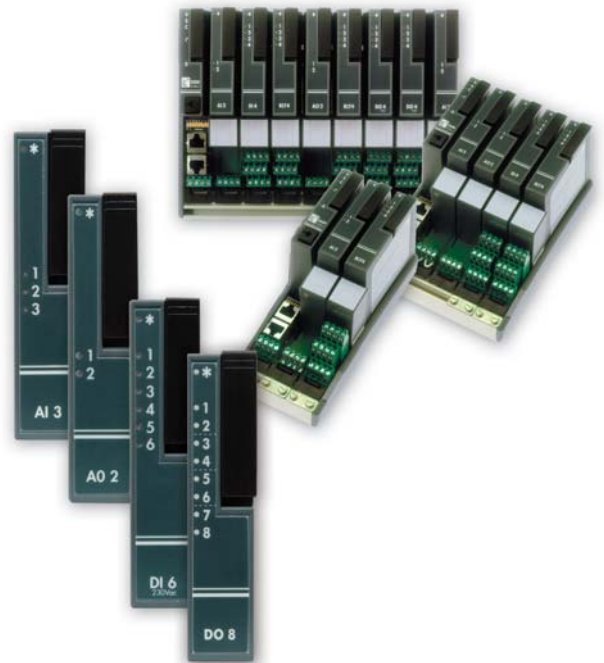*. . . in temperature and process control*

The easy and economical way to build a distributed process control system, tailored to your needs

Six base sizes allow for cost effective acquisition of up to 64 analogue or 128 digital inputs or outputs. The bases take up to 16 plug-in I/O modules and provide the flexibility for DIN rail or panel mounting. The 2500 can then be distributed where the control action is required; reducing wiring costs as only twisted pair communication cable need be taken to the user interface or PLC.

Analogue I/O

- Universal analogue input: T/C, RTD, Pot, 0-100mV 0-10vdc, 4-20mA
- 4-20mA with isolated 24v supply
- Analogue outputs for re-transmission or control
- LEDs indicate sensor fail
- Test disconnects

A unique input circuit incorporates digital filtering (Delta-Sigma filter), to ensure the high stability, accuracy and resolution expected from a Eurotherm product. The I/O provides open and short circuit monitoring and sensor fail action for most input measurements. High accuracy analogue outputs meet the most exacting demands of modern industry.

Digital I/O

- Contact sense and logic inputs
- Logic and relay outputs
- LEDs provide direct feedback of I/O state
- Channel to channel isolation

Output modules provide user selectable actions for on/off, time proportioned or valve position outputs. Intelligence in the output modules enables the 2500 to calculate the output timing with a higher resolution than the nominal 110m second scan rate (TPO 10mS and VP 55mS).

Inputs and outputs share a common, comprehensive alarm capability.

A uniquely flexible concept . . .
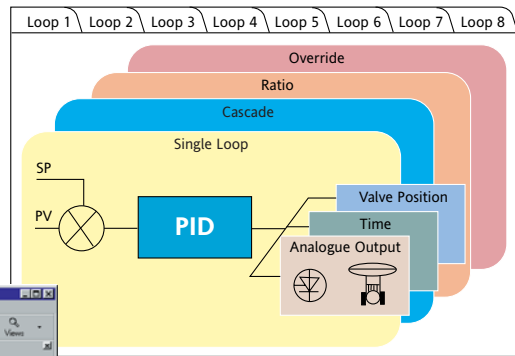
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Customised Control to meet your requirements

- Easy multi-loop control

- Built in ramp function for profile applications

- Advanced overshoot protection

- Giving the best possible control for the widest range of applications
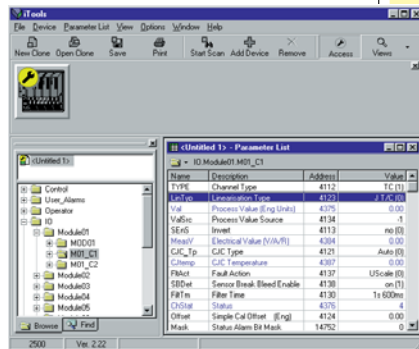
The control capability of the 2500 offers up to eight control blocks; each block capable of on/off, single loop, cascade, ratio, or override control.

Easy interconnection between loops makes the 2500 simplicity itself to configure for all normal control applications. Utilising the advanced toolkit and other specialist block functions, you can easily provide understandable solutions to the most complex control problems.

Open Communications for integration flexibility

- Modbus

- Profibus™ DP

- DeviceNet™

- Ethernet

With four performance levels (data acquisition, alarm monitoring, signal conditioning and multiloop control) and six base sizes, you can select the ideal combination of capability and size for your application. However, the ease of integration of the 2500 goes much further as it directly supports a wide range of open, industry standard communications interfaces. These enable easy connection to supervisory computers, PLCs and other host systems. Up to 16 2500 base units may be interconnected, to provide distributed multi-loop control or data acquisition networks. The 2500 can share the communications bus with other devices such as discrete controllers, indicators, chart recorders and drives.

. . . in signal conditioning and control

- **Advanced PID for PLCs**

- **Dependable, accurate process control**

- **A powerful system built from standard modules**

- **Hot Swap - Reduced downtime, higher productivity**

Tablet Coating

Sealed Quench Furnace

Annealing Lehr

Extrusion Control

Remote Data Logging

Eurotherm – helping industry get the most out of advanced measurement and control techniques

Behind the design of Eurotherm's 2500 I/O system are over 40 years of hard-earned applications experience in temperature and process control. This experience is available every time you contact Eurotherm for technical advice or product information. With well-trained experienced regional engineers throughout many countries, we are only a telephone call away from helping you solve your next measurement or control challenge.
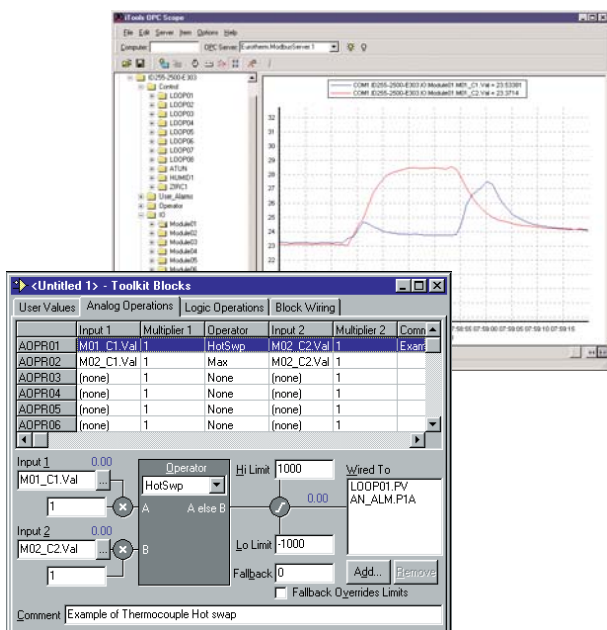
Configuration Tools

- Automatic network node identification

- Easy connectivity - 'drag and drop'

- Clone file load, save and verify

- Application documentation

"iTools", a Windows based PC configuration package, is used to configure and store the I/O and PID parameters as well as commission your process.

A helpful multi-window browse-able format provides rapid access to inputs, outputs, alarms PID and Toolkit mathematical functions.

A custom sensor linearisation tool lets you download up to three special sensor characteristics for use within the acquisition, alarm or control strategy.

Easy Commissioning

- OPC compliant

- Supports DDE - access to other Windows packages

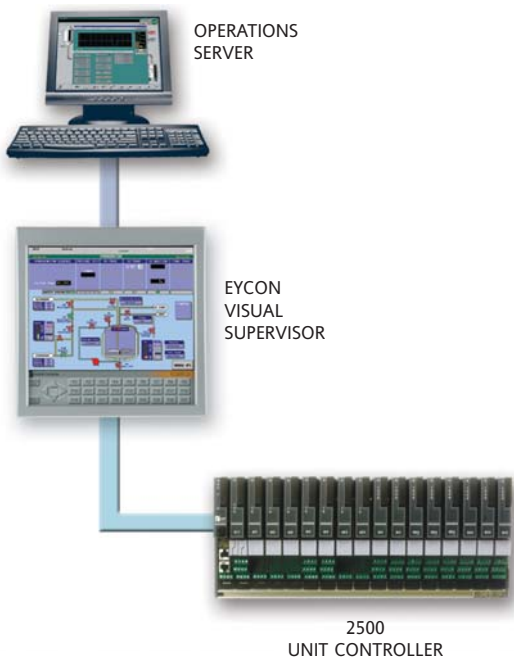- Real time trending and logging

- Variable scan rate

Combined with the iTools OPC server, OPC SCOPE – a powerful trending and logging package, facilitates easy commissioning by providing clear visibility of process variables through multiple time base windows.

Toolkit Block Functions

- Humidity calculation

- Carbon potential

- Math functions

- Hot swap, signal select...

- Logic

Libraries of special 'Toolkit' function blocks provide the 2500 with more than just the expected high standard of I/O and control. 'Toolkit blocks' execute the mathematical or logical expressions required in creating an application. The functions are easily parameterised with iTools and are wired together using 'drag and drop' techniques. This simplifies the creation of complex applications.

A uniquely flexible concept . . .

OPERATIONS
SERVER

EYCON
VISUAL
SUPERVISOR

2500
UNIT CONTROLLER

- Fast delivery
- Expandable - only pay for the I/O you need
- World wide support
- High density
- High MTBF – fault tolerant
- 3 Year Warranty - low cost of ownership

Future proof solutions - whatever your application

- Remote I/O
- Alarm monitoring
- Signal conditioning
- Distributed multi- loop Control

Designed to meet the ever-growing expectations of tomorrow's industry, the 2500 provides a powerful and flexible I/O system that enables the distribution of acquisition and intelligence to the working end of the process.

This, and world-beating applications knowledge and support from Eurotherm, combine to save you both time and money.

- Scalable solutions - grow as you go
- Control solutions from Eurotherm

The 2500 exceeds today's rigorous industrial requirements for temperature, vibration and humidity and fulfils all relevant CE requirements.

Fermentation

Freeze Drying

Furnace Atmosphere Control

Gas Carburising

Environmental Monitoring

. . . for easier system integration

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Series 2500 specifications

		Acquisition	Toolkit	Control Loop Blocks	2 Way	4 Way	8 Way	10 Way	12 Way	16 Way
					Maximum Number of Channels per Base					
I/O Types	AI2	TC, PRT, POT, Volts, mV, mA			4	8	16	20	24	32
	AI3	4 to 20mA with isolated 24 vdc supply			6	12	24	30	36	48
	AI4	T/C, mV, mA			8	16	32	40	48	64
	A02	0 to10V dc or 0/4 to 20mA			4	8	16	20	24	32
	DI4	Logic or Contact sense			8	16	32	40	48	64
	DI6_MV	ac mains input 115V rms			12	24	32	60	72	96
	DI6_HV	ac mains input 230V rms			12	24	32	60	72	96
	DI8_LG	Logic			16	32	64	80	96	128
	DI8_CO	Contact			16	32	64	80	96	128
	DO4_LG	Externally powered 10mA			8	16	32	40	48	64
	D04_24	Externally powered 100mA			8	16	32	40	48	64
	RLY4	3 x N/O, 1 x C/O			8	16	32	40	48	64
Alarm Functions	Analogue module	8 per module	8 per module	8 per module	IS4 High absolute, 4 Low absolute assignable to any channel in the module					
	Digital module	8 per module	8 per module	8 per module	IStru, ISfalse, GOtrue, GOfalse and Change alarms. Alarms mask, Inhibit and Blocking					
	User function block	4 per base	4 per base	4 per base	Deviation high, Deviation low, Deviation band, Rate of change. All with separate hysteresis					
	Alarm modes				Latching or non-latching. Alarm Blocking					
Calculation Function	Mathematicals		16	16	Add, Subtract, Multiply, Divide, Absolute difference, Maximum Minimum, Sample and hold, Power, Square root, Log, Ln					
Exponential	Logic functions		16	16	AND, OR, XOR, Latch, Equal, Not equal, Greater than, Less than, Greater than or equal to, less than or equal to					
	Carbon potential		1	1	Sooting Alarm, Automatic Probe Cleaning, Endothermic Gas Connection.					
	Humidity		1	1	Wet and dry bulb measurement technique					
Control	Control loops			Up to 8	On/Off single PID, Cascaded PID, Ratio Control or Override Control					
	Control algorithms				Linear, Water, Fan, Oil					
	Control outputs			Up to 2	Analogue, Time Proportioned or Motorised Valve control with or without feedback potentiometer					
	No. of PID sets			3						
	Auto/manual control			y	Bumpless transfer or forced manual output available.					
	Setpoint rate limit			Each loop	Ramp in units per sec. per minimum or per hour.					
	Motorised valve control			y	Vp bounded and unbounded					
	Tuning			y	One-shot Auto tune or Manual					
	Loop alarms			4 per PID block	High absolute, Low absolute, Deviation high, Deviation low, Deviation band, Rate of change. All with separate hysteresis					
Communications	Modbus	y	y	y	Jumper selectable 2 or 4 wire RS485, 2 x RJ45					
	Profibus – DPv1	y	y	y	High speed RS485. Up to 12Mb/s, 9 pin D-type connector or 2 x RJ45					
	Ethernet (Modbus TCP)	y	y	y						
	DeviceNet	y	y	y						
Configuration	iTools	Windows 2000, XP, (4.0): Minimum recommended platform								

Eurotherm: International sales and service

Understanding and providing local support is a key part of Eurotherm's 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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