Eurotherm T2550 Process Automation Controller (PAC)

High performance control in a versatile, modular system

Benefits

Precision control, advanced data security, energy management, and flexible I/O combined with powerful programmable application capability supports the development of systems that can easily integrate with existing platforms and 3rd party equipment as required.

The Eurotherm T2550 PAC product is designed with built-in functionality that reflects our core technology and application expertise – reducing engineering effort, helping to provide systems that are delivered on time and work first time.

- High-performance control in a versatile modular system
- Proven control algorithms already packaged and implemented where you need them
- Energy management solutions
- Embedded technologies to help meet requirements such as FDA 21 CFR Part 11 and AMS2750 without additional engineering

Key features

- Flexible modular I/O
- Cost-effective high availability options that don't require expensive engineering
- Point of measurement, tamper-resistant, redundant data recording
- Integrated batch management
- Distributed control and recording environment
- Integration with HMI visualisation software
- IEC based programming tools

eurotherm.com/t2550

WATLOW®
Powered by Possibility

Eurotherm T2550 PAC

Product overview

The Eurotherm T2550 PAC System enables accurate and repeatable process control and information recording with complete redundancy options for improved availability.

Non-stop control and data acquisition is essential in today's competitive manufacturing environment. Regardless of the state of the surrounding environment, your process is able to run continuously without data loss which can mean the difference between a successful production run and an expensive scrap or rework.

The T2550 Programmable Automation Controller (PAC) is a high performance solution 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, and sequential control, combined with tamper-resistant data recording at point of measurement – all designed to maximize your return on investment.

Maximize process uptime

Using the in-built high availability features of the T2550 PAC reduces engineering costs and helps to maximize process uptime. Controller redundancy is automatically commissioned – simply plug the additional processor module into the redundant base and press synchronize – no special cabling or engineering is required. 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, for any reason, can be done with the power on – and initialization is automatic. These powerful features combine with the high MTBF of the system's I/O and passive backplanes to provide extremely high system availability.

The T2550 PAC also supports online reconfiguration and online monitoring for all continuous and logic control functions. With support for adding and hot swapping I/O modules, active strategy components can be modified to support system enhancements without the need for a shutdown.

Redundant data recording

The T2550 PAC provides tamper-resistant data recording at point of measurement. This powerful feature is offered with redundancy simply by plugging in the additional processor module. Again, no additional engineering is required as the system synchronizes itself. The data is held in non-volatile memory and is in a proprietary format designed to resist tampering. If your data has value to you, the T2550 PAC combines simplicity and capability to bring a compelling offer to the process control market place.

Autonomous and integrated, scalable, and distributed

The T2550 PAC provides a comprehensive standalone solution or a powerful addition to a wider system. Communicating over 10/100Base-T Ethernet (ELIN), its peer-to-peer communications system can be used for interlocking, signal conditioning, alarm monitoring, remote data acquisition, or devolved control. The T2550 PAC supports Modbus TCP, serial Modbus RTU (both as master or slave), Profibus slave, simple customer specific protocols, and OPC. The T2550 PAC can be used in conjunction with other systems such as PC based SCADA packages, Programmable Logic Controllers, and Eycon visual supervisor, or can provide an effective standalone solution.

A range of DIN rail mounting base sizes is available for I/O modules and serial communication interfaces. Multiple bases can be easily interconnected so processors can share interlocking, acquisition, and multi-loop control solutions in distributed and larger scale applications.

Scalable control units match process hierarchy

The modular nature and seamless interaction of ELIN based control units allow both physical distribution and adoption of a structured control methodology.

T2550 programmable automation controller

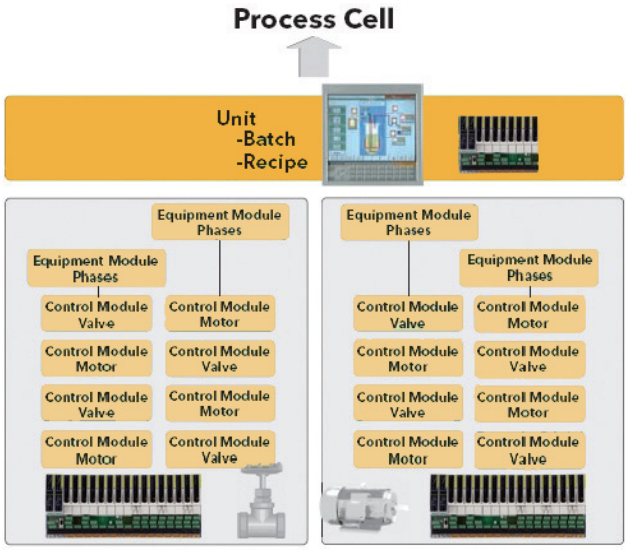
Each T2550 PAC base is capable of analog, logic, and sequence control and is self-contained up to a capacity of 128 I/O points. Larger systems can be easily implemented by interconnecting multiple T2550 PAC base units to form a distributed system utilizing the peer-to- peer communications.

Alternative Ethernet and serial communications protocols are available to facilitate simple connection to other equipment.

Devices supporting their own serial protocol can be connected to the T2550 PAC using the open communications (raw communications) option.

T2550 PAC unit supervisor

Large systems or complex sequence and batch applications are treated in a 'layered' fashion by decoupling the front-end, closed loop control and its associated I/O and control modules (logical devices) from the main strategy. This follows the S88.01 standard for batch control and is achieved by assigning the role of strategy coordination to the 'short' version of the T2550 PAC. This T2550 PAC, which uses the same processor as the standard controller has no I/O and provides coordination and sequence control of the lower level elements.



Eurotherm T2550 PAC

Redundant processing

Using the T2550 PAC as a redundant controller pair automatically improves your process resilience to an individual controller or communications malfunction. If an issue is detected with external or field I/O communications to the active controller, or the active controller itself detects an issue, then the secondary controller automatically takes over, providing uninterrupted control and bumpless transfer of the communications, process I/O, and data historian. An alarm alerts the operator that the changeover event has occurred.

A processor can be replaced for any reason with the power on. Commissioning a redundant capable processor is simple: Plug the second processor into a redundant base unit and press synchronize – all the rest is automatic. No special cabling is required.

Continuous and logic control

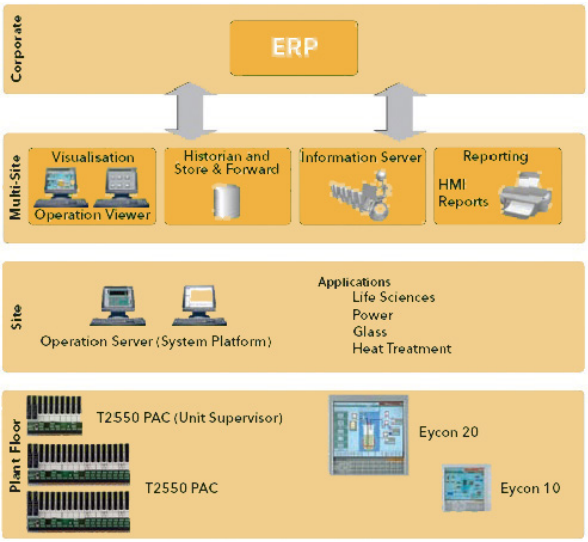
The T2550 PAC supports the level of block structuring normally only found in advanced DCS systems. The continuous strategy is built up by interconnection of function blocks from a rich library of analog and logic elements.

Sequence control

Sequences act in a supervisory role relative to the continuous database and can be loaded and unloaded independently. This is increasingly important for batch sequences, which relate to the process rather than the physical equipment, as these are regularly changed to meet the requirement of flexible plants. The capacity of the local filing system allows storage of a large number of sequences. Their operation is controlled through specialized blocks in the continuous database.

ELIN system architecture

ELIN is Ethernet based Local Instrument Network. The ELIN control network is the backbone of the control and data acquisition network that provides peer-to-peer communications between control nodes and seamless access to all data by operator and configuration workstations.



All nodes appear as part of a coherent distributed database. The database in any networked element is accessible to any other network element, allowing complete flexibility in strategy interconnection.

ELIN supports OPC with a readily available server for direct connection to operator and configuration workstations. It also supports the Eycon visual supervisor and other Eurotherm control and logging units in which standalone or panel-mounted display and control is needed. Remote monitoring, diagnostics, and application enhancement is available using off site communications, which should be included in any cybersecurity risk assessment.

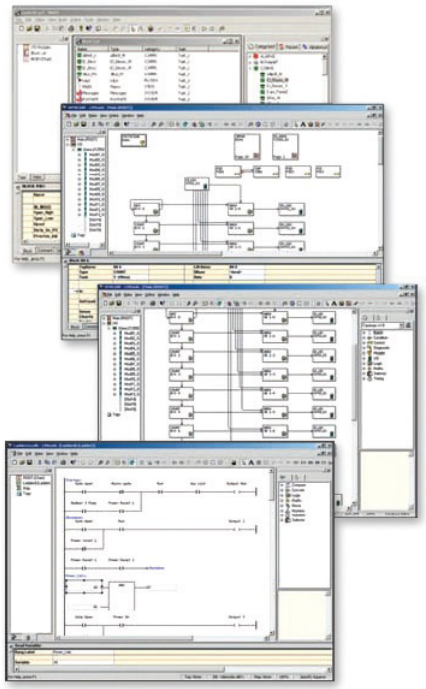
Configuration

At the heart of the system is the LINtools configuration and engineering station. LINtools is a comprehensive set of configuration, test, documentation, and commissioning tools for strategy elements distributed over the LIN control backbone.

The LINtools suite includes graphical configuration of block structured continuous control, sequence control SFCs, ladder, and graphics for any LIN based product. View and Online reconfiguration modes allow dynamic monitoring and editing of running databases and flow charts.

LINtools follows the IEC 61131-3 standard for sequence configuration, while adopting a decoupling of continuous and sequential strategy appropriate to complex process control.

LINtools is designed for simplicity and productivity. Online help, free-format text annotation, and area editing are included to make LINtools easy to use. LINtools runs on a standalone or networked PC.



IEC 61131

Languages appropriate for the I/O type and for the application are:

- Function block diagrams
- Structured text
- Sequence function charts
- Ladder logic control

Eurotherm T2550 PAC

Online reconfiguration

Large and complex control systems are expected to serve many needs and perform for long periods without shutdown under ever varying workloads. Online reconfiguration provides a useful foundation for enhancement of a deployed control system and allows modification of the systems application software while it is running. It allows active strategy components to be modified, wrapped with additional functionality, or replaced with a different implementation. The T2550 PAC has generic support for adding and hot swapping I/O. Online reconfiguration can use the same or new I/O interfaces and any internally available variables. You can tentatively 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 test the strategy to verify that it is correct before final application.

Continuous control

Continuous strategies are configured graphically on screen using ‘block structured’ techniques implemented across the system. The control configurator supports a comprehensive library of functions together with powerful editing and compound definition facilities. Merging allows the re-use of similar sections of databases, avoiding duplication of effort. Free text can be placed on the screen or attached to function blocks for simple production of descriptive documentation. Context-sensitive help reduces the need of referring to manuals.

Sequence

Sequences are configured graphically using Sequential Function Charts (SFCs) following the IEC 61131-3 standard. Steps initiate Actions which may be Structured Text statements (ST) or nested SFCs. Transitions determine when control passes from one step to the next. By accessing the continuous control strategy this configurator presents the available points through a menu system thus removing the need to remember the names of points and reducing the likelihood of typing errors.

The sequence configurator supports text annotation and context sensitive help. A combination of mapping lists and generic Sequential Function Charts are available to easily duplicate identical SFC models on different units (tags).

Action block

Action blocks in the continuous control strategy have their functionality defined in Ladder diagrams or Structured Text (ST) within a standard template. These are particularly useful for implementation of plant control modules.

Documentation

LINtools provides an electronic documentation facility including the graphical representation of the control strategy and a listing of the block parameters and connections. This can be transferred across the network and output can be to a printer, Postscript, or AutoCAD compatible format. Free-format user annotations can be added to complete your documentation requirements.

Multi-setpoint programmer

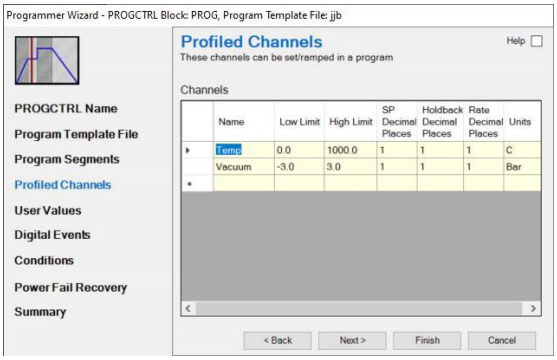
Many applications need to vary the process value over time: Temperature control is one such application in which it is very common to ‘ramp’ the process value from one level to another over a set time period using a setpoint program.

The T2550 PAC provides support for multiple setpoint programs that can be run simultaneously. Each program is capable of profiling up to eight channels, with up to 32 segments per profiled channel. In addition to controlling the setpoint during each segment of the profile, the controllers can also be used to activate up to 16 digital events during a segment.

The setpoint program feature enables an operator to select and run a pre-configured setpoint program. A preview facility allows the operator to view the selected program before running it. Once the program is running, the setpoint and achieved process values are both plotted on the trend screen.

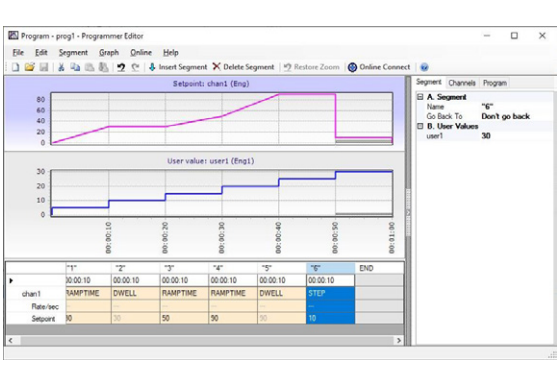
Setpoint program wizard

For ease of use, LINtools incorporates a wizard for creating a setpoint program. By following the on-screen prompts and editing the parameters as required, a setpoint program can be simply and quickly created with all required blocks automatically created and added to the database.



Setpoint program editor

In addition to the setpoint program wizard, programs can be created or edited off–line using the setpoint program editor supplied with LINtools. As an ActiveX, this tool can be inserted into any of your visualization packages.



Eurotherm T2550 PAC

Redundant recording and archiving

The T2550 PAC has non-volatile flash memory for tamper-resistant data storage, and provision of redundant data logging. In addition all PAC processors support Ethernet connectivity. As such, data stored within the internal flash memory can be configured to periodically archive to primary, secondary, and tertiary FTP servers. Archiving files to FTP servers provides a continuous archiving capacity..

Data historian

Data historian is used to store process variables, messages and alarm information in the internal flash memory in order to generate historical data in the form of a set of tamper-resistant history files. The following example provides estimated memory duration based on an 8-way base logging 16 parameters to a single group:

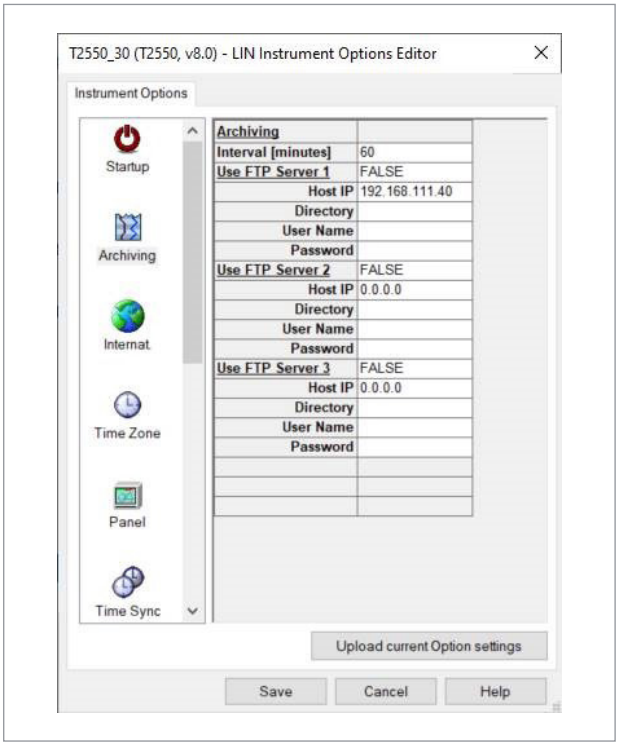
Recording interval	Estimated data storage duration	
(update A)	min/max Off	min/max On
1s	60 hrs	31 hrs
5s	12 days	6 days
10s	25 days	13 days
20s	50 days	26 days
60s	150 days	77 days

FTP push

For efficiency, historical data files are automatically deleted on a first in first out (FIFO) basis from the internal flash memory of the T2550 PAC (7Mb for history). In order to provide longevity of data the T2550 PAC is able to push historical data files (.uhh) to primary, secondary, or tertiary FTP servers at user defined intervals. Thus, depending on the archive strategy chosen, historical data can be retained.

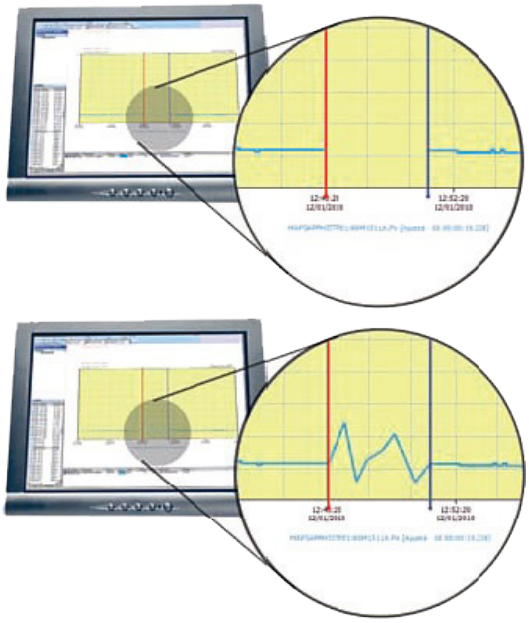
Data archiving

Data archiving is used to copy selected parts of the history, i.e. one or more history files (.uhh) to primary, secondary, or tertiary FTP Servers.



Historian Store and Forward technology

'Store and Forward' is a self healing 21 CFR Part 11 data archiving system which automatically stores data during a communication in the T2550 PAC hardware and then forwards this data to the configured data historian server once communication is reinstated.The T2550 PAC provides dual redundant data acquisition using tamper-resistant (.uhh) files created at the local level, which results in an electronic recording system with data integrity.



Alarm management

Alarms are managed and collected within the T2550 PAC to provide features such as alarm status and priority, acknowledgement, date, and time-stamping at the source, as well as suppression and local message historian storage.

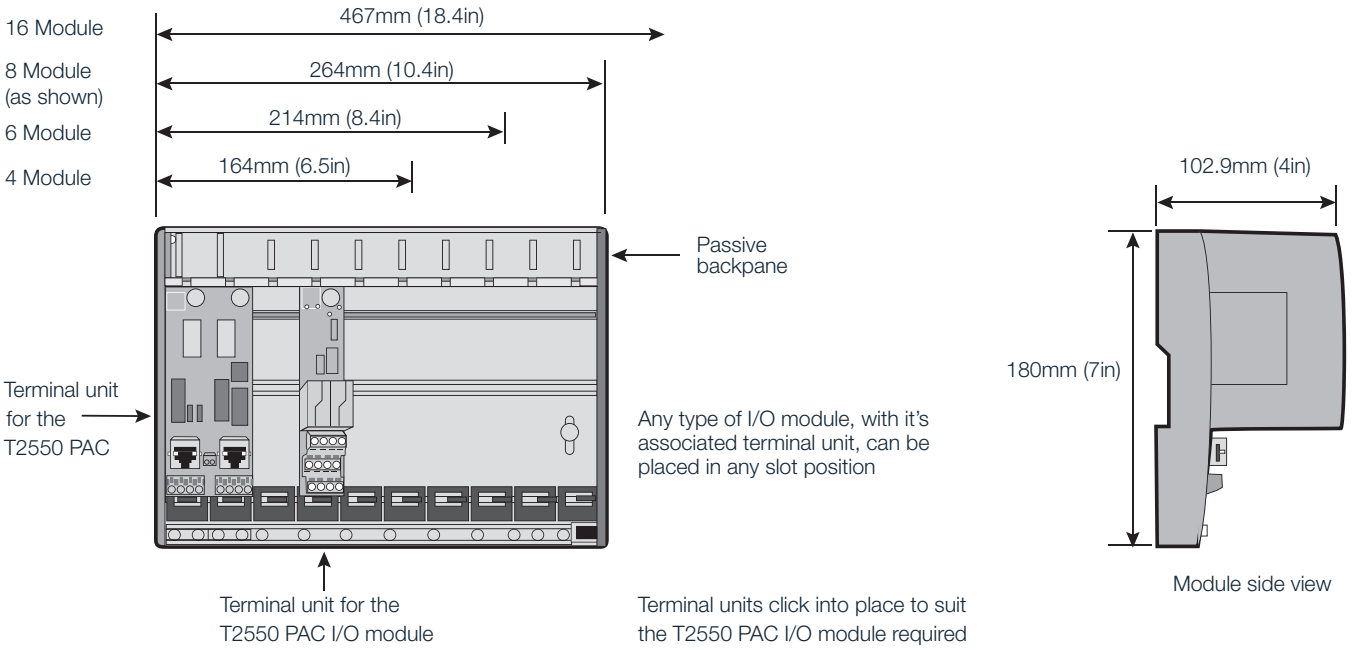
Open communications

The T2550 PAC provides a special function block to define any simple serial communications protocol. This function block can be used to integrate many 3rd party devices which use ASCII communications, such as bar code readers and particle counters. Direct control over transmit and receive also allows multi-node connections.

HMI reports

HMI reports provides an intuitive reporting package to develop and print reports using the data from the T2550 PAC. The package includes a report studio for configuring report projects and a run-time execution module to generate and print reports in many different formats to printers, file servers, and via email. HMI reports is also optionally available as a web portal.

Specifications



T2550B base unit

The base unit is fitted with the T2550 PAC I/O controller modules plus additional I/O modules. These modules plug onto terminal units, which provide the wiring interface between the plant or machine and the I/O modules. Bases are available in 5 sizes to suit the number of modules required in a particular system.

Communication between the I/O modules and the processor is effected by the use of a passive internal module I/O bus running the width of the base.

Each module position is tracked separately for additional security during live replacement of I/O modules.

The base consists of an aluminium extrusion, the internal I/O bus, and mounting supports. It is designed to be DIN rail mounted or directly fixed to a bulkhead or mounting plate. Both base and modules can be installed horizontally or vertically.

Mechanical										
I/O module capacity	0 module base		4 module base		6 module base		8 module base		16 module base	
Width	36mm	1.4in	164mm	6.5in	214mm	8.4in	264mm	10.4in	467	18.4in
Weight (no modules)	0.2Kg	0.4lb	0.45Kg	0.9lb	0.6Kg	1.3lb	0.7Kg	1.5lb	1.2Kg	2.6lb
Width (all modules)	0.5Kg	1.1lb	1.3Kg	2.8lb	1.7Kg	3.7lb	2.1Kg	4.6lb	3.7Kg	8.1lb
Height	180mm (7 in)									
Depth	103mm (4 in), or 133mm (5.2 in) with retaining lever raised.									
Mounting	DIN rail or bulkhead, can be mounted horizontally or vertically									
DIN rail	Use symmetrical DIN rail to EN50022 – 35mm x 7.5mm or 35mm x 15mm (1.4" x 0.3" or 1.4" x 0.6")									
Casing	Without additional protection IP20									
Ventilation space	25mm (1 in) free space above and below									

Specifications

Termination units

The I/O modules are mounted on the base using terminal assemblies. Terminal assemblies provide the interface between the input and output signals and the I/O modules. Terminal assemblies and I/O modules are keyed to inhibit insertion of the incorrect module to reduce risk of damage to both equipment and plant.

Individual termination units provide for easy module replacement leaving the field wiring connected. Modules are inserted and removed from the termination unit using a unique, tool-less, locking lever system.

Test disconnect units

Terminal assemblies have an optional fuse or link (isolator or disconnect). This provides a series of connections between the customer terminals and the I/O module, permitting pluggable fuse or link units to be placed in series with the signal. Fuse and link units are not interchangeable.

Base unit order code

1	Model
T2550B	Base unit for Redundancy Process Controller

2	Base size
16R	2 processor slots, 16 I/O positions
08R	2 processor slots, 8 I/O positions
06R	2 processor slots, 6 I/O positions
04R	2 processor slots, 4 I/O positions
00S	1 processor slot, No I/O positions

3	Earthing system
None	Two earth clamps fitted
C16	Earth clamps for 16 I/O base
C08	Earth clamps for 8 I/O base
C06	Earth clamps for 6 I/O base
C04	Earth clamps for 4 I/O base

T2550 PAC general specifications

General	
Supply voltage range	19.2 to 28.8V dc
VA requirements	< 80W maximum for fully loaded rack
Fuse rating	4A time lag (Not customer replaceable)
IOC warm start time	1 hour without external batteries
IOC power consumption	1.5W maximum
Surge current	8A maximum
Module power consumption	See individual module specification
Environmental	
Operating temperature	0 to 55°C (32°F to 131°F)
Storage temperature	-25 to 85°C (-13°F to 185°F)
Relative humidity	5 to 95% (non-condensing)
RFI	
EMC emissions	BS EN61326 2002-02
EMC immunity	BS EN61326 2002-02
Safety	
	BS EN61010-1/A2;19931995 Installation cat II, Pollution degree 2 Safety earth and screen connections are made to clearly marked earth terminals at the bottom of the base
Vibration	
Vibration	EN60068-2 test FC Vibration: IEC1131-2 section 2.1.3 0.075mm peak amplitude 10-57Hz; 1g, 57-150Hz
Shock	20g static shock
Diagnostic LEDs	
Diagnostic LEDs indicate module diagnostic status.	
All modules	A green LED at the top indicates the module is powered and operating correctly
T2550 PAC analog modules	Have red LEDs for each channel to indicate channel malfunction
T2550 PAC digital modules	Have Yellow LEDs for each channel to indicate the channel state

Processor module	
Primary processor and communications diagnostics are available from the LEDs on the front of the processor module. More advanced diagnostics are available remotely using LINtools monitor online over Ethernet to review the diagnostic blocks.	
T2550 PAC Controller module	A green LED at the top indicates the module is powered and operating correctly
Internal diagnostics	A red LED indicates an issue detected during internal self diagnostic routines
Battery (if installed)	A green LED indicates battery health
Serial communications	A yellow LED indicates communications activity
Duplex	Indicates inter processor communications
Primary/Standby	Two LEDs indicate status information
IP address	A yellow LED indicates if the unit has resolved its IP address for Ethernet communications
Ethernet	Two LEDs indicate link activity
Link speed	10/100Base-T
Power On self tests	On power up the T2550 PAC automatically performs Power On self tests. These are a series of diagnostic tests used to assess the instrument health.
CPU redundancy	
Processor redundancy is available for continuous, logic, and sequence control. A pair of processors operate in primary / secondary configuration with a high speed data link between them providing exact tracking of the control, logic, and sequence databases. Transfer from the primary to secondary processor is bumpless. The non-active processor can be replaced while the system is running and on synchronization it loads its strategy from the active primary processor.	
Redundant	< 0.6s bumpless transfer for processor and I/O
Changeover time	dependant on application size
Synchronisation time	dependant on application size

Specifications

Processor switchover

During a processor switchover all outputs remain at the last value. The new primary processor begins executing the application from precisely the same point as the original processor. Each processor has its own Ethernet IP address and each redundant pair uses two neighboring node addresses on the ELIN network. This enables the system to communicate with the primary while still continuously testing communications to both processors. On processor switchover the ELIN node address is dynamically swapped to allow SCADA applications to display and log uninterrupted data. Switchover amongst LIN nodes is transparent.

The following conditions can cause the processor to switchover:

Hardware alert: Issue detected during primary controller internal health checks.

Hardware removal: Removing the primary processor will cause the secondary to take immediate control. Removing the secondary will have no effect on control but will cause a system alarm on redundant configured systems.

Internal communications: Primary and secondary controllers continually monitor the communications to the I/O, on the local base. Should the primary controller not be able to communicate with the I/O and the secondary can still communicate with the I/O, switchover will occur. If the secondary processor observes an issue in the primary communications or can see more I/O modules, the secondary processor will request a switchover.

External communications: Monitors external controller communications. Should the primary controller not be able to communicate with other declared nodes on the LIN network and the secondary can still communicate with the declared nodes, a switchover will occur. If the secondary processor observes that it can see more declared nodes, the secondary processor will request a switchover.

Manual request: A user can request a switchover if a secondary processor is running, synchronized and healthy.

Removable SD memory card: The storage of the cold start application files, the processor firmware and software license code is on an SD flash card to enable easy transfer from one processor to a replacement.

Physical	
CPU	Motorola MPC852T
Bus size	32 bit
System clock	66 MHz
Removable flash card size	32 Mbytes
Control switches Processor front panel Watchdog reset. Processor-synchronization/push button switches: Switchover. Processor resynchronization.	

Power supply connection	
The duplex terminal unit supports dual power supply connection. In the event of a single power supply failure both processors are still supplied allowing redundant operation to continue uninterrupted. To facilitate hot start of the processors, a super capacitor maintains memory for up to 1 hour in the event of complete power failure	
Super cap (Processor)	Maintains memory/real time clock and enables hot start for up to 1 hour
Simplex (O base)	Battery support for data in SRAM and the Real-Time Clock for a minimum of 72 hour continuous (5 year intermittent use)
Redundant	Additional terminals for an external battery connection to support SRAM and the Real-Time Clock

Watchdog relays	
Each processor is fitted with a single watchdog relay.	
Watchdog relay	SPST, 1 per CPU, connectable in parallel or series
Contact rating (resistive)	24V ac/dc at 0.5A
Isolation	30V ac rms or 60V dc
Live plug-in	
Processors and I/O modules can be replaced while powered without any disturbance to the field wiring or other inputs and outputs – reducing downtime and minimizing disturbance to other signal conditioning strategies.	

T2550 PAC I/O, C Order code

1	Basic product
T2550	Programmable Automation Controller

2	IOC and software (L = standard license D = data logging)			
	Foundation	**Standard**	**Control**	**Advanced**
L10/D10	Unbounded	0	0	off
L20/D20	Unbounded	50	4	off
L30/D30	Unbounded	100	8	off
L40/D40	Unbounded	Unbounded	12	off
L50/D50	Unbounded	Unbounded	16	off
L60/D60	Unbounded	Unbounded	24	off
L70/D70	Unbounded	Unbounded	32	off
L80/D80	Unbounded	Unbounded	Unbounded	off
L90/D90	Unbounded	Unbounded	Unbounded	on

3	Card size
F32	32MB Flash (SD) Card

4	Ethernet communications protocol
ELIN	Ethernet Local Instrument Network (LIN) , FTP, SNTP, Modbus Slave
MB-TCPM	Modbus-TCP Master communications (also includes ELIN)

5	Serial communications protocol
SERIAL	HMI & Raw Comms (non isolated)
MB	Modbus Master Comms (non isolated)
PROFIBUS	Profibus DP or DPv1 Comms

T2550T Terminal Unit for PAC IOC Order code

1	Model
T2550T	Terminal Unit for IO Controller

2	Terminal unit type
IOC	Terminal Unit for IOC

3	Type
R	Dual width for Redundancy
S	Single width for Simplex

4	Comms connector type
RJ45	RJ45 Connector
9DTYPE	9 Pin D Type Connector

5	Battery
NONE	No Battery Fitted
B1	Single Battery

Specifications

Control specifications	
Continuous database resources	
Maximum database size	default max values 210k bytes
Database resources	
Number of database blocks	630
Number of database templates	50
Number of template libraries	32
Number of external databases	32
Number blocks in local dbase cached elsewhere	1260
Number blocks in remote dbases cached locally	315
Number of server tasks	6
Number of field-to-field connections	1260
Sequence control resources	
Sequence memory programme data	105k bytes
SFC resources	
Number of root SFCs loadable	31
Number of steps loadable	420
Number of 'wires' permitted going into and out of step	1407
Number of 'wires' permitted going into transitions	840
Number of action associations.	1680
Number of actions	840
User tasks	
Multiple tasks are available to the user to tune the update rate of I/O response and the control function.	
User Tasks	4
User task update rates	
Task I – Synchronous to fast I/O	10ms or N*10ms
Only version 2 10ms I/O types can be assigned to this task (see table)	
Task 2 – Auxiliary task to task1	10ms or N*10ms
Runs at task 1 rate or integer multiple of task 1 rate	
Task 3 – Synchronous to Standard I/O	110ms or N*110ms
All analog and digital I/O types can be assigned to this task	
Task 4 – Auxiliary task to task3	110ms or N*110ms
Runs at task 3 rate or integer multiple of task 3 rate	

Supported I/O module types

The T2550 PAC shares 2500 series I/O modules with the T2750 PAC

Type	Description	Maximum update speed Version 1 modules	Maximum update speed Version 2 modules
AI2	Analog Input 2 channels (all I/O types)	110ms	–
AI3	Analog Input 3 channels (mA + Tx PSU)	110ms	–
AI4	Analog Input 4 channels (TC, mV, mA)	110ms	–
AO2	Analog Output 2 channels (mA or V)	110ms	110ms/10ms*
DI4^	Digital Input 4 channels (logic	110ms	–
DI6_MV	Digital Input 6 channels (115V ac rms)	110ms	–
DI6_HV	Digital Input 6 channels (230V ac rms)	110ms	–
DI8_LG	Digital Input 8 channels (logic)	110ms	10ms
DO4_LG^	Digital Output 4 channels (10mA)	110ms†	10ms
DO4_24^	Digital Output 4 channels (100mA)	110ms†	10ms
RLY4^	Relay Output 4 channels (3 n/o, 1 c/o)	110ms†	10ms
DO8	Digital Output 8 channels (1A per ch)	10ms	–
FI2	Frequency Input 2 channels	10ms	–
ZI	Zirconia Input Module	110ms	–

Notes:

† The T2550 PAC only supports the original (Version 1) modules in simplex operation.

* Version 2 Analog Output modules can be run at the 10ms task on 4 or 6-way bases.

^ Module no longer sold by Eurotherm, but continues to be supported on existing installations.

Setpoint programmer

(V5.0 or higher) resources (max no.)	
Programs	Limited by available database memory
Profiled channels per program	8
Digital events per program	128
User values per program	32
Segments per program	32

Programs / per prog (max)	Channels /per prog (max)	Digital events / per prog (max)	No. of users per prog (max)
1 Program	8	128	32
2 Programs	4	64	16
4 Programs	2	32	8
8 Programs	1	16	4

Specifications

Continuous strategy function blocks categories

Definitions for licensing purposes: F = Foundation, S = Standard, C = Control, A = Advanced

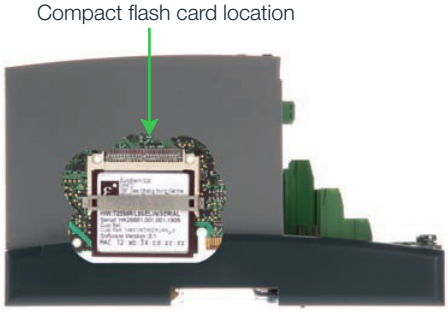
Software license	Category				
I/O Block	**F**	**S**	**C**	**A**	**Description**
AI_UIO, AO_UIO	✓				Universal analog I/O
DI_UIO, DO_UIO	✓				
FI_UIO, MOD_UIO	✓				
MOD_DI_UIO, MOD_DO_UIO	✓				
TPO_UIO, VP_UIO	✓				
CALIB_UIO	✓				Analog calibration
Communications					
GW_CON, GWPROFS_CON	✓				Gateway configuration block
GW_TBL	✓				Gateway table block
RAW_COM			✓		Open communication
Conditioning					
CHAR, UCHAR	✓				Characterization
AN_ALARM, DIGALARM	✓				Analog alarm
INVERT		✓			Analog inversion
FILTER, LEAD_LAG		✓			Filter
RANGE		✓			Range
FLOWCOMP		✓			Compensated flow
ZIRCONIA	✓				Zirconia Function Block
GASCONC				✓	Natural gas concentration data
AGA8DATA				✓	AGA8 calculation
Control					
AN_CONN, DG_CONN	✓				Analog and digital connection block
ANMS, DGMS		✓			Analog and digital manual stations
SIM		✓			Simulation
SETPOINT		✓			Set-point
TC_SEL		✓			Thermocouple Select
TC_LIFE			✓		Thermocouple Life
MAN_STAT		✓			Manual station
MODE		✓			Mode block
PID_LINK, TUNE_SET		✓			PID linking, Tune set block
PID, 3_TERM, LOOP_PID			✓		Control block
Timing	**F**	**S**	**C**	**A**	
TIMER, TIMEDATE	✓				Timer & Time/date event
DELAY		✓			Delay
TPO	✓				Time-proportioning output
RATE_ALM	✓				Rate alarm
RATE_LMT		✓			Rate limit
TOTAL, TOTAL2, TOT_CON		✓			Totalization
DTIME		✓			Dead-time
SEQE		✓			Sequence
SEQ			✓		Sequence

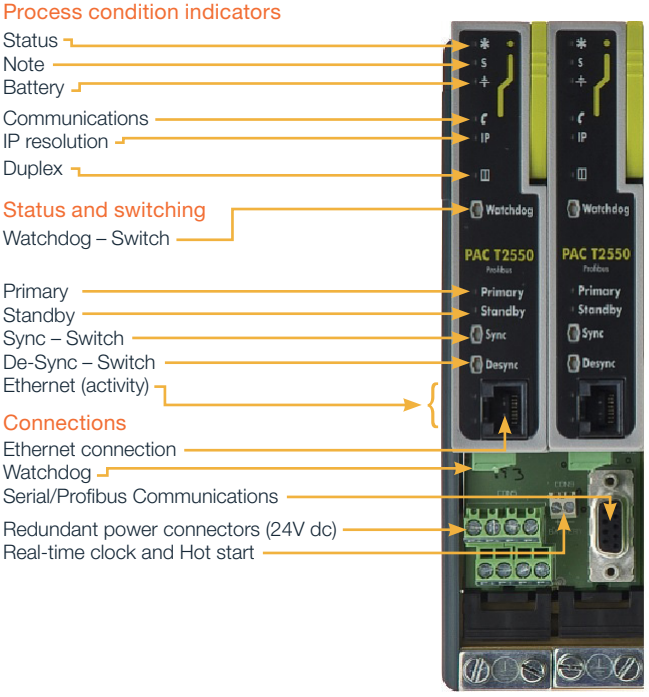
License	Category				
I/O Block	**F**	**S**	**C**	**A**	**Description**
ALC	✓				Alarm collection
SELECT, SWITCH		✓			Selector, Switch
2OF3VOTE		✓			Best-average
Logic					
PULSE, LATCH, COUNT		✓			Pulse & Latch & Count block
AND4, OR4, XOR4 NOT		✓			AND, OR, Exclusive-OR, NOT
COMPARE		✓			Compare
Maths					
ADD2, SUB2, MUL2, DIV2		✓			Add, Subtract, Multiply, Divide
EXPR, ACT_2A2W3T		✓			Expression
ACTION, DIGACT, WORD_ACT			✓		Action blocks
ACT15A3W, ACTUI818			✓		
Diagnostic					
ALL Diag Blocks	✓				Diagnostic block
Recorder					
RGROUP	✓				Recording group
Programmer					
PROGCHAN, SEGMENT		✓			
PROGCTRL	✓				
SPP_RAMP		✓			
Batch					
RECORD, DISCREP		✓			Record & Discrepancy block
SFC_MON, SFC_DISP		✓			SFC monitor and display blocks
SFC_CON			✓		SFC control

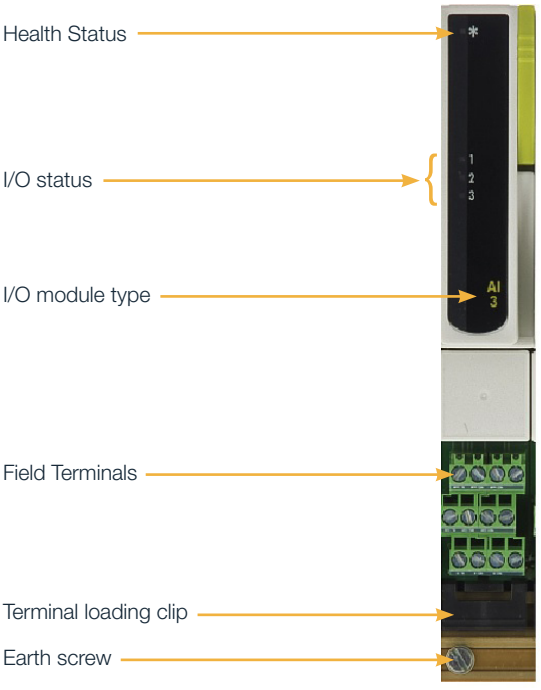
Specifications

Communications	
Ethernet communications	
The T2550 PAC supports Ethernet LIN (ELIN) protocol that provides peer-to-peer communications between bases and to other Ethernet devices over 10/100 Base-T Ethernet from each processor. Simultaneously it can support Modbus-TCP Master or Slave to other Modbus-TCP devices.	
ELIN port	
Connectors	Shielded RJ45 connector per processor
Network medium	Ethernet Cat5
Network type	LIN over Ethernet
Speed	10/100Base-T
Network topology	Star connection to a switch
Line length (maximum)	100 metres, extendible by repeater
Allocation of IP address	Fixed, DHCP, Link-Local, BootP
Broadcast storm protection	Integrated in the processor
LIN address	8-way switch-bank – Duplex (bits SW2-8) 10-way switch-bank – Simplex
Max numbers of slaves	16 Modbus-TCP slaves
Serial communications	
Third-party devices such as PLCs supporting Modbus can be readily integrated into the ELIN based architecture by direct connection to T2550 PAC control units. The Modbus communications allows a T2550 PAC to be used as a gateway providing access to database elements in any ELIN node.	
RS422/485 serial communications	
Connector	2x RJ45 connector
Comms medium	RS422 (5-wire) or RS485 (3-wire), jumper select
Line impedance	120Ω-240Ω twisted pair
Line length	1220m maximum at 9600 bits/sec
Units per line	16 maximum (electrical loading) expandable by use of buffers
Max number of slaves	64 serial slave devices
Note: Use of a communications buffer/isolator is recommended.	
Modbus/J-BUS	
Protocol	Modbus/J-BUS RTU and TCP as master and/or slave
RTU serial data rate	Selectable 600-38.4k bits/sec
RTU serial character format	8 bit, selectable parity, 1 or 2 stop bits
Configuration memory size	17,224 bytes
Modbus data tables	250, configurable as registers or bits
Maximum table length	64 registers or 999 bits
Number of communication links	1 x Modbus – RTU slave OR master 1 x Modbus – TCP master 1 x Modbus – TCP slave
Maximum number of slaves	20 serial slave devices
Redundancy	Modbus communications are supported by the controller in simplex and redundant mode.
Profibus	
Physical medium	2-wire RS485
Connectors	Single 9-way D-type
Data rate	Determined by Profibus master, 12MB max
Isolation	50V dc; 30V ac
Open communication	
Protocol	Device driven
Data rate	1200 to 38.4k bits/sec
Data format	7 or 8 data bits, none/even/odd parity

Cut away of case showing
Compact flash card location







Specifications

AI2: Two channel analog input

This analog input module is used to monitor analog signals from a wide range of plant sensors. The mA and TC inputs each require the appropriate terminal unit. The second channel of the AI2 has a special high impedance range for use with zirconia probe inputs.

General	
Number of channels	2
Input types	TC, RTD, Volts, mA, mV, Potentiometer, Pyrometer, Zirconia probe
mV range	-150mV to +150mV at input impedance >100MΩ
mA range	-22mA to +22mA with 5Ω burden in the terminal unit
Volts range	-10.2V to +10.2V at input impedance 303kΩ
RTD support	Support for 2, 3 and 4 wire resistance thermometer devices
Ohms range	0 to 640Ω 2, 3 or 4-wire lead compensation
Hi Ohms range	0 to 5kΩ 2, 3 or 4-wire lead compensation
Pot range	5% to 95% 'rotation' of 100Ω to 5kΩ pot
Resolution	Better than 0.001% of range
Linearity	Better than 0.003% of range
Input filtering	OFF to 999.9 seconds
Input accuracy	Electrical input factory calibrated to better than 0.1% of reading
System isolation	Reinforced, 264V ac maximum
Channel isolation	Reinforced, 264V ac maximum between thermocouple channels
Functional	264V ac maximum between RTD, volts and mA
Series mode rejection	60dB (50-60Hz)
Common mode rejection	120dB (50-5kHz)
Power consumption	2W maximum
TC Input specification	
Linearization types	J, K, L, R, B, N, T, S, C, PL2, PT100, Linear, SqRoot, plus custom
CJC system	Measured by RTD fitted on terminal unit
Initial CJC accuracy	±0.5°C typical (±1°C maximum)
CJC rejection	Better than 30:1 over -10°C to +70°C

Note: User calibration options can improve performance, limited only by noise and non-linearity.

AI2 – Order code

Module	
2500M/AI2UNIV/-	Two Channel – isolated universal input

Terminal unit	
2500T/AI2-TC/NONE	Terminal unit for TC with CJC
2500T/AI2-DC/NONE	Terminal unit for MV, V, PT100, Hz inputs
2500T/AI2-DC/SHUNT	Terminal unit for 5 ohm shunt fitted for mA

Specifications

AI3: Three channel analog input

Provides three isolated current input channels specifically designed to meet the requirements of modern two wire transmitters. Each channel has its own isolated 24V supply for transmitter excitation. Each channel's 24V dc supply is protected against short circuit and utilizes a sophisticated trip and try system in which the module senses over current and cuts the power. After a period the circuit checks for continued circuit malfunction. The module can be optionally fitted with disconnects to allow isolation of an individual input and allow work on the loop to continue without power applied.

General	
Number of channels	3
Input range	-28mA to +28mA
Resolution	Better than 1uA (16 bits with 1.6 sec filter time)
Linearity	Better than 10uA
Initial accuracy	Factory calibrated to better than ±0.1% of reading
Input filtering	OFF to 999.9 seconds
Burden resistance	60Ω nominal, 50mA max current
Channel PSU	22-25V dc, current limited 30mA nominal, self-resetting
System isolation	Reinforced, 264V ac maximum
Channel isolation	Functional, 50V ac maximum
Power consumption	4W maximum

Notes:
1. User calibration options can improve performance, limited only by noise and non-linearity.
2. Total burden can be increased to 250Ω or HART by removing a link track on the terminal unit.

AI3 – Order code

Module	
2500M/AI3/-	Three channel – isolated 4-20mA analog input with Isolated 24V Tx PSU

Terminal unit	
2500T/AI3-UNIV/NONE	Terminal unit with dummy cover fitted
2500T/AI3-UNIV/DCONNECT	Terminal unit with disconnect

Specifications

AI4: Four channel analog input

This analog input module is used to monitor analog signals from a wide range of plant sensors. The mA and TC inputs each require the appropriate Terminal Unit.

General	
Number of channels	4
Input types	TC, mV, mA, Pyrometer mV range: -150 - +150mV at input impedance >100MΩ mA range: -22 - +22mA with 5Ω burden in the terminal unit
Resolution	Better than 0.001% of range
Input filtering	OFF to 999.9 seconds
Initial input accuracy	Electrical Input Factory Calibrated to better than 0.1% of reading. mA range with 5Ω burden in the terminal unit, better than 0.2% of reading.
System Isolation	Reinforced, 264V ac maximum
Channel isolation	Functional, 264V ac maximum separating Ch1 and Ch2 from Ch3 and Ch4
Series mode rejection	60dB (50-60Hz, 1mA rms)
Common mode rejection	120dB (50-5kHz, 50V rms)
Initial accuracy	Better than 0.1% of reading, ±0.1Ω
Power consumption	2W maximum
TC Input specification	
Linearization types	J, K, L, R, B, N, T, S, C, PL2,linear, SqRoot, plus custom
CJC system	Measured by RTD fitted on terminal unit
Initial CJC accuracy	±0.5°C typical (±1°C maximum)
CJC rejection	Better than 30:1 over -10°C to +70°C

Notes:
1. User calibration options can improve performance, limited only by noise and non-linearity.
2. Wiring care and sensor choice should be used to prevent ground loops when using non-isolated TCs.

AI4 – Order code

Module	
2500T/AI4UNIV	Four channel – T/C, mV, mA input

Terminal unit	
2500T/AI4-TC/NONE	Terminal unit for 4 channel TC with CJC
2500T/AI4-MV/NONE	Terminal unit for 4 channel mV
2500T/AI4-MA/NONE	Terminal unit for 4 channel mA

Specifications

AO2: Two channel analog output

This analog output module provides two isolated analog output channels. Each output can be independently configured for current or voltage mode. The module can be optionally fitted with disconnects to allow isolation of an individual output and allow work on the individual loop to continue without power applied.

General	
Number of channels	2
Current output	-0.1 to 20.5mA; 10V dc max. Compliance with total burden less than 500Ω
Voltage output	-0.1V to 10.1V dc; 20mA max. compliance with total load greater than 500Ω -0.3 to 10.3V dc; 8mA max. compliance with total load greater than 1500Ω
Resolution	Better than 1 part in 10,000 (15 bit typical)
System isolation	Reinforced, 264V ac
Channel isolation	Functional, 264V ac maximum
Power consumption	2.2W maximum

AO2 – Order code

Module	
2500M/ AO2UNIV/-	Two channel isolated mA, volts

Terminal unit	
2500T/AO2-UNIV/NONE	Terminal unit
2500T/AO2-UNIV/DCONNECT	Terminal unit with disconnect

Specifications

DI8: Eight channel logic/contact input

This eight channel digital input module accepts eight logic inputs and is available in two factory option formats for voltage or contact-closure input.

General	
Number of channels	8
Input functions	On/Off pulse and de-bounce inputs with input invert
System isolation	Reinforced, 264V ac maximum
Channel isolation	50V ac functional isolation, 4 pairs of channels
Power consumption Logic	1W maximum
Contact	2.5W maximum
'Contact' variant	
Contact closure	
ON state	Input resistance threshold 100Ω (<1KΩ typical)
OFF state	Input resistance threshold 10KΩ (>7KΩ typical)
Wetting current	4mA typical
'Logic' variant	
Logic inputs	
ON state	Input voltage threshold >10.8V dc, 30V max
OFF state	Input voltage threshold <5.0V dc non-overlapping
Input impedance	5KΩ approx. (>2mA drive required for 'ON')

DI8 – Order code

Module	
2500M/DI8LOGIC/- 2500M/DI8CONTACT/-	Eight channel – Logic input Eight channel – Contact nput

Terminal unit	
2500T/DI8-UNIV/NONE 2500T/DI8-UNIV/DCONNECT	Terminal unit with dummy cover fitted Terminal unit with disconnects

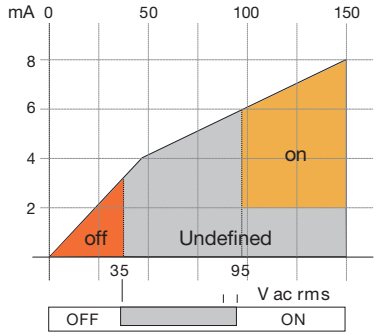
Specifications

DI6: Six channel AC voltage input

The six channel digital input module accepts AC voltage inputs and is available in two factory options optimized for 115V ac or 230V ac ranges.

General	
Number of channels	6
Input functions	On/Off or de-bounce
Frequency	47Hz-63Hz
Transient immunity	EN50082
System isolation	Reinforced, 264V ac maximum
Channel isolation	Functional, 264V ac maximum
Power consumption	0.45W maximum
'115V ac' variant	
Active On state	>95V ac rms, 132V ac rms maximum
Inactive OFF state	<30V ac rms
Main input current	More than 2mA required for 'ON'
Maximum input current	8mA

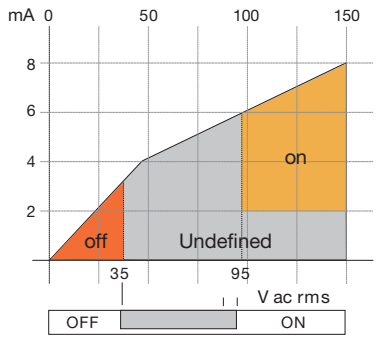
OperationV-I curve for 115V AC Operation*



V-I curve for
115V ac operation

'230V ac' variant	
Active On state	>180V ac rms, 264V ac rms maximum
Inactive OFF state	<60V ac rms
Main input current	More than 2mA required for 'ON'
Maximum input current	9mA

OperationV-I curve for 115V AC Operation*



V-I curve for
230V ac operation

INADVERTENT USE OF THE WRONG RANGE

115V type on 230V ac No damage will result. Power dissipation will be higher than desirable for continued use on all 6 channels simultaneously.

THIS IS NOT A RECOMMENDED MODE OF OPERATION

DI6 – Order code

Module	
2500M/DI6HVAC/	Six channel AC mains isolated digital input

Terminal unit	
2500T/DI6-UNIV	Universal terminal unit

Specifications

DO8: Eight channel digital output module

The DO8 provides higher packing density and lower cost per channel. The eight digital output module provides eight logic outputs which are typically used for control, alarms, or events outputs. Each channel has a 24V output with 0.75A capability (subject to a maximum of 4A total per module) and can be used for driving solenoids, relays, lamps, fans, thyristor units, single phase Solid State Relays (SSRs), or some three phase SSRs

General	
Voltage supply (external)	18-30V dc
Leakage current off state	<0.1mA
Current output	Channel maximum: 0.75A/channel Module maximum: 4A total (500mA/channel, all channels ON)
Output voltage	>Voltage supply (Vs.) less 3V
System isolation	Reinforced, 264V ac maximum
Channel isolation	Channels share a common connection
Power consumption	0.6W maximum

DO8 – Order code

Module	
2500M/DO8/-	Eight channel digital output 1A/channel; Max 4A/module

Terminal unit	
2500T/DO8/-	Terminal unit with dummy cover fitted

Specifications

FI2: Two channel frequency input

Provides two isolated frequency input channels and selectable voltage output for loop wetting current or sensor supply. Each input channel may be independently configured for magnetic, voltage, current, or contact sensor types.

General	
No of channels	2
Channel isolation	Functional, 100V ac maximum
System isolation	Reinforced, 264V ac maximum
Power consumption	3.6W maximum
Frequency measurements	
Range:	Logic 0.01Hz-40KHz, debounce off
Magnetic	10Hz-40KHz
Resolution	60ppm
Accuracy	±100ppm, reference. ±160ppm overall, ±0.05% drift over 5 years
Pulse counting	
Range:	Logic: dc-40KHz, debounce off
Magnetic	10Hz-40KHz
Magnetic sensor input specification	
Input range	10mV-80V p-p
Absolute maximum input	±100V
Input impedance	>30KΩ
Logic input specification	
VOLTAGE Input range	0-20V
Absolute maximum input	50V
Input impedance	>30KΩ
Threshold	0-20V (0.5V steps), ±0.2V hysteresis, <5V = ±0.4V accuracy >5V = ±0.7% accuracy
Sensor break level	50-350mV
Sensor short circuit	N/A

CURRENT Input range	0-20mA
Absolute maximum input	30mA
Threshold	0-20mA (0.5mA steps), ±0.2mA hysteresis <5mA = ±0.4V accuracy, >5mA = ±0.7% accuracy
Sensor break level	0.05-0.350mA
Sensor short circuit detect	when <100Ω; restored when >350Ω
CONTACT Input range	N/A
Absolute maximum input	N/A
Input impedance	5KΩ
Threshold	0-20V (0.5V steps), ±0.2V hysteresis <5V = ±0.4V accuracy, >5V = ±0.7% accuracy
Debounce	05, 10, 20, 50ms
Note: with debounce on, max frequency is limited based upon debounce time	
Output specification Voltage	Selectable, 8, 12, or 24V dc
Maximum current	1V @ 25mA
Accuracy	±20%

FI2 – Order code

Module	
2500M/FI2/-	Two channel digital frequency input

Terminal unit	
2500T/FI2/NONE	Terminal unit with dummy cover fitted

Specifications

ZI: Two channel isolated zirconia input module

The ZI module provides two analog input channels, optimized for Zirconia probe oxygen sensor measurements. Channel 1 with CJC sensor fitted provides a mV measurement for a thermocouple input, while Channel 2 provides a high impedance input range suitable for a Zirconia probe signal. The Zirconia function block includes an impedance test to indicate the health of the probe.

General	
Input Types	Analog voltage, Channel 1 - mV (TC), and Channel 2 - 2V (Zirconia probe)
Thermocouple input specification (Ch1 ONLY)	
Input Range	-77mV to +100mV
Calibration Accuracy	±0.1% of electrical input, ± 10µV
Noise	5µV p-p with 1.6s Filter
Resolution	<2µV with 1.6s Filter
Sensor Break Detect	250nA break high, low or off
Input Impedance	10MΩ
Cold junction sensor specification (Ch1 ONLY)	
Temperature Range	-10°C to +70°C (14°F to 158°F)
CJ Rejection	< 30:1
CJ Accuracy	± 1.3°C, ±0.5°C typ. (± 34.3 °F, ± 32.9°F) ('Automatic' cold junction compensation)
Zirconia input specification (Ch2 ONLY)	
Input Range	-10mV to +1800mV
Calibration Accuracy	± 0.2% of electrical input
Noise	0.1mV p-p with 1.6s Filter
Resolution	<50µV with 1.6s Filter
Sensor Impedance Measurement	0.1kΩ to 100kΩ ± 2%
Input Impedance	>500MΩ
Input Leakage Current	±4.0nA, max ±1nA typical
General specifications	
Power consumption	1.8W maximum
Common mode rejection	>80db, 48 - 62Hz
Series mode rejection	>60db, 48 - 62Hz
Isolation channel - channel	Functional (basic insulation), 264V ac max
Isolation to system	Reinforced (double insulation), 264V ac max

ZI – Order code

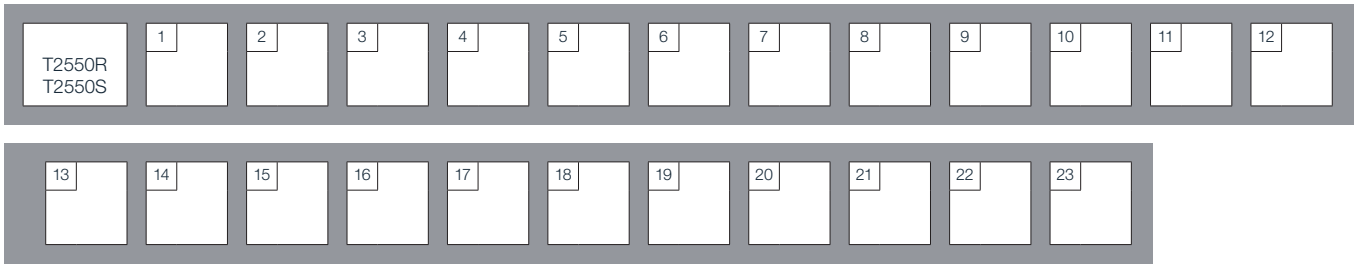
Module	
2500M/ZI/-	Zirconia Input

Terminal unit	
2500T/ZI/NONE	Terminal unit

Specifications

Order code specifications

T2550 PAC series composite coding



1	Basic product
T2550R	Dual processor - redundant capable base and I/O
T2550S	Single processor - redundant ready base and I/O

2	Base size
16R	2 IOC position for redundant operation 16 I/O module position
08R	2 IOC position for redundant operation 8 I/O module position
06R	2 IOC position for redundant operation 6 I/O module position
04R	2 IOC position for redundant operation 4 I/O module position
00S	2 IOC position for redundant operation 0 I/O module position

3	Earthing system
NONE	Two earth clamps fitted
C16	Earthing clamp for a 16 I/O module base
C08	Earthing clamp for an 8 I/O module base
C06	Earthing clamp for a 6 I/O module base
C04	Earthing clamp for a 4 I/O module base

4	IOC and software (standard license)/(data logging)			
	Foundation	Standard	Control	Advanced
L10/D10	Unbounded	0	0	off
L20/D20	Unbounded	50	4	off
L30/D30	Unbounded	100	8	off
L40/D40	Unbounded	Unbounded	12	off
L50/D50	Unbounded	Unbounded	16	off
L60/D60	Unbounded	Unbounded	24	off
L70/D70	Unbounded	Unbounded	32	off
L80/D80	Unbounded	Unbounded	Unbounded	off
L90/D90	Unbounded	Unbounded	Unbounded	on

5	Ethernet communications protocol
ELIN	HMI comms (non isolated)
MB-TCPM	Modbus master comms (non isolated) and raw comms Profibus DP slave comms (9 pin D connector)

6	Serial communications protocol
SERIAL	HMI comms (non isolated)
MB	Modbus master comms (non isolated) and raw comms
PROFIBUS	Profibus DP slave comms (9 pin D connector)

7	Terminal unit connector
1	RJ45 connector for Modbus
2	9 pin D type connector for Profibus only

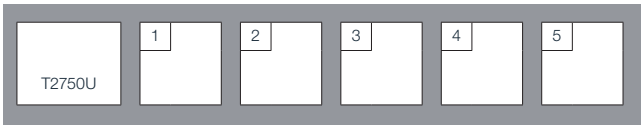
7-22	Module and termination
AI2-TC	2 ch — isol universal analog I/P with CJC for T/C
AI2-DC	2 ch — isol universal analog I/P for PT100, Hiz inputs
AI2-MA	2 ch — isol universal analog I/P - 5 shunt fitted for mA inputs
AI3	3 ch — isol 4-20mA analog I/P with 24V Tx PSU
AI3-DT	3 ch — isol 4-20mA analog I/P with 24V Tx PSU with disconnects
AI4-TC	4 ch — non isol T/C, with CJC
AI4-MV	4 ch — non isol mV I/P
AI4-MA	4 ch — non isol mA IP
A02	2 ch — isol analog O/P mA, volts
A02-DT	2 ch — isol analog O/P mA, volts with disconnects
DI6-230V	6 ch — 230 volt ac logic I/P
DI6-115V	6 ch — 115 volt ac logic I/P
DI8L	8 ch — non isol digital I/P (logic I/P only)
DI8L-DT	8 ch — non isol digital I/P (logic I/P only) with disconnects
DI8C	8 ch — non isol digital I/P (contact I/P only)
DI8C-DT	8 ch — non isol digital I/P (contact I/P only) with disconnects
DO8	8 ch — digital O/P 0.75A per channel, max 4A per module
FI2	2 ch — frequency I/P
ZI	Zirconia I/P
BLANK	Blank terminal unit
NONE	No terminal unit or blank fitted

23	Installation guide manual
ENG	English
CHI	Chinese
GER	German
FRA	French

Specifications

Order code specifications

T2550 PAC series composite coding



1	Basic product
T2550U	Programmable Automation Controller (PAC) License upgrade

2	IOC existing license			
	Foundation	**Standard**	**Control**	**Advanced**
L10/D10	Unbounded	0	0	off
L20/D20	Unbounded	50	4	off
L30/D30	Unbounded	100	8	off
L40/D40	Unbounded	Unbounded	12	off
L50/D50	Unbounded	Unbounded	16	off
L60/D60	Unbounded	Unbounded	24	off
L70/D70	Unbounded	Unbounded	32	off
L80/D80	Unbounded	Unbounded	Unbounded	off
L90/D90	Unbounded	Unbounded	Unbounded	on

3	Existing communications license
NONE	Modbus master communications not enabled
MBMC	Modbus master communications

2	IOC required new license			
	Foundation	**Standard**	**Control**	**Advanced**
L10/D10	Unbounded	0	0	off
L20/D20	Unbounded	50	4	off
L30/D30	Unbounded	100	8	off
L40/D40	Unbounded	Unbounded	12	off
L50/D50	Unbounded	Unbounded	16	off
L60/D60	Unbounded	Unbounded	24	off
L70/D70	Unbounded	Unbounded	32	off
L80/D80	Unbounded	Unbounded	Unbounded	off
L90/D90	Unbounded	Unbounded	Unbounded	on

3	Required new communications license
NONE	Modbus master communications not enabled
MBMC	Modbus master communications

Eurotherm
Faraday Close, Worthing,
West Sussex, BN13 3PL
United Kingdom
Phone: + 44 (0)1903 268500

www.eurotherm.com

Contact your local sales representative

Published August 2023

Document Number HA031113 Issue 2

WATLOW
Powered by Possibility