T2750

Programmable Automation Controller

... high performance control in a versatile modular system

The T2750 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, sequential and batch control, combined with secure data recording at point of measurement – all designed to maximize your return on investment.

Maximize Process Uptime

Using the PAC System hardware reduces engineering costs and its high availability maximizes 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 processor is automatic, with uninterrupted control and bumpless transfer of communications and process I/O. Replacement of a controller 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 T2750 Controller 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.

- **Cost Effective Controller Redundancy**
  - Automatic commissioning
  - Bumpless changeover
  - Redundant communications
- **Power Supplies**
  - Redundant system supply
- **High System Availability**
  - Redundant CPUs with automatic takeover
  - Live replacement of CPU with automatic initialisation
  - Online reconfiguration
  - Extensive health monitoring and diagnostics with watchdog relay
  - I/O Modules with very high, field-proven MTBF
  - Passive I/O backplane
- **Redundant Data Logging**
- **Multi-setpoint Programmer**
- **Hot swap I/O**
- **Alarm Monitoring**
- **Signal Conditioning**
- **IEC 61131 Programming**
  - Ladder
  - Sequence Function Chart (SFC)
  - Function Block Diagram (FBD)
  - Structured Text (ST)
- **Advanced PID Control**
  - Single loop
  - Cascade control
  - Ratio control
  - Override control
  - Autotune

A highly available, redundant solution

Eurotherm®
by Schneider Electric

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Redundant Data Recording

The T2750 provides secure 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 secure format to inhibit tampering. If your data has value to you, this simplest of offerings is the most powerful in the market place.

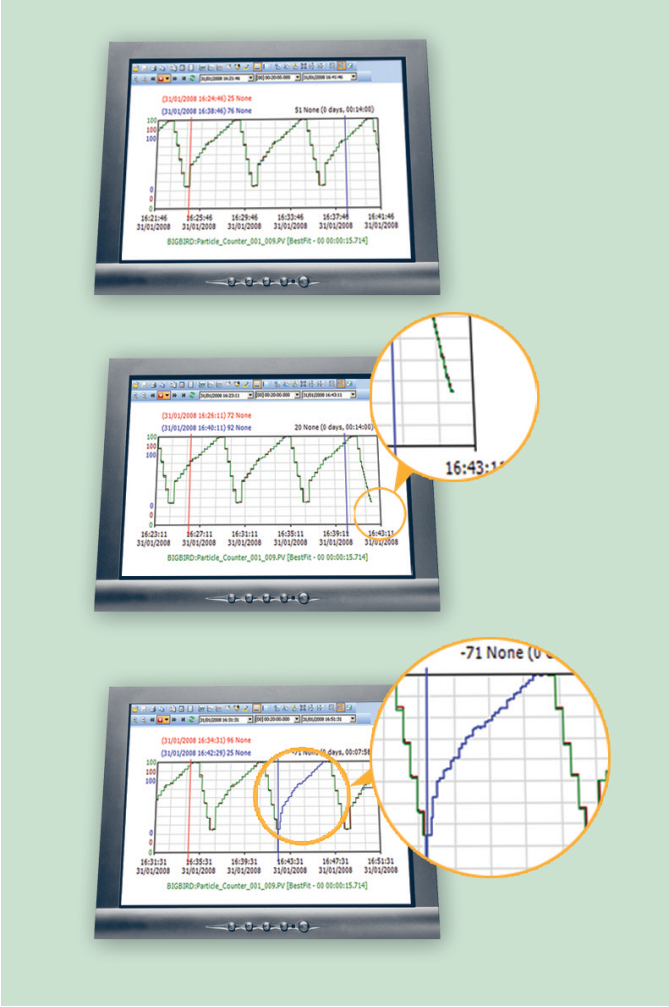
Data Integrity

When integrity of process information is important the Foxboro PAC System is the obvious choice. The T2750 PAC provides secure 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 in a secure format to inhibit tampering.

'Store and Forward' is a self healing data archiving system which automatically stores data during a communication failure with the PAC and then forwards this data to the configured data historian server once communication is reinstated. This logging method is used on pharmaceutical 21 CFR Part 11 compliant projects.

The Foxboro PAC also offers dual redundant data acquisition using tamper-proof files created at the local level, which results in a secure electronic recording system with total data integrity.

If your data has value to you, the Foxboro PAC offering is the most powerful in the market place.



Data Redundant Control Processing

Configuring a second PAC controller as a part of a controller pair automatically protects your process against controller or communications failure. If external or field I/O communications to the active controller, or the active controller itself fail, then the secondary controller automatically takes over providing uninterrupted control and bumpless transfer of the communications, process I/O, and data historian.

Commissioning a redundant capable processor is as simple as plugging in the second processor into a base unit and pressing synchronize – all the rest is automatic. No special cabling is required.

Control and Logic

The Foxboro 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 the in-built peer-to-peer communications.

The PAC hardware supports the level of block structuring normally only found in advanced Distributed Control Systems. The continuous strategy is built up by interconnection of function blocks from a rich library of analog, logic, and advanced elements. Control operations can be programmed in a language appropriate for your I/O type and application including:

- Function Block Diagrams
- Sequence Function Charts
- Structured Text
- Ladder Logic

Application Configuration

The LINtools (Local Instrument Network) configuration and engineering station can be launched as a stand-alone application, or from within the IDE to enable easy IEC 61131-3 standard based configuration. Tools for test, documentation, monitoring, on-line reconfiguration, and commissioning are also built into the LINtools package. The ArchestrA IDE is an Integrated Development Environment from which application objects representing physical PAC elements are configured. It can be used as a part of a larger ArchestrA-based application.

Flexible Batch Processing

Cost-effective batch processing solutions can be implemented by incorporating the Eycon series of visual supervisor displays. The Eycon Batch Manager provides comprehensive batch control allowing an operator with suitable access permissions to load, start, hold, restart, or abort a batch. For more flexible and extensible batch applications the Foxboro PAC System can be configured with integration into Wonderware InBatch.

Enterprise Extensibilty

Thanks to the inclusion of the Wonderware PAC Software (a software component of the Invensys InFusion Enterprise Control System) the Foxboro PAC System is at home in a Wonderware System Platform ArchestrA based application architecture.

The system is scalable (stand alone to distributed architectures) and extensible using System Platform and infrastructure to add capability and value. Wonderware Historian integration provides protection against the loss of process critical data in conjunction with the PAC's hardware on board data acquisition and storage.

Base Rack and I/O Configuration Options

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. I/O modules from the T2550 PAC hardware are also compatible with the T2750 base unit, preserving your investment in Invensys hardware.

Communications

As well as being capable of fully stand-alone operation, the Foxboro PAC System uses ELIN, an Ethernet based Local Instrument Network as the backbone of the control and data acquisition network providing peer-to-peer communications between control nodes.

The Foxboro PAC system supports native device protocols, including Modbus TCP, Modbus Serial Master/Slave, Profibus and OPC. Using Wonderware System Platform opens the PAC to the ArchestrA namespace, with the inherent advantages this provides. Also available for use within a System Platform architecture is a fully featured DAServer. The PAC hardware can also be used with other systems such as PC based SCADA packages, Programmable Logic Controllers, and HMI software including Wonderware InTouch and the Eurotherm Eycon.

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 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 future desired setpoint and historically achieved process values are 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 in any of your visualisation packages.

Redundant Recording and Archiving

The PAC (Programmable Automation Controller) has internal nonvolatile flash memory for secure tamper resistant data storage, providing for 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 secure, infinite archiving capacity.

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	
	Min/Max Off	Min/Max On
1s	11 days	6 days
5s	57 days	29 days
10s	114 days	59 days
20s	228 days	118 days
60s	685 days	353 days

Data Historian

The data historian is used to store PV's, message, and alarm information in the internal flash memory in order to generate historical data in the form of a set of secure, tamper resistant history files.

Alarm Management

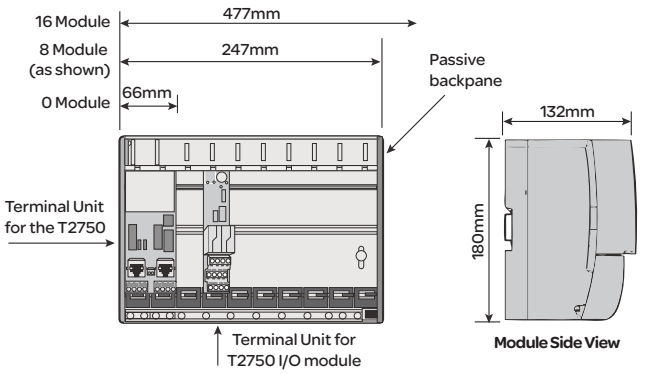
Alarms are managed and collected within the PAC hardware to provide features such as alarm status and priority, acknowledgement, date and time stamping at the source, as well as suppression and local historian message storage.

Quick Reports

Quick Reports provides an intuitive reporting package to develop and print reports using the secure data from the PAC system. 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 and file servers, and via e-mail. HMI reports are also optionally available as a web portal.

Specifications

Mechanical Details



Terminal Units click into place to suit the T2750 I/O module required
Any type of I/O modules can be placed at any slot position

T2750 Base Unit

The base unit is fitted with the T2750 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 3 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 along 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 the bulkhead or mounting plate. Both base and modules can be installed horizontally or vertically.

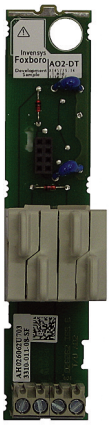
Mechanical

I/O Module capacity	0	8	16
Width (mm)	66	247	477
Weight no modules (Kg)	0.2	0.7	1.2
all modules (Kg)	0.5	2.1	3.7

Height:	180mm
Depth:	132 -135 mm with retaining lever raised
Mounting:	DIN rail or Bulkhead, can be mounted horizontally or vertically
DIN rail:	Use symmetrical DIN rail to EN50022-35 x 7.5 or 35 x 15
Casing:	Without additional protection IP20
Ventilation space:	25mm free space above and below

Terminal 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 prevent 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: Some terminal assemblies have an optional fuse or link (isolator or disconnect). This provides a series connection 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.

Redundant Base – ORDER CODE

T2750B-16R/C16/CDM/-/-	16 module base with earth clamps
T2750B-08R/C08/CDM/-/-	8 module base with earth clamps
T2750B-16R/NON/CDM/-/-	16 module base without earth clamps
T2750B-08R/NON/CDM/-/-	8 module base without earth clamps
T2750B-00R/NON/CDM/-/-	0 module base for additional processors and comms

T2750M: Controller General Specifications

Supply voltage range:	24V dc ±20%
VA requirements:	< 80W maximum for fully loaded rack
Fuse rating:	0.5A time lag (Not customer replaceable)
IOC hot start time:	1 hours without external batteries
IOC power consumption:	4.0 W maximum
Surge current:	8A maximum
Module power consumption:	See individual module specification

Environmental

Operating temperature:	0 to 55°C
Storage temperature:	–25°C to 85°C
Relative humidity:	5 to 95% (non-condensing)

RFI

EMC emissions:	BS EN61326 – 1: 2006 Class A
EMC immunity:	BS EN61326 – 1: 2006 Industrial Locations

Safety

BS EN61010-1/A2;19931995 Installation cat II, Pollution degree 2
Safety earth and screen connections are made to earth terminals at the bottom of the base

Vibration

Vibration:	IEC1131-2 (2007) section 4.2.1 1.75mm peak amplitude 5-8.4Hz; 1g peak amplitude, 8.4-150Hz 30 minutes dwell at resonance in all 3 planes
Shock:	15g static shock

Diagnostic LEDs

Diagnostic LED's indicate module diagnostic status.

All modules:	A green LED at the top indicates the module is powered and operating correctly.
PAC analog modules:	Have red LEDs for each channel to indicate channel failure.
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 the LINtools monitor online over Ethernet to review the diagnostic blocks.

PAC Controller module:	A green LED at the top indicates the module is powered and operating correctly
Internal diagnostics:	A red LED indicates failure of the internal self diagnostic routines or an abnormal operating state.
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 link:	yellow LED indicate Ethernet link and flashes to show activity
Ethernet Link speed:	A green LED indicates 100Mbs operation
USB link:	A green LED indicate USB activity, periodic flashing shows an error
USB over-current indication:	A yellow LED indicates an over current error

Power on Self Tests: On power up the T2750 automatically performs Power On Self Tests. These are a series of diagnostic tests used to assess the instrument health. The above LEDs indicate module diagnostic status in case of a problem.

Processor Redundancy

CPU redundancy is available for continuous, logic, sequence and batch 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 control databases. Transfer from the primary to secondary processor is bumpless. The non-active processor can be replaced while the system is running and on synchronisation 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

Processor Switchover

During a processor switch over all outputs remain at the last value. The new primary processor begins executing its application from precisely the same point as the original processor. Each processor has its own Ethernet IP address and each redundant pair uses two neighbouring 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. Change over amongst LIN nodes is transparent.

The following conditions can cause the processor to switch over:

Hardware Failure: Failure of 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, changeover will occur. If the secondary processor observes a fault 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 changeover.

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

Removable SD Memory Card

The storage of the cold start application files, the processor firmware, and software licence code is on a secure SDHC card this enables easy transfer from one processor to a replacement.

Physical

CPU:	Freescale Power QUICC II Pro processor MPC8313
Bus Size:	32 bit
System Clock:	333 MHz
Logging Capacity:	32MB on board, Log files transferred by FTP or USB
Removable SDHC Card Size:	32 Mbytes
USB:	Redundant USB 2.0 connected on terminal unit
Control Switches:	Processor front panel
Push Button Switches:	Watchdog reset. Processor synchronisation/ changeover. Processor desynchronisation

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.

A super capacitor maintains memory for up to 1 hour in the event of complete power failure. This facilitates a hot start of the processors. An external battery can be fitted to extend this back up time on the redundant system.

Redundant:	< 0.6s bumpless transfer for processor and I/O
Super cap (Processor):	Maintains memory/real time clock and enables hot start for up to 1 hour in absence of battery backup input
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

External rechargeable battery: Retains memory and real-time clock chip in absence of main supply to extend Warm start capacity > 1 hour.

Code	Description
T2750A-BBA	Backup Battery Assembly – includes Charger and Battery
T2750A-BBB	Backup Battery Spare / Replacement Battery
T2750A-BBC	Backup Battery Spare Charger

Watchdog Relays

Each processor is fitted with a single watchdog relay.

Watchdog relay:	SPST, 1 per CPU, connected on the terminal unit
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 minimising disturbance to other signal conditioning strategies.

T2750 CPU only — ORDER CODE

Basic Product

T2750M Controller

1 – License

L	D	Foundation	Standard	Control	Advanced
A	U	Unbounded	0	0	off
B	L	Unbounded	0	4	off
C	M	Unbounded	100	8	off
D	N	Unbounded	Unbounded	12	off
E	P	Unbounded	Unbounded	16	off
F	Q	Unbounded	Unbounded	24	off
G	R	Unbounded	Unbounded	32	off
H	S	Unbounded	Unbounded	Unbounded	off
J	T	Unbounded	Unbounded	Unbounded	on

2 – Removable Memory Card

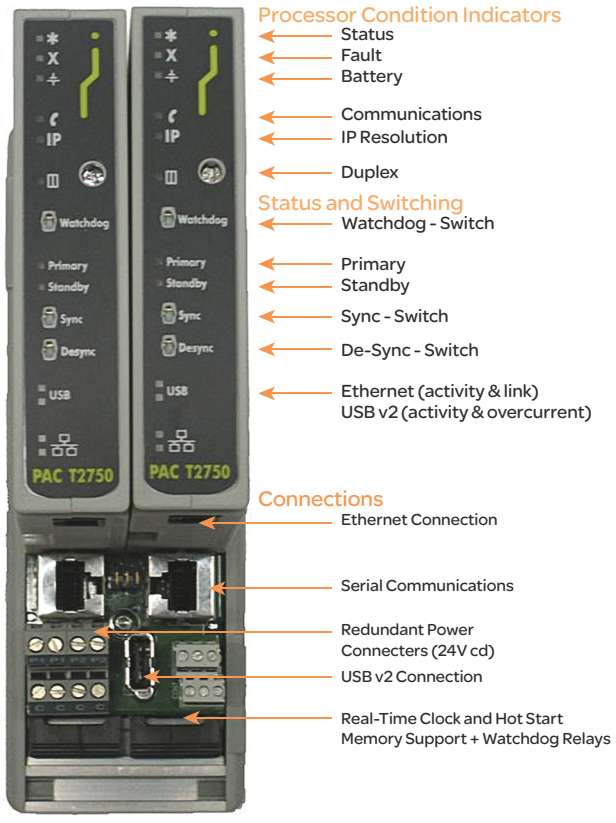
A SDHC card (standard)

3 – Communications Protocol

1 ELIN, FTP, SNTP, Modbus RTU/TCP slave

2 Option 1 + Modbus RTU/TCP master and Raw Communications

Note: L = Standard control license; D = Data logging enabled license



Control Specifcation

Continuous Database Resources

Maximum Database Size default max values	800k bytes

Database Resources

Number of database blocks	2048
Number of database templates	170
Number of template libraries	32
Number of external databases	32
Number blocks in local Dbase cached elsewhere	4096
Number blocks in remote Dbases cached locally	1024
Number of server tasks	6
Number of field-to-field connections	4096

Sequence Control Resources

Sequence memory Program data	400k bytes

SFC Resources

Number of root SFCs loadable	120
Number of steps loadable	1600
Number of 'wires' permitted going into and out of step	5360
Number of transitions	2400
Number of 'wires' permitted going into transitions	3200
Number of action associations	6400
Number of actions	3200

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 1 – Synchronous to Fast I/O Only 10ms I/O types can be assigned to this task (see I/O modules types)	10ms at minimum
Task 2 – Auxiliary task to task1 Runs at task 1 rate or integer multiple of task 1 rate	10ms ≤ N*5ms
Task 3 – Synchronous to Standard I/O All analogue and digital I/O types can be assigned to this task	110ms at minimum
Task 4 – Auxiliary task to task 3 Runs at task 3 rate or integer multiple of task 3 rate	110ms ≤ N*5ms

Supported I/O Module Types

The T2750 Controller shares I/O modules with the T2550 and 2500 Remote I/O.

Type	Description	Max update speed mods Version 2†
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
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)	10ms
DI8_CO	Digital Input 8 channels (contact)	10ms
DI16	Digital Input 16 channels (contact and logic)	10ms
DO4_LG	Digital Output 4 channels (10mA)	10ms
DO4_24	Digital Output 4 channels (100mA)	10ms
RLY4	Relay Output 4 channels (3 n/o, 1 c/o)	10ms
RLY8	Relay Output 8 channels (8 n/o)	10ms
DO8	Digital Output 8 channels (1A per ch)	10ms
DO16	Digital Output 16 channels (1A per ch)	10ms
FI2	Frequency Input 2 channels	10ms
ZI	Zirconia Input Module	110ms

Note: †The T2750 supports only Version 2

Setpoint Programmer Resources

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

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

Function Blocks Categories

F = Foundation, **S** = Standard, **C** = Control, **A** = Advanced

License	Category				
I/O Block	**F**	**S**	**C**	**A**	**Description**
AI_UIO, AO_UIO	✓				Universal analog I/O
DI_UIO, DO_UIO	✓				Universal Digital I/O
FI_UIO, MOD_UIO	✓				Frequency input, I/O module
MOD_DI_UIO, MOD_DO_UIO	✓				Multiple channel digital I/O
TPO_UIO, VP_UIO	✓				Time proportional out, valve position
CALIB_UIO	✓				Analog calibration
Communications					
GW_CON	✓				Gateway configuration
GW_PROFM_CON	✓				Profibus master gateway
GW_TBL	✓				Gateway table
RAW_COM	✓				Raw (Open) communication
Conditioning					
CHAR, UCHAR	✓				Characterisation, user defined
AN_ALARM, DIGALARM	✓				Analog and digital alarm
INVERT		✓			Analog Inversion
FILTER, LEAD_LAG, LEADLAG		✓			First-order, Lead-lag
RANGE		✓			Re-ranges an analog input
FLOWCOMP		✓			Compensated flow
ZIRCONIA	✓				Compensated Zirconia Function
GASCONC				✓	Natural gas concentration data
AGA8DATA				✓	American Gas Association #8 calculation
EMS_AN_ALM	✓				Acquisition, alarm, and calibration
TC_SEL		✓			Thermocouple Select
TC_LIFE			✓		Thermocouple Life
Control					
AN_CONN, DG_CONN, AN_DATA	✓				Analog and Digital connection block
ANMS, DGMS		✓			Analog and Digital manual station
SIM		✓			Simulation
SETPOINT		✓			Set-point
TC_SEL		✓			Thermocouple Select
TC_LIFE			✓		Thermocouple Life
MAN_STAT		✓			Manual station
MODE		✓			Control mode selection
PID_LINK, TUNE_SET		✓			PID linking, Tune PID parameter
PID, 3_TERM, LOOP_PID			✓		PID control, including autotuning
Timing					
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		✓			SEQ extender
SEQ			✓		Multi-segment slope/level/time
Selector					
ALC	✓				Alarm collection with common logic out
SELECT, SWITCH		✓			Selector, Switch
2OF3VOTE		✓			Selects 'best' input from 3, with average
Logic					
PULSE, LATCH, COUNT		✓			Pulse, Latch, Count
AND4, OR4, XOR4 NOT,		✓			AND, OR, Exclusive-OR, NOT
COMPARE		✓			Greater/less than/equal of 2 inputs
Maths					
ADD2, SUB2, MUL2, DIV2		✓			Add, Subtract, Multiply, Divide
EXPR		✓			Free-format expression, Action control
ACTION, DIGACT, WORD_ACT			✓		Action blocks
ACT15A3W, ACTUI818, ACT_2A2W3T			✓		Action blocks
Control Module					
VLV1IN, VLV2IN, VLV3WAY		✓			Valve control modules
MTR3IN Motor		✓			Control module
DUTYSTBY, AN_ALM_2		✓			Motor duty/stby, Alarm with disable
Diagnostic					
DIAG blocks (all)	✓				Diagnostic
NETHOST	✓				Diagnostic block
Recorder					
RGROUP	✓				Recording group
Programmer					
PROGCHAN, SEGMENT		✓			Channel configuration, Seg. display
PROGCTRL	✓				Programmer control
SPP_RAMP		✓			Allow local ramping of setpoints
Batch					
RECORD, DISCREP		✓			Record and Discrepancy block
SFC_MON, SFC_DISP		✓			SFC monitor and display blocks
SFC_CON			✓		SFC control

Note - Refer to LIN Blocks documentation for a complete list.

Communications

Ethernet Communication

The T2750 supports Ethernet LIN (ELIN) protocol that provides secure peer-to-peer communications between each processor over 10/100 BASE-T Ethernet. Simultaneously it can support Modbus-TCP Master and Slave to other Modbus-TCP devices.

Ethernet Port

Connectors:	RJ45 connector per processor
Network medium:	Ethernet Cat5
Network type:	LIN over Ethernet, Modbus-TCP master and slave
Speed:	10/100 BASE-T auto-select
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)
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 controllers. The Modbus communications allows a T2750 to be used as a gateway providing access to database elements in any ELIN node.

RS422/485 Serial Communications

Connector:	2 x Shielded 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 configurable master or slave
Data rate:	Selectable 600-38.4k bits/sec
Data format:	8 bit, selectable parity 1/2 stop bits
Modbus data tables:	64, configurable as registers or bits
Maximum table length:	200 registers or 999 bits
Redundancy:	Modbus communications are supported by the controller in simplex and redundant mode 3 GWF may be run simultaneously.
Example:	1x Modbus -TCP master 1x Modbus - TCP slave 1x Modbus RTU slave or master Max (GWF) file size: 20k bytes

Raw Communication

Protocol:	Device driven, Support for simple protocols written by user
Data rate:	1200 to 38.4k bits/sec
Data format:	7 or 8 data bits, none/even/odd parity

Profibus Master

Device shall be supplied by an isolated voltage source

Supply Voltage:	24V ± 6V DC with reverse voltage protection
Current at 24V:	130 mA (typically)
PSU Connector:	Mini-COMBICON, 2-pin
Profibus DP slaves:	125 max
Total cyclic input data:	5712 bytes max
Total cyclic output data:	5712 bytes max
Cyclic input data:	244 bytes/slave max
Cyclic output data:	244 bytes/slave max
Configuration data:	244 bytes per slave max
Baud rate:	9,6 kBits/s, 19,2 kBits/s, 31,25 kBits/s, 45,45 kBits/s 93,75 kBits/s, 187,5 kBits/s, 500 kBits/s, 1, 5 MBits/s, 3 MBits/s, 6 MBits/s, 12 MBit/s
Dimensions:	(L x W x H) 100 x 52 x 70mm (without connector)

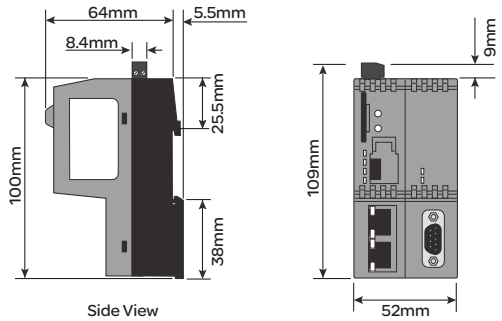
T2750A PBM Profibus Master

- Simple or Duplex operation
- Ethernet to Profibus Master Gateway

The netHOST gateway allows the T2750 to acess Profibus Master functionality via a standard Ethernet interface.

The modular gateway design combines the two network interfaces in a DIN rail mountable housing. LED indicators are visualising status information for rapid on-site diagnostics. The protocol conversions are pre-programmed and load as firmware into the device.

Mechanical Details



Code	Description
T2750A-PBM	Profibus Master

2500M-A: Two Channel Analog Input

This analog input module is used to monitor analogue 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 for oxygen measurement.

No 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:	–25mA to +25mA with 5Ω burden in the terminal unit
Volts range:	–10.3V to +10.3V 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 7kΩ 2, 3 or 4-wire lead compensation
Pot range:	0% to 100% 'rotation' of 100Ω to 7kΩ pot
Resolution:	Better than 0.001% of range
Linearity:	Better than 0.01% of range
Input filtering:	OFF to 999.9 seconds
Input accuracy:	Electrical input factory calibrated to better than 0.1% of reading, for mA inputs better than 0.25% of reading ±2uA
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation) between thermocouple channels
Series mode rejection:	60dB (47-63Hz)
Common mode rejection:	120dB (47-63kHz)
Power consumption:	2W maximum

TC Input specification

Linearisation types:	J, K, L, R, B, N, T, S, C, PL2, PT100, Linear, SqRoot, plus custom
CJC system:	Measured by RTD, located beneath the input connector
Initial CJC accuracy:	±0.5°C typical (±1°C maximum)
CJC rejection:	Better than 30:1 over -10°C to +70°C

AI2 – ORDER CODE

Module

2500M-A000 Two Channel – isolated universal input

Terminal Unit

2500T-AT00 Terminal unit for TC with CJC
2500T-AD00 Terminal unit for Mv, V, PT100, Hiz inputs
2500T-AD20 Terminal unit for 5Ω shunt fitted for mA

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

2500M-C: 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 utilises a sophisticated trip system in which the module senses over current and cuts the power. After a period the circuit checks for continued circuit malfunction. To allow work on the loop to continue safely the module can be optionally fitted with disconnects to allow isolation of an individual input.

Input range:	-28mA to +28mA
Resolution:	Better than 0.5uA with 1.6 sec filter time (equivalent: 16 bits)
Linearity:	Better than 1uA
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:	20-25V dc, current limited 30mA nominal, self-resetting
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation). No common ground.
Power consumption:	Current input mode – 2.2W 3 powered loops – 4.0

AI3 – ORDER CODE

Module

2500M-C000 Three channel – isolated 4-20mA analogue input with Isolated 24V Tx PSU

Terminal Unit

2500T-DU00 Terminal unit with dummy cover fitted
2500T-DU30 Terminal unit with disconnect

Notes:

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

2. Total burden can be increased to 250Ω by cutting a link track on the terminal unit.

2500M-D: 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.

No of channels:	4
Input types:	TC, mV, mA, Pyrometer mV range: –150 to +150mV at input impedance >100MΩ
mA range:	–25 to +25mA with 5Ω burden in the terminal unit
Resolution:	Better than 0.001% of range
Input filtering:	OFF to 999.9 seconds
Initial accuracy:	Electrical input factory calibrated to better than 0.1% of reading Burden resistor 5Ω ±1% (fitted to terminal unit)
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation) Ch1 and Ch2 from Ch3 and Ch4
Series mode rejection:	60dB (47-63Hz)
Common mode rejection:	120dB (47-63Hz)
Power consumption:	2W maximum

TC Input specification

Linearisation types:	J, K, L, R, B, N, T, S, C, PL2,linear, SqRoot, plus custom
CJC system:	Measured by RTD, located beneath the input connector
Initial CJC accuracy:	±0.5°C typical (±1°C maximum)
CJC rejection:	Better than 30:1 over -10°C to +70°C

AI4 – ORDER CODE

Module

2500M-D000 Four channel – T/C, mV, mA input

Terminal Unit

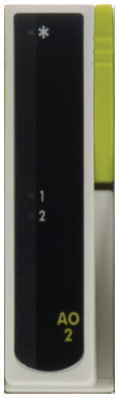
2500T-FT00 Terminal unit for 4 channel TC with CJC
2500T-FM00 Terminal unit for 4 channel mV
2500T-FV00 Terminal unit for 4 channel mA

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.

2500M-E: 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. To allow work on the individual loop to continue safely, the module can be optionally fitted with disconnects to allow isolation of an individual outputs.

Current output:	–0.1 to 20.5mA; 10V dc max. Compliance with total burden less than 500Ω
Resolution:	Better than 1 part in 10,000 (1uA typical)
Voltage output:	–0.1V to 10.1V dc; 20mA max. compliance with total load greater than 550ohms –0.3 to 10.3 V dc; 8mA max. compliance with total load greater than 1500Ω
Resolution:	Better than 1 part in 10,000 (0.5mV typical)
System isolation:	300V RMS or dc (double isolation)
Channel isolation:	300V RMS or dc (basic isolation. No common ground)
Power consumption:	2.2W maximum

AO2 – ORDER CODE

Module

2500M-E000 Two channel isolated mA, volts

Terminal Unit

2500T-NU00 Terminal unit
2500T-NU30 Terminal unit with disconnect

2500M-K: Six Channel AC Voltage Input

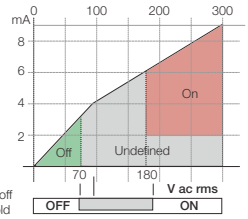
The six channel digital input module accepts AC voltage inputs and is available in two factory options optimized for 115V ac or 230V ac ranges.

No of channels:	6
Input functions:	On/Off or de-bounce
Frequency:	47Hz-63Hz
Transient immunity:	EN50082
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation)
Power consumption:	0.5W maximum

'115V ac' Variant

Active On state:	>95V ac rms, 150V ac rms maximum
Inactive OFF state:	<35V ac rms
Main input current:	More than 2mA required for 'ON'
Maximum input current:	8mA

V-I curve for 115V ac Operation

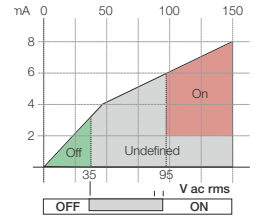


* The threshold may be between Vmaxoff and Vmion Ioff is defined at the threshold

'230V ac' Variant

Active ON state:	>180V ac rms, 264V ac rms maximum
Inactive OFF state:	<70V ac rms
Min input current:	More than 2mA required for 'ON'
Maximum input current:	9mA

V-I curve for 230V ac Operation



DI6 – ORDER CODE

Module

2500M-KA00 Six channel high voltage 230 volt ac logic
2500M-KB00 Six channel high voltage 115 volt ac logic

Terminal Unit

2500T-LU00 Terminal unit

Note:

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

2500M-L /-M: 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.

No of channels:	8
Input functions:	On/Off. pulse and de-bounce inputs with input invert
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	50V RMS or dc (basic insulation) between pairs [1&2] to [3&4] to [5&6] to [7&8]
Power consumption Logic:	0.6W maximum
Contact:	1.9W maximum

'Contact' Variant

Contact closure:	ON state:	Input resistance threshold <1KΩ typical
	OFF state:	Input resistance threshold >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
Input current:		2.5mA approx. at 10.5V; 8mA max. at 30V

DI8 – ORDER CODE

Module

2500M-L000 Eight channel – Logic input
2500M-M000 Eight channel – Contact input

Terminal Unit

2500T-MU00 Terminal unit with dummy cover fitted
2500T-MU30 Terminal unit with disconnect

2500M-6: Sixteen Channel Digital Input

This digital input module accepts sixteen inputs and can be wired either for voltage input or for contact closure.

No of channels:		16
Input functions:		On/Off, pulse and de-bounce
System isolation:		300V RMS or dc (double insulation)
Channel isolation:		Channels share a common connection
Power consumption	Logic:	0.75W maximum
Power consumption	Contact:	2.0W maximum

'Contact' Mode

Module Internal Isolated

Power supply (P):		16-18V dc
Contact closure:	ON state:	Input resistance threshold <1KΩ typical
	OFF state:	Input resistance threshold >7KΩ typical
Wetting current:		>4mA
Wetting voltage:		>12V

'Logic' Mode

Logic inputs:	ON state:	Input voltage threshold >10.8V dc, 30V max.
	OFF state:	Input voltage threshold <5.0V dc
Input current:		3.8mA @ 12V dc; 2.8mA @ 24V dc

DI16 – ORDER CODE

Module

2500M-6000 Sixteen channel digital input

Terminal Unit

2500T-6U00 Terminal unit with dummy cover fitted

2500M-F: Four Channel Relay Output

This module provides four relay outputs. The relay contacts are all fitted with removable snubber circuits to reduce contact arcing and prolong contact life.

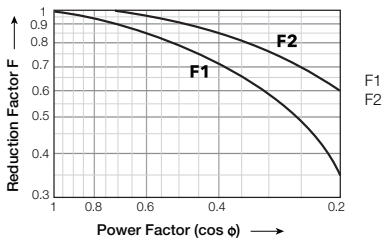
No of channels:	4 (3 normally open + 1 changeover)
Max current rating:	2A at up to 240V ac; 0.5A at 200V dc, increasing to 2A at 50V dc (resistive)
Min ratings:	AgCdO contacts offer best operating life switching more than 100mA 12V
Fuse (option):	3.15A, 20mm ceramic, time lag (T), in terminal unit
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation)
Contact life:	>10million operations @ 240V ac, 1A rms >600,000 operations @ 240V ac, 2A rms
Mechanical life:	>30 million operations
De-rating:	The above ratings summarise the performance with resistive loads. With complex loads further de-rating may be required
Power consumption:	1.1W maximum

Relay De-rating

AC Voltage

As the AC load becomes more "difficult" a more significant de-rating factor is required. The graph below shows the derating to be applied in terms of contact life, assuming the load requirement is predefined.

Reduction factor for inductive ac loads



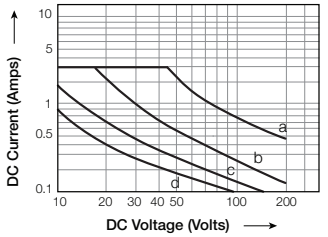
F1 = worst case
F2 = typical

Contact life = resistive contact life x reduction factor

DC voltage

DC operation is also limited for difficult loads, particularly where there is significant inductance. Here the working current must be limited as shown where the load time constant (L/R, in ms) is the significant factor.

Max dc load breaking capacity



a = resistive
b = 20ms
c = 40ms
d = 60ms

RLY4 – ORDER CODE

Module

2500M-F000 Four channel isolated relay output

Terminal Unit

2500T-T000 Terminal unit

2500T-T040 Terminal unit with four 3.15A fuses

2500M-8: Eight Channel Relay Output

This module provides eight relay outputs. These outputs may require external snubber circuits (application dependent).

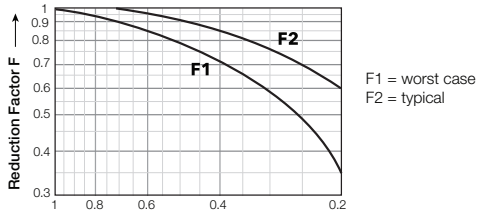
No of channels:	8 normally open
Max current rating:	2A at up to 240V ac; 0.5A at 200V dc, increasing to 2A at 50V dc (resistive)
Min ratings:	AgCdO contacts offer best operating life switching more than 100mA 12V
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation)
Contact life:	>10million operations @ 240V ac, 1A rms >600,000 operations @ 240V ac, 2A rms
Mechanical life:	>30 million operations
De-rating:	The above ratings summarise the performance with resistive loads. With complex loads further de-rating may be required
Power consumption:	2.5W

Relay De-rating

AC Voltage

As the AC load becomes more "difficult" a more significant de-rating factor is required. The graph below shows the derating to be applied in terms of contact life, assuming the load requirement is predefined.

Reduction factor for inductive ac loads



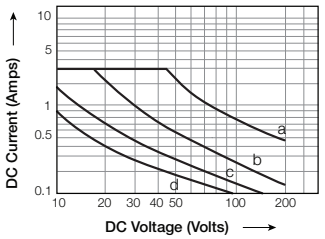
F1 = worst case
F2 = typical

Contact life = resistive contact life x reduction factor

DC voltage

DC operation is also limited for difficult loads, particularly where there is significant inductance. Here the working current must be limited as shown where the load time constant (L/R, in ms) is the significant factor.

Max dc load breaking capacity



a = resistive
b = 20ms
c = 40ms
d = 60ms

RLY8 – ORDER CODE

Module

2500M-8000 Eight channel isolated relay output

Terminal Unit

2500T-8U00 Terminal unit

2500MF-JE & HE: Four Channel Digital Output Module

This digital output module provides four logic outputs and is available in two factory option formats for standard or high output.

No. of channels:	4
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	Channels share a common connection
Current assumption:	100mA max
Output functions:	TPO and VP in module

'Logic' Variant

Voltage supply:	18<Vs <30V dc
Output current:	>8mA high drive per channel (Current limited)
Output voltage:	At least Voltage supply (Vs) -3V switch drop

'24V' Variant

External supply:	12 <Vs <30V dc
Output current:	100mA maximum high drive per channel (Current & Temperature limted)
Output voltage:	At least Voltage supply (Vs) -3V switch drop

DO4 – ORDER CODE

Module

2500M-JE00 Four channel digital logic output 10mA max
2500M-HE00 Four channel digital 24d switched output

Terminal Unit

2500T-RU00 Terminal unit with dummy cover fitted
2500T-RU30 Terminal unit with disconnects

2500M-N: Eight Channel Digital Output Module

The DO8 digital output module provides eight logic outputs, which are typically used for control, alarms or event 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.

Voltage supply (external):		18-30V dc
Leakage current off state:		<100uA
Current output:	Channel max.:	0.75A/channel
	Module max.:	4A total (500mA/channel, all channels ON)
Output voltage:		>Voltage supply (Vs) less 3V
System isolation:		300V RMS or dc (double insulation)
Channel isolation:		Channels share a common connection
Power consumption:		0.6W maximum

DO8 – ORDER CODE

Module

2500M-NE00 Eight channel digital output
Max 4A/module

Terminal Unit

2500T-S000 Terminal unit with dummy cover fitted

2500M-7: Sixteen Channel Digital Output Module

digital output module provides sixteen short-circuit protected outputs, which are typically used for control, alarms, or event outputs. Each channel can drive up to 0.7A and can be used for driving solenoids, relays, amps, fans, thyristor units, single phase Solid State Relays (SSRs), or some three phase SSRs.

Voltage supply (external):		24Vdc ±20%
Leakage current off state:		<10uA
Current output:	Channel maximum:	0.7A/channel
	Module Thermal Cut-off:	90±3°C, restart: 88±3°C
Short Circuit Protection:		0.7A to 1.7A per channel
Output voltage:		>Voltage supply (Vs) less 1V
System isolation:		300V RMS or dc (double insulation)
Channel isolation:		Channels share a common connection
Power consumption:		Module 0.6W maximum
		Plant side 850W maximum

DO16 – ORDER CODE

Module

2500M-7E00 Sixteen channel digital output
Max 4A/module

Terminal Unit

2500T-7U00 Terminal unit with dummy cover fitted

2500M-P: 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.

System isolation:	300V RMS or dc (double insulation)
Channel isolation:	100V RMS or dc (basic insulation)
Power consumption:	3.7W 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
Accuracy:		±0.4V or ±7% of range, whichever is the greater
Sensor break level:		50-310mV ±10%
Sensor short circuit:		N/A
CURRENT	Input range:	0-20mA
Absolute maximum input:		30mA
Input impedance:		1KΩ
Threshold:		0-20mA (0.5mA steps), ±0.2mA hysteresis
Accuracy:		±0.4mA or ±7% of range, whichever is the greater
Sensor break level:		0.05-0.31mA ±10%
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
Accuracy:		±0.4V or ±7% of range, whichever is the greater
Debounce:		5, 10, 20, 50mS

Note: with debounce on, max frequency is limit and resolution is 600ppm

Output Specification

Voltage:	Selectable as 8, 12, or 24V dc at10mA
Maximum current:	25mA
Voltage drop at full load:	1V @ 25mA
Accuracy:	±20%

FI2 – ORDER CODE

Module

2500M-P000 Two channel digital frequency input

Terminal Unit

2500T-U000 Terminal unit with dummy cover fitted

2500T-NU00 Terminal unit

2500M-R: Zirconia Input

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
CJ Rejection:	< 30:1
CJ Accuracy:	± 1.3°C, ±0.5°C typ. ('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

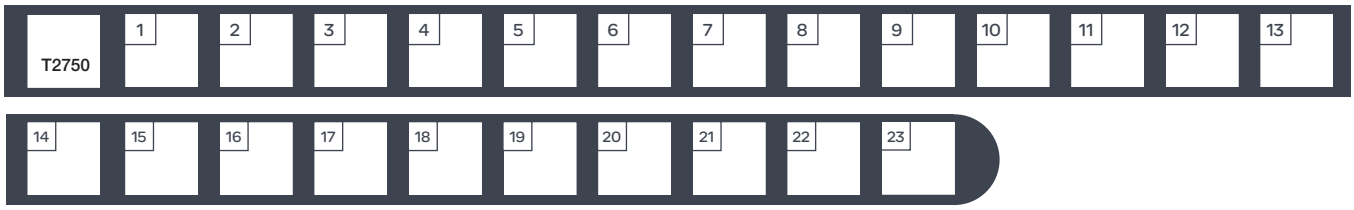
Power consumption:	1.8W maximum
Common mode rejection:	>80db, 48 - 62Hz
Series mode rejection:	>60db, 48 - 62Hz
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation)

ZI – ORDER CODE

Module
2500M-R000 Zirconia input

Terminal Unit
2500T-Z000 Terminal unit

Order codes



Basic Product

T2750	CPU(s) Base & I/O Module

1 Redundant

R	2 CPUs for Redundant operation
S	1 CPU for Simplex operation

2 Base Size

A	16 I/O module positions
C	8 I/O module positions
F	CPU(s) only (no I/O module)

3 Earthing System

0	Two earth clamps fitted
1	Earthing for 8 Module Base
2	Earthing for 16 Module Base

4 License

L	D	Foundation	Standard	Control	Advanced
A	U	Unbounded	0	0	Off
B	L	Unbounded	50	4	Off
C	M	Unbounded	100	8	Off
D	N	Unbounded	Unbounded	12	Off
E	P	Unbounded	Unbounded	16	Off
F	Q	Unbounded	Unbounded	24	Off
G	R	Unbounded	Unbounded	32	Off
H	S	Unbounded	Unbounded	Unbounded	Off
J	T	Unbounded	Unbounded	Unbounded	On

Note: L = Standard Control License; D = Data logging enabled license

5 Communications Protocol

1	ELIN, FTP, SNTP, Modbus RTU/TCP slave
2	Opt 1 + Modbus RTU/TCP master and Raw Comms
3	Profibus Master includes (Opt2)

6 Terminal Unit Connectors

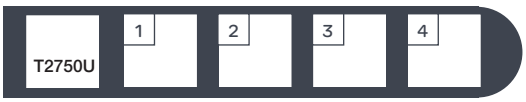
A	RJ45 Modbus and USB

7 Disconnects and Fuses

0	Standard terminations
1	Disconnects and Fuses

8-23 Module and Terminations

BLANK	2 ch – T/C mV Input with CJC
C	2 ch – PT100. HiZ Input
D	2 ch – mA Input
E	3 ch – 4-20mA with Tx PSU
G	4 ch – non isol T/C, with CJC
H	4 ch – non isol mV Input
J	4 ch – non isol mA Input
K	2 ch – mA, V Output
M	4 ch– 24V Digital Input
P	6 ch – 230 volt ac. Input
Q	6 ch – 115 volt ac. Input
R	8 ch – Logic Inputs
S	8 ch – Contact Inputs
6	16 ch – Contact or Logic Input
T	4 ch – Logic Output 10mA max
V	4 ch – 24 volt dc Output
Z	8 ch – Digital Output
7	16 ch – Digital Output
X	4 ch – Relay Output
8	8 ch – Relay Output
3	2 ch – Frequency Input
5	1 ch – Zirconia Input
A	Blank Terminal Unit
0	No Terminal (empty space)



Basic Product

T2750U	Licence Upgrade Only

1 Existing License

L	D	Foundation	Standard	Control	Advanced
A	**U**	Unbounded	0	0	Off
B	**L**	Unbounded	50	4	Off
C	**M**	Unbounded	100	8	Off
D	**N**	Unbounded	Unbounded	12	Off
E	**P**	Unbounded	Unbounded	16	Off
F	**Q**	Unbounded	Unbounded	24	Off
G	**R**	Unbounded	Unbounded	32	Off
H	**S**	Unbounded	Unbounded	Unbounded	Off
J	**T**	Unbounded	Unbounded	Unbounded	On

Note: L = Standard Control License; D = Data logging enabled license

2 Communications Protocol

1	ELIN, FTP, SNTP, Modbus RTU/TCP slave
2	Opt 1 + Modbus RTU/TCP master and Raw Comms

3 Required License

L	D	Foundation	Standard	Control	Advanced
A	**U**	Unbounded	0	0	Off
B	**L**	Unbounded	50	4	Off
C	**M**	Unbounded	100	8	Off
D	**N**	Unbounded	Unbounded	12	Off
E	**P**	Unbounded	Unbounded	16	Off
F	**Q**	Unbounded	Unbounded	24	Off
G	**R**	Unbounded	Unbounded	32	Off
H	**S**	Unbounded	Unbounded	Unbounded	Off
J	**T**	Unbounded	Unbounded	Unbounded	On

4 Communications Protocol

ELIN	ELIN, FTP, SNTP, Modbus RTU/TCP slave
MBMT	Opt 1 + Modbus RTU/TCP master and Raw Comms

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