INSTALLATION SAFETY REQUIREMENTS

Various symbols used on the instrument are described below:

Caution (refer to the accompanying documents) | Functional (ground) earth | Protective earth terminal

INSTALLATION CATEGORY AND POLLUTION DEGREE

This product has been designed to conform to BS EN61010 installation category II and pollution degree 2. These are defined as follows:

Installation category II. The rated impulse voltage for equipment on nominal 230V ac mains is 2500V.

Pollution degree 2. Normally, only non-conductive pollution occurs. However, occasionally a temporary conductivity caused by condensation shall be expected.

PERSONNEL

Installation must be carried out only by qualified personnel.

ENCLOSURE OF LIVE PARTS

To prevent hands or metal tools touching parts that may be electrically live, the unit must be installed in an enclosure.

BLANK TERMINAL UNIT

Base Units are supplied to hold 16 modules. In the event that a Base Unit is not fully populated a blank terminal unit, Part no. 026373, is supplied with the unit. It is important to fit this immediately to the right of the last module in order to maintain IP20 rating.

WARNING: Live sensors

The unit is designed to operate with the temperature sensor connected directly to an electrical heating element. However you must ensure that service personnel do not touch connections to these inputs while they are live. With a live sensor, all cables, connectors and switches for connecting the sensor must be mains rated.

WIRING

It is important to connect the unit in accordance with the wiring data given in this instruction sheet. Take particular care not to connect AC supplies to the low voltage sensor input or other low level inputs and outputs. Only use copper conductors for connections (except thermocouple inputs) and the wiring of installations comply with all local wiring regulations. For example in the UK use the latest version of the IEE wiring regulations (BS7671). In the USA use NEC Class 1 wiring methods.

POWER ISOLATION

The installation must include a power isolating switch or circuit breaker. This device should be in close proximity (1 meter) to the unit, within easy reach of the operator and marked as the disconnecting device for the instrument.

EARTH LEAKAGE CURRENT

Due to RFI Filtering there may be earth leakage current of up to 3.5mA. This may affect the design of an installation of multiple units protected by Residual Current Device (RCD) or Ground Fault Detector, (GFD) type circuit breakers.

OVERCURRENT PROTECTION

It is recommended that the DC power supply to the system is fused appropriately to protect the cabling to the unit. The unit provides a fuse on the T2550R module to protect the supply from a fault within the unit.

VOLTAGE RATING

The maximum continuous voltage applied between any of the following terminals must not exceed 264Vac:

- DI6 input or RLY4 relay output to logic, dc or sensor connections;
- any connection to ground

The unit must not be wired to a three-phase supply with an unearthed star connection. Under fault conditions such a supply could rise above 264Vac with respect to ground and the unit would not be safe.

EQUIPMENT & PERSONNEL PROTECTION

1. The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure.
2. Separate or redundant control paths must be provided for critical control functions.
3. System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
4. Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

Eurotherm Limited
Telephone: (+44 1903) 268500
Fax: (+44 1903) 265982
E-mail: info@eurotherm.com
Web: www.eurotherm.co.uk

MANUFACTURING ADDRESS

U.K. Worthing

All Modules, including the IOC Modules comply with the 40 Year Environment Friendly Usage Period.

Signed (Kevin Shaw, R&D Director): Date: 24th June 2016

O: indicates that the concentration of hazardous substance in all of the homogeneous materials for this part is below the limit as stipulated in GB/T 26572.
X: indicates that concentration of hazardous substance in at least one of the homogeneous materials used for this part is above the limit as stipulated in GB/T 26572

This table is made according to SJ/T 11364.

X: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。

O: 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。

本表格依据SJ/T 11364的规定编制。

部件名称 Part Name	有害物质 - Hazardous Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 Metal parts	X	O	O	X	O	O
塑料部件 Plastic parts	O	O	O	O	O	O
电子件 Electronic	X	O	O	O	O	O
触点 Contacts	O	O	X	O	O	O
线缆和线缆附件 Cables & cabling accessories	O	O	O	O	O	O

RESTRICTION OF HAZARDOUS SUBSTANCES

This certificate relates to the product models mentioned above. The data shown here is related to the following version of the China RoHS 2.0: Administrative Measures for the Restriction of Hazardous Substances in Electric Appliances and Electronic Products" released January 21st 2016.

Type	Description	Slow Task (110 ms)	Fast Task (10 ms)
AI2	Analogue I/P 2 channels (universal; 3 terminal unit options)	√	-
AI3	Analogue I/P 3 channels (4-20mA, with transmitter PSU)	√	-
AI4	Analogue I/P 4 channels (TC, mV, mA terminal unit options)	√	-
AO2	Analogue O/P 2 channels (0-20mA or 0-10V output)	√	√
DI4	Digital I/P 4 channels (logic)	√	-
DI8_CO*	Digital I/P 8 channels (contact closure)	√	√
DI8_LG*	Digital I/P 8 channels (logic)	√	√
DI6_MV	Digital I/P 6 channels (ac mains input, 115V rms)	√	-
DI6_HV	Digital I/P 6 channels (ac mains input, 230V rms)	√	-
DO4_LG*	Digital O/P 4 channels (externally powered, 100mA)	√	√
DO4_24*	Digital O/P 4 channels (externally powered, 100mA)	√	√
DO8	Digital O/P 8 channels	√	√
RLY4*	Relay O/P 4 channels (2 amp; 3 n/o, 1 change over)	√	√
FI2	Frequency I/P 2 channels (logic, contact closure)	√	√
ZI	Zirconia I/P 2 channels (mV, 2V range)	√	-

Note * Module upgraded, refers to Version 2 modules.

MODULE TASK RATES

COMPACT FLASH (CF) CARD PRECAUTIONS

The flash card must not be reformatted. Files and System folders must not be deleted. The card must not be removed from a reader without the correct removal procedure being followed. If these rules are not adhered to, the card may be damaged and the instrument malfunction.

CONDUCTIVE POLLUTION

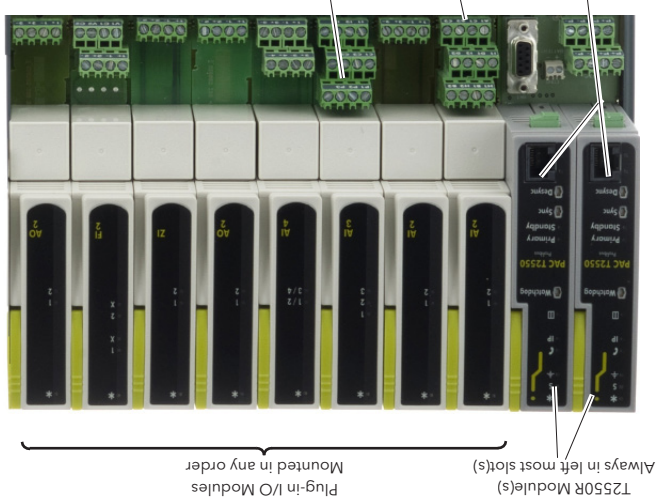
Electrically conductive pollution must be excluded from the enclosure in which the unit is mounted. To secure a suitable atmosphere in conditions of conductive pollution, fit an air filter to the air intake of the enclosure. Where condensation is likely, include a thermostatically controlled heater in the enclosure.

INSTALLATION REQUIREMENTS FOR EMC

To ensure compliance with the European EMC directive certain installation precautions are necessary: For general guidance refer to EMC Installation Guide, Part no. HA025464. If using relay outputs it may be necessary to fit suitable filters for suppressing the emissions. The filter requirements will depend on the type of load. For typical applications we recommend Schaffner FN321 or FN612. Do not connect this unit to a DC distribution network.

Eurotherm®
by Schneider Electric

T2550 EUROTHERM PAC
INSTALLATION AND WIRING INSTRUCTIONS



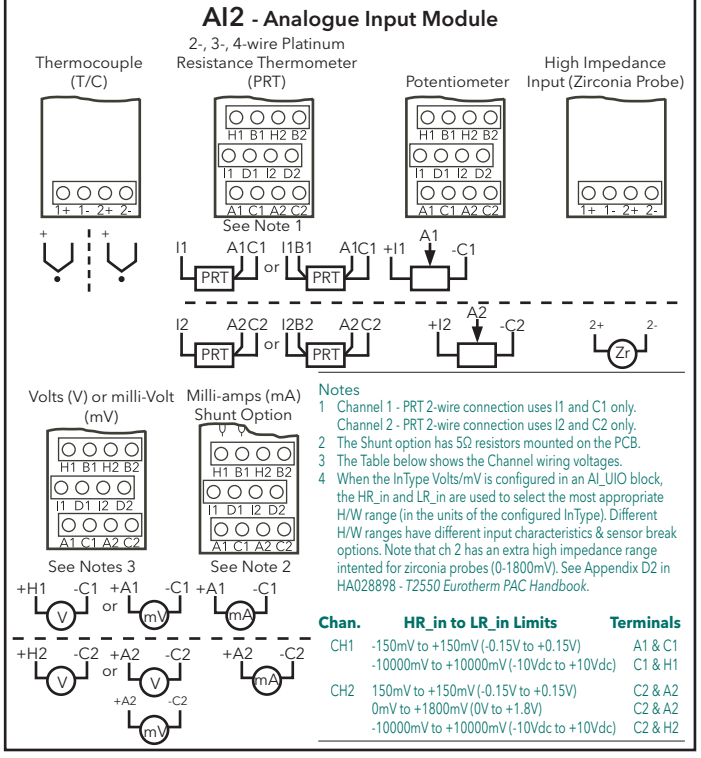
The T2550 is a modular system which can provide multi-loop PID control, analogue and digital I/O, signal conditioning and computational blocks using a variety of plug-in modules.

The Base Unit can be supplied with up to 16 I/O modules, and can be fitted with a LIN or Profibus Duplex Terminal Unit, or a LIN Simplex Terminal Unit. The base unit is suitable for DIN rail (35mm Top hat) or bulkhead mounting.

Customer connections with plant devices are provided by terminal units, specific to each module type, that clip into the Base Unit. The terminal units also provide interconnections between I/O modules and the Input/Output Controller (IOC) Modules which contain system configuration and communications support. The I/O Modules, which clip into their terminal units, are dedicated to specific analogue or digital, input or output. The IOC Modules contain the configuration for the system and communications support.

The system requires 24Vdc at less than 100mA per T2550 IOC Module. A suitable Power Supply is the 2500P, available as 1.3, 2.5, 5, or 10 amp units.

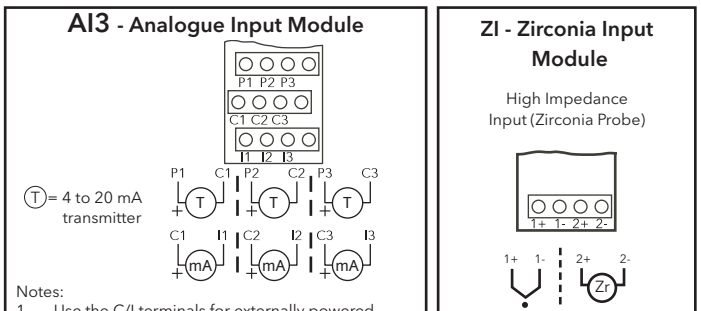
AI2 - Analogue Input Module



Notes
1 Channel 1 - PRT 2-wire connection uses I1 and C1 only. Channel 2 - PRT 2-wire connection uses I2 and C2 only.
2 The Shunt option has 5Ω resistors mounted on the PCB.
3 The Table below shows the Channel wiring voltages.
4 When the InType Volts/mV is configured in an AI_UIO block, the HR_in and LR_in are used to select the most appropriate H/W range (in the units of the configured InType). Different H/W ranges have different input characteristics & sensor break options. Note that ch 2 has an extra high impedance range intented for zirconia probes (0-1800mV). See Appendix D2 in HA028898 - *T2550 Eurotherm PAC Handbook*.

Chan.	HR_in to LR_in Limits	Terminals
CH1	-150mV to +150mV (-0.15V to +0.15V)	A1 & C1
	-10000mV to +10000mV (-10Vdc to +10Vdc)	C1 & H1
CH2	150mV to +150mV (-0.15V to +0.15V)	C2 & A2
	0mV to +1800mV (0V to +1.8V)	C2 & A2
	-10000mV to +10000mV (-10Vdc to +10Vdc)	C2 & H2

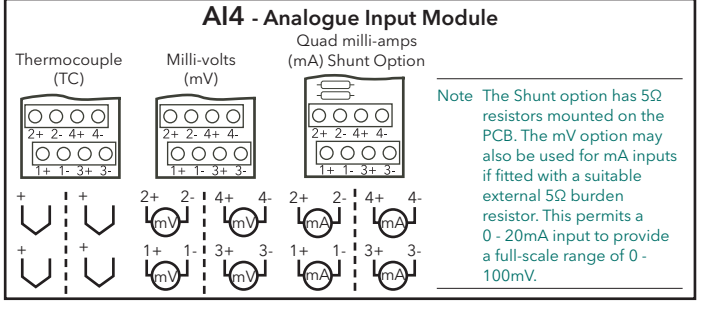
AI3 - Analogue Input Module



Notes:
1 Use the C/I terminals for externally powered inputs. Use the P/C terminals when using the module's internal supply'
2. The number of AI3 modules must be restricted such that the overall, steady-state power consumption of the all base modules does not exceed an average of over 3W per module (e.g. 24 Watts for 8-unit bases or 48W for 16-unit bases).

ZI - Zirconia Input Module

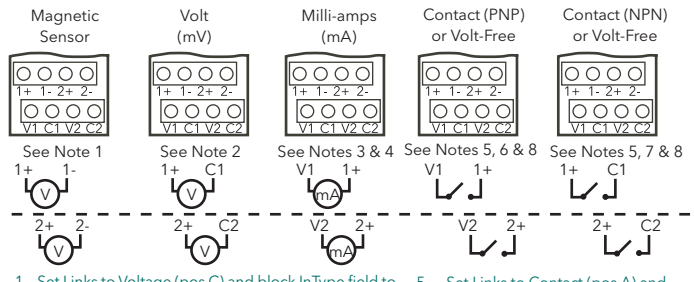
AI4 - Analogue Input Module



Note The Shunt option has 5Ω resistors mounted on the PCB. The mV option may also be used for mA inputs if fitted with a suitable external 5Ω burden resistor. This permits a 0 - 20mA input to provide a full-scale range of 0 - 100mV.

FI2 - Frequency Input Module

Caution
Do not install more than 8 FI2 modules in a single Base Unit if the channel output load at 24V is more than 5mA per channel. If more loads are required than this restriction permits, an external power supply must be used.



1 Set Links to Voltage (pos C) and block InType field to Magnetic. Threshold internally configured.
2 Set Links Voltage (pos C) and block InType field to V. If using an output supply to power a sensor, set output supply to 8V, 12V, or 24V.
3 Set Links to Current (pos B), block InType field to mA and select the internal current burden resistor. When the internal burden resistor is selected the transducer must not exceed 12V. The output supply must be set to the requirements of the transducer, 8V, or 12V.
4 The Terminal Unit includes an internal 1KΩ burden resistor. If using an external current burden resistor, connect between 1+ and C1 (channel 1) and 2+ and C2 (channel 2). Set links to Voltage (pos C), and block InType field to V. The Threshold must be set to the midpoint between the peak to peak voltage across the burden. The output supply must be set to the requirements of the transducer, 8V, 12V, or 24V.
5 Set Links to Contact (pos A) and block InType field to V. Recommend, set output supply to 8V for minimal temperature rise.
6 Set Threshold 75% of output (V), i.e. 6V, 9V, or 18V.
7 Set Threshold 25% of output (V), i.e. 2V, 3V, or 6V.
8 If using an external barrier, measure the peak-to-peak voltage and chose a midway theshold. Increase the PSU setting in order to increase the span of the measured voltage if required.

Link1 and Link2
Contact (position A)
Current (position B)
Voltage (position C)

APPLICATION DETAILS

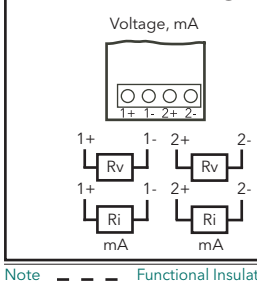
All configurations can apply a Debounce value of 0ms (if not required), 5ms, 10ms, 20ms, or 50ms, using an algorithm that ensures pulse edges closer than the set time, are excluded.

Caution
Do NOT configure Debounce if using Control loops based on a frequency PV.

For Voltage (position C) or Current (position B), to acheive good pulse detection, and help prevent inappropriate detection of noise spikes and best repeatability, the Threshold must be set close to the midpoint, between the peak to peak values of the Input. It may be necessary to disable the Sensor Break and Sensor Short Circuit detection via the Options.SBreak and Options.SCct fields in the associated FI_UIO block to prevent inappropriate alarms. The Sensor Break alarm is set if the Input value falls below 0.05V or 0.05mA. The Sensor Short circuit alarms is set if the Input value rises above 91% of the output supply Volts (Volts or milli-amps).

For NAMUR, Current (position B), must be set to 8V output supply, and the Threshold must be set to 1.65mA. Sensor Break and Sensor Short circuit detection can be enabled, if required. Cable shielding must not be connected to both the T2550 and encoder ends.

AO2 - Analogue Output Module

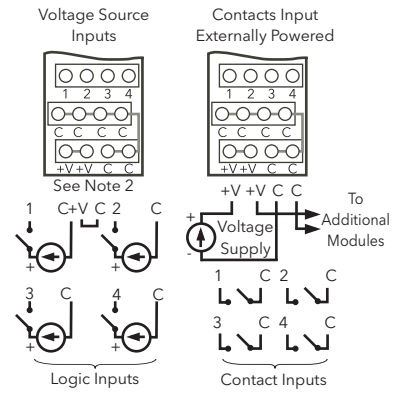


Note Voltage Mode. Input impedance 'Rv' of the device connected to this output module must be > 550Ω for -0.1Vdc to 10.1Vdc range and > 1500Ω for the -0.3Vdc to +10.3Vdc range.
Current Mode. Input impedance (or loop impedance) 'Ri' of the device connected to this output module must be < 550Ω.

Note — — — Functional Insulation. This is defined as: Insulation between conductive parts that is necessary only for the proper functioning of the equipment. This does not necessarily provide protection against electric shock.

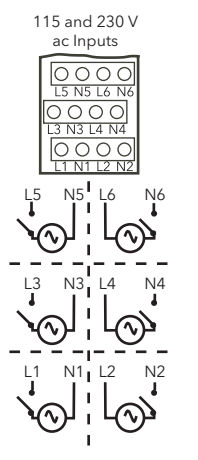
═══ Reinforced Insulation. This is defined as: Insulation between conductive parts, which provides protection against electric shock.

DI4 - Digital Input Module



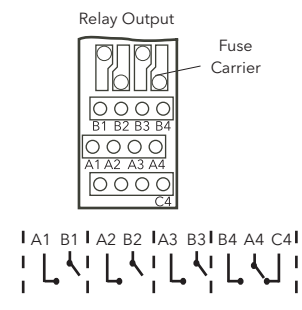
Notes
1 Negative logic inputs can be connected if required. Reverse polarity of the input connections.
2 MUST fit link (+V to C) in place of external supply.

DI6 - Digital Input Module



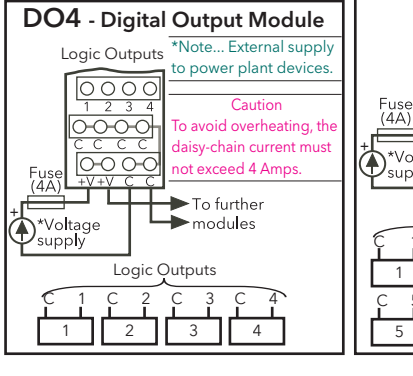
DI8 - Digital Input Module

RLY4 - Relay Module

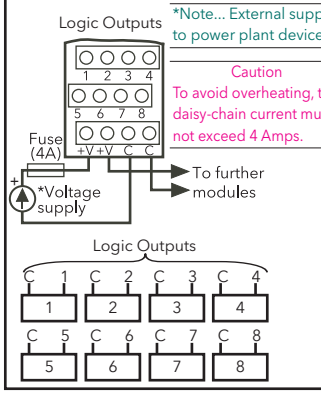


Notes
1 Relays above shown in power off state
2 Fuses supplied for the Relay units are 3.15A (T type), 20mm to EN60127.
3 Fitted labels show manufacturing data including space to record which snubbers have been removed.

DO4 - Digital Output Module



DO8 - Digital Output Module



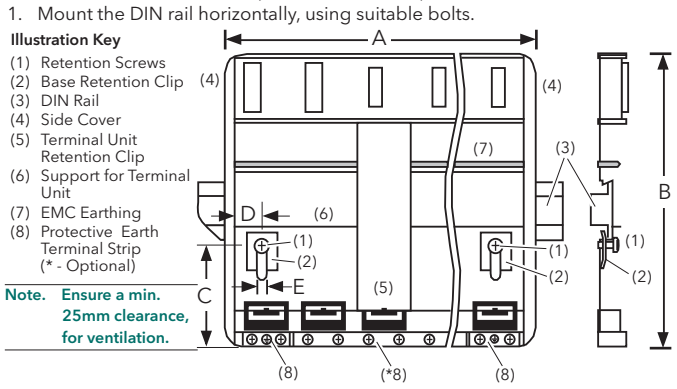
The Base Unit

TO MOUNT THE BASE

This unit is intended to be mounted within an enclosure, or in an environment suitable for IP20 rated equipment. It can be DIN rail or bulkhead mounted.

DIN RAIL MOUNTING (HORIZONTAL)

1. Mount the DIN rail horizontally, using suitable bolts.



Base unit	Dimensions (mm)					Weight (kg)	
	A	B	C	D	E	No Modules	All Modules
T2550B-00S	36	180	68	15	5	0.1	0.3
T2550B-04R	164	180	68	15	5	0.4	1.3
T2550B-06R	214	180	68	15	5	0.6	1.7
T2550B-08R	264	180	68	15	5	0.7	2.1
T2550B-16R	467	180	68	15	5	1.3	3.8

2. Ensure that the DIN rail makes good electrical contact with the metal base of the enclosure.
3. Loosen screws (1) in the base, and allow them, and the associated base retention clips (2) to drop to the bottom of he screw slot.
4. In the back of the base is an extruded slot which locates with the DIN rail(3).
5. Fit the top edges of this into the top edge of the DIN rail (3). Slide the screws (1) with the associated clips (2) upwards as far as they will go towards the top of the screw slots. The angled edge of the base retaining clip (2) must locate behind the bottom edge of the DIN rail.
6. Tighen the screws (1).

DIN RAIL MOUNTING (VERTICAL)

Caution

The base unit may be mounted vertically but, in such a case, a fan should be fitted in the cubicle in such a way as to ensure a free flow of air round the modules.

1. Mount the DIN rail vertically, using suitable bolts.
2. Ensure that the DIN rail makes good electrical contact with the metal base of the enclosure.
3. Loosen screws (1) in the base, and move them and the associated base retention clips (2) to the bottom of the screw slot.
4. In the back of the base is an extruded slot which locates with the DIN rail (3)
5. Fit the top edge of this into the top edge of the DIN rail (3)
6. Slide the screws (1) with the associated clips (2) upwards as far as they will go towards the top of the screw slots. The angled edge of the base retaining clip (2) must locate behind the bottom edge of the DIN rail.
7. Tighten the screws.

DIRECT PANEL MOUNTING

1. Remove the screws (1) and base retention clips (2).
2. Hold the base horizontally or vertically on the panel and mark the position of the two holes on the panel.
3. Drill two 5.2mm holes in the panel.
4. Using M5 bolts supplied, secure the base to the metal panel.

WARNING

Do not operate the equipment without a protective earth conductor connected to one of the earth terminals on the base unit. The earth cable should have at least the current rating of the largest power cable used to connect to the unit.

Connect the protective earth with a suitable tinned copper eyelet, and use the screw and washer supplied with the base unit, tightened to a torque of 1.2Nm (910.5lbin).

This connection also provides a ground for EMC purposes.

For DIN rail mounting, use symmetrical DIN rail to EN50022-35 X 7.5 or 35 X 15 mounted horizontally or vertically.

Connecting the 24Vdc Power Supply

Caution

Before proceeding with any wiring on this unit, please read section on Wiring, and Safety and EMC information. It is the responsibility of the installer to ensure the safety and EMC compliance of any particular installation.

The power supply is the 2500P. This is a DIN rail mounted unit, which may be mounted adjacent to the base or remotely. Alternatively, an existing power supply may be used provided it meets the specification below.

The IOC terminal unit is not fused, but is diode protected against connection of a reversed polarity supply. Connection of a reversed polarity supply will not damage the unit. All modules are individually fused. The fuse is not user replaceable, therefore the unit must be returned to the factory for replacement.

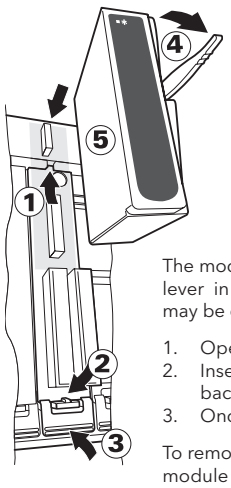
POWER SUPPLY SPECIFICATION

Power supply voltage:	24Vdc ± 20%
Supply ripple:	2Vp-p max
Power comsumption:	82W max per base

Note. The current taken by each module is 100mA on average. 18V is the absolute low supply voltage limit. The use of an 18V Power Supply with any appreciable voltage drop may cause unpredictable or out of specification operation. Damage may occur when a supply voltage >30Vdc is used.

I/O Modules & Terminal Units

TO FIT A TERMINAL UNIT



1. Locate tag (1) on the Terminal Unit PCB with the slot in the Base.
2. Press the lower end of the Terminal Unit (2) until secured in place by the Retention clip (3). This is indicated by a 'click' as the clip locks into place.
3. To remove, press the Retention clip to release the Terminal Unit and withdraw it from the slot in the Base Unit.

TO FIT A MODULE

The module must be fitted and removed with the Retaining lever in the open position, as shown, or the module case may be damaged.

1. Open the Retaining lever on the face of the module (4).
2. Insert the module (5), ensuring that it engages with the backplane and terminal unit connectors.
3. Once secure, close the retaining lever.

To remove a module, open the retaining clip and pull the module out of the base unit.

I/O MODULE TERMINATION DETAILS

The module terminals accept wire sizes from 0.20 to 2.5mm^2 (14 to 24AWG). The screws should be tightened to 0.4Nm (5.3 lb in) using a 3.5mm flat screwdriver.

Setting the IP Address

Each instrument uses a one-to-one mapping of LIN Node Number to an IP Address defined by the 'network.unh' file.

Note: The Compact Flash card is accessed using a standard Compact Flash card reader. The 'network.unh' file MUST be edited using the Instrument Properties dialog. It can be edited using a text editor program, e.g. 'notepad.exe', but this is not recommended.

ALLOCATION OF IP ADDRESS

DHCP: The instrument (IP host) asks a DHCP server to provide it with an IP Address. Typically this happens at start-up, but can be repeated during operation. DHCP includes the concept of assigned values that will 'expire'. A DHCP server is required that is configured to respond correctly to the request. This configuration depends on the local company network policy.

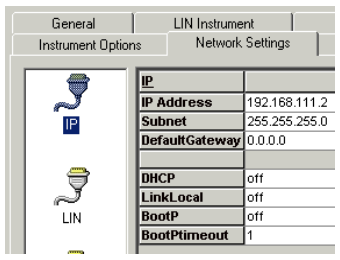
BootP or Bootstrap Protocol (Internet (TCP/IP protocol)): This is used by a network computer to obtain an IP Address and other network information such as server address and Default Gateway. Upon startup, the client station transmits a BOOTP request to the BOOTP server, which returns the required information. A BootPtime-out period can be configured. If this period elapses before the IP Address, Subnet mask, and Default Gateway address are obtained, the values display 0.0.0.0.

Link-Local: Used as a fallback to either DHCP or BootP, or it can be used on its own as the only IP Address configuration method. Link-Local always assigns an IP Address in the range 169.254.X.Y. This IP Address range is reserved for use by Link-Local and is explicitly defined as private and non-routable. The Link-Local algorithm ensures that an instrument (IP host) on a network choses a unique IP Address from the Link-Local range. Link-Local is supported by Windows 98 onwards.

Manual: This requires the IP Address to be explicitly defined in the 'network.unh' file.

EDITING THE NETWORK SETTINGS

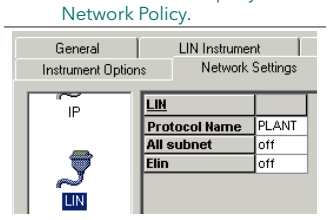
Each instrument uses a one-to-one mapping of LIN Node Number to a single IP Address, defined in the Instrument Properties dialogue.
When despatched from the factory, the instrument is configured using DHCP with Link-Local Fallback, and a default LIN Network name, 'NET'.



If the instrument is to have a fixed IP Address, e.g. 192.168.111.2, and use the LIN Protocol Name, e.g. 'PLANT', the Instrument Properties dialogue must be used to modify these parameters.

Note. The IP Address must comply with the local company Network Policy.

To display the Instrument Properties dialogue, select the **Properties** command after selecting the Instrument Folder in an appropriate Explorer view.



RECOVERY FROM UNKNOWN IP ADDRESS CONFIGURATION

To reset the IP Address, and Subnet Mask (255.255.255.0) of an Instrument with an unknown IP Address when a Compact Flash card reader is not available, set the LIN Address switches as denoted below.

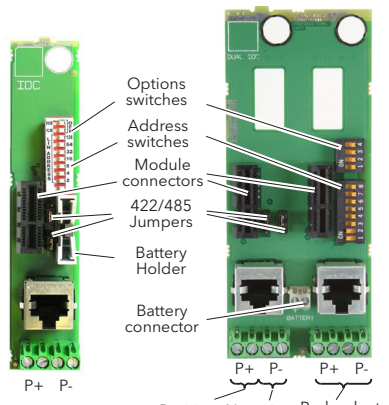
IOC Unit	LIN Address Switches	In Position	For IP Address
Simplex Unit	ALL (SW1:S1 to SW1:S8)	OFF	192.168.111.222
Duplex Unit			
Simplex Mode	ALL (SW1:S1 to SW1:S8)	OFF	192.168.111.222
Duplex Mode	ALL (SW1:S1 to SW1:S8)	ON	Left - 192.168.111.222 Right - 192.168.111.223

A Computer with a fixed IP Address on this Subnet can then be connected directly to the instrument and used to inspect and edit the IP Address of the T2550 IOC module.

Note. Use the Instrument Properties dialogue to edit the IP Address. The Terminal Configurator may also be used, but this is not recommended.

Terminal Unit (Simplex and Duplex Unit)

The Terminal Units have links and switches for configuring the Mode, LIN address and instrument Restart options. The Simplex Unit uses one set of 10 switches to set these configurations. The Duplex Unit has one set of 8 switches, SW1, to configure the Duplex operation and instrument LIN address, and one set of 4 switches, SW2, to set the instrument restart configuration.



Note. The power supply connections also apply to the Profibus Terminal Unit

The Ethernet Port

This is a 10/100base T port. It can be connected to a hub or switch with Cat5 cable via the RJ45 connector to create a network of Tactician instruments, including a range of operator interface units, and to interface with devices supporting Modbus-TCP as a master or a slave.

The Terminal Unit will autonegotiate if connected directly to a device supporting 10/100base T Ethernet, so RJ45 cross-over cables not required.

BATTERY SUPPORT

The Simplex Unit supports Battery backup via the Lithium Manganese Dioxide battery, maintaining the Real-Time Clock for 1.5 years continuous use.

Warning

If batteries are abused, a caustic solution may leak that can result in the corrosion of aluminium and copper. The caustic solution must be neutralised using a weak acidic solution, i.e. vinegar, or washed away with copious amounts of water. Batteries must be disposed of according to current local regulations, and not discarded with normal refuse.

The Duplex Unit supports external Battery backup only.

CONNECTIONS TO RJ45 SOCKET

RJ45 Pin	Colour	Signal
8	Brown	Not Used
7	Brown/White	Not Used
6	Green	RX-
5	Blue/White	Not Used
4	Blue	Not Used
3	Green/White	RX+
2	Orange	TX-
1	Orange/White	TX+
	Plug shroud to Cable screen	

Caution

Wire colours may vary according to cable manufacturer

SW1: LIN ADDRESS CONFIGURATIONS

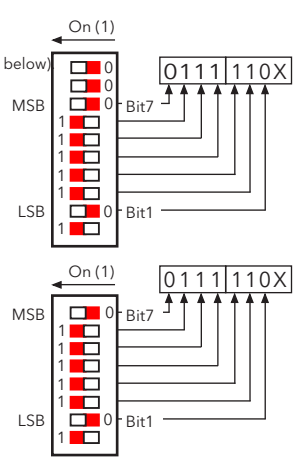
In Duplex mode, the primary is initially in the left-hand (even address) first slot and the secondary, the right-hand (odd address) second slot. If the secondary must take over, and become the primary, it will also take over the even address.

In Simplex mode, it always adopts the even address. It is strongly recommended that the odd address remains unallocated on this LIN segment to avoid address clashes if a second module is subsequently added.

A Simplex Unit always adopts the even address. It is strongly recommended that the odd address remains unallocated on this LIN segment.

Simplex Terminal Unit

SW1:	Function
10 }	Simplex Only (See SW2 Note below)
9 }	
8	Addr. Bit 7 (MSB, value 128)
7	Addr. Bit 6
6	Addr. Bit 5
5	Addr. Bit 4
4	Addr. Bit 3
3	Addr. Bit 2
2	Addr. Bit 1 (LSB, value 2)
1	Not Used



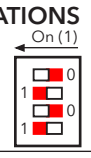
Duplex Terminal Unit

SW1:	Function
8	Addr. Bit 7 (MSB, value 128)
7	Addr. Bit 6
6	Addr. Bit 5
5	Addr. Bit 4
4	Addr. Bit 3
3	Addr. Bit 2
2	Addr. Bit 1 (LSB, value 2)
1	On = Duplex, Off = Simplex

Binary	Hex
0000	0
0001	1
0010	2
0011	3
0100	4
0101	5
0110	6
0111	7
1000	8
1001	9
1010	A
1011	B
1100	C
1101	D
1110	E
1111	F

SW2: OPTION CONFIGURATIONS

SW2:	Function
4	Not Used
3 }	Duplex Only (See Note below).
2 }	
1	On = Restart after Watchdog Off = Remain in Reset



Note. 'Hot/Cold' start-up.

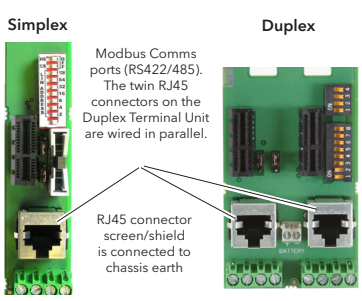
Bit 2(9)	Bit 3(10)	Function
Off	Off	Automatic database generation.
On	Off	Attempt cold start. Halt if fails.
Off	On	Attempt hot start. Halt if fails.
On	On	Attempt hot start, if failed attempt cold start. Halt if fails.

Serial Communications (Modbus & Profibus)

The Serial network supports Modbus and ProfiBus communications protocols. Modbus communications are via the RJ45 connector on the Terminal Unit, but Profibus communications are via a standard 9-way D-Type connector on a dedicated Profibus Terminal Unit.

The system power connections (standard screw terminals) are provided by the Terminal Unit.

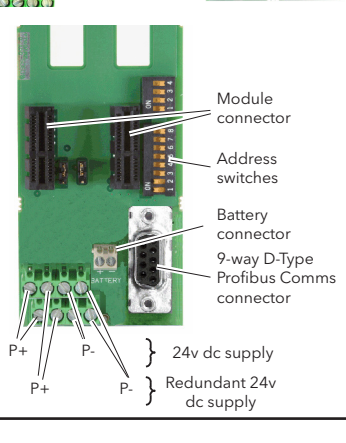
The Serial connection may be used to connect to an operator interface unit, create a Modbus or Profibus network or communicate with a variety of third-party serial devices.



BAUD RATE

In Modbus networks, each instrument baud rate is configured via the Instrument Properties dialog, and MUST be set the same for both the instrument transmitting and the instrument receiving data.

In Profibus networks, the Baud Rate is is defined by the Profibus Master, by detecting the fastest Baud Rate that all devices can operate. The Profibus Terminal Unit operates at 12M Baud.



SERIAL NETWORK CONNECTOR (EIA 485)

Modbus				Profibus		
Pin	Colour	3-wire signal	5-wire signal	Pin	Signal	Description
-	-	-	-	9	Not Used	N/A
8	Brown	N/A	RxA	8	A	Receive/Transmit A
7	Brown/White	N/A	RxB	7	Not Used	N/A
6	Green	Cmn	Cmn	6	VP	5V
5	Blue/White	N/A	N/A	5	Cmn	Signal Common
4	Blue	N/A	N/A	4	Not Used	N/A
3	Green/White	Cmn	Cmn	3	B	Receive/Transmit B
2	Orange	A	TxA	2	Not Used	N/A
1	Orange/White	B	TxB	1	Shield	Shield (ground)
	Plug shroud to Cable screen					

Caution

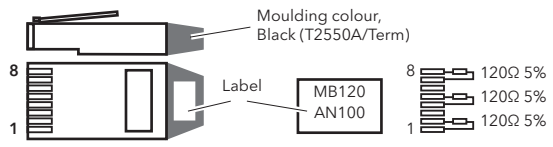
Wire colours may vary according to cable manufacturer

COMMUNICATIONS LINE TERMINATOR

The communications line MUST be terminated ONLY on **the last device in the chain** using the appropriate load resistors. To minimise on site wiring and to provide the correct resistor values, 'Terminators' are available from your distributor.

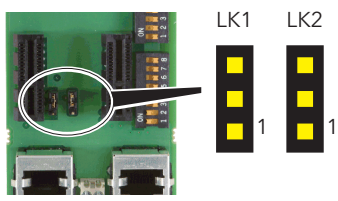
RJ45 LINE TERMINATION

The Modbus TCP/IP RJ45 line terminator, T2550A/Term, is plugged into the last RJ45 socket in the chain. If the operating interface is a PC or PLC this should be terminated in accordance using the appropriate load resistors.

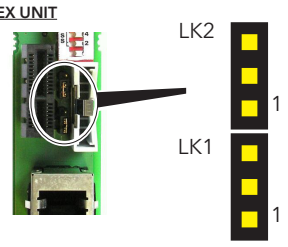


LINK CONFIGURATION

DUPLEX UNIT



SIMPLEX UNIT

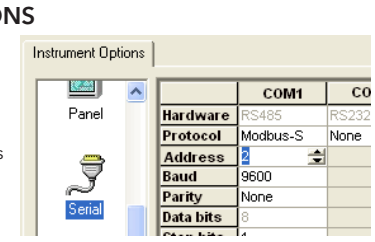


Fit applicable links as shown:

Link	Pos	Terminal Unit	Profibus Terminal Unit
LK1 and LK2	1-2	2 (3) wire (default)	Profibus Network Terminated
LK1 and LK2 (default)	2-3	4 (5) wire	Profibus Network Unterminated

ADDRESS CONFIGURATIONS

Profibus Address configurations from 1 to 127 must be set in the **Instrument Properties dialog** via the Instrument Folder or Modbus Tools. 0 is an invalid address, and when configuring a duplex Profibus system the last permitted Address configuration is 125, to allow an even address, e.g. 126, for the second IOC in the redundant pair.



Note. Explicit Modbus Registers, in Modbus Tools MUST be configured to permit Profibus Slave communications, see Instrument Handbook.