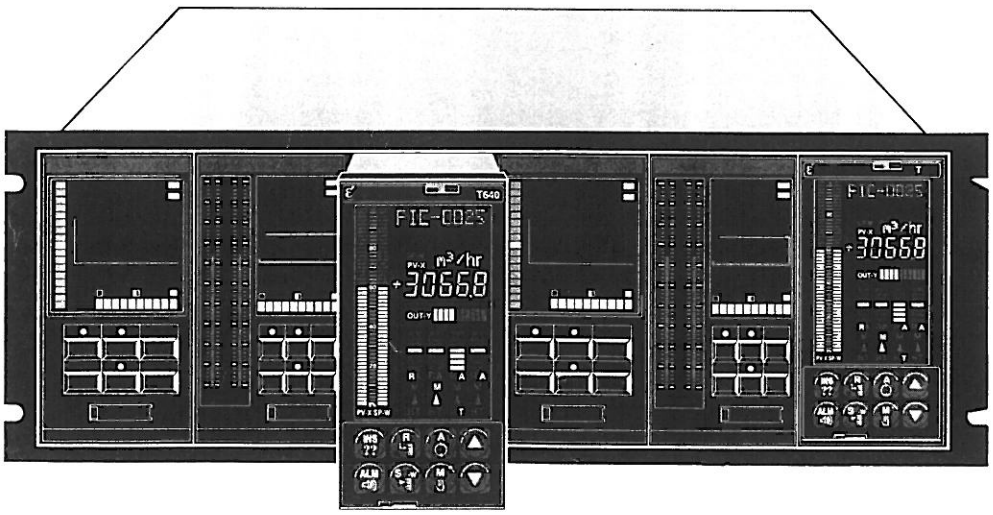
# 6000

NETWORK

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## T750

## Adapter sleeve

## Product specification

- **T640 plugs directly into 7950 rack**
- **Electrically compatible with 6350/60/66/70/80/82**
- **Long-term support for your TCS controller**
- **T640 plugs into 7910 and 7911 adapter sleeve**

**General**

The T750 adapter sleeve allows a T640 to be plugged directly into a 7950 rack. A T640 in a T750 sleeve has the same physical structure (dimensions and connectors) and the same I/O allocation as the 6350/60/66/70/80/82 and other members of the 6000 controller family with the same pinout.

The T750 is designed to support your investment in the 6000 instrument series by using existing spare slots or upgrading the functionality to that of T640s.

In emulating 6000 instruments some of the T640's own functionality is restricted. This occurs because the T640 in a T710 sleeve has a larger pinout. The main restrictions are the loss of the alarm relay and the second isolated transmitter power supply. The following features have been retained with some modification:

**Watchdog** This output is supplied in the form of volt-free contacts within the T640. The T750 modifies this to a logic output to emulate the 6000 instruments.

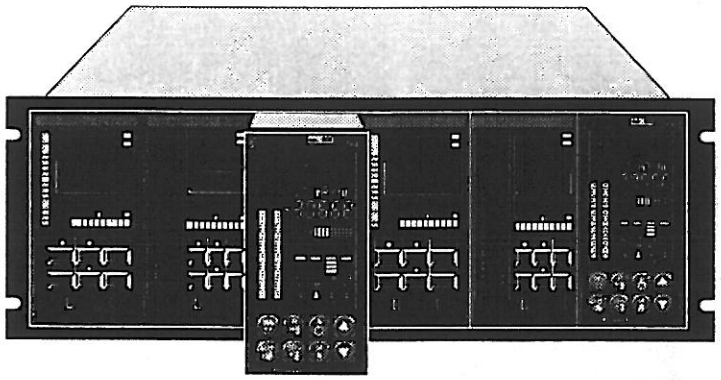
**Second isolated 0-20mA output** As supplied this output is not available; however two jumpers (P15 & P16) in the T750 may be positioned so that this output replaces AN3.OUT and AN4.OUT. If this option is chosen the TA637X/8X should be used as AN4.OUT is not available on TA635X/6X.

**ALIN** This communication channel is fundamental to the T640 and it is therefore brought out on pins 4, 5 and 6. As the pins were formerly unused, spills and connectors are supplied with the T750 to allow connection.

**RS422/485** The T640 isolates this communications port. The T750 connects the common signal to ground in order to emulate the 6000 instruments.

**Power Supply** The 6000 instruments only support 24 volt power supplies, a mains option being available in the 7950 sleeve. When selecting a T640 for use in a T750 the DC option must be specified so that it receives its power in the same manner.

The T750 may be used with 7910 and 7911 adapter sleeves. However, because of the enclosed nature of these sleeves the maximum ambient temperature is derated to 40°C. Special provision must also be made for giving access to the ALIN connections, if required.



## T750 PIN CONNECTIONS

| T750 PIN No | TA637X/8X TERMINAL No | 637X/8X INSTRUMENT FUNCTION | TA635X/6X TERMINAL No | 6350/60 INSTRUMENT FUNCTION | T640 FUNCTION | SITE | CH | BIT | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 14 | 0 VOLTS SUPPLY | | | DC – POWER IN 1 | | | | |
| 2 | 16,17,18,19 | 0 VOLTS ANALOGUE | 16,17,18,19 | 0 VOLTS REFERENCE | ANALOGUE GND | | | | |
| 3 | 43 | 0 VOLTS DIGITAL | 14,34,43 | 0 VOLTS POWER ♦ | DIGITAL GROUND | | | | |
| 7 | 28 | DIG OUT. DC. P/UP | | | EXT SUPPLY IN 24 VOLTS | | | | |
| 8 | 15 | DC SUPPLY I/P | 15 | DC SUPPLY I/P | DC + POWER IN 1 | | | | |
| 9 | 13 | WATCH DOG OUT 1 | 13,28 | WATCH DOG OUT 1 | WATCHDOG | | | | |
| 10 | 1 | AN1. IN | 1 | PV. IN (1 - 5V) | ANALOGUE INPUT | 1 | 1 | | |
| 11 | 2 | AN2. IN | 2 | REM. SP. IN (1 - 5V) | ANALOGUE INPUT | 1 | 2 | | |
| 12 | 3 | AN3. IN | 3 | SP. TRIM IN (1 - 5V) | ANALOGUE INPUT | 1 | 3 | | |
| 13 | 4 | AN4. IN | 31 | PV. IN (0 - 10V) | ANALOGUE INPUT | 1 | 4 | | |
| 14 | 31 | AN5. IN * | 32 | REM. SP. IN (0 - 10V) | ANALOGUE INPUT | 2 | 1 | | |
| 15 | 32 | AN6. IN * | 33 | SP. TRIM IN (0 - 10V) | ANALOGUE INPUT | 2 | 2 | | |
| 16 | 20 | DIG1. OUT | 20 | HI. ALM. OUT (0) | DIGITAL OUTPUT | 1 | | 0 | |
| 17 | 21 | DIG2. OUT | 21 | LO. ALM. OUT (0) | DIGITAL OUTPUT | 1 | | 1 | |
| 18 | 22 | DIG3. OUT | 22 | HW. ALM. OUT (0) | DIGITAL OUTPUT | 1 | | 2 | |
| 19 | 23 | DIG4. OUT | 23 | BAT. LOW OUT (0) | DIGITAL OUTPUT | 1 | | 3 | |
| 20 | 24 | DIG5. OUT | 24 | REM. AUT. OUT (0) | DIGITAL OUTPUT | 2 | | 0 | |
| 21 | 25 | DIG6. OUT | 25 | HLD + MAN. OUT (0) | DIGITAL OUTPUT | 2 | | 1 | |
| 22 | 26 | DIG7. OUT | 26 | BIT 1 OUT (1) | DIGITAL OUTPUT | 2 | | 2 | |
| 23 | 27 | DIG8. OUT | 27 | BIT 2 OUT (1) | DIGITAL OUTPUT | 2 | | 3 | |
| 24 | 5 | DIG1. IN | 5 | ADD1 IN (1) | DIGITAL INPUT | 1 | | 0 | |
| 25 | 6 | DIG2. IN | 6 | ADD2 IN (1) | DIGITAL INPUT | 1 | | 1 | |
| 26 | 7 | DIG3. IN | 7 | ADD4 IN (1) | DIGITAL INPUT | 1 | | 2 | |
| 27 | 8 | DIG4. IN | 8 | ADD8 IN (1) | DIGITAL INPUT | 1 | | 3 | |
| 28 | 9 | DIG5. IN | 9 | COMP. EN. IN (1) | DIGITAL INPUT | 2 | | 0 | |
| 29 | 10 | DIG6. IN | 10 | REM. SP. EN. IN (1) | DIGITAL INPUT | 2 | | 1 | |
| 30 | 11 | DIG7. IN | 11 | TRACK EN. IN (1) | DIGITAL INPUT | 2 | | 2 | |
| 31 | 12 | DIG8. IN | 12 | HOLD EN. IN (0) | DIGITAL INPUT | 2 | | 3 | |
| 32 | 37 | AN1. OUT | 40 | 3T OUT (0 - 10V) | ANALOGUE OUTPUT | 1 | 1 | | |
| 33 | 38 | AN2. OUT | 38 | PV OUT | ANALOGUE OUTPUT | 1 | 2 | | |
| 34 | 39 | AN3. OUT | 39 | SP/DEV OUT | ANALOGUE OUTPUT | 2 | 1 | | † |
| 35 | 29 | XMT. OUT (–) RS422 | 29 | XMT. OUT (–) RS422 | RS422 TX – | | | | |
| 36 | 30 | XMT. OUT (+) RS422 | 30 | XMT. OUT (+) RS422 | RS422 TX + | | | | |
| 37 | 44 | RCV. IN (–) RS422 | 44 | RCV. IN (–) RS422 | RS422 RX – | | | | |
| 38 | 45 | RCV. IN (+) RS422 | 45 | RCV. IN (+) RS422 | RS422 RX + | | | | |
| 39 | 40 | AN4. OUT | | | ANALOGUE OUTPUT | 2 | 2 | | † |
| 40 | 35 | TX. SUPPLY (–) | 35 | TX. SUPPLY (–) | TX POWER SUPPLY – | | | | |
| 41 | 36 | TX. SUPPLY (+) | 36 | TX. SUPPLY (+) | TX POWER SUPPLY + | | | | |
| 43 | 41 | OS4 ISOL (–) | 41 | 3T. OUT ISOL 4 - 20mA (–) | CURRENT OUTPUT – | 1 | 3 | | |
| 45 | 42 | OS4 ISOL (+) | 42 | 3T. OUT ISOL 4 - 20mA (+) | CURRENT OUTPUT + | 1 | 3 | | |
| 47 | 33 | AN7. IN * | | | ANALOGUE INPUT | 2 | 3 | | |
| 48 | 34 | AN8. IN * | | | ANALOGUE INPUT | 2 | 4 | | |
| | A | DC SUPP1 IN (20 - 30V) | A | DC SUPP1 IN (20 - 30V) | | | | | |
| | B | 24V SUPP OUT | B | 24V SUPP OUT | | | | | |
| | C | DC SUPP2 IN (20 - 30V) | C | DC SUPP2 IN (20 - 30V) | | | | | |
| 4 | | ALIN GND | | | ALIN GND | | | | |
| 5 | | ALIN PHASE A | | | ALIN PHASE A | | | | |
| 6 | | ALIN PHASE B | | | ALIN PHASE B | | | | |

* Not available with 6370/80 models

♦ For 6350/60 fit P17 to Pins 1-2. This links DC – POWER IN 1 to DIGITAL GROUND

The T750 connects the RS422 GND to DIGITAL GROUND

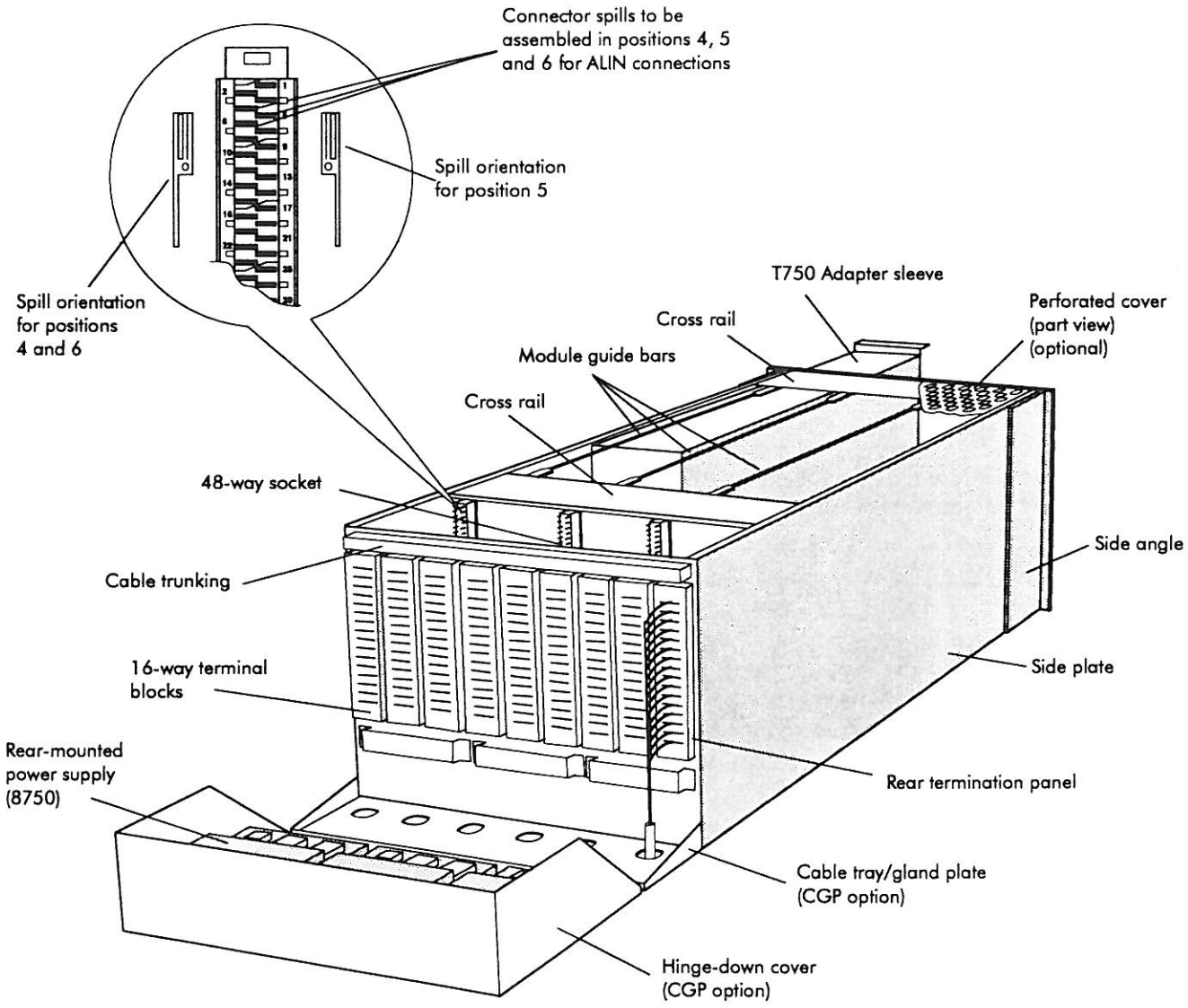
† When 2nd current option is selected the following applies

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 34 | 39 | — | 39 | — | CURRENT OUTPUT – | 2 | 3 | |
| 39 | 40 | — | N/C | — | CURRENT OUTPUT + | 2 | 3 | |

## INSTALLATION

### To install the T750 sleeve:

If required assemble ALIN system connector spills in positions 4, 5 and 6 of the system connector. Holding the spill by the wire wrap tail, with the spill correctly orientated, insert into the connector housing. Wire ALIN connections using Faston crimp terminals supplied.



## INSTALLATION (continued)

### Link settings

Check that the links within the T750 are correctly set.

| Links | P15 and P16 | P17 |
|---|---|---|
| 1-2 | Pins 34 and 39 are connected to the second isolated analogue output | 0 volts supply is linked internally to 0 volts digital |
| 2-3 * | Pin 34 and 39 are non-isolated voltage outputs. | Power supply input isolated |

* Factory setting is 2-3 for all links

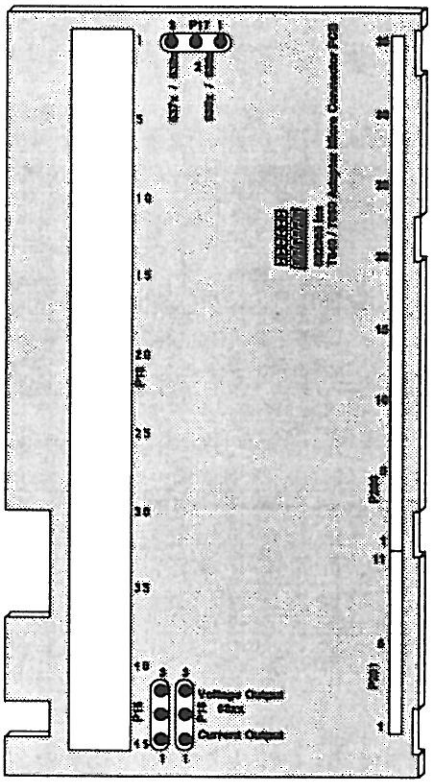
For instrument emulation:

| Instrument | P15 and P16 | P17 |
|---|---|---|
| 635x and 636x | 2-3 | 1-2 |
| 637x and 638x | 2-3 | 2-3 |

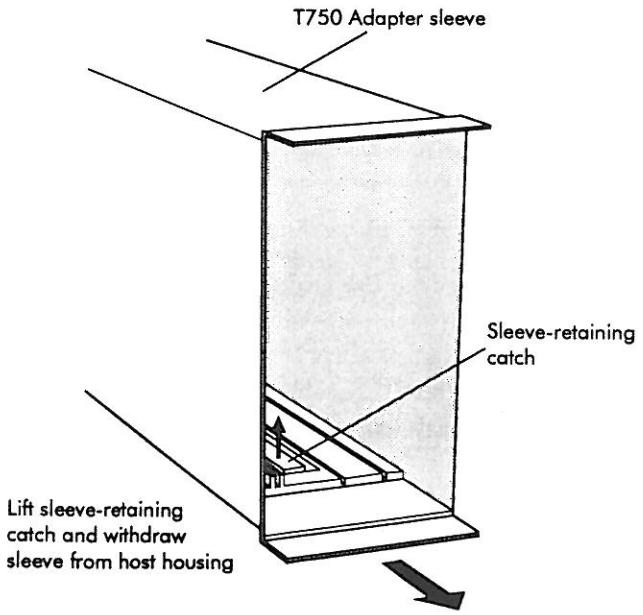
Insert the T750 sleeve into the empty housing/slot by lining up the sleeve with the guide rails and sliding the sleeve home until the system connector mates fully with the termination assembly.

Note. When handling the T640 Controller anti-static precautions must be observed.

Insert the T640 Controller into the T750 sleeve by lining up the T640 printed circuit boards with the T750 board guides and sliding the unit home until the edge connectors fully mate.




Lock the T640 into the sleeve by sliding the locking catches at the top and bottom of the T640 front panel to the locked position. (See T640 User Guide)




### Removal of T750 sleeve

Unlock the T640 controller by sliding the locking catches at the top and bottom of the T640 front panel to the unlocked position. (See the T640 User Guide).

Using the T640 extractor key located in the front panel (See T640 User Guide) withdraw the T640 Controller from the T750 sleeve.

Lift the sprung T750 retaining catch and withdraw the T750 from the host housing.

## SPECIFICATION for T640 in T750 sleeve

### Environmental

| | |
|---|---|
| Storage temperature: | –10°C to +85°C |
| Operating temperature: | 0°C to +50°C |
| RFI emissions: | To meet EN55022 Class B |
| RFI susceptibility: | To meet IEC801 Parts 2-4, acceptability Class 2 |
| Instrument safety: | To meet BS4743 Class II |
| Isolation: | To meet BS4743, with isolated I/O as Class II |

### Power supply

| | |
|---|---|
| Input voltage range: | 19 to 55V DC (includes rectified 48V AC rms) |
| Power rating: | 25VA |
| Hold up time: | 20ms |
| Fuse: | 20 x 5 mm 250V AC anti-surge cartridge, 2A |

### Analogue inputs

| | |
|---|---|
| Channels: | 8 |
| Input ranges: | 0-5V and 0-10V, with software-selectable range 0-1.25 V range is jumper selectable but all inputs and voltage outputs take on this range |
| Resolution: | 0.025% |
| Accuracy: | 0.05% |
| Gain drift: | 30ppm/°C |
| Offset drift | 65µV/°C |
| Input impedance: | 1MΩ pull-down to -1.2V |
| Break detection: | Within one sample. Protection strategy selected from within the configuration (e.g. up-scale, down-scale) |
| Isolation: | None |
| Sample rate: | 9ms per configured input. Only the configured inputs are scanned. The fastest loop update cannot be less than 20ms |

### Transmitter power supplies

| | |
|---|---|
| Channels: | 1 |
| Voltage: | 24V (± 5%) |
| Current: | 22mA |
| Current limit: | 30mA max |
| Isolation: | 60V working |

### Voltage analogue outputs

| | |
|---|---|
| Channels: | 4 (see note) |
| Input ranges: | 0-5V and 0-10V, with software-selectable range 0-1.25 V range is jumper selectable but all inputs and voltage outputs take on this range |
| Resolution: | 12 bits - 1.25mV on 5V range and 2.5mV on 10V range |
| Accuracy: | 0.05% |
| Gain drift: | 30ppm/°C |
| Offset drift: | 70µV/°C |
| Current drive: | ± 5 mA |
| Overload detection: | Triggered if the output cannot obtain the desired value. |
| Isolation: | None |

### Current analogue outputs

| | |
|---|---|
| Channels: | 1 (see note) |
| Input ranges: | 0-20mA (Software rangeable to 0-10mA, 4-20mA etc.) |
| Resolution: | 5µA |
| Accuracy: | 0.1% |
| Gain drift: | 80ppm/°C |
| Offset drift: | 0.9µA/°C |
| Output Drive: | 0-1kΩ |
| Isolation: | 60V working |

### Digital inputs

| | |
|---|---|
| Channels: | 8 |
| Thresholds: | Logic 1: –7.5V maximum<br>Logic 0: –3.5V minimum |
| Hysteresis: | 1.0V minimum<br>3.5V maximum |
| Input voltage: | 28V max |
| Input Impedance: | 200kΩ for inputs <10V, 100kΩ for inputs >10V |

### External supply

| | |
|---|---|
| (DC pull-up) | If used this input will set the pull-up voltages for the DIGITAL OUTPUTS and the WATCHDOG OUTPUT. If not the internal supply is used<br>Min voltage 15.5V<br>Max voltage 28V<br>Min current 120mA |

### Digital outputs

| | |
|---|---|
| Channels: | 8 |
| Output levels: | Logic 0:- 0V<br>Logic 1:- 15V (14 to 15.5V with internal supply, or equal to external supply -1.4V) |
| Drive impedance: | Logic 0: 68Ω, 37mA absolute max<br>Logic 1: 2.2kΩ |

### Watchdog output

| | |
|---|---|
| Watchdog fail: | High impedance |
| Watchdog OK: | 2.7kΩ pull-up to 15V or direct connection to external supply |

### ALIN

| | |
|---|---|
| Cable type: | Screened twisted pair |
| Impedance: | 82Ω nominal |
| Network topology: | Single non-branching network |
| Network terminations: | 82Ω at each end |
| Maximum load: | 20 nodes |
| Maximum length: | 100 meters |
| Isolation: | 60V working |
| Grounding: | Single point ground per system |

### RS422

| | |
|---|---|
| Transmission standard: | RS422/485 (selectable) |
| Cable type: | Twisted pair |
| Impedance: | 120-240Ω |
| Maximum load: | 16 |
| Maximum length: | 1200m (at 9600 baud) |
| Baud rate: | 300, 1200, 4800, 9600 (Software selectable) |
| Protocol: | Binary or Modbus |
| Grounding: | Connected internally to digital ground |

**Note.**

A second isolated current loop output is jumper-link selectable. The connections used replace two of the voltage analogue outputs.

## ORDERING INFORMATION

### T750 Order code

The T750 may be ordered on its own as T750. There are no options.

| Base Unit |
|---|
| T750 |

Example

| Base Unit | Code |
|---|---|
| T750 Adapter sleeve | T750 |

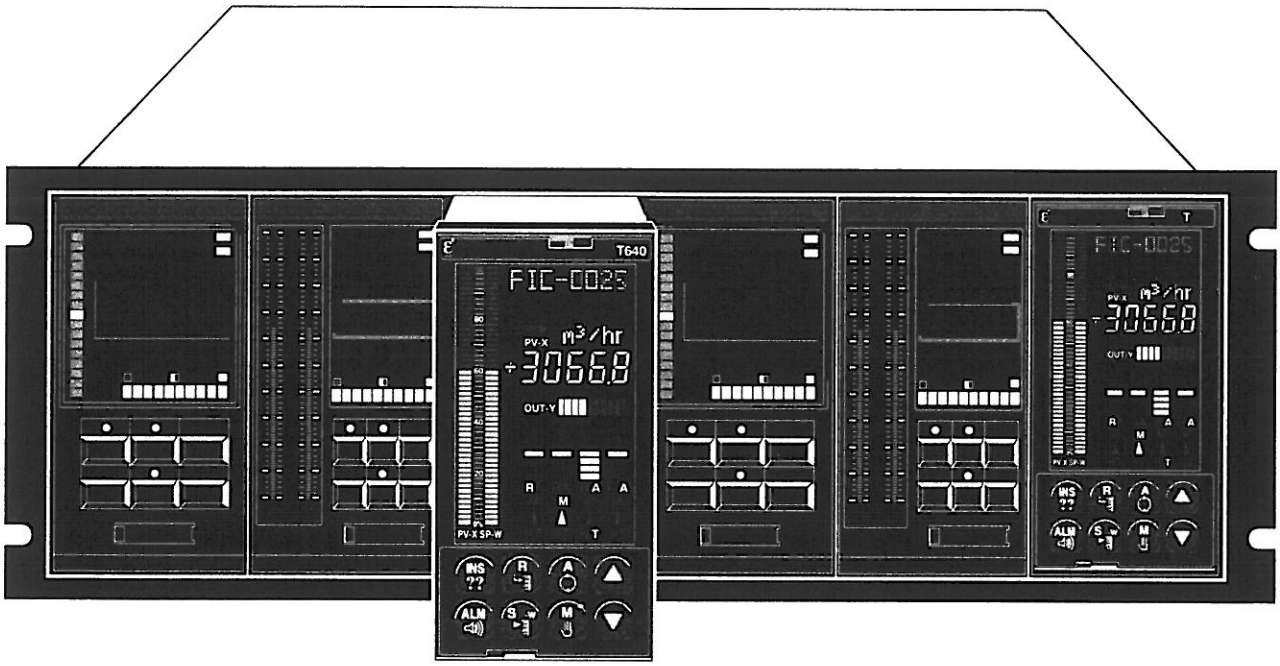
Alternatively the T750 may be specified as part of the T640 order code replacing the T710.

Notes

| Base Unit | Power Supply | Serial Comms | Site 1 I/O Board | Site 2 I/O Board | Memory Module | Sleeve | Calibration Certificate | Config Sheet | Labelling Language |
|---|---|---|---|---|---|---|---|---|---|
| T640 | DC | 422 | HI | HI | M002 | T750 | — | — | EN |

Example

1. Only the T640/DC option is compatible with the T750
2. Both 422 and 485 options are available but 422 must be specified to emulate 6000 instruments
3. Only the HI I/O options are supported by T750
4. All memory modules are supported

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