

PROCESS DISPLAY
programmable with alarms
Type 500-TT
User Guide

Continuous development may necessitate
changes in these details without notice



PROCESS MEASUREMENT, CONTROL & DISPLAY INSTRUMENTATION

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Note

This user guide is written for the 5 digit version and enhanced features which were introduced with software version 7.

This user guide may also be used for the earlier 4.5 digit version, which uses identical hardware. Appendix 5 provides information on the differences brought about with software V7.

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WARNING!

It is important that this guide is read and fully understood before attempting installation or commissioning of the instrument. Instructions appearing in this document, and current safety legislation, must be observed to ensure personal safety and to prevent damage to the instrument or equipment connected to it.

The instrument should be installed, commissioned and operated only by suitably qualified and authorised personnel.

Safety and EMC information

Safety: EN61010 -1

Immunity: EN50082-1

Emissions: EN50081-1

CE certified



The specifications for the instrument must not be exceeded. If the instrument is used in a manner not specified, the protection provided by the instrument may be compromised.



The instrument must be installed in an enclosure that provides adequate protection against electric shock.



Ensure that power to the instrument is switched off and signal wiring isolated from hazardous voltages before carrying out installation or maintenance.



The instrument is designed for installation in a clean, dry environment (Pollution degree 1). *A transparent rubber hood offering front of panel protection up to IP65 is available as an optional extra.*



Stroud Instruments Ltd strongly recommends that repairs and re-calibration work are done on a return to factory basis in order that our quality standards, product specifications and safety precautions are not compromised.



The instrument is double insulated

Note: Clean with a moist cloth - USE NO SOLVENTS.

Installation



WARNING: Installation should be conducted by appropriately skilled and authorised personnel only.



WARNING: Ensure that power to the instrument is switched off and signal wiring isolated from hazardous voltages before carrying out installation.



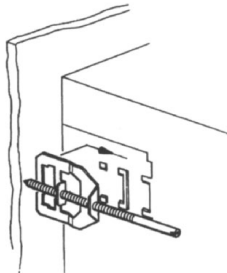
WARNING: The instrument must be installed in an enclosure that provides adequate protection against electric shock.

Location

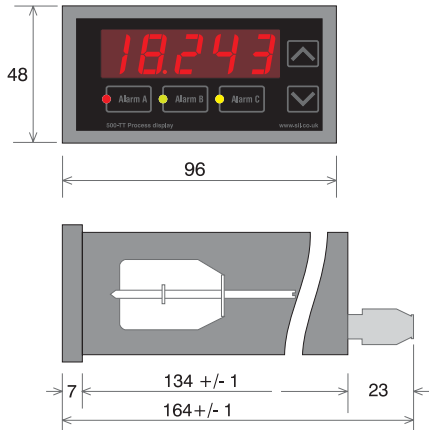
- The instrument is designed for installation in a clean, dry environment
- Do not install near to switch gear, motor controllers or other sources of strong magnetic fields.
- Avoid exposure to direct sunlight and ensure the ambient temperature inside the enclosure that the unit is mounted in will not exceed our specification.

Fixing

1. From the front of the control panel insert the instrument into the cut-out.
2. From the rear of the control panel fit the two screw clamps as shown and tighten screws just sufficient to secure: NB do not over tighten!



Dimensions

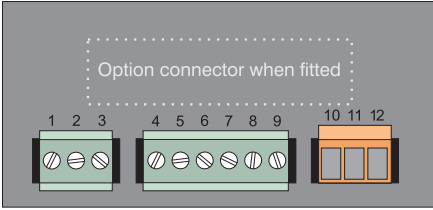


Panel cut-out: $45^{+0.6} \times 92^{+0.8}$ mm (DIN43700)

Wiring and connections

- Segregate power supply and signal wiring.
 - Use screened cable for all signal wiring with the screen earthed at instrument end only.
 - All connections should be made using ferrules.
- Unpluggable screw terminal connectors are provided. Wire capacity is 0.2 - 2.5 sq. mm (24 - 12 AWG) for Supply connector and 1.0 sq. mm (16 AWG) for Inputs and Alarms connectors.

Input and output connections

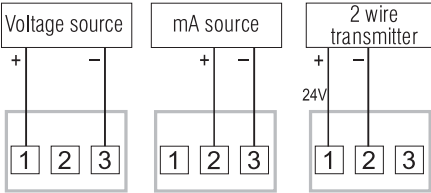


WARNING: Ferrules must be used for AC mains power wiring



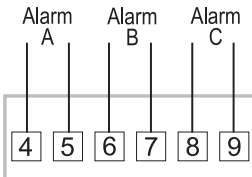
WARNING: Ensure that the orange power supply connector is plugged into the correct (orange) socket.

Input signal



Please note: for 2 wire transmitter inputs (mA only), the 24VDC transducer supply must be enabled (see page 6) and is available on terminal 1 when the input is configured for mA inputs.

Alarm outputs



Power supply connections

This instrument is supplied in *one* of two power supply versions.

1. AC mains supply in the range 85 - 260 V, 50/60Hz, 3VA.
2. Low voltage option 11-32 VDC, 4W or 12-24VAC

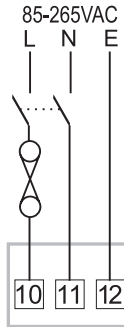


WARNING: Check that the supply voltage on the data label (on top of instrument) is suitable for the application.

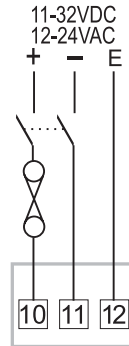
Power supply wiring to the instrument should be protected by a suitable fuse and double pole switch - see below. The switch should be clearly marked as the isolating switch for the instrument.

The power wiring terminals are on the orange connector (terms 10, 11 and 12).

AC mains



Low voltage



Please note:

The unit cannot be changed by the user from one type of power supply version to another. This conversion can only be done on a return to factory basis.

Operation

The 500-TT Process Display provides a display of an analogue signal in engineering units. The input may be programmed to accept most standard voltage and milliamp process signals. Scaling to user specified engineering units is also catered for. Three programmable alarms provide voltage free contacts that change state when the input signal passes adjustable reference set-points. All adjustable functions are programmed from the front panel of the unit.

The 5 digit display will show the monitored signal level in volts, milliamps or engineering units as programmed.

Any readings detected above the chosen range will be displayed as 'OErr'. A reading less than the chosen range will be displayed as 'UErr'. See Appendix 3 for a complete list of display messages.

DEFAULT SETTINGS

The unit is supplied ready to go with preset defaults. The default settings are given in Appendix 1.

INPUTS

Source and scaling

The input may be programmed to accept most standard voltage and milliamp process signals. The display may be scaled to user specified engineering units.

Transducer Supply

When configured for mA inputs a 24VDC @ 20mA transducer supply is optionally available on Terminal 1. To enable or disable this option, see page 6.

ALARM SETTINGS

Delay

The delay function inhibits a trip operation until the period programmed has expired.

Hysteresis

The hysteresis may be programmed with values of up to 100% of the input signal fullscale from either above or below the set trip point. Hysteresis values may be programmed in percentages or display units.

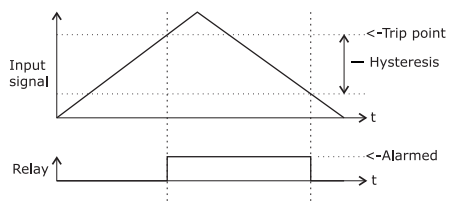
Interlocked action

Each channel can be independently set to operate at the alarm trip point but reset at a different point using the hysteresis setting. This feature can be used in duty-standby pump control and can also include the delay function.

Alarm type

Each alarm channel may be set as 'Active High' or 'Active Low'.

Active High Channels

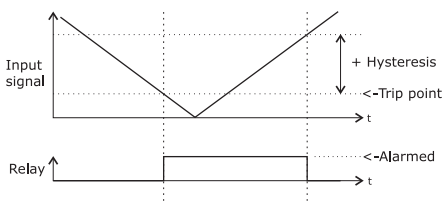


Active High channels are:

- Not alarmed on power up
- Stay not alarmed with input signal below set point

- Become alarmed if the signal is above the set-point continuously for the delay time
- Stay alarmed if the signal remains above the set-point minus the hysteresis value
- Become not alarmed if the signal falls below the set-point minus the hysteresis continuously for the delay time.

Active Low Channels



Active Low channels are:

- Not alarmed on power up
- Stay not alarmed if the signal remains above the set-point
- Become alarmed if the signal is below the set-point continuously for the delay time
- Stay alarmed if the signal remains below the set-point plus the hysteresis value
- Become not alarmed if the signal rises above the set-point plus the hysteresis continuously for the delay time.

Relay action

The relay output follows the alarm state for its channel and the programmed action type setting. This may be set to de-energise (off) on alarm or energise (on) on alarm.

Channel status indication

Tri-colour LEDs provide continuous indication of the status of each channel.

- Green indicates a non-alarmed state
- Red indicates that the channel is in an alarm state
- Flashing green indicates that the input signal is within the hysteresis or delay band and is approaching the set-point.
- Flashing red indicates that the input signal has passed the set-point and is within the hysteresis or delay band.
- Yellow indicates a programming mode and may be steady or flashing depending on the programming mode (see Setting up).

Setting up

Enabling transducer supply

If specified at time of order this facility will have been enabled at the factory.

PLEASE NOTE this facility is for use with mA inputs only and when enabled the instrument will not accept voltage inputs. The transducer supply is enabled by an internal link.



WARNING: Switch off all supplies and isolate signal and alarm relay wiring from dangerous voltages before proceeding

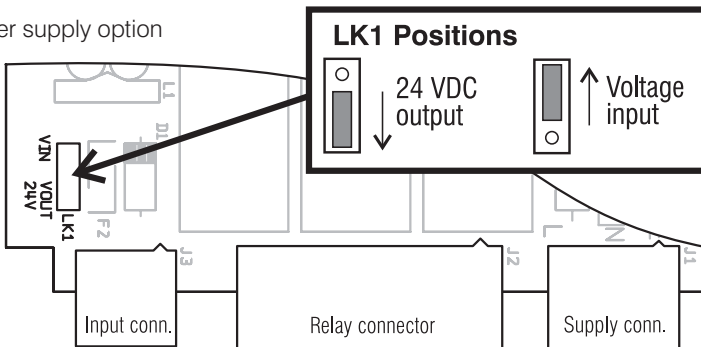
1. Unplug all connectors and remove rear panel (four screws).
2. Slide out the printed circuit assembly.
3. Set jumper link LK1 to 'Vout 24V' position - see diagram below.
4. Replace rear panel and plug in connectors.

Programmable functions

All parameters are displayed as a label alternating with the value currently set. Parameters are adjusted with the Up - Down arrow buttons. Control of the output relays is maintained whilst programming is in progress, however, in this mode the front panel LEDs do not indicate the control state but are used to indicate programming mode in progress.

The display can be programmed to show the signal level in Volts, Milliamps or Custom Units. The default setting is Custom Units with the display reading 0 - 100.0, representing the input signal as a percentage.

Transducer supply option





Initialisation

On power up the display briefly indicates 'SIL' and then 'SO-X' where X is the software version number. During this period the LEDs are flashed alternately green/red to indicate that they are all functioning. The settings are read from the internal EEPROM at this point. If the checksum does not match the stored data then 'Err' will be displayed and the LEDs will continue to flash red/green indefinitely. The relays will remain off and will not follow the control algorithm. Pressing any trip button will set the unit to defaults and attempt to re-save the settings. The unit should be re-powered to check that the error does not occur again. *NB the calibration settings may have been lost if this error occurs.*

Programming

There are three programming modes:

• Global parameters -

For setting:

- Input source (*mA or volts*),
- Scaling
- Custom units
- Custom unit decimal point position
- Custom unit zero value
- Custom unit full scale value
- Linearisation
- Reset to factory default settings
- Programme Lock
- Unit address (expansion option only)

• Channel specific parameters -

For setting:

- Hysteresis type
- Hysteresis value
- Alarm type
- Relay action
- Delay

• Alarm level parameters -

For setting trip points

Entry into each of these modes and the parameters to be set are covered in the following sections.

Notes:

- Control continues whilst any programming is being performed but the LEDs show yellow to indicate programming mode in progress.
- All parameters are displayed as a parameter label alternating with the value currently set e.g. 'trIP' followed by '75.0'. Whilst the parameter is being modified (using the 'Up' or 'Down') buttons the display remains on the value.
- Each press of the 'Up' or 'Down' buttons advance the setting by one count. If either 'Up' or 'Down' is held pressed or approximately two seconds the units digit remains as set and the tens digit advances. After a further 10 seconds the 100s digit advances and so on. All parameters 'wrap around' when their minimum or maximum values are reached.
- Parameters that become invalid as a result of changes to other parameters will be automatically clipped to the new valid range.
- Changes to parameters that effect the control are implemented in real time. The status of the relays will immediately reflect the new settings.
- Not pressing any buttons for two minutes will revert the instrument back to normal measuring operation and save any settings already modified.

Setting *Global* parameters

In this mode the programming menu follows a set sequence, stepping onto the next item with each press of the Alarm B button.

1. Enter Global parameters mode by pressing and holding trip buttons, **Alarm A** and **Alarm C**, for a minimum of two seconds. All three Alarm LEDs will flash yellow to indicate entry into the global parameter programming mode.
2. Each press of the **Alarm B** button will advance the menu through to the next parameter. Changing the parameter value is effected by pressing the 'Up' or 'Down' buttons until the value required is shown on the display.

Table 1 shows the parameters in menu sequence order, the values which can be applied and the display viewed in each case.

3. Pressing **Trip A** button will revert to the previous parameter in the menu.
4. Stepping past the last menu item will revert the unit back to normal operating mode and save any settings already modified.

Notes:

- (i) *Hint* - If a 4-20mA input signal is being monitored and a trip level at, near or even below 4mA is required, set the Input Source to 0 - 20mA. This will avoid problems with the instrument displaying under-range error (*U Err*) as the input falls to 4mA.
- (ii) User Linearisation and Programme Lock functions are only available on instruments with software version 7 and above, See Appendix 5.

Table 1 - Programmable global parameters

Parameter	Display	Value	Display
Input Source	<i>SOURC</i>	Current Voltage	<i>CUrr</i> <i>UOLt</i>
Scale	<i>SCALE</i>	4-20mA 0-10mA 0-20mA 0-2V 0-1V	<i>4-20 *</i> <i>0-10 *</i> <i>0-20 *</i> <i>0-2 ‡</i> <i>0-1 ‡</i>
		* values available when Source = current	‡ values available when Source = voltage
Expansion <i>for information only - not adjustable</i>	<i>AddOn</i>	None fitted RS485 serial BCD	<i>n0</i> <i>SErI (future option)</i> <i>bCd</i>
Unit Address	<i>Addr</i>	Any value from 1 to 127, only used when the serial expansion card is fitted	
Custom Units	<i>CUSt</i>	Not required Required	<i>n0</i> <i>YES</i>
-----NB if Custom Units are <i>not</i> selected, menu jumps to 'Reset to Default' parameter.-----			
Custom Unit Decimal point position **	<i>CUDP</i>	None Position 1 Position 2 Position 3 Position 4	<i>n0nE</i> <i>0.0</i> <i>0.00</i> <i>0.000</i> <i>0.0000</i>
Custom Unit Zero **	<i>CUZE</i>	Adjustable -9999 to 19999	
BCD Output Polarity NB for future use - not currently available	<i>BCdP</i>	Active high Active low	<i>A_hI</i> <i>A_lO</i>
Custom Unit - Full scale **	<i>CUFS</i>	Adjustable -9999 to 19999	
----- ** NB these parameters are not available when Custom Units 'CUSt' = 'n0' -----			

Table 1 - continued

Parameter	Display	Value	Display
User Linearisation	<i>LInFn</i>	2 break points	2
		3 break points	3
		4 “	4
		5 “	5
		6 “	6
		7 “	7
		8 “	8
		9 “	9
		10 “	10
		No linearisation	<i>OFF</i>
NB with any setting other than <i>OFF</i> , subsequent presses of Button B will step through the X and Y settings for each of the number of break points selected. If <i>OFF</i> is selected in the above steps, the next press of Button B will step to the 'Reset to Default' setting.			
Breakpoint (1) X value	<i>HP0I</i>	Adjustable 0 to 19999	
Breakpoint (1) Y value	<i>YP0I</i>	Adjustable 0 to 19999	
NB display will read <i>HP0'n</i> and <i>YP0'n</i> for breakpoint (n) where 'n' is displayed as a number 1 to 10			
Reset to Default	<i>dEFt</i>	displays “n0” to start	
Press and hold 'up' and 'down' buttons until display shows “YES” to indicate that defaults have been now set. See 'Default settings' for parameter values set with this action.			
Programme Lock	<i>LOC</i>	Protect settings	<i>On</i>
		Enable programming	<i>OFF</i>
NB Simulatneously press 'Up' and 'Down' buttons to toggle setting			

Setting *Channel Specific* parameters

In this mode the programming menu follows a set sequence, stepping onto the next item with each press of the Alarm 'X' button (where 'X' is A, B or C).

1. To set Channel Specific parameters, hold pressed - for a minimum of two seconds - the appropriate 'Alarm' button for the channel to be set. The selected Alarm channel LED will show flashing yellow and the display will show the parameter label '*hYSt*' (hysteresis type) alternating with the parameter value . This indicates that the unit is at the first menu item in Table 2 below i.e. the Hysteresis 'Type' setting.

2. Each press of the Trip button will step through the menu sequence to the next parameter. Changing the parameter value is effected by pressing the 'Up' or 'Down' buttons until the value required is shown on the display. The following shows the parameters in menu sequence order, the values which can be applied and the display in each case.
3. Stepping past the last menu item will revert the unit back to normal operating mode and save any settings already modified.

Table 2 - Programmable *Channel Specific* parameters

Parameter	Display	Value	Display
Hysteresis type	<i>hYSt</i>	Percentage Display Units	<i>PERC</i> <i>dISP</i>
Hysteresis value	<i>hYSP</i> * <i>hYSd</i> * * label displayed depends on Hysteresis Type setting	Adjustable 0-100% of full-scale, value as percentage (<i>hYSP</i>) or display units (<i>hYSd</i>)	
----- For an explanation of how hysteresis is applied see graphs in Alarm Settings on page 4 -----			
Alarm type	<i>AltYP</i>	Active High Active Low	<i>hI9h</i> <i>L0</i>
Relay state	<i>rELAY</i>	Normally OFF [†] Normally ON [†]	<i>nOFF</i> <i>n_On</i>
Delay	<i>dELAY</i>	Adjustable 0-999.9 sec in 0.1 sec steps	

Setting Alarm Levels

1. Enter the Alarm level mode by momentarily pressing the appropriate 'Alarm' button for the channel to be set.
The selected Alarm channel LED will indicate steady yellow and the display will show the parameter label '*trIP*' alternating with the level set for the selected channel e.g. '*trIP*' followed by '75.0'.
2. Adjust the Alarm trip level by pressing the 'Up' 'Down' buttons.
3. Store the new setting by pressing the Alarm button.

Notes:

- (i) The units used to display the level set are Milliamps, Volts or the custom units as configured in 'Setting Global Parameters'.
- (ii) Pressing the 'Up' or 'Down' buttons continuously for a period causes the value to automatically increment - see Note (iii) on Page 8 for details.
- (iii) Pressing the trip button of another channel will also store the adjusted setting and move the programming function to the new channel.

Appendix 1- Default settings

Factory set defaults and to which the unit may be subsequently reset (see Table 1).

Input source	Current
Scale	4-20mA
Expansion	No extra options fitted
Unit address	1
Custom Units	Yes
Custom Unit Dec. Point	0.00
Custom Unit Zero	0.00
Custom Unit Full scale	100.00
Alarm Level	Alarm A - 75.00% Alarm B - 50.00% Alarm C - 25.00%
Delay	1.0 sec
Hysteresis	Type - percentage Value - 1.0%
Alarm Type	Active high
Relay State	Normally off i.e. will energise on alarm
Programme Lock	Off
User Linearisation	Off

Appendix 2 - Indicator signals

Colour	Steady	Flashing
Green	Non-alarmed state	Input signal is within the hysteresis or delay band and is approaching the set-point
Red	Channel in an alarmed state	Input signal has passed the set-point and is within the hysteresis or delay band
Yellow	Unit in Alarm Level programming mode	(i) Single LED Unit in programming Channel Specific parameters mode (ii) All LEDs Unit in programming Global parameters
Alternating Green and Red	N/a	(i) Momentarily (on power up) self-test to indicate all LEDs functioning (ii) Continuously with 'EErr' appearing in the four-digit display indicates a power up self-diagnostic error (see 'Initialization' in the Setting up section).

Appendix 3 - Display messages

No	Message	Meaning	Mode
1	SIL	Alternates with message No.2 on power up	Initialisation
2	SO-X	software version number (<i>where 'X' = revision number</i>)	Initialisation
3	EErr	Power up self-test error	Initialisation
4	OErr	reading is above the chosen range	In operation
5	UErr	reading is less than 4mA when on the 4-20mA scale	In operation
6	trIP	PL* for trip level setting -alternates with value	Alarm Levels
7	hYSt	PL* for hysteresis type -alternates with value	Channel Spec
8	PERC	Value for No.7 - indicates percentage selected	Channel Spec
9	diSP	Value for No.7 - indicates display units selected	Channel Spec
10	hYSP	PL* for hysteresis expressed as % -alternates with value	Channel Spec
11	hYSD	PL* for hysteresis in display units -alternates with value	Channel Spec
12	AlTYP	PL* for alarm type - -alternates with value	Channel Spec
13	h19h	Value for No.12	Channel Spec
14	L0	Value for No.12	Channel Spec
15	rELAY	PL* for relay action - alternates with value	Channel Spec
16	nOFF	Value for No.15	Channel Spec
17	n_On	Value for No.15	Channel Spec
18	dELAY	PL* for delay setting - alternates with value (0-999.9 sec)	Channel Spec
19	SOURC	PL* for Input source - alternates with value	Global params
20	CUrr	Value for No. 19	Global params
21	UOLT	Value for No. 19	Global params
22	SCALE	PL* for scale - alternates with value (Nos. 23,24,25 or 26)	Global params
23	4-20	Value for No. 22 (4-20mA)	Global params
24	0-10	Value for No. 22 (0-10mA)	Global params
25	0-20	Value for No. 22 (0-20mA)	Global params
26	0-1	Value for No. 22 (0-1V)	Global params
* PL = Parameter Label			

No	Message	Meaning	Mode
27	0-2	Value for No. 22 (0-2V)	Global params
28	AddOn	Expansion board fitted	Global params
29	bCd	BCD - Value for 28 (BCD expansion option fitted)	Global params
30	SErI	RS485 - Value for 28 (serial expansion option fitted)	Global params
31	YES	Value for Nos. 34, 43	Global params
32	nO	Value for Nos. 34, 43	Global params
33	Addr	PL* for Unit address - <i>only used with serial expansion</i>	Global params
34	CUST	PL* for custom units - alternates with value (No.31 or 32)	Global params
35	CUdP	PL* for decimal point position - alternates with value	Global params
36	nOnE	Value for No. 35	Global params
37	0.0	Value for No. 35 (one decimal position)	Global params
38	0.00	Value for No. 35 (two decimal positions)	Global params
39	0.000	Value for No. 35 (three decimal positions)	Global params
40	0.0000	Value for No. 35 (four decimal positions)	Global params
41	CUZE	PL* for custom unit zero - alt's with value (-9999 to 19999)	Global params
42	CUFS	PL* for custom unit full scale = alt's with value (as No.41)	Global params
43	LInFn	PL* for Linearisation function Values for <i>LInFn</i> are 2, 3, 4, 5, 6, 7, 8, 9, 10 and OFF	Global params
44	HP0 1	PL* for Breakpoint (1) X value, similarly <i>HP02</i> for BPt (2), etc. Appears if No 43 value is not equal to <i>OFF</i>	Global params
45	YP0 1	PL* for Breakpoint (1) Y value, similarly <i>YP02</i> for BPt (2), etc. Appears if No 43 value is not equal to <i>OFF</i>	Global params
46	dEFT	PL* for reset to default - alt's with value (initially No. 31)	Global params
47	LOC	PL* for Programming Lock (values for <i>LOC</i> are OFF or ON)	Global params
* PL = Parameter Label			

Appendix 4 - BCD Output option

Connections

25 way 'D' female connector:

Signal	Pin No
1	3
2	16
4	4
8	17
10	5
20	18
40	6
80	19
100	7
200	20
400	8
800	21
1000	9
2000	22
4000	10
8000	23
10000	11
20000	24
40000 / Over-range for 4.5 digit scaling*	12
80000	25
Data Valid	15
Hold	14
0v	1
Reserved for future use	2, 13

Operation

This optional board provides parallel BCD output data which reflects the state of the displayed reading. No indication of the decimal point position is provided.

The DATA VALID signal indicates updated data is present on the BCD outputs.

The HOLD input holds the BCD data at the value of the last valid measurement.

The active state of DATA VALID and HOLD signals may be inverted by internal jumper links.

The OVER-RANGE signal* is set high when data is beyond displayable range.

Polarity of the BCD outputs (data, polarity and over-range) is configurable to be either active high or active low - see Global Parameters on page 9.

Note:

* The over-range signal is currently only available for full scale displays of up to 19999 i.e. 4.5 digits.

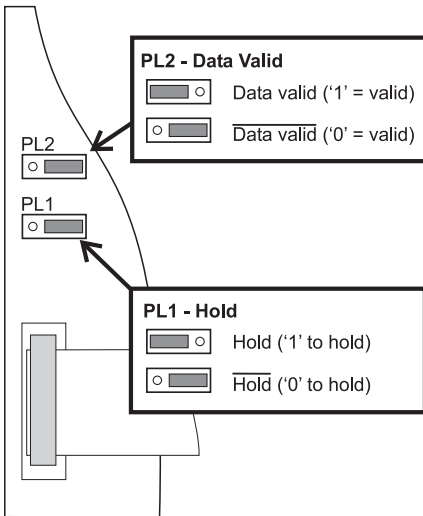
Data Valid & Hold signals

The active states of the Data Valid and Hold signals may be inverted as follows:



WARNING: Switch off all supplies and isolate signal and alarm relay wiring from dangerous voltages before proceeding.

1. Unplug all connectors and remove rear panel (four screws).
2. Slide out the printed circuit assembly.
3. Set jumper links to the positions required - see diagram below:



BCD Option Specification

NB all outputs are TTL compatible and will drive up to eight LS TTL loads.

BCD outputs

Parallel BCD output reflecting the displayed reading.

Over-range output

This signal is currently only available for full scale displays of up to 19999 i.e. 4.5 digits.

TTL logic high ('1') when data is beyond displayable range.

Data Valid output

When valid data is present on the outputs the DATA VALID output is set to active state. The active state is configurable to be active high ('1') or active low ('0') by internal jumper links.

Hold input (TTL compatible)

When in its active state the Hold signal prevents data from being updated. When inactive the data will continue to be updated with each measurement cycle. The active state is configurable to be active high ('1') or active low ('0') by internal jumper links.

Appendix 5 - Changes from earlier versions

With effect from software version 7 the 500-TT became a full 5-digit instrument with enhanced features. This appendix provides details of essential differences between the current version and previous 4.5 digit version. To determine which software version you have: the display on power-up briefly indicates “SL” followed by “SO-X” where ‘X’ is the software version.

Displayed message changes

Early versions	From software V 7	Displayed in mode for setting
<i>AtYP</i>	<i>A 1tYP</i>	Channel Specific parameters
<i>rELY</i>	<i>rELAY</i>	Channel Specific parameters
<i>dELY</i>	<i>dELAY</i>	Channel Specific parameters
<i>SrCE</i>	<i>SOUrC</i>	Global parameters
<i>SCAL</i>	<i>SCALE</i>	Global parameters
<i>AdDn</i>	<i>AddOn</i>	Global parameters

New functions

User linearisation - see page 11

Programme lock - see page 11

Specification

INPUTS

Input source selectable: mA or Volts
Input scaling selectable: 4-20mA, 0-10mA, 0-20mA, 0-1V, 0-2V
Input Impedance: Current inputs 50 ohms; voltage inputs >290k ohms
Custom engineering units:

Zero	Min. -9999, Max. 99999
Span	Min. -9999, Max. 99999

Decimal point selection:
none, 0.0, 0.00, 0.000, 0.0000

OUTPUTS

Relay with volt-free single pole contact per channel
Contact rating: 6A @ 230V AC resistive
2.5A @ 24V DC resistive

HYSTERESIS

Adjustable 0-100% of span; value as percentage or display units.

DELAY

Adjustable 0 - 999.9 sec in 0.1 sec steps

ALARM ACTION

Adjustable active high or active low

RELAY TYPE

Adjustable de-energise on alarm or energise on alarm

LINEARISATION

Up to 10 breakpoints - user programmable

DISPLAY

Type: 5 digit red LED 14.2mm high
Resolution: 0.001mA or 0.001V
Accuracy: +/- 0.05% of FSD

TRANSDUCER SUPPLY

24VDC @ 20mA

ISOLATION

The output relay contacts are isolated from the supply and input.

REPEATABILITY

The switching point will repeat within $\pm 0.1\%$ of span.

INPUT OVER-RANGE PROTECTION

Voltage Inputs: 250 volts RMS or DC
Current Inputs: 100mA dc (fused)

TEMPERATURE COEFFICIENTS

Zero: $\pm 0.02\%$ span/ $^{\circ}\text{C}$
Span: $\pm 0.02\%$ span/ $^{\circ}\text{C}$

TEMPERATURE RANGE

Operating: -10°C to $+60^{\circ}\text{C}$
Storage: -20°C to $+70^{\circ}\text{C}$

SUPPLY VOLTAGE REJECTION

Span change: $< 0.1\%$ span / % supply change.

POWER SUPPLY

Universal ac supply accepts 85 Vac to 265 Vac, 50/60Hz, 3VA Protected by a fusible resistor.
Low voltage supply options:
11-32VDC 4 W / 12 to 24VAC
Protected by an internal self-resetting fuse.

WEIGHT

Approx. 350g

SAFETY & EMC

Safety: EN61010 -1
Immunity: EN50082-1
Emissions: EN50081-1
CE certified