



The SI3500 is a member of the SI3000 Readout Family.  
All members of the family are marked SI3000 on the front panel.

This manual is specifically for the SI3500 Model with Digital Orbit Interface

user and installation manual



# Index

Section	Title	Page
1.0	<b>Index</b> . . . . .	1
2.0	<b>Safety Summary</b> . . . . .	2
	Warnings and Cautions . . . . .	2
3.0	<b>Service and Repair</b> . . . . .	4
4.0	<b>Bench Mounted or Installed into a Panel</b> . . . . .	5
4.1	Bench Mounted with associated Orbit® Digital Probes and power supply . . . . .	5
4.2	Panel Mounting . . . . .	6
4.3	Panel Dimensions . . . . .	7
4.4	Assembly Dimensions . . . . .	8
5.0	<b>Display Panel</b> . . . . .	9
5.1	Layout of Front Panel . . . . .	9
5.2	Layout of Rear Panel . . . . .	10
5.3	Overview of Features . . . . .	11
6.0	<b>Operating Screen</b> . . . . .	13
6.1	MENUS and SETUPS . . . . .	14
6.2	Probe Menu Channel A . . . . .	15
6.2.1	Probe Type Channel A . . . . .	16
6.2.2	Probe Menu Channel B . . . . .	17
6.2.2.1	Probe Type Channel B . . . . .	18
6.3	Measurement Menu Page 1 . . . . .	19
6.3.1	Measurement Menu Page 1 (cont.) . . . . .	20
6.3.2	Measurement (Distance) Menu Page 2 . . . . .	21
6.3.3	Measurement (Distance) Menu Page 2 . . . . .	22
6.3.4	Measurement (Angle) Menu Page 2 . . . . .	23
6.4	Limit Menu . . . . .	24

Section	Title	Page
6.5	Input/Output Menu . . . . .	25
6.6	Serial Port Menu . . . . .	26
6.7	Display Menu Screen 1 . . . . .	27
6.7	Display Menu Screen 2 . . . . .	28
6.7	Display Menu Screen 3 . . . . .	29
6.8	Utilities Menu . . . . .	30
6.8.1	Password Menu . . . . .	31
6.8.2	Password Entry . . . . .	32
6.8.3	Utilities Menu (Factory Default Restore) . . . . .	33
6.9	Operator Screen . . . . .	34
6.10	X Y Mode . . . . .	35
6.11	Logging Menu Page 1 . . . . .	36
6.12	Logging Menu Page 2 . . . . .	37
7.0	<b>RS232 User Input Commands</b> . . . . .	38
7.1	RS232 User Input Command Details . . . . .	39
7.1	RS232 User Input Command Details (cont.) . . . . .	40
7.1	RS232 User Input Command Details (cont.) . . . . .	41
7.2	RS232 Output Formats . . . . .	42
8.0	<b>Interface Connections</b> . . . . .	44
8.1	I/O Connector . . . . .	44
8.2	Communications Connector RS232 . . . . .	45
8.3	Power Connector . . . . .	45
8.4	Orbit® Connectors . . . . .	46
9.0	<b>Technical Specifications</b> . . . . .	47

Return Of Goods  
Solartron Sales Offices

# 2.0 Safety Information

---

## Terms in this Manual

**WARNING** statements identify conditions or practices that could result in personal injury or loss of life.

**CAUTION** statements identify conditions or practices that could result in damage to the equipment or other property.

## Symbols in this Manual



This symbol indicates where applicable cautionary or other information is to be found.

## Service Safety

This equipment has been designed and tested to meet the requirements of the Low Voltage Directive (1997) and has been supplied in a safe condition. This manual contains information and warnings that must be followed by the user to ensure safe operation and to retain the apparatus in a safe condition.

## Power Source

24v +/-10% DC 0.625A

## 2.0 Safety Information (cont.)

---

### **WARNINGS:**

**Do not operate in an explosive atmosphere**

**Do not remove covers or panels**

To avoid personal injury, do not remove covers and panels. Do not operate the equipment without the covers and panels fitted. There are no internal adjustments required during commissioning of the equipment.

### **Grounding the Equipment**

The unit is supplied by 24V DC and therefore does not require an earth grounding cable to avoid electric shock. However it is recommended that the unit is properly grounded to a known good earth via the bolt at the rear of the SI3500 to meet the full specification and EMC requirements.

## 3.0 Service and Repair

---

This equipment contains no user serviceable parts.

This equipment must be returned to your Solartron dealer for any service and repair.

The SI3500 is designed to be maintenance free. Contact with solvents should be avoided. Any attempt to dismantle the SI3500 will invalidate the warranty.

The SI3500 is a precision instrument and should be handled with care.

## 4.0 Bench Mounted or Installed into a Panel

---

### 4.1 Bench Mounted with associated Solartron Orbit® Digital Probes and power supply



# 4.0 Bench Mounted or Installed into a Panel (cont.)

---

## 4.2 Panel Mounting

- Ensure that there is sufficient space behind the relevant instrument panel for the SI3500 and its cabling (refer to section 4.3 for dimensions).
- Cut out the panel aperture to the dimensions shown.
- Working from behind the panel, with the box fully located, fit the side brackets to the studs and slide them forward toward the panel until they lock into place.
- Screw the brackets to the panel.

**CAUTION:** Do not over tighten the screws as this may damage the case of the instrument.

**WARNING:** On installing or removing the SI3500, you must be aware of any hazardous equipment or materials in the vicinity. Make sure that any equipment into which the SI3500 system is to be installed is switched off and made safe.

**CAUTION:** Avoid installing the SI3500 close to switch gear, contactors or motor starters.

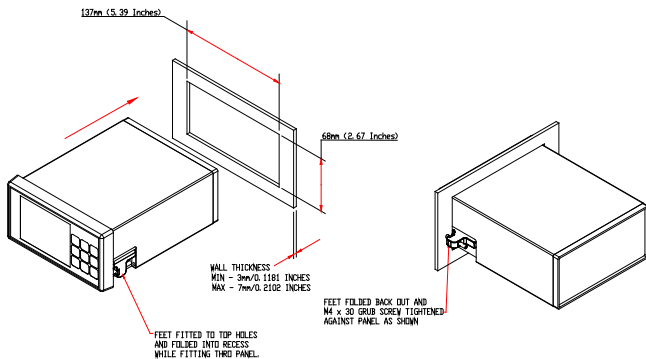
**CAUTION:** Do not place other signal and power supply wiring in the same loom as the SI3500 wiring.

**CAUTION:** Use screened cables for all leads, with the screen earthed at one end only.

**CAUTION:** Do not plug probes into the unit when it is switched on.

## 4.0 Bench Mounted or Installed into a Panel (cont.)

### 4.3 Panel Dimensions

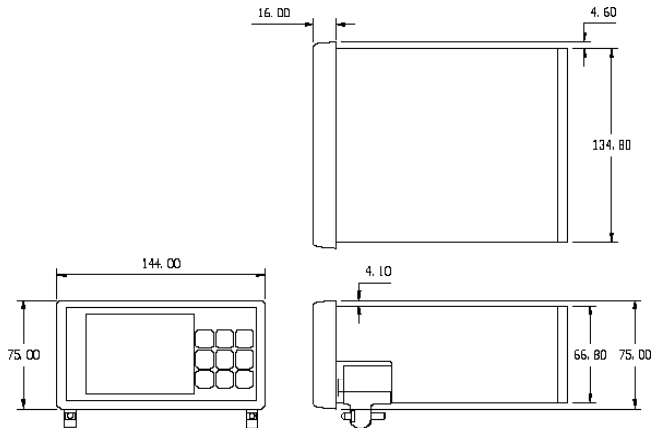




## 4.0 Bench Mounted or Installed into a Panel (cont.)

---

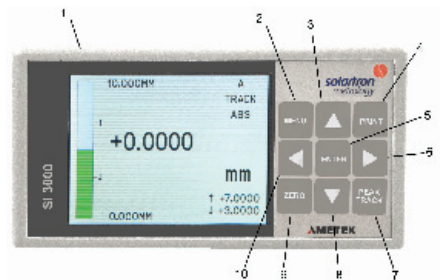
### 4.4 Assembly Dimensions



# 5.0 Display Panel

---

## 5.1 Layout of Front Panel

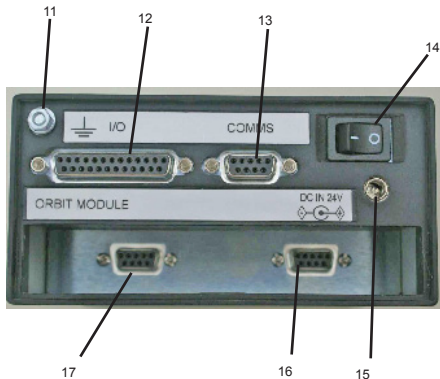


- 1 Liquid Crystal Operator Colour Display
- 2 Return to Setup Menu
- 3 Scroll Up (Moves cursor around screen), Apply Preset (ABS/PRE)
- 4 Print Option
- 5 Enter
- 6 Scroll Right (select option)
- 7 Track, Peak+, Peak-, Diff
- 8 Scroll Down (Moves cursor around screen)
- 9 Zero (ABS/TARE)
- 10 Scroll Left (select option)

## 5.0 Display Panel (cont.)

---

### 5.2 Layout of Rear Panel



- 11 Screen Earth
- 12 Input/Output Connection
- 13 RS232 Communications
- 14 24V DC ON/OFF Switch
- 15 24V DC Supply
- 16 Orbit Connection
- 17 Orbit Connection

## 5.0 Display Panel (cont.)

### 5.3 Overview of Features

Transducers	<p>1 or 2 transducers may be connected            SI3100 Series LVDT            (Note: when setting up LVDT enter sensitivity in mV/V/mm regardless of final choice of measurement units)            SI3300 Series 4-20 mA or DC inputs (0-5 V, 0-10 V, <math>\pm 5</math> V, <math>\pm 10</math> V)</p> <p>SI3500 Series – Orbit (Digital Probes and Linear Encoders)</p>																												
Measurements and Display	<p>The SI3000 series can display in single measurement mode A, B, A+B, A-B, (A+B)/2, (A-B)/2 and (B-A)/a</p> <p>The SI3300 and SI3500 series can display in dual measurement mode the sensor information A and B only; it is not possible to display any combinational information in dual display mode.</p> <p>(Note: (B-A)/a limited to <math>\pm 2.5</math> deg.)</p>																												
Limits	<p>Upper and lower limits are set for each individual measurement channel (A and B) and for a combinational measurement (e.g. A+B)</p> <p>The SI3000 series has 6 isolated open collector limit outputs which are allocated in accordance to the measurement mode.</p> <table border="1" data-bbox="288 629 1330 718"> <thead> <tr> <th></th> <th>Lower</th> <th>Good</th> <th>Upper</th> <th>Lower</th> <th>Good</th> <th>Upper</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Active</td> <td>Active</td> <td>Active</td> <td>Off</td> <td>Off</td> <td>Off</td> </tr> <tr> <td>B</td> <td>Off</td> <td>Off</td> <td>Off</td> <td>Active</td> <td>Active</td> <td>Active</td> </tr> <tr> <td>A+B etc</td> <td>Active</td> <td>Active</td> <td>Active</td> <td>Active</td> <td>Active</td> <td>Active</td> </tr> </tbody> </table> <p>If the measurement is within limit, then the good limit output is set, otherwise the upper or lower limit outputs are set to indicate a reading out of limit.</p>		Lower	Good	Upper	Lower	Good	Upper	A	Active	Active	Active	Off	Off	Off	B	Off	Off	Off	Active	Active	Active	A+B etc	Active	Active	Active	Active	Active	Active
	Lower	Good	Upper	Lower	Good	Upper																							
A	Active	Active	Active	Off	Off	Off																							
B	Off	Off	Off	Active	Active	Active																							
A+B etc	Active	Active	Active	Active	Active	Active																							

## 5.0 Display Panel (cont.)

### 5.3 Overview of Features (cont.)

Functions	<p>The SI3000 series has the following functions available from the front panel keypad or controllable from the RS232 and some discrete inputs.</p> <p>Zero: Allows a reading to be set to zero (display shows TARE) all measurements are then referenced to the zero position.</p> <p>Print: Allows measured data to be printed via the RS232 port.</p> <p>Peak/Track Allows the readout to be switched from track mode to peak+ or peak-. In peak mode the displayed value will only change if it is greater than (peak+) or less than (peak-) the current displayed value.</p> <p>Menu (keypad only) accesses menu screens for set up.</p> <p>The SI3300 and SI3500 series have the following additional functions:</p> <p>Preset: Allows a preset value to be added to the displayed reading only – does not change the analogue outputs. Enable preset from the preset menu and activate with the up arrow key.</p> <p>In dual display mode it is possible to set the preset and zero to activate on both channels</p> <p>Log Mode: The readout can log and store data in three modes</p> <p>Normal logging which will store a number of readings at a predefined interval. Setup and start from logging menu screen</p> <p>Trigger start which will store a number of readings at a predefined interval, once the start logging input is triggered.</p> <p>Log on Trigger which will store a reading every time the logging input is triggered, this mode is started from the logging menu.</p>			
Inputs	6 discrete inputs, Zero, Change from track to peak+ to peak-, print, log, real reset, preset			
Analogue Outputs			Analogue Output 1	Analogue Output 2
	A	A	Off (null)	
	B	Off (null)	B	
	A+B etc.	A+B etc.	A+B etc.	
	Dual Display (SI3500 and SI3300 only)	A	B	
Each analogue output can be independently set for 4-20 mA or a DC voltage (0-5 V, 0-10 V, $\pm 5$ V and $\pm 10$ V)				

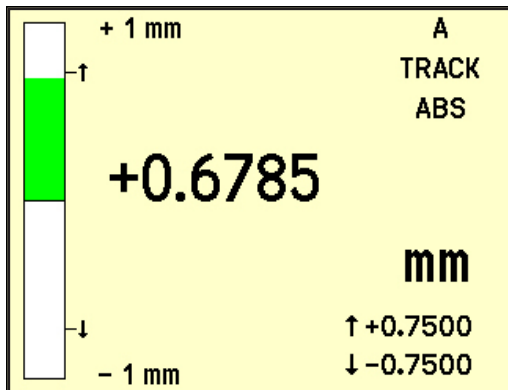
## 6.0 Operating Screen

---

Display seen directly after powering up

**Note:** This screen will vary depending on the Operator Screen displayed prior to powering down

Press MENU go to 6.1



# 6.0 Operating Screen (cont.)

## 6.1 MENUS and SETUPS

Scroll up or down using the  $\Delta$   $\nabla$  keys to the required sub menu PRESS (ENTER)

### Probes 6.2

Selects the type of probes to be used with this instrument, the parameters, channels and Identification associated with each probe.

### Limits 6.4

Sets up the Upper and Lower measurement limits

### Serial Port 6.6

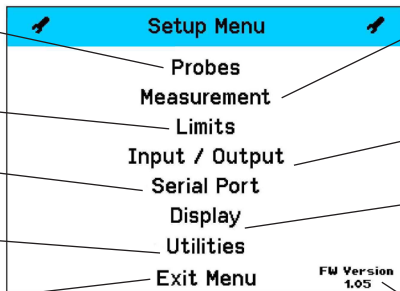
Sets up the parameters for the Serial RS232 Port.

### Utilities 6.8

Restore Factory Default Settings

### Exit Menu 6.9

Shows Operator Screen



### Measurement 6.3

Selects Measurement type. A,B,(A+B) etc.  
Measurement Mode (Track, Peak+, Peak-, Diff)  
Reset Mode (Manual/Auto)  
Trigger Time (0000 ms)  
Peak Trigger Level (+/-000.00000xx)  
Units (mm,inch for distance)(rad,deg for angle)  
Unipolar/Bipolar (Auto Mode, Unipolar, Bipolar)  
Distance 'n' (0001.0000) for angle

### Input/Output 6.5

Logic I/O + Analogue outputs  
Print options

### Display 6.7

Set Language, Contrast,  
Bar Offset, Bar  
(+/-000.00000)  
AutoRange (on/off)  
Places After Decimal  
point (0 to 6)

Shows current  
Firmware version

# 6.0 Operating Screen (cont.)

## 6.2 Probes Channel A

Use  $\triangle$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.  
e.g. Extend + or Retract+

The screenshot shows the 'Probes Menu - Channel A' interface. The menu items are:

- Probe Type
- Direction
- Measurement Range 123.456
- Probe ID AAAAAAAAAA
- Notify
- Next Menu

Callouts from the right side of the screen point to specific elements:

- From 'Orbit':  $\triangleleft$   $\triangleright$  NONE see 6.2.1
- From 'Retract +':  $\triangleleft$   $\triangleright$  EXTEND +
- From '123.456': Preset by Probe (Orbit)
- From 'AAAAA': To confirm Probe ID, register a new Probe or Probe ID blank. Select NOTIFY, Press Enter. Follow Screen Instructions
- From 'Next Menu': Press ENTER see 6.2.2 Channel B

### Notes

Press MENU to return to the Operator Screen  
With cursor over NEXT MENU Press ENTER for next sub Menu  
With cursor over EXIT MENU Press ENTER to return to Setup Menu  
All Solartron Orbit® Probes have a unique ID



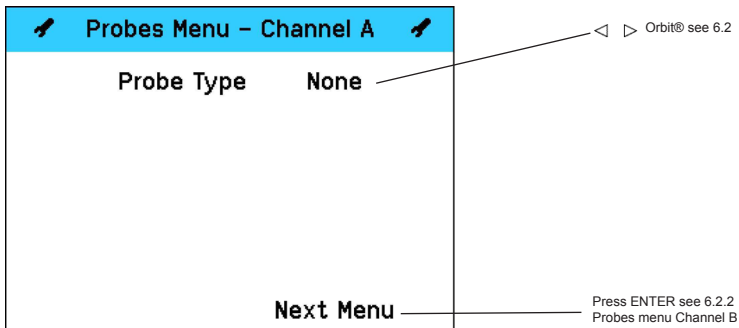
# 6.0 Operating Screen (cont.)

---

## 6.2.1 Probe Type Channel A

Use  $\triangle$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.

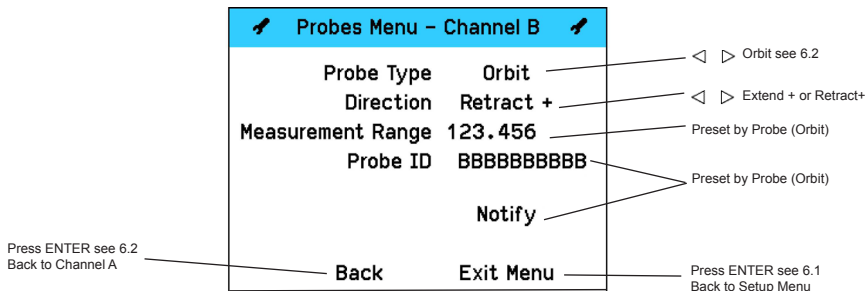


# 6.0 Operating Screen (cont.)

## 6.2.2 Probes Channel B

Use  $\triangle$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.  
e.g. Extend + or Retract+



### Notes

Press MENU to return to the Operator Screen  
With cursor over NEXT MENU Press ENTER for next sub Menu  
With cursor over EXIT MENU Press ENTER to return to Setup Menu  
With cursor over Back Press ENTER to return to Channel A see 6.2  
All Probes have a unique ID

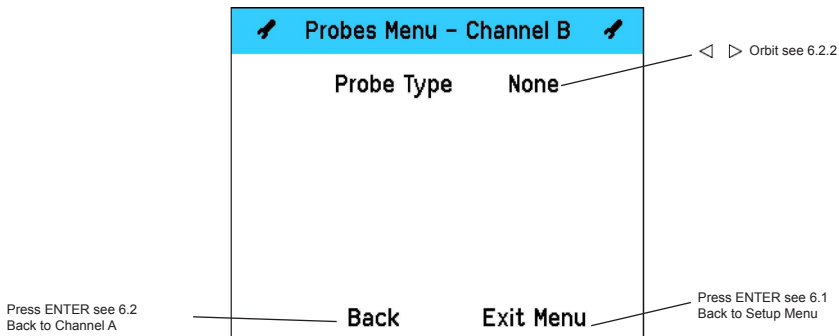
# 6.0 Operating Screen (cont.)

---

## 6.2.2.1 Probe type Channel B

Use  $\triangle$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.



# 6.0 Operating Screen (cont.)

---

## 6.3 Measurement Menu Page 1

Use  $\triangle$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.

The screenshot shows a menu screen with a blue header bar containing the text "Measurement Menu Page 1" and two pencil icons. Below the header, the text "Measure Type" and "Measure Mode" is displayed on the left, and "A" and "TRACK" is displayed on the right. At the bottom right, the text "Next Menu" is visible. Three callout lines point from the right side of the screen to the text "A", "TRACK", and "Next Menu".

$\triangleleft$   $\triangleright$  Orbit see 6.2  
(Distance) $B, A+B, (A+B)/2, A-B, (A-B)/2$   
( $B-A$ )/ $a$  (Angle = limited to 5 deg)

$\triangleleft$   $\triangleright$  PEAK +, PEAK -, or Diff  
see 6.3.1 / 6.9

Press ENTER Go to  
Measurement Menu Page 2 see 6.3.2

# 6.0 Operating Screen (cont.)

## 6.3.1 Measurement Menu Page 1

Use  $\Delta$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.

**Measurement Menu Page 1**

Measure Type	A
Measure Mode	PEAK+
Peak Reset Mode	Manual
	↓
Peak Trigger Time	12345
	↓
Peak Trigger Level	+123.456789
	Next Menu

$\triangleleft$   $\triangleright$  Measure Type B,A+B,(A+B)/2,A-B,(A-B)/2, (B-A)/a  
(Shows on Operator Screen in mm, inch for distance)  
(Shows on Operator Screen in rad, deg for angle)

$\triangleleft$   $\triangleright$  Measure Mode Track, Peak+, Peak-, Diff

$\triangleleft$   $\triangleright$  Auto, Manual

**Auto Mode only**

$\Delta$   $\nabla$  Press ENTER to Edit parameter

$\triangleleft$   $\triangleright$  To move cursor

$\Delta$   $\nabla$  To increment/decrement numbers

$\Delta$   $\nabla$  To change +/-  
Press ENTER to Exit Mode

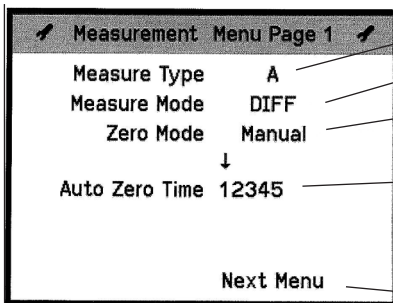
Press ENTER see 6.3.2.

# 6.0 Operating Screen (cont.)

## 6.3.2 Measurement (Distance) Menu Page 2

Use  $\triangle$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.



$\triangleleft$   $\triangleright$  Measure Type B, A+B, (A+B)/2, A-B, (A-B)/2, (B-A)/a  
(Shows on Operator Screen in mm, inch for distance)  
(Shows on Operator Screen in rad, deg for angle)

$\triangleleft$   $\triangleright$  Measure Mode Track, Peak+, Peak-, Diff

$\triangleleft$   $\triangleright$  Auto, Manual

**Diff Mode only**

$\triangle$   $\nabla$  Press ENTER to Edit parameter

$\triangleleft$   $\triangleright$  To move cursor

$\triangle$   $\nabla$  To increment/decrement numbers

$\triangle$   $\nabla$  To change +/-  
Press ENTER to Exit Mode

Press ENTER

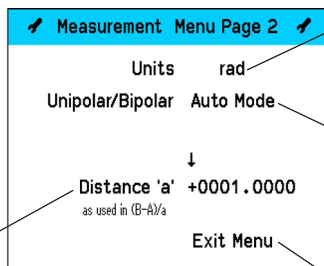


# 6.0 Operating Screen (cont.)

## 6.3.4 Measurement (Angle) Menu Page 2

Use  $\Delta$   $\nabla$  to move the cursor around the screen.

Use  $\leftarrow$   $\rightarrow$  to select options.



$\leftarrow$   $\rightarrow$  rad, deg (used for angle measurement (B-A)/a)

$\leftarrow$   $\rightarrow$  Bipolar, Unipolar or Auto Mode

### Bipolar selected

Measurement range displayed Top + xx rad/deg  
Bottom - xx rad/deg

Centrally Tracks the +/- measurements within limits in green turning to red when outside the limits, flashes **OVER/UNDER** when outside the Measurement range.

### Unipolar selected

Measurement range displayed Top + xx rad/deg  
Bottom 0 xx rad/deg

Tracks the + measurement within limit turning to red when outside the limit, flashes **OVER/UNDER** when outside the Measurement range.

### Auto Mode

Auto Select

Press ENTER see 6.1  
Back to Setup Menu

### Auto Mode only

$\Delta$   $\nabla$  Press ENTER to Edit parameter

$\leftarrow$   $\rightarrow$  To move cursor

$\Delta$   $\nabla$  To increment/decrement numbers

$\Delta$   $\nabla$  To change +/-  
Press ENTER to Exit Mode

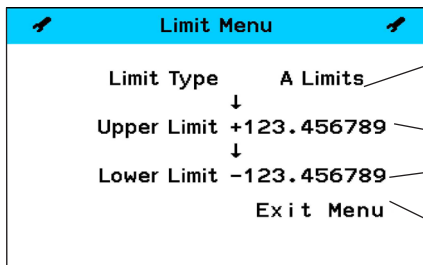


# 6.0 Operating Screen (cont.)

## 6.4 Limit Menu

Use  $\Delta$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.



3 types of limits can be displayed A,B and "Computed Limits" when more than one measurement type selected see 6.3

- $\Delta$   $\nabla$  Press ENTER to Edit parameter
- $\triangleleft$   $\triangleright$  To move cursor
- $\Delta$   $\nabla$  To increment/decrement numbers
- $\Delta$   $\nabla$  To change +/-  
Press ENTER to Exit Mode

Press ENTER see 6.1  
Back to Setup Menu

## 6.0 Operating Screen (cont.)

---

### 6.5 Input/Output Menu

Use  $\triangle$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.

The screenshot shows the 'Input/Output Menu' with the following items and their corresponding options:

Item	Option
Logic Inputs	Active Low
Logic Outputs	Active Low
Analogue O/P Ch A	0 to 5 V
Analogue O/P Ch B	0 to 5 V
Print Button Options	Single
Print Discrete Options	Single
Exit Menu	

Callouts from the right side of the screen point to the options:

- Active High
- Active High
- 0 to 10V, -5 to +5V  
-10 to +10V 4-20mA
- 0 to 10V, -5 to +5V  
-10 to +10V 4-20mA
- Continuous
- Press ENTER see 6.1  
Back to Setup Menu

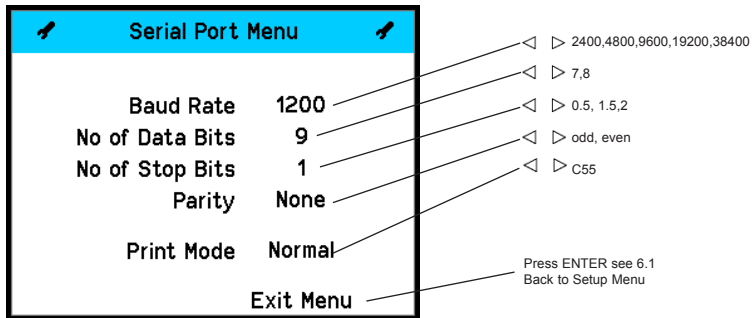
## 6.0 Operating Screen (cont.)

---

### 6.6 Serial Port Menu

Use  $\triangle$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.



# 6.0 Operating Screen (cont.)

## 6.7 Display Menu - Screen 1

Use  $\Delta$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.

The screenshot shows the 'Display Menu Page 1' with the following settings and annotations:

- Language:** English
- Contrast:** 50
- Bar Offset:** +0000.0000
- Bar AutoRange:** Off
- Places After DP:** 0
- Next Menu:** (Option)
- Exit Menu:** (Option)

Annotations on the left side:

- Varies the screen contrast for optimum operator viewing screen (points to Contrast)
- Offsets bar + or - (points to Bar Offset)
- Switches Bar Auto Range On/Off (points to Bar AutoRange)
- Sets places after Decimal Point. This needs to be set separately for CHA, CHB + Computed Measurement (A+B, A-B etc.) (points to Places After DP)
- Press ENTER see 6.1 for next menu (points to Next Menu)

Annotations on the right side:

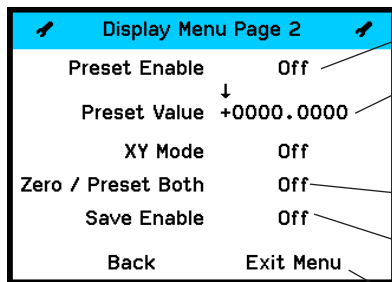
- $\triangleleft$   $\triangleright$  0,5,10,15,20,25,30,35,40,45,50,55,60,65,70,75,80,85,90,95,100 (points to Contrast)
- $\Delta$   $\nabla$  Press ENTER to Edit parameter (points to Contrast)
- $\triangleleft$   $\triangleright$  To move cursor (points to Contrast)
- $\Delta$   $\nabla$  To increment/decrement numbers (points to Bar Offset)
- $\Delta$   $\nabla$  To change +/- Press ENTER to Exit Mode (points to Bar AutoRange)
- $\triangleleft$   $\triangleright$  On (points to Places After DP)
- $\triangleleft$   $\triangleright$  1,2,3,4,5,6 (points to Next Menu)
- Press ENTER see 6.1 Back to Setup Menu (points to Exit Menu)

# 6.0 Operating Screen (cont.)

## 6.7 Display Menu - Screen 2

Use  $\Delta$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.



Use  $\triangleleft$   $\triangleright$  On, Off

$\Delta$   $\nabla$  Press ENTER to Edit number

$\Delta$   $\nabla$  To move cursor

$\Delta$   $\nabla$  To increment/decrement number

$\Delta$   $\nabla$  To change +/-  
Press ENTER to Exit Mode

Use  $\triangleleft$   $\triangleright$  On, Off (see section 6.10)

$\triangleleft$   $\triangleright$  Off/Zero/Preset/Both  
Option to save Zero, Preset or Both

$\Delta$  Select Back/Exit Menu  
Enter to Action

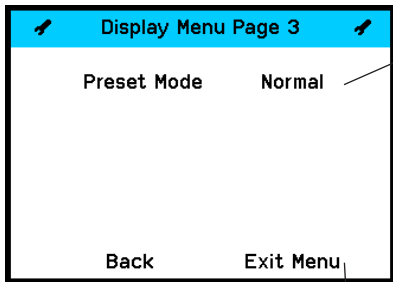
$\nabla$

# 6.0 Operating Screen (cont.)

## 6.7 Display Menu - Screen 3

Use  $\triangle$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.



Use  $\triangleleft$   $\triangleright$  Normal, As Offset

In "Normal" mode applying the preset 'masters' (the reading becomes the preset value, e.g. with an abs reading of 1.2 a preset value of 10.0, when apply preset is pressed the reading goes to 10.0).

In "As Offset" mode, this toggles between Offset and Absolute.

Returning to absolute doesn't clear mastering it just disables it till Offset is next applied, or zero is pressed.

E.g (with a preset value of 10)

Mode	Reading	Action/Note
Abs	1.2	
		Zero
Tare	0.0	
		Apply Preset Button
Pre	10.0	
		Move Probe from 1.2 to 1.4
Pre	10.2	
		Apply Preset Button
Abs	1.4	
		Apply Preset Button
Pre	10.2	Note the previous mastering is reapplied
		Zero
Pre	10.0	Note the part has been re-mastered

$\triangle$  Select Back/Exit Menu

$\nabla$  Enter to Action

Note to clear a stored master, from a display of abs (not Pre – if in Pre hit apply preset button to return to abs), Zero (to Tare), then Zero again (to abs).

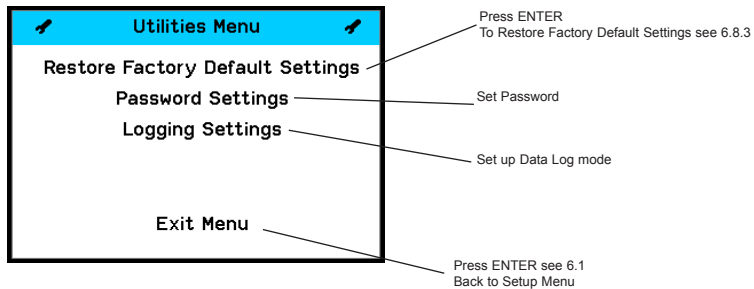
# 6.0 Operating Screen (cont.)

---

## 6.8 Utilities Menu

Use  $\triangle$   $\nabla$  to move the cursor around the screen.

Use  $\triangleleft$   $\triangleright$  to select options.



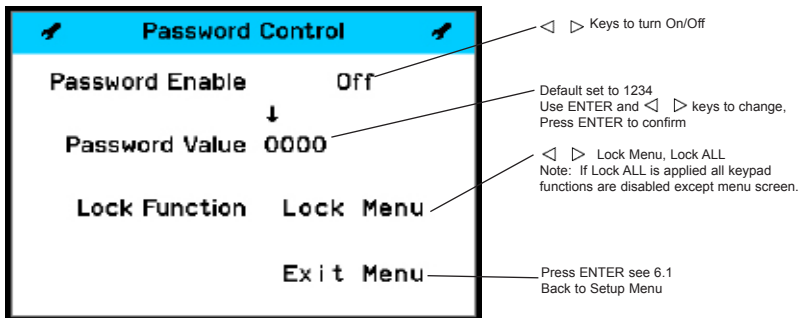
# 6.0 Operating Screen (cont.)

---

## 6.8.1 Password Menu

Use  $\Delta$   $\nabla$  to move the cursor around the screen.

Use  $\leftarrow$   $\rightarrow$  to select options.





# 6.0 Operating Screen (cont.)

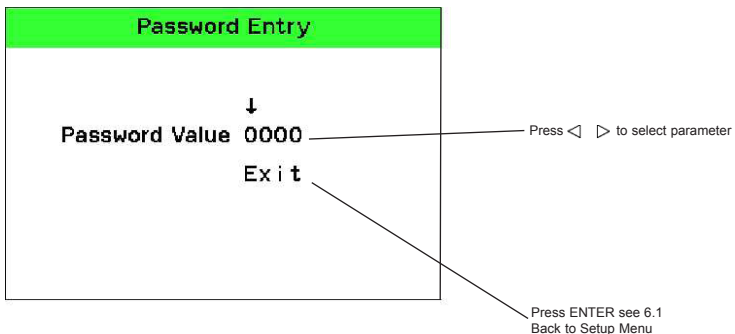
---

## 6.8.2 Password Entry

Note: Only seen if password enabled

Use  $\Delta$   $\nabla$  to move the cursor around the screen.

Use  $\leftarrow$   $\rightarrow$  to select options.

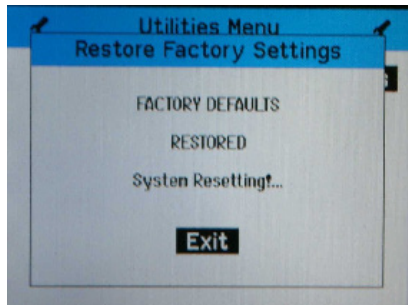


## 6.0 Operating Screen (cont.)

---

### 6.8.3 Utilities Menu (Factory Default Restore)

The following is displayed for 3 seconds, the unit automatically defaults to factory setting and returns to the Operator Screen.



# 6.0 Operating Screen (cont.)

## 6.9 Operator Screen

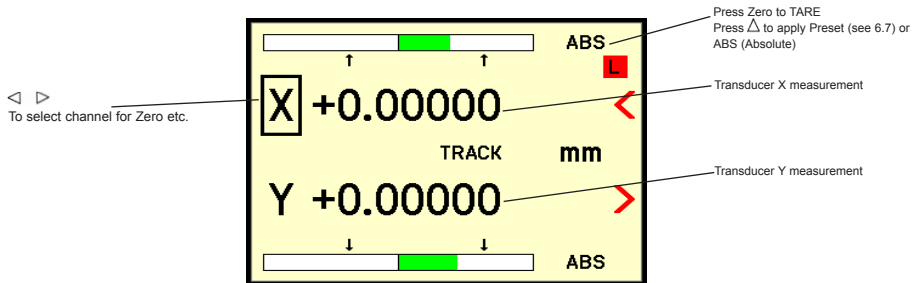
The diagram shows a rectangular operator screen with a yellow background. On the left side, there is a vertical scale with a green bar. The scale has markings for +1 mm at the top and -1 mm at the bottom. The green bar is positioned between the 0 and +1 mm marks, with a small upward arrow indicating the current level. The main display area shows the number **+0.6785** in large black font. To the right of the number, the word **TRACK** is displayed above **ABS**. Below the main number, the unit **mm** is shown. At the bottom right, there are two lines of text: **↑ +0.7500** and **↓ -0.7500**. The screen is annotated with several callouts:

- Auto Range ON/OFF see 6.7 Display Menu**: Points to the vertical scale.
- Selected Measurement Menu see 6.3**: Points to the **TRACK** label.
- Track PEAK+,PEAK-,DIFF Selected at Measurement menu see 6.3 or PEAK/TRACK membrane on keypad**: Points to the **TRACK** label.
- TRACK Measures actual distance/angle within the set limits displaying green. Turning red when outside the set limits. Returning to green when back inside the limits.**: Points to the **TRACK** label.
- PEAK+ Measures within the set limits displaying green turning red when outside the set limits. Pressing ENTER resets**: Points to the **ABS** label.
- PEAK- Measures within the set limits displaying green turning red when outside the set limits. Pressing ENTER resets**: Points to the **ABS** label.
- DIFF measures Peak+, Peak-, measures within the set limits displaying green turning red when outside of limits out If manual set, Peak +/- Press enter to reset. If Auto set, Peak + reset to probe actual position**: Points to the **ABS** label.
- Below Peak Trigger Time/Peak Trigger Level**: Points to the **ABS** label.
- If Auto set, Peak - reset to probe actual position**: Points to the **ABS** label.
- Above Peak Trigger Time/Peak Trigger Level**: Points to the **ABS** label.
- If Auto set, Diff - Diff zeroed every time period**: Points to the **ABS** label.
- Selected by Limit Menu**: Points to the **ABS** label.
- Press MENU see 6.1 Set Up Menu**: Points to the **ABS** label.
- Press Zero to select ABS (Absolute) or TARE (Offset)**: Points to the **ABS** label.
- Press  $\Delta$  to apply Preset (see 6.7) or ABS (Absolute)**: Points to the **ABS** label.

# 6.0 Operating Screen (cont.)

---

## 6.10 X Y Mode



## 6.0 Operating Screen (cont.)

---

### 6.11 Logging Menu Page 1

The screenshot shows the 'Logging Menu Page 1' with the following items:

Mode	Standard
Auto Summary	Off
Interval (ms)	000001000
Duration (ms)	000060000
Itemise	Off
Next Menu	Exit Menu

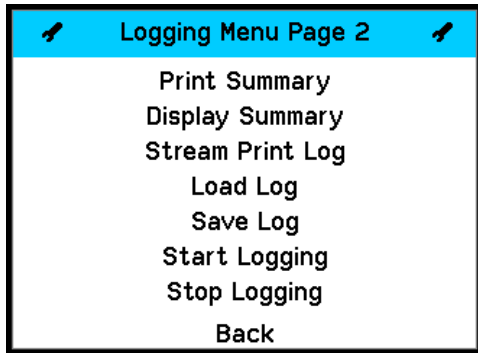
Annotations and instructions:

- Use ◀ ▶ to select Standard, Start on Discrete Input or Trigger on Discret Input
- Use ◀ ▶ to select On, Off
- ◀ ▶ Press ENTER to edit number
- ◀ ▶ To Move Count
- △ ▽ To Increment Number
- Press ENTER to Exit mode

## 6.0 Operating Screen (cont.)

---

### 6.12 Logging Menu Page 2



Use  to move to option  


Press ENTER to Select option

# 7.0 RS232 User Input Commands

---

The unit shall respond to the following RS232 User Input Commands

Command	Command Sequence	Number of Parameter Bytes	Description
Print	^"O'	0	Print Mode = Normal : Standard print Print Mode = C55 : C55 compatible print (Print Mode option is located in the 'serial port' menu)
Extended Print	^"P'	1	Print in SI3500 Format
Get Detail	^"E'	2	Return Details about the SI3500 <i>ABS or TARE, Measurement Type, Unit of Measure, Limit Values</i>
Set Unit	^"S'	11	Set Various SI3500 Settings <i>Limits, Stroke, Measurement Type, Measurement Mode, Zero, Start/Stop Continuous Print, Set Print Button Mode, Notify, Stop Notify, Peak Reset, Discrete Inputs Active Hi/Lo, Discrete Outputs Active Hi/Lo</i>

Detailed Command specification with full parameter details follows on the next pages.

# 7.0 RS232 User Input Commands (cont.)

## 7.1 RS232 User Command Details

In the following table sp is used to mean an Ascii space (Dec 32 Hex 20)  
Shaded cells mean they are not used for the command shown

Command	Total No of Chars	Character Number												
		1	2	3	4	5	6	7	8	9	10	11	12	13
<b>Print</b>	2	^	O											
<b>Extended Print</b>														
<i>Current Measurement</i>	3	^	P	0										
<i>Channel A</i>	3	^	P	1										
<i>Channel B</i>	3	^	P	2										
<b>GetDetail</b>														
<i>Get Abs or Tare</i>	4	^	E	A	0									
<i>Get Measurement Mode</i>	4	^	E	M	0									
<i>Get Unit of Measure</i>	4	^	E	U	0									
<i>Get Current Mode LL</i>	4	^	E	L	0									
<i>Get Current Mode UL</i>	4	^	E	L	1									
<i>Get Computed LL</i>	4	^	E	L	2									
<i>Get Computed UL</i>	4	^	E	L	3									
<i>Get Channel A LL</i>	4	^	E	L	4									
<i>Get Channel A UL</i>	4	^	E	L	5									
<i>Get Channel B LL</i>	4	^	E	L	6									
<i>Get Channel B UL</i>	4	^	E	L	7									
<i>Get Computed Stroke</i>	4	^	E	S	0									
<i>Get Channel A Stroke</i>	4	^	E	S	1									
<i>Get Channel B Stroke</i>	4	^	E	S	2									



# 7.0 RS232 User Input Commands (cont.)

## 7.1 RS232 User Command Details (cont.)

In the following table sp is used to mean an Ascii space (Dec 32 Hex 20)

Command	Total No of Chars	Character Number												
		1	2	3	4	5	6	7	8	9	10	11	12	13
<b>SetUnit</b>														
Set Limits														
Set Ch A UL	13	^	S	L	A	U	1	.	2	3	4	sp	sp	sp
Set Ch A LL	13	^	S	L	A	L	0	.	7	8	9	sp	sp	sp
Set Ch B UL	13	^	S	L	B	U	1	.	2	3	4	sp	sp	sp
Set Ch B LL	13	^	S	L	B	L	0	.	7	8	9	sp	sp	sp
Set Computed UL	13	^	S	L	C	U	1	.	2	3	4	sp	sp	sp
Set Computed LL	13	^	S	L	C	L	0	.	7	8	9	sp	sp	sp
<b>Set Measurement Type</b>														
A	13	^	S	M	0	sp	sp	sp	sp	sp	sp	sp	sp	sp
B	13	^	S	M	1	sp	sp	sp	sp	sp	sp	sp	sp	sp
A+B	13	^	S	M	2	sp	sp	sp	sp	sp	sp	sp	sp	sp
(A+B)/2	13	^	S	M	3	sp	sp	sp	sp	sp	sp	sp	sp	sp
A-B	13	^	S	M	4	sp	sp	sp	sp	sp	sp	sp	sp	sp
(A-B)/2	13	^	S	M	5	sp	sp	sp	sp	sp	sp	sp	sp	sp
(B-A)a (angle)	13	^	S	M	6	sp	sp	sp	sp	sp	sp	sp	sp	sp
<b>SetUnit</b>														
<b>Set Measurement Mode</b>														
Track	13	^	S	O	N	sp	sp	sp	sp	sp	sp	sp	sp	sp
Peak+	13	^	S	O	+	sp	sp	sp	sp	sp	sp	sp	sp	sp
Peak-	13	^	S	O	-	sp	sp	sp	sp	sp	sp	sp	sp	sp
Diff	13	^	S	O	D	sp	sp	sp	sp	sp	sp	sp	sp	sp

# 7.0 RS232 User Input Commands (cont.)

## 7.1 RS232 User Command Details (cont.)

X = Value eg 3.4 pad with spaces

Command	Total No of Chars	Character Number												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Zero	13	^	S	Z	sp	sp	sp	sp	sp	sp	sp	sp	sp	sp
Peak Reset	13	^	S	P	E	A	K	R	E	S	E	T	sp	sp
Start Continuous Print	13	^	S	P	R	I	N	T	C	O	N	T	sp	sp
Stop Continuous Print	13	^	S	P	R	I	N	T	S	T	O	P	sp	sp
Set Print Key Single Mode	13	^	S	P	R	I	N	T	M	O	D	E	S	sp
Set Print Key Cont Mode	13	^	S	P	R	I	N	T	M	O	D	E	C	sp
Set I/O Logic State														
Logic Inputs Active Low	13	^	S	I	-	I	N	P	-	L	O	sp	sp	sp
Logic Inputs Active High	13	^	S	I	-	I	N	P	-	H	I	sp	sp	sp
Logic Outputs Active Low	13	^	S	I	-	O	U	T	-	L	O	sp	sp	sp
Logic Outputs Active High	13	^	S	I	-	O	U	T	-	H	I	sp	sp	sp
Notify														
Notify Probe Channel A	13	^	S	N	O	T	I	F	Y	-	C	H	A	sp
Notify Probe Channel B	13	^	S	N	O	T	I	F	Y	-	C	H	B	sp
Stop Notify	13	^	S	N	O	T	I	F	Y	H	A	L	T	sp
Get Orbit Device Channel A	13	^	S	G	I	D	-	A	sp	sp	sp	sp	sp	sp
Get Orbit Device Channel B	13	^	S	G	I	D	-	B	sp	sp	sp	sp	sp	sp
Zero Both	5	T	Z	0	0	0								
Zero One	5	T	Z	1	0	0								
Preset On	13	S	R	-	O	N	sp	sp	sp	sp	sp	sp	sp	sp
Preset Off	13	S	R	-	O	F	F	sp	sp	sp	sp	sp	sp	sp
Set Preset Value	13	S	R	:	±	X	X	X	X	X	X	X	X	sp
Preset Toggle	13	S	R	-	T	O	G	L	E	sp	sp	sp	sp	sp
Peak Reset	13	S	R	E	S	E	T	sp	sp	sp	sp	sp	sp	sp

# 7.0 RS232 User Input Commands (cont.)

## 7.2 RS232 Output Formats

### PRINT OUTPUT FORMATS

C55 Compatible		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19					
Format	Sign	Reading: right aligned, DP set by precision											Units			Limit	\n	\r								
Example	+0.00017mm					0	•	0	0	0	1	7		m	m				=	\n	\r					
	-0.0017mm					0	•	0	0	1	7			m	m				=	\n	\r					
	-0.017mm					0	•	0	1	7				m	m				=	\n	\r					
NORMAL		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Format	Sign	Reading: right aligned, DP set by precision											Units			Limit	\r	\n								
	+1.1308mm									1	•	1	3	0	8			m	m			=		\r	\n	
	-1.1308inch									1	•	1	3	0	8			i	n	c	h		=		\r	\n
	-1.1308									1	•	1	3	0	8							=		\r	\n	
	-1.13mm										1	•	1	3				m	m			=		\r	\n	

Note. XY print is not available when C55 'Print Mode' is selected. In this case only the selected channel will be printed.

Where:  =space  
 \r = CR  
 \n = LF



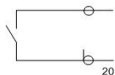
# 8.0 Interface Connections

## 8.1 I/O CONNECTOR (Mounted on I/O Board)

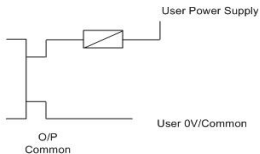
25 WAY D TYPE SOCKET, FIXED TO REAR PANEL

PIN	DESCRIPTION	DETAIL
1	CH1 OVER RANGE	
14	CH1 IN RANGE	
2	CH1 UNDER RANGE	
15	CH2 OVER RANGE	
3	CH2 IN RANGE	
16	CH2 UNDER RANGE	
4	Isolated O/P Common	
17	'Zero key' Isolated I/P	
5	'Print key' Isolated I/P	
18	'Reset key' Isolated I/P	
6	'Peak key' Isolated I/P	
19	Log Control	
7	'Preset Enable'	
20	Isolated I/P Common	
8	Not Used	
21	Not Used	
9	Not Used	
22	Not Used	
10	Not Used	
23	CH1 Analogue O/P Common	CH1 O/P Return
11	CH1 Analogue O/P	CH1 Analogue O/P
24	CH2 Analogue O/P Common	CH2 O/P Return
12	CH2 Analogue O/P	CH2 Analogue O/P
25	Not Used	
13	Not Used	

### Input Schematic



### Output Schematic



### ANALOGUE OUTPUT SPECIFICATION

Update interval	1.25mS
Bandwidth	500Hz
Rise time	70mS
Accuracy	0.1% FSO

# 8.0 Interface Connections (cont.)

---

## 8.2 COMMS CONNECTOR

9 WAY D TYPE PCB SOCKET, FIXED TO REAR PANEL

PIN	RS232 CONFIGURATION
1	Not Used
2	RS232 Tx
3	RS232 Rx
4	Not Used
5	RS232 GND
6	Not Used
7	Not Used
8	Not Used
9	Not Used

## 8.3 POWER CONNECTOR (Mounted on rear panel)

2.5 mm Chassis Mounted DC skt

PIN	DESCRIPTION	DETAIL
1	+24V DC Power IN(centre pin)	Power for Instrument routed through a switch
2	POWER RETURN	



# 8.0 Interface Connections (cont.)

---

## 8.4 ORBIT® Connectors

2 off 9 way D Type Sockets in recess under rear panel

ORBIT CONNECTION (From Orbit Adapter)	
PIN	DESCRIPTION
1	Not Used
2	RS485 A
3	RS485 B
4	Not Used
5	0V
6	+5V
7	+5V
8	Not Used
9	0V

## 9.0 Technical Specification

MAIN INSTRUMENT	
Display Type	Colour LCD with integral backlight.
Display Length (mm)	±ABCD.EFGHJ
Display Length (inches)	±ABCD.EFGHJK
Resolution - Display	0.05µm or 0.000005"
Analogue Display	Solid Vertical bar
Keypad	9 key membrane keypad (Print, Zero, Peak/Track, Enter, Menu and navigation keys)
Temperature	Storage temperature range: -20°C to +85°C, Operating temperature range: 0°C to +50°C
IP Rating	Front panel: IP65, Case: IP51
POWER SUPPLY	
Voltage	+24V DC ±10%
Power	5 Watts maximum at 24V DC
(Universal 100-240V AC Input 24V DC PSU supplied with unit)	
MECHANICAL	
Weight	1.1kg excluding transducers
Dimensions	See drawing
ELECTRICAL CONNECTIONS (Rear Panel)	
DC Power	2.5mm DC Socket (Ctr pin +24V , Outer Return)
Orbit	2 x 9way D type sockets (in recess)
Serial Comms (RS232)	9 way D type socket
Input/Output	25 way D type socket
Digital Inputs	4 off switch activated with common isolated return
Digital Outputs	6 off current sink with common isolated return, programmable ACTIVE HI or LO Each pin can sink 500mA @ up to 40V
Analogue Outputs	1 for Channel A , 1 for Channel B, Independent Channel Range selection of : 0 to 5V, 0 to 10V, ± 5V, ± 10V, 4 to 20 mA - Accuracy 0.1% FSO