Solartron Metrology

SI1000 SERIES DISPLAY UNIT

user and installation manual

AMETEK®
ULTRA PRECISION TECHNOLOGIES

Index

1.0 Safety Summary

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
24 V ±10 % DC 20 VA

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 24 VDC 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 tag at the rear of the SI1000 to meet the full specification and EMC requirements.

2.0 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 SI1000 is designed to be maintenance free.

Contact with solvents should be avoided.

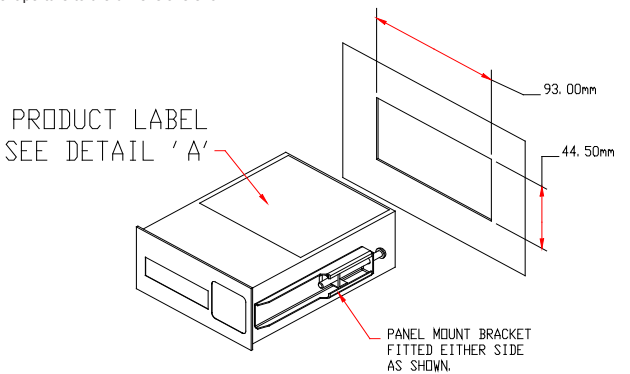
Any attempt to dismantle any of the SI1000 will invalidate the warranty.

The SI1000 series are precision instruments and should be handled with care.

3.0 Installation into a Panel

- Ensure that there is sufficient space behind the relevant instrument panel for the SI1000 and its cabling

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.

3.0 Installation into a Panel (cont)

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

WARNING: On installing or removing the SI1000, you must be aware of any hazardous equipment or materials in the vicinity. Make sure that any equipment into which the SI1000 system is to be installed is switched off and made safe.

CAUTION: Avoid installing the SI1000 close to switch gear, contactors or motor starters.

CAUTION: Do not place other signal and power supply wiring in the same loom as the SI1000 wiring.

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

4.0 General Description

4.1 OVERVIEW

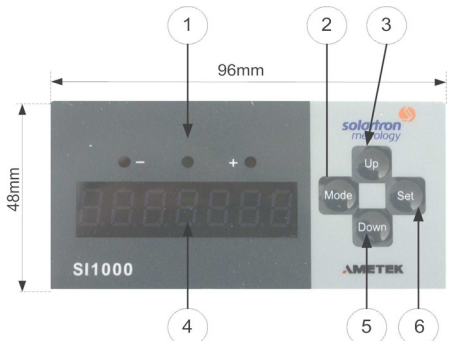
The SI1000 series of readouts provides a simple way of using Solartron transducers. All of the basic metrology functions are provided within this small robust instrument.

4.2 SPECIFICATION

See the Product data Sheet 502892

5.0 Display Panel and Connections

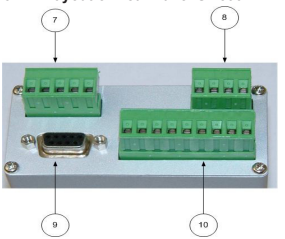
5.1 FRONT AND REAR PANEL LAYOUTS



1	Range Lamps
2	Mode Key ◄
3	UP and Hold Key ▲
4	7 digit Red Display
5	Down and Zero Key or Preset Key ▼
6	Set Key ►

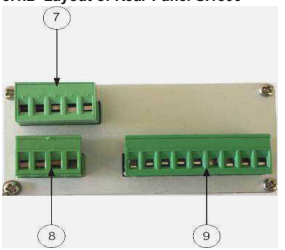
5.0 Display Panel and Connections (cont)

5.1.1 Layout of Rear Panel SI1500



7	RS232 and RS485 Connection
8	Analogue Outputs 4-20 mA or VOLT
9	Digital Probe (Orbit Input)
10	High/Middle/Low Alarm Output Zero Input Hold/Peak+/Peak-/Diff input 24 VDC Input

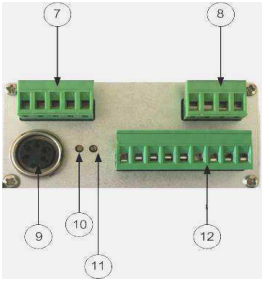
5.1.2 Layout of Rear Panel SI1300



7	RS232 and RS485 Connection
8	Analogue Inputs: 4-20 mA or VOLT
9	High/Middle/Low Alarm Output Zero Input Hold/Peak+/Peak-/Diff input 24 VDC Input

5.0 Display Panel and Connections (cont)

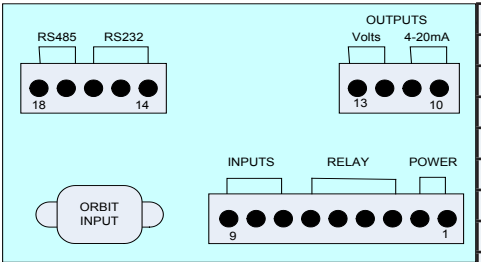
5.1.3 Layout of Rear Panel SI1100



7	RS232 and RS485 Connection
8	Analogue Outputs: 4-20 mA or VOLT
9	LVDT Transducer Input
10	Transducer Zero Adjustment
11	Transducer Gain Adjustment
12	High/Middle/Low Alarm Output Zero Input Hold/Peak+/Peak-/Diff input 24 VDC Input

5.0 Display Panel and Connections (cont)

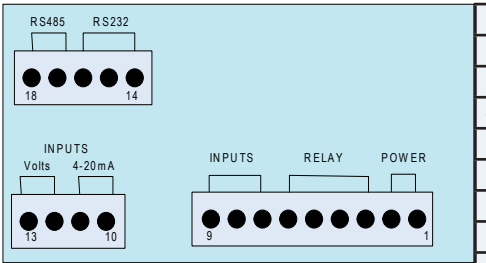
5.2 CONNECTION DETAILS - SI1500



1	+24V DC Power
2	0V DC Power
3	Relay Common
4	Relay High Limit
5	Relay OK limit
6	Relay Low Limit
7	Input Relay Common
8	Zero Input Relay
9	Hold Peak-P Peak-n Diff Relay
10	Analogue Current +
11	Analogue Current -
12	Analogue Voltage +
13	Analogue Voltage -
14	RS232 TXD
15	RS232 RXD
16	RS232 GND
17	RS485 A(+)
18	RS485 B (-)

5.0 Display Panel and Connections (cont)

5.2 CONNECTION DETAILS - SI1300



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5	Relay OK limit
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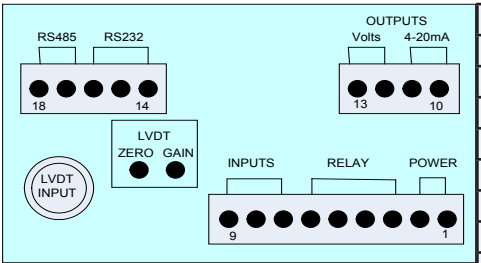
8	Zero Input Relay
9	Hold Input Relay
10	Analogue Current IN+
11	Analogue Current IN-
12	Analogue Voltage IN+
13	Analogue Voltage IN-
14	RS232 TXD
15	RS232 RXD
16	RS232 GND
17	RS485 A(+)
18	RS485 B (-)

5.0 Display Panel and Connections (cont)

5.2 CONNECTION DETAILS - SI1100



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11	Analogue Current -
12	Analogue Voltage +
13	Analogue Voltage -
14	RS232 TXD
15	RS232 RXD
16	RS232 GND
17	RS485 A(+)
18	RS485 B (-)

6.0 Set Up Options

6.1 MAIN MENU OVERVIEW

Menu	Parameter	Setting Range			
0.1dP	Set decimal point position.	nnnnnnn. To nn.nnnnn			
02.St Hi	Set High Alarm	0099.9999 to -099.9999			
03.St Lo	Set Low Alarm	0099.9999 to -099.9999			
04.St0db	Set Relay Hysteresis Time	0.1 to 9,9 seconds			
05SE AL	Switch Relay On or OFF	On / Off			
06.bEEP	Switch Audible Alarm On or OFF	On / Off			
07SE1 nP	Select Display Measurement Mode	Hold	Peak +	Peak -	Difference
	See "Function" section 7.0				
08HoLdt	Set Auto Hold Time	00 - 10 secs			

6.0 Set Up Options (cont)

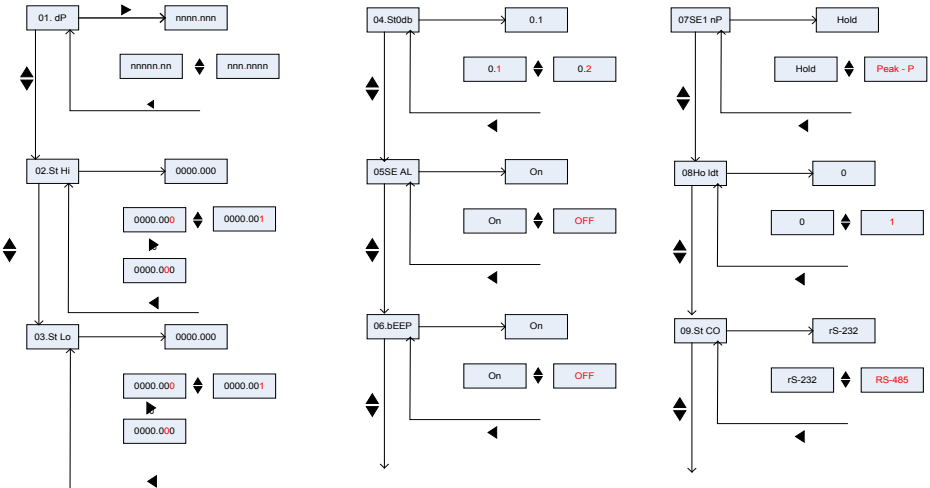
Menu	Parameter	Setting Range		
09.St CO	Select RS232 or RS485	RS232 / RS485		
10 bPS	Set Communication protocol	4800 / 9600 / 38400 / 115200 Data Bits (8), Parity (None) Stop Bits (1)		
11Addr	Set Communication address	1 - 99		
12StoUt	Set Analogue Output Signal	None / +10 to -10 / +5 to -5 / 0 to +10 / 0 to +5 / 4-20 mA		
13H "Er	Enable Zero Key See "Function" section 7.0	On / Off	Zero Display Press 3s	
14H 1 nP	Enable Hold Key	On / Off	Hold Display Press 3s	
15dir	Set Direction	Extend / Retract		
16OFFD	Set Offset or Preset	On / Off	Preset Display Press 3s	

6.0 Set Up Options (cont)

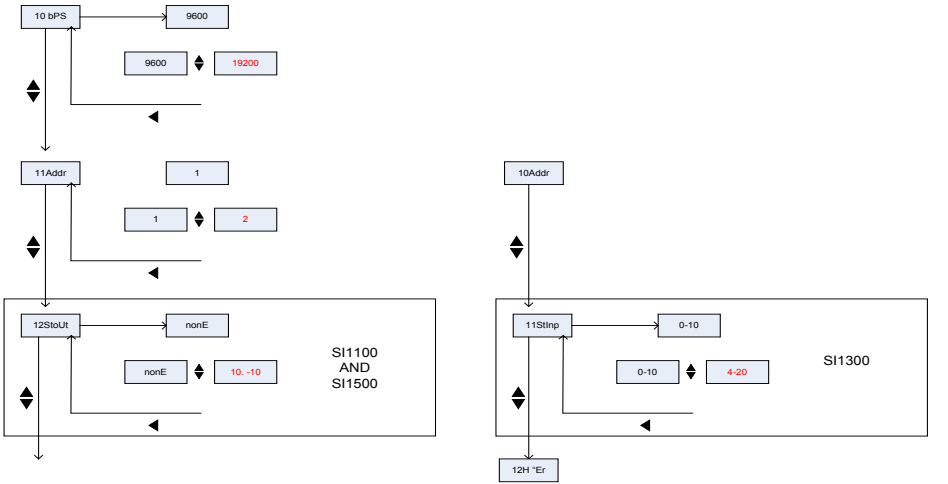
Menu			Parameter	Setting Range
	17rEAL		Show Real value (Probe absolute Reading)	
	18Unit		Select Units	mm / inches
	19StAn9		Select calibration	On / Off
	20CAL HI		Set Scale maximum	Set the Display Maximum Reading
	21CALLo		Set scale minimum	Set the Display Minimum Reading
	22ACAL		Set Calibration	Calibrate

6.0 Set Up Options (cont)

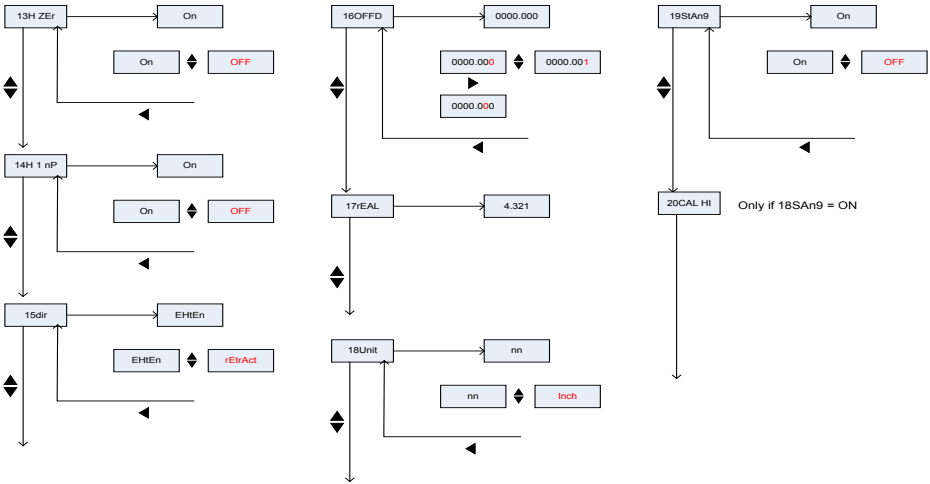
6.2 MENU SETUP DETAIL



6.0 Set Up Options (cont)



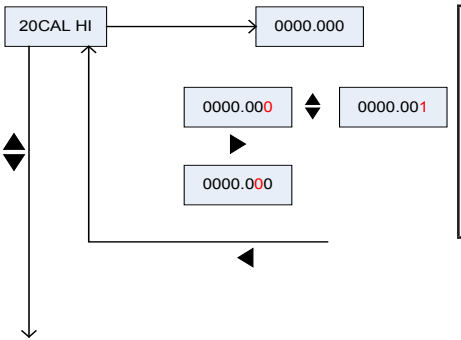
6.0 Set Up Options (cont)



6.0 Set Up Options (cont)

6.3 CALIBRATION MENU

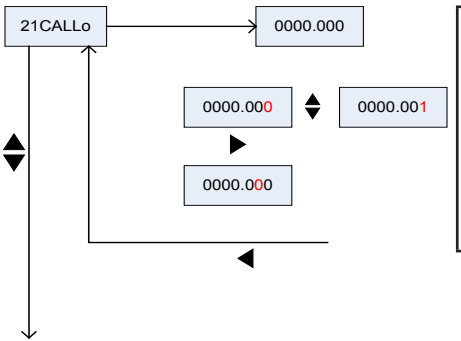
6.3.1 Set the Maximum Reading to the Maximum Sensor Output



Set the Display to the maximum value for the Digital Probe Eg DP2 =2.0	Range 0099.999 to – 0099.999 Eg Set Max Value to 2 0002.000	

6.0 Set Up Options (cont)

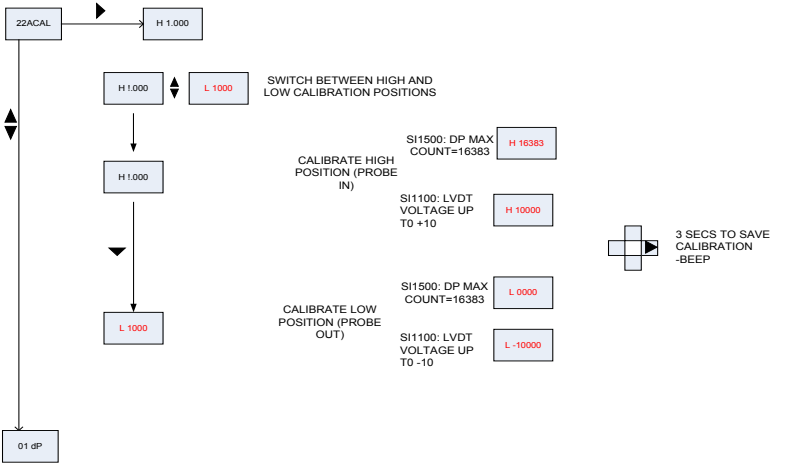
6.3.2 Set the Minimum Reading to the Minimum Sensor Output



Set the Display to the maximum value for the Digital Probe Eg DP2 =0	Range 0099.999 to – 0099.999 Eg Set Max Value to 0 0000.000	

6.0 Set Up Options (cont)

6.3.3 Calibrate the Maximum and Minimum



7.0 Functions

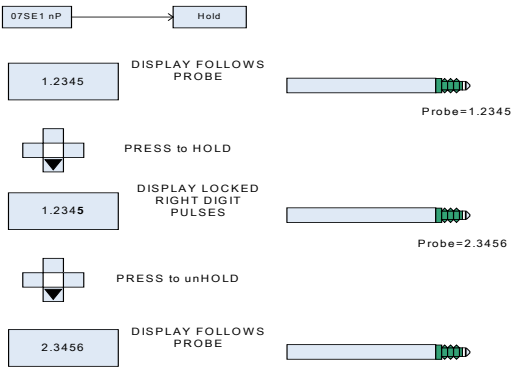
7:1 Zero Function

The Zero position is remembered by the SI1000 series even after a power cycle

To put the SI1000 readouts into absolute mode, find the probe true zero position (mid stroke for an LVDT) or fully out for a Digital Probe. Zero at this position.

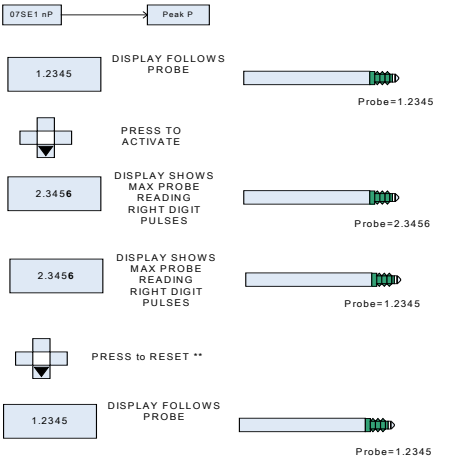
Use the Real Value Menu to find the probe true zero position this always displays the actual probe reading.

7:2 Hold Function



7.0 Functions

7:3 Peak Function



** THE SI1000 WILL REMAIN IN PEAK P MODE UNTIL THE TIME SET IN MENU 08 HAS COMPLETED. PEAK-N AND DIFF MODES OPERATE IN THE SAME WAY

7.0 Functions

7:4 Input Relays

ZERO RELAY

Close Zero Relay (PIN 8 and PIN 7) >100mS

ZERO DISPLAY

Release Relay

HOLD PEAK-P PEAK-N DIFF MODE RELAY

Select Mode Menu 7

Close Hold Relay (PIN 9 and PIN 7)

SI1000 will activate HOLD or PEAK-P or PEAK-N or DIFF (as selected Menu 7)
Right Display Digit will pulse

SI1000 will remain in MODE all time relay closed
Right Display Digit will pulse

Release Relay

SI1000 will remain on MODE until time set in Menu 8 elapsed
Right Display Digit will pulse for this time.

SI1100 LVDT SET UP

The SI1100 has two potentiometers.

GAIN and OFFSET

These can be used to adjust the LVDT null and GAIN as required. Use the SI1100 in Real Mode (Menu 17) to adjust the GAIN and OFFSET. The output range is +/-10V. Depending on where the offset is set.

8.0 Communication Protocol (RS232 and RS485)

Data Reading Input Format

Command (2 Bytes)	ID (2 Bytes)	End Code (2 Bytes)
>R	XX	0D 0A

Data Reading Output Format

Command (2 Bytes)	ID (2 Bytes)	Range Lamps (1 Byte)	Reading (8 Bytes)	End Code (2 Bytes)
<R	XX	< or = or>	XXXXXXXX	0D 0A

Example

SI1500 Display 0.504 OK (Middle lamp) To SI1500 “<R”,”01”,”=”,” chr$(13),chr$(10)” From SI1500 “>R”, “01”, “=” , “+000.504”,chr4(13),chr$(10)	

Alarm High/Low Value Reading Input Format

Command (2 Bytes)	ID (2 Bytes)	End Code (2 Bytes)
<S	XX	0D 0A

8.0 Communication Protocol (RS232 and RS485)

Alarm High/Low Value Reading Output Format

Command (2 Bytes)	ID (2 Bytes)	Alarm Hi/Low Data (17 Bytes)	End Code (2 Bytes)
>S	XX	XXXXXXXX,XXXXXXXX	0D 0A

Example

SI1500 Display High Alarm Value 0.500 Low Alarm value -0.005

To SI1500 “<S”,”01”,”=”,” chr$(13),chr$(10)”

From SI1500 “>S”, “01”, “=” , “+000.500,-000.500”,chr$(13),chr$(10)

Appendix A - Units Supplied with Power Supply