solartron

Digital Readout DR400

CE installation manual/
user guide

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installation manual

1.0: Safety Summary

This Equipment is designed as Safety Class I apparatus to comply with EN61010-1.

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.

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.

Power source

Apply no more than 265V rms (AC) between supply conductors or conductor and ground.

1.0: Safety Summary (continued)

WARNING: Do not operate in an explosive atmosphere

WARNING: 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 the equipment.

Warning: Danger arising from loss of ground

During a fault condition and upon loss of protective ground (earth) connection, all accessible conducting parts - including controls that might appear to be insulated - can render an electric shock.

CAUTION: Use correct Fuse

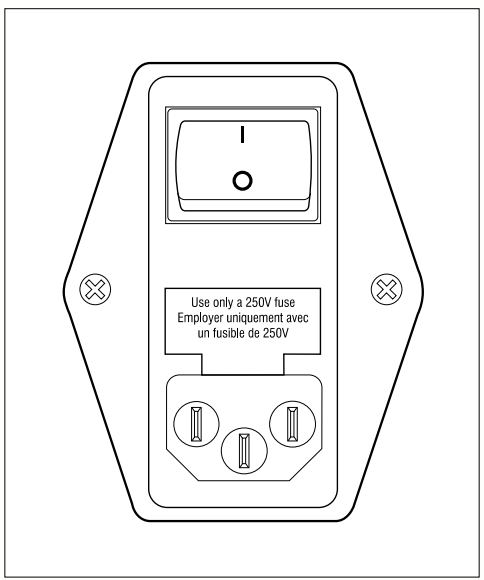
To avoid a fire hazard, use the correct fuse type, voltage and current rating as specified for the equipment. Refer fuse replacement to qualified service personnel.

Grounding the equipment

The unit is grounded through the mains lead: to avoid electric shock, plug the power lead into a properly-wired receptacle before connecting to the input or output terminals. A protective ground connection by the way of the grounding conductor in the power lead is essential for safe operation.

Replacing the fuse

At the rear right of the Digital Readout remove the fuse cover of the IEC320 connector and replace the fuse with the same 20mm type and value.



This equipment contains no user serviceable parts other than the fuse.

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

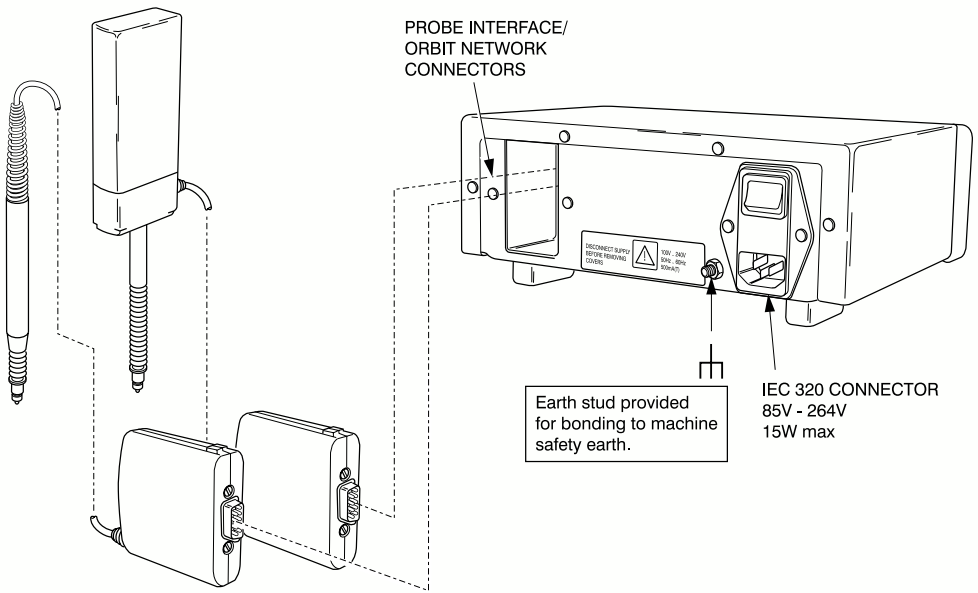
Dismantling the unit will invalidate the warranty.

3.0: Digital Readout Interface

Probe(s) must be identified to the Digital Readout when first installed. Simply press probe tip when prompted.

3.1 Connecting 1 or 2 Probes

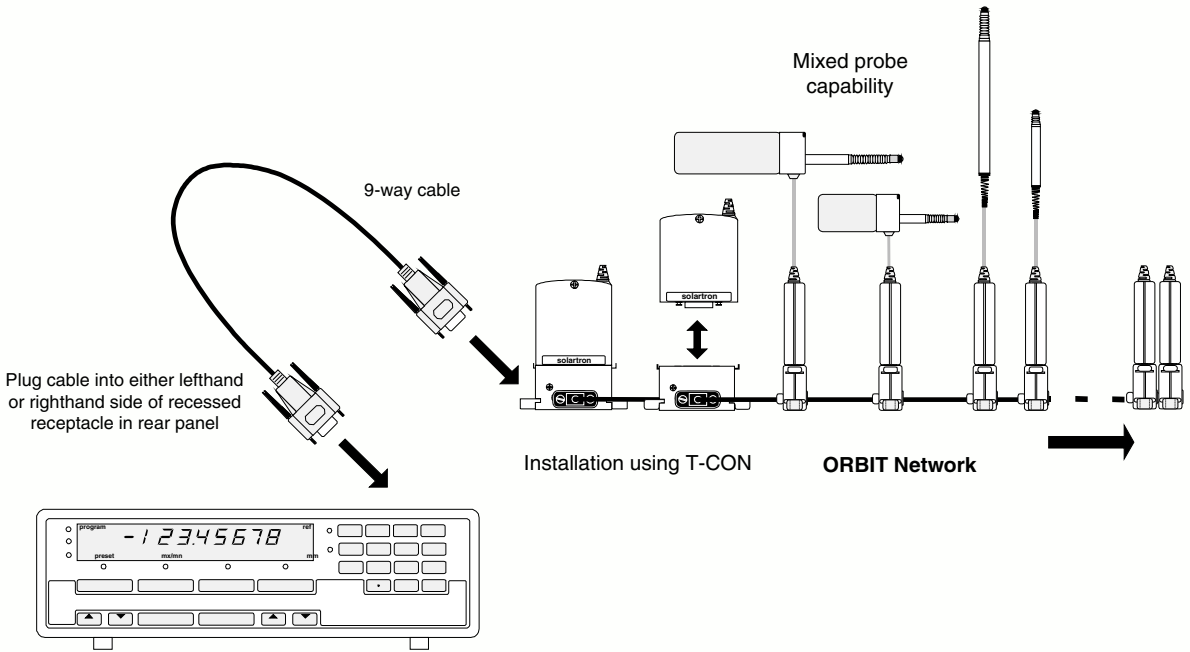
To connect a Linear Encoder or Digital Probe ensure cable from Probe Interface Electronics (PIE) is at bottom of unit and plug into either left hand or right hand side of recessed receptacle.



3.0: Digital Readout Interface (Continued)

3.2 Connecting up to 30 probes

(The DR400 can only be setup to one or two probes)



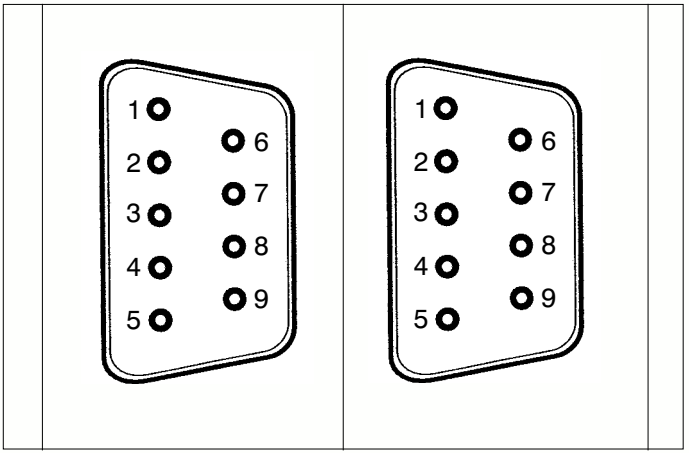
- Accessories

T-CON part number	971000
9 way cable (1.5m)	006869

4.0: Probe Interface/Orbit Network Connections

Connector type: 9 way D-sub female

Pin	Function
1	0V
2	RS485(A)
3	RS485(B)
4	0V
5	0V
6	+5V
7	+5V
8	+5V
9	0V



View from rear of unit

user guide

Using this manual

The Digital Readout functions are covered in two sections:

Operation mode

Setup mode

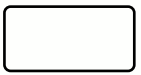
“Operation mode” shows you how to use the functions which are immediately available to you without the need to first set them up.

“Setup mode” shows you how to use the functions which are accessed in setup mode or which must first be configured using Setup mode.

The following symbols are adopted in this manual:

● indicates that the lamp is “on”

 indicates that a lamp is flashing

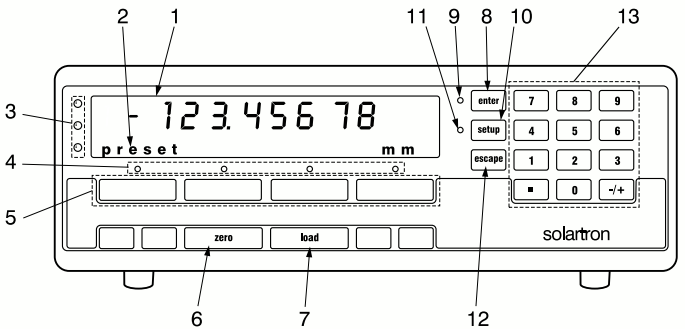
 represents a key which performs a specific action

e.g. enter

 represents a “soft key”

e.g 

Layout of controls



1. Numeric display - shows readings.
2. Information display - shows user information and soft key legends.
3. Range lamps - top: out of tolerance high. middle: within tolerance. bottom: out of tolerance low.
4. Soft key lamps - lit only when the function is available.
5. Soft keys - perform the function shown on the information display.
6. Zero key - zeros the numeric display.
7. Load key - to load a preset.
8. Enter key - completes number entry and moves to the next selection.
9. Enter lamp - flashes, prompting you to press the enter key.
10. Setup key - selects the setup menu.
11. Setup lamp - lamp is on when in setup mode.
12. Escape key - aborts number entry and takes you back to the previous selection.
13. Numeric keys - to enter numeric information.

Getting started: Factory settings

1. Connect the probe (Linear Encoder or Digital Probe)

2. Switch the power ON.

3. The Digital Readout will run through a start-up routine. If the readout has not been connected to the probe before, you will see the following display:

Move the probe tip and the display will change to the following:

Press the ‘zero’ key and the display will change to the following.

The system is now ready to start measuring.

Note: To establish the actual position within the stroke of a Digital Probe, press “escape” in place of “zero” in the above sequence.

General

There are two modes of use ‘Operation’ and ‘Setup’. The Digital Readout will always be in the ‘Operation’ mode following power-up.

In ‘Operation’ mode the setup lamp is OFF.
In ‘Setup’ mode the setup lamp is ON.

To enter Setup mode.
First make sure that you are at the main ‘operation’ menu
(if not press escape key until you are).

Then press ‘setup’.

To enter operation mode
(main operation menu)
Press ‘setup’.

General: continued

soft keys

Up to 4 menu items can be displayed at any one time. When the lamp above a key is lit it indicates that the function is available.

Pressing the soft key results in an action taking place.

enter key

Used to:

- save numbers keyed in.
- save settings after they have changed.
- move to the next step in a menu sequence.

Enter lamp flashes prompting you to press enter key.

escape key

Used to:

revert to previous number entered or previous step in a menu sequence without saving changes.

setup key

Switches between Operation & Setup mode.

Note: Escape from preset menu to main operation menu before pressing setup key.

In Setup mode.

setup key can be pressed at any stage to revert to Operation mode (ensure you press **enter** first to save current change).

General: continued

The DR400 can be used with a single probe (Linear encoder or Digital Probe) or a pair of probes, for A+B and A-B measurements.

NOTE: For dual probe use, both probes must be of the same type, (i.e. Digital Probe and Digital Probe or Linear Encoder and Linear Encoder).

Operation mode: Zero & mm/inch

Operation	Key stroke	Display
To zero the numeric display and establish an absolute datum. Press zero.	zero	
To Change between inches and mm proceed as follows.		
To select inch. Toggle to inch.	mm	
To select mm. Toggle to mm.	inch	
To load current preset. To set the preset refer to Operation mode: Preset	load	

Operation mode: Preset

Allows you to key in and load a preset.

To key in and load a preset proceed as follows:

Operation	Key stroke	Display
To select preset. Press preset.	preset	
To key in a preset. (eg. 12.3456).	use numeric keys	
To save preset. Press enter.	enter	
To load preset into numeric display press the load key.	load	

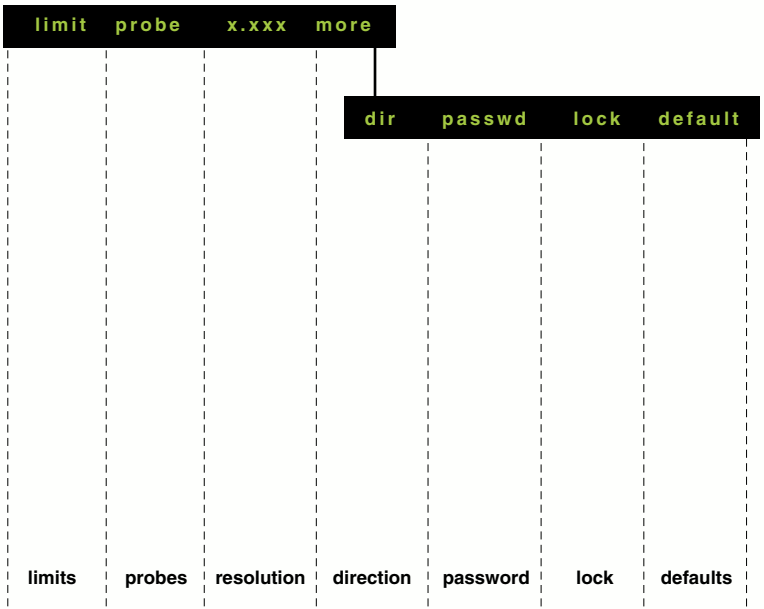
Notes

1. ‘del’ deletes the last character in the number entry.
2. Ensure you have the direction of count set correctly (see Setup dir menu).

Operation mode: Preset (continued)

Operation	Key stroke	Display
To return to main operation menu.	escape	

Setup mode: Menus



Setup mode: Limits

(Allows you to store limits to control the range lamps. Upper and lower limits may be entered directly, and range lamps can be enabled or inhibited.
To store upper and lower limits and control whether range lamps are enabled or inhibited.

Operation	Key stroke	Display
To select limits menu.	setup limit	hi limit = ▮.▮▮▮▮
To enter upper limit (e.g. 0.01).	use numeric keys	hi limit = 0.01 del
To store upper limit.	enter	lo limit = ▮.▮▮▮▮
To enter and store lower limit (e.g. -0.01).	use numeric keys enter	range lamps on? no

Setup mode: Limits (continued)

Operation	Key stroke	Display
To turn range lamps on, toggle to “yes” or To turn range lamps off toggle to “no”.	no / yes	range lamps on? yes / range lamps on? no
To complete press enter.	enter	limit probe x.xxx more
To return to operating mode.	setup	

Setup mode: Probes

Allows you to set up individual probes or pairs of probes (A + B or A - B).

To select individual probe, A+B or A-B.

Operation	Key stroke	Display
To select probe menu.	setup → probe	use: individual probe
To set up a single probe toggle through choices to ‘individual probe’.		use: individual probe
To set up 2 probes in an A + B configuration toggle to ‘A + B’.	individual probe	use: A+B
To set up 2 probes in an A - B configuration toggle to ‘A - B’.	A+B	use: A-B

Setup mode: Probes (continued)

To install a new probe.

Operation	Key stroke	Display
Select ‘individual probe’ as previous page.		use : individual probe
To identify current probe.	enter	YH.5230 ID= ▮▮▮▮▮▮▮▮▮▮ new
To specify a new probe, select “new”.	new move probe tip	move probe tip *
To complete.	setup	

Note: Procedure for A+B and A-B configurations is similar to the above.

Setup mode: Resolution

To change the displayed resolution for a probe.

Operation	Key stroke	Display
To select resolution menu.	setup X.XXX	1.2345 no of digits: less more
To decrease number of full decades displayed.	less	1.234 no of digits: less more
To increase decades displayed.	more	1.234 no of digits: less more
To complete and return to Operation mode.	enter • setup	

Note: 1. When full resolution of probe has been reached more choice will disappear.
2. When showing maximum number of digits, step size is determined by probe type.

Setup mode: Direction

To change the direction of count.

Operation	Key stroke	Display
To select direction menu.	setup • more • dir •	direction: retract = + •
For increasing count as probe extends toggle to ‘extend=+’.	retract = + •	direction: extend = + •
For increasing count as probe retracts toggle to ‘retract=+’.	extend = + •	direction: retract = + •
To complete and return to Operation mode.	enter • setup	

Setup mode: Password

To change the password.

Operation	Key stroke	Display
To enter existing password press setup and key in password (factory default is 0000).	setup, use numeric keys, enter	
Select password menu	more, pass_wd	change password? no
Toggle to 'yes'.	no	change password? yes
Press enter.	enter	new password: del
Key in new password (e.g. 9999).	use numeric keys	new password:9999 del
To complete.	enter, setup	

Setup mode: Lock

Lock is set on or off. When enabled mm/inch, numeric pad and setup key in operate are locked. When unlocked password is still required for password, lock and default options.

Operation	Key stroke	Display
To enter password press setup and key in password (factory default is 0000).	setup use numeric keys	password: 0000 del
press 'enter'.	enter	
Setting Lock To select lock menu Select 'on' for lock to become live when setup key is pressed to go back to Operation mode.	more lock	lock: off
	off	lock: on

Setup mode: Lock (continued)

Operation	Key stroke	Display
Press ‘enter’.	enter	dir passwd lock deafult
To complete and return to Operation menu.	setup	
Clearing Lock To clear lock.	setup	enter passwd= del
Using numeric key pad enter password.	enter	enter passwd= ▮▮▮▮ del
Lock is now cleared. To return to Operation mode press setup.	setup	

Setup menu: Default

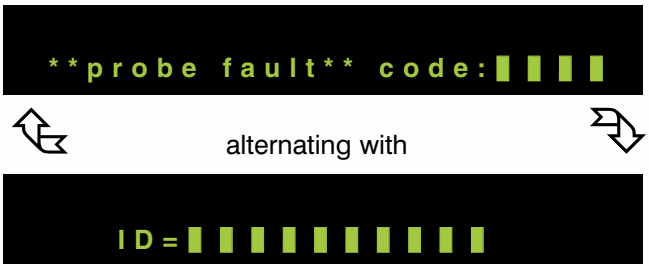
To recall factory defaults.

Operation	Key stroke	Display
To enter password press setup and key in password (factory default is 0000).	setup use numeric keys enter	
To select default.	more default	clear all settings ? no
Select recall.		
Proceed as instructed.		

Errors: Error Messages

Display	Error	Action
	Digital Probe over range.	Reposition probe within measuring range.
	Digital Probe under range.	Reposition probe within measuring range.
	Displayed number outside allowable range (±999.999 99mm or 39.370078 inch).	Use smaller preset value.
	Probe not connected Probe has been changed	Switch off unit. Connect probe. Select ‘new’, then proceed. as instructed.

Errors: Error Messages (continued)

Display	Error	Action
	Overspeed error (Tip of Linear Encoder has been moved too fast).	enter Then proceed as instructed .
	Probe fault.	Record error code. Consult your Solartron Dealer.

Specification

ENVIRONMENTAL

Operating Temperature (°C)	0 to 40 deg. C
Storage Temperature (°C)	-20 to 60 deg. C
Humidity	0 to 95% non condensing
Safety Rating	EN61010-1

IP Rating

Front panel module	IP65
Complete unit	IP40

EMC

Emission	EN50081-1
Immunity	EN50082-2

Power supply	via IEC 320 Connector
Line voltage	85V to 264V
Line frequency	47Hz to 440Hz
Power	15W max
Line fuse	2A T
Fuse size	20mm

Nominal Dimensions

Width	235mm	
Height	80mm	(96mm incl. feet)
Depth	190mm	
Weight	2.2kg	

Specification

Readout Specification	
Numeric Display	9 digit LED display with polarity and decimal point.
Display Length	±999.999 99mm or ±39.370078 inches with automatic suppression of redundant leading zero's.
Digital Resolution with Digital Probe:	
	DP1 0.05µm or 2 millionths inch, DP2 0.1µm or 5 millionths inch.
	DP5 0.5µm or 20 millionths inch, DP10 0.5µm or 20 millionths inch.
Display Resolution with Linear Encoders:	
	0.05µm or 2 millionths inch.
Information Display	24 character alpha numeric display.
Range Lamps	Indicate Hi/OK/Lo for limit detection.
Functions commanded through front panel	
Zero	Single key operation to zero reading on display.
Load	Single key operation to load the stored preset value.
Units	Choice of mm or inches.
Preset	Change and view the stored preset value.
Limits/Tolerance	High and Lo limit values, indication by range lamps.
Mathematics	Two probes may be used in an A+B or A-B configuration.
Resolution	Choice of 0.01µm, 0.1µm, 1µm, 10µm, 100µm
	or 1, 10, 100, 1000, 10,000 millionths of an inch.
	Note: Automatic inhibit of excessive resolution for probe in use
Count Direction	Increasing count can be assigned to retraction or extension of probe tip.
Lock	Password protection of all features.

Return of Goods

Devices returned for repair should be shipped prepaid to your Solartron dealer. The shipping container should be marked: “Return for Repair” Model..... Type.....

The following information should accompany the device:

1. A purchase order, unless the device is being returned under warranty.
2. Application, type of environment and length of time in service of the device.
3. Description of the faulty operation of the device and the circumstances of the failure.
4. Name and telephone number of the person to contact if there are questions about the returned device.
5. Statement as to whether warranty or non-warranty service is required.
6. Complete shipping instructions for the return of the device.
7. Original purchase order number and date of purchase.

Adherence to these procedures will expedite handling of the returned device and will prevent unnecessary additional charges for inspection and testing to determine the condition of the device.

Solartron reserve the right to repair or replace goods returned under warranty.

SOLARTRON METROLOGY OFFICES

OFFICES WORLDWIDE - Addresses for Repairs

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