Solartron Metrology

SI7500

ORBIT®-Digital Display

Quick-start guide

AMETEK®

ULTRA PRECISION TECHNOLOGIES

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1.0 About this manual

This document is not a complete user or installation guide, it is intended as an aid for new users to familiarise themselves with the SI7500 digital readout and it's functionality.

For more detailed information on the SI7500 and it's functionality, please refer to the **SI7500 User Manual** (document number 502823), available from Solartron Metrology.

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.

Safety considerations

The SI7500 is completely enclosed and provides no potentially hazardous outputs. Safety considerations are related to power connections and physical mounting.

WARNING

If the SI7500 falls from its mounting location, serious personal injury or damage to the equipment can result.

Power cord and plug

Do not locate the power cord where it can be walked on or will create a tripping hazard. Connect the 3-wire power plug to only a 3-wire grounded outlet. Never connect 2-wire to 3-wire adapters to the power cord or remove the third ground wire to fit the plug into a 2-wire electrical outlet. Modifying or overriding the third-wire ground creates a safety hazard and should not be permitted.

2.0 Safety Information (cont.)

WARNING

Always disconnect the power cord from the source of AC power before unplugging it from the SI7500 power connector. The AC voltage available at electrical outlets is extremely dangerous and can cause serious injury or death.

Electrical wiring and connections

Perform regular inspections of all connections to the SI7500. Keep connections clean and tight. Locate cables away from moving objects. Do not create tripping hazards with power cords, input cables and other electrical wiring. Use shielded cables to connect to the parallel, serial RS-232 and RS-485 ports. Make certain that cables are properly terminated and firmly connected on both ends.

Location and mounting

Mount the SI7500 on a stable surface.

Power surge suppressor

Connect the SI7500 to power through a high-quality power surge suppressor. Surge suppressors limit the amplitude of potentially damaging power line transients caused by electrical machinery or lightning.

CAUTION

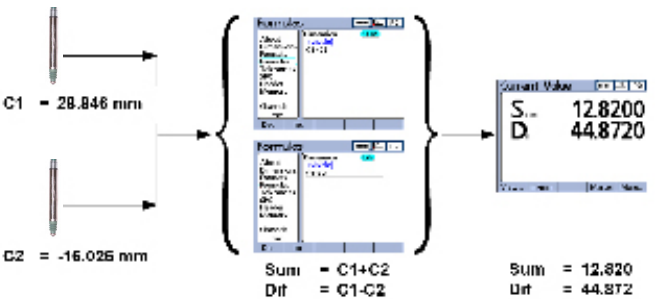
Industrial quality surge suppressors are recommended. Surge suppressors found in inexpensive power strips are insufficient to protect the SI7500 from damage.

3.0 Introduction to the SI7500

3.1 Functionality Of The SI7500

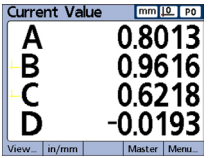
The SI7500 is a 16 channel advanced digital readout system for performing single or multipoint gauge measurements at very high levels of precision and accuracy. Dimensional inspection of components can be made using a range of Orbit transducers, encoders and other sensors as part of in-line production activities or final quality inspection. Measurements can be conducted completely under operator control, or can be semi-automated and conducted in conjunction with a multipoint fixtured gauge system.

Up to 16 Orbit modules can be assigned to as many SI7500 channel inputs. Channel inputs can be algebraically combined or processed by powerful user programmed mathematics and control formulas to display dimensions such as flatness, volume and runout.

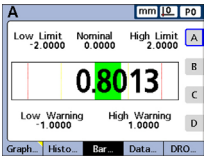


3.0 Introduction to the SI7500 (cont.)

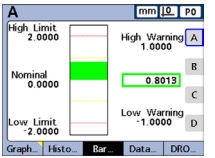
The SI7500's user interface screens include a digital readout of current values, bar and dial position value indicators, graphs of values, histograms of measurement statistics and tables of measurement and SPC data.



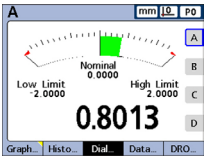
Digital readout (DRO)



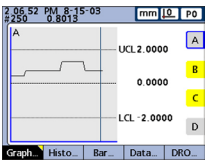
Horizontal bar



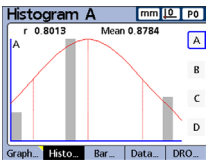
Vertical bar



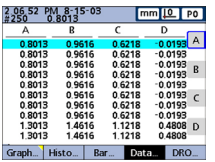
Dial



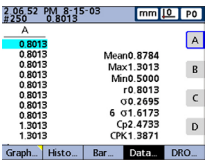
Graph of values



Histogram of values



Measurement data



SPC data

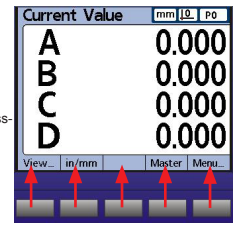
3.0 Introduction to the SI7500 (cont.)

3.2 Navigating The Menu

The SI7500's menus are navigated by use of the keys displayed below:

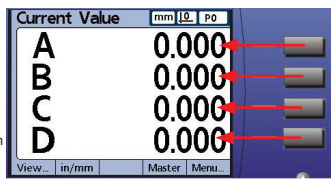
Softkeys are used to select options displayed at the bottom of the LCD screen.

Particular options are selected by pressing the softkey immediately below the displayed option.

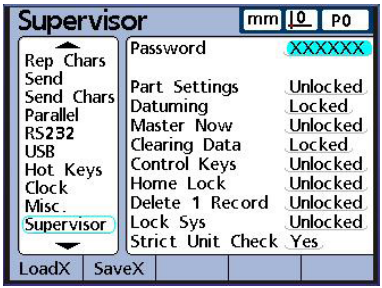


Dimension keys are used to select and view options displayed on the right of the screen.

Pressing the dimension key horizontally aligned to a given option will select it.



3.0 Introduction to the SI7500 (cont.)



Actions such as navigating the Setup menu, configuring options and entering data are performed using a combination of the dimension & soft keys as well as the cursor, keypad and command keys (on this page).

In the setup menu, the cursor keys move the cursor around the screen and allow the user to cycle through the available options.

The keypad is used for the entry of numerical data.

The command keys are used to confirm option selections, enter data and exit menu's.

Confirms selections & enters data

Cancels selections & deletes data

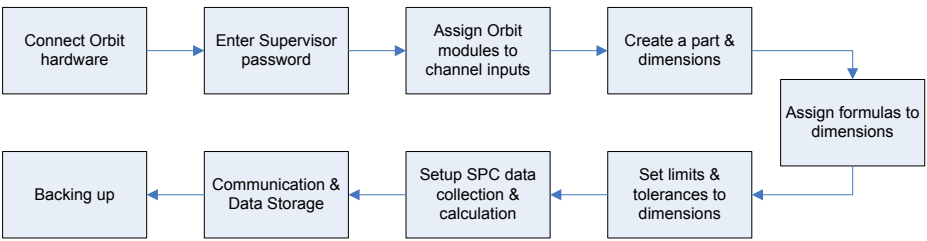
Saves and exits currently displayed menu or screen. Any changes to settings are applied on exit.

Exits currently displayed menu or screen without saving. Settings revert to previous values, changes are not applied.

4.0 Getting started

4.1 Setup Procedure

The flow chart below details the steps required to setup & begin using the SI7500. The next few sections in this guide will address each step in turn.

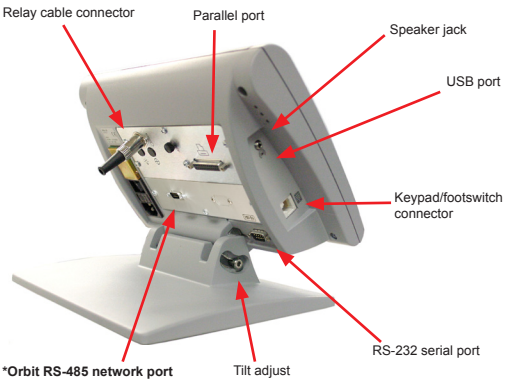


4.0 Getting started (cont.)

4.2 Connecting Orbit Hardware

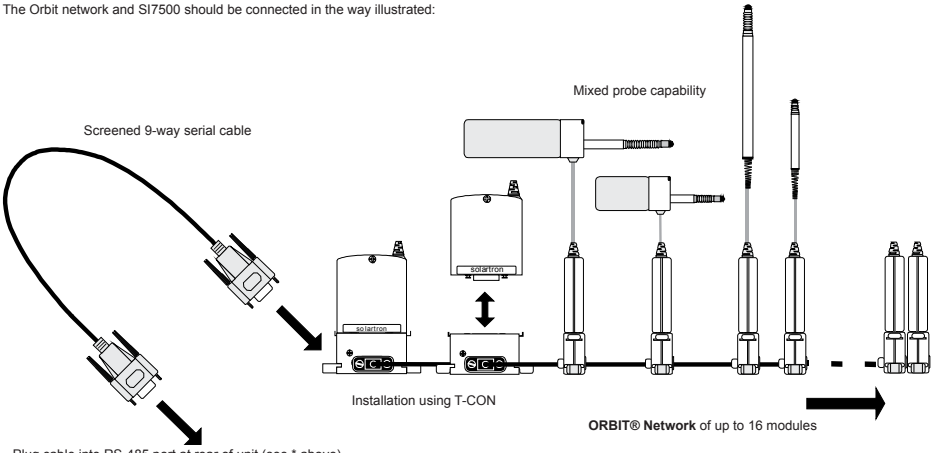
The SI7500 can be connected to a network of up to 16 Orbit modules via the Orbit RS-485 port on the rear of the instrument. There is no requirement for an extra power supply or Orbit Interface module.

The Orbit network must be connected to the SI7500 with the 9-way cable supplied to ensure proper function of the measuring system. If a longer cable than that enclosed in the box is required, contact Solartron Metrology for a suitable upgrade.



4.0 Getting started (cont.)

The Orbit network and SI7500 should be connected in the way illustrated:



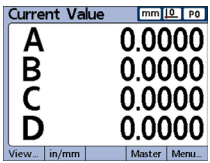
5.0 Setting up the SI7500

5.1 Accessing The Setup Menu

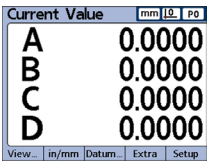
The SI7500's settings are modified in a setup menu. This is accessible from the default display screen (for factory settings, this is the DRO screen).

After connecting the SI7500 to Orbit modules, as above, apply power to the unit.

Once the DRO screen is displayed, navigate to the setup menu by pressing the relevant softkeys for Menu>Setup.



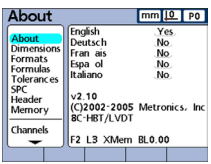
press the Menu softkey



press the Setup softkey

The About screen of the setup menu is now displayed which contains details of the SI7500 unit including firmware version and serial number.

To navigate the menu, use the cursor keys, as described in section 3.

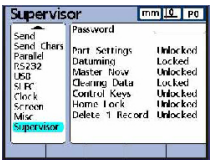


5.0 Setting up the SI7500 (cont.)

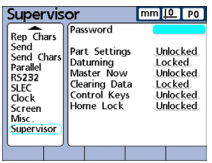
5.2 Entering The Supervisor Password

The SI7500's default settings include password protection of setup options. The supervisor password must be entered in order to modify setup menu options.

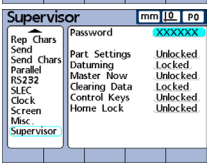
From the About screen of the setup menu, navigate to the Supervisor screen using the cursor keys.



Press the right-arrow cursor to select the password field.



Using the Numeric keypad, enter the supervisor password. The factory default password is: 070583.

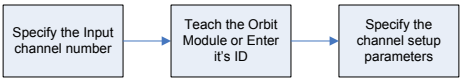


Press Enter and then Finish once the password has been entered to get back to the setup menu.

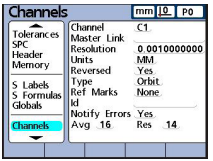
5.0 Setting up the SI7500 (cont.)

5.3 Assigning Orbit Modules To Channel Inputs

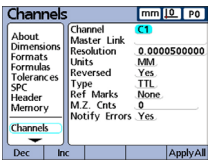
The flow chart below outlines the procedure to follow in setting up & assigning Orbit modules to SI7500 channel inputs:



Firstly, scroll to the Channel screen from the setup menu.



Select the channel number of choice using the decrement & increment softkeys.



Move the cursor to the "Id" field. Select either a) Teach or b) Entry with the relevant softkey to register the Orbit module in question. Either of these 2 options will associate a particular Orbit module with one of the SI7500's input channels.

5.0 Setting up the SI7500 (cont.)

a) Selecting "Teach" will cause an on-screen message to appear, prompting you to press the OK softkey and then actuate the relevant module (for a Digital Probe or Linear Encoder, move the probe tip).

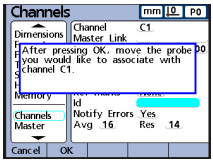
If the module input has been successfully read, another on screen message will appear notifying you of the successful “teaching” of the Orbit module.

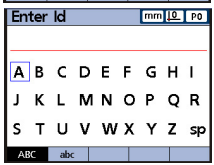
b) Selecting "Entry" will bring up the Enter Id screen whereby you can input the Orbit module’s Id (as displayed above the bar-code on the PIE case, connected to the T-CON).

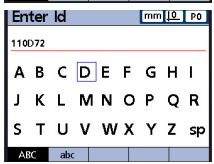
To enter the Id code, select the desired characters with the cursor keys and use the Enter and Cancel keys to respectively enter or delete a character. Numerals are written to the address directly from the Numeric keypad. The Id will be displayed at the top of the screen (underlined in red) as it is written.

Once the complete module Id is displayed at the top of the screen, press the Finish softkey to store the Id and return to the channel screen. If the module Id has been successfully read, an on-screen message will appear notifying you of the successful reading of the Orbit module’s information.

Repeat this process until the Id’s of all Orbit modules on the network are assigned to a particular SI7500 input channels.







5.0 Setting up the SI7500 (cont.)

5.4 Parts, Dimensions, Formulas & Channels

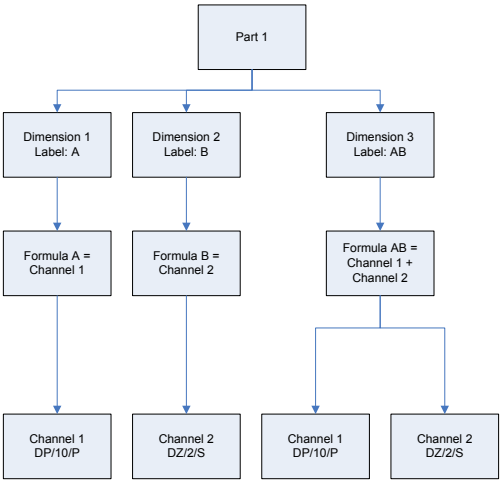
The SI7500 allows for the storage of numerous gauging programs and their use with common Orbit hardware. This enables one SI7500 and Orbit modules to be used to measure a range or family of similar components with the same fixture or even separate, un-related fixtures (Orbit module numbers permitting).

In the SI7500's terminology these programs are called "Parts" and contain all the details required to gauge a component including probe setup, tolerances, data handling details etc.

Each Part can contain up to 16 "Dimensions", these are the features the fixture measures and are what will be displayed by SI7500 as measurement data.

Dimensions are in turn composed of programmable "Formulas" ranging from direct channel inputs to complex mathematical formulae.

The diagram on the right demonstrates a simple Part, Dimension and Formula structure. It also shows how channel inputs are referenced and manipulated within formulae to generate the Dimension data.



5.0 Setting up the SI7500 (cont.)

5.6 Creating A Part And Dimensions

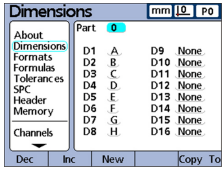
The SI7500's factory settings' default Part is 0. To add or change to a different Part, enter the Dimensions screen of the Setup menu and highlight Part. With the Part field highlighted, the softkeys can be used to cycle between existing parts or to create new Parts.

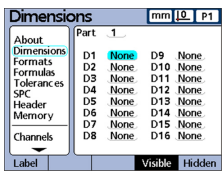
NOTE: Dimensions are visible by default, displayed on the DRO and stored in the database. Dimensions can also be defined as hidden, for use as variables in formulas and not displayed. Hidden dimensions are not printed on reports or sent to computers as data files. Visible and hidden dimensions use the same naming convention. Pressing the Visible or Hidden softkey will display either register of dimensions.

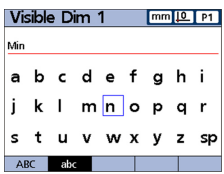
A maximum of 16 visible and hidden Dimensions can be created for each Part. To create a Dimension, a 3 character alpha-numeric label must be entered.

To enter a Dimension label, select a Dimension and press the Label softkey. An Alpha entry screen will be displayed where the 3 character alpha-numeric label can be entered, using the cursor keys to select alphabetic characters and the keypad to enter numbers.

It is advisable to create Dimension labels that reflect the measurement they correspond to.





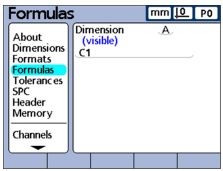


5.0 Setting up the SI7500 (cont.)

5.7 Creating Formulas

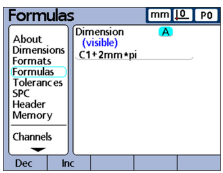
Formulas define SI7500 Dimension outputs using channel inputs from Orbit modules or probes. They can also be used to activate outputs, perform conditional tests, control a sequence of events, semi-automate the measurement process and many other functions.

This section of the guide will demonstrate how to setup a Formula, for more detailed information and a list of Formulas available on the SI7500, please refer to the SI7500 User Manual (document number 502823).



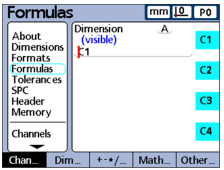
After creating the necessary Dimensions, navigate to the Formulas screen in the Setup menu.

Press the Right Cursor key to enter the Formula Setup screen and highlight the first dimension. The dimension can be decremented or incremented by pressing the Dec or Inc Softkey.



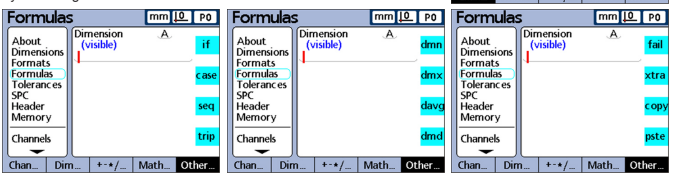
5.0 Setting up the SI7500 (cont.)

Press the down cursor arrow key to access the formula line. A red cursor will appear at the extreme left of the formula line. This cursor indicates the insertion point for any new formula function. Move the cursor to the desired insertion point by pressing Cursor keys.



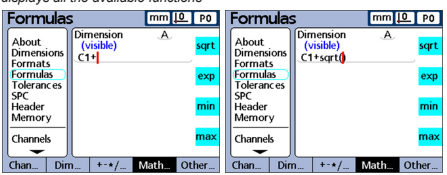
The softkeys control the display of channel and other functions required to construct formulas. Once displayed, formula functions are selected using the dimension keys at the right of the screen.

Repeatedly pressing any bottom softkey displays multiple sets of related functions for that softkey. For example, repeatedly pressing the "Other" softkey displays three sets of related functions near dimension keys at the right of the screen.



Pressing the Other softkey repeatedly displays all the available functions

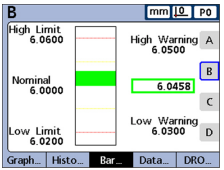
Pressing a dimension key at the right of a Formula screen inserts the Formula function associated with the key into a Formula at the insertion point indicated by the vertical red cursor bar.



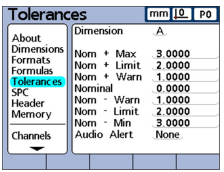
5.0 Setting up the SI7500 (cont.)

5.8 Limts & Tolerances

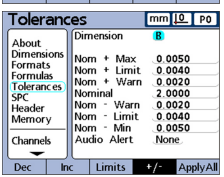
The tolerances screen enables the specification of nominal values, upper/lower warnings, upper/lower limits and minimum/maximum bar graph levels for each dimension. Tolerance ranges are indicated numerically and by bands of color on the Current Value bar and dial screens. The default bar and dial displays show Pass values in green, Warning values in yellow, and Fail values in red.



Cycle through the Setup menu to the Tolerances screen.



Press the right arrow cursor to highlight the Dimension field. Use the increment/decrement softkeys to select the desired Dimension.

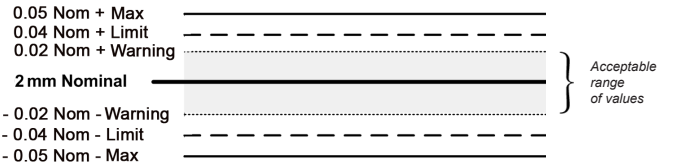


Nominal values with tolerances can be specified as a nominal value between +/- tolerances, or as a nominal value with ++/-- tolerances distributed entirely on the plus side or entirely on the minus side of the nominal value.

5.0 Setting up the SI7500 (cont.)

5.8.1 Nominal With +/- Tolerances

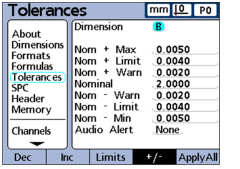
A nominal value is displayed between plus and minus tolerances.



Press the +/-softkey to specify a nominal value with +/- tolerances, and then highlight the desired fields, and then use the numeric keypad to enter values.

This example screen (to the right) contains the nominal value and tolerances listed below:

- Nominal = 2.0000 mm
- Warning tolerance = ± 0.0020 mm
- Limit tolerance = ± 0.0040 mm
- Max tolerance = ± 0.0050 mm

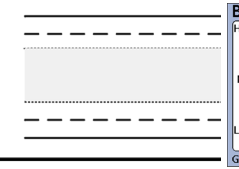


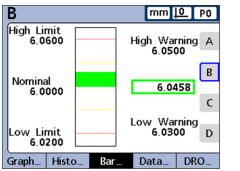
NOTE: Values specified using the +/- Tolerances screen will also be converted to fixed limits if the Limits softkey is pressed.

5.0 Setting up the SI7500 (cont.)

5.8.2 Nominal With ++ Tolerances

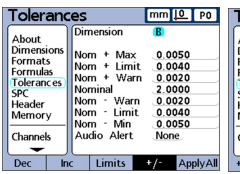
A nominal value is displayed with tolerances entirely on the plus side of nominal.



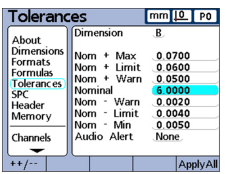


To specify a range of tolerances above the nominal value (+ Tolerance):

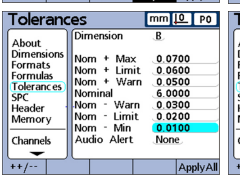
1. Press the +/- softkey



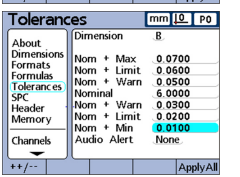
2. Enter the high end of the positive tolerance range into the + Max, + Limit and + Warn fields, and then enter the nominal value.



3. Enter the low end of the positive tolerance range into the -Warn, and press the ++/-- softkey to change the fields to + Warn.



Repeat this procedure for the - Limit and - Min fields. This establishes the lower end of the positive range of tolerances.



5.0 Setting up the SI7500 (cont.)

5.8.3 Nominal With -- Tolerances

A nominal value is displayed with tolerances entirely on the minus side of nominal.

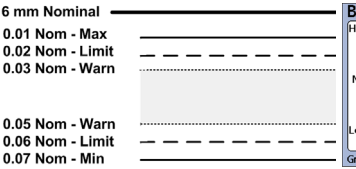
To specify a range of tolerances below the nominal value (- Tolerance):

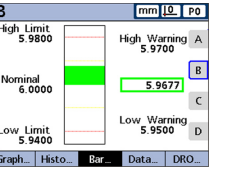
1. Press the +/- softkey.

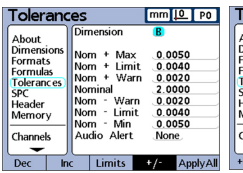
2. Enter the low end of the negative tolerance range into the - Max, - Limit and -Warn fields, and then enter the Nominal value.

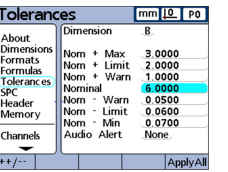
3. Enter the high end of the negative tolerance range into the + Warn, and press the ++ /-- soft-key to change the field to - Warn.

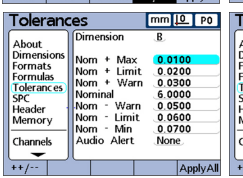
Repeat this procedure for the + Limit and + Max fields. This establishes the upper end of the negative range of acceptable tolerances.

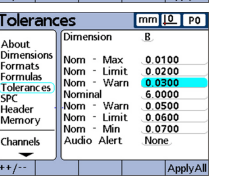








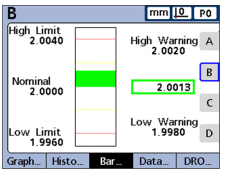




5.0 Setting up the SI7500 (cont.)

5.8.4 Nominal With Fixed Limits

A nominal value is displayed between plus and minus fixed limits.

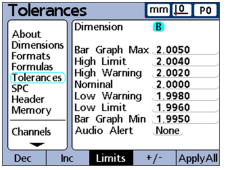


To specify fixed limits above and below a nominal value:

1. Press the Limits softkey to specify a nominal value with fixed limits.
2. Highlight the desired fields, and then use the numeric keypad to enter values.

The example below of 2 mm ± 0.005 mm is used to show a nominal value with fixed limits.

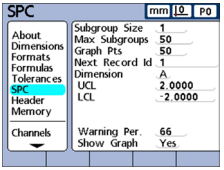
- Nominal = 2.0000 mm
- High warning = 2.0020
- Low warning = 1.9980
- High limit = 2.0040
- Low limit = 1.9960
- Bar graph max = 2.0050
- Bar graph min = 1.9950



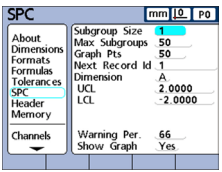
5.0 Setting up the SI7500 (cont.)

5.9 SPC Configuration

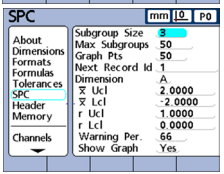
The SPC screen contains fields for specifying statistical process control parameters including the Subgroup (sample) Size and Max (number of) subgroups stored, upper and lower mean control limits, and upper and lower range control limits. Record ID numbers can also be viewed or changed.



Use the numeric keypad to specify the desired number of samples to be included in each subgroup. Each subgroup can contain from 1 to 10 samples. SPC parameters in the lower half of the screen and graphs of data displayed on the screen are different for subgroup sizes of 1 and subgroup sizes greater than 1.

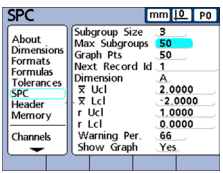


Subgroup size = 1



Subgroup size > 1

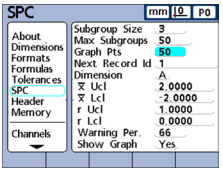
Use the numeric keypad to enter the maximum number of subgroups to be stored for the specified dimension. Each dimension can store samples in from 2 to 1000 subgroups.



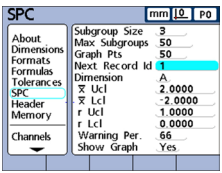
5.0 Setting up the SI7500 (cont.)

Use the numeric keypad to enter the maximum number of points that will be plotted on graphs of subgroups for the specified part.

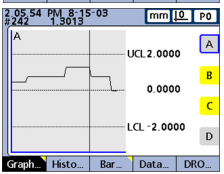
NOTE: When there are fewer graph points specified than subgroups, the re-sulting dimension graphs might need to be scrolled to view all the subgroup data.



Record ID numbers are displayed on graphs and can be included in printed reports and transmitted data.

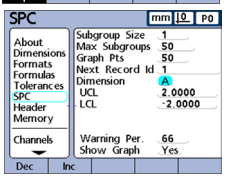


Normally, the Next Record ID field starts at 1 and is automatically incremented by the system each time a new record is stored. However, the Next Record ID field can be set to any value by the user to restart a new database at a specified record number, or for a variety of other reasons. Use the numeric keypad to specify the Next Record ID.



NOTE: Entering a Next Record ID of 999,999,999 will prevent any data from being recorded in the database.

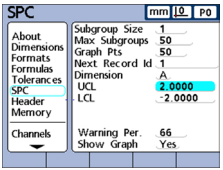
Use the Dec or Inc softkey to select a dimension to specify as a control limit.



5.0 Setting up the SI7500 (cont.)

5.9.1 UCL & LCL Or Xbar & r UCL & LCL

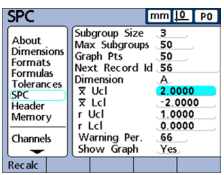
The UCL and LCL fields are displayed when the subgroup size is 1 and the Xbar and r Ucl and Lcl fields are displayed when the subgroup size is greater than 1.

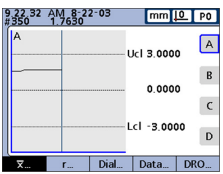


By default, the UCL and LCL fields display the upper and lower (acceptance) limits specified earlier on the Tolerance setup screen. The limits are used by the SI7500 graphing software to scale the value axis of SPC graphs.

CAUTION: The UCL and LCL values shown on the SPC setup screen should not be altered after initial setup. Change them only if you are certain that your application requires different values.

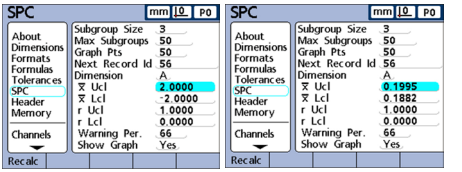
The Xbar Ucl and Xbar Lcl are the likely limits of the values of Xbar in future subgroups. These limits are either entered manually or calculated (Recalc softkey) on the basis of existing subgroup data. The Xbar Ucl and Xbar Lcl values are displayed as horizontal lines on the Xbar chart and used to generate SPC limit alarms.





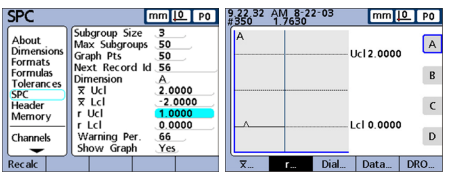
5.0 Setting up the SI7500 (cont.)

The Xbar chart above shows upper and lower control limits that were entered into the Tolerance setup screen as upper and lower acceptance limits prior to the collection of subgroup measurement data. Once subgroup data has been collected, the upper and lower control limits can be simultaneously recalculated by highlighting either of the Xbar control limit fields and pressing the Recalc softkey.



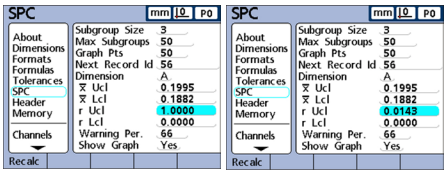
Alternatively, the x upper and lower control limits can be entered directly into the Xbar Ucl and Xbar Lcl fields using the numeric keypad.

The r Ucl and r Lcl are the likely limits of the values of the r of future sub-groups calculated on the basis of existing subgroup data. These limits are either entered manually or calculated (Recalc softkey) on the basis of existing subgroup data. The r Ucl and r Lcl values are displayed as horizontal lines on the chart and used to generate SPC limit alarms.



5.0 Setting up the SI7500 (cont.)

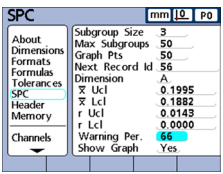
The chart shown earlier indicates upper and lower control limits that were included as upper and lower acceptance limits prior to the collection of subgroup measurement data. Once subgroup data has been collected, the upper and lower control limits can be simultaneously recalculated by highlighting either of the r control limit fields and pressing the Recalc softkey.



Alternatively, the r upper and lower control limits can be entered directly into the Ucl and Lcl fields using the numeric keypad.

The Warning Per field is used to specify the upper and lower warning limits on the Xbar and r SPC charts as a percentage of upper and lower control limits. For example when the **Warning Per = 66**

and:	then:
Xbar Ucl = 2.0000	Xbar upper warning = 1.3200
Xbar Lcl = -2.0000	Xbar lower warning = -1.3200
r Ucl = 1.0000	r upper warning = 0.6600
r Lcl = 0.0000	r lower warning = 0.0000



Warnings and over-limits are indicated on Xbar and r SPC charts by color changes to yellow for warnings, and red for over-limits.

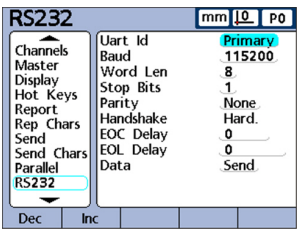
5.0 Setting up the SI7500 (cont.)

5.10 Communications & Data Storage

The SI7500 can communicate measuring results by means of printing, storing or transmitting data through its onboard USB, RS-232 and Parallel ports. This section details the setup options for the RS-232 and USB ports. For a full list of the available options and their implementation, please refer to the SI7500 User Manual (document number 502823).

5.10.1 RS-232 Setup

The RS-232 screen contains the following fields for specifying the RS-232 serial port settings for communication with a computer or RS-232 channel input device. Where possible, the settings should be identical to those on the receiving device.



UART ID: For communication to any RS-232 device, this option should be set to "Primary".

Baud rate: The Baud field is used to specify the baud rate of serial data. Use the Dec or Inc softkey to decrease or increase the baud rate from 1200 to 115,200.

Word length: The Word Len field is used to specify the number of bits contained in each data word. Use the 7 or 8 softkey to specify the word length.

Stop bits: The Stop Bits field is used to specify the number of stop bits included after each data word. Use the 1 or 2 softkey to specify the number of stop bits.

5.0 Setting up the SI7500 (cont.)

Parity: The Parity field is used to specify odd or even parity for error checking, or to omit parity error checking. Use the None, Odd or Even softkeys to specify parity error checking parameters.

Handshaking: The Handshake field shows the type of synchronous signaling used by the system to prevent data collisions on the serial port. This is set to hardware and cannot be changed.

End of character (EOC) delay: The EOC delay field is used to specify the delay inserted after each character is transmitted. This delay can be increased or decreased to accommodate various serial devices. Use the numeric keypad to specify delays (in milliseconds) from 0 to 10 seconds between characters.

Specifying end of line (EOL) delay: The EOL delay field is used to specify the delay inserted after each line is transmitted. This delay can be increased or decreased to accommodate various serial devices. Use the numeric keypad to specify delays (in milliseconds) from 0 to 10 seconds between lines.

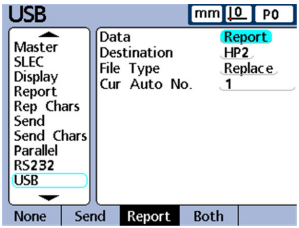
Serial port data type: Data can be sent to the serial port as a report formatted in the Report Setup screen, or as record data formatted in the Send Setup screen, or as both.

The serial port can also be disabled for data transmission by selecting the None softkey.

5.0 Setting up the SI7500 (cont.)

5.10.2 USB Setup

The USB screen contains fields for specifying the USB port settings for communication with a printer or USB flash memory device.



Data: Data can be sent to the USB port as a report formatted in the Report Setup screen, or as record data formatted in the Send Setup screen, or as both. The USB port can also be disabled for data transmission by pressing the None softkey.

Destination: Data can be sent through the USB port to be printed on a printer (HP and Epson compatible printers are supported) or to be stored as a file on a USB flash drive. Files stored on flash drives are named DataN.txt by the SI7500 system, where N denotes the number of the data file.

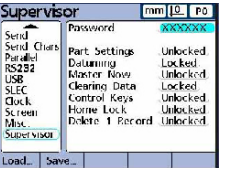
File type: The USB port data file type can be specified to replace existing files (of the same name) on the USB flash drive, append to the existing file or create new files that are auto-numbered sequentially in ascending order (Data1.txt, Data2.txt.....DataN.txt).

Current auto (file) number: When the USB data file type is specified as AutoNo, the file number of the next file saved to the USB drive can be manually specified by entering the desired number into the Cur Auto No data field. For example, entering a 2 into the Cur Auto No field will cause the next data file saved on the USB drive to be named Data2.txt. Any file that already exists on the USB flash drive with the same name will be overwritten.

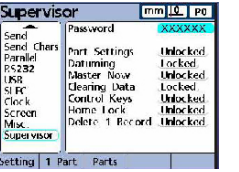
5.0 Setting up the SI7500 (cont.)

5.11 Backing Up

The SI7500 features the capacity to Save & Load configurations (Settings and Parts) using a USB flash memory stick. It is recommended that after satisfactory configuration of the SI7500, a backup copy of the settings be taken. This can be done by saving the SI7500 settings as a file onto a USB flash memory stick. The settings can later be copied onto the same or another SI7500 to refresh a configuration or to speed the installation procedure in applications using several units.



1. With a USB flash memory stick connected to the SI7500, and having already entered the Supervisor password...



2. Re-enter the Supervisor screen in the Setup menu.

3. Select the Supervisor password field and press the softkey below the “Load..” or “Save..” option.

4. Select the desired data type to save or load by pressing the softkey below the displayed options.

5. Follow the on-screen prompts to finalise the data transfer.

6.0 Operation

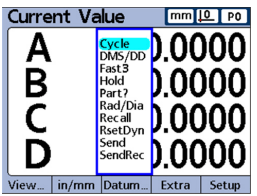
6.1 Basic Operation

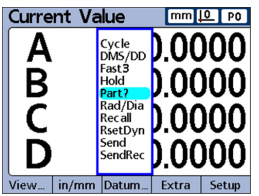
The SI7500 is ideally used for static gauging, where parts are measured at rest. The gauging process itself can be semi or fully automated to varying degrees, as required. The flow chart below details a standard SI7500 measurement process:

6.2 Selecting A Part

To select a part:

1. Press the Menu softkey, the Extra softkey and use the cursor keys to highlight Cycle or Part?
2. Press Enter. If Part? was highlighted, you will be prompted for a part number. Use the Numeric Keypad to specify the part and press the Enter key.



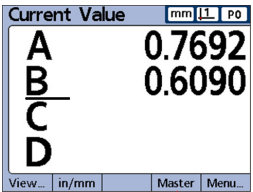


If Cycle was highlighted, the part number will be incremented. Continue incrementing to select the desired part number.

6.0 Operation (cont.)

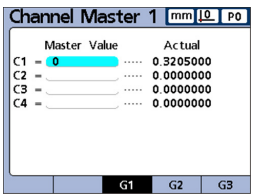
6.3 Establishing A Measurement Reference

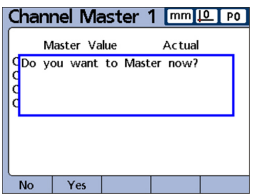
Since all Orbit modules (with the exception of Analogue Input Modules) are pre-calibrated, typically only a single point needs to be calibrated on the SI7500 to define a reference position. Analogue Input Modules however require a full calibration to be performed by the SI7500 to derive the resolution of the instrument to which they are connected, instructions for this procedure can be found in chapter 5 of the **SI7500 User Manual** (document number 502823).

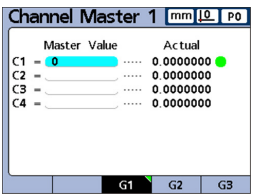


To calibrate a single reference point (from the main display screen -DRO screen is default):

1. Press the Master softkey. Use the cursor keys to select the desired channel if necessary.
2. Position the probe against the measurement reference surface.
3. Use the Numeric Keypad to enter the reference value (zero or the desired offset) into the Master Value data field. Press the Enter key, then press the Yes softkey to calibrate the measurement reference.
4. A green dot will appear next to the actual value indicating that the reference point is calibrated.







6.0 Operation (cont.)

6.4 Conduct A Measurement

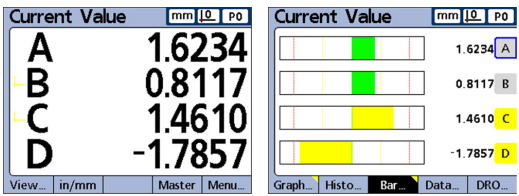
The SI7500's DRO and Bar Graph screens display continuously updating Dimension values. The instrument is designed such that once a part is in place and Orbit Digital probes or other modules are reading appropriately, the currently displayed reading can be 'captured' and saved into the instrument's internal memory.

Data capture can be triggered by RS-232, external I/O input, footswitch or most simply by manually pressing the "Enter" key.

6.5 Review Measurement Data

The SI7500 stores recorded measurement data in its memory for immediate operator feedback and review as part of a quantified manufacturing system. Measurements and statistics can be reviewed in graph or tabular format, as displayed in section 3.1.

To navigate between display screens, press the "View" softkey followed by (for example) the "Bar" softkey:



6.0 Operation (cont.)

6.6 Send Or Report Results

Reports of current dimension values, screen views, stored measurement results or even SI7500 setup parameters can be printed, transmitted to a PC or PLC or saved to a USB flash memory stick simply by displaying the desired screen and pressing the "Print" key.

The report and data transmission formats are prepared in the Header, Report, Send, USB and RS-232 setup screens described in the SI7500 User Manual (document number 502823), available from Solartron Metrology.

The table below lists all the data output formats the SI7500 can provide and from what display screen to generate them:

Report type	Screen	User actions
Current dimensions (Numeric display)	DRO	Press Print key
Graphs of dimension values (SPC subgroups = 1)	Graph...	Press Print key
Histograms of dimension values (SPC subgroups = 1)	Histogram...	Press Print key
xbar chart of subgroup mean values (SPC subgroups> 1)	xbar chart	Press Print key
r chart of subgroup range values (SPC subgroups>1)	r chart	Press Print key
Current dimension values (Bar display)	Bar...	Press Print key
Current dimension values (Dial display)	Dial...	Press Print key
Data table multiple-dimensions	Data...	Press Print key, respond to prompt
Data table single-dimensions	Data...	Press dimension softkey, press Print key, respond to prompt