

Huntron Workstation LCR Meter Tutorial

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Huntron Workstation software

It is very helpful if you have a working knowledge of Microsoft Windows prior to using Huntron Workstation.

You are allowed to create a backup copy of the software disk. *Your purchase agreement allows for copies to be made for backup purposes only- copying for distribution or resale is strictly prohibited.*

Installation Instructions

Install the software **BEFORE** connecting any hardware. For more installation details follow the "Getting Started" sheet included with your Huntron product.

Insert the Huntron Workstation DVD. The DVD should Autorun and begin the installation process. If your PC has Autorun disabled then open a browse Window, locate the DVD and select WorkstationSetup.exe. This will begin the installation process. During the install you will be asked to install additional software for Access Probers. Select the appropriate response based on your Prober hardware.

Installation of Additional Support Software

Installation of software for the support of supported external instrument will be required for the proper operation and control.

Keysight E4980AL LCR Meter

Insert the Keysight IO Libraries Suite CD or download the software from keysight.com. Run the IO Libraries Suite installer. The install process should begin. Use default selections as prompted during the installation process as there are no special conditions needed for the meter hardware.

To enable Workstation for the **Keysight E4980AL** copy the "**HuntronExternal4.dll**" file from the path "C:\Program Files (x86)\Huntron Workstation 4.3\E4LCRE4980AL" to the path "C:\Program Files (x86)\Huntron Workstation 4.3". Select "Yes" to overwrite the existing "HuntronExternal4.dll" file in that path.

Note: If you are using a 32bit version of Windows, the files will be located in a "Program Files/Huntron Workstation" folder.

Hardware Setup

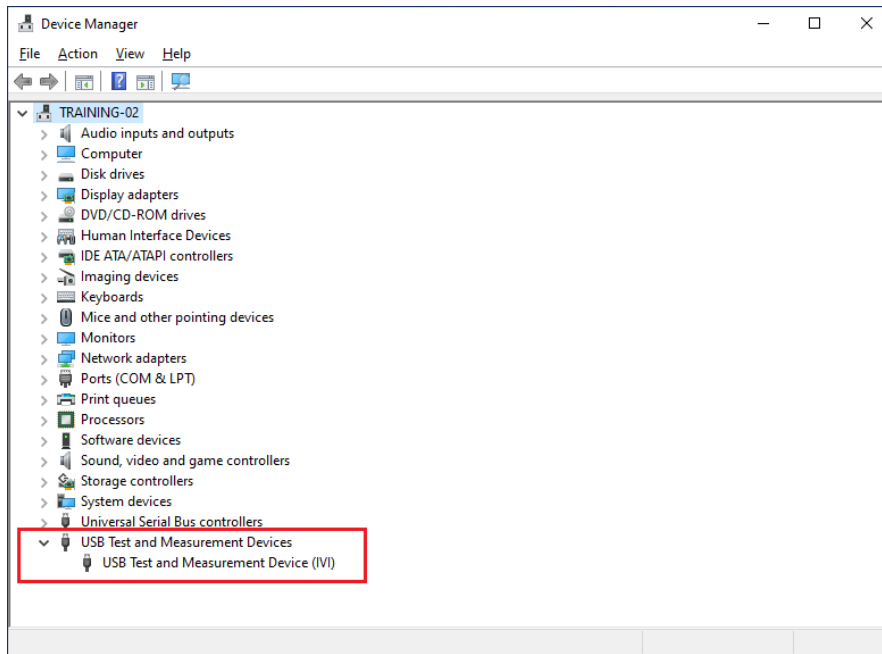
Connect the LCR Meter to Power.

Connect the LCR Meter to the PC using the USB cable.

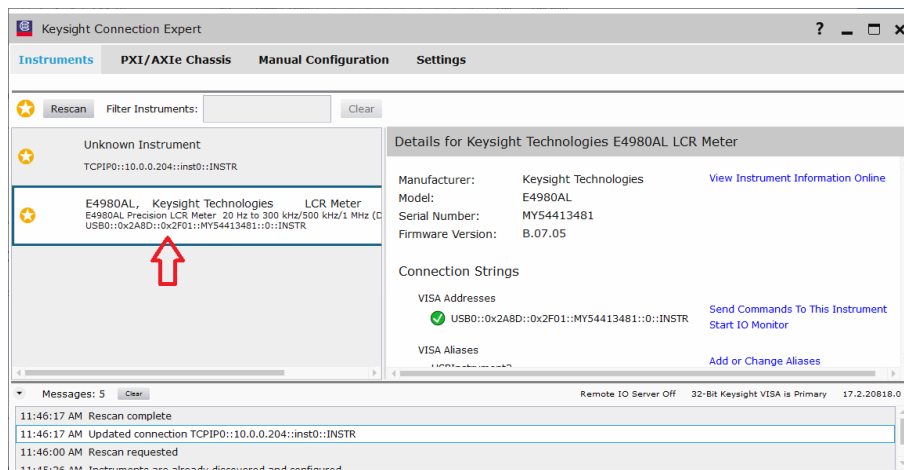
If a Huntron Access Prober is being used connect the LCR Meter to the Prober using the appropriate cables and adapters.

Power on the LCR Meter.

Open the Windows Device Manager and verify that the LCR Meter shows as an IVI device in the USB Test and Measurement Devices category.



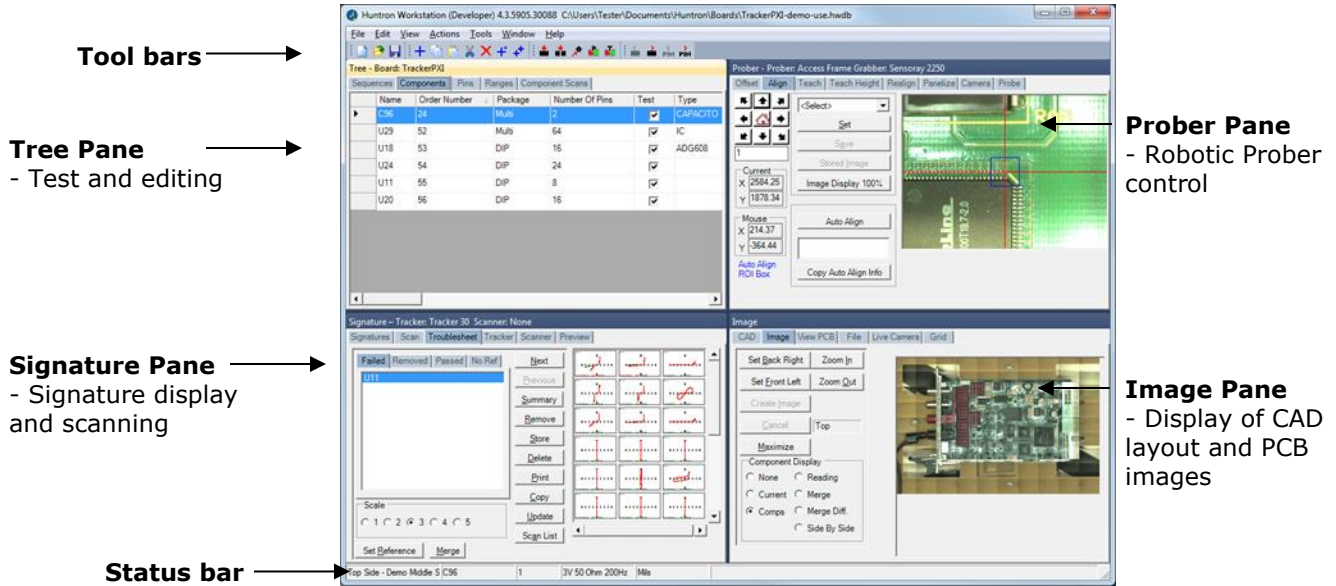
You can also open the Keysight Connection Expert and verify the E4980AL LCR Meter appears in the instrument list. Make note of the serial number and VISA USB address.



Huntron Workstation Main Interface

When starting Huntron Workstation for the first time, you will be prompted for an activation code. Type in the code exactly as it is presented on the software disk envelope or the installation DVD. If you were sent an activation code email it is best to copy and paste the codes to avoid typing mistakes.

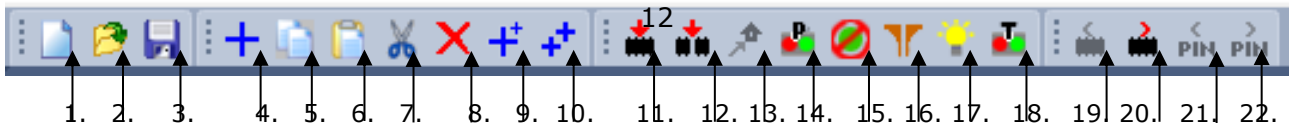
Use upper case letters and note the differences between the letter "O" and the number zero.



The Main Window for Huntron Workstation 4 features a multi-pane layout so many aspects of the test creation and execution can be displayed at the same time. The Panes are interactive to a certain degree in that changes in one Pane will affect other Panes. The Panes can be resized, floated independently or "tabbed" to the sides of the window. The Status Bar displays information about items currently selected and status information while processes are running.

The Toolbar

The Toolbar just under the application menus allows for quick access to several program functions. The function of each is broken out in the diagram below.

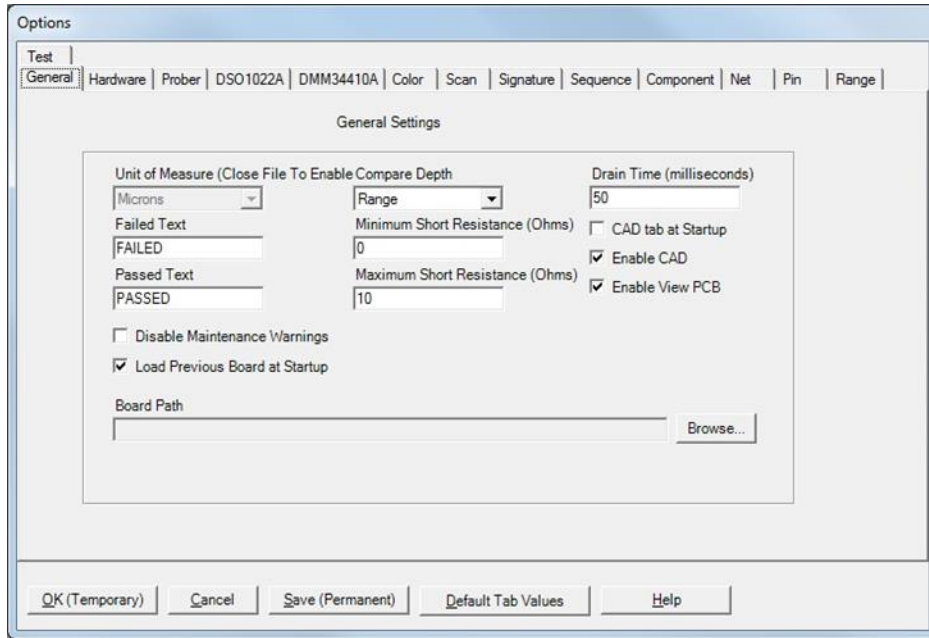


- | | |
|--|--------------------------------------|
| 1. Create New Board database | 13. Initialize Prober Home |
| 2. Open Board database | 14. Connect/Disconnect Prober |
| 3. Save As... | 15. Clear Prober STOP condition |
| 4. Add New (Sequence, Component or Range) | 16. Change Access DH/DH2 Probes |
| 5. Copy (Sequence, Component, Net or Range) | 17. ON/OFF Access DH2 Interior Light |
| 6. Paste (Sequence, Component, Net or Range) | 18. Connect/Disconnect Tracker |
| 7. Cut (Sequence, Component, Net or Range) | 19. Previous Component or Net |
| 8. Delete (Seq., Comp., Net, Range or Scan) | 20. Next Component or Net |
| 9. Build New (Sequence, Component) | 21. Previous Pin |
| 10. Repeat New (Sequence, Component) | 22. Next Pin |
| 11. Scan Component or Net | |
| 12. Scan Sequence | |

Hardware Setup

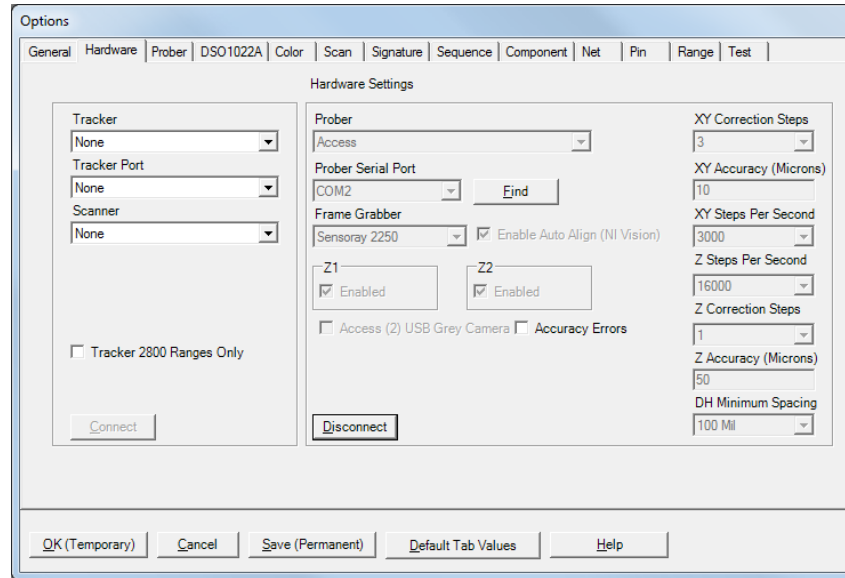
Turn on the Huntron Access Prober (if used) and the LCR meter.

When first starting Huntron Workstation, select **Options** from the Tools menu. The Options window is used to setup default settings used when working in Huntron Workstation.

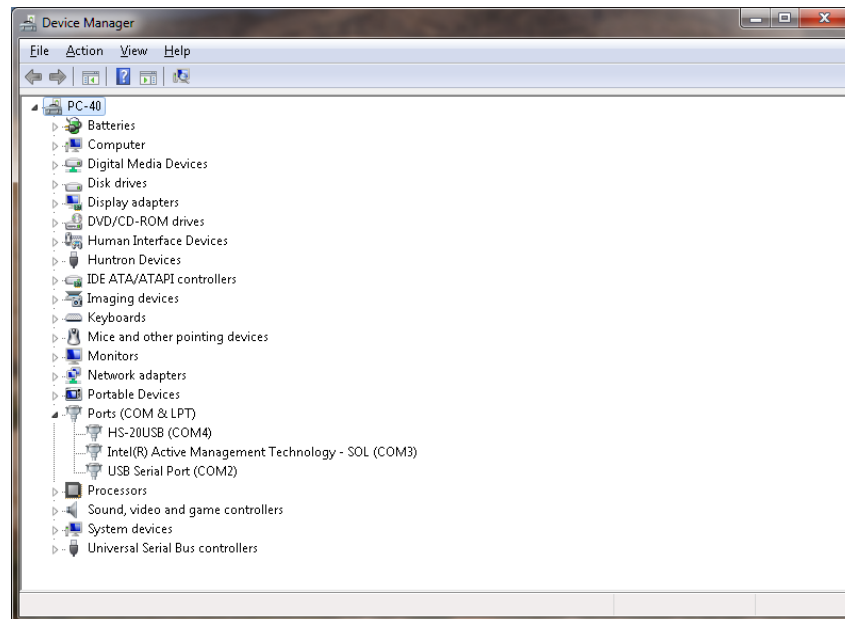


Select the **General** tab and set the desired Unit of Measure (use **Microns** for Huntron Access Probers, **Mils** for any other Prober). Also Select Compare Depth of **Range**.

Select the **Hardware** tab and leave the type of Tracker hardware, the Tracker Port and Scanner options at **None**.



If an Access Prober is being used you will need to select the type of Access Prober, the port for the Prober and the Frame Grabber (camera) type. Select the Prober Serial Port the Prober connection is using which will either be a COM port (older probers) or USB (newer Probers). Alternatively, go to the Windows **Control Panel**, select **System** and select **Device Manager**. Locate the Ports settings as shown in the image below. Use the COM number shown next to "HS-20USB".



Check the Access (2) USB Grey Camera checkbox if you have an Access 2 Prober where the camera has a grey colored body rather than black.

Click the **Connect** button to initiate communication with the selected hardware.

Select the tab that is available for your meter, **LCRE4980AL**.

Select the correct **USB VID PID** for your model, set the Port for **USB**, Connection to **None** and input the serial number of the meter being connected. Click the **Connect** button to connect with the instrument.

The screenshot shows the 'Options' dialog box with the 'LCRE4980AL' tab selected. The 'General' sub-tab is active. The following fields are visible:

- USB VID PID: 0x2A8D-0x2F01
- Port: USB
- Connection: None
- Serial Number: MY54413481

A 'Connect' button is located at the bottom center of the dialog. At the bottom of the dialog are buttons for 'OK (Temporary)', 'Cancel', 'Save (Permanent)', 'Default Tab Values', and 'Help'.

Select the **Sequence** tab and check the Enable LCRE4980AL checkbox.

The screenshot shows the 'Options' dialog box with the 'LCRE4980AL' tab selected and the 'Sequence' sub-tab active. The 'Default Sequence Settings' section is visible, with the 'General' sub-tab selected. The following settings are shown:

- Type: Components
- Slot: Middle
- Side: Top
- Compare Priority: All
- Auto Store Level: Sequence
- Sort Band Width: 38100
- Z Home Between Component
- Show Instructions
- Auto Store ASCII
- Auto Store Passed
- Stop on Failed Component
- Enable LCRE4980AL
- Enable Tracker
- Enable Access DH, DH2

An 'Instructions' text area is present, with a tooltip that reads 'Instructions for setup and testing of this sequence'. At the bottom of the dialog are buttons for 'OK (Temporary)', 'Cancel', 'Save (Permanent)', 'Default Tab Values', and 'Help'.

Select the **Range** tab and set the Range 1 Tester to LCR4980AL. Check the box to enable only Range 1.

Select the **LCRE4980AL tab** on the **Range Tab**. The settings available in this tab may vary depending on the model used. You can set the plus and minus Tolerance amount, Measurement type, and nominal measurement value. **Tolerance** is controlled by the Comparison setting at the Range level. It can be in measurement units (i.e. farads, ohms, etc.) or by percentage. These are simply setting defaults for when you add new components to the test. You can change the values at any time.

The screenshot shows the 'Options' dialog box with the 'Range' tab selected. The dialog has a tabbed interface with 'Range' being the active tab. Below the tabs, there are four sections for 'Range 1' through 'Range 4'. Each section has a table of settings:

Range	+Tolerance	-Tolerance	Measurement	Range	Nominal	Level	ALC	DCI ISO
Range 1	10	10	CPD	AUTO		1	<input type="checkbox"/>	<input type="checkbox"/>
Range 2							<input type="checkbox"/>	<input type="checkbox"/>
Range 3							<input type="checkbox"/>	<input type="checkbox"/>
Range 4							<input type="checkbox"/>	<input type="checkbox"/>

At the bottom of the dialog, there are five buttons: 'OK (Temporary)', 'Cancel', 'Save (Permanent)', 'Default Tab Values', and 'Help'.

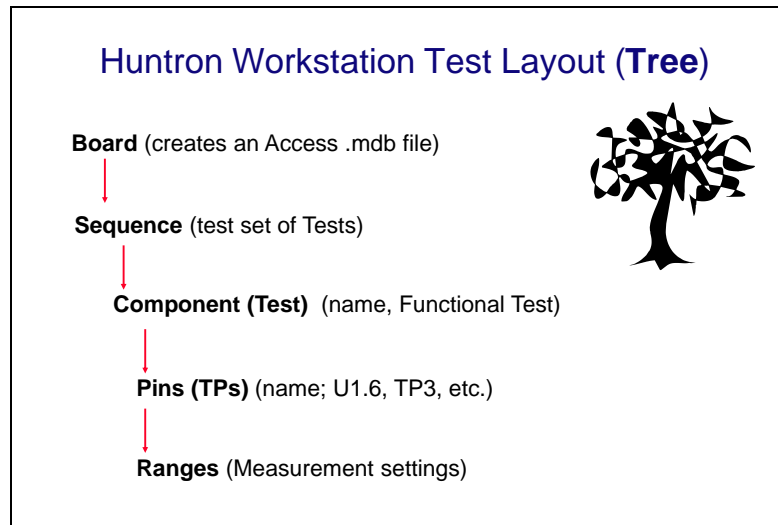
Click the **Save (Permanent)** button to save this configuration as the startup default.

Using Workstation with a LCR Meter

A LCR meter based test uses the concept of Test Points (TP). The Workstation Software has, for programming purposes, the concept of components and pins. When used with a LCR meter it is best to think of components as tests and pins as Test Points (TP).

Creating a LCR Meter Board Test

There are a number of steps necessary to creating a board test.



Example of Board Test Information:

Board Name: Sample (creates "Sample.mdb" file)

Revision: (This field is optional)

Sequence: DC Measurements

Component (Test): Test Points

Pins (TP): Per TP settings for X, Y, Z locations, etc..

Ranges: Per TP measurement settings, tolerance, etc..

The user has total discretion as to the information input into these fields. There is no "right" way as to what information is entered as every user's situation will be different. The above example is just one way the information might be entered.

Entering information into the Entry windows is very straight forward. The easiest way to move from field to field is by pressing the **TAB** key. You can also use the mouse to click into a particular field so you can enter information.

Test Building Procedures

- Determine TP Locations on the board and the tests to be performed
- Create Test Database in the Tree Pane
 - o Add Board, Sequence, and Components (Tests)
 - o Modify Range settings as needed

If an Access Prober is being used:

- Perform Camera Offset
- Select Alignment points
- Teach component pin (TP)

Using the test:

- Scan Sequences and Set References

Listed above is a general outline on how you would proceed when preparing to test a board. As with any type of complex test equipment, practice makes perfect so take the time to learn and practice these procedures.

Creating a Board Database

The screenshot shows a dialog box titled "Add New Board". It contains the following fields and controls:

- Name: Scope Tests
- Revision: (empty)
- System: (empty)
- Unit: power board
- Top Name: Top
- Manufacturer: (empty)
- Test Routine Number: (empty)
- Unit of Measure: Microns (dropdown menu)
- Data Source: User
- Bottom Name: Bottom
- Buttons: OK, Cancel, Buttons..., Help
- Checkboxes: Show Instructions, F2B File, XML File
- Buttons: Load F2B File..., Remove F2B File..., Load XML File..., Remove XML File
- Instructions: (empty text area)

To create a new Board, select **New** from the File menu or use the New button in the toolbar. Input information into the "Add New Board" dialog as needed. The only field that is required is board **Name** (Example "Sample"). Other fields such as Revision, System, Unit, Manufacturer and Gold Disk Number can be completed with related information if desired.

Adding a New Sequence

To add a new Sequence, select the **Sequence** tab in the Tree pane. Select **Add New Sequence** from the Edit menu or click the Add New button (+) in the toolbar.

Details:

Sequence Name Field: Enter Sequence name

Slot field: Select the Prober slot that the board will be in when scanning.

Compare Priority: Selects the comparison priority between **Same** (serial number), **All** (serial numbers; this is the recommended setting) or **Min/Max** (Merged min/max signatures)

Instructions field: Enter any instructions or system information that you wish to pass on to future users. Note: the **ENTER** key in this field will work as a carriage return.

Other functions within this window can be read about by clicking the **HELP** button.

Select the **Testers tab** and check the **Enable LCR4980AL** checkbox.

Adding a New Component (Test)

To add a new Component (Test), select the **Component** tab in the Tree pane. Select **Add New Component** from the Edit menu or click Add New button (+) in the toolbar.

Details:

Component Name field: Enter the component name (Test Name) in this field.

Package and **Number of Pins** fields: The Number of Pins should be set to at least the number of TPs in this Test (component). Select more pins than the current number of TPs allows more TPs to be added later. For unused pins (TPs) uncheck the **Scan Pin** check box on the **Pin Tab** after the Component is created.

Type field: This information is optional but you can enter the component type in this field.

Pin Spacing: Not used with meter tests. Leave the default value in this field

Connection Type: Set to Prober for Access Prober users

Open Check Type: Not used with meter tests

Correction Steps: Sets the maximum amount of correction steps used with the Huntron Access Prober when moving to the first TP of the Test.

Instructions field: Enter any instructions or component information that you wish to pass on to future users. Rich text images can be pasted into this field.

Other functions within this window can be read about by clicking the HELP button.

Pin Edit

Settings for individual pins can be modified by open the Pin Edit window. You can open the Pin Edit window by selecting the Pin tab in the Tree pane, right-click the row header and select Edit Pin.

The screenshot shows a 'Pin' dialog box with the following fields and controls:

- Pin Name: 1
- Pin Number: 1
- Net Name: (empty)
- Correction Steps: 0
- Channel: A (dropdown)
- Scan Pin:
- Pause:
- Relay Number: 0
- Order Number: 1
- Pin ID: 319
- Component ID: 1
- Instructions ID: (empty)

Buttons: OK, Cancel, Help

Bottom tabs: Instructions (selected), Prober, Pulse, Shorts, Features, LCRE4980AL

Name: Type directly into the Name field to change the pin name

Net Name: Type directly into the Name field to change the Net name

Correction Steps: Modifies the number correction steps used with Access Probers. This may need to be modified for very small pitch devices.

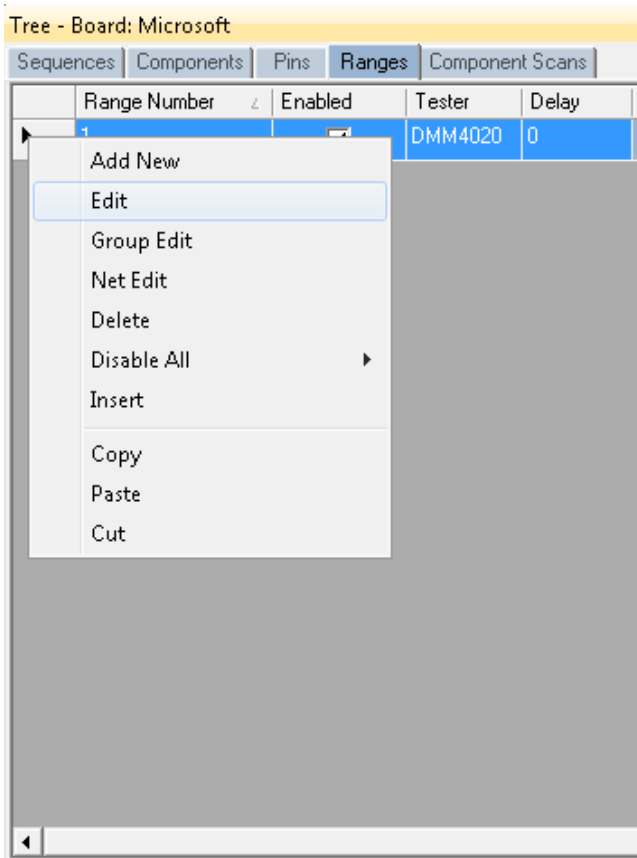
Scan Pin: Enables or disables scanning of the selected pin

Pause: Prober will pause and display Pin Instructions before scanning

Other functions in this window are not used with LCR meter test systems.

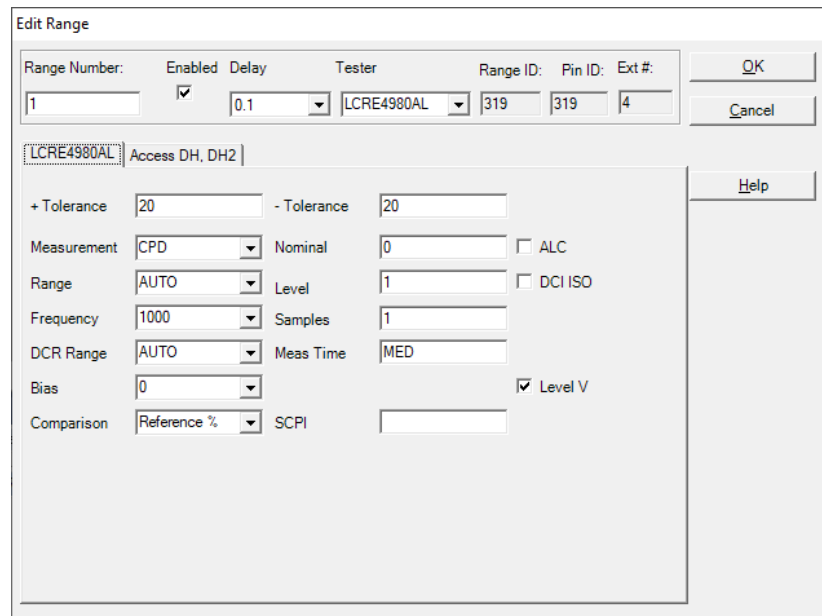
Modifying a Range (LCR Measurement Setup)

When a new component (Test) is added to a Sequence default range(s) are added to each pin (TP). The defaults are set up in the **Tools/Options/Range/LCRE4980AL** tab. These settings need to be modified based on signal being measured at each TP. The goal is to obtain a good measurement at each TP. The test only stops after a component (test) is completed.



Select the Tree/Range tab to display the ranges for the selected component pin. RIGHT click on the row header (far left grey area of the row) to display a quick menu (shown left)

To edit a Range, select the Range tab in the Tree pane. Select **Edit Range** from the **Edit** menu or the quick menu shown above by right-clicking on the row header. The Edit Range dialog will be displayed.



Edit Range Details (settings may be different based on instrument model):

Note: All of the settings can be modified directly in the Range grid.

+Tolerance: The amount above the Reference or Nominal Reading which determines the High Pass Limit. This is used during comparison to the value listed in the Nominal field. This amount can be a value or percentage depending on the Comparison setting.

-Tolerance: The amount below the Reference or Nominal Reading which determines the Low Pass Limit. This is used during comparison to the value listed in the Nominal field. This amount can be a value or percentage depending on the Comparison setting.

Measurement: Sets type of LCR Measurement

Range: Sets the measurement Range (AUTO recommended if available)

Comparison: Sets the comparison mode. **Nominal** compares the measurement to the entered Nominal value. **Reference** compares the measurement to the stored reference measurements.

Nominal % uses the Tolerance setting as a percentage of the Nominal value. **Reference %** uses the Tolerance setting as a percentage of the Reference value.

Nominal: Enter the nominal value for the measurement in ohms, farads or henrys (ex: 1Kohms=1000 Ohms; 1uF=.000001 Farads; 1uH=.000001 Henrys). This is the value used when test **Comparison** is set to **Nominal or Nominal%**.

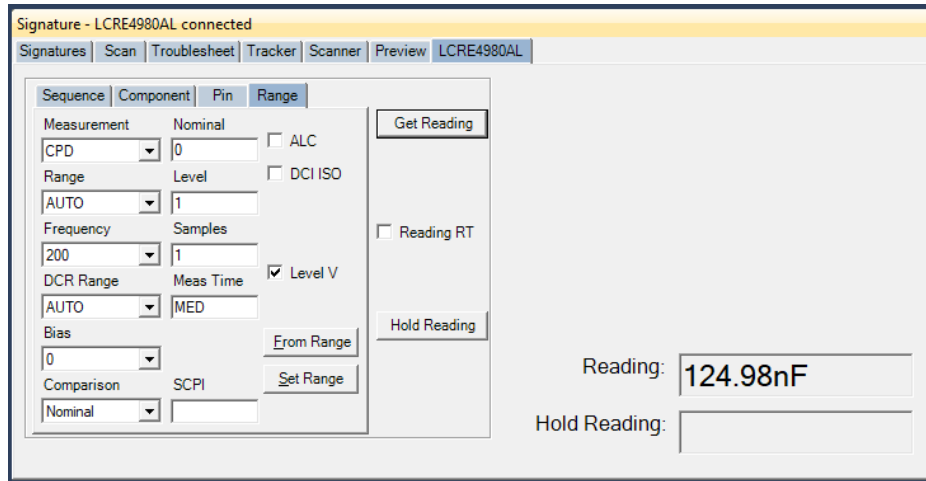
Level and **Samples** are typically set at 1.

SCPI: Allows for additional SCPI commands to be set before a sample is taken.

Using a Huntron Access Prober with a E4980AL LCR meter

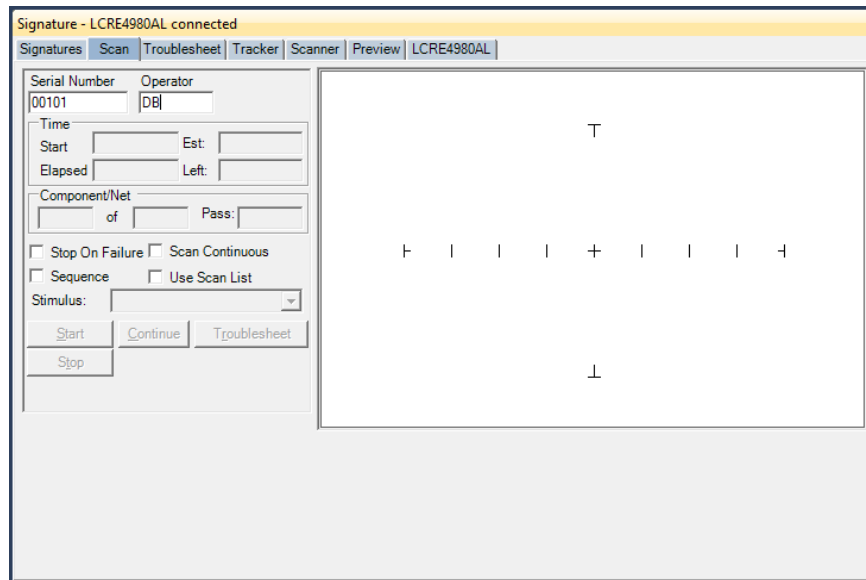
The steps needed to use your meter with an Access single or dual headed Prober is identical to those used with the Huntron Tracker. Refer to the full Huntron Workstation tutorial for Prober set up procedures.

Manual Modes



Manual measurements can be obtained using the **LCRE4980AL** tab in the **Signature** pane. This pane may be useful when configuring test parameters for a Test Point (TP). Setup the Measurement parameters and click **Get Reading** to observe the measurement.

Scanning a Sequence or Component



Select the Sequence or Component to be scanned in the Tree Pane.

Select the **Scan** tab in the Signature Pane (shown above).

Input a **Serial Number** into the Serial Number field; this will be the name of the scan.

The **Stop On Failure** check box will cause the scanning to stop if a component comparison fails.

This is most useful when scanning known good boards to add as references.

The **Scan Continuous** check box will cause the scan to go into a loop mode where it will scan without stopping until a signature comparison fails.

Enable the **Sequence** checkbox to scan all of the components in the Sequence.

The **Use Scan List** check box will add the ability to use a Scan List when the Scan Sequence dialog appears (see Creating a Scan List section).

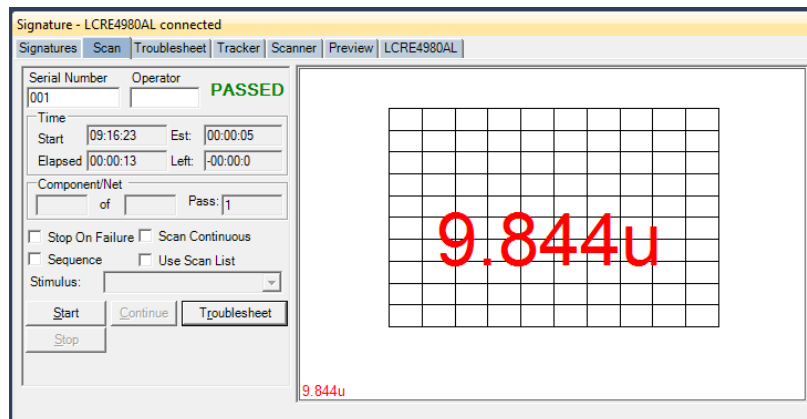
Press the **Start** button to execute the scan.

The test instructions prompt will be displayed. Clicking OK will start the scan for probers

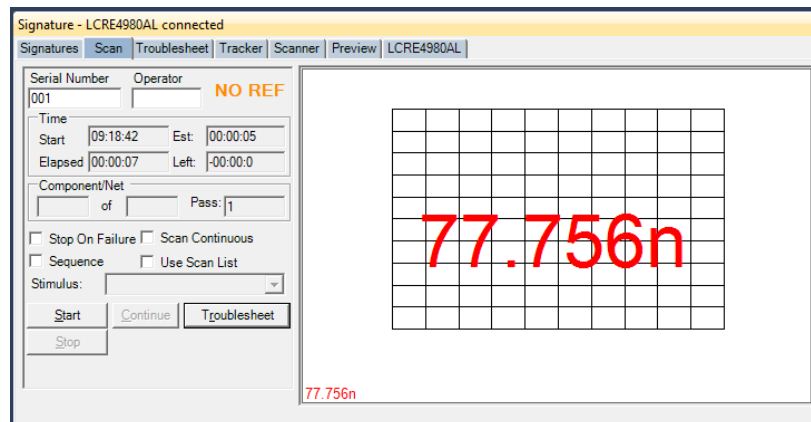
Scan Results

When a scan is complete, the results Passed, Failed or No Ref (No Reference) will be displayed (the text of the results message can be changed in the **Tools/Options/General** settings).

If the **Comparison** type set at the **Range** level is set to **Nominal** or **Nominal%** then the PASSED or FAILED test result will be based on comparing against the **Nominal value** set for the Range.



If the Comparison type set at the **Range** level is set for **Reference** or **Reference%** then the test result will display NO REF (No Reference).

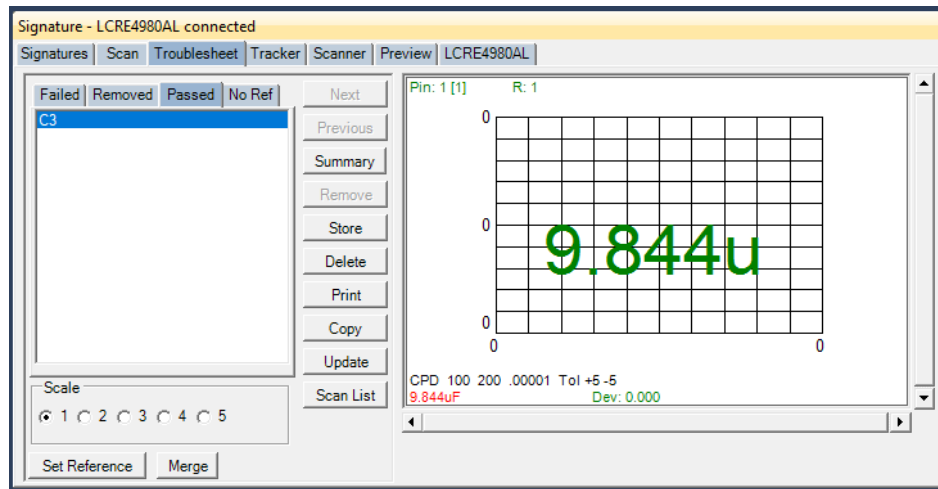


The **NO REF** message will be displayed on the first scan of any test since there are no scans stored as Reference.

Clicking the **Troubleshoot** button will display the signature differences in the Troubleshoot tab of the Signature pane.

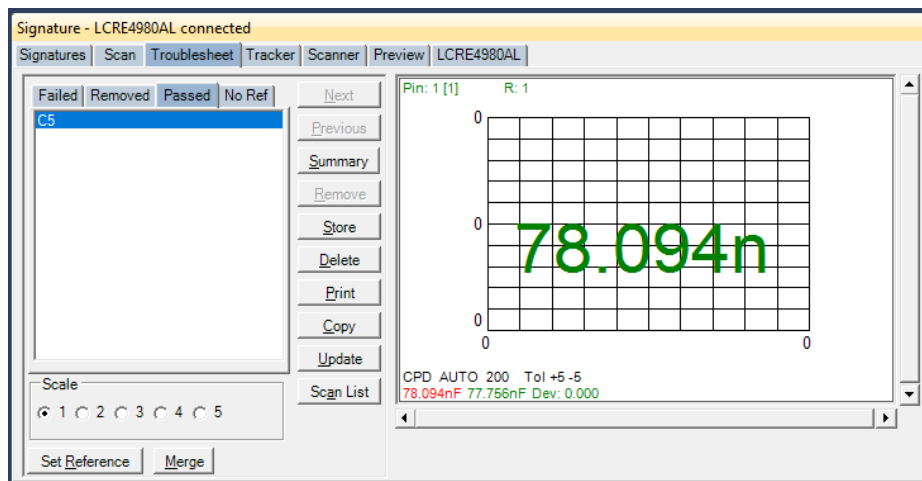
Viewing Signatures – Troubleshoot

Click the Troubleshoot button to view the test result based on a **Nominal value**.

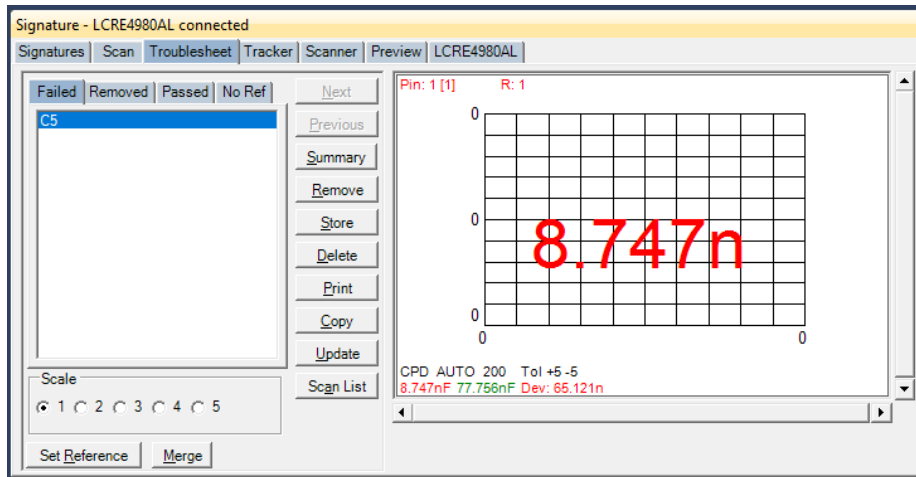


The component name will be display to the left in the Passed or Failed tab. The **Deviation (Dev)** shown in the signature box is the amount that the measured value deviates from the Nominal value plus the tolerances set for the range.

For scans that use a Comparison setting of **Reference** or **Reference%**, click the **Set Reference** button to make this measurement the comparison Reference for this test.



When the test is executed again the result will compare against the stored Reference and display the result. Here is the Troubleshoot for a Failed result.



The measured value, the Reference value and the Deviation will be displayed in the Signature box.

Viewing Signatures Troubleshoot Report

To view and print the Troubleshoot report, press the **Print** button in the Troubleshoot window. You can select from several options including a Sequence or Component Level report, the level of detail and add problem and solution comments to the report. Click **Preview** to view the report on-screen.

Troubleshoot Report

Top Level
Sequence

Detail Level
Component/Net

Problem
Low 5V

Solution
replaced C11

Preview Close

Troubleshoot Report
6/3/2008 1:25:27 PM

<i>Serial #</i>			
<i>Operator</i>			
<i>Results</i>			
<i>Problem</i>			
<i>Solution</i>			

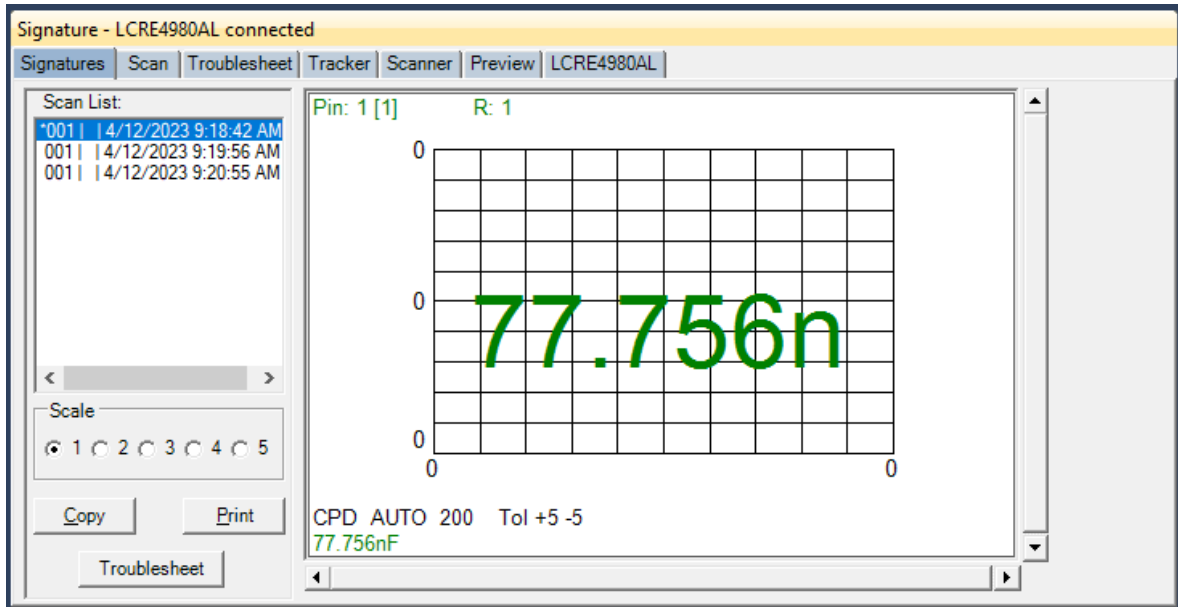
Board Information			
<i>Name:</i>	89006880	<i>Revision:</i>	A1
<i>Top Name:</i>	Top	<i>Gold Disk:</i>	
<i>Bottom Name:</i>	Bottom	<i>Manufacturer:</i>	
<i>Instructions:</i>		<i>System:</i>	

Sequence Information			
<i>Name:</i>	Top	<i>ID:</i>	1
<i>Order Number:</i>	1	<i>Stop on Failed Component:</i>	False
<i>Z Home Between Components:</i>	True	<i>Top Side:</i>	True
<i>Component Sequence:</i>	True	<i>Compare Priority:</i>	All
<i>Instructions:</i>		<i>Show Instructions:</i>	False
<i>Total Component/Nets:</i>	55	<i>Total Scanned:</i>	54
<i>Total Passed:</i>	54	<i>Total Failed:</i>	0
		<i>Total Removed:</i>	0

Current Page: 1 Total Pages: 1 Zoom Factor: 100%

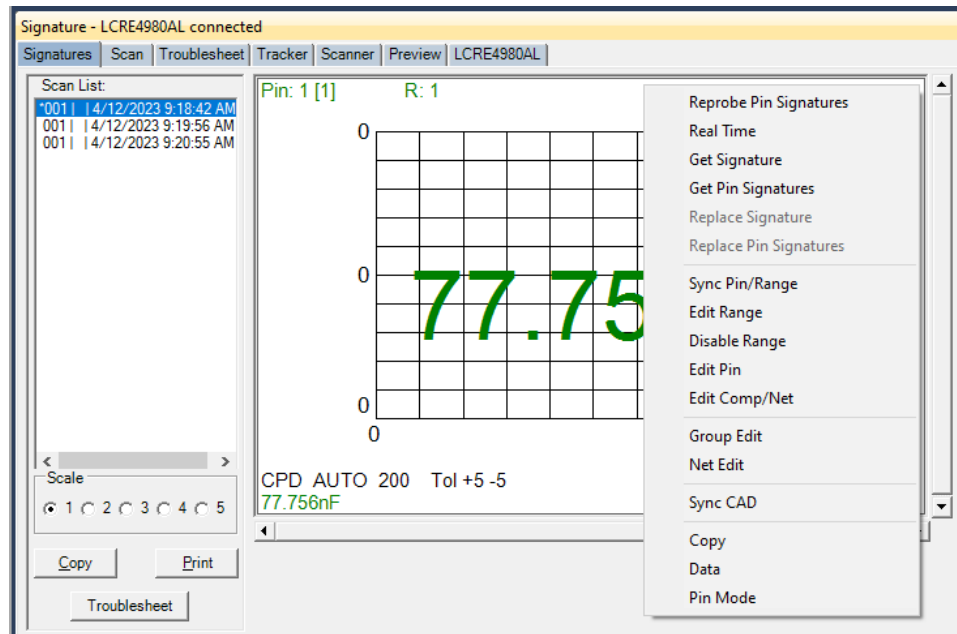
The report can be printed or exported in several different formats including HTML and PDF by selecting **File/Export Document** in the Preview window.

Viewing Signatures in the Signatures Pane



To view scanned signatures, select the **Signatures** tab in the Signature Pane. Signatures marked with an asterisk * indicate that this scan is set as a Reference. The Scan name, date and time will be displayed on the left side of the window and signatures on the right. The **Scale** buttons will change the number of columns displayed. Scaling the window will increase the number of signatures displayed. The **Copy** button will copy the signatures to the Windows clipboard so they can be pasted into another program (in a metafile format). The **Print** button will print the signatures in one of several different user selected formats.

Viewing Signatures – Right Click



Additional options when viewing signatures can be displayed by right clicking in the signature area.

Reprobe Pin Signatures: Will reprobe the selected test point and prompt to replace the previous measurement

Real Time: Updates measurement in real time

Get Signature: Capture signature

Get Pin Signatures: Captures signatures for all of the displayed ranges

Replace Signature: Replaces the stored signature with the current signature displayed for the selected pin, range and scan (shown in the Scan List to the left)

Replace Pin Signatures: Replaces the stored signatures with the current signatures displayed for the selected pin, all ranges and scan – works only in Range Mode

Sync Pin/Range: Selects pin and range in the Tree (see default in Tools/Options)

Edit Range: Selects the pin and range in the Tree and opens the Edit Range dialog

Disable Range: Disables the selected Range

Edit Pin: Selects the Pin the in the Tree and opens the Edit Pin dialog

Edit Comp/Net: Selects the Component or Net the in the Tree and opens the Edit dialog

Teach Pin: Selects the pin the Prober Teach pane

Teach Height Pin: Selects the pin the Prober Teach Height pane

Group Edit: Opens Group Edit dialog for editing of component pin parameters as a group

Net Edit: Opens Net Edit dialog for editing of Net pin parameters as a group

Sync CAD: Will link the selected signature to the CAD image displayed in the Image/CAD pane.

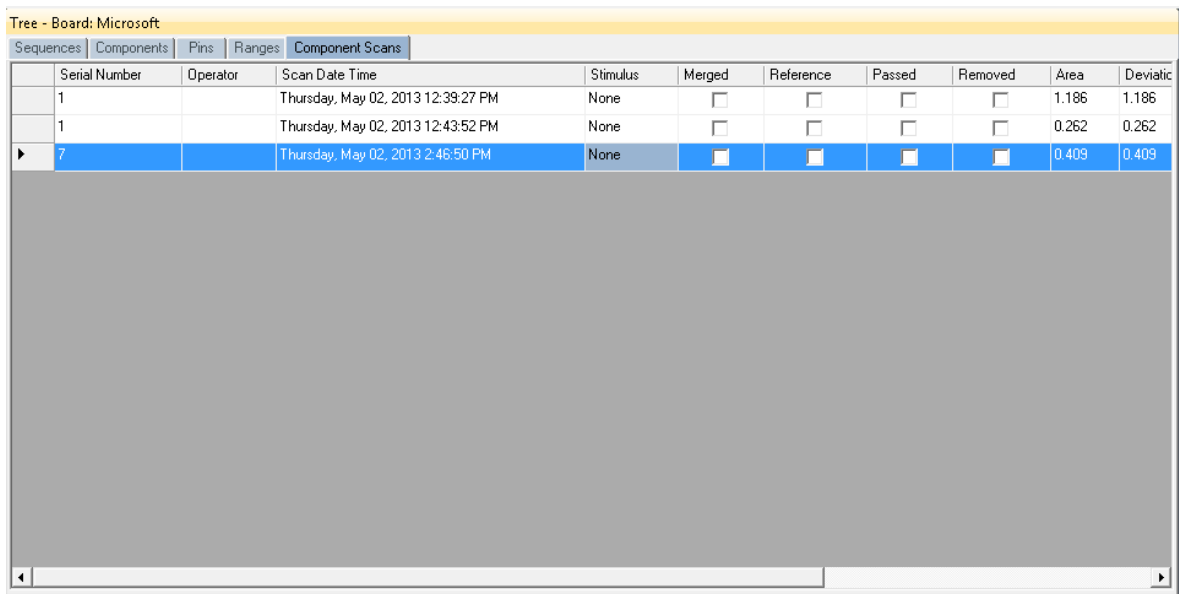
Sync CAD will be disabled if there is no linked CAD data.

Copy: Copies the current signature box to the clipboard

Data: Not used with non-Tracker applications.

Range/Pin Mode: Displays signature with Range priority or Pin priority; see default in Tools/Options).

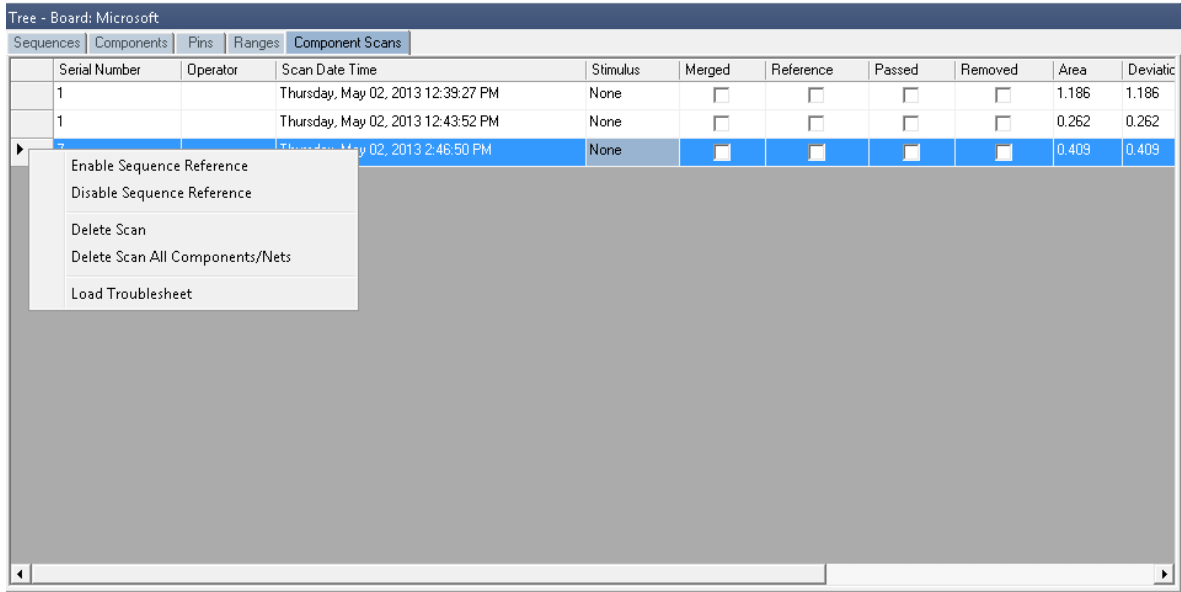
Component Scans Information



Serial Number	Operator	Scan Date Time	Stimulus	Merged	Reference	Passed	Removed	Area	Deviatio
1		Thursday, May 02, 2013 12:39:27 PM	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.186	1.186
1		Thursday, May 02, 2013 12:43:52 PM	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.262	0.262
7		Thursday, May 02, 2013 2:46:50 PM	None	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.409	0.409

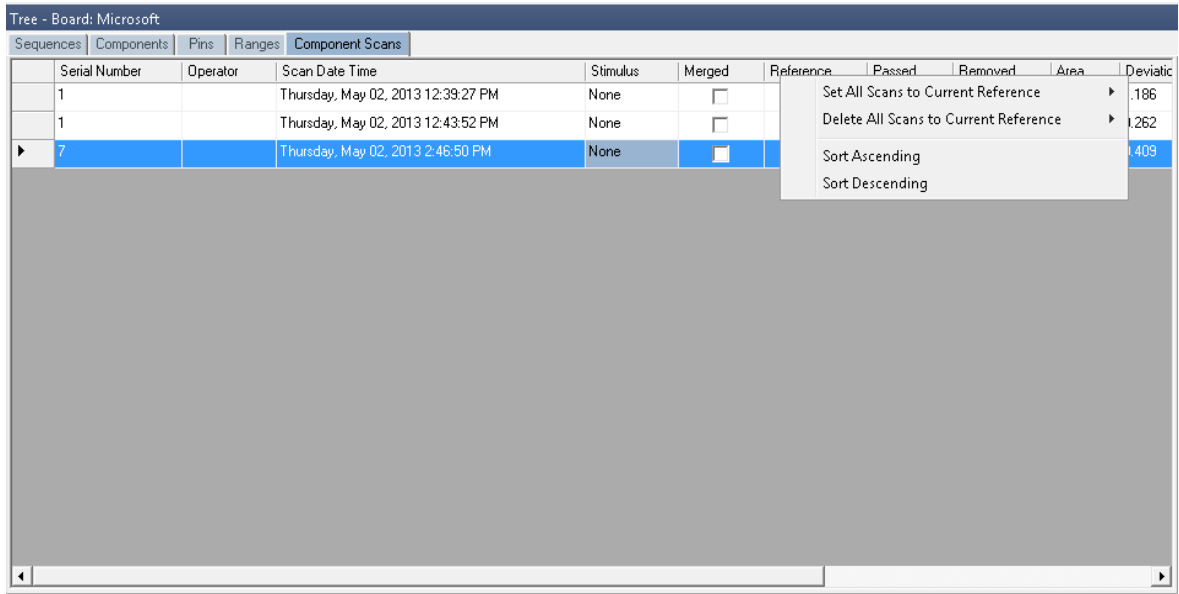
Selecting the **Scans** tab in the Tree Pane will display all of the scans performed **on the selected component** in a table format. The Scan information displayed includes the serial number, operator, date/time, Merge setting (checked if this scan is included in the Merge set), Reference setting (checked indicates it is set as a comparison Reference), Pass status (will be checked if components passed comparison), Removed status (will be checked if component was removed from Troubleshoot), Area number (highest of scanned pins), Deviation, Min/Max status and other settings (see Help for more information).

Component Scans – Right Clicking (Auxiliary menus)



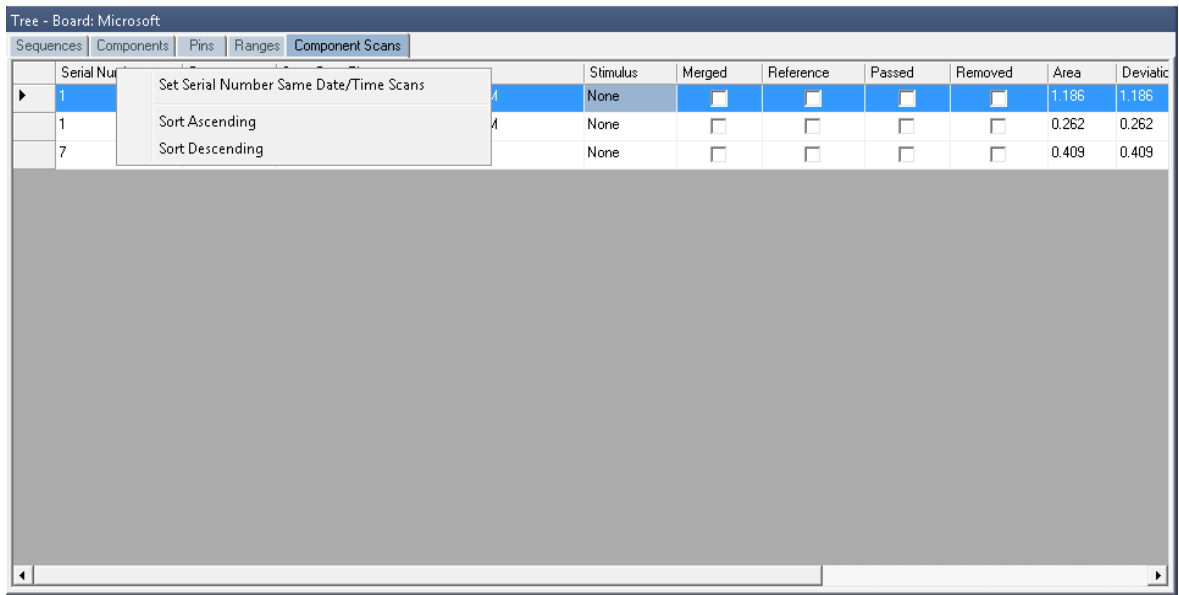
Right clicking on the Row bar of the Component Scans pane displays an additional menu for performing specific tasks such as deleting a scan for the selected components or all components. **Enable Sequence Reference/Disable Sequence Reference** will mark or unmark the selected scan as a reference (comparison) scan for all components in the Sequence. **Delete Scan** will erase the selected scan for the current component only. **Delete Scan All Components/Nets** will erase the selected scan for all components or nets in the Sequence. **Load Troubleshooting** will display the selected scan in the Signature pane/Troubleshooting tab.

Component Scans – Right Clicking (Auxiliary menus)



Right clicking on the Column bar of the Scans pane displays an additional menu for performing specific tasks such as sorting or globally setting parameters. The menu will vary depending on the column selected. In the image above, the Reference column header was right-clicked.

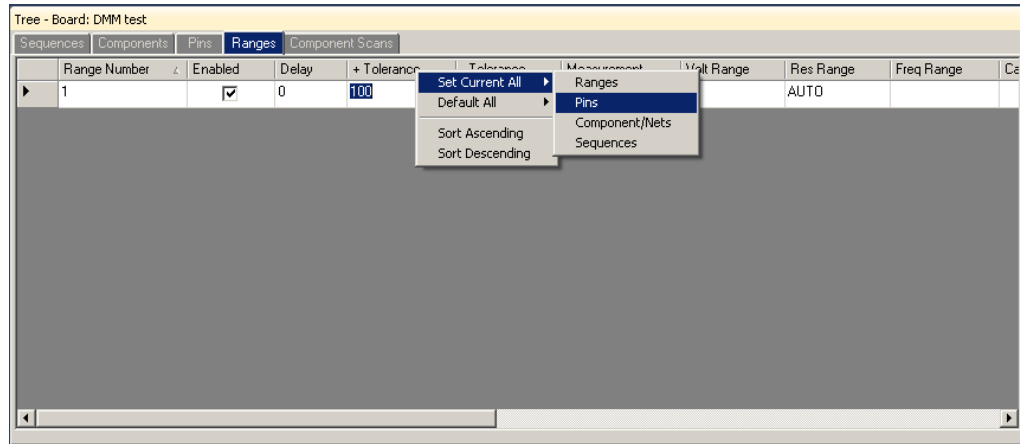
Component Scans – Right Clicking (Auxiliary menus)



Right clicking on the Column bar of the Scans pane displays an additional menu for performing specific tasks such as sorting or globally updating items. In the image above, the Serial Number column header was right-clicked.

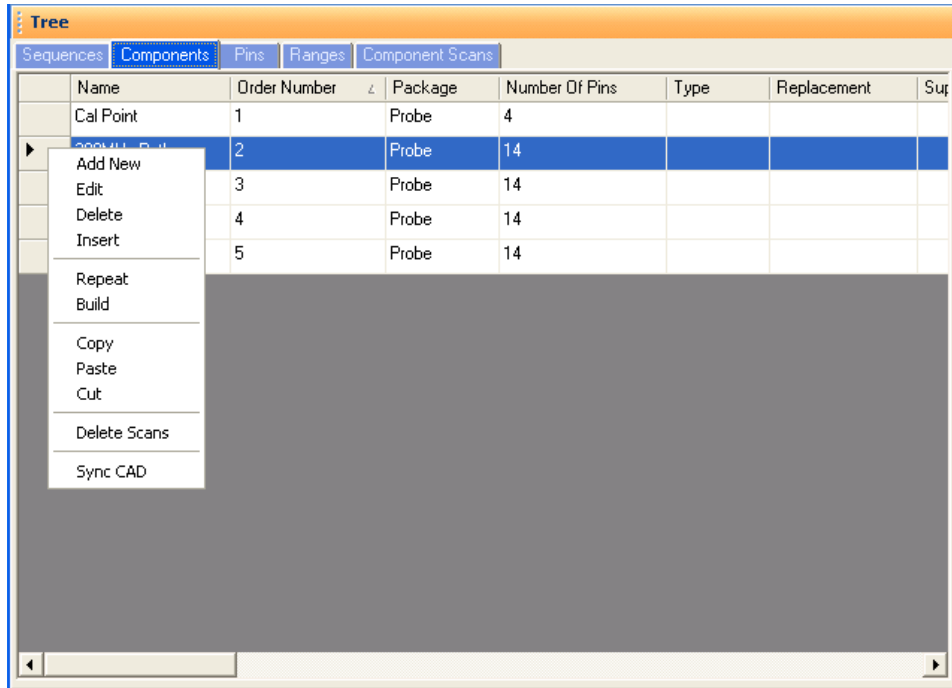
Range Tab – Right-click Menu

One very useful feature making quick global changes to range parameters is the menu available by right-clicking the column header (the title area directly above the column) in the Range tab.



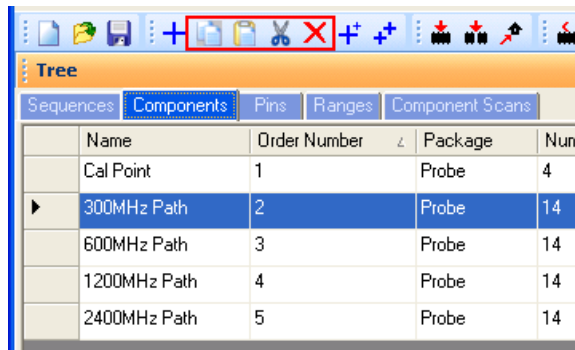
After making a parameter change for the range, **right-click** the column header for that parameter as shown in the image above to display the menu. The most useful selection is **Set Current All/Pins** where all of the pins of the component will be modified to the same setting as the selected Pin. This menu is available for most Range parameters. Remember to make the parameter change first then use **Set Current All/Pins**.

Sequence/Component/Pin Editing – Right Click menus



Right clicking on the Row header bar of the Tree pane displays an additional menu for performing specific tasks such as **Add New**, **Insert**, **Delete**, **Repeat**, **Build** (repeat but with name incremented by 1), **Copy**, **Paste** and **Cut**. Right clicking works at all levels of the Tree pane including Sequence, Component (shown above), Pins, Ranges and Scans. The **Sync CAD** option available at the Component and Pin levels will synchronize the selected component or pin to the CAD image in the Image pane.

It is also possible to select groups of components by holding the **SHIFT** or **CTRL** keys while selecting components in the Tree. To copy, paste, cut or delete groups of components, use the Copy, Paste, Cut or Delete Toolbar buttons below the main menu.



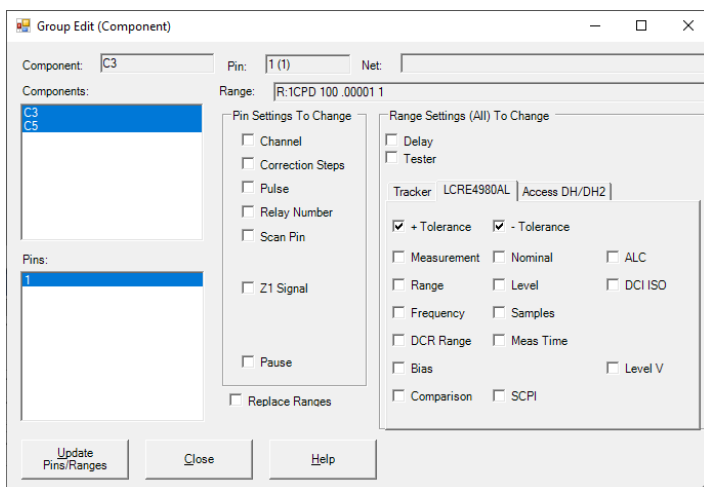
Pin Editing – Right Clicking (Auxiliary menus)

Name	Pin Number	Order Number	Net Name	Scan Pin	Unique Pin	Channel
	1	1		<input type="checkbox"/>	<input type="checkbox"/>	A
	2	2		<input type="checkbox"/>	<input type="checkbox"/>	A
	3	3		<input type="checkbox"/>	<input type="checkbox"/>	A
	4	4		<input checked="" type="checkbox"/>	<input type="checkbox"/>	A
S'W3 Out A	5	5		<input type="checkbox"/>	<input type="checkbox"/>	A
S'W3 Out B	6	6		<input checked="" type="checkbox"/>	<input type="checkbox"/>	A
DIV2 In	7	7		<input type="checkbox"/>	<input type="checkbox"/>	A
DIV2 Out	8	8		<input type="checkbox"/>	<input type="checkbox"/>	A
S'W5 Out	9	9		<input checked="" type="checkbox"/>	<input type="checkbox"/>	A
DDS In	10	10		<input checked="" type="checkbox"/>	<input type="checkbox"/>	A
DDS Out	11	11		<input checked="" type="checkbox"/>	<input type="checkbox"/>	A
S'W2 Out	12	12		<input checked="" type="checkbox"/>	<input type="checkbox"/>	A
ATTEN In	13	13		<input checked="" type="checkbox"/>	<input type="checkbox"/>	A
ATTEN Out	14	14		<input checked="" type="checkbox"/>	<input type="checkbox"/>	A

Right clicking on the Row header bar of the Tree/Pins pane allows for editing of the pin information. Select **Edit** to open the Edit window for the selected pin.

Note: Some Pin settings can also be edited directly in the Pins grid by clicking the appropriate field and modifying the setting.

Group Edit and **Net Edit** allow you make changes to the pin of a component and have those modifications also change components that have the same number of pins within the same Sequence.



Change the desired settings for the current Pin **first** then select Group Edit from the right-click menu (see above). Components with the same number of pins will be listed. Select the components and pins you want to be changed. Select the Pin Settings check box(s) for the setting(s) you want changed. Check the Ranges box to match the ranges (this will cause signatures to be deleted). Click the **Update Pins/Ranges** button to make the changes.