electronplus+

ASA101A User Manual

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1 Notices

..1.1 Copyright

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..1.2 Part number

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..1.3 Issue

24.001, 18 March 2024

..1.4 Location

The latest version of this document can be found on our website: www.electron.plus

..1.5 Published by

BFRAD Limited (t/a Electron Plus)
Unit 8 Manor Farm Business Centre
Manor Lane
Stutton
Suffolk
IP9 2TD
UK

Hereafter referred to as **Electron Plus**

..1.6 Notes

- We frequently update our manuals and add new features and improvements as they available, please ensure that you check our website for an updated version of this document, especially if updating your **Electron Plus** software.

- We make every effort to ensure the accuracy of this manual's contents. If you find any errors, have suggestions for expanding on a feature, or feel that we can improve it's contents then please contact us at **support@electron.plus**

- Copying or reproducing this document or any part of this document without written permission of **Electron Plus** is strictly prohibited.

..1.7 Trademark acknowledgement

Electron Plus fully recognises and acknowledges any trademark(s) of the respective trademark holder, these include (but not limited to):

Windows™ is a trademark of Microsoft Corporation.

Transzorb™ is a trademark of Vishay General Semiconductor, LLC.

..1.8 Purpose of manual

The purpose of this manual is to enable you to safely setup, configure and operate your **Electron Plus** instrument, associated software and/or accessories.

Please pay particular attention to any section with a warning symbol.

..1.9 Safety warnings

Warnings, cautions and notes are colour coded through-out this manual. These are divided into several categories and are described below:

A WARNING notice signifies a potential danger. It draws attention to a procedure, practice, or similar aspect that, if not executed correctly or followed, may lead to personal injury or loss of life.
DO NOT advance beyond a WARNING notice until the specified conditions are thoroughly comprehended and fulfilled.

CAUTION - Damage may occur to your equipment or any DUT (device under test).A CAUTION notice signifies a potential danger. It draws attention to an operational procedure, practice, or similar aspect that, if not correctly executed or adhered to, could lead to damage to the product, your equipment, DUT (device under test) or loss of crucial data. Refrain from advancing beyond a CAUTION notice until the specified conditions are thoroughly understood and met.

NOTE - General text, with useful information or tips.

2 Specifications

..2.1 Absolute Maximum Ratings

Exceeding these specifications, even briefly, may cause permanent damage to the device.

Parameter	Rating
Input Voltage (via connector 'spike')	-12V to +12V
Input Voltage (via connector 'USB')	-0.6V to +5.5V
Operating Temperature (Centigrade)	-20°C to +50°C
Operating Temperature (Fahrenheit)	-4°F to +122°F
Storage Temperature (Centigrade)	-40°C to +75°C
Storage Temperature (Fahrenheit)	-40°F to +167°F

In normal operation the unit is exposed to higher input voltages from undischarged capacitors on the DUT. Ensure these are safely discharged prior to testing with an ASA - not only to protect the ASA from damage, but also to eliminate the risk of shock to the user from high voltages that maybe present across capacitors (e.g. SMPSU caps).

..2.2 Physical Specifications

These parameters do not include packaging materials, accessories or non-permanently attached cables/connectors.

Parameter	Value
W x H x D (metric)	112mm x 35mm x 90mm
W x H x D (inch)	4.41" x 1.38" x 3.54"
Weight (metric)	0.XXX Kg
Weight (imperial)	0.XXX Lbs

..2.3 General Specifications

..2.4 PC Requirements

3 Getting Started

..3.1 System requirements

We recommend *at least* Windows 7 operating system - although most customers are using Windows 10 or Windows 11.

ASA is available in both 32 bit and 64 bit from the **Electron Plus** website.

Minimum requirement for connection to ASA device:
1x USB 2.0 type A (common) for connection to the instrument, at 0.5A.

Screen resolution of at least 1440(W) x 900(H), it will work with others, but you risk some of the CONTROL RIBBON items not being visible.

ASA uses the PC sound card for various alerts, although it will operate correctly without sound.

Technical Note
We test EPIC builds mainly on Windows 10/64 bit machines with 1920x1080 monitors.

..3.2 Getting help

Help is available by email: **support@electron.plus**

If you are experiencing an issue with EPIC, please email a copy of the following files (see below) found in the EPIC installation folder along with a description of the problem.

log.txt
bugreport.txt

This will help us understand your problem and provide a quicker fix.

4 Introduction

..4.1 Welcome

Congratulations and thank you for purchasing an **Electron Plus** product.

Please take a few minutes to read the ‘Before you start’ section of this manual, especially as misusing this product can result in damage to it, your device-under-test or potentially place you in-danger.

..4.2 Before you start

The supplied metal spike is **SHARP**. When you have finished using the ASA101A, unscrew the spike, turn it round and screw it lightly back into the ASA101A.

Ensure that all DUT* capacitors and energy storage devices are fully discharged before using the ASA101A.
The **SIGNAL** connection is protected by a large 'transzorb' style device, but damage WILL occur if the ASA101A is placed across a fully charged DCLINK capacitor.

The **COMMON** connection is connected directly to the chassis of the instrument and therefore the USB 0V and shell.

Before connecting your device, please ensure you have installed the USB driver.

DUT* - device under test

..4.3 New in software

ASA covers most **Electron Plus** instruments and not all instruments are updated between versions:

V24.001
Change to Daily Update Check function
Split Views out of Display menu
Bug fixes
Various small tweaks

V22.001
Change of name to ASA from EPIC
Bug fixes

V21.012
Bug fixes
ASA - addition of manual mode

V21.011
Bug fixes
CTL503 - Vgs vs Id (at fixed Vds) mode added
CTL503 - updates to status display
CTL503 - removal of DEVTEST button/function.

V21.010
Bug fixes
Addition of version compiled for 32 bit systems
CTL503 added to EPIC
ASA200/240 - addition of SIGNAL/COMMON to EDIT page

V21.009
Bug fixes
SPA100 added to EPIC
REF50X added to EPIC

V21.008
Bug fixes

..4.4 Installation sequence

Please install the **ASA** software and the associated USB driver software BEFORE connecting your device to a computer.

You do not need to remove a previous copy of **ASA**, the new copy will overwrite the necessary existing file(s). The "settings.txt" file will only be created if it is not present.

When **ASA** is first started, it will build a number of files (unless they are already there from a previous installation) in the installation directory.

If upgrading from EPIC V21.009 or earlier please be aware that the new program EXE is called either ASA32.EXE or ASA64.EXE and that previous shortcuts might not work or will link to previous copy.

..4.5 Installing the Software

Electron Plus products require a USB connection to a PC running **ASA** (our proprietary software) in order to function.

ASA now comes in two compiled versions (since version 21.010):

ASA64 - for 64 bit Windows installations & PC's (we recommend this).
ASA32 - for 32 bit legacy Windows machines.

You can download the latest copy of **ASA** for free from www.electron.plus/pages/software, **ASA** is being constantly revised with new features, updates and bug fixes.

1. Select which variant you wish to use go ahead and download it (typically by double-clicking on the ZIP file named something like: Install_ASA24001_64.ZIP)

2. Open the downloaded file (typically Windows will recognise the ZIP format and open the file and display the contents like a folder), double click the EXE file - typically called Install_ASA24001_64.exe)

3. Follow the on screen instructions to complete the installation.

Before starting **ASA**, we recommend installing any USB drivers, see next section for details.

This manual MAY NOT represent the most up-to-date features and screen-shots, if something is unclear, please contact support@electron.plus and we will promptly try to assist you.

..4.6 Installing the USB driver

The product covered in this document communicates with the host PC via USB using an FTDI FT230X bridge IC.

A copy of the official FTDI device driver is available from the SOFTWARE section of our website (www.electron.plus/pages/software), device drivers can also be downloaded directly from FTDI's website (www.ftdichip.com/drivers).

Download the FTDI driver (CDM21228_Setup), open the ZIP file and run CDM21228_Setup.EXE, this will install the D2XX drivers necessary.

It is possible that you already have this FTDI device driver installed, however we still recommend following this procedure.

5 Operation

..5.1 Selecting Instrument

When **ASA** is first installed it will initially start in ASA100 mode.

To change this:

INSTRUMENT > CHANGE INSTRUMENT and select the actual instrument you wish to use, you will then have to close and reopen **ASA** for this to take effect.

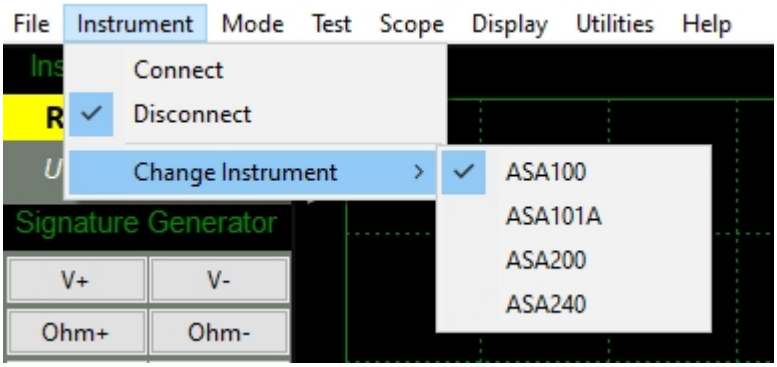

Fig. 1

Technical Note
Variable used in settings.txt: ActiveInstrument=ASA100

..5.2 Connecting Instrument

To connect to the instrument you can use the options in the MENU or the button on the Control Ribbon.

INSTRUMENT > CONNECT to connect, or **DISCONNECT** to disconnect.

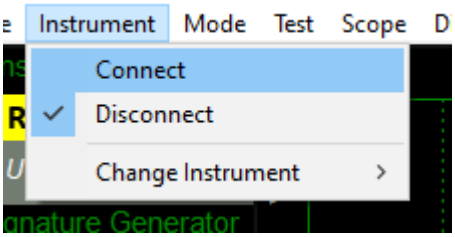

Fig. 2

or

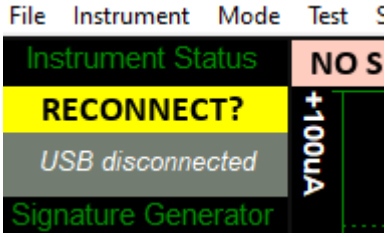

Fig. 3

Before the instrument connects it will check the identification in the FTDI USB bridge IC, an error message will be shown if the instrument selected is not the same as the instrument connected.

Technical Note
Upon successful connection, ASA will download the calibration coefficients file from the USB bridge IC. These are then stored in the ASA folder as "ASA_cal.txt"

..5.3 Check for updates

Once per day **ASA** will check if there is a newer version available. This feature maybe disabled or re-enabled here:

UTILITIES > DAILY UPDATE CHECK

Tick will enable **ASA** to perform the daily update check, unticking will prevent **ASA** from performing the daily update check.

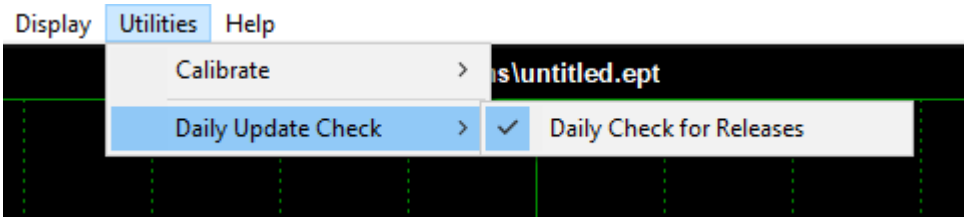

Fig. 4

Technical Note
In "settings.txt": CheckWebsiteForUpdate=1 or 0 determines if this function is enabled/disabled.
Also in "settings.txt": DateOfLastUpdateCheck=04/11/2021 (is self-explanatory).
If function is enabled and date <> today an electron.plus webpage (dedicated to software version) is scanned for current for software version number. If the listed version number is higher than the installed version number a message is displayed to the user.

..5.4 Control Ribbon

The Control Ribbon has most of the functions necessary for the operation of the instrument.

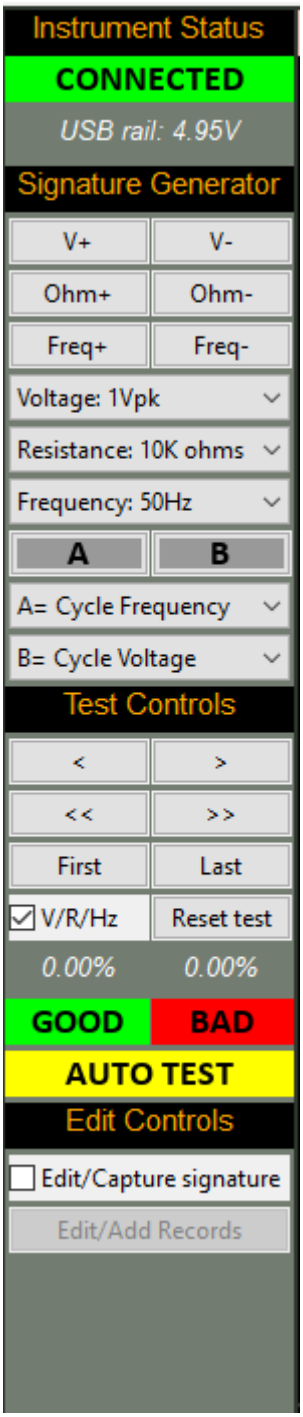

Fig. 5

The following sections are descriptions of Instrument Status, Signature Generator, Test Controls and Edit Controls and their functions.

.5.4.1 Instrument Status

Reconnect/Connected button shows the status of the connection between the instrument and **ASA**:

Fig. 6

Pressing this button will connect or disconnect the instrument to **ASA**.
Should the instrument be disconnected, the status of this button will automatically change.

Below the connection button is a text display that shows (typically) the voltage of the USB connection at the input to the instrument.
This is useful in diagnosing problems with the USB cable, or the computer port. This voltage will dip a small amount when the instrument is generating signals in the 100ohm setting.

.5.4.2 Signature Generator

This section of the Control Ribbon selects the output voltage, resistance and frequency of the test waveform generated by the ASA.

Fig. 7

Pressing the **V+** or **V-** button will increase or decrease the output voltage from the instrument, this is in steps, and ranges from 0.2Vpk to 10Vpk. These steps are 0.2Vpk, 0.4Vpk, 0.6Vpk, 0.8Vpk, 1Vpk, 2Vpk, 3Vpk, 4Vpk, 5Vpk and 10Vpk.

Fig. 8

Pressing the **Ohm+** or **Ohm-** button will increase or decrease the output resistance from the instrument, this is in steps, and ranges from 100 ohms to 10K ohms (10,000 ohms). These steps are 100 ohms, 1K ohms and 10K ohms.

Fig. 9

Pressing the **Freq+** or **Freq-** button will increase or decrease the output frequency the instrument, this is in steps, and ranges from 10Hz to 1KHz (1,000Hz). These steps are 10Hz, 20Hz, 50Hz, 100Hz, 200Hz, 500Hz and 1KHz.

Voltage, resistance and frequency settings may also be set directly from the drop down boxes shown below.

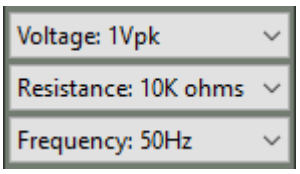

Fig. 10

These also show the current setting of the voltage, resistance and frequency.

Buttons **A** and **B** (as shown below) can be used to quickly access a favourite or much used function.

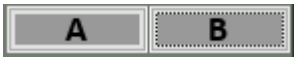

Fig. 11

The two push-buttons on the ASA101A (also labelled A and B) map directly to these two on-screen buttons, and when pressed the on-screen buttons will go yellow.

Two drop down lists below enable the user to select the function associated with each button (list shown below, with button A assigned to cycle frequency):

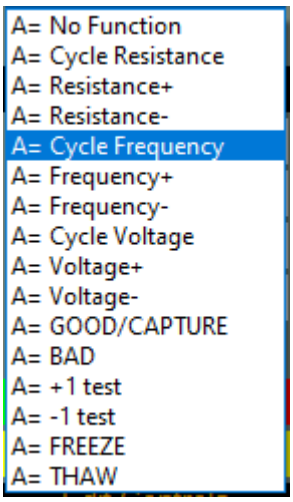

Fig. 12

The cycle function (i.e. Cycle Frequency) will go up relevant function and 'roll-over' to the minimum setting (e.g. 200Hz, 500Hz, 1KHz, 10Hz, 20Hz....), this function is useful if you are perhaps testing electrolytic capacitors and only want to assign a single button to the finding the best signature.

+1 / -1 test will increment or decrement the test number (equivalent to pressing the left/right arrow under Test Controls.

GOOD/CAPTURE and BAD are equivalents to the same named buttons under Test Controls.

FREEZE/THAW currently have no function in EPIC 20.012

Note

1Vpk means that the output voltage of the instrument has a peak voltage of +/-1Vpk, this would be equivalent of 2Vpk-pk (peak to peak) or 0.707Vrms.

.5.4.3 Test Controls - Advanced Mode

The Pin/record selected is incremented/decremented manually (using the buttons below) or advanced automatically (when in Auto Test, Auto Capture or Single Capture).

Fig. 13

These buttons (above) will increment/decrement through the individual Pin/records - using the controls below will increment/decrement through entire components at a time.

Fig. 14

Skipping straight to the first* record or the last press one of the buttons below.

Fig. 15

When changing to a different record, the instruments output voltage/resistance/frequency settings are automatically set to those of the new record (if a golden signature has been captured, if no signature has been captured they remain as before). This feature is enabled by default (see below), uncheck the box to disable.

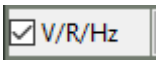

Fig. 16

To clear all **DUT Signatures** (GOOD and BAD) and reset to the first record, press the button below. Before the reset, a pop-up window will be ask if you really want to do this.

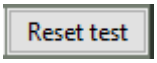

Fig. 17

The above function will not reset captured **Golden Signatures** (make sure you save the .EPT file at regular intervals).

Note
Floating the mouse over one of the buttons above will bring up a small text description of the button function.

Note
***The first usable record is #2, as record #1 is reserved for other (historic) functions.**

During a test, the percentage of pins that test **GOOD** and **BAD** is calculated and displayed (see image below).

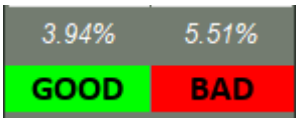

Fig. 18

GOOD and **BAD** buttons (above) will mark each record as either GOOD or BAD - typically this is used when overriding automatically tested signature results.

The next button has several different functions depending on which mode is being used. Default state is manual testing (use GOOD/BAD buttons to register the results of a signature test), pressing the button (below) will start an automatic test (**AUTO TEST**) at the current Pin/record:

Fig. 19

When the **AUTO TEST** is running, the button will show **TEST IN PROGRESS** (see below). Pressing the button will stop the automatic test. The test maybe resumed by pressing the button again.

Fig. 20

If the Edit/Capture signature tickbox (see Edit Controls) is ticked, then capture mode is selected and there will now be two buttons (see below) instead of the three before:

Fig. 21

The **SINGLE CAPTURE** button will capture the Live Signature and it's associated voltage/resistance/frequency settings and store it as the Golden Signature for that Pin/record, once done, it will automatically advance to the next Pin/record (ready for another capture).

The **AUTO CAPTURE** button will start the automatic capturing of Golden Signatures (see Auto Capture). When AUTO CAPTURE is running, the buttons will look like:

Fig. 22

Pressing **CAPT IN PROGRESS** button will stop the automatic capture.

.5.4.4 Edit Controls - Advanced Mode

The default condition is Manual Test (Edit/Capture signature unticked).

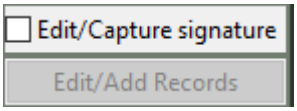

Fig. 23

To enter **Capture signature** mode, tick the box (see below).

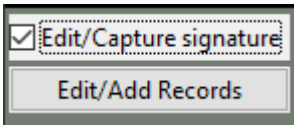

Fig. 24

Pressing the **Edit/Add Records** button (see above) will open a new window (see Edit/Add Records & Images).

.5.4.5 Freeze Controls - Compact Mode

Compact Mode is designed so that you can quickly perform:
1. classic analog signature analysis display
2. fast comparison between two circuits

To switch between Compact and Advanced modes click here.

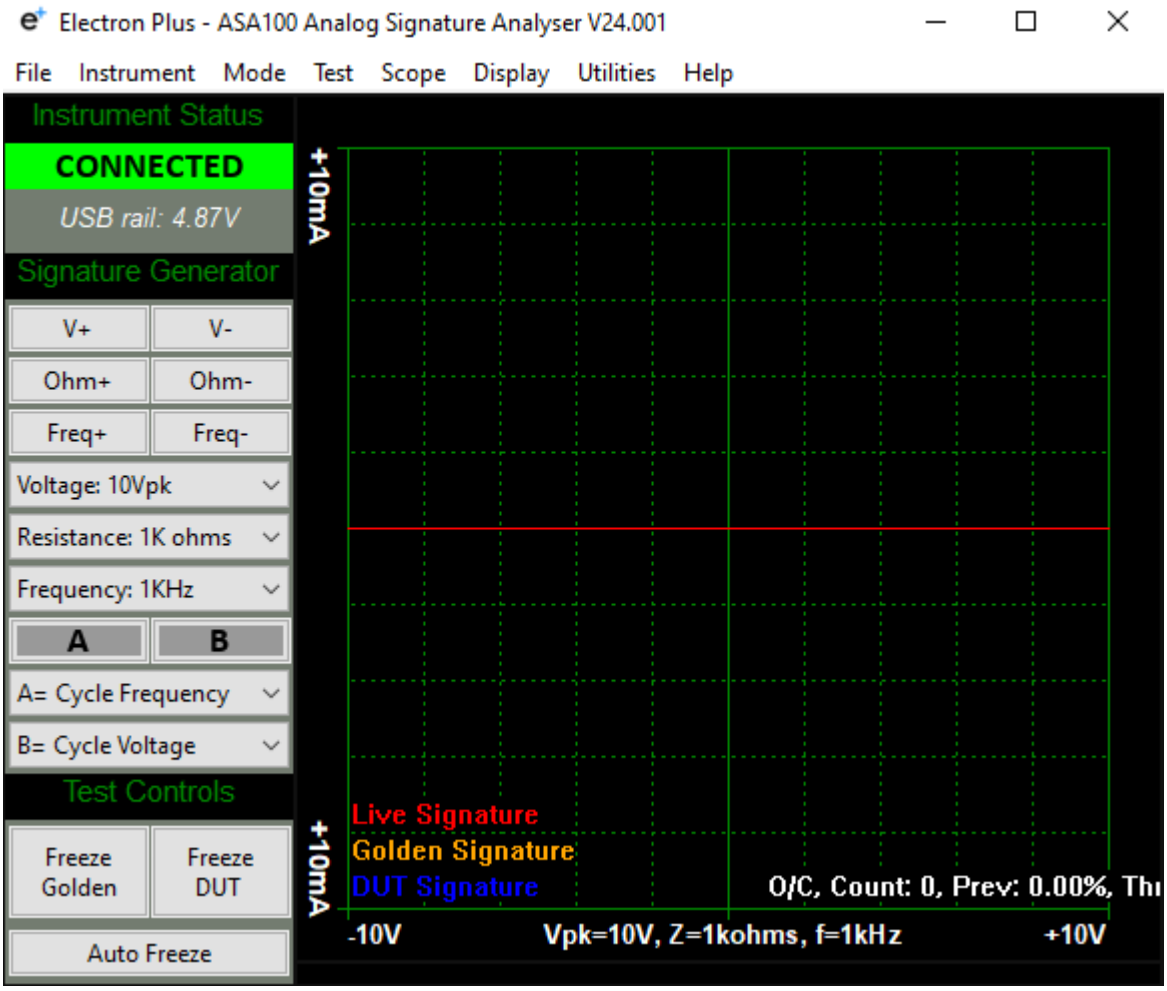

Fig. 25

The basic controls (signature generator) are the same as Advanced mode. Three extra controls (bottom left) have the following functions:

Freeze Golden button/function

Pressing this button will freeze the current signature and keep it displayed in a golden colour until it is either unfrozen (pressing the button again), or by enabling Auto Freeze.

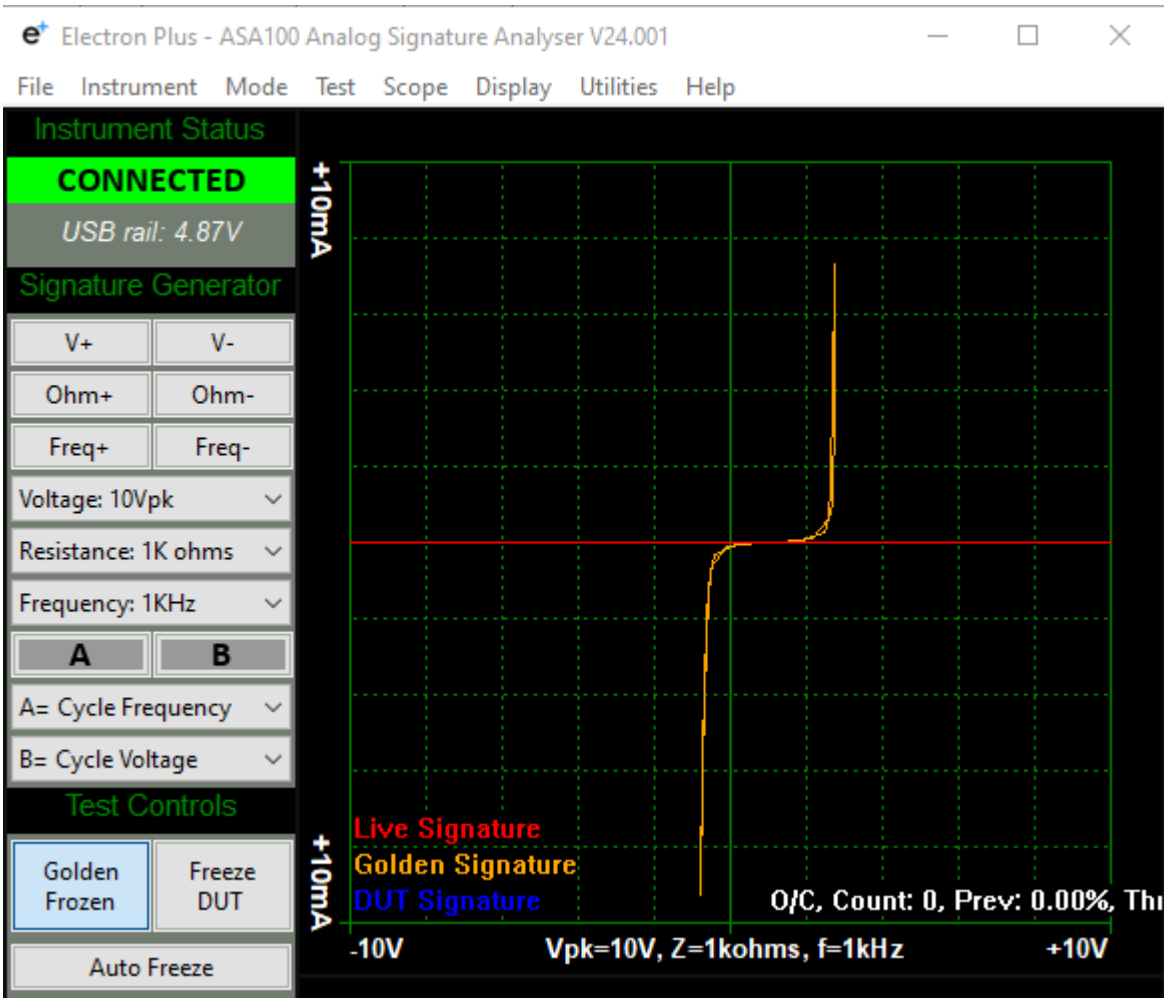

Fig. 26

You might typically use this if you are comparing two signatures live, i.e. the base-emitter junction of a known good transistor (say in the working left-channel of an audio amplifier) vs a suspect base-emitter junction (in the faulty right channel of the same amplifier).

Freeze DUT button/function

Pressing this button will freeze the current signature and keep it displayed in a blue colour until it is either unfrozen (pressing the button again), or by enabling Auto Freeze.

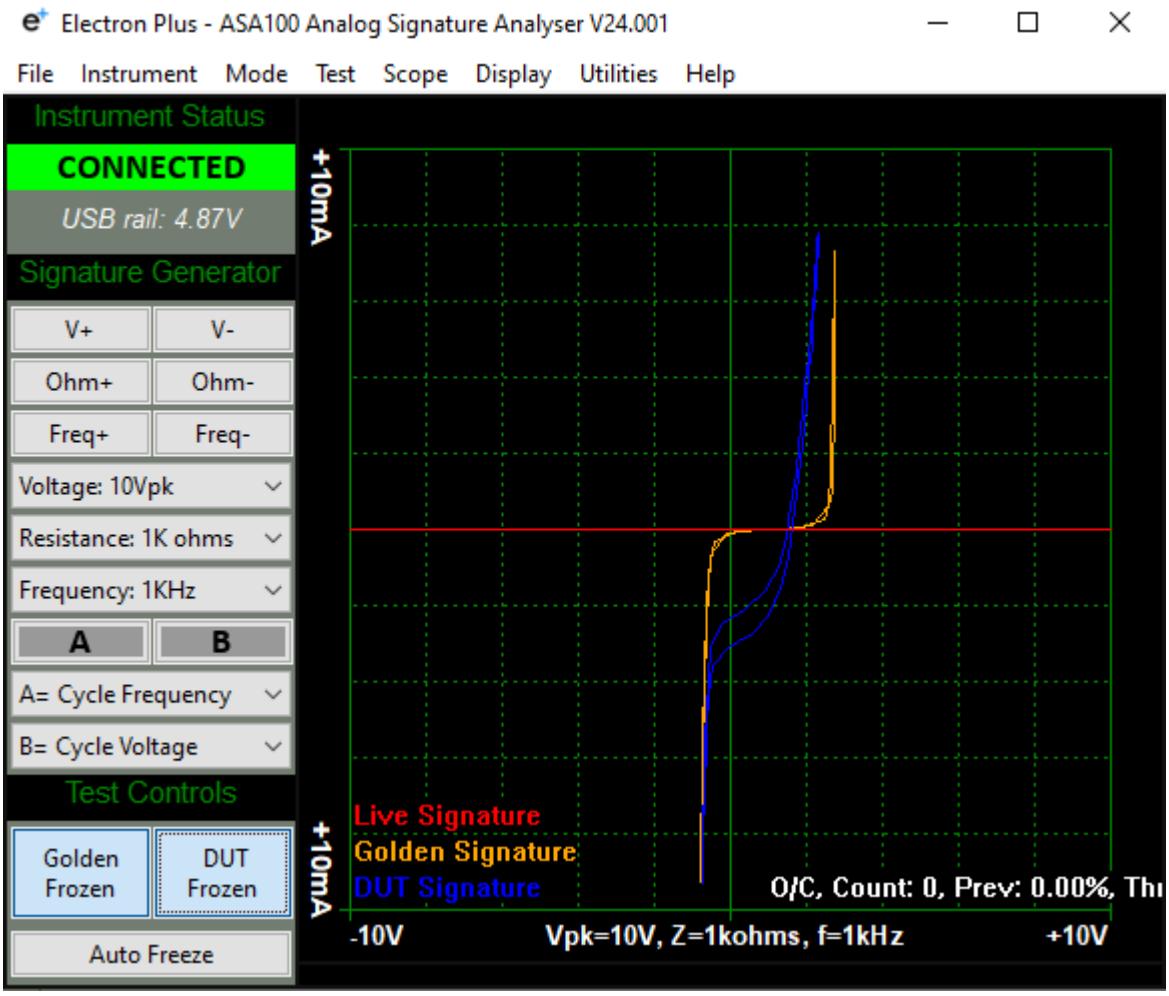

Fig. 27

Auto Freeze button/function

Auto Freeze allows for rapid comparison between two signatures without having to remember the previous signature and having to interact with the controls.

When enabled, Auto Freeze will:

1. apply test probes across known good test points, then
2. wait for the signature to stabilise (stability settings are adjustable), then
3. signature is automatically captured (now in gold), then
4. apply test probes across DUT test points, then
5. wait for the signature to stabilise (stability settings are adjustable), then
6. signature is automatically captured (now in blue), then goto step 1.

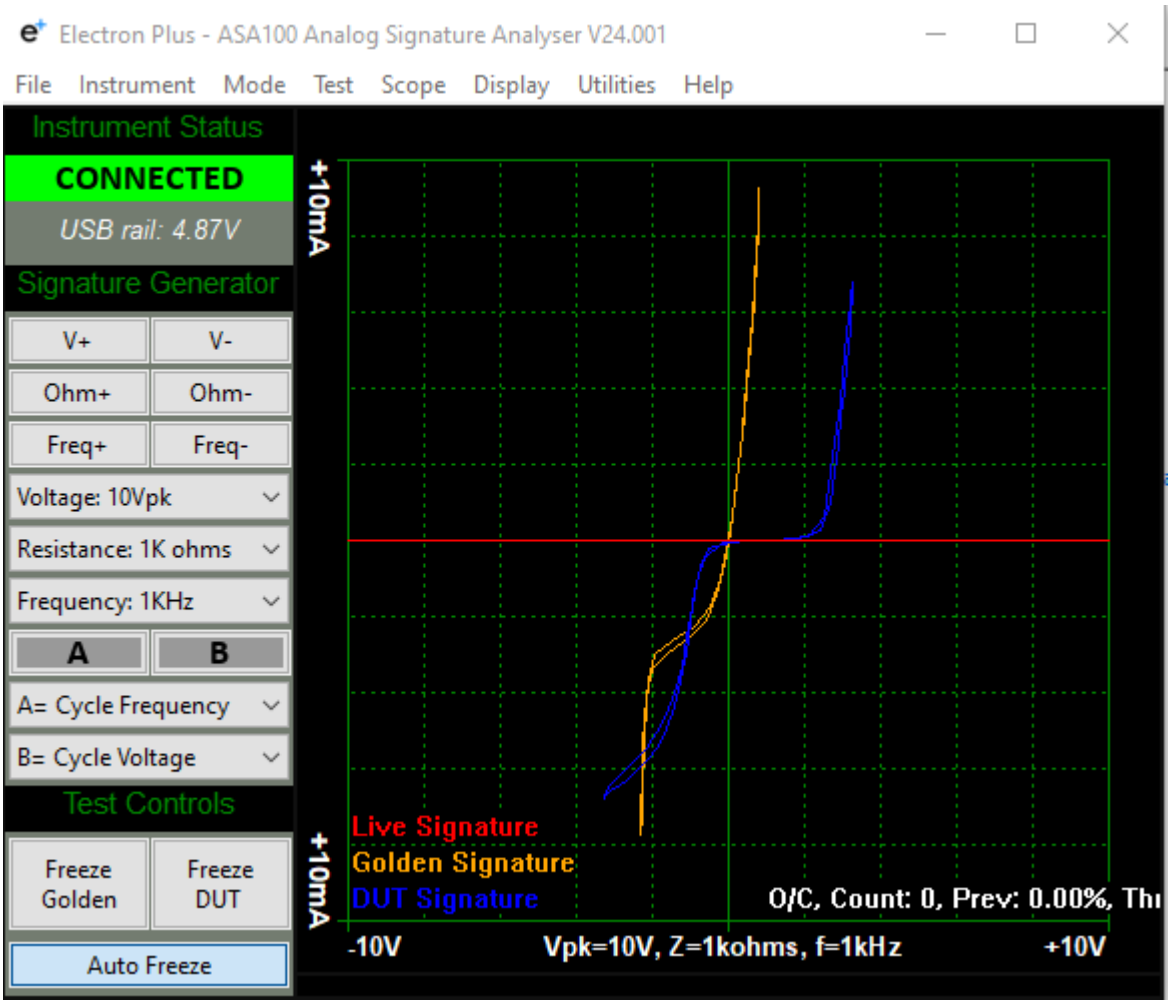

Fig. 28

Switching off Auto Freeze will preserve the screen until a new signature is displayed.

..5.5 Menu Bar

Across the top of the screen is the Menu Bar.

Controls for file management, instrument connection, overall mode, test settings, scope settings, visualisation, utilities and help are here:

Fig. 29

A detailed description of each drop down menu follows on the next few pages.

5.5.1.1 File > New

This topic is also covered here.

To create a new, empty .EPT test file:

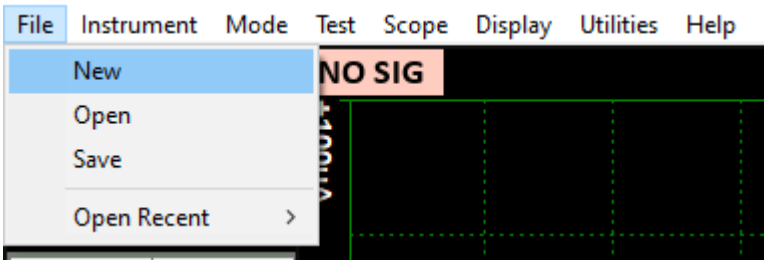

Fig. 30

Will bring up the Save file selector:

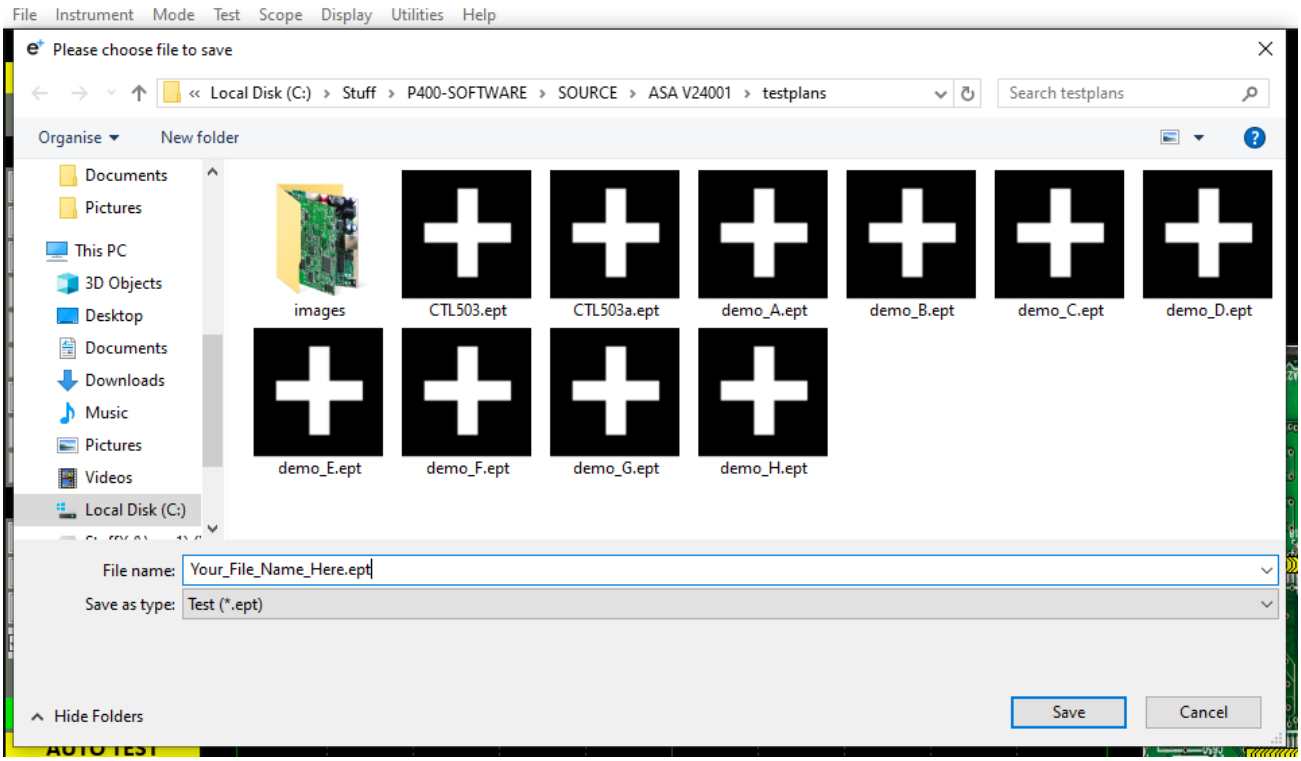

Fig. 31

Files can be saved to any location on your computer or network, however consider the speed of access to the file if storing across a network (especially lower cost NAS devices).

.EPT files are based on the common CSV file format.

5.5.1.2 File > Open

To open a .EPT test file:

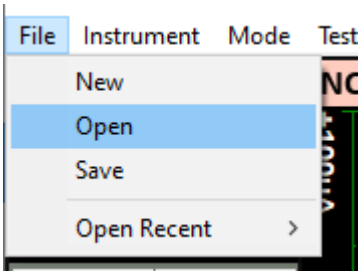

Fig. 32

Select the .EPT file to open:

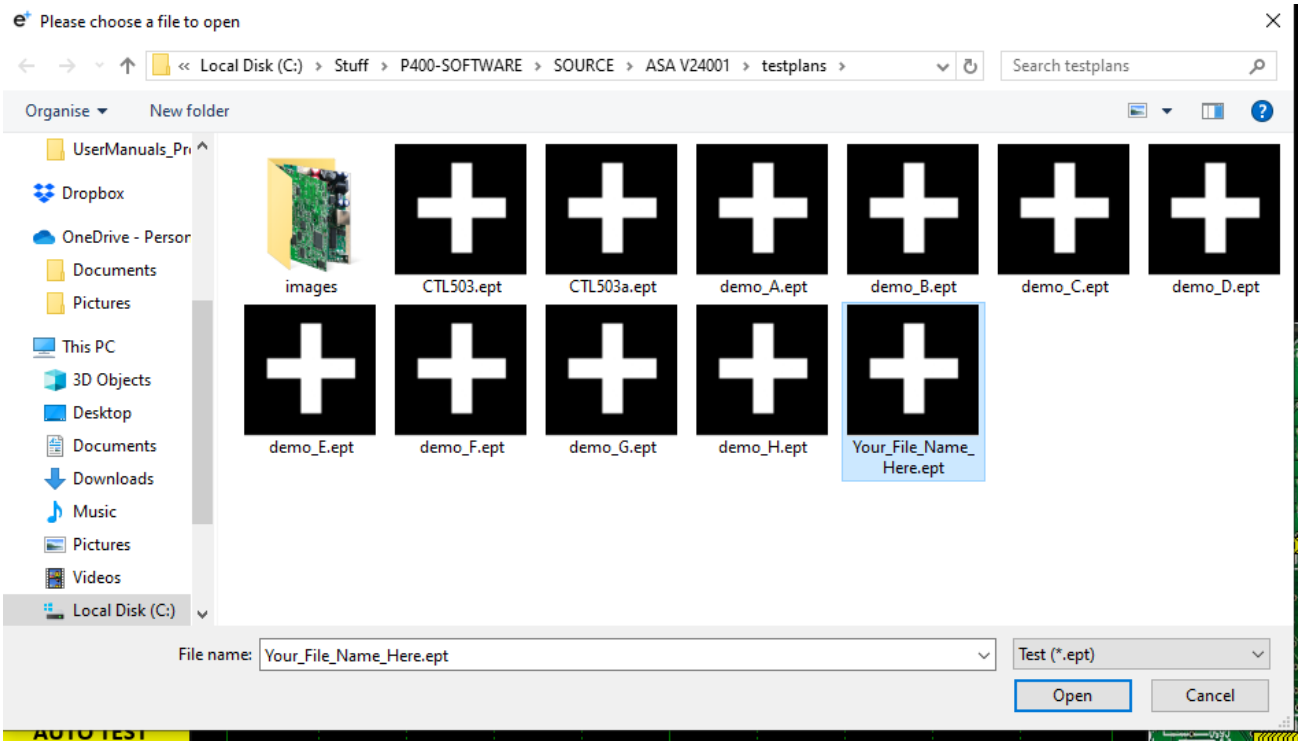

Fig. 33

5.5.1.3 File > Save

To save a .EPT file:

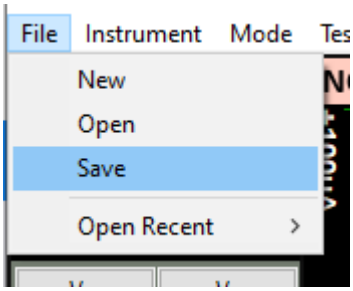

Fig. 34

Enter either a new name OR just click SAVE on the file selector:

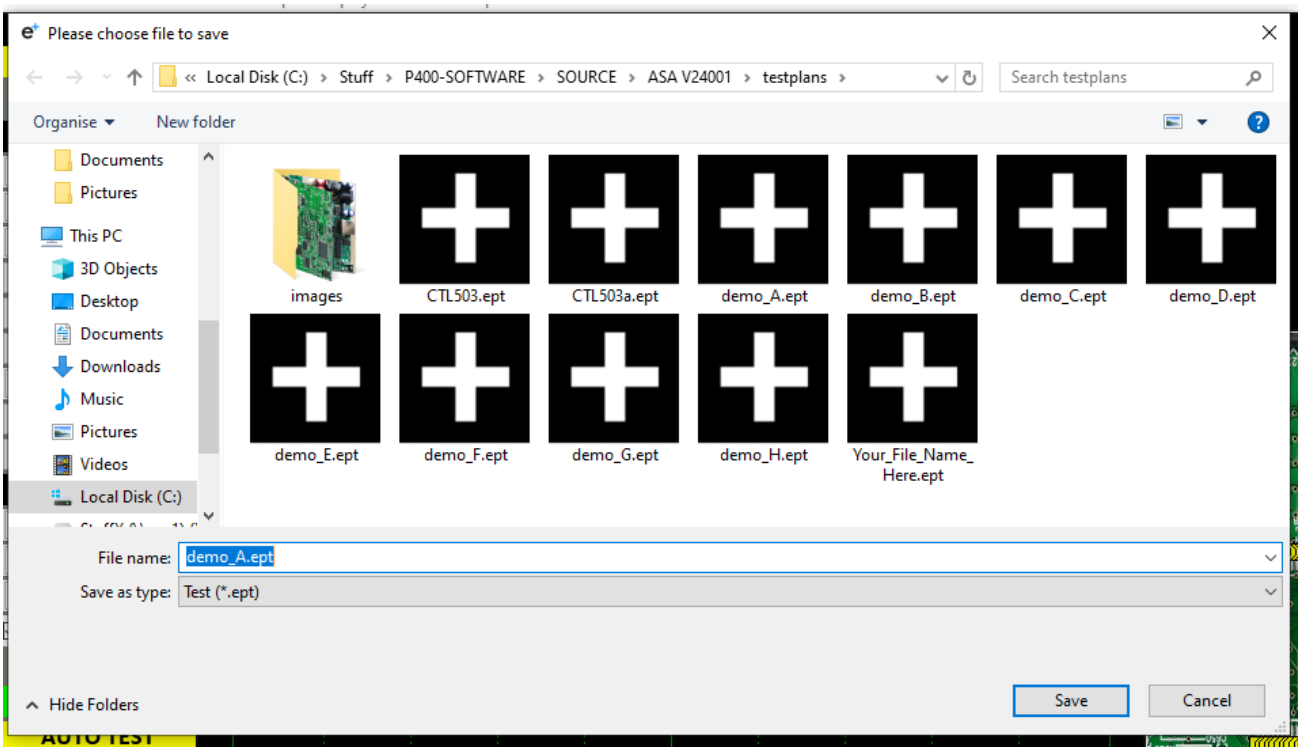

Fig. 35

5.5.1.4 File > Open Recent

To open a recently saved .EPT file:

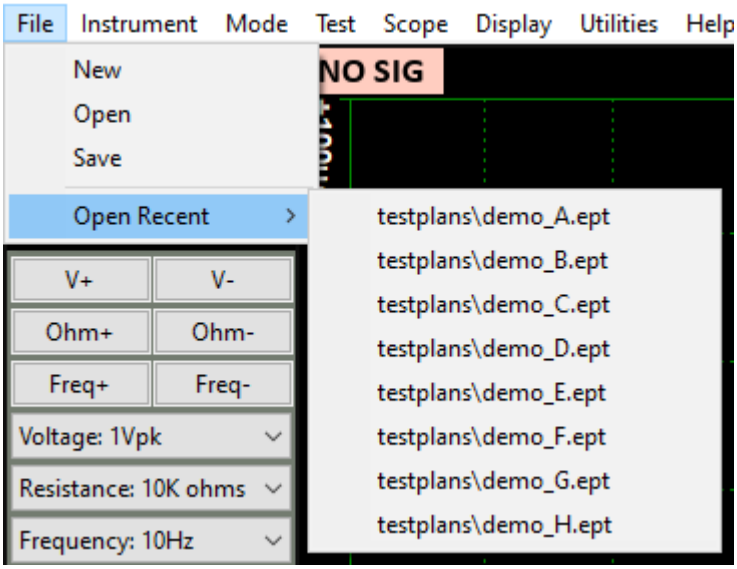

Fig. 36

Select a file to open by selecting one of the eight most recent .EPT files:

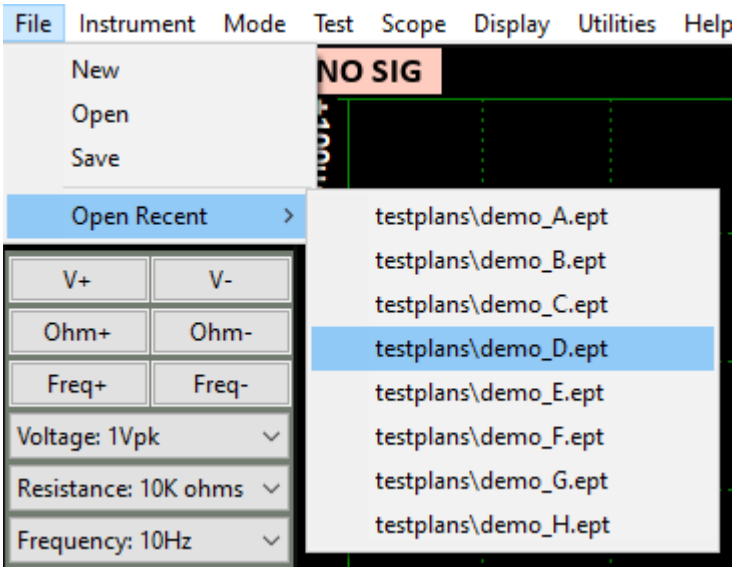

Fig. 37

5.5.2.1 Instrument > Connect/Disconnect

To connect to the instrument you can use the options in the MENU or the button on the Control Ribbon.

INSTRUMENT > CONNECT to connect, or **DISCONNECT** to disconnect.

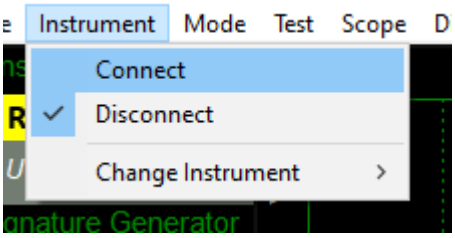

Fig. 38

or

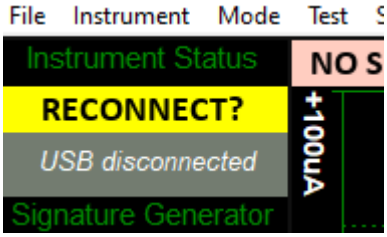

Fig. 39

Before the instrument connects it will check the identification in the FTDI USB bridge IC, an error message will be shown if the instrument selected is not the same as the instrument connected.

Technical Note
Upon successful connection, ASA will download the calibration coefficients file from the USB bridge IC. These are then stored in the ASA folder as "ASA_cal.txt"

5.5.2.2 Instrument > Change Instrument

When **ASA** is first installed it will initially start in ASA100 mode.

To change this:

INSTRUMENT > CHANGE INSTRUMENT and select the actual instrument you wish to use, you will then have to close and reopen **ASA** for this to take effect.

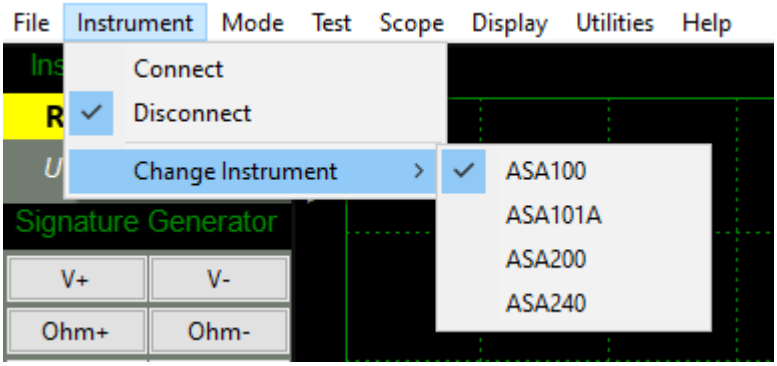

Fig. 40

Technical Note
Variable used in settings.txt: ActiveInstrument=ASA100

5.5.3.1 Mode > Advanced/Compact Mode

To change between Compact and Advanced modes:

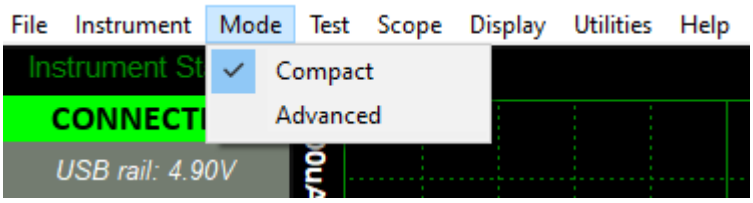

Fig. 41

The operational mode is immediately changed.

A description of Compact Mode function can be found here.

5.5.4.1 Test > Signature Overwrite

This function determines whether or not to overwrite an already captured golden signature.

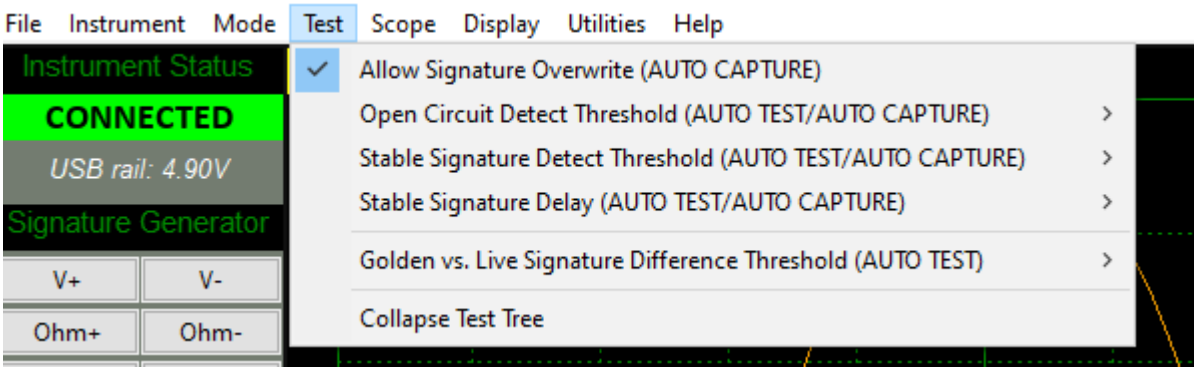

Fig. 42

If disabled (no tick) the AUTO CAPTURE will move to the next available pin that has not been sampled (i.e. pink).
If enabled (ticked) the AUTO CAPTURE will move to the next pin regardless if it has been sampled (i.e. pink OR yellow).

Typically this function is disabled (no tick), however if you wish to use AUTO CAPTURE to gather new golden signatures then this function should be enabled. In either case you can still overwrite a previously captured golden signature if you manually click on the pin concerned.

5.5.4.2 Test > Open Circuit Detect Threshold

Selects the percentage variation from true 'open circuit' that ASA uses to determine the 'open circuit' condition.

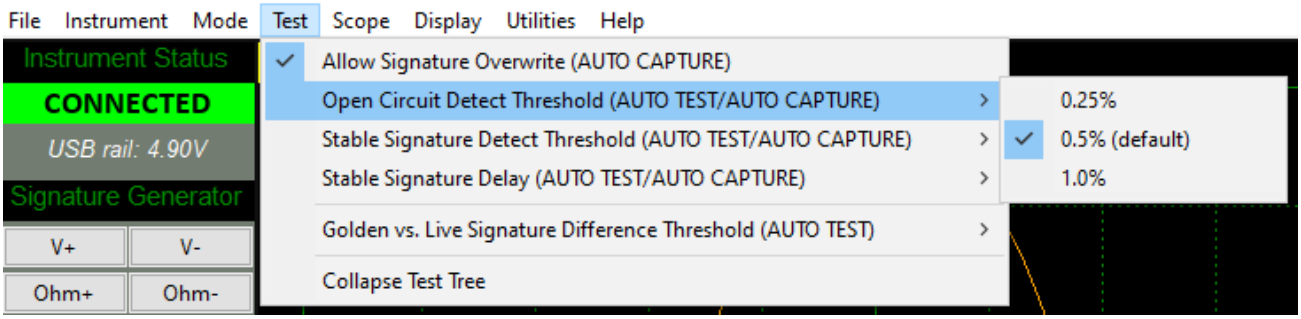

Fig. 43

Typically leave this at 0.5% (default) unless it is causing false OC triggers (reduce to 0.25%) or there is noise in the test setup (raise to 1%).

To aid tuning, text at the bottom right of the graph displays O/C when open circuit conditions are met:

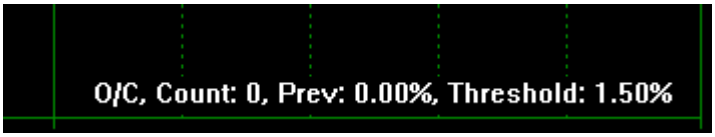

Fig. 44

5.5.4.3 Test > Stable Signature Detect Threshold

Selects the percentage variation allowable between consecutive signature samples before the ASA considers the signature meets the basic stable status.

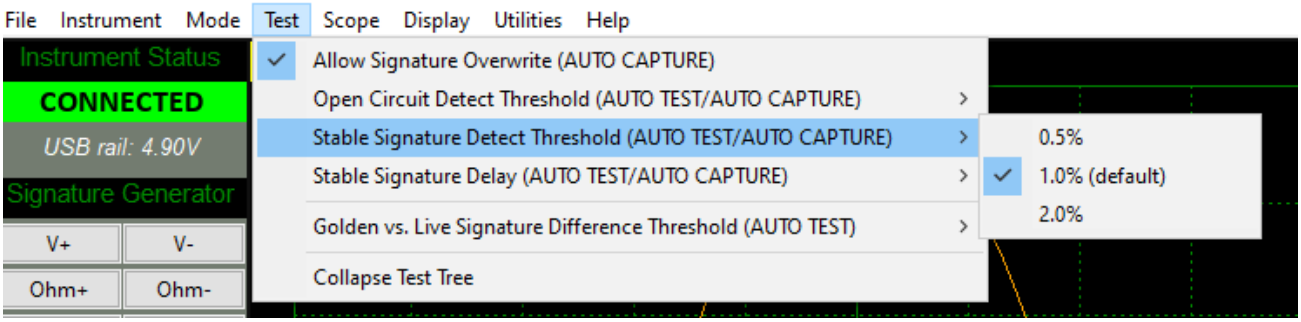

Fig. 45

Typically leave this at 1% (default) unless noise in the DUT (rare but possible) is causing false stable signature triggers (increase to 2%) or there is requirement for tighter performance between good and bad signatures (reduce to 0.5%).

Setting to 2% will typically decrease the time to detect a stable signature. Setting to 0.5% will typically increase the time taken to detect a stable signature.

To aid tuning, text at the bottom right of the graph displays **Stable** when stable conditions are met:

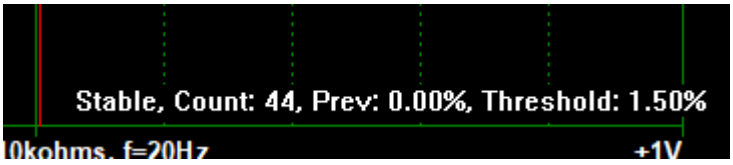

Fig. 46

5.5.4.4 Test > Stable Signature Delay

Controls the number of consecutive cycles that meet the 'stable signature' condition to be considered a stable signature (the point at which a signature is automatically captured).

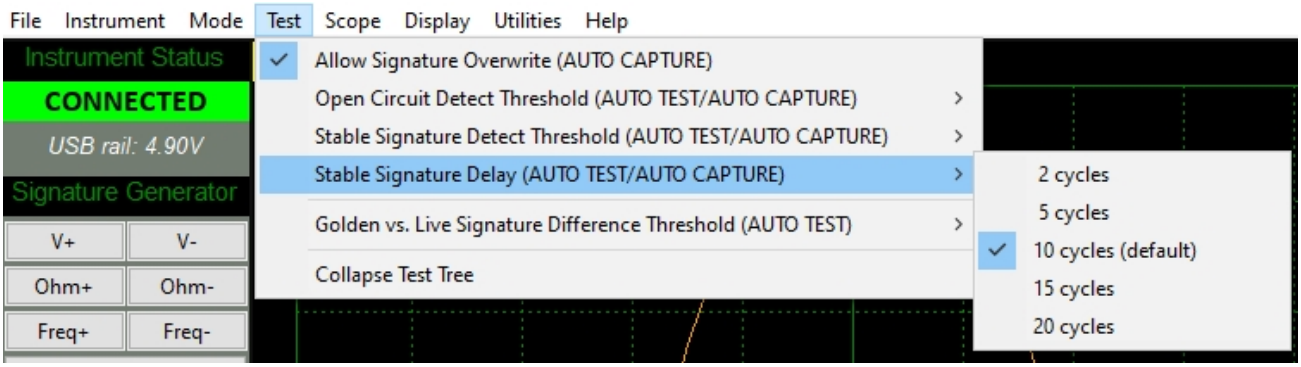

Fig. 47

To aid tuning, text at the bottom right of the graph displays **Count** when stable conditions are met:

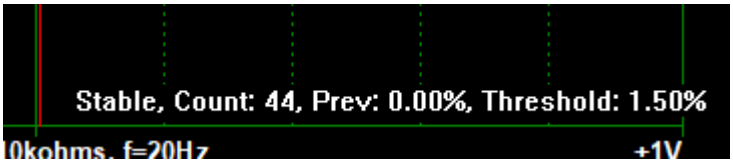

Fig. 48

5.5.4.5 Test > Golden/Live Signature Difference Threshold

Selects the percentage variation between a previously captured Golden Signature and the live signature before the ASA considers them a match.

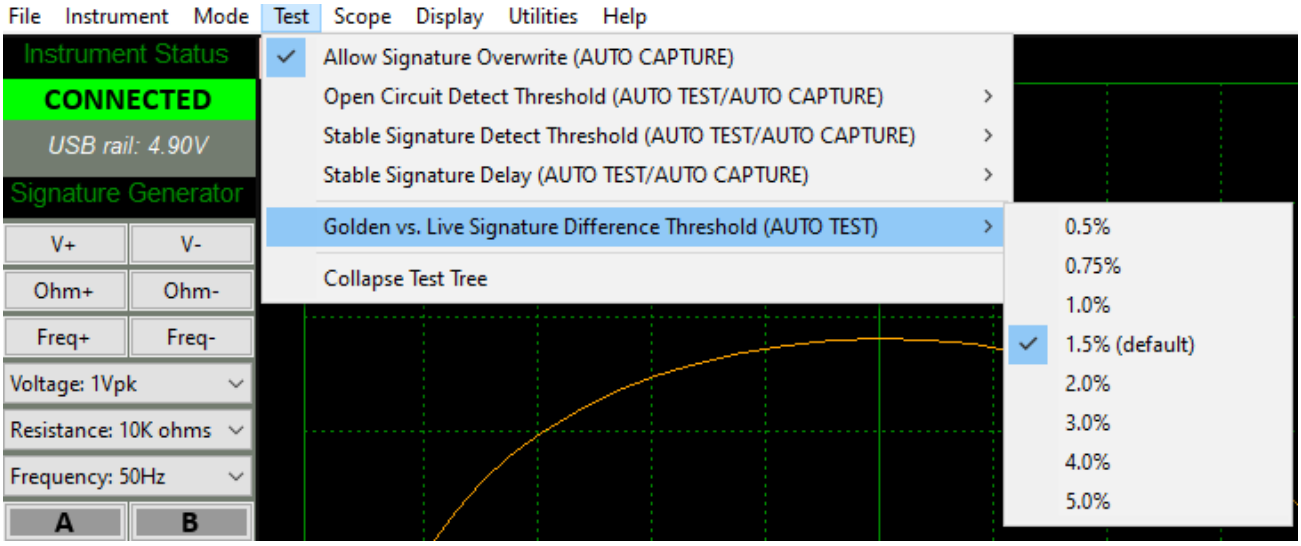

Fig. 49

Smaller percentages will typically increase the time it takes to match signatures and also result in fewer matches (due to noise and other minor differences between the Golden and DUT units.
Increasing the percentage will increase the number of false positives (by widening the acceptance criteria).

5.5.4.6 Test > Collapse Test Tree

Collapsing the Test Tree will quickly close all the expanded test points and is there to save time manually collapsing each test point (useful on larger boards).

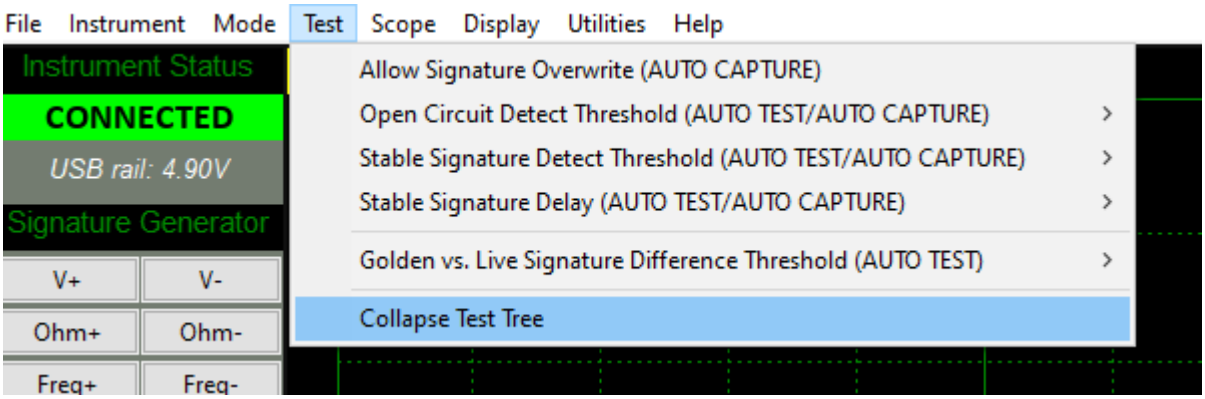

Fig. 50

An example of a partially expanded Test Tree:

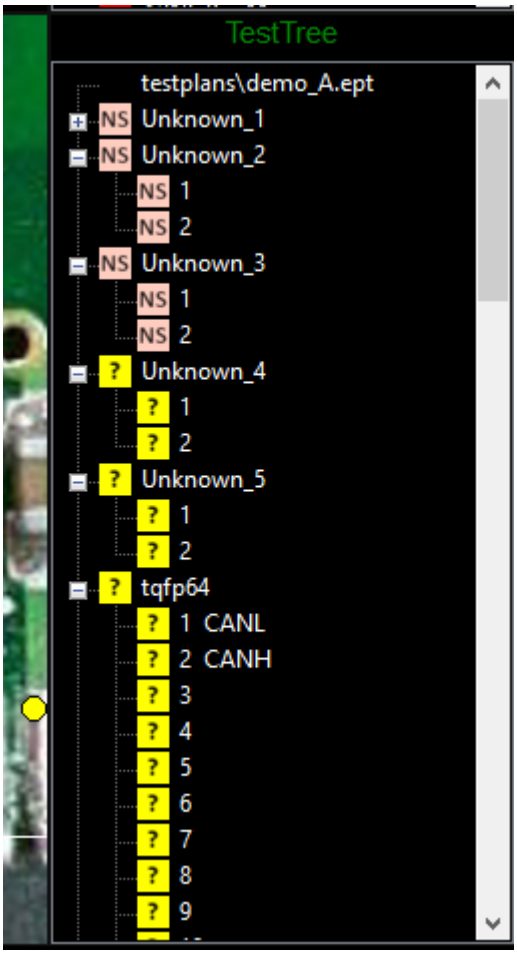

Fig. 51

The same Test Tree after the 'Collapse Test Tree' function is triggered:

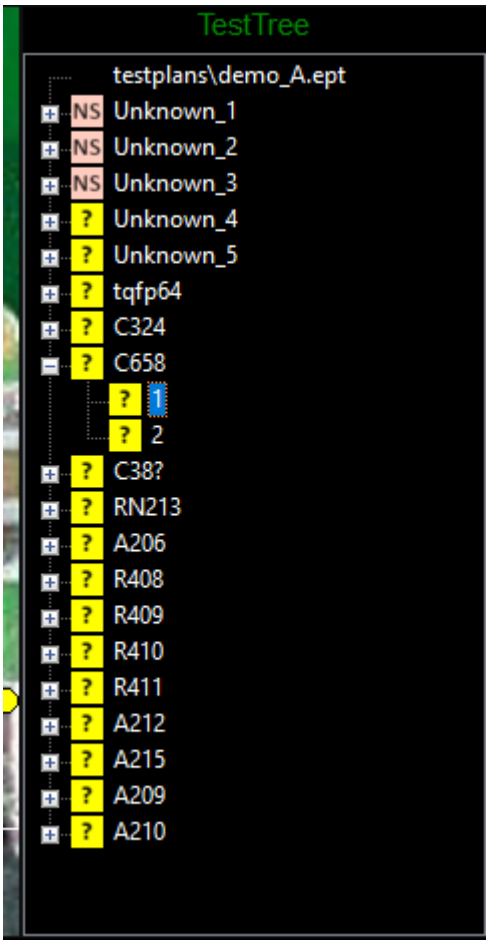

Fig. 52

NOTE - The currently selected pin/component is deliberately not collapsed.

5.5.5.1 Scope > Graticule

To enable/disable the Graticule:

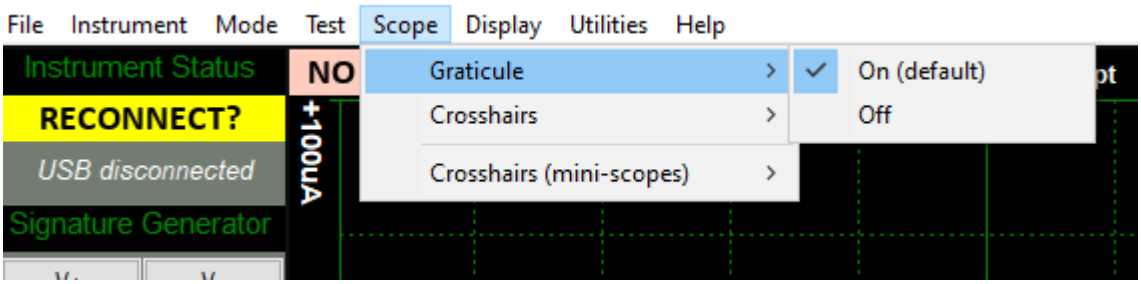

Fig. 53

An example with the Graticule ON:

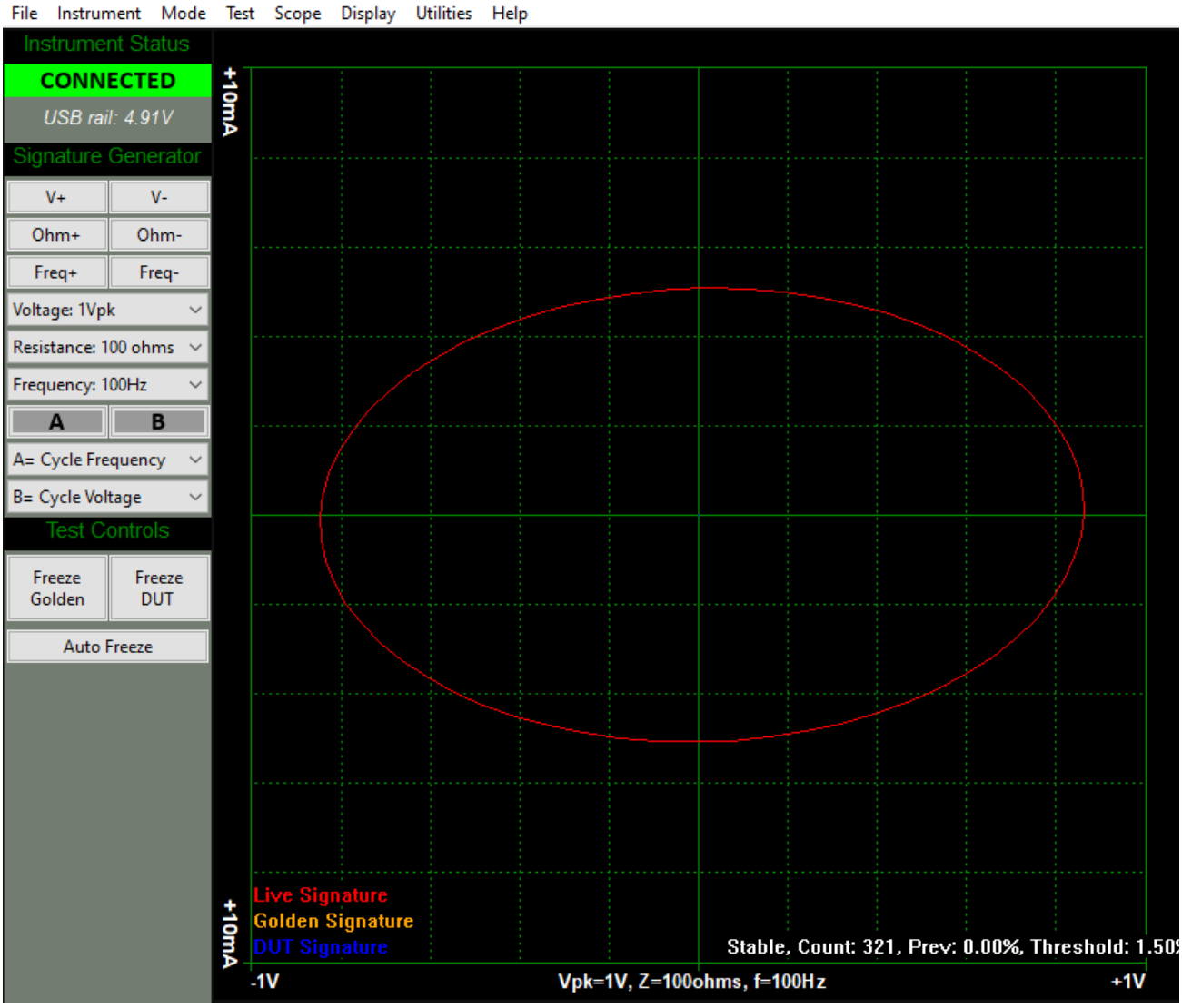

Fig. 54

An example with Graticule OFF:

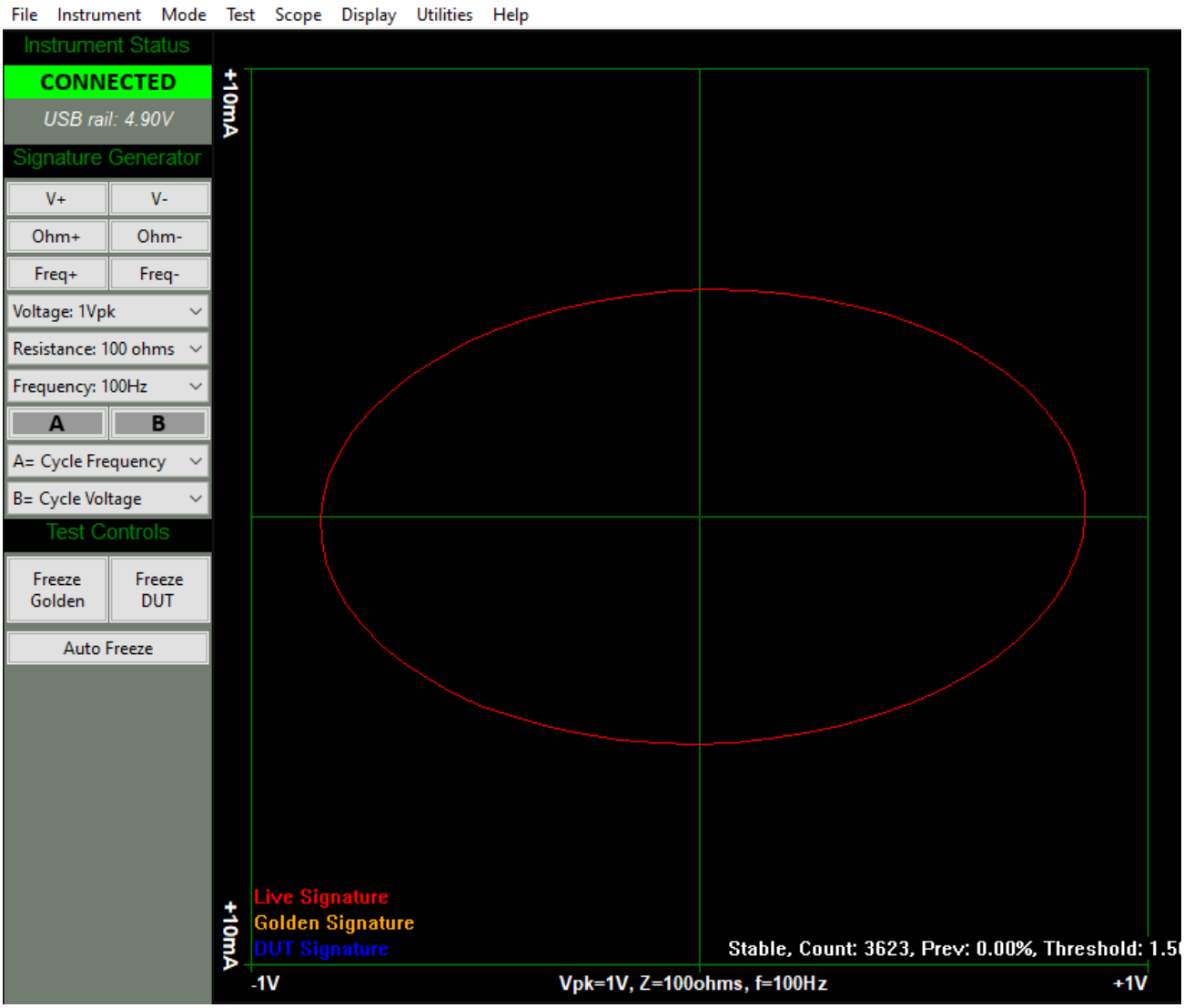

Fig. 55

5.5.5.2 Scope > Crosshairs

The Crosshairs have three settings:

Fig. 56

Example shown here Crosshairs ON (graticule OFF for clarity):

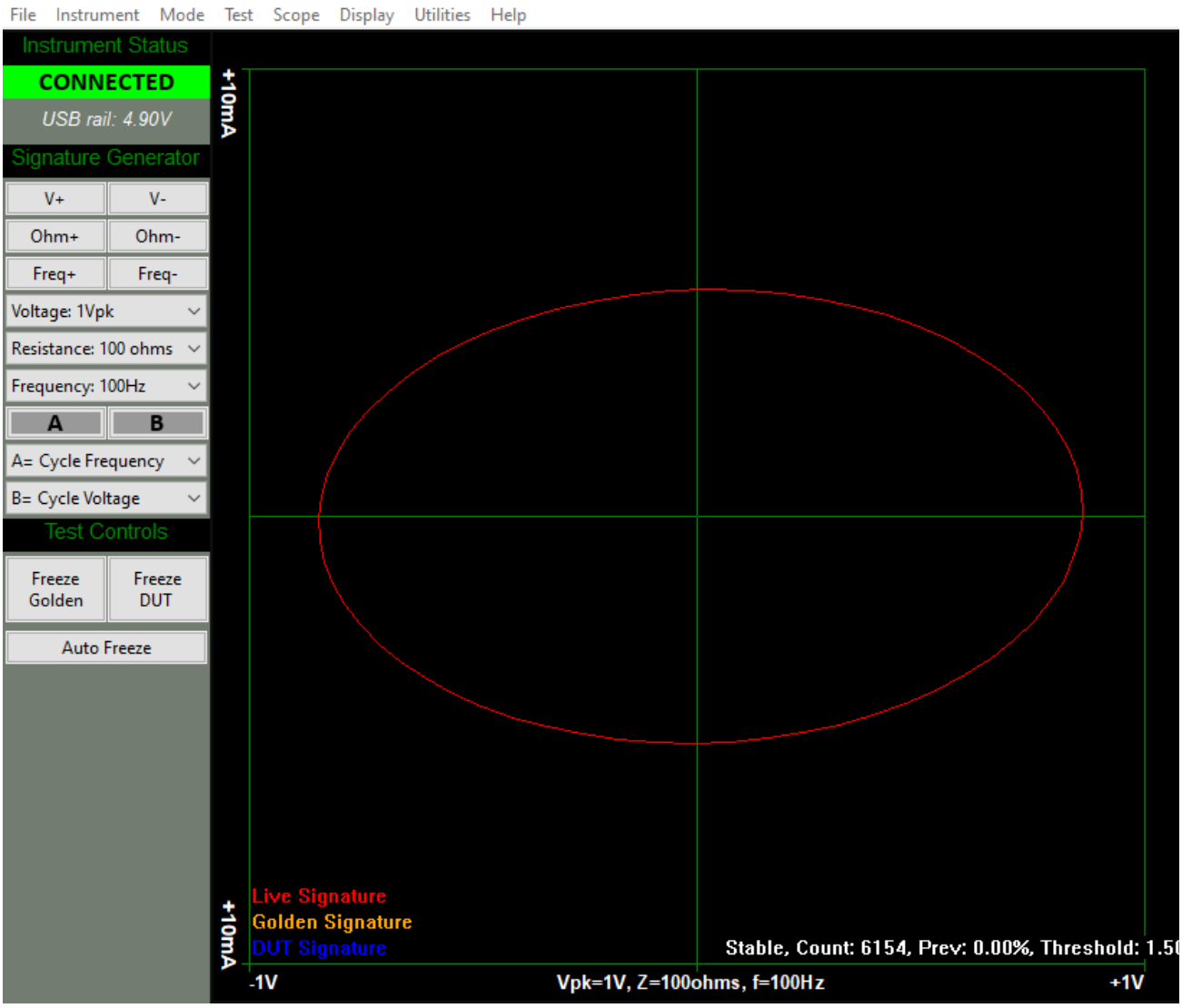

Fig. 57

Example shown here Crosshairs Classic (graticule OFF for clarity):

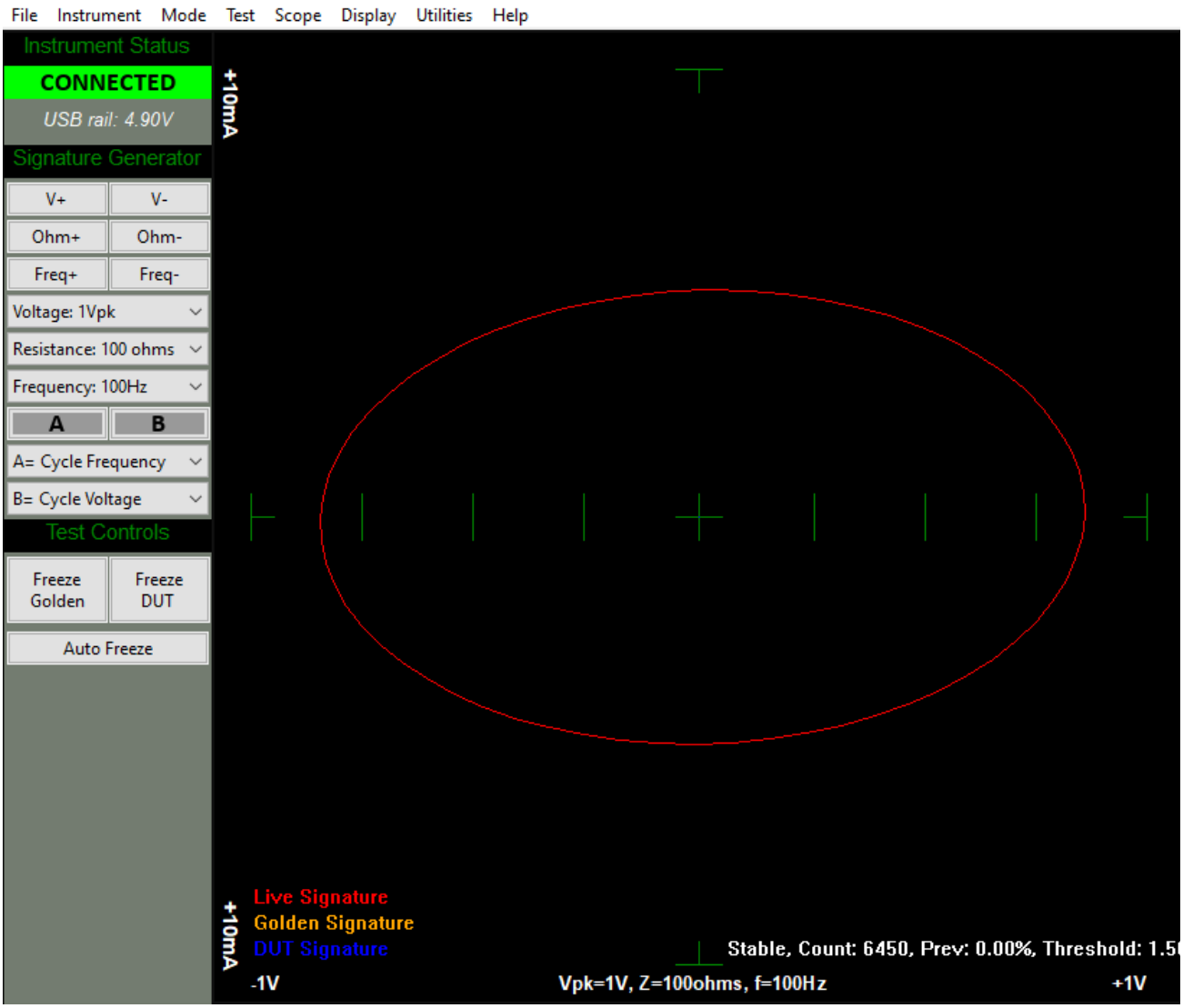
File
Instrument
Mode
Test
Scope
Display
Utilities
Help
Instrument Status
CONNECTED
USB rail: 4.90V
Signature Generator
V+
V-
Ohm+
Ohm-
Freq+
Freq-
Voltage: 1Vpk
Resistance: 100 ohms
Frequency: 100Hz
A
B
A= Cycle Frequency
B= Cycle Voltage
Test Controls
Freeze Golden
Freeze DUT
Auto Freeze
+10mA
+10mA
Live Signature
Golden Signature
DUT Signature
Stable, Count: 6450, Prev: 0.00%, Threshold: 1.5
-1V
Vpk=1V, Z=100ohms, f=100Hz
+1V

Fig. 58

Example shown here Crosshairs Off (graticule OFF for clarity):

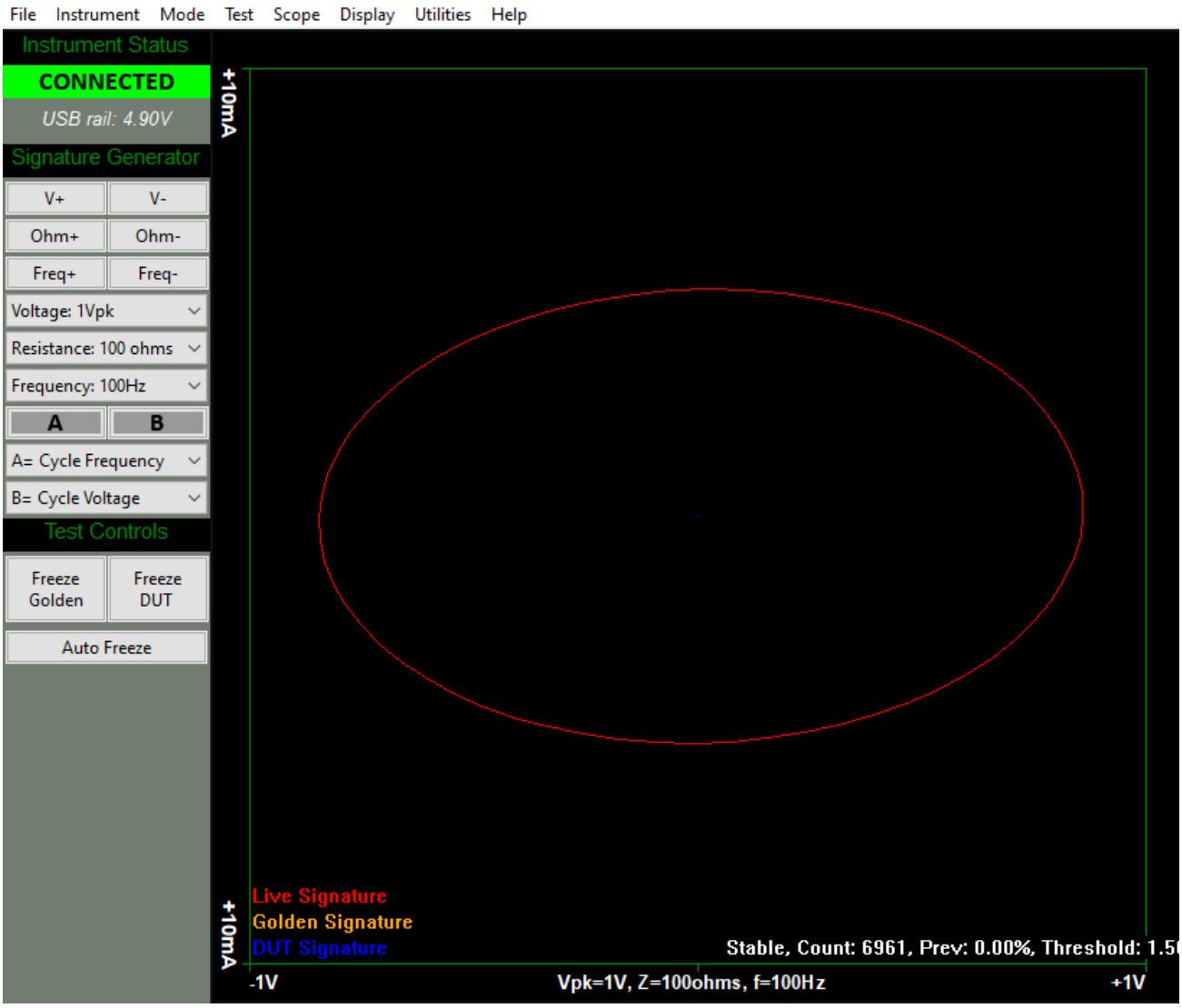

Fig. 59

5.5.5.3 Scope > Crosshairs (mini-scopes)

To enable/disable the Crosshairs in the mini-scopes:

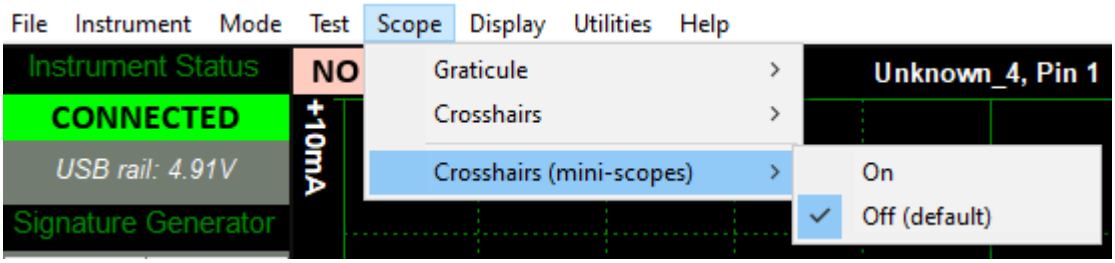

Fig. 60

An example of mini-scopes with the Crosshairs OFF (default):

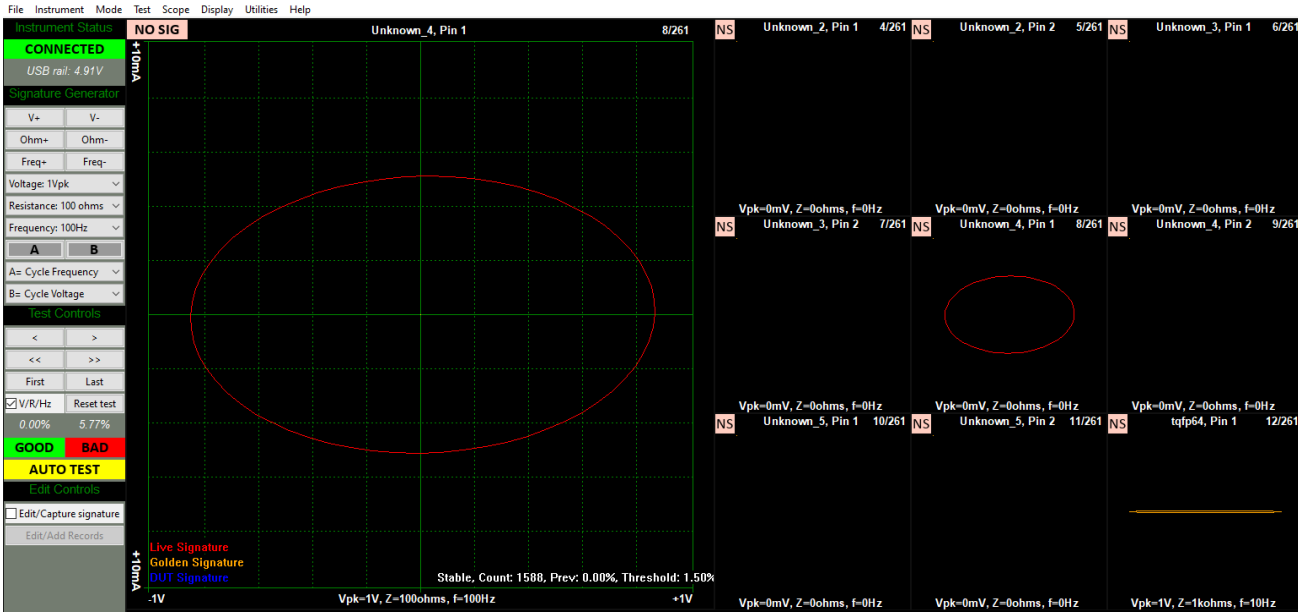

Fig. 61

An example of mini-scopes with the Crosshairs ON:

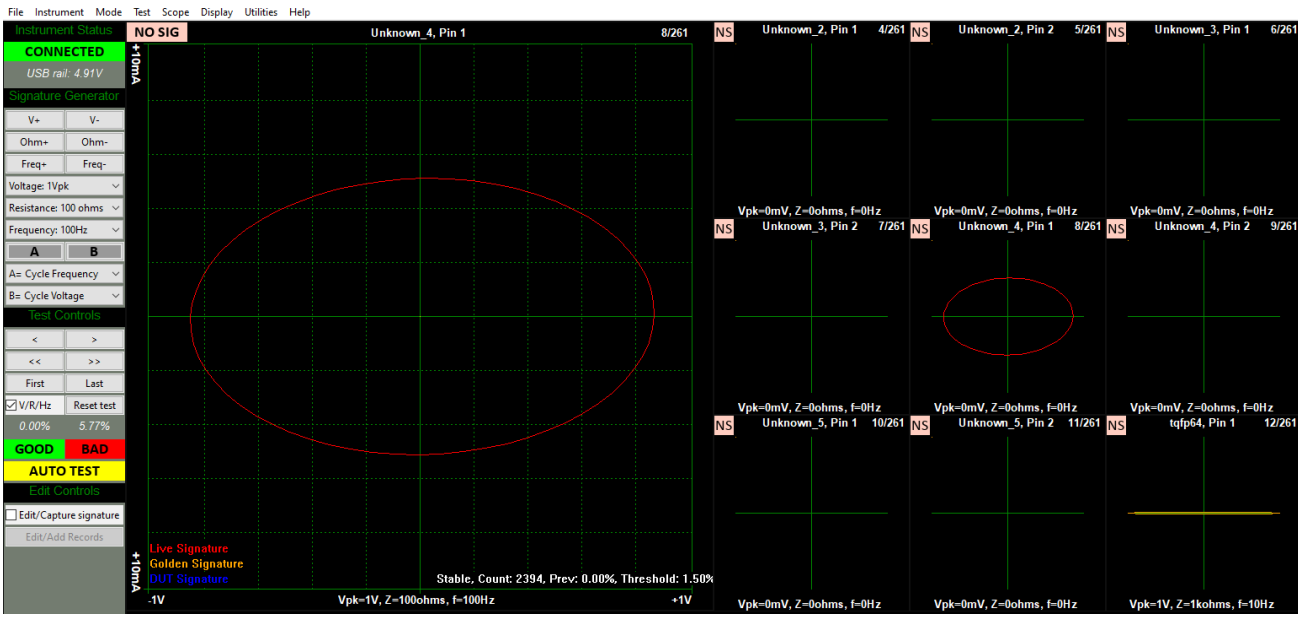
File Instrument Mode Test Scope Display Utilities Help
Instrument Status
CONNECTED
USB rail: 4.91V
Signature Generator
V+ V-
Ohm+ Ohm-
Freq+ Freq-
Voltage: 1Vpk
Resistance: 100 ohms
Frequency: 100Hz
A B
A= Cycle Frequency
B= Cycle Voltage
Test Controls
< >
<< >>
First Last
V/R/Hz Reset test
0.00% 5.77%
GOOD BAD
AUTO TEST
Edit Controls
Edit/Capture signature
Edit/Add Records
NO SIG
Unknown_4, Pin 1
8/261
+10mA
Live Signature
Golden Signature
DUT Signature
Stable, Count: 2394, Prev: 0.00%, Threshold: 1.50%
-1V
Vpk=1V, Z=100ohms, f=100Hz
+1V
NS Unknown_2, Pin 1 4/261
NS Unknown_2, Pin 2 5/261
NS Unknown_3, Pin 1 6/261
NS Unknown_3, Pin 2 7/261
NS Unknown_4, Pin 1 8/261
NS Unknown_4, Pin 2 9/261
NS Unknown_5, Pin 1 10/261
NS Unknown_5, Pin 2 11/261
NS tqfp64, Pin 1 12/261
Vpk=0mV, Z=0ohms, f=0Hz
Vpk=1V, Z=1kohms, f=10Hz

Fig. 62

5.5.6.1 Display > PCB Crosshairs

The PCB view Crosshairs can be 1 pixel wide (white) or 3 pixels wide (white centre line, flanked by black lines), this can be changed here:

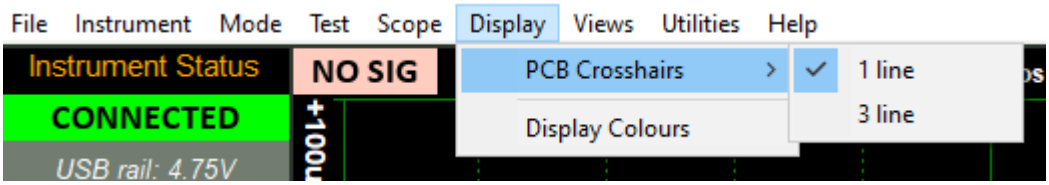

Fig. 63

An example of 1 line crosshairs (most commonly used):

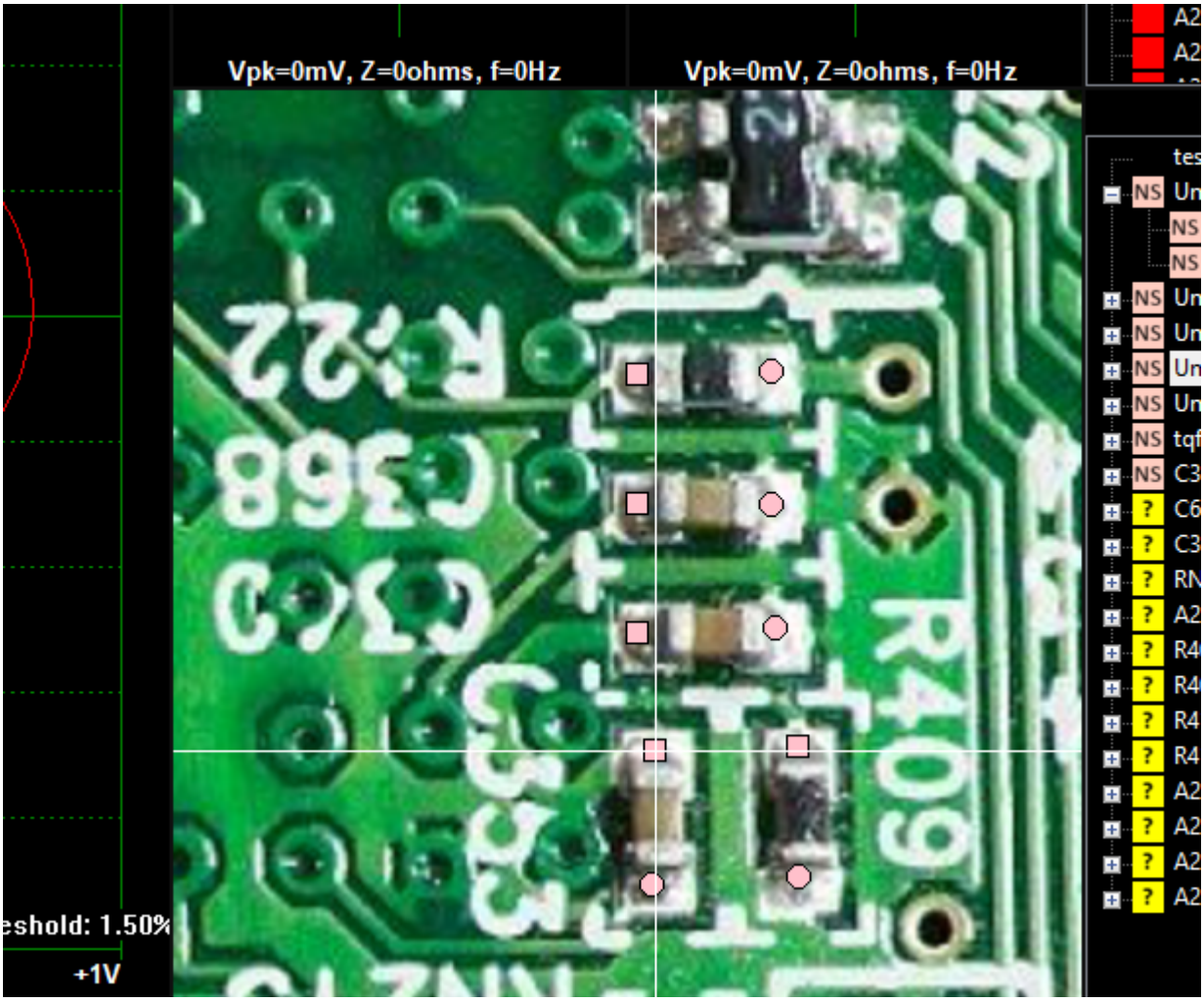

Fig. 64

An example of 3 line crosshairs (useful if you have a light/white coloured PCB image):

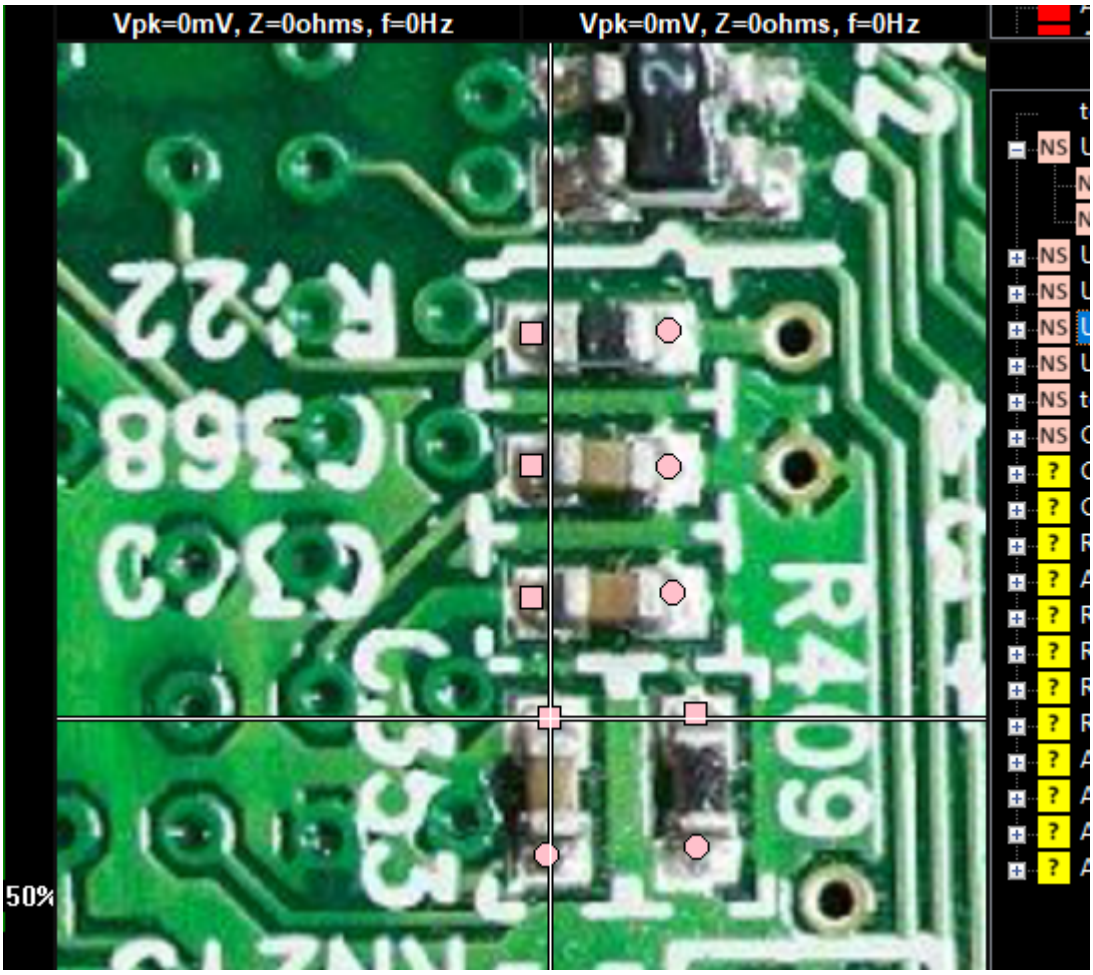

Fig. 65

5.5.6.2 Display > Display Colours

Display Colours can be changed:

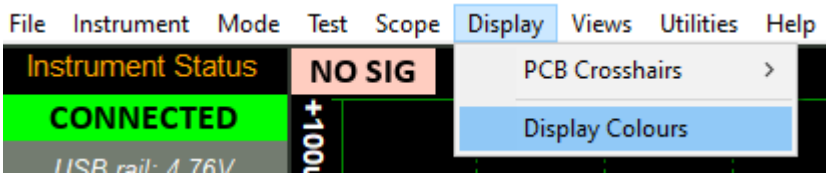

Fig. 66

When this option is selected a separate window is brought up:

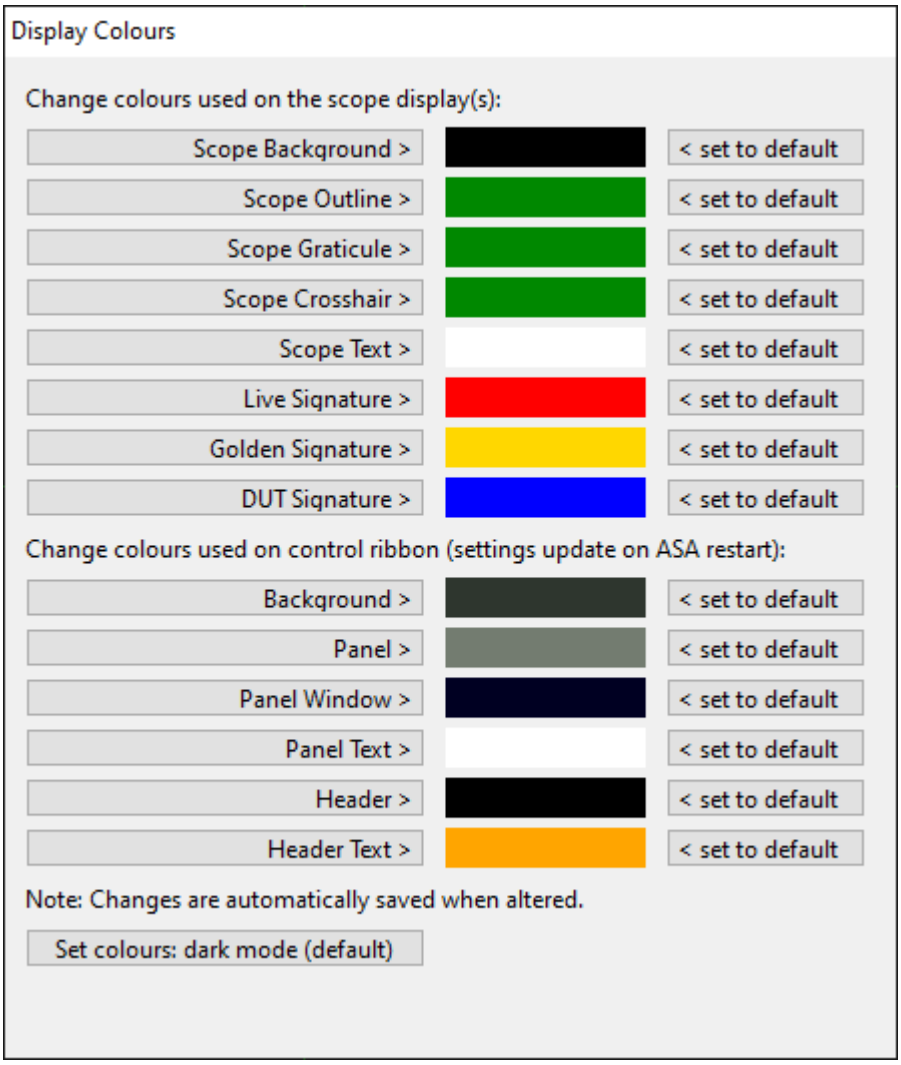

Fig. 67

Clicking a button (e.g. "Scope Background") will bring up a colour palette, select a new colour and click OK to make the change:

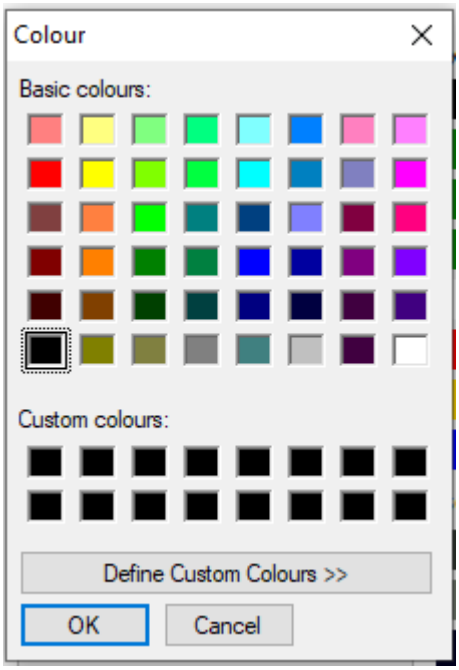

Fig. 68

Each coloured item option (e.g. "Scope Background") can be reset to default by pressing the "< set to default" button.
All coloured item options can be set to default simultaneously by pressing the "Set colours: dark mode (default)" button.

.5.5.7 Views

There are multiple 'view' configurations that can be selected. Users will often prefer one style (commonly this is: **2 mini-scopes + PCB + TestTree+ BadTree**), however we encourage testing alternate 'views' as they may be better suited to your testing.

The options are shown below - on the following pages are examples of the same Pin/record (41/127) viewed in different configurations.

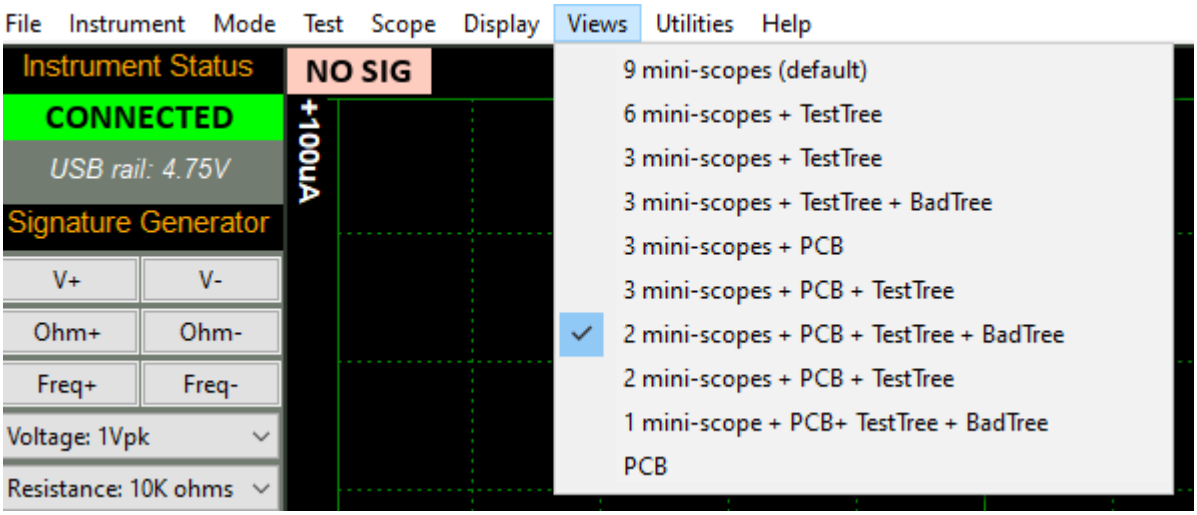

Fig. 69

The mini-scopes are useful to see a previous test or the next test.

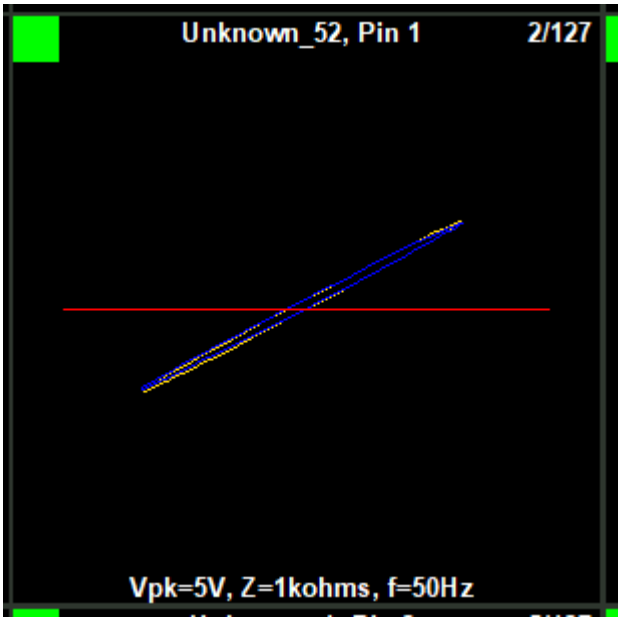

Fig. 70

The coloured square in the top-left corner of a mini-scope is the test status of that Pin/record, and follows the convention:

GREEN - good signature

RED - bad signature
YELLOW - untested (no DUT signature captured)
PINK - no Golden signature recorded yet.

5.5.7.1 Views > 9 mini-scopes

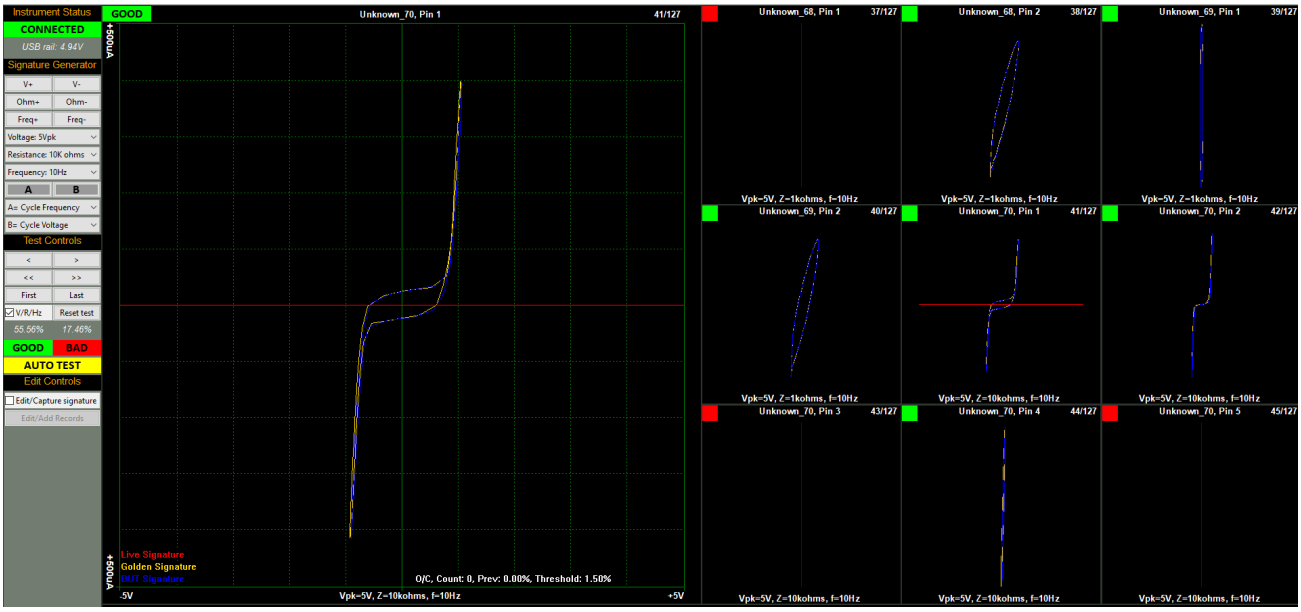

Fig. 71

The centre mini-scope of the 9 is the current Pin/record (same image as the main scope).

Clicking on any of the mini-scopes will select that Pin/record as the main scope image.

5.5.7.2 Views > 6 mini-scopes + TestTree

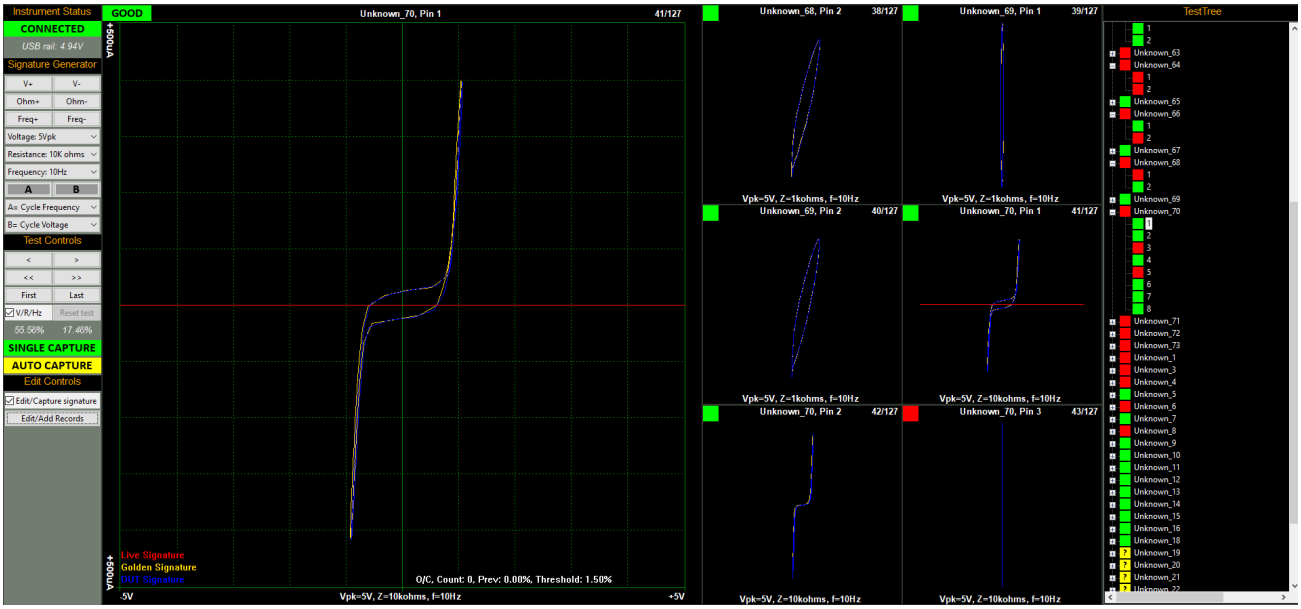

Fig. 72

The centre-right mini-scope of the 6 is the current Pin/record (same image as the main scope).

Clicking on any of the mini-scopes or TestTree points will select that Pin/record as the main scope image.

5.5.7.3 Views > 3 mini-scopes + TestTree

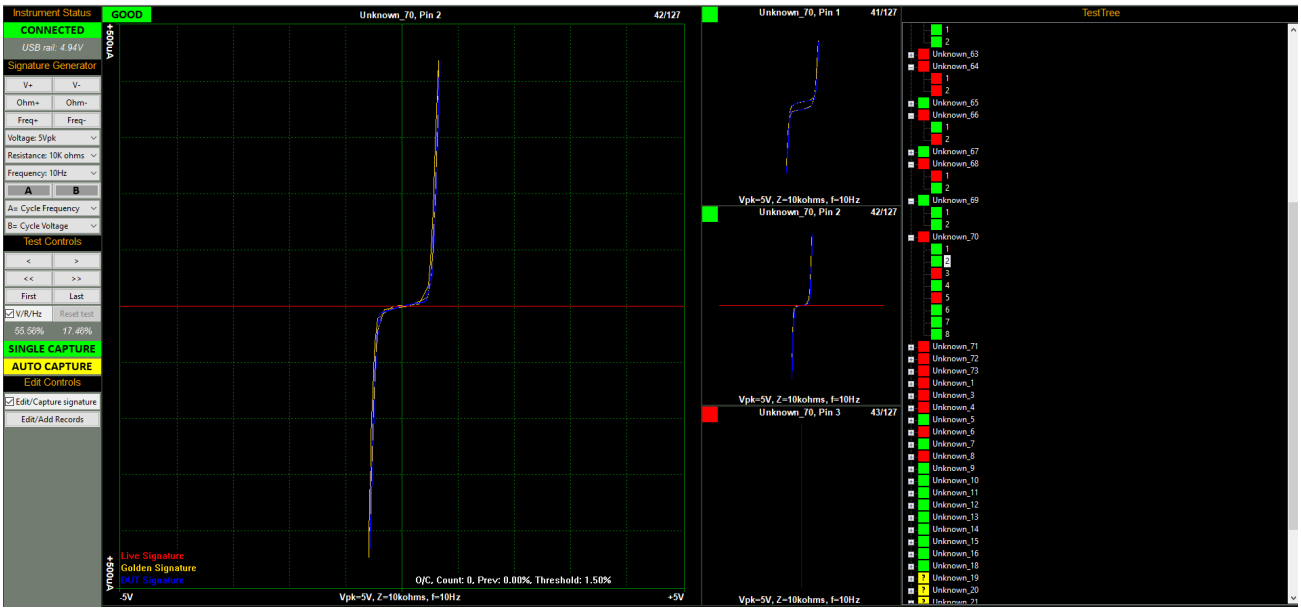

Fig. 73

The centre mini-scope of the 3 is the current Pin/record (same image as the main scope).

Clicking on any of the mini-scopes or TestTree points will select that Pin/record as the main scope image.

5.5.7.4 Views > 3 mini-scopes + TestTree + BadTree

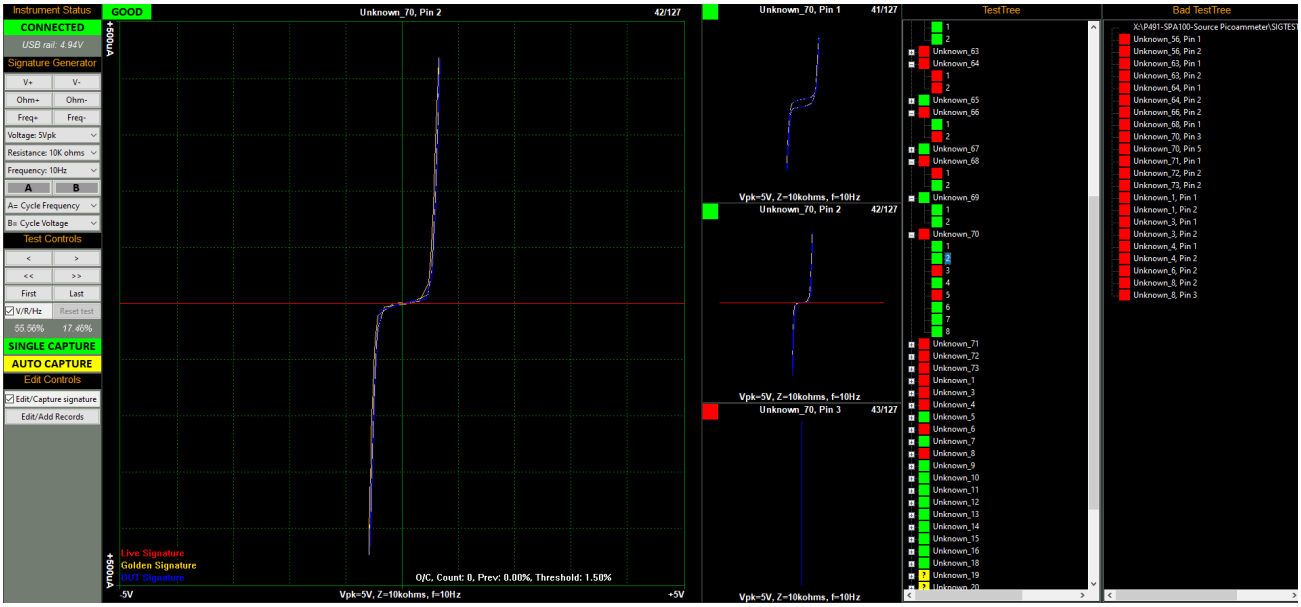

Fig. 74

The centre mini-scope of the 3 is the current Pin/record (same image as the main scope).

Clicking on any of the mini-scopes, TestTree or BadTree points will select that Pin/record as the main scope image.

5.5.7.5 Views > 3 mini-scopes + PCB

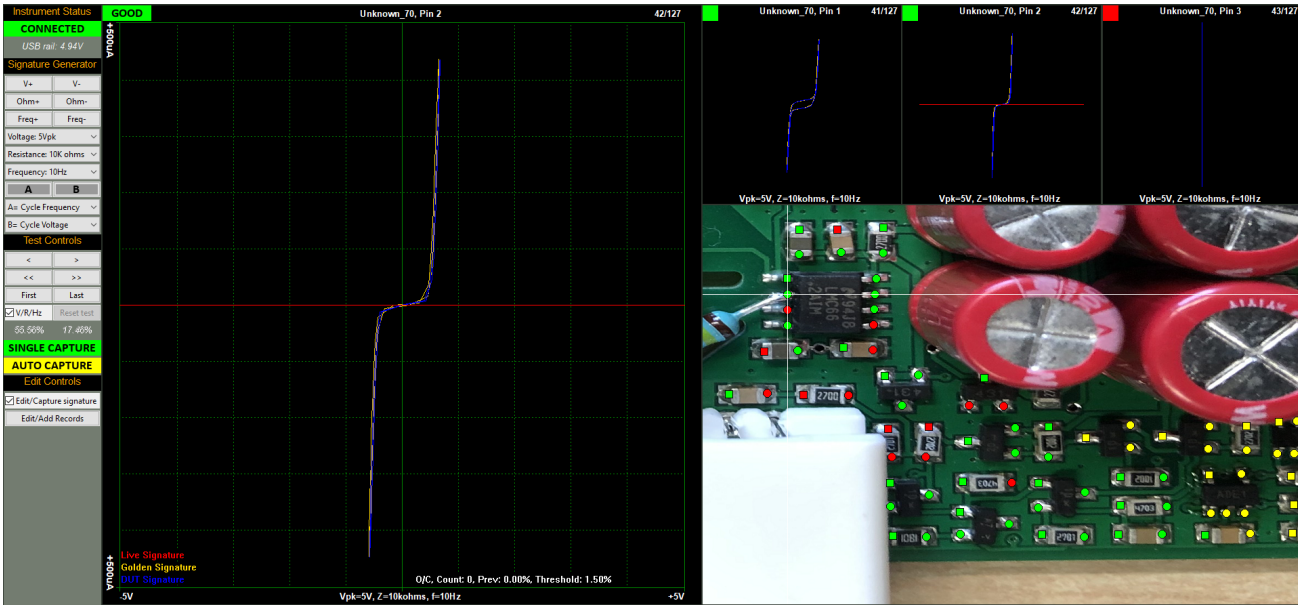

Fig. 75

The middle mini-scope of the 3 is the current Pin/record (same image as the main scope). Clicking on any of the mini-scopes or test points (on the PCB image) will select that Pin/record as the main scope image.

5.5.7.6 Views > 3 mini-scopes + PCB + TestTree

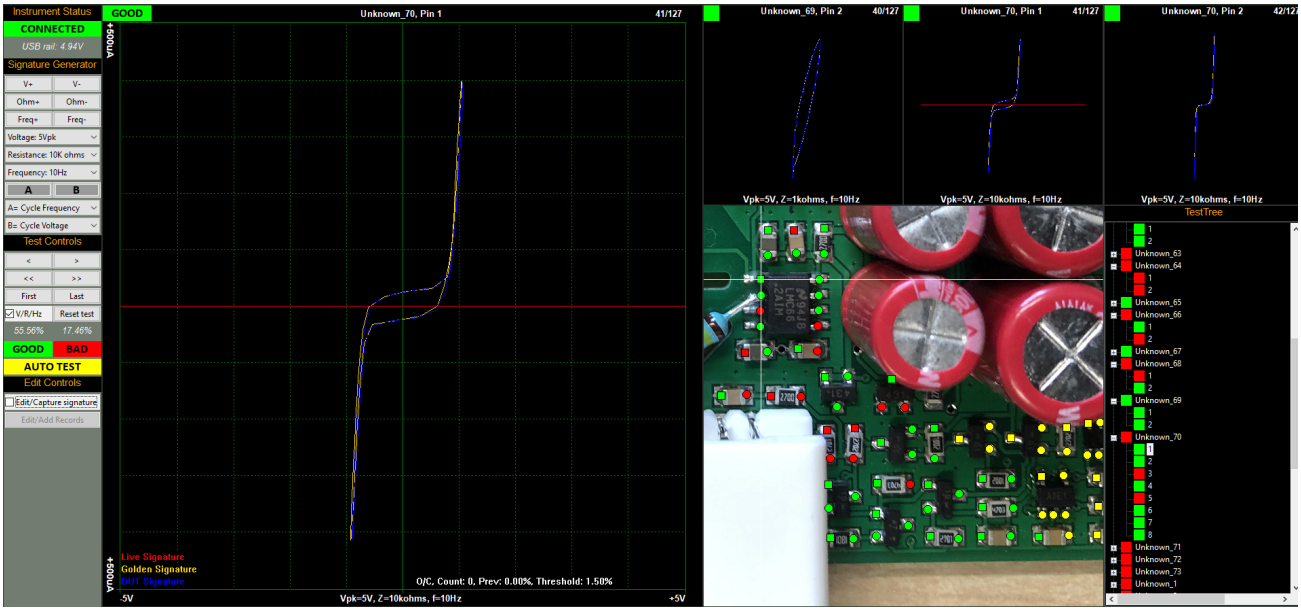

Fig. 76

The middle mini-scope of the 3 is the current Pin/record (same image as the main scope). Clicking on any of the mini-scopes, TestTree points or test points (on the PCB image) will select that Pin/record as the main scope image.

Clicking on any area of the PCB image (but not on a test point) will toggle the image from the selected view to the overall PCB image and back - this function is useful if you need to see where you are on the larger board.

5.5.7.7 Views > 2 mini-scopes + PCB + TestTree + BadTree

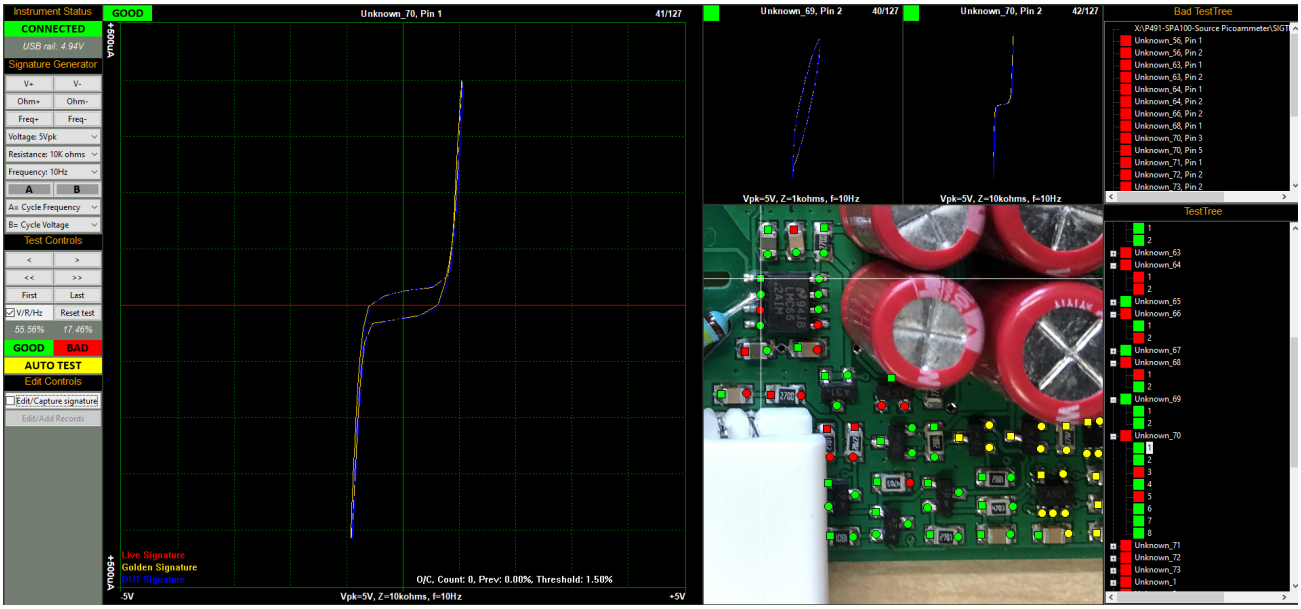

Fig. 77

The left mini-scope displays the previous Pin/record and the right mini-scope displays the next Pin/record. Clicking on any of the mini-scopes, TestTree points, BadTree points or test points (on the PCB image) will select that Pin/record as the main scope image.

5.5.7.8 Views > 2 mini-scopes + PCB + TestTree

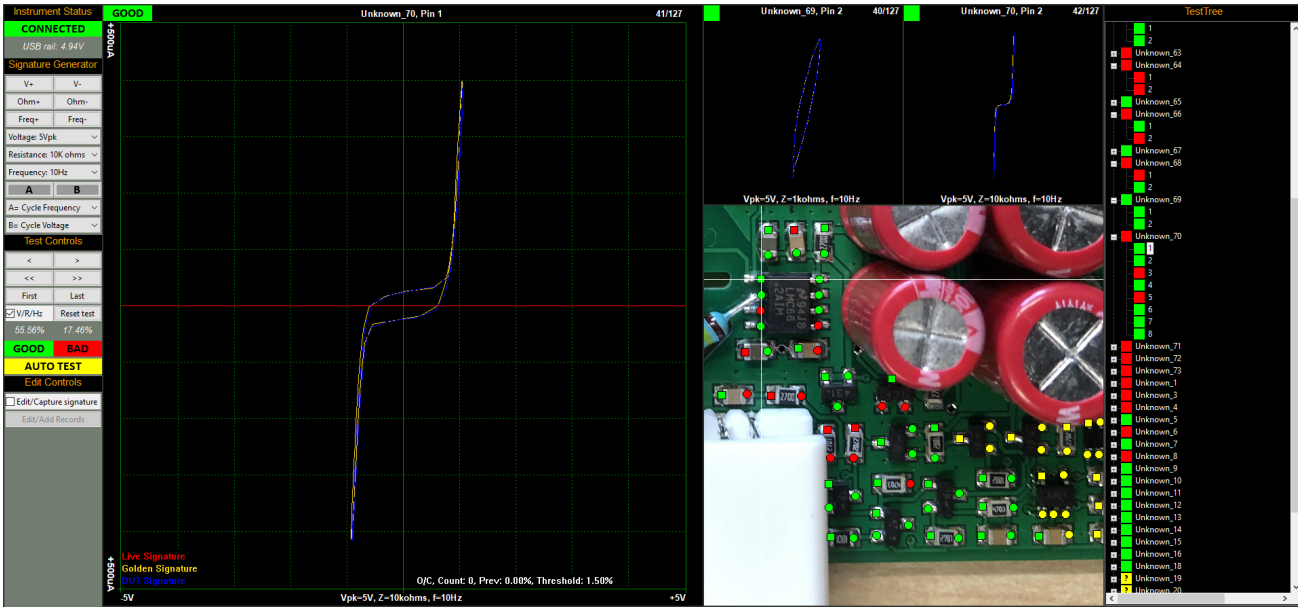

Fig. 78

The left mini-scope displays the previous Pin/record and the right mini-scope displays the next Pin/record. Clicking on any of the mini-scopes, TestTree points or test points (on the PCB image) will select that Pin/record as the main scope image.

Clicking on any area of the PCB image (but not on a test point) will toggle the image from the selected view to the overall PCB image and back - this function is useful if you need to see where you are on the larger board.

5.5.7.9 Views > 1 mini-scope + TestTree + BadTree

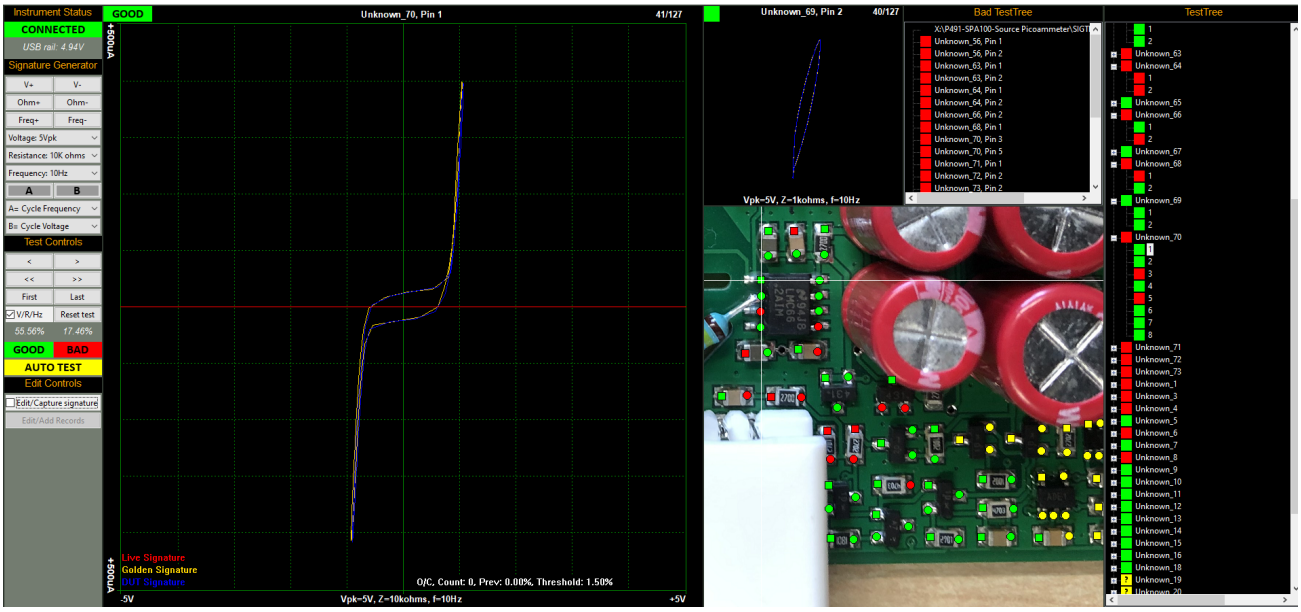

Fig. 79

The mini-scope displays the previous Pin/record. Clicking on the mini-scope, TestTree points, BadTree points or test points (on the PCB image) will select that Pin/record as the main scope image.

5.5.7.10 Views > PCB

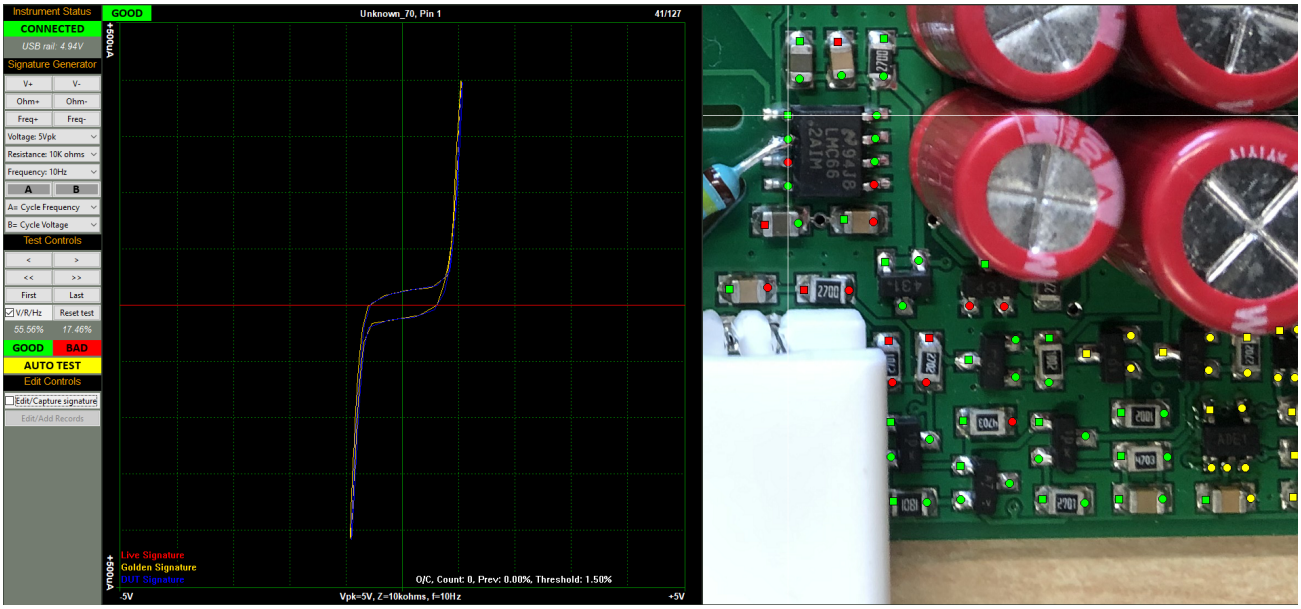

Fig. 80

Clicking on the test points (on the PCB image) will select that Pin/record as the main scope image.

Clicking on any area of the PCB image (but not on a test point) will toggle the image from the selected view to the overall PCB image and back - this function is useful if you need to see where you are on the larger board.

5.5.8.1 Calibrate

To calibrate the ASA (unlikely you will need to):

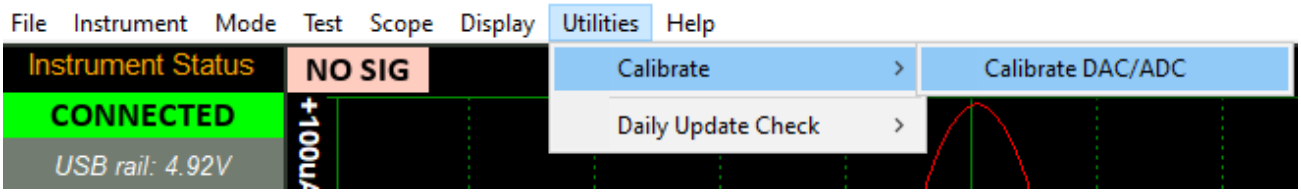

Fig. 81

This will bring up the calibration window, to calibrate you will follow the steps (1 to 12):

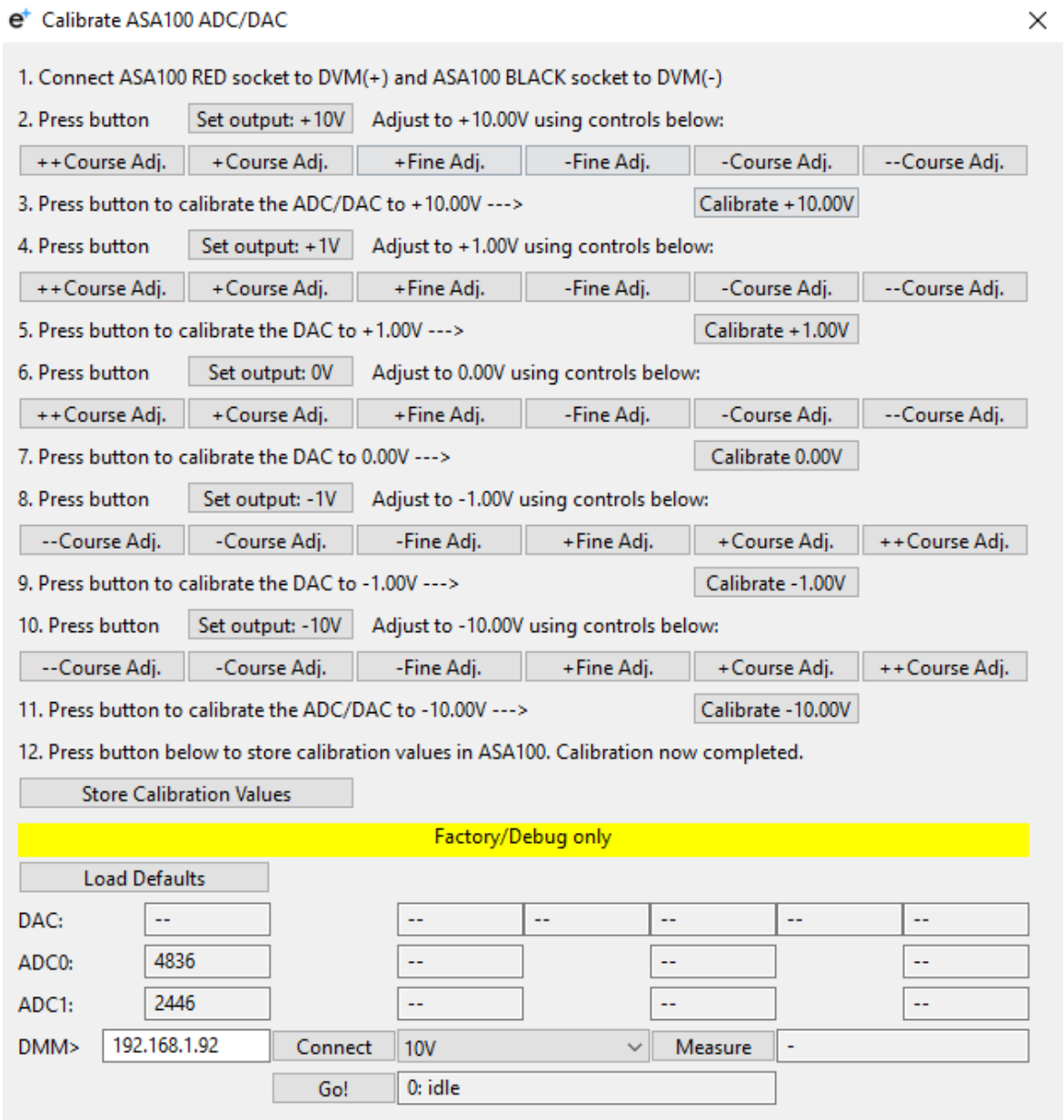

Fig. 82

Do not use the controls below the yellow "Factory/Debug only" bar. These are for Electron

Plus factory use only.

5.5.8.2 Daily Update Check

To change the Daily Update Check mode:

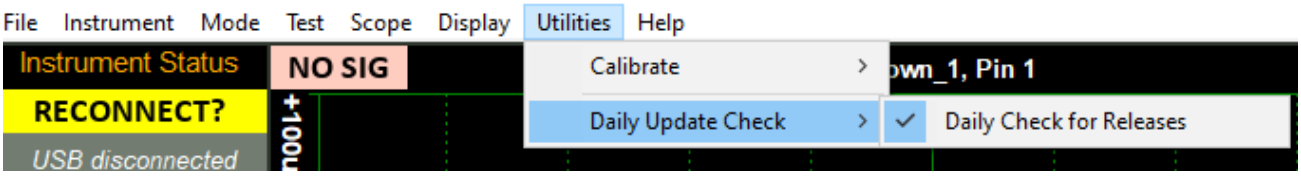

Fig. 83

For a more detailed description of this function, click here.

5.5.9.1 About

Displays "About" information:

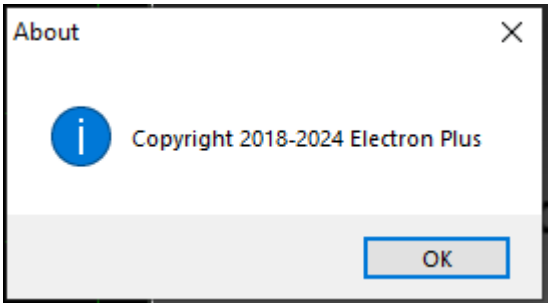

Fig. 84

Click "OK" or the close "X" to close this window.

5.5.9.2 Support

Displays "Support" information:

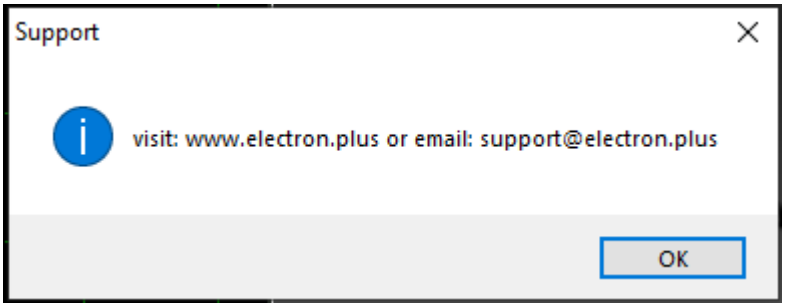

Fig. 85

Click "OK" or the close "X" to close this window.

..5.6 Setting up a test file

Over the next few pages we will show an example of:

1. Setting up a new test file
2. Adding an image to the test file
3. Defining and naming some test points (resistors, capacitors, IC's etc..)

.5.6.1 Creating new test file

To setup a new test you must first create a new file:

FILE > NEW

Select a location and name for the new test. The file extension is .ept, and will be automatically appended when the file is saved.

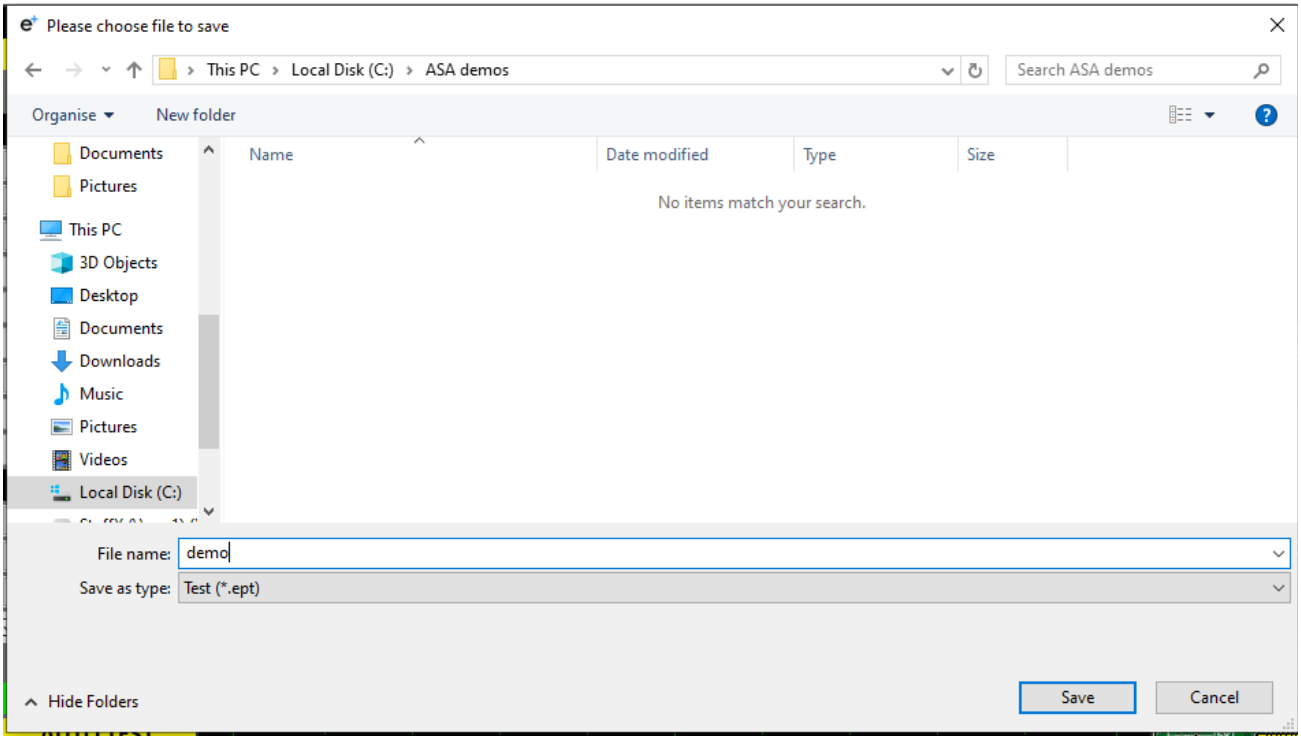

Fig. 86

Once the file has been saved it will be automatically loaded/used by the software. The file name and path will be shown on the top of the main-scope image.

The screen will look something like Fig below (depending on View selected, click here to see View options and how to change them):

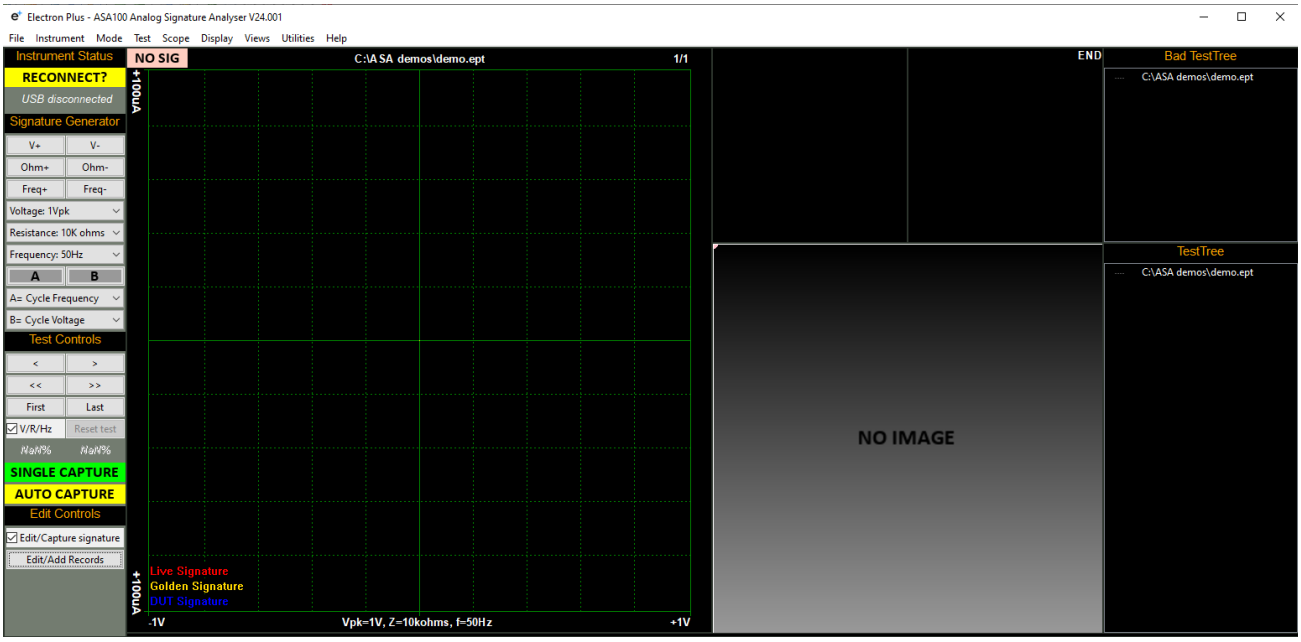

Fig. 87

At this point you can either start capturing signatures or add an image of the your PCB.

Note
.ept files are essentially CSV (comma separated variables) formatted spreadsheets. Commas in text fields are automatically swapped with £ symbols to avoid misinterpretation of the file.

.5.6.2 Adding an image

One or more images can be added to the test file.

Images can be located anywhere on your computer or network, however we advise that you keep them in the same folder as the .ept test file or a related sub-folder.

These must be orientated and cropped as you would use them - ideally the image would be square, but it is not critical. They must be in the form of a .jpg and should not exceed 4500 x 4500 pixels. There is no practical limit on the number of images that can be added (one per test point is possible) - in practice however most test setups contain a single image.

To add an image goto the "Edit/Add Records & Images" pop-up window by:

Selecting "Edit/Capture signature" tick box.

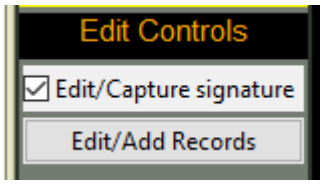

Fig. 88

..and pressing the "Edit/Add Records" button, this will bring up a pop-up window:

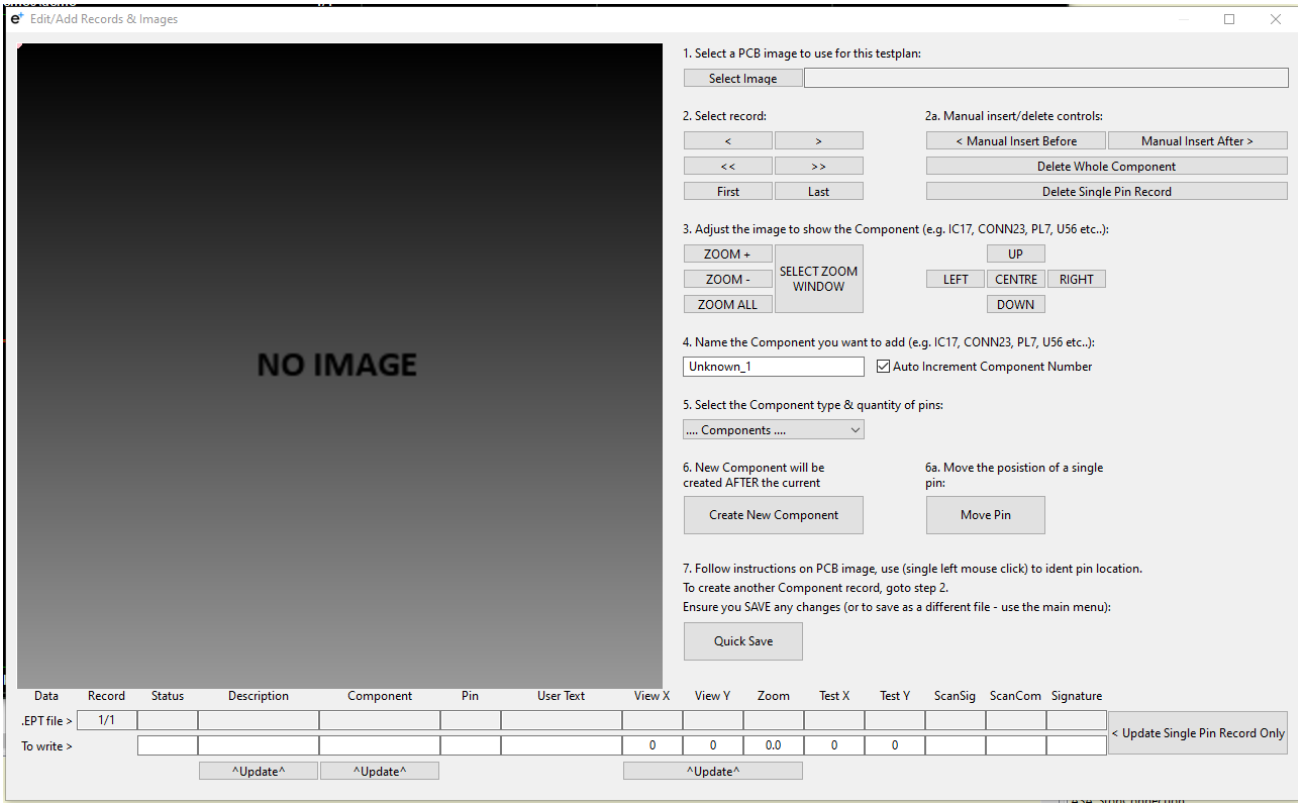

Fig. 89

Pressing "Select Image" button will bring up a file selector:

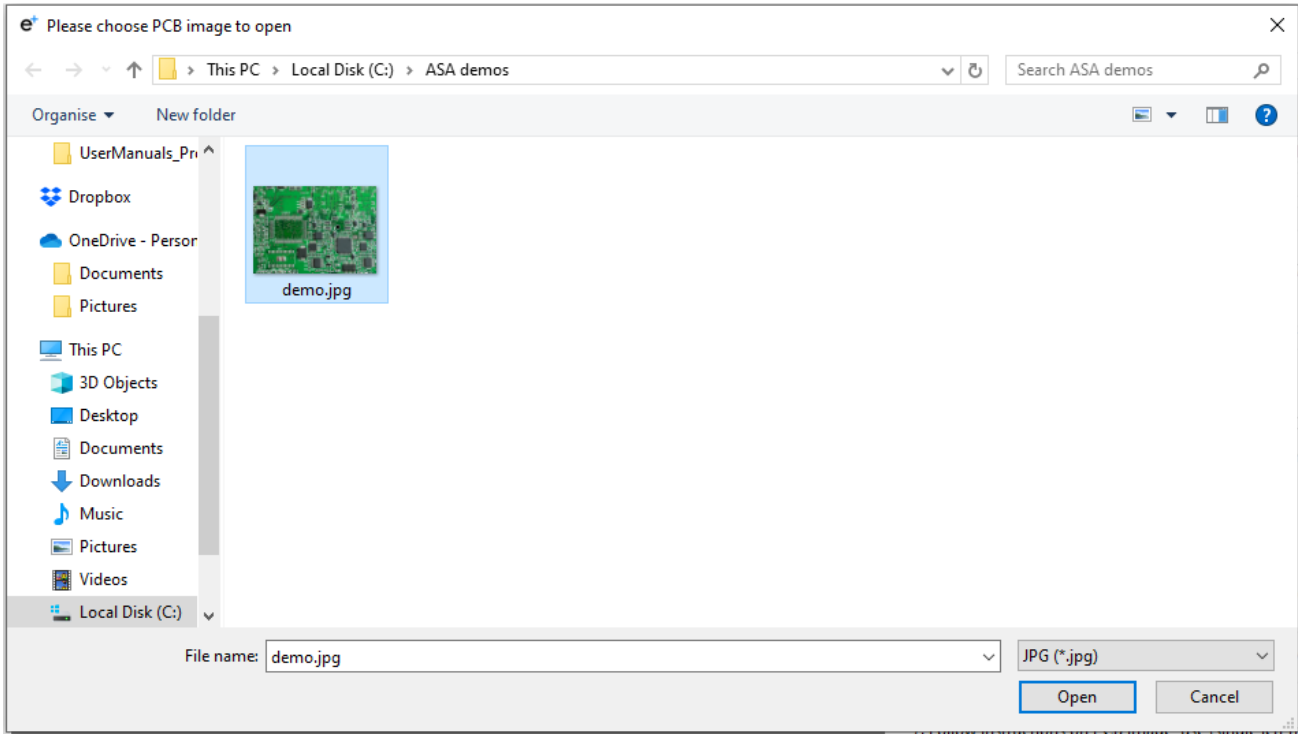

Fig. 90

Once an image is chosen the screen will look something like this:

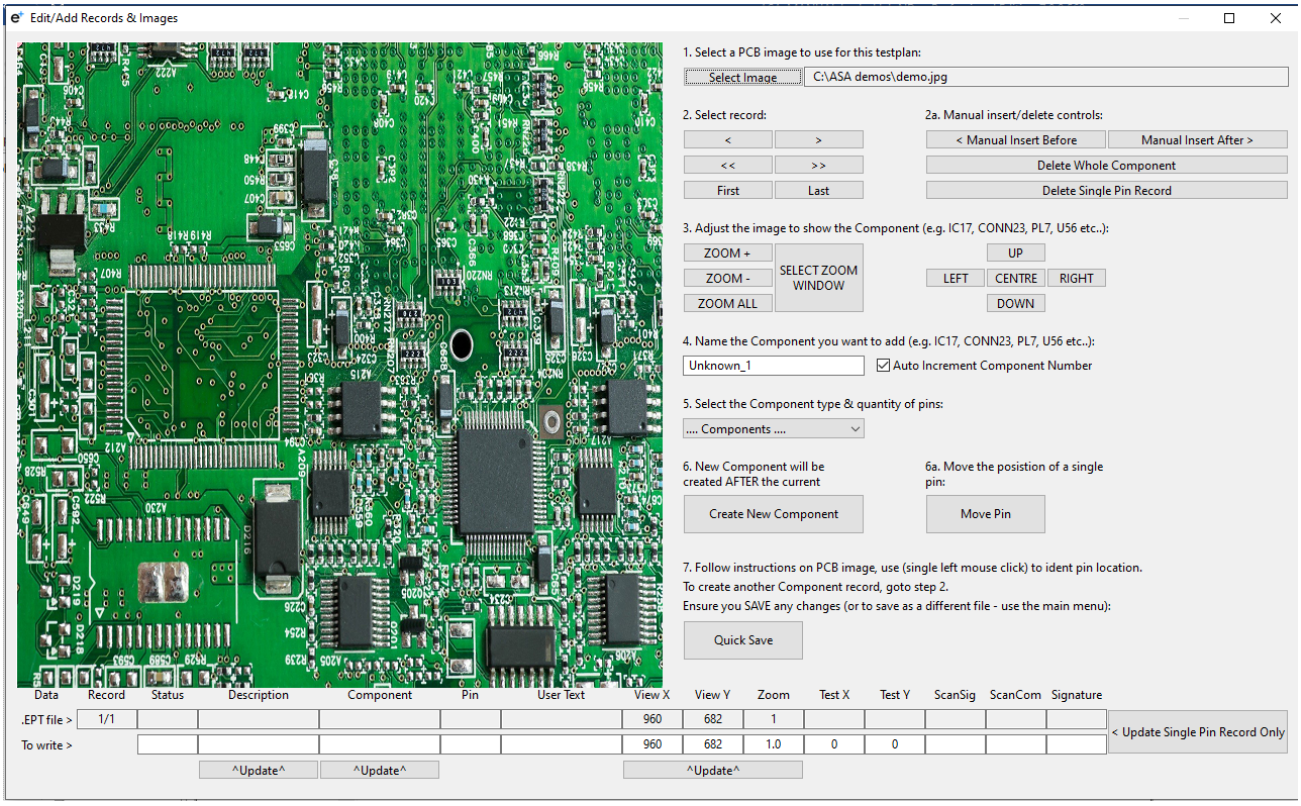

Fig. 91

Remember to perform a "Quick Save" at this point by pressing the "Quick Save" button.

Next we will add some test points.

.5.6.3 Adding a component

We will now add a small group of components.

Pressing the "Select Zoom Window" button:

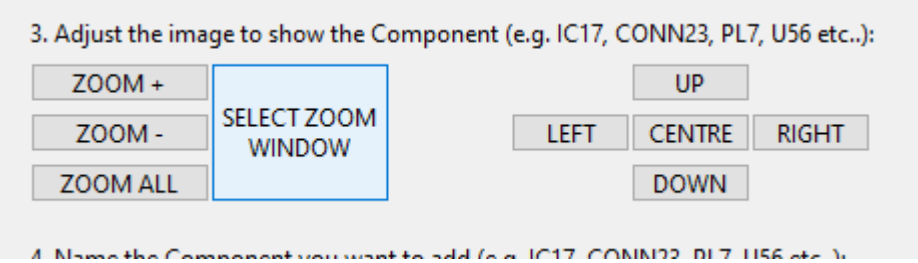

Fig. 92

Text at the top of the PCB screen will show "Click on top-left corner of Component", click the mouse pointer at the top-left of the area of interest:

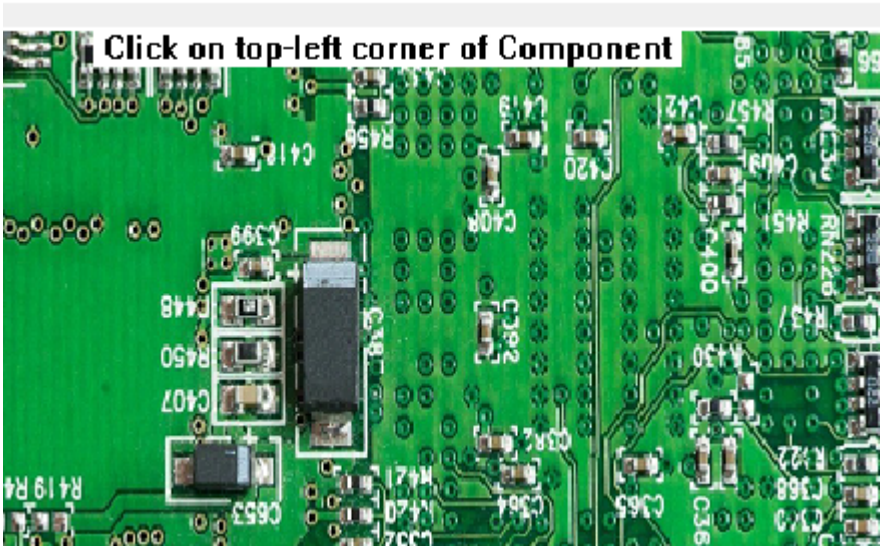

Fig. 93

After doing this the text will change to "Click on bottom-right corner of Component", click the mouse pointer at the bottom-right of the area interest:

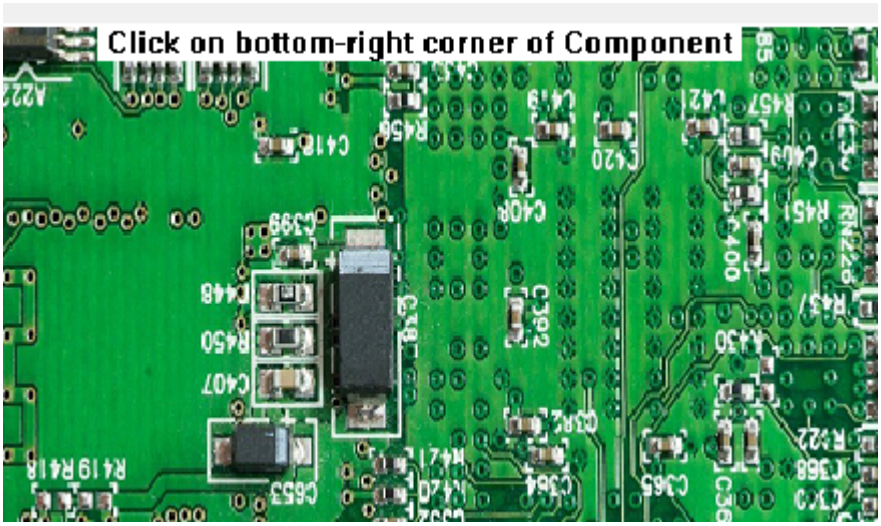

Fig. 94

After both corners have been selected, the PCB image will zoom in to the area of interest:

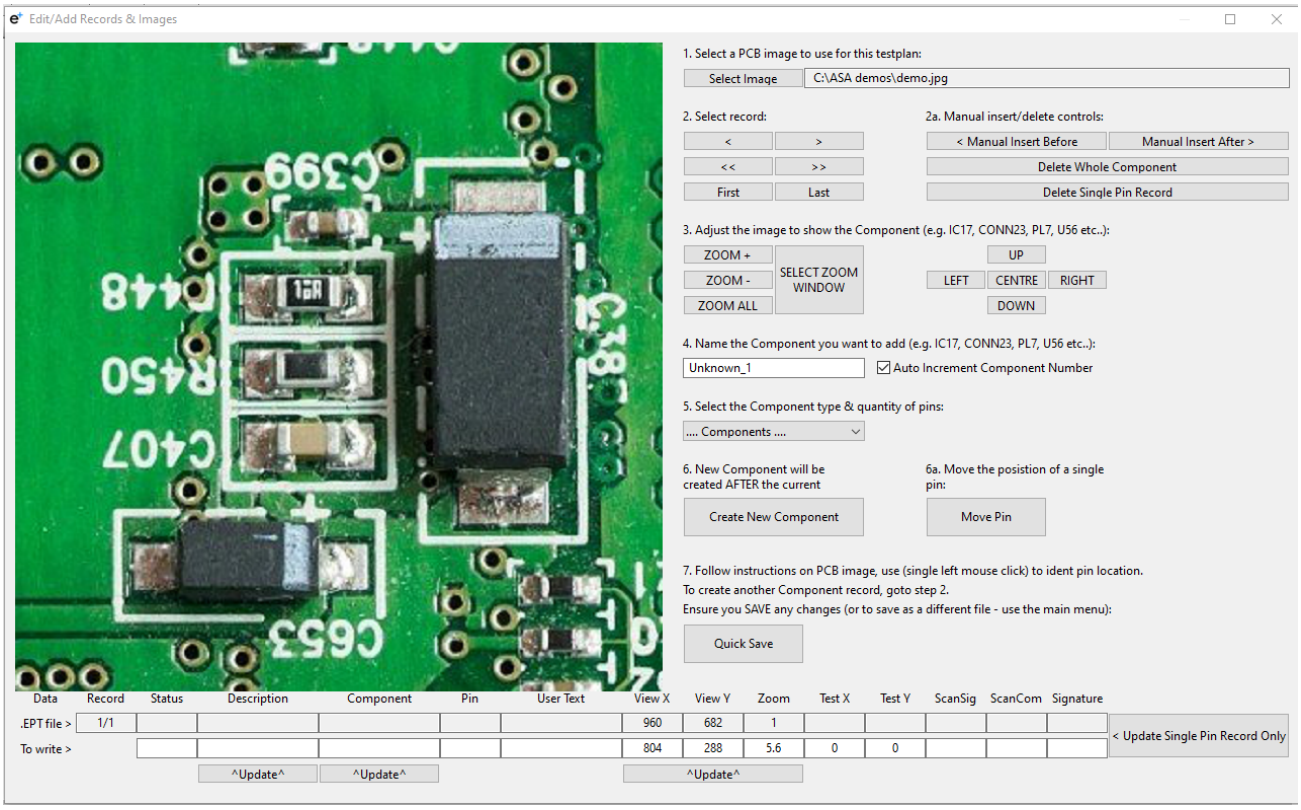

Fig. 95

Note image co-ordinates and zoom factor are displayed in the line of boxes at the bottom of the image.

"ZOOM ALL" button will return the show the complete image. "ZOOM+" button will zoom in, "ZOOM-" button will zoom out. Zooming happens in whole steps. The five adjustment buttons to move the image by small amounts:

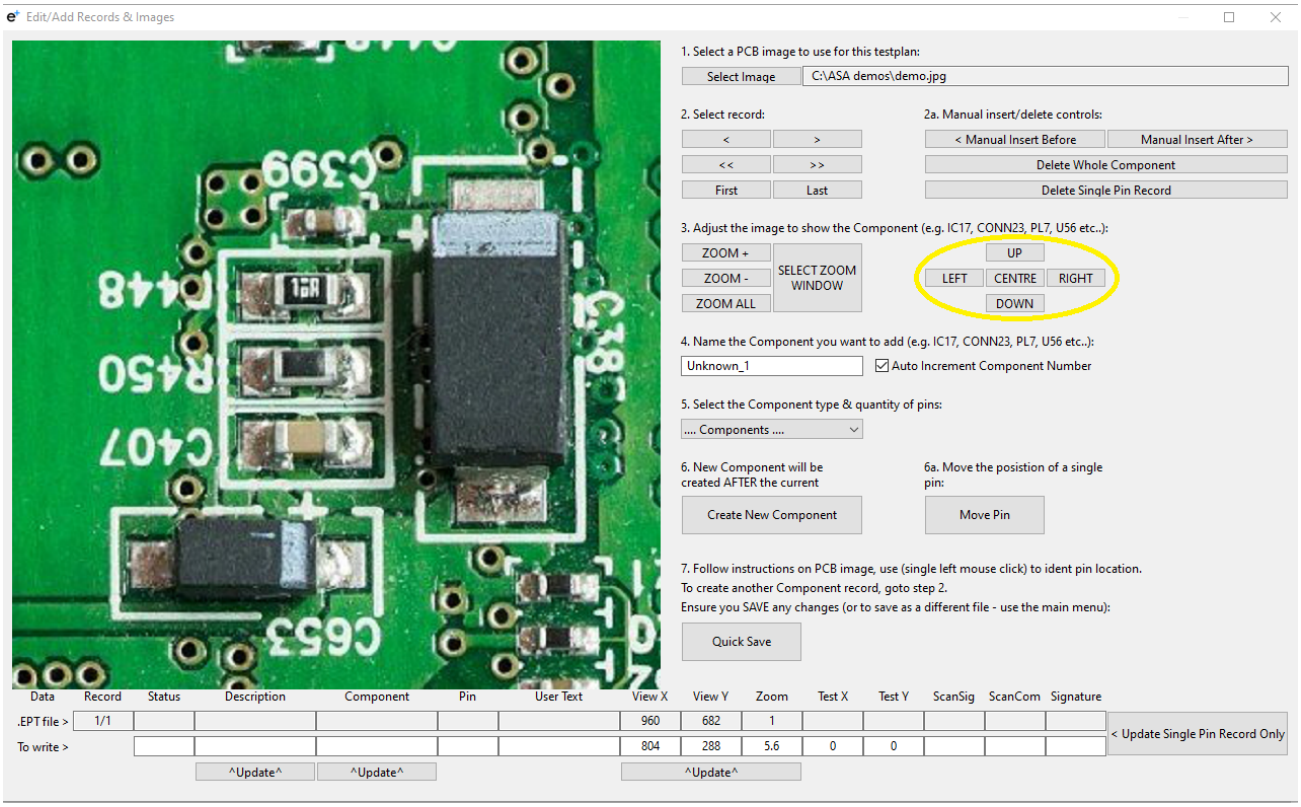
Edit/Add Records & Images
1. Select a PCB image to use for this testplan:
Select Image
C:\ASA demos\demo.jpg
2. Select record:
<
>
<<
>>
First
Last
2a. Manual insert/delete controls:
< Manual Insert Before
Manual Insert After >
Delete Whole Component
Delete Single Pin Record
3. Adjust the image to show the Component (e.g. IC17, CONN23, PL7, U56 etc..):
ZOOM +
ZOOM -
ZOOM ALL
SELECT ZOOM WINDOW
UP
LEFT
CENTRE
RIGHT
DOWN
4. Name the Component you want to add (e.g. IC17, CONN23, PL7, U56 etc..):
Unknown_1
Auto Increment Component Number
5. Select the Component type & quantity of pins:
.... Components ....
6. New Component will be created AFTER the current
Create New Component
6a. Move the posistion of a single pin:
Move Pin
7. Follow instructions on PCB image, use (single left mouse click) to ident pin location.
To create another Component record, goto step 2.
Ensure you SAVE any changes (or to save as a different file - use the main menu):
Quick Save
Data
Record
Status
Description
Component
Pin
User Text
View X
View Y
Zoom
Test X
Test Y
ScanSig
ScanCom
Signature
.EPT file >
1/1
960
682
1
To write >
804
288
5.6
0
0
< Update Single Pin Record Only
^Update^
^Update^
^Update^

Fig. 96

We will now add a component (small electrolytic capacitor - C653), first we create the name of the part and then select the component type - component name will be automatically assigned if you don't input a name (it can be renamed later):

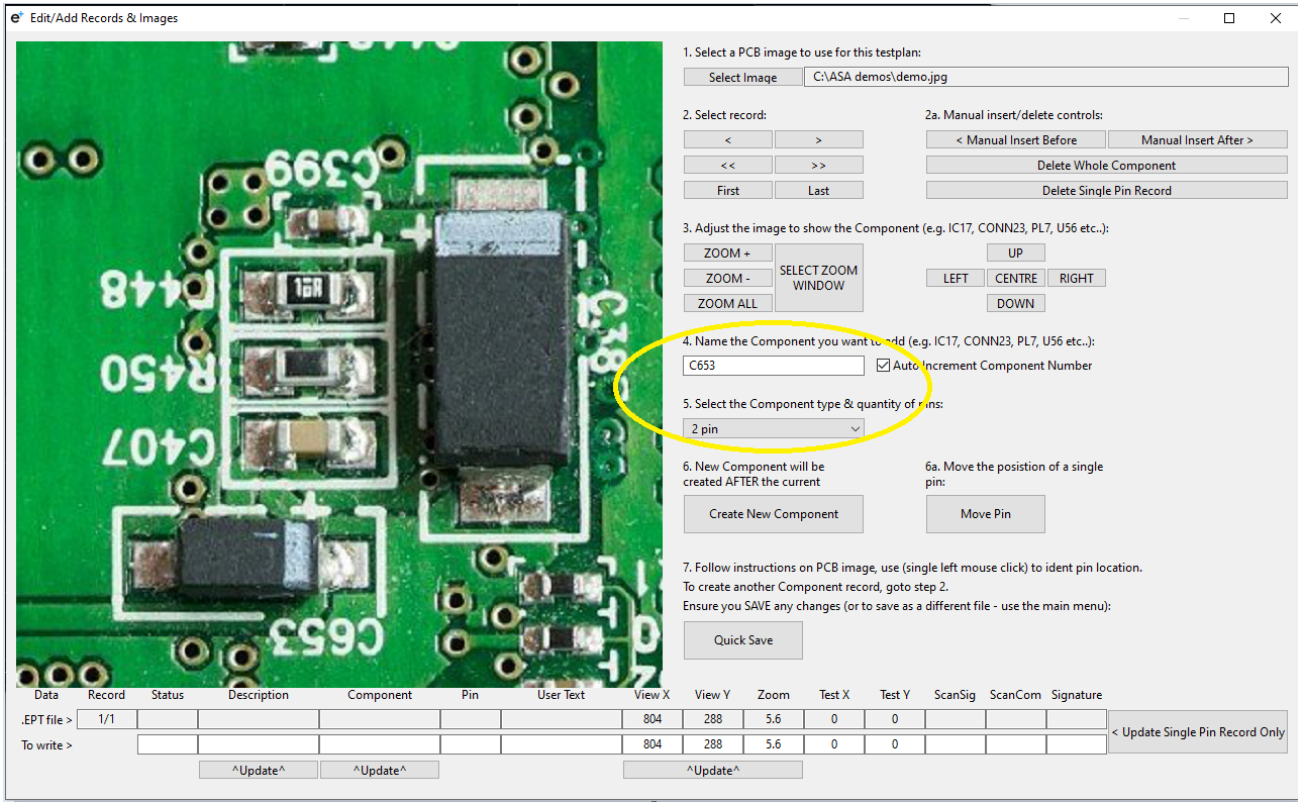

Fig. 97

Now we click "Create New Component", as soon as this is done the text at the top of the image screen will show "Click on Pin 1":

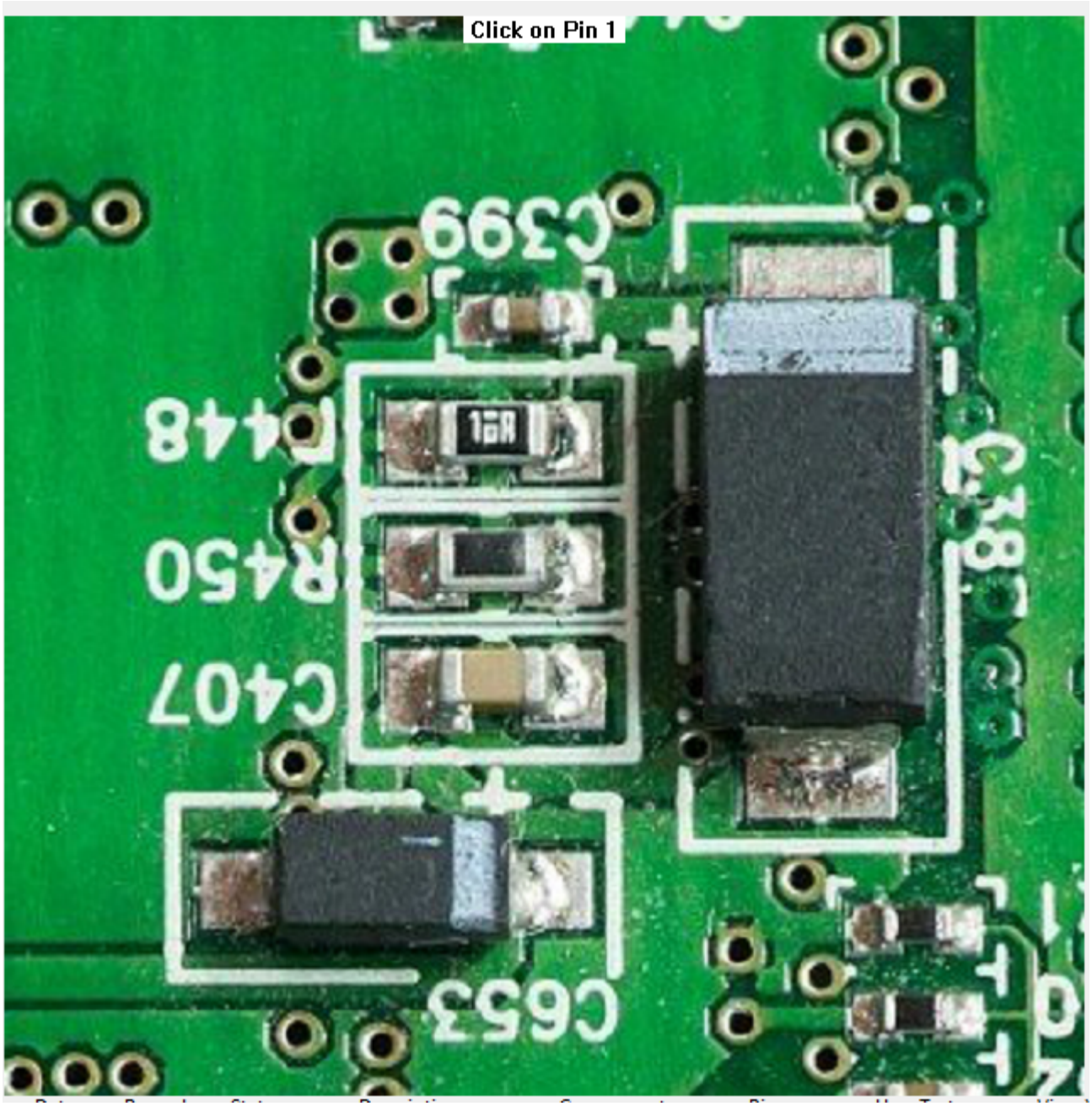

Fig. 98

Now we click the mouse pointer on Pin 1 of the capacitor - a PINK square (PINK=test point without signature assigned, square indicates it is Pin 1) as well as crosshairs will now be displayed:

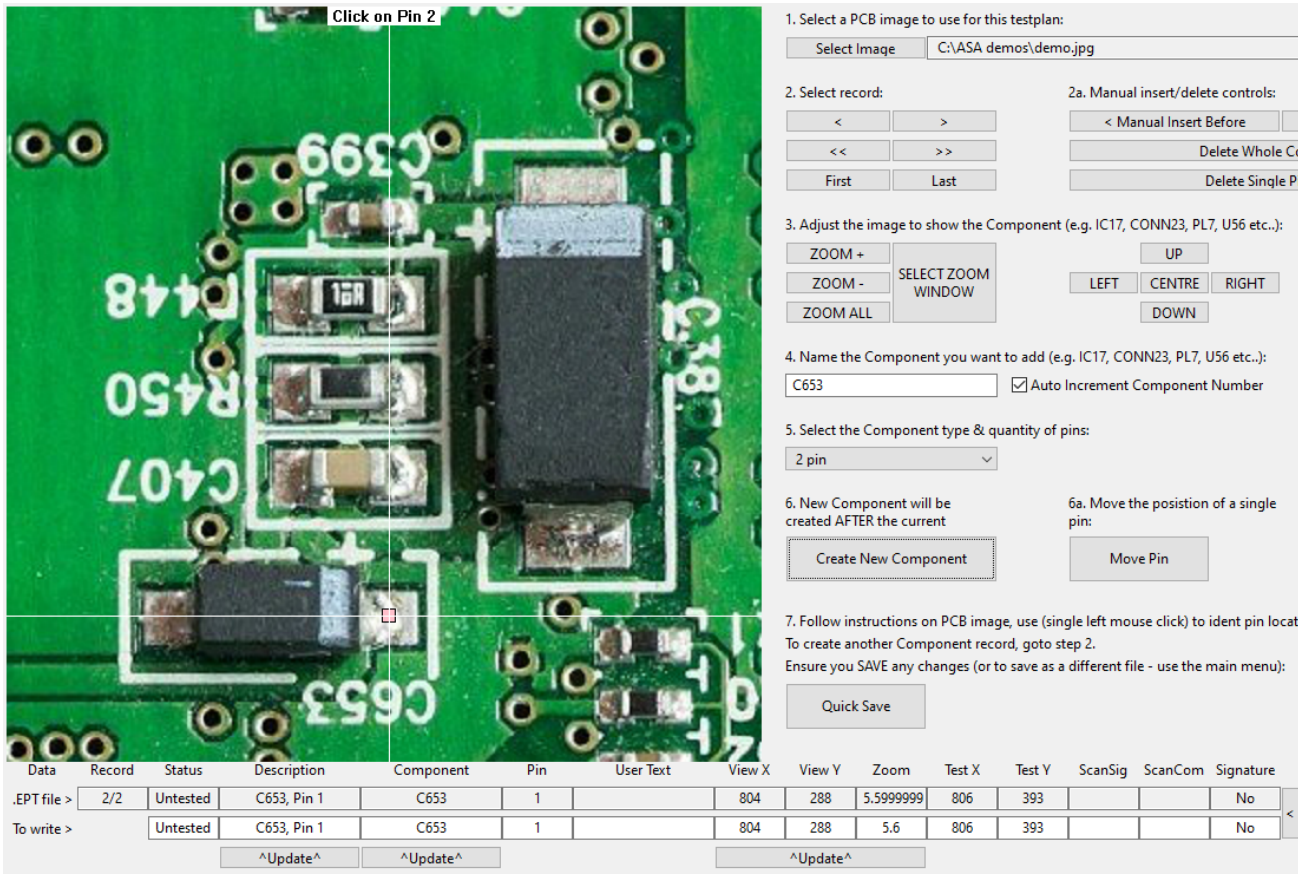

Fig. 99

Note that the text boxes at the bottom of the screen will be updated. Next, we click the mouse pointer on Pin 2 of the component:

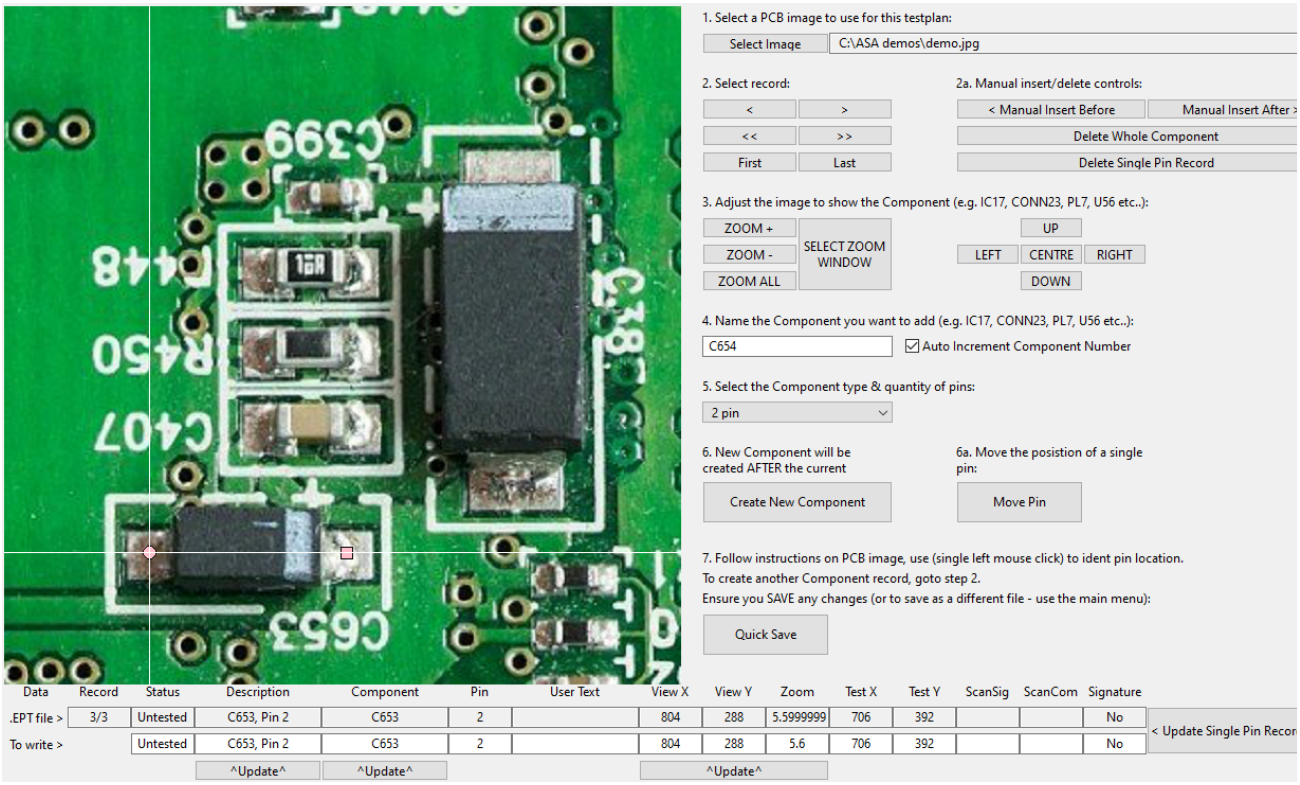

Fig. 100

Note that as the component ID has been automatically incremented (as the tick-box "Auto Increment Component Number" is selected).

Next we will click the "Create New Component" button and then use the mouse pointer to define more pins of a few more passive components:

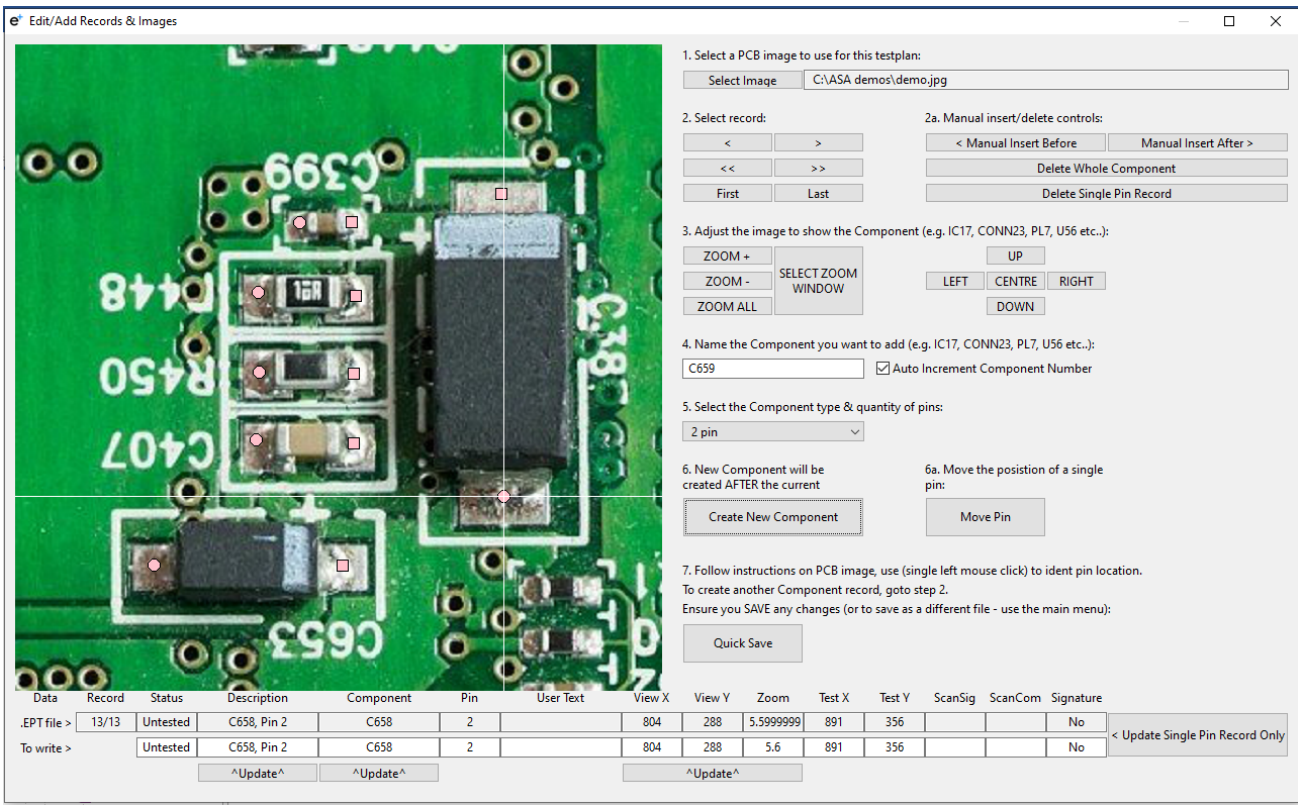

Fig. 101

Now we've added these extra 5 components (extra 10 pins), we will adjust their names to suit. This is done by:
1. Selecting the record to adjust using either the "Select record" controls OR clicking the mouse pointer on any pink square/circle belonging to the component.
2. Changing the component name in the field shown below:

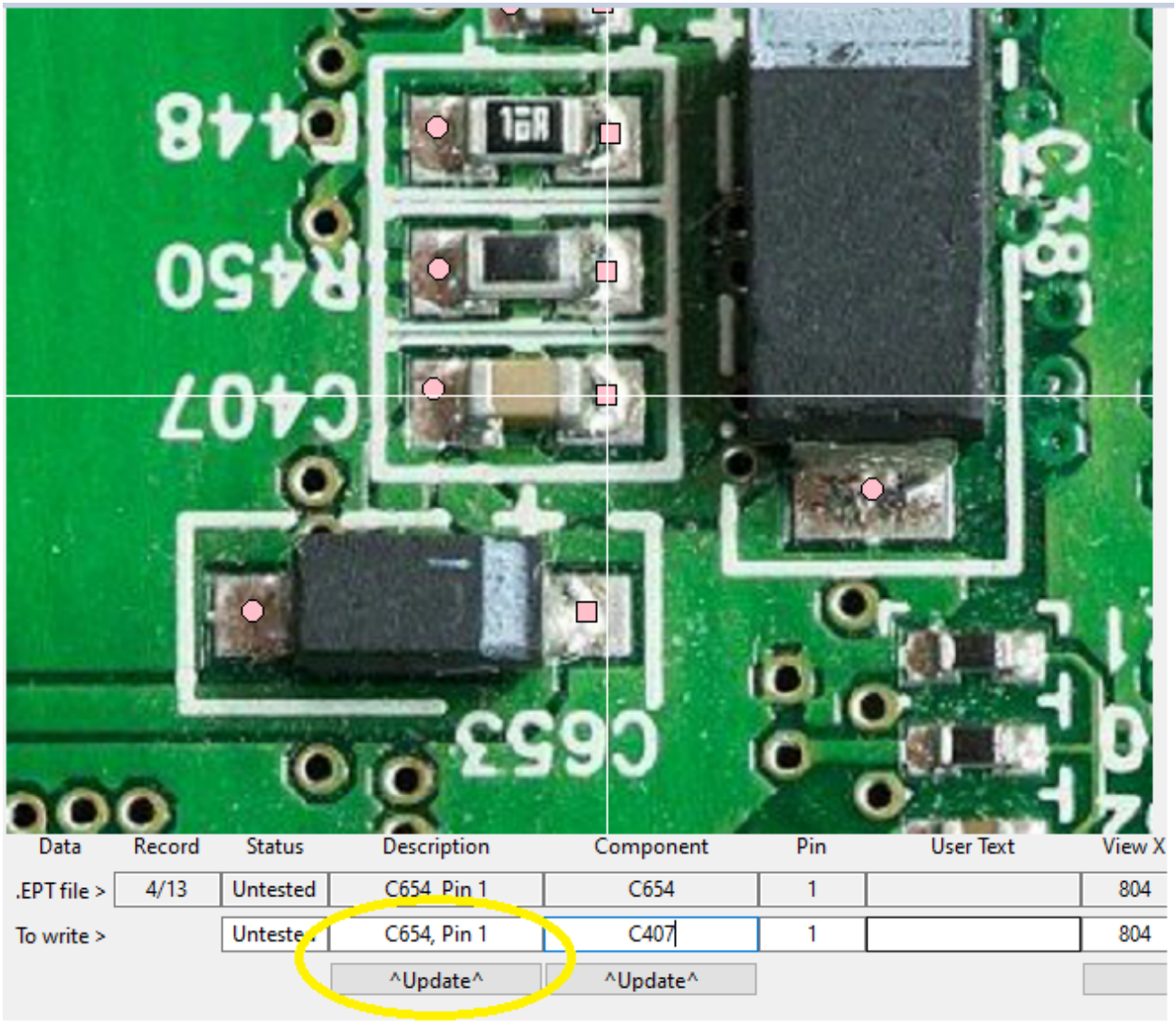
R448
15R
R450
C407
C653
Data
Record
Status
Description
Component
Pin
User Text
View X
.EPT file >
4/13
Untested
C654, Pin 1
C654
1
804
To write >
Untested
C654, Pin 1
C407
1
804
^Update^
^Update^

Fig. 102

3. Pressing the "^Update^" button (to complete the Component name change).

Both pin records for that component (formerly C654) have now been changed to C407:

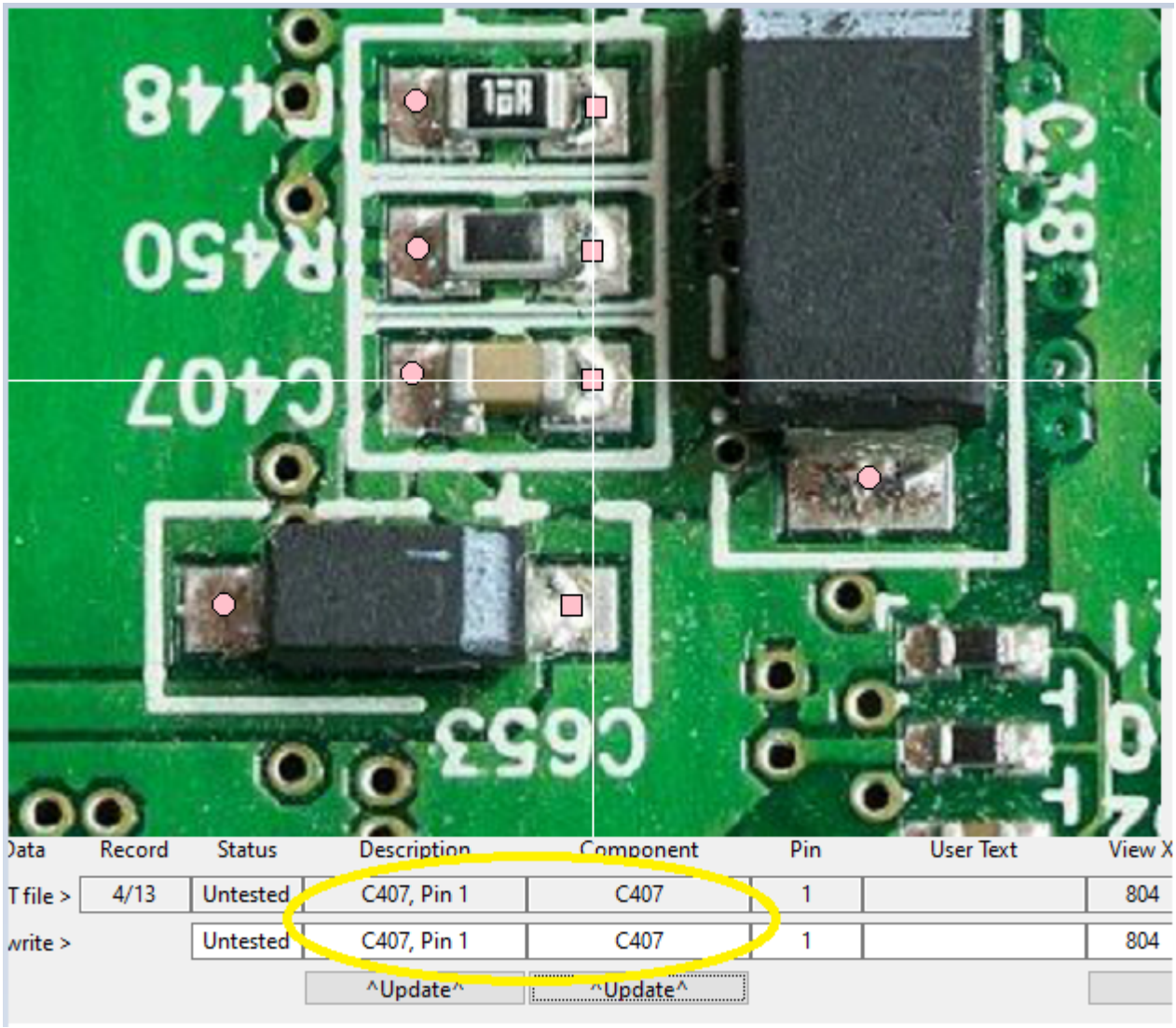

Fig. 103

Be sure to hit "Quick Save" regularly.

.5.6.4 Adding an IC

Adding an IC is very similar to adding a simple 2 pin component.

1. First we find the last component record by pressing "Last"** :

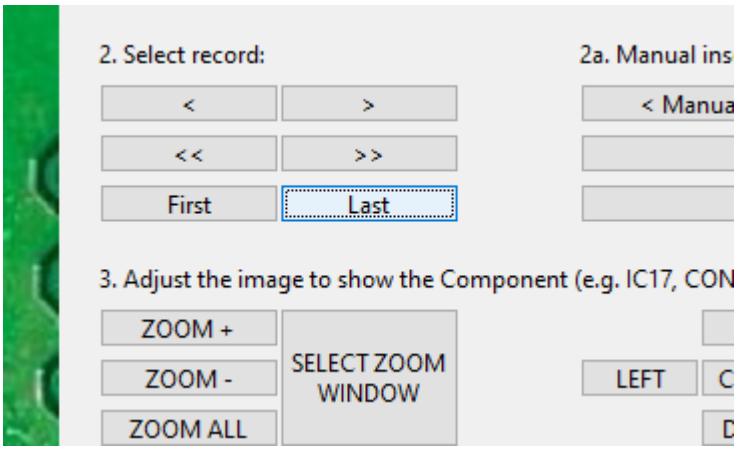

Fig. 104

2. Next we locate the IC we want to setup (using "ZOOM ALL" to show the whole PCB and the "SELECT ZOOM WINDOW" to show the IC:
3. Set the name of the component IC (in this case A215).
4. Select the component (8 pin DIP/SO).

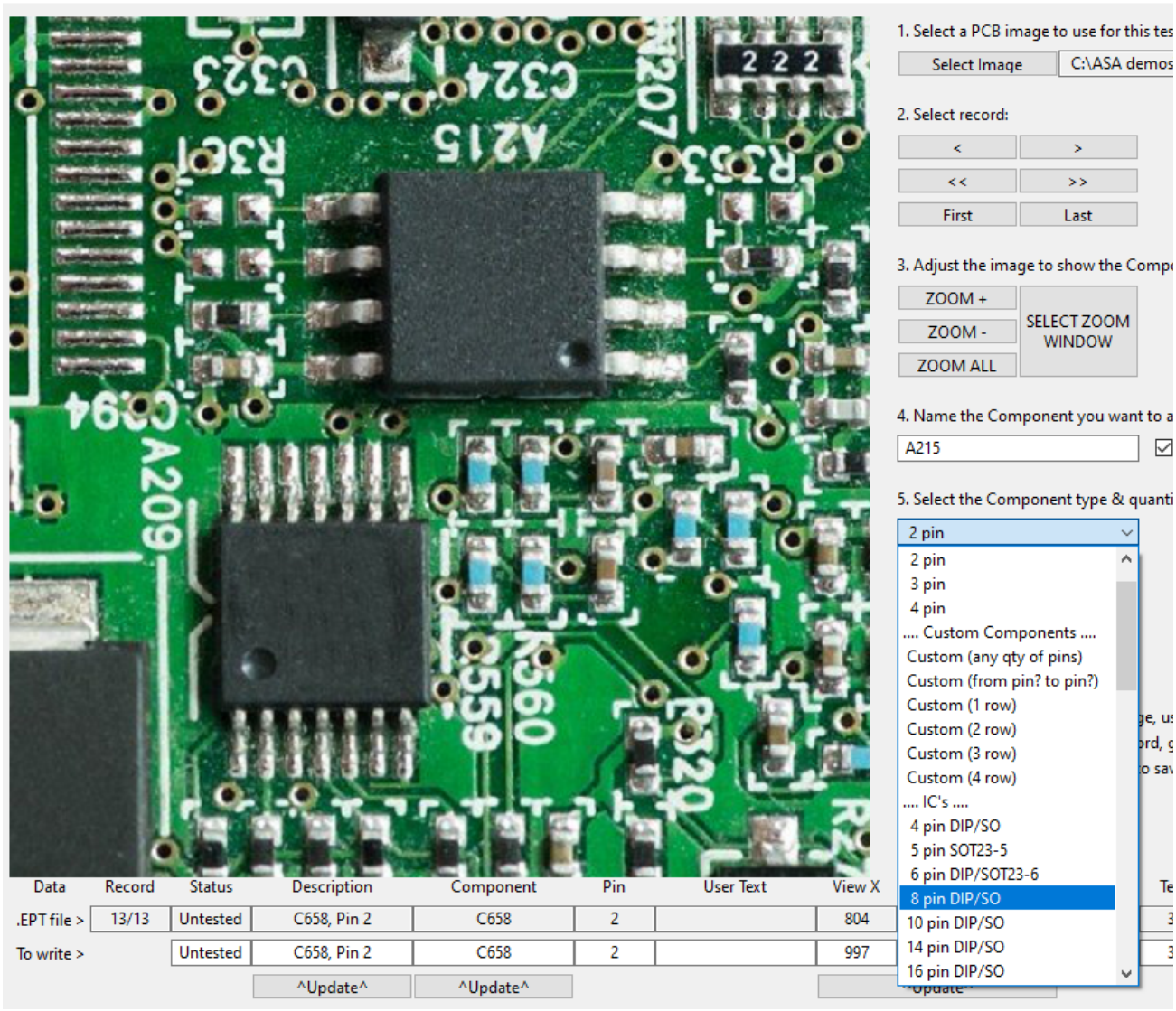
1. Select a PCB image to use for this tes
Select Image
C:\ASA demos
2. Select record:
<
>
<<
>>
First
Last
3. Adjust the image to show the Compo
ZOOM +
ZOOM -
ZOOM ALL
SELECT ZOOM WINDOW
4. Name the Component you want to a
A215
5. Select the Component type & quanti
2 pin
2 pin
3 pin
4 pin
.... Custom Components ....
Custom (any qty of pins)
Custom (from pin? to pin?)
Custom (1 row)
Custom (2 row)
Custom (3 row)
Custom (4 row)
.... IC's ....
4 pin DIP/SO
5 pin SOT23-5
6 pin DIP/SOT23-6
8 pin DIP/SO
10 pin DIP/SO
14 pin DIP/SO
16 pin DIP/SO
Data
Record
Status
Description
Component
Pin
User Text
View X
.EPT file >
13/13
Untested
C658, Pin 2
C658
2
804
To write >
Untested
C658, Pin 2
C658
2
997
^Update^
^Update^

Fig. 105

With that done, now click the "Create New Component" button, and the screen looks like this:

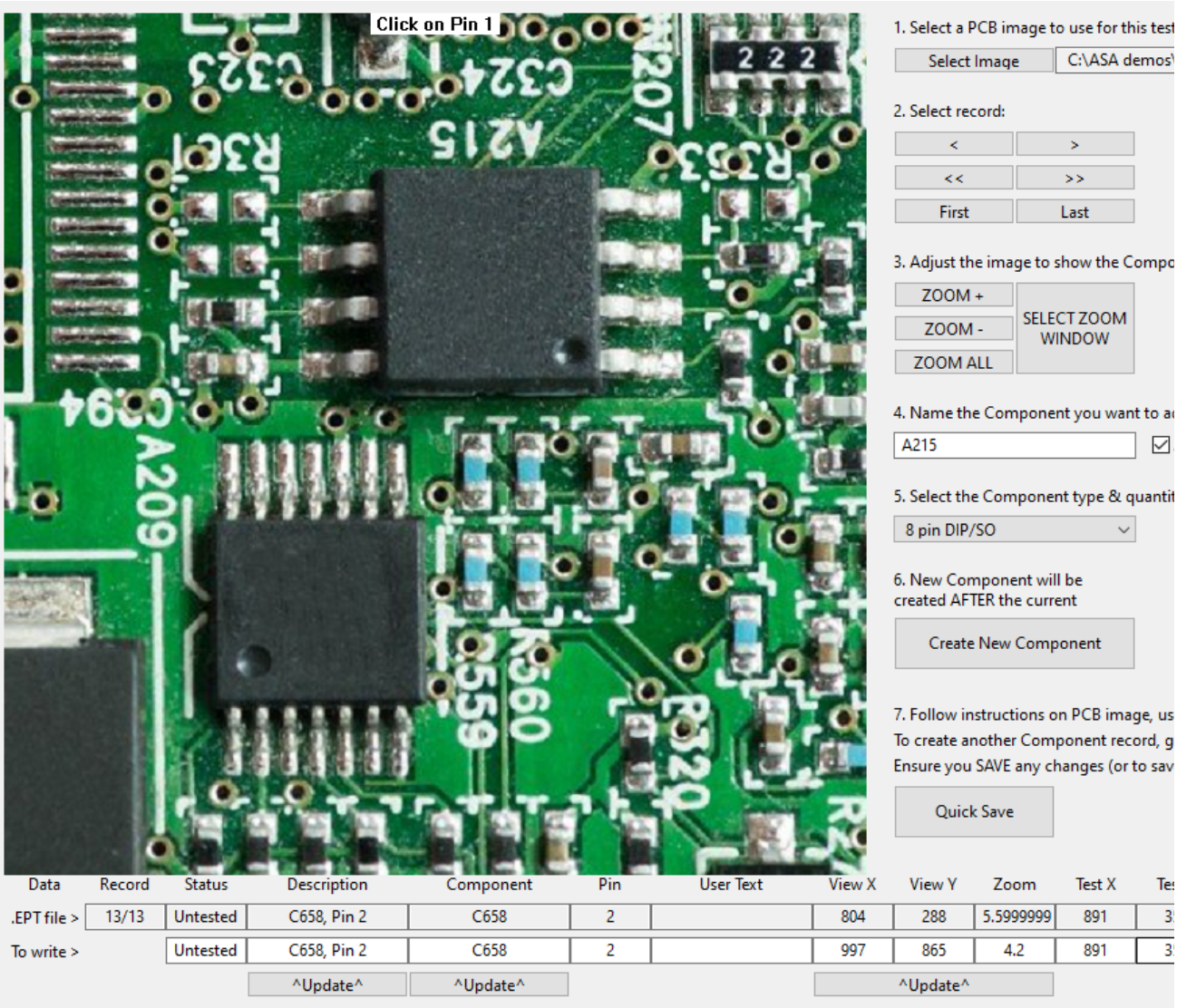

Fig. 106

Click the mouse pointer onto Pin 1 of the IC and a PINK square will be created.

Instead of automatically going to Pin 2, the software will ask you to click on the last pin on that side (e.g. Pin 4):

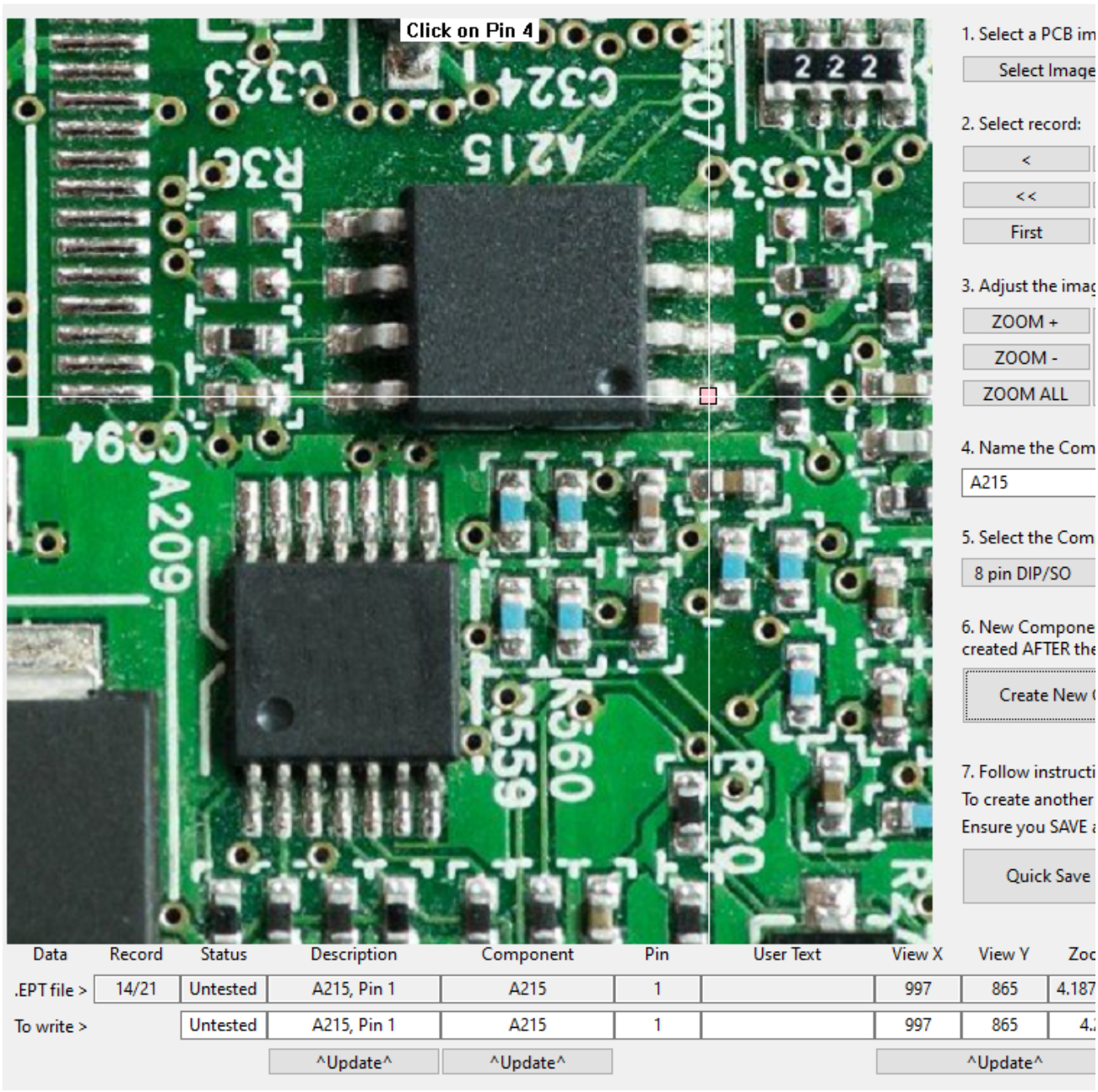
Click on Pin 4
1. Select a PCB im
Select Image
2. Select record:
<
<<
First
3. Adjust the imag
ZOOM +
ZOOM -
ZOOM ALL
4. Name the Com
A215
5. Select the Com
8 pin DIP/SO
6. New Compone
created AFTER the
Create New
7. Follow instructi
To create another
Ensure you SAVE
Quick Save
Data
Record
Status
Description
Component
Pin
User Text
View X
View Y
Zoo
.EPT file >
14/21
Untested
A215, Pin 1
A215
1
997
865
4.187
To write >
Untested
A215, Pin 1
A215
1
997
865
^Update^
^Update^
^Update^

Fig. 107

Once Pin 4 has been added, the software will automatically create Pins 2 and 3, then will ask for Pin 5:

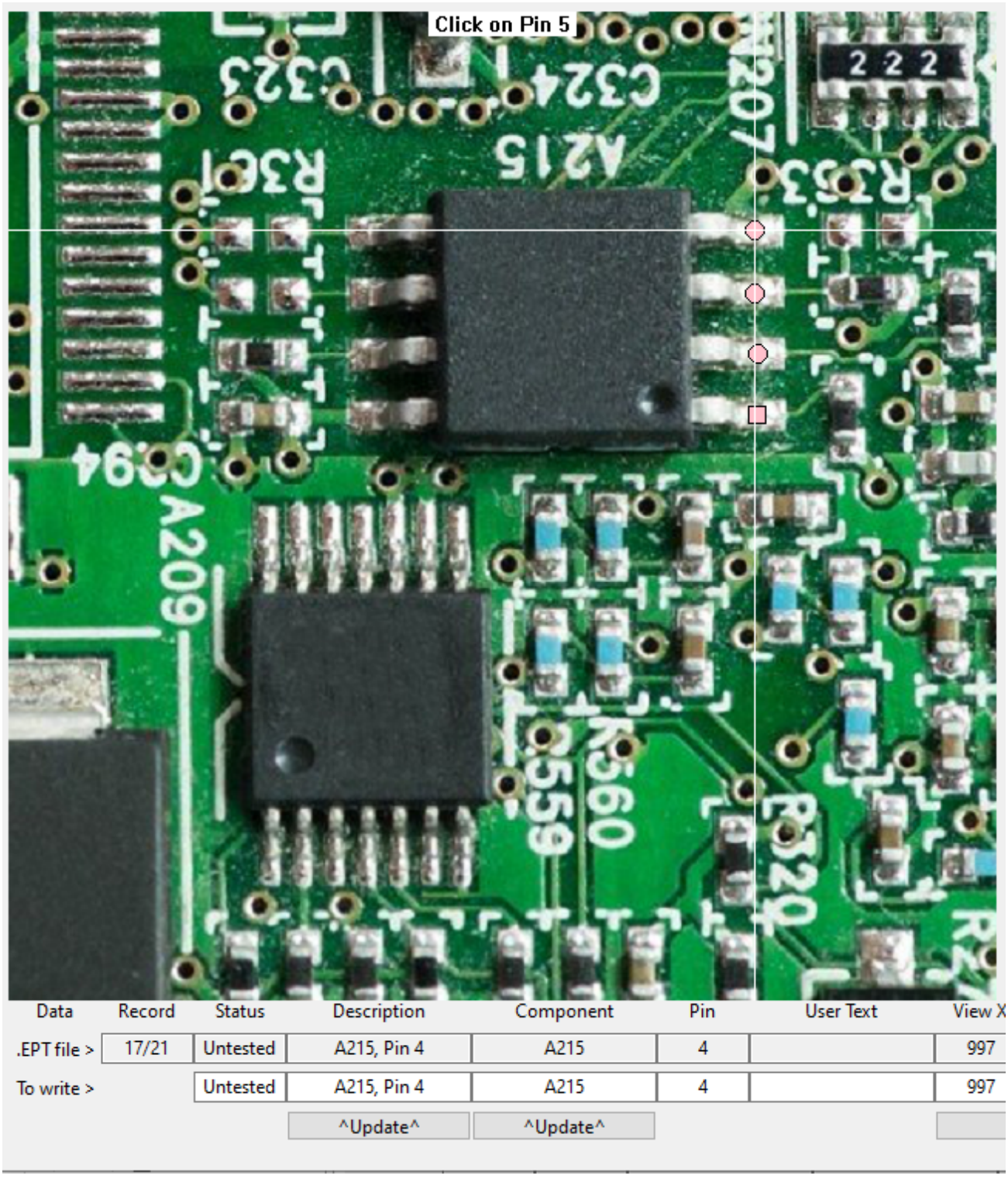

Fig. 108

Once Pin 5 has been added, the software will ask for Pin 8:

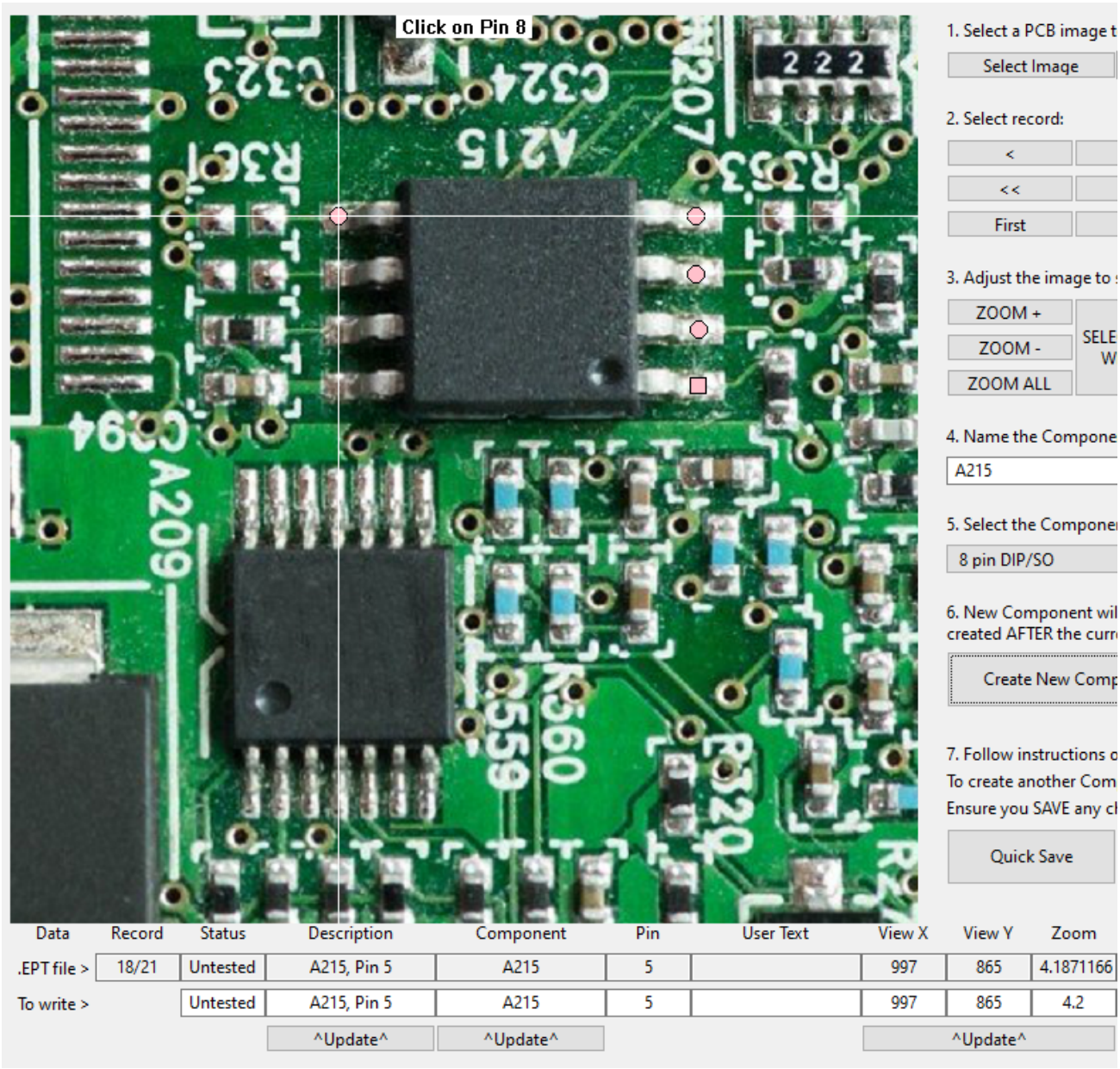
Click on Pin 8
1. Select a PCB image t
Select Image
2. Select record:
<
<<
First
3. Adjust the image to
ZOOM +
ZOOM -
ZOOM ALL
4. Name the Compone
A215
5. Select the Compone
8 pin DIP/SO
6. New Component wil
created AFTER the curr
Create New Comp
7. Follow instructions o
To create another Com
Ensure you SAVE any c
Quick Save
Data Record Status Description Component Pin User Text View X View Y Zoom
.EPT file > 18/21 Untested A215, Pin 5 A215 5 997 865 4.1871166
To write > Untested A215, Pin 5 A215 5 997 865 4.2
^Update^ ^Update^ ^Update^

Fig. 109

When Pin 8 has been added, the software will automatically create Pins 6 & 7:

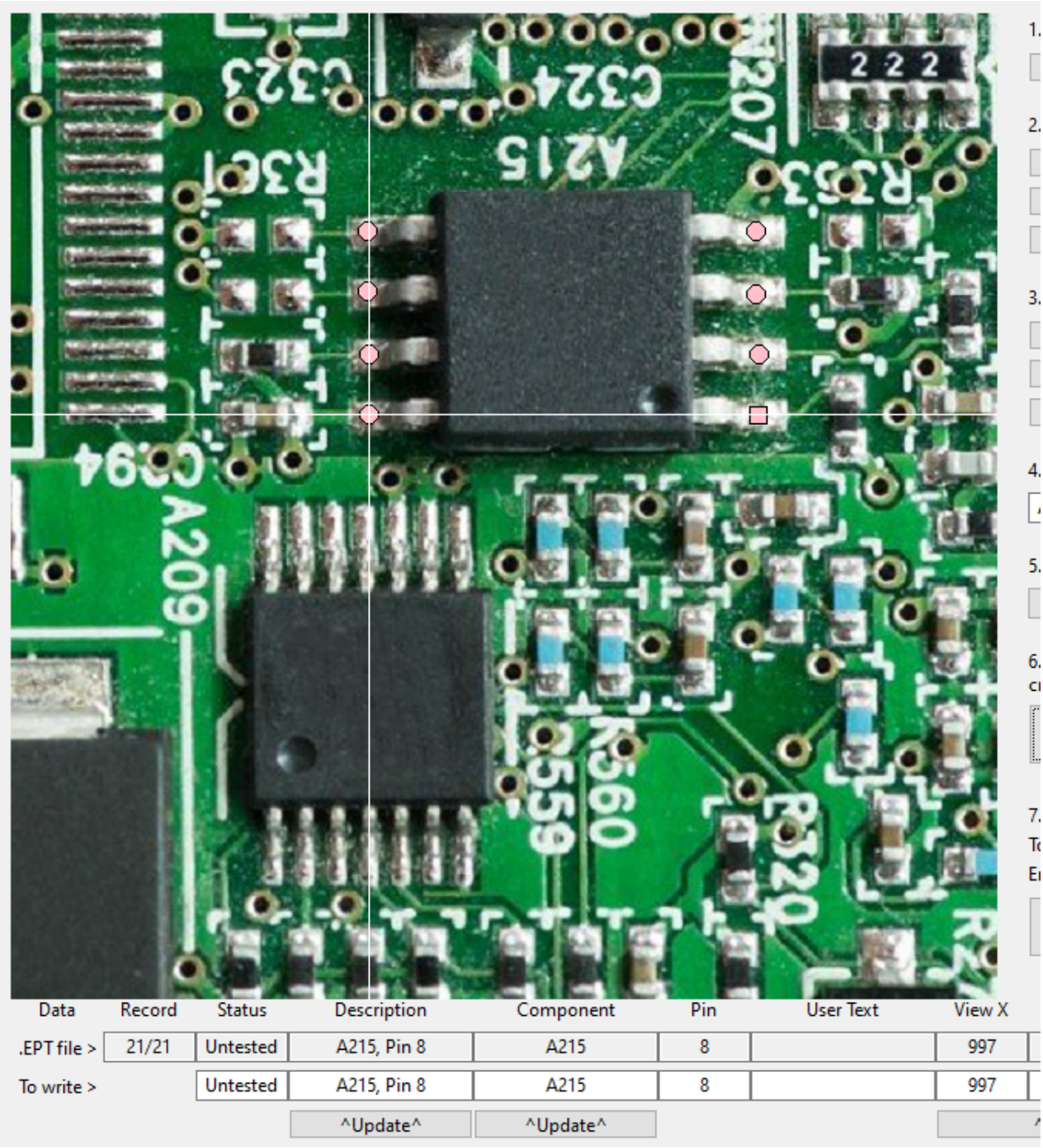

Fig. 110

This process also works with square package components (like QFP's) as well as multi-row connectors.

An example of a QFP (64 pins), this was done by defining only 8 locations (Pins 1,16,17,32,33,48,49 and 64):

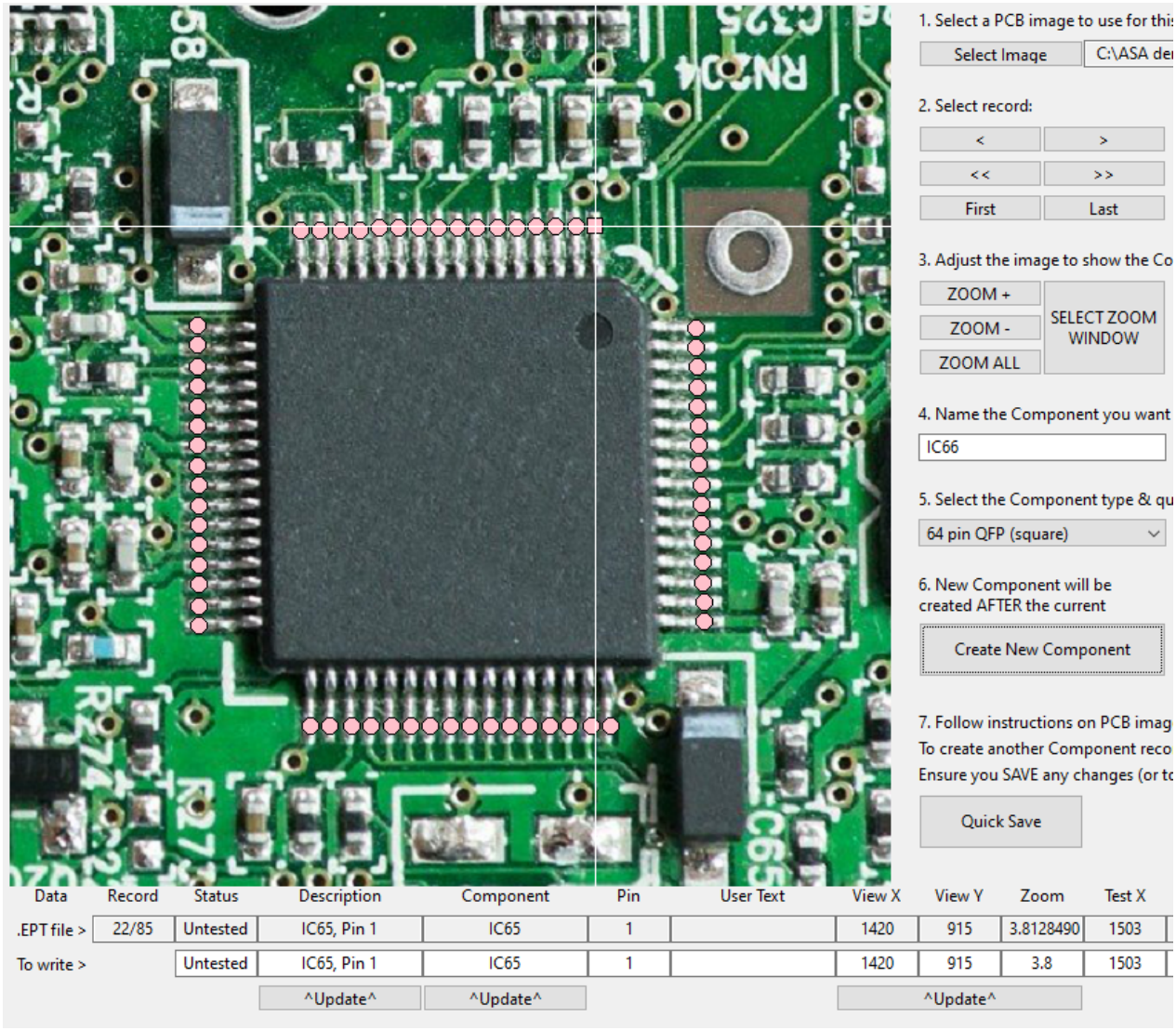

Fig. 111

Be sure to hit "Quick Save" regularly.

**Components do not have to be inserted at end of the sequence - the software will automatically insert the new component after the currently selected component record.

.5.6.5 Moving a pin

If a pin is placed in the wrong place, then it can be moved using the "Move Pin" button/function:

1. Select the Pin to move:

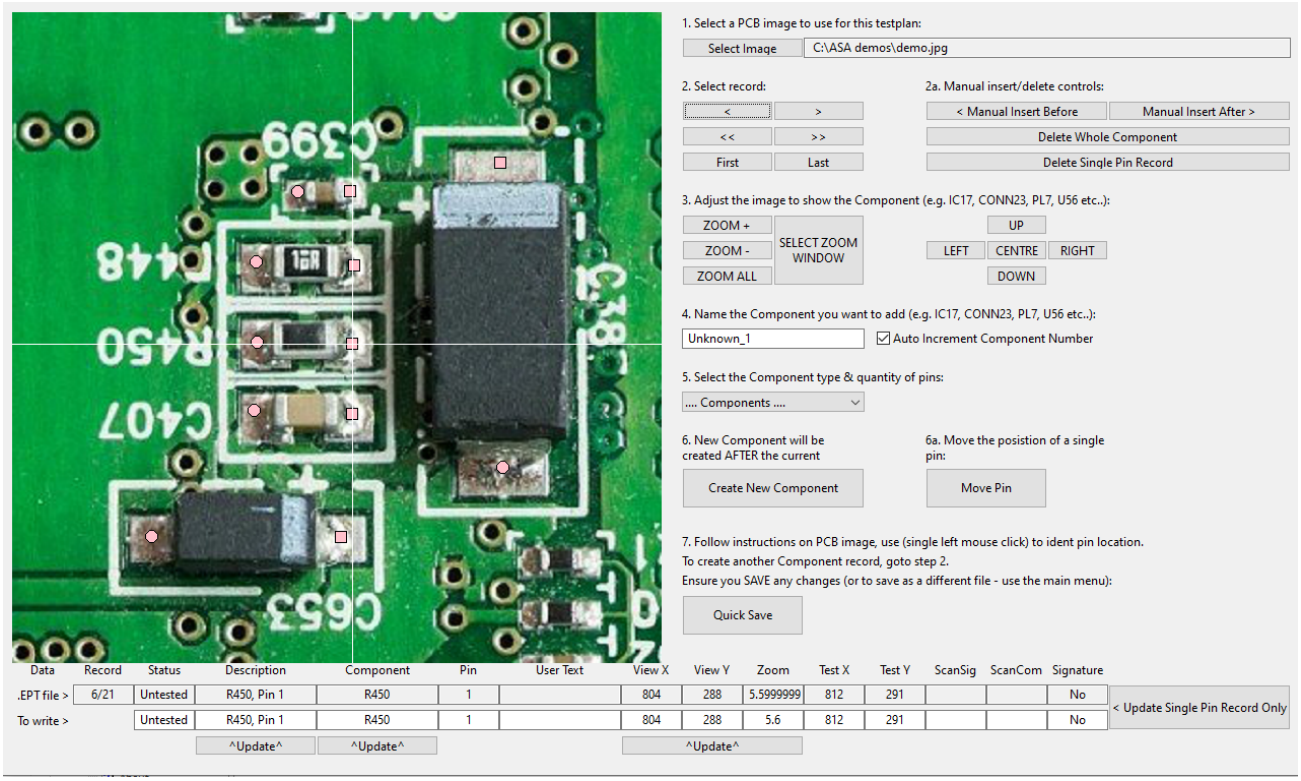

Fig. 112

2. Press the "Move Pin" button, text will appear at the top of the PCB image ("Move Pin: Click on new location for Pin 1"), click the mouse pointer on the new location for the Pin:

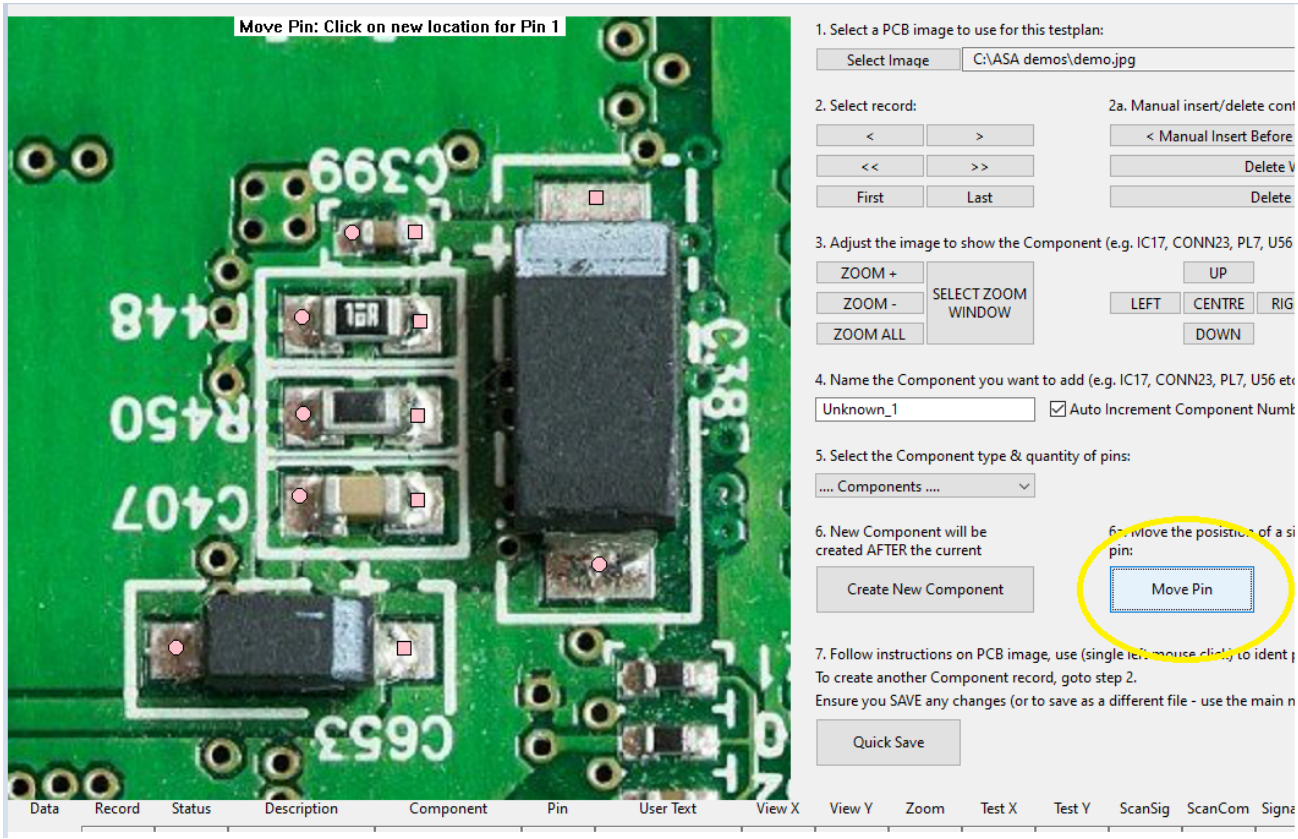

Fig. 113

The Pin has been relocated to the new position:

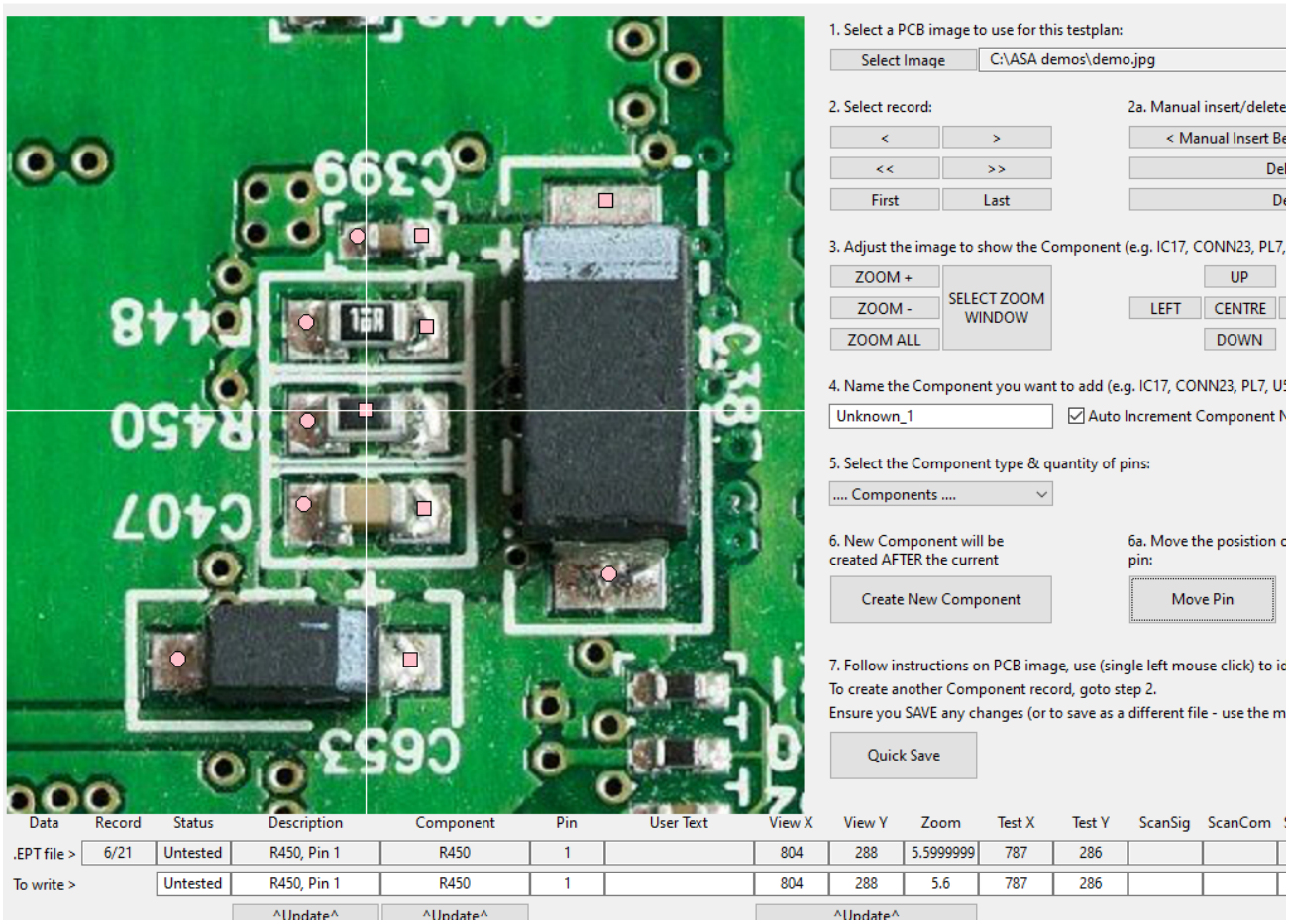

Fig. 114

Be sure to hit "Quick Save" regularly.

.5.6.6 Deleting components/pins

To delete a whole component, select any pin record that contains that component, then press the "Delete Whole Component" button:

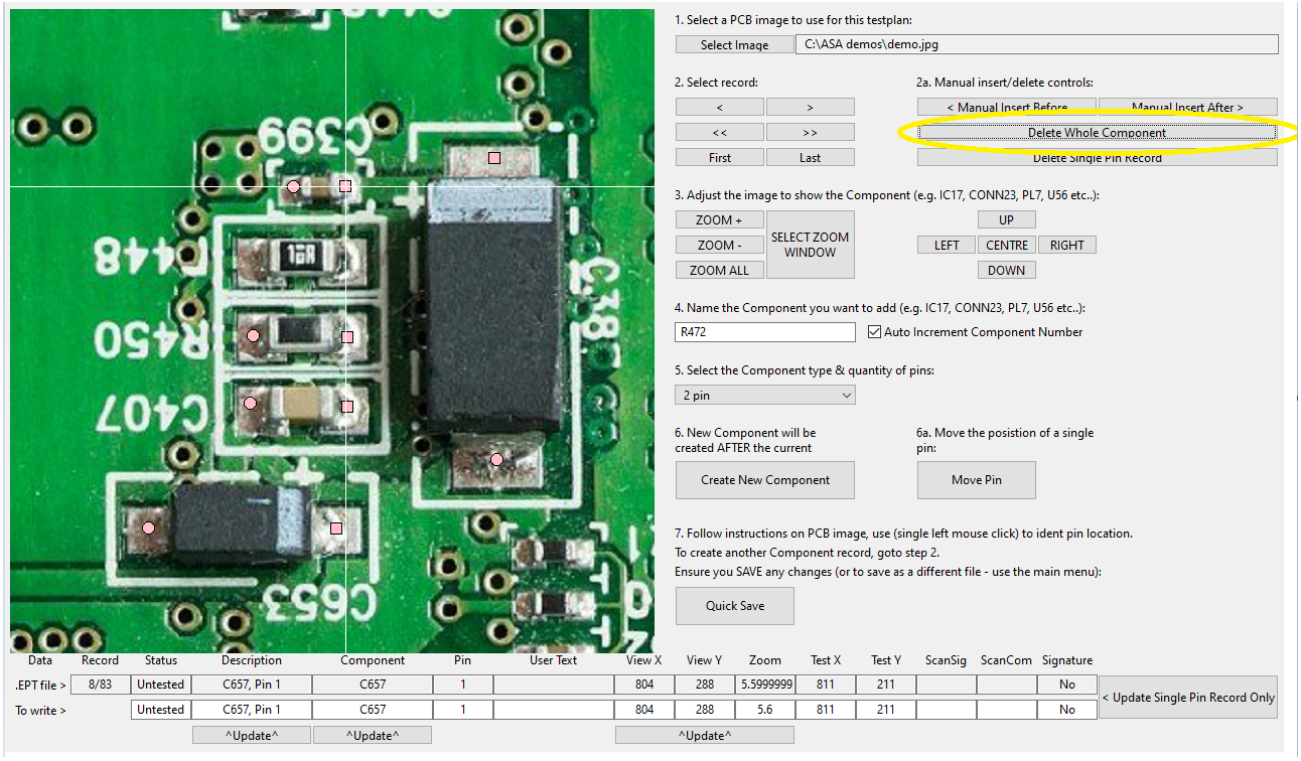

Fig. 115

The component record (in this example R448) that contained Pins 1 & 2 has been deleted. Deleting components with a large number of pins may take several seconds.

To delete a single pin record, select the pin and press the "Delete Single Pin Record", in this case 'C399, Pin 1' has been deleted:

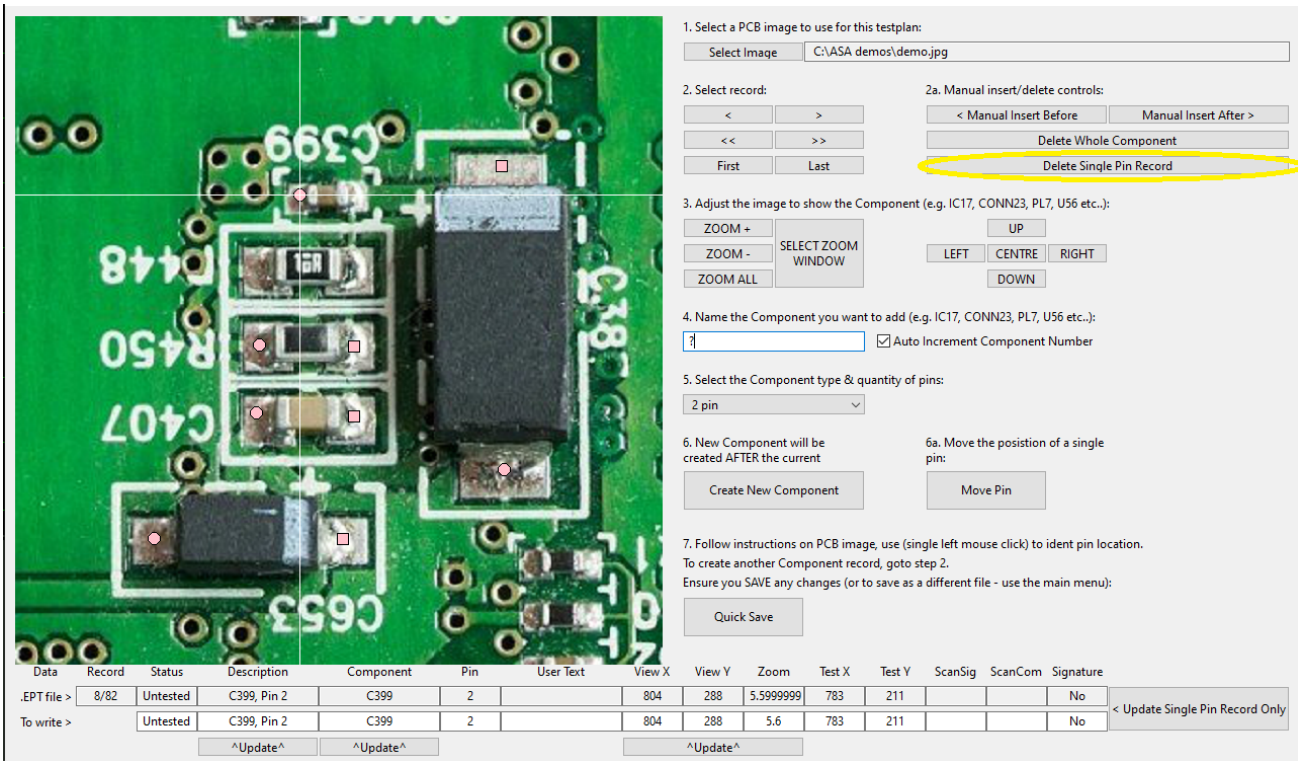

Fig. 116

Be sure to hit "Quick Save" regularly.

..5.7 Capturing Golden signatures

Capturing 'golden' signatures should happen AFTER the test file has been setup and the test points have been chosen.

Capturing signatures can be done either singly ("Single Capture") or automatically ("Auto Capture"):

.5.7.1 Single Capture

.5.7.2 Auto Capture

..5.8 Performing a test

.5.8.1 Auto Test

6 Technical