SECULIFE ESXTRA
ELECTROSURGICAL UNIT ANALYZER

Contents

WARNING - USERS
The SECULIFE ESXTRA Analyzer is for use by skilled technical personnel only.

WARNING - USE
The SECULIFE ESXTRA Analyzer is intended for testing only and they should never be used in diagnostics, treatment or any other capacity where they would come in contact with a patient.

WARNING - MODIFICATIONS
The SECULIFE ESXTRA Analyzer is intended for use within the published specifications. Any application beyond these specifications or any unauthorized user modifications may result in hazards or improper operation.

WARNING - CONNECTIONS
**All connections to patients must be removed before connecting the Device Under Test (DUT) to the Analyzer. A serious hazard may occur if the patient is connected when testing with the Analyzer.
Do not connect any leads from the patient directly to the Analyzer or DUT.**

WARNING - POWER ADAPTER
Unplug the Power Adapter before cleaning the surface of the Analyzer.

WARNING - LIQUIDS

Do not submerge or spill liquids on the Analyzer. Do not operate the Analyzer if internal components not intended for use with fluids may have been exposed to fluid, as the internal leakage may have caused corrosion and be a potential hazard.

CAUTION - SERVICE

The SECULIFE ESXTRA **Analyzer is intended to be serviced only by authorized service personnel. Troubleshooting and service procedures should only be performed by qualified technical personnel.**

CAUTION - ENVIRONMENT

The SECULIFE ESXTRA **Analyzer is intended to function between 15 and 30 °C. Exposure to temperatures outside this range can adversely affect the performance of the Analyzer.**

CAUTION - CLEANING

Do not immerse. The Analyzer should be cleaned by wiping gently with a damp, lint-free cloth. A mild detergent can be used if desired.

CAUTION - INSPECTION

The SECULIFE ESXTRA **Analyzer should be inspected before each use for wear and the Analyzer should be serviced if any parts are in question.**

NOTICE – SYMBOLS

Symbol	Description
⚠	**Caution** **(Consult Manual for Further Information)**
⚥	**RF Current Transformer**
♻	**Per European Council Directive 2002/95/EC, do not dispose of this product as unsorted municipal waste.**

NOTICE – ABBREVIATIONS

Amps	**Amperes**
c	**centi- (10^{-2})**
C	**Celsius**
CF	**Crest Factor**
°	**degree**
DFA	**Digital Fast Acquisition**
DUT	**Device Under Test**
hrs	**hours**
Hz	**hertz**
k	**kilo- (10^{3})**
kg	**kilograms**
kHz	**kilohertz**
lbs	**pounds**
L1, L2, L3	**Location 1, 2, 3**
M	**Mega- (10^{6})**
MHz	**Megahertz**
μ	**micro- (10^{-6})**
μA	**microampere**
m	**milli- (10^{-3})**
mA	**milliampere**
mHz	**millihertz**
mm	**millimeter**
ms	**millisecond**
mV	**millivolts**
Ω	**ohm**
PC	**Personal Computer**
Pk	**peak**
RF	**Radio Frequency**
RMS	**Root Mean Square**
US	**United States**
V	**volt**
VDC	**Direct Current Voltage**

CE

EG - KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY

GMC-I MESSTECHNIK

Dokument-Nr./ Document.No.:	820 / 11-020
Hersteller/ Manufacturer:	GMC-I GOSSEN-METRAWATT GMBH
Anschrift / Address:	Südwestpark 15 D - 90449 Nürnberg
Produktbezeichnung/ Product name:	Electrosurgical Analyzer Electrosurgical Analyzer
Typ / Type:	SECULIFE ES XTRA
Bestell-Nr / Order No:	M695C

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinien
überein, nachgewiesen durch die vollständige Einhaltung folgender Normen:

The above mentioned product has been manufactured according to the regulations
of the following European directives proven through complete compliance with the
following standards:

Nr. / No.	Richtlinie	Directive
2006/95/EG 2006/95/EC	Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen - Niederspannungsrichtlinie – Anbringung der CE-Kennzeichnung : 2011	Electrical equipment for use within certain voltage limits - Low Voltage Directive - Attachment of CE mark : 2011

EN/Norm/Standard	IEC/Deutsche Norm	VDE-Klassifikation/Classification
EN 61010-1 : 2001	IEC 61010-1 : 2001	VDE 0411-1 : 2002

Nr. / No.	Richtlinie	Directive
2004/108/EG 2004/108/EC	Elektromagnetische Verträglichkeit - EMV Richtlinie -	Electromagnetic compatibility - EMC directive -

Fachgrundnorm / Generic Standard

EN 61326-1 : 2006

Nürnberg, den 25.02.2011	
Ort, Datum / Place, date:	Geschäftsführung / managing director

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SECULIFE ESXTRA
ELECTROSURGICAL UNIT ANALYZER

The SECULIFE ESXTRA Electrosurgical Analyzer is a high-accuracy True RMS RF Voltmeter designed to be used in the calibration and routine performance verification of Electrosurgical Generators. It offers a higher degree of accuracy than previously attainable with conventional Electrosurgical Unit Analyzer designs. The SECULIFE ESXTRA provides an advanced low reactance internal load bank with a range of 1 to 6400 ohms in 1 ohm increments. It is microprocessor based and utilizes a combination of unique hardware and software to provide accurate and reliable test results, even from "noisy" ESU Generator waveforms such as "Spray". The DFA™ Technology utilized in the SECULIFE ESXTRA allows the system to aggressively digitize the complex RF waveforms produced by Electrosurgical Generators, analyze each individual digital data point, and provide highly accurate measurement results.

The SECULIFE ESXTRA, unlike many conventional ESU Analyzers, has internal HV setup relays to control the measurement path, allowing the user to switch between Power measurements, Leakage measurements, CQM/RECQM/ARM testing, or even run an autosequence that could include any or all of these tests – without even moving wires around!

The current transformer internal to the SECULIFE ESXTRA senses the RF current flowing through the internal test load and produces a ratiometric voltage which is digitized and analyzed by the microprocessor. Combining the standard and low ranges of the SECULIFE ESXTRA with the use of the current transformer, the user has full control over the ability to get high accuracy and high resolution readings from all types of Electrosurgical Generators.

The following are highlights of some of the main features:

- True RMS readings using DFA™ technology

- Industry standard current sensing technology

- mV, mV peak, mA, crest factor and power (wattage) ranges

- Color QVGA display with touchscreen

- +/- 1% of reading measurement accuracy

- Digital calibration – no pots to turn

- Selectable display options

- Graphical on-screen representation of measured RF signal

- Standard (1000 mV) and low range (100 mV) with autoscaling capability

- Pulsed RF waveform measurement mode for low duty cycle pulsed outputs offered by some electrosurgical manufacturers

OVERVIEW

This section looks at the layout of the SECULIFE ESXTRA and gives descriptions of the elements that are present.

| Scope Output | Footswitch Interface Automated DUT Activation | QVGA Display with touchscreen | Durable Powder-Coated, Custom Aluminum Case | Swivel Carrying Handle |

Safety Jacks RF Input

Power Switch

Front USB Port

Computer Interface
Serial Port (DB9 RS232)
2 USB Ports
PS/2 Keyboard/Mouse
10/100 Ethernet

Power
Kycon 3 pos locking connector
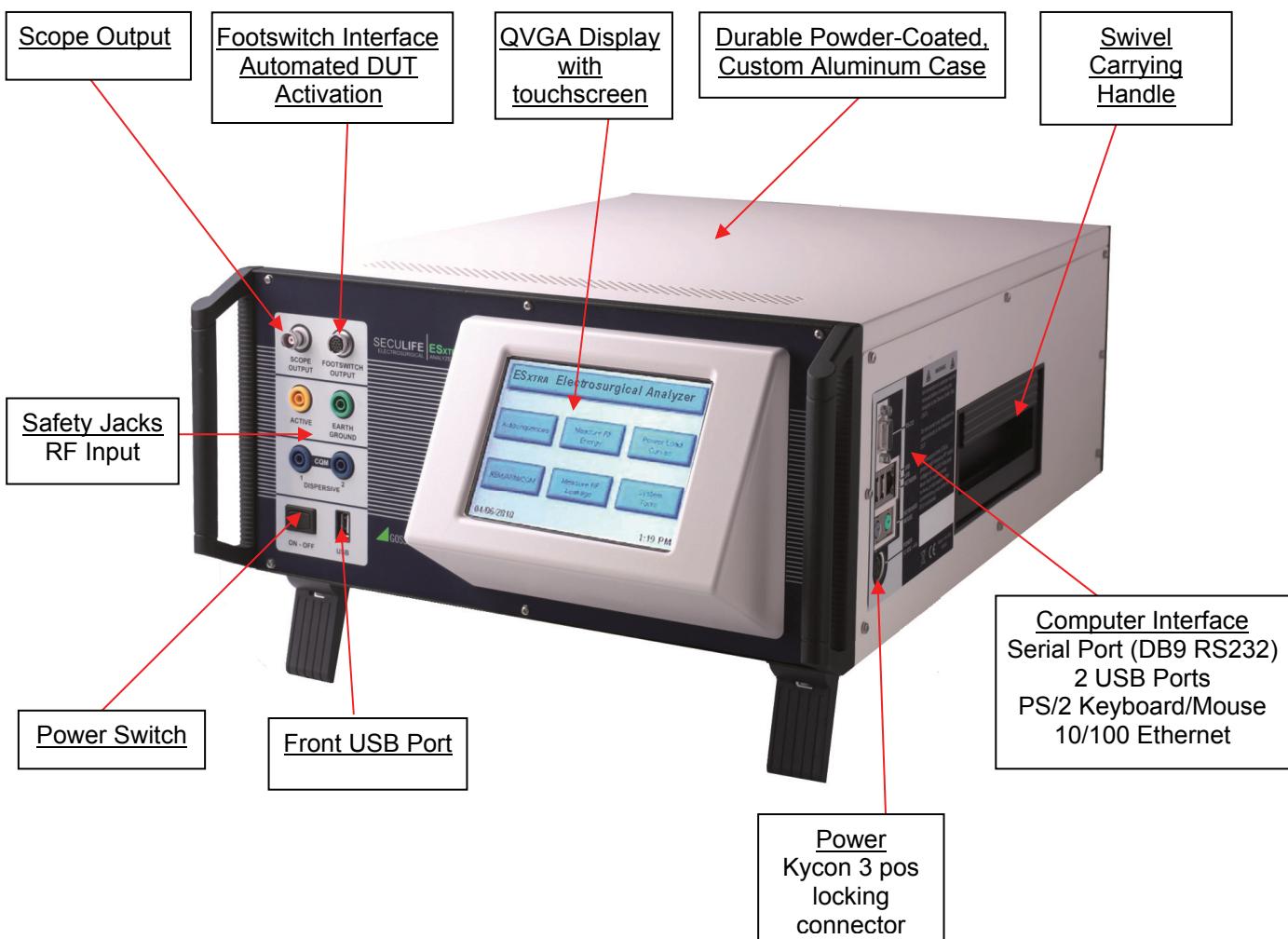
MAIN SCREEN

The SECULIFE ESXTRA boots to the main screen by default. The power up screen can be changed in the System Setup screen. The main screen provides a quick way to select the desired operating mode.
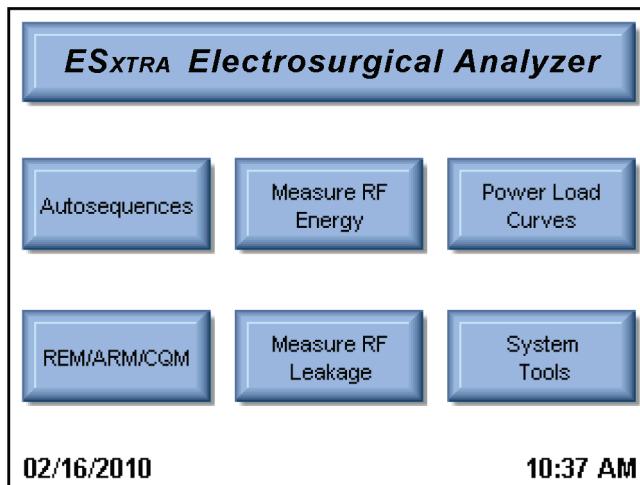
Autosequences

This mode provides for automated DUT testing. Autosequences can consist of any combination of user instructions, RF measurements, Load Curves, or CQM tests. Autosequences can be edited, loaded, and saved to either on board memory or external USB flash drives.

Measure RF Energy

This mode provides for RF measurements. The user can configure the SECULIFE ESXTRA for the desired RF measurement including Pulsed/Continuous waveform measurement, load setting, etc.

Power Load Curves

This mode provides for automated load curve testing of the DUT. Load curves can be configured for multiple load values and power levels.

REM/ARM/CQM

This mode allows the user to test the REM/ARM/CQM function of the DUT. The resistance can be manually entered, either by adjusting a specific resistance value or by adjusting a percent of resistance. This mode also has the ability to set the CQM load to an open circuit.

Measure RF Leakage

This mode provides for RF Leakage measurements. The user can configure the SECULIFE ES<small>XTRA</small> for the desired RF Leakage measurement including Pulsed/Continuous waveform measurement, load setting, etc. All switching for the leakage modes is performed by internal relays.

System Tools

This mode provides for configuration of the SECULIFE ES<small>XTRA</small>. In this mode the user can calibrate the touchscreen, update the system firmware, and adjust settings such as filter rate and system volume.

System Information

The system information screen is shown by pressing the SECULIFE ESXTRA title bar on the main screen. This window provides the basic information about the system including software versions and calibration due date.
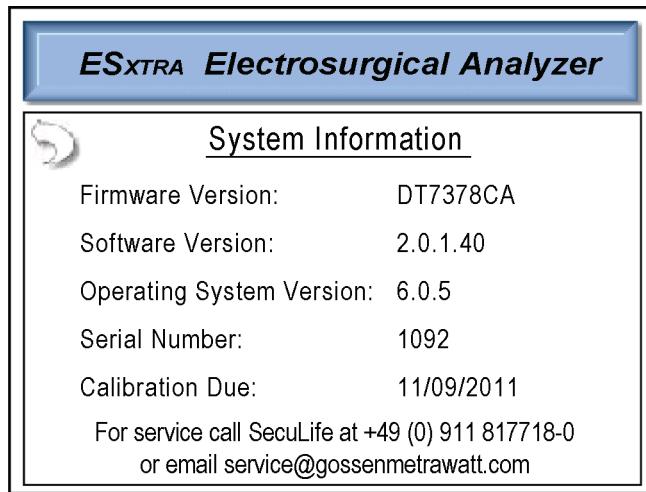
To exit the system information screen, simply press anywhere on the screen.

AUTOSEQUENCES
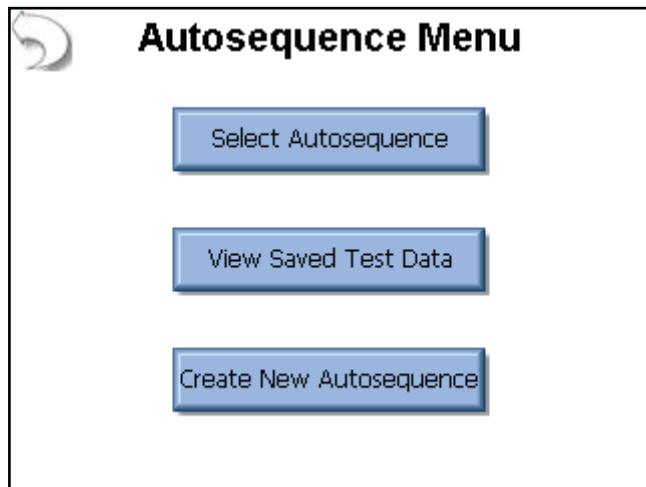
This screen allows the user to load an autosequence, view previously saved test results, or create new autosequences. The following screen is shown after selecting an autosequence.
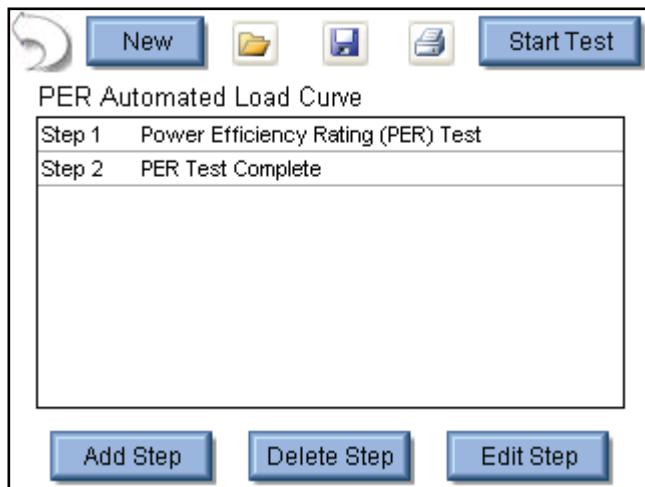
The procedure can consist of any combination of user instructions, RF measurements, Load Curves, or CQM tests. When a step is selected, it is highlighted in blue and expanded to show the step details. When a step is not selected, the background is white and only the essential details of the step are shown. The following buttons are available in this screen.

New – This button will create a new autosequence.

Open – This button will show the file open dialog box that will open an existing autosequence.

Save – This button will show the file save dialog box.

Print – This button will show the print dialog box.

Start Test – This button start the shown autosequence.

Add Step – This button will show the add step dialog box, shown below. To add a step to the autosequence, select where to add the step and then press OK.
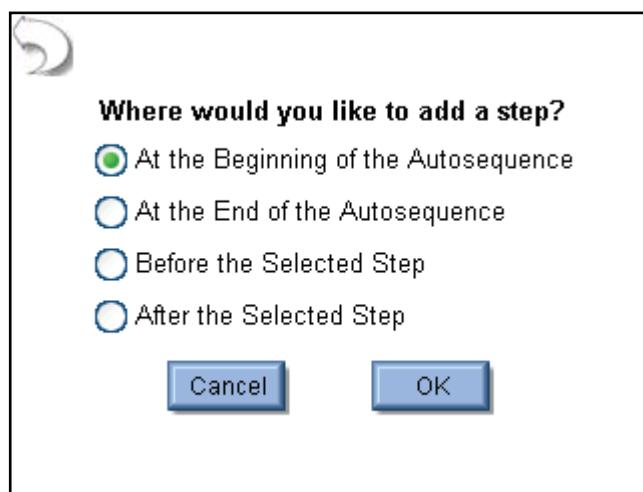
Delete Step – This button will delete the selected step from the autosequence.

Edit Step – This button will show the edit step window, shown below.
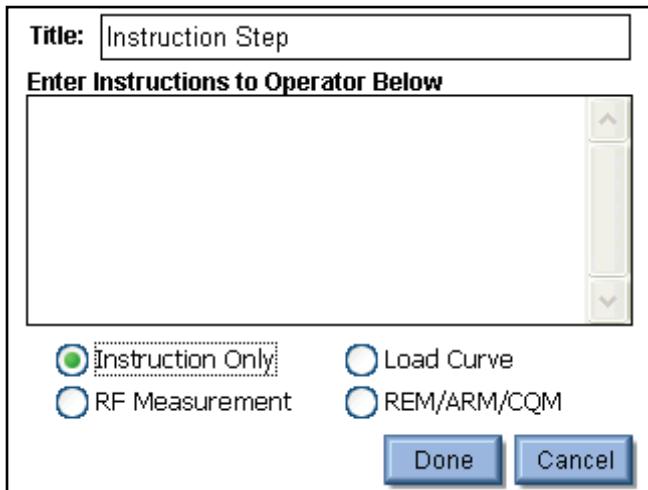
Each step has a field for the step title and instructions to the user. These fields must be entered using an external keyboard or remotely with a PC. Each step can be configured as an Instruction Only, RF Measurement (including leakage mode), Load Curve, or REM/ARM/CQM step by selecting the appropriate option button at the bottom of the step edit screen.

DUT Setup: For RF Measurements and Load Curves, the user needs to configure how the DUT will be activated. For these measurements, the DUT can be activated by the Operator or the SECULIFE ESxtra. As shown below. When Operator is selected, the user will be prompted when to activate or deactivate the SECULIFE ESxtra.
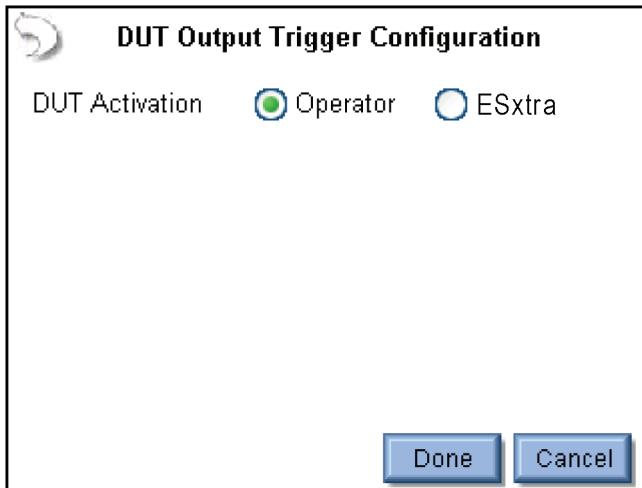
When SECULIFE ESxtra is selected as the trigger source, the activation can be setup manually or by DUT manufacturer and model. For Manual Setup, the user selects the desired footswitch output to be used. If RS-232 is enabled, the user also selects the baud rate and enters commands to be used for DUT setup and control.

When entering commands, use the "%P" to represent the power level. In the example below,

SECULIFE ESxtra would send the command ":FTP300" when setting the power level to 300 watts.
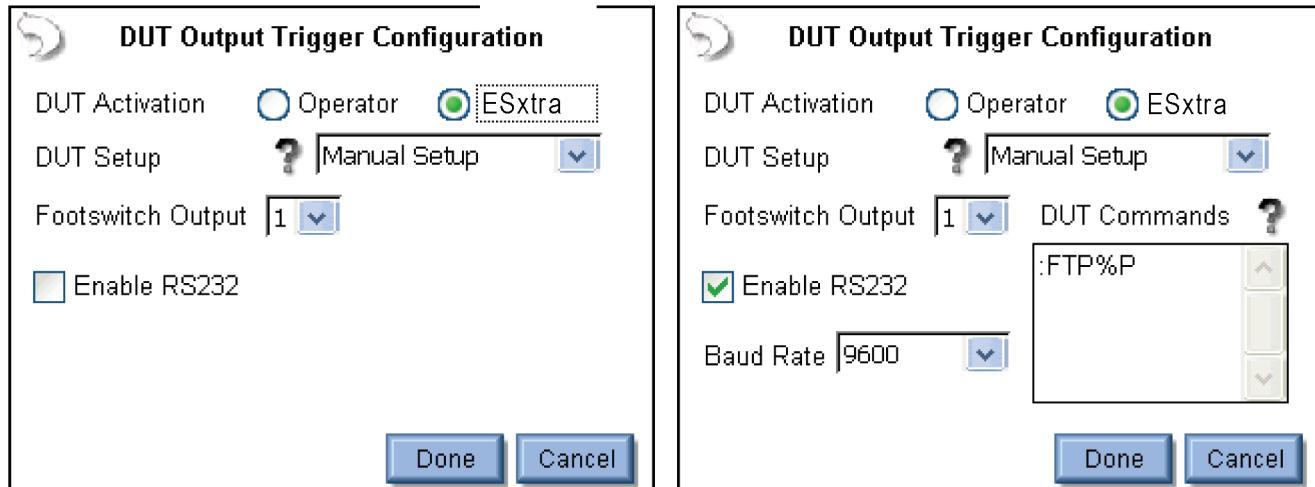
When the DUT Setup is set to Setup by Model, the user selects the DUT manufacturer and model as well

as the desired output mode. The SECULIFE ESxtra handles all of the RS-232 and footswitch output

setup.
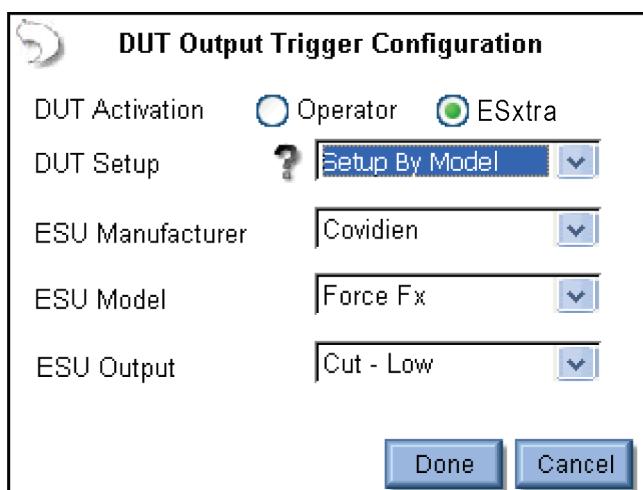
RF Measurement Step: All of the options in the standard RF measurement and leakage modes are available to the RF measurement step configuration.
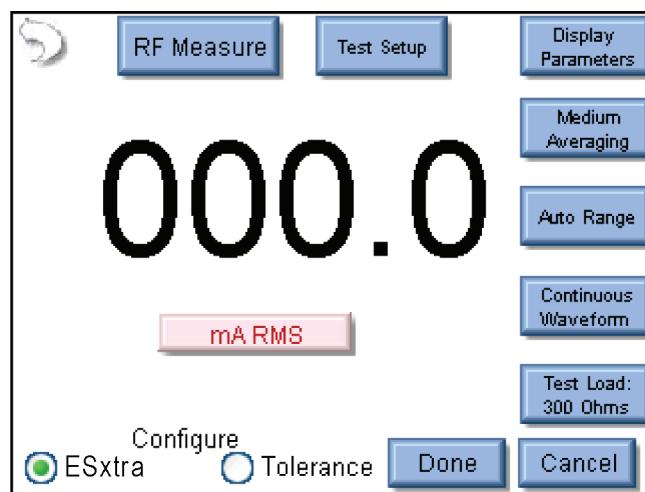
The user must configure both the SECULIFE ESXTRA meter as well as the measurement tolerance. To setup the tolerance, select the Tolerance option button at the bottom of the screen.
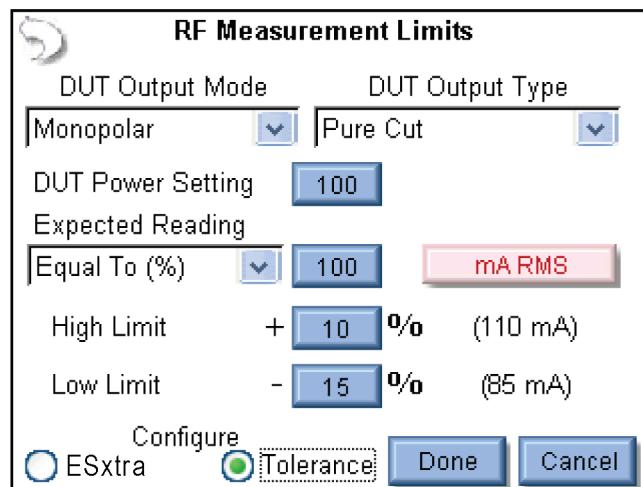
DUT Output Mode – This setting is for display only, to identify to the user the output mode used.

DUT Output Type – This setting is for display only, to identify the type of output to be measured.

DUT Power Setting – This setting represents what the DUT should be set to for the current step.

Expected Reading – This sets how the SECULIFE ESXTRA determines whether a measurement passes or fails. Available settings are Equal To (%), Less Than, Greater Than, or Equal To (Value).

Measurement Units – The user can press on the red units button to select what is to be measured for the current step. Available measurements can be found in the Measure RF Energy chapter, page 16.

High / Low Limit – These settings determine the limits of the measurement. If Expected Reading is set to "Equal To (%)", the limits will be based on a percentage of the expected reading. If the Expected Reading is set to "Equal To (Value)", the limits will be based on a measurement offset from the expected reading. The numbers in parenthesis below the measurement units display the reading limits based on expected value settings and High/Low Limits.

Load Curve Step: All of the options in the standard load curve are available to the load curve step configuration.
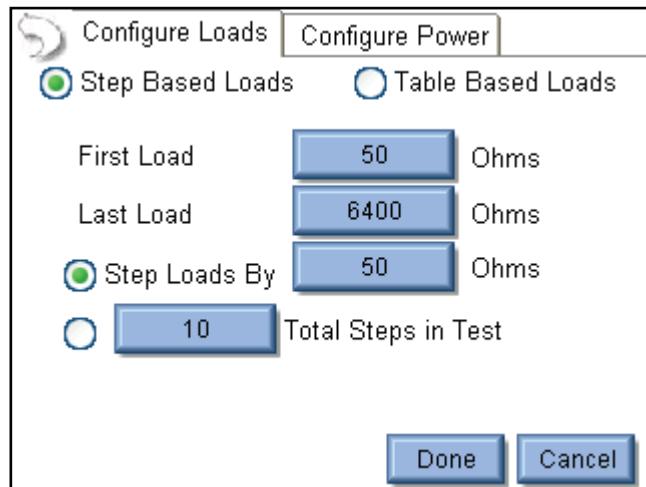
The tabs across the top of the screen allow the user to configure the Loads and Power settings to be used for the Load Curve.

Configure Loads Tab: The loads can be configured as either a step based load change or a Table based load change. For the step based loads, the user enters the first load to be used and the last load to be used. Then the SECULIFE ESXTRA steps the loads by either a fixed resistance or by a calculated amount to achieve a fixed number of steps for the test. In the previous picture, the load curve would start at 50 ohms, and increment the load by 35 ohms $\left(\dfrac{750-50}{20} \right)$ to provide 20 total steps in the test. For table based loads, the following screen is shown, allowing the user to select specific resistances to be used for the test.

Single Power Level Tab: For the load curve power configuration, the user can set the

SECULIFE ESxtra to run the load curve at a single power levels or multiple power levels.

The following screen shows the configuration for a single power level.

By pressing on the power setting, the user will be able to enter the desired power level for the load curve

test.

Multiple Power Levels Tab: When using multiple power levels, the configuration options are similar to the Load config. The user can select either step based power levels based on a fixed change in watts or based on the number of desired steps in the test.

For list based power levels, the user can enter any combination of power settings to use for the load curve, as shown below.

CQM Step: For CQM autosequence steps, the user configures the initial CQM resistance and selects whether the operator will be allowed to modify the CQM resistance.
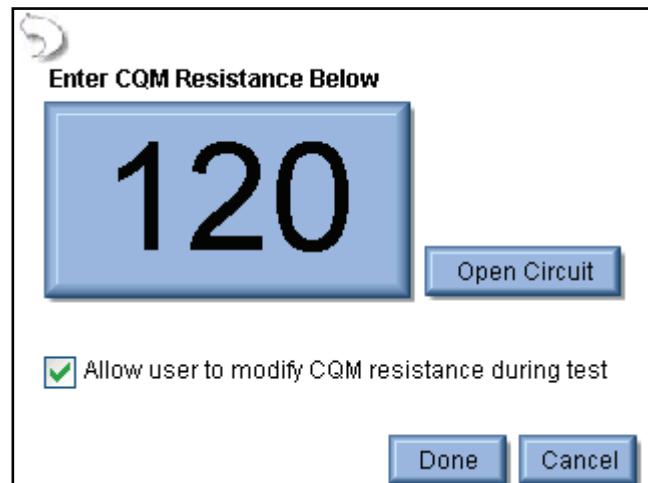
Running the Autosequence: When an autosequence is started, the user is first prompted to enter information about the DUT. The data can be entered by pressing on one of the fields and entering the information from the onscreen keyboard, external keyboard, or barcode scanner.

Instruction Only Steps – The step will display the instructions that the user is supposed to follow before proceeding to the next step. Once the instructions have been performed, the status must be updated to identify if the step passed or failed. Notes can be added by pressing the paperclip icon at the bottom of the screen.
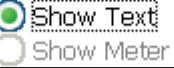
RF Measurement steps: This step will begin by showing the operator the step title and instructions. After the instructions are read, pressing the Show Meter button will allow the operator to perform the measurement. If the step is setup for the operator to trigger the DUT, the operator must activate the DUT and then press Capture to analyze the measurement and validate the step. If the step is setup to automatically trigger the generator, the operator simply presses the Capture button and the DUT will automatically be activated and the measurement analyzed.
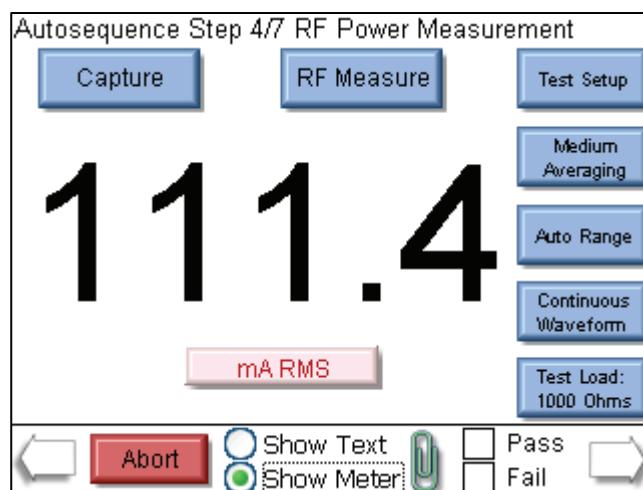

The step can be re-run by pressing the New Capture button after a reading has been taken.
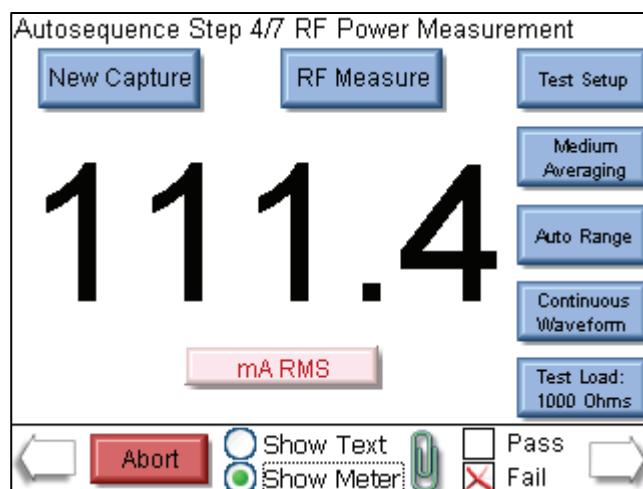
Load Curve Steps: This step will begin by showing the operator the step title and instructions. After the instructions are read, pressing the Show Meter button will allow the operator to perform the load curve.
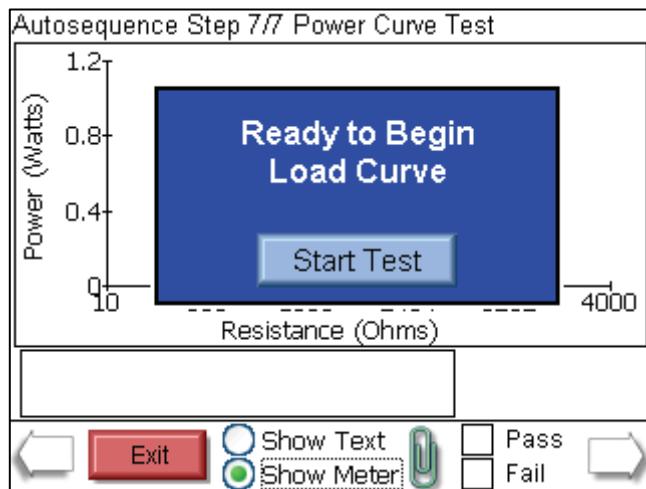
At the end of the load curve, the operator can view the measurements or rerun the load curve. The operator must manually validate the test by pressing the Pass or Fail box.
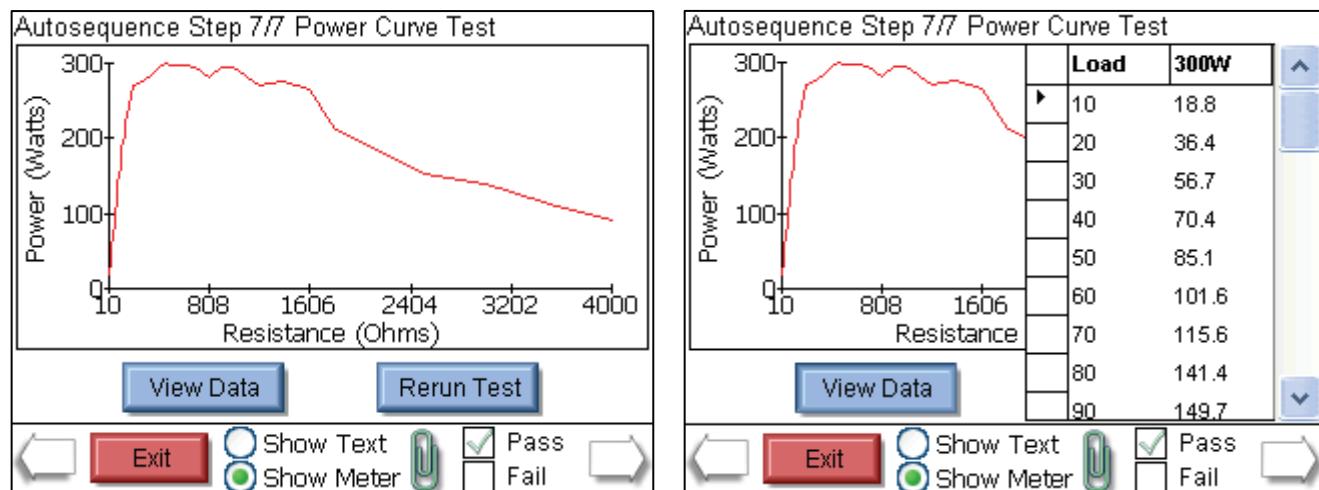
CQM Step: This step shows both the instructions and the step configuration. If the step has been configured to allow the user to adjust the CQM resistance, the following screen will be shown. The user must manually determine the pass or fail status of this step.
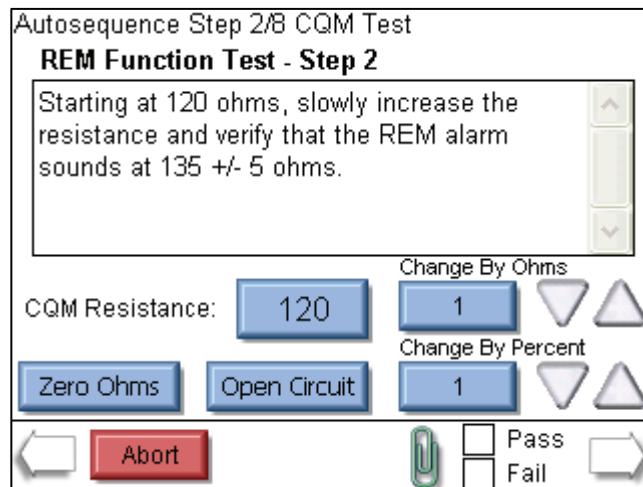
Autosequence Results: After all of the steps have been completed, the result screen will be shown. This screen indicates whether the test passed or failed.
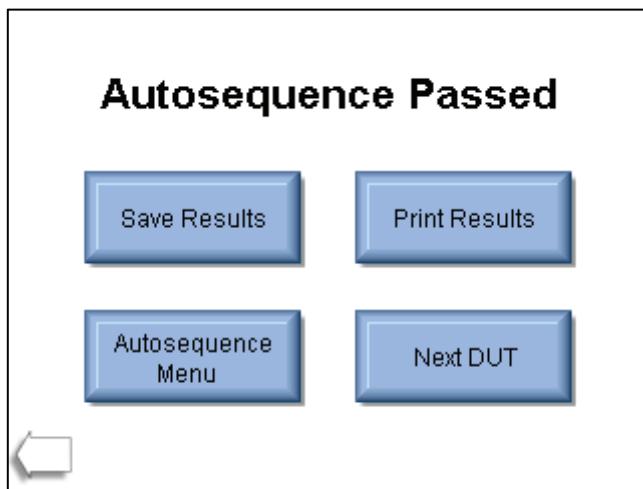
**Save Results** – This button allows the user to save the autosequence results to a file.

Print Results – This button allows the user to print the autosequence results.

Autosequence Menu – This button returns the user to the main autosequence menu.

Next DUT – This initiates a new autosequence and returns the user to the DUT information screen.

Back Arrow – This takes the user back a step, allowing the full test to be reviewed.

MEASURE RF ENERGY
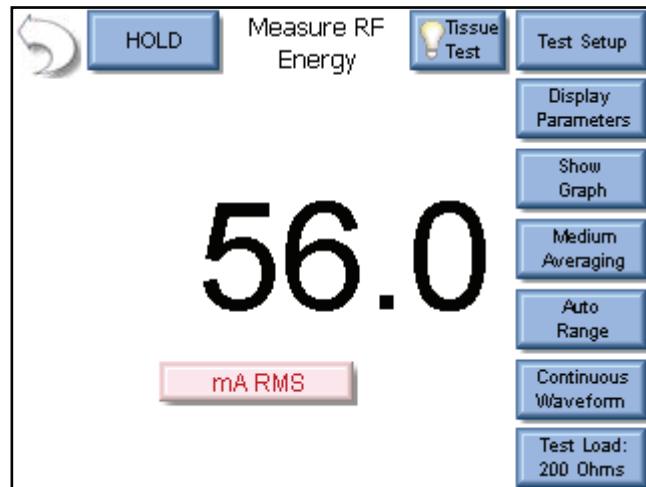
The RF Measure screen allows the user to take RF measurements. The measurement mode can be configured using the keys around the top and right side of the screen.

Back Arrow - Pressing the back arrow takes the user to the Main Screen.

Hold Key - The Hold key toggles the Hold mode.

Measurements are not updated while in the Hold mode.

Display Parameters - This key allows the user to select the number of measurements, or zones, that are shown on the screen. 6 Screen configurations are available, 5 Display Screens which have 1, 2, 3, 4 and 5 display zones respectively, and a Measurement List Screen which shows all available measurements.

Each Display Zone can be customized to show the desired parameter from the following options:

| Mode	Parameter	Abbreviation	Description
Pulsed and Continuous Mode	mV RMS	mV	This is the mV measured directly from the RF current transformer.
	mA RMS	mA	This is the converted mA measurement based on the RF donut mV to mA attenuation ratio.
	Power in Watts	Watts	This is the computed power based on load setting and mA measured.
	mV Peak	mV Pk	This is the maximum mV measured in the buffer. NOTE: This is shown as absolute value.
	mV Peak - to - Peak	mV P-P	This is the difference between maximum mV measured and min mV measured.
	mV Peak / Peak - to - Peak	Pk/P-P	This is the ratio of Peak versus Peak to Peak millivolts.
	mV Positive Peak Only	mV Pk+	This is the maximum positive mV measured in the buffer. For asymmetric waveforms this can determine if the output polarity is reversed.
	Crest Factor	CF	This is the ratio of peak to rms of the measured waveform.
Pulsed Mode Only	Time Pulse - On	Ton	This is the duration that the pulsed waveform is on. (See Diagram 1)
	Time - Pulse Off	Toff	This is the duration that the pulsed waveform is off. (See Diagram 1)
	Time - Total Cycle	Tcyc	This is the total cycle time of the pulsed waveform (i.e. Ton + Toff). (See Diagram 1)
	% Duty Cycle	%Duty	This is the ratio of the pulse on time (Ton) versus cycle time (Tcyc). (See Diagram 1)
	mV Pulse	mV cyc	This represents the RMS mV over one pulsed cycle. (See Diagram 1)
	mA Pulse	mA cyc	This represents the RMS mA over one pulsed cycle. (See Diagram 1)
	Watts Pulse	Wcyc	This represents the RMS Watts over one pulsed cycle. (See Diagram 1)
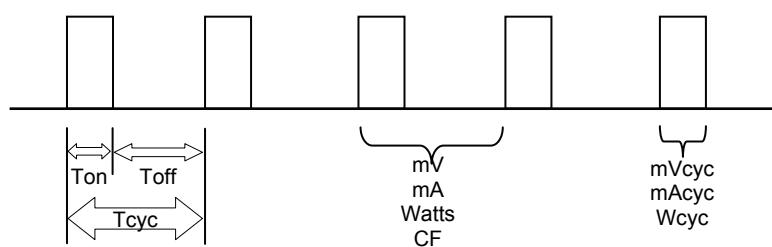
Diagram 1 (**Pulsed mode only**)

Show Graph - This key allows the user to display a graph of the latest RF measurement. Graphs can be saved and loaded from internal memory or external USB storage.
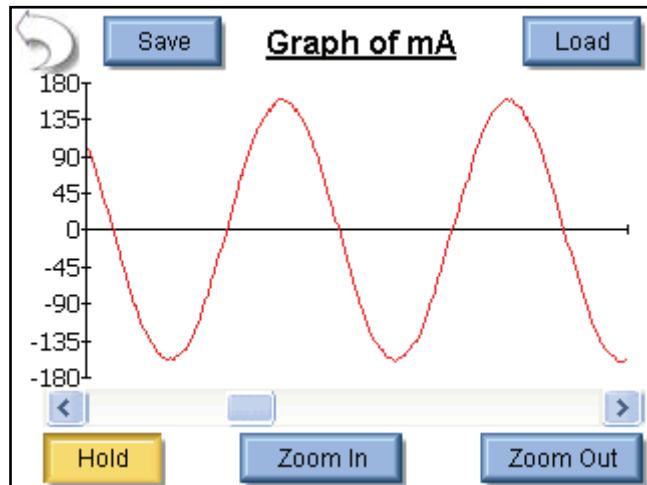
Back Arrow – Returns to RF Measurement Screen

Save – Stores waveform to a comma delimited file.

      This file can then be imported into Microsoft® Excel.

Load – Opens previously saved waveform data.

Hold – Stops the waveform measurement update.

Zoom In – Expands the waveform to better view the individual data samples.

Zoom Out – Shows more waveform data to better view the overall waveform.

Averaging - This key allows the user to select the FAST, MEDIUM, or SLOW averaging mode. Fast averaging will provide a quick response to incoming signals. Slow averaging will provide a more stable display, but will be slower to respond to small changes in the RF input signal. The value for the Averaging settings can be configured in the System Setup screen.

Input Range - Allows the user to select the range for the RF input. The range can be selected as 100mV, 1000mV, or Auto range.

Input Mode - Allows the user to select the mode for the RF measurement. The mode can be selected as Continuous or Pulsed.

Test Load - This button shows a menu that allows the user to select internal load mode, external load mode, or the combination of internal/external loads. The menu also allows for the selection of the internal and external load values.

Load Configuration		
Load Values:		Load Mode:
200	Internal Load	● Internal
0	External Load	○ External
200	Total Load	○ Int\Ext

POWER LOAD CURVES

Load Curve Menu

Configure Load Curve

Run Default Load Curve

Open Load Curve Profile

View Saved Curve Data

The load curve menu allows the user to manually configure a load curve, run the factory default load curve, run a saved load curve profile, or view a load curve that was run previously.

Load Curve Configuration

Load Config | Power Config | ESU Setup

⊙ Step Based Loads   ○ Table Based Loads

First Load   50   Ohms

Last Load   6400   Ohms

⊙ Step Loads By   50   Ohms

○   10   Total Steps in Test

Save Configuration   Start Load Curve
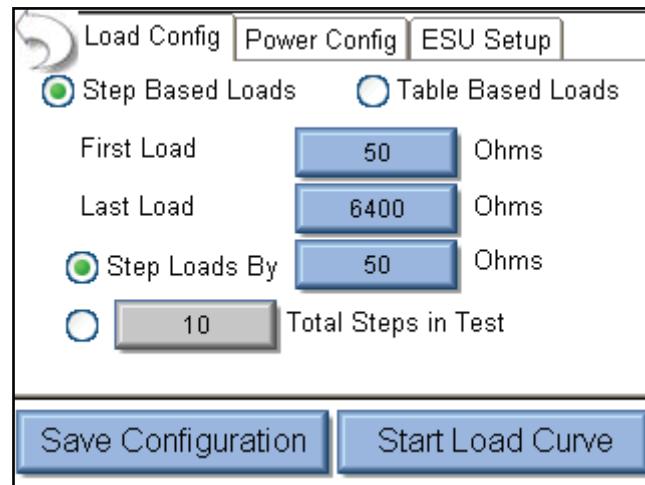
The tabs across the top of the screen allow the user to configure the Loads, Power, and ESU generator.

Load Config Tab: The loads can be configured as either a step based load change or a Table based load change. For the step based loads, the user enters the first load to be used and the last load to be used. Then the SECULIFE ESXTRA steps the loads by either a fixed resistance or by a calculated amount to achieve a fixed number of steps for the test. In the picture above, the load curve would start at 50 ohms, and increment the load by 35 ohms $\left(\dfrac{750 - 50}{20} \right)$ to provide 20 total steps in the test. For table based loads, the following screen is shown, allowing the user to select specific resistances to be used for the test.

Single Power Level Tab: For the load curve power configuration, the user can set the SECULIFE ESXTRA to run the load curve at a single power levels or multiple power levels. The following screen shows the configuration for a single power level.

By pressing on the power setting, the user will be able to enter the desired power level for the load curve test.

Multiple Power Levels Tab: When using multiple power levels, the configuration options are similar to the Load config. The user can select either step based power levels based on a fixed change in watts or based on the number of desired steps in the test.

For list based power levels, the user can enter any combination of power settings to use for the load curve, as shown below.

ESU-Setup: The ESU can be triggered by the Operator or the SECULIFE ESxtra. As shown below. When Operator is selected, the user will be prompted when to activate or deactivate the ESU.
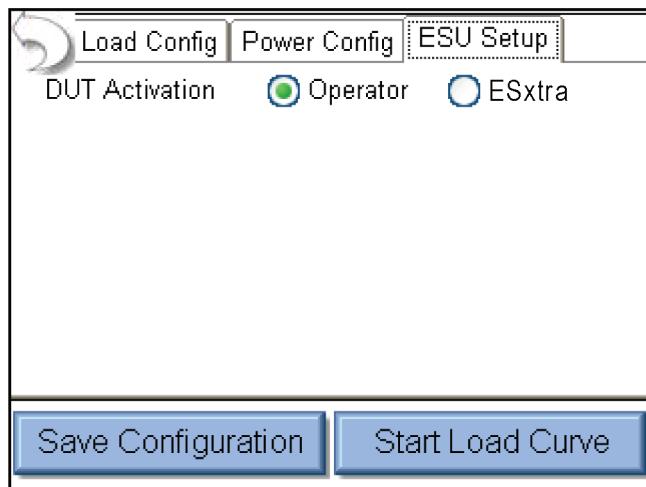
When SECULIFE ESxtra is selected as the trigger source, the activation can be setup manually or by DUT manufacturer and model. For Manual Setup, the user selects the desired footswitch output to be used. If RS-232 is enabled, the user also selects the baud rate and enters commands to be used for DUT setup and control.

When entering commands use "%P" to represent the power level. In the example below,

SECULIFE ESXTRA would send the command ":FTP300" when setting the power level to 300 watts.
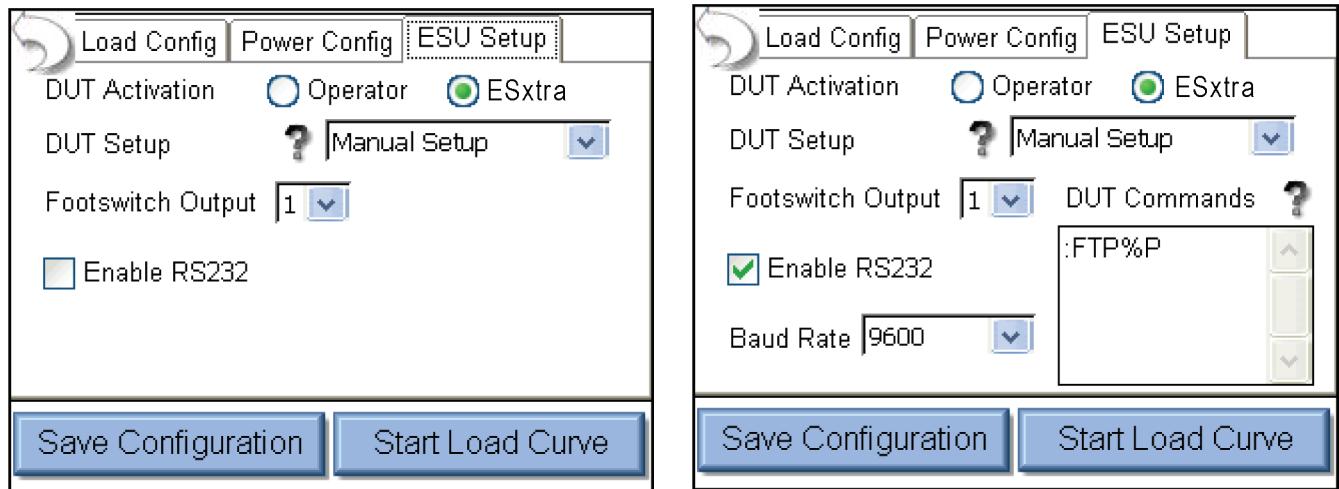

When the DUT Setup is set to Setup by Model, the user selects the DUT manufacturer and model as well

as the desired output mode. The SECULIFE ESXTRA handles all of the RS-232 and footswitch output

setup.
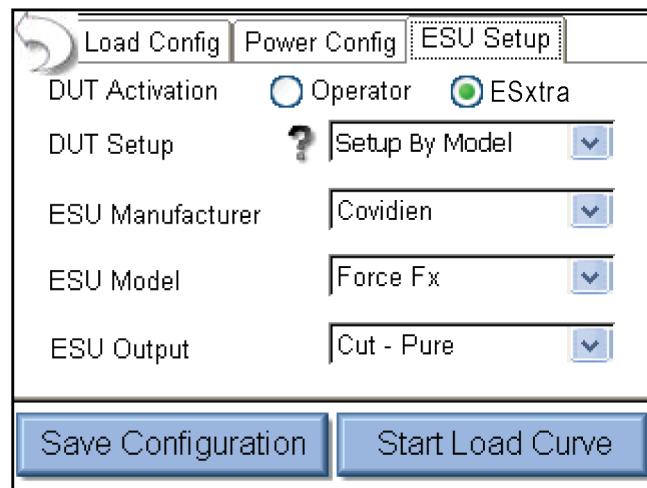
REM/ARM/CQM

The REM/ARM/CQM key from the main menu will access the Return Electrode Control Quality Monitor Test. This menu allows for the user to control the resistance between the blue CQM terminals on the front of the SECULIFE ESXTRA.
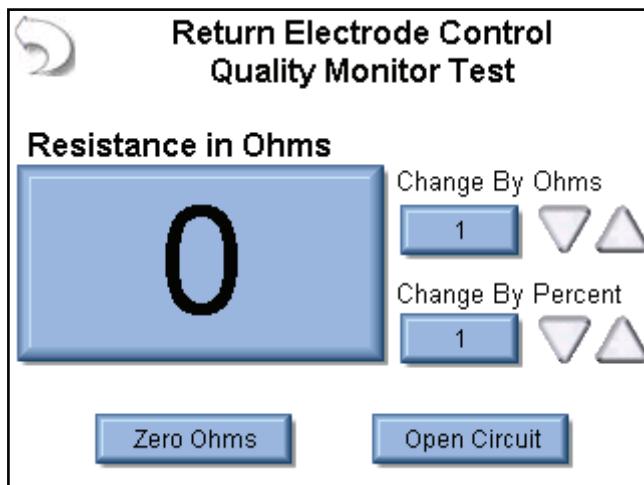
CQM Resistance – The CQM resistance can be entered directly be pressing on the resistance indicator button. The maximum CQM resistance is 500 ohms.

Change by Ohms – These buttons allow the user to adjust the CQM resistance up or down by a set number of Ohms. The maximum step size is 500 ohms.

Change by Percent – These buttons allow the user to adjust the CQM resistance up or down by a percentage of the current resistance. Maximum percent change is 500%. The minimum resistance change is 1 ohm. That is, if the current resistance is 1 ohm and the % change is 1%, pressing the UP / Down buttons will still change the resistance by 1 ohm.

Zero Ohms – This button will set the CQM resistance to zero ohms.

Open Circuit – This button will toggle the CQM resistance to an open circuit.
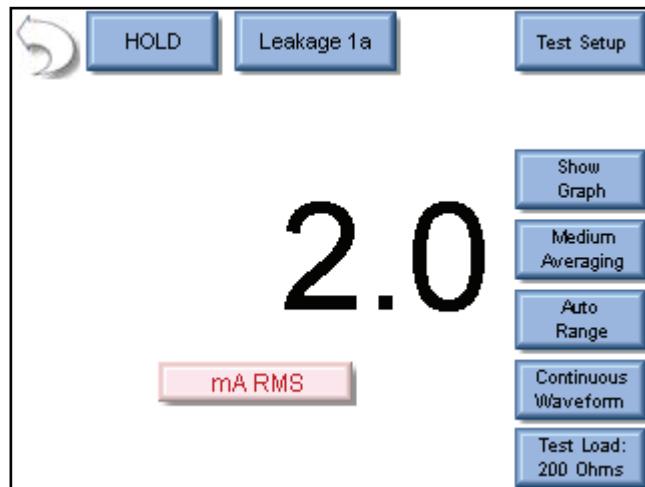
MEASURE RF LEAKAGE

The RF Leakage screen allows the user to take RF leakage mA measurements. For RF Leakage, only mA can be measured. The measurement mode can be configured using the keys around the top and right side of the screen.

Back Arrow - Pressing the back arrow takes the user to the Main Screen.

Hold Key - The Hold key toggles the Hold mode.

Measurements are not updated while in the Hold mode.

Leakage Mode - This button allows the user to select which measurement mode is to be used. There are four leakage measurement modes available.

Test Setup - This key shows a picture of the connections for the current mode.
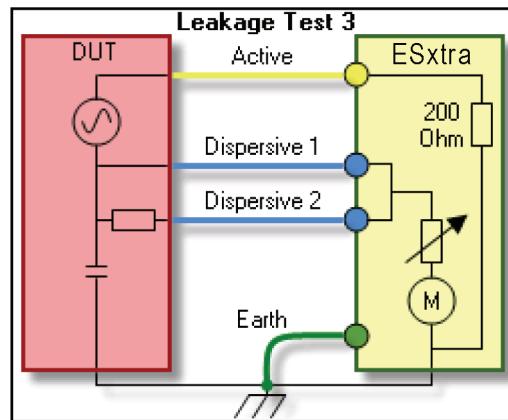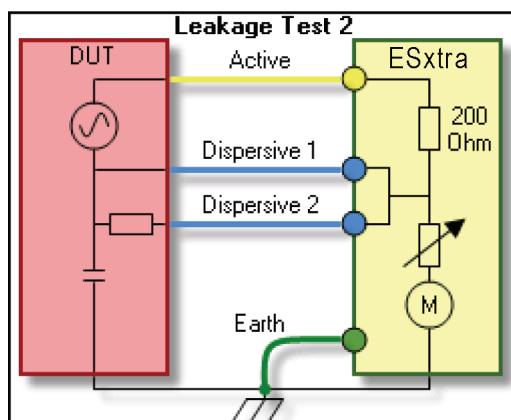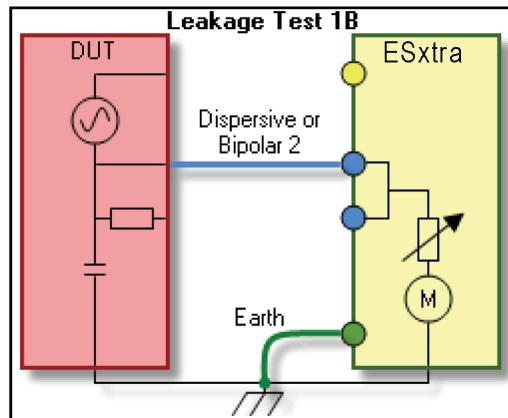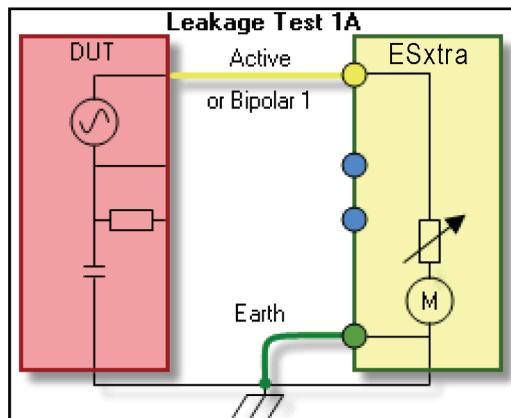
Show Graph - This key allows the user to display a graph of the latest RF measurement. Graphs can be saved and loaded from internal memory or external USB storage.

Averaging - This key allows the user to select the FAST, MEDIUM, or SLOW averaging mode. Fast averaging will provide a quick response to incoming signals. Slow averaging will provide a more stable display, but will be slower to respond to small changes in the RF input signal. The value for the Averaging settings can be configured in the System Setup screen.

Input Range - Allows the user to select the range for the RF input. The range can be selected as 100mV, 1000mV, or Auto range.

Input Mode - Allows the user to select the mode for the RF measurement. The mode can be selected as Continuous or Pulsed.

Test Load - This button shows a menu that allows the user to select internal load mode, external load mode, or the combination of internal/external loads. The menu also allows for the selection of the internal and external load values.

SYSTEM TOOLS

The tools screen allows the user to adjust system settings as well as update the SECULIFE ESXTRA firmware or calibrate the touchscreen. There are two pages of system tools. The arrows at the bottom of the page navigate through the system setup pages. The round indicators at the bottom of the screen identify which page is currently viewed.
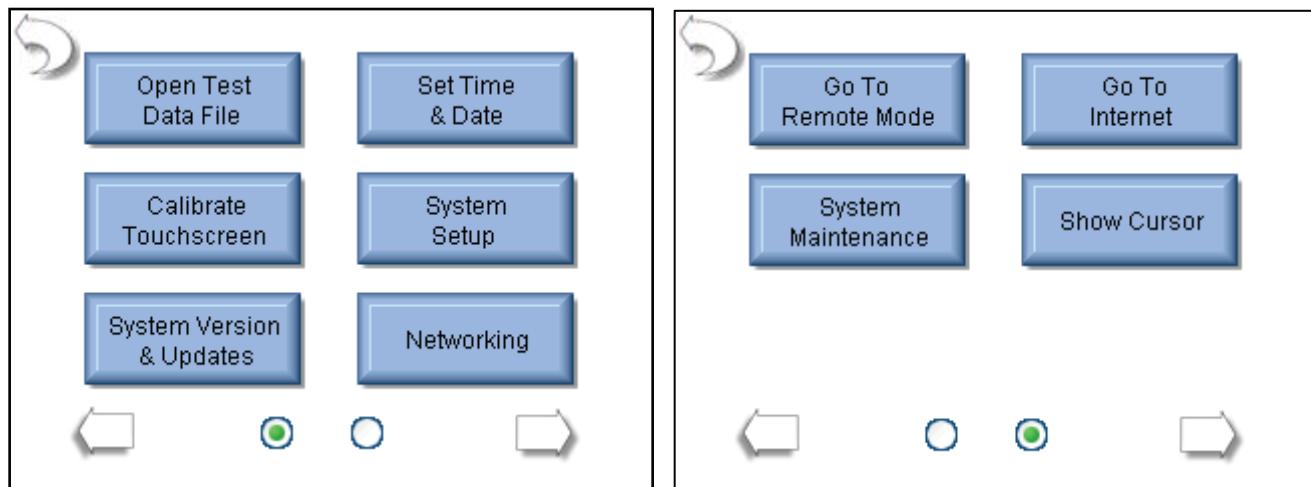
Open Test Data File – This button allows for quick access to previously stored Autosequence Results, Load Curve Results, or RF Waveform data.

Set Time and Date – This button shows the Time and Date configuration screen. To change the Date or Time, the user presses the appropriate button.
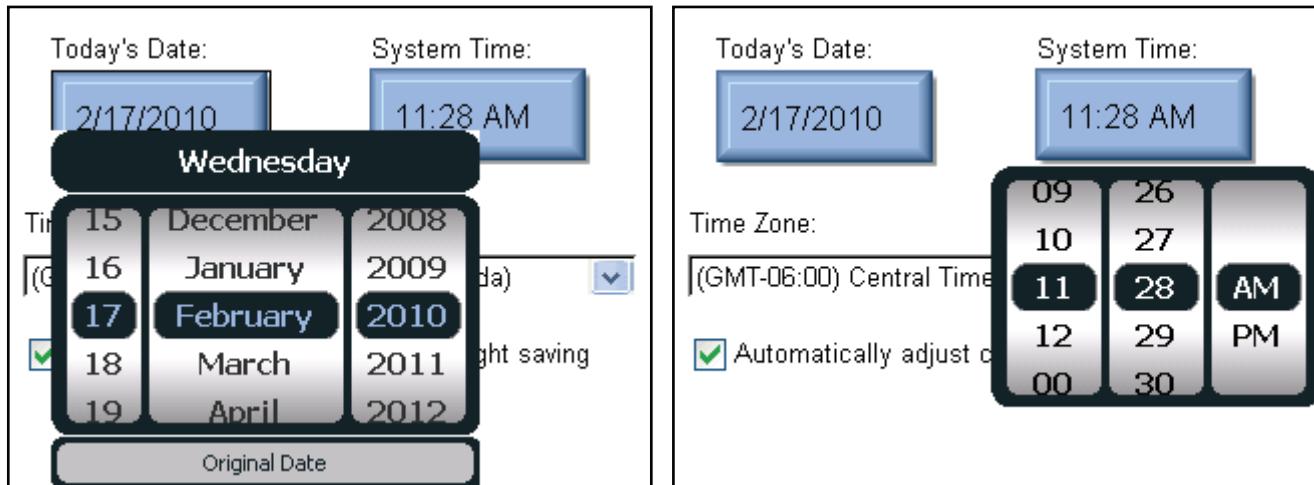
Then the Time/Date settings are set by scrolling the display to the desired value. Once the proper setting is shown, the Date/Time button is pressed again to accept the change.

Time Zone – This setting allows the user to localize the SECULIFE ESXTRA to the user's time zone.

Daylight Savings – The SECULIFE ESXTRA can be configured to automatically adjust the time for Daylight Savings.

Calibrate Touchscreen – This button allows the user to calibrate the touchscreen using a 4, 7, or 20 point calibration. Once calibration is started, follow the on – screen prompts to perform the calibration
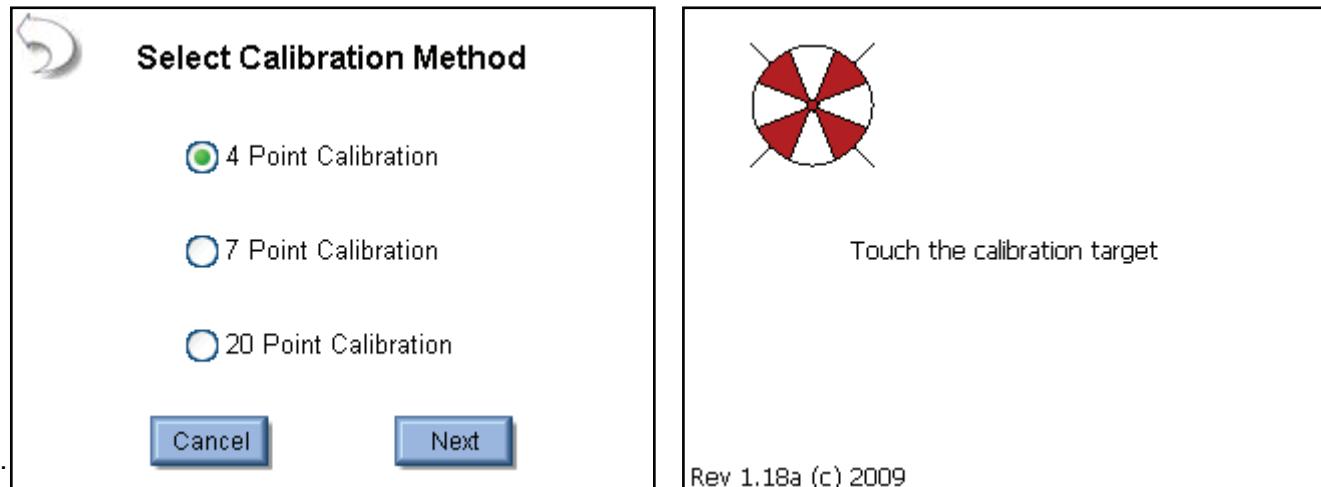
System Setup – This button shows the System Setup screen which allows the user to configure the SECULIFE ESXTRA.
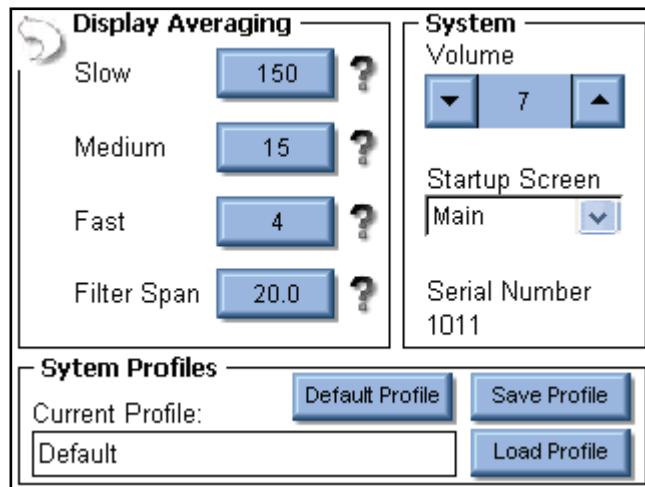
Display Averaging – The Display averaging settings of Slow, Medium, and Fast are programmed here. These determine the number of samples used in averaging the RMS measurements. The larger the number, the more stable the reading, but the less sensitive the system will be to small changes in readings. The filter span determines the maximum change in input readings that will be averaged.

Volume – This sets the volume for the SECULIFE ESXTRA.

Startup Screen – This selects the screen that is loaded as the SECULIFE ESXTRA powers up.

Serial Number – This is a read only display of the SECULIFE ESXTRA serial number.

Profiles – Profiles are used to save the measurement configuration, averaging settings, volume, and startup screen. If the user wants to change how the SECULIFE ESXTRA powers up, the settings can be modified and then saved to a profile. The profile will be loaded on system startup.

System Version and Updates – This buttons shows the Current System Version screen shows the revision of all of the software running on the SECULIFE ESXTRA and allows the user to update the system to new versions or restore previous versions.
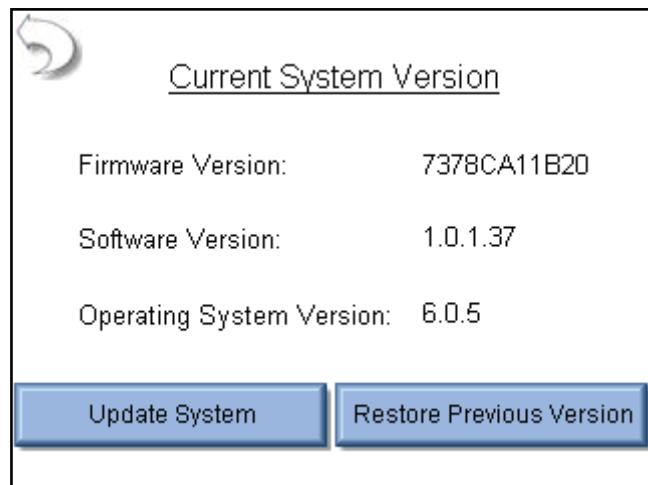
Update System – This button allows the user to update the SECULIFE ESXTRA through the internet (FTP site) or with a USB Flash drive.

FTP Update:

The system will default to updating from the internet and will indicate to the user whether the FTP site is reachable. If it is, an Update button will appear at the bottom of the screen.

When the Update button is pressed, the SECULIFE ESXTRA will connect to the FTP server and check for available updates to the system.
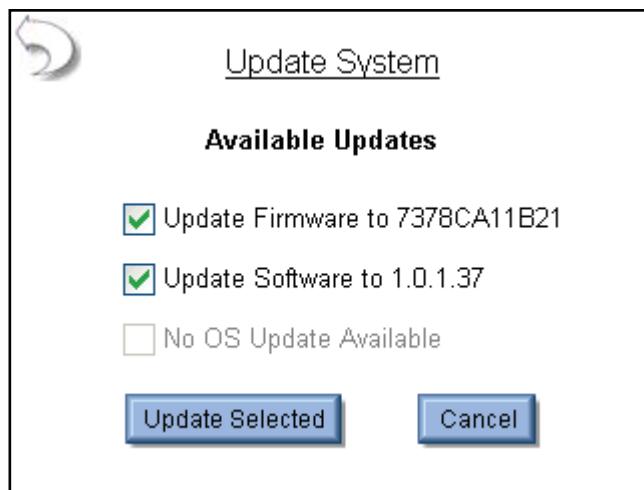
The user can perform all updates at once or select the software to update by using the check boxes. Once the desired updates are selected, the Update Selected button is pressed.

The SECULIFE ESXTRA will automatically download and install the updates to the system. When updating the Software or OS, the SECULIFE ESXTRA will need to be rebooted.

The process for updating the system is to download the updated files, backup the existing software, install the new software, and reboot if necessary.
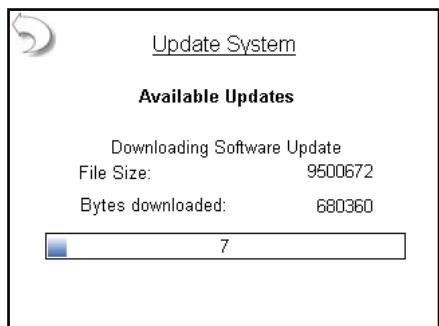
Downloading Updates
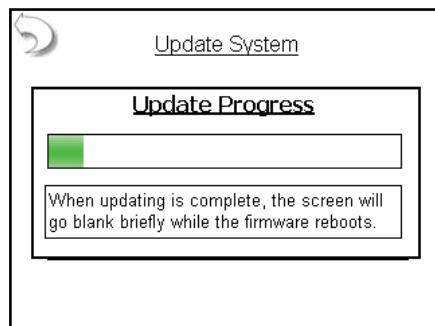
Updating Firmware
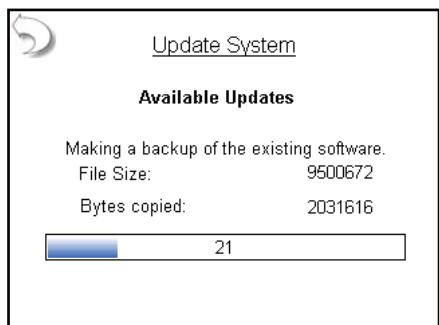
Backing Up Software
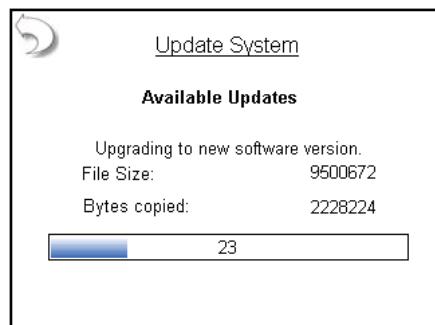
Installing Updates
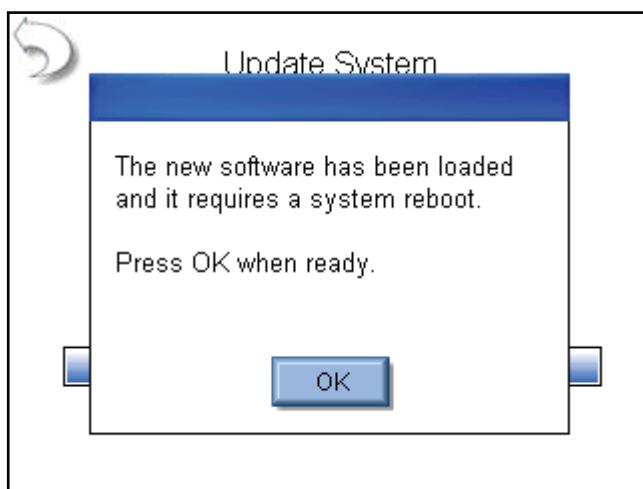
Update from Flash Disk: When updating from flash disk, the user must individually update the Firmware, Software, and Operating System. Firmware update files should begin with the filename DT7378 and have an extension of ".S19".

Software update files should begin with the filename "SECULIFE ESXTRA _", end with the revision code and have an extension of ".exe". Operating system files should begin with "NK_" and have an extension of ".bin"
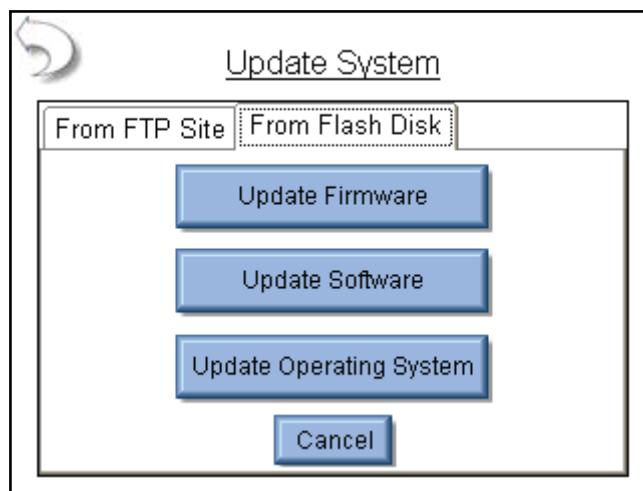
Restore Previous Versions: Each time the SECULIFE ESXTRA is updated, it creates a backup of the previous version in case it is ever needed. The firmware, software, and operating system are restored independently. To restore a previous version, first select the file from the backup log and then press the Restore button.

Restore System

| Firmware | Software | Operating System |

Select Desired File and Press Restore

7378CA11B8.s19

7378CA11B9.s19

7378CA11B14_Backup_12-18-2009.s19

7378CA11B17.s19

7378CA11B20.s19

7378CA11B21.s19

Restore   Cancel
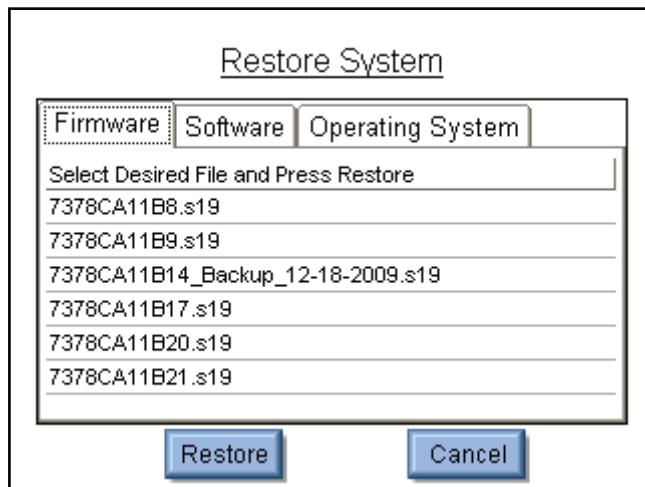
Networking - The networking screen shows the current network information and allows the user to select DHCP (automatic) or Static IP address mode.

TCP/IP Configuration

Address Type:	DHCP
IP Address:	192.168.2.138
Subnet Mask:	255.255.255.0
Default Gateway:	192.168.2.1
MAC Address:	00:07:32:0D:17:13
Network Name:	ESxtra_1011

OK   Renew Dhcp   Cancel

Address Type – The user can select whether the IP address is received automatically from a DHCP server or configured for a Static IP address.

IP Address – This field identifies the IP address when DHCP is enabled or allows the user to enter an IP address when the Static Address Type is selected.

Subnet Mask – This field identifies the Subnet Mask when DHCP is enabled or allows the user to enter a Subnet Mask when the Static Address Type is selected.

Default Gateway – This field identifies the Default Gateway when DHCP is enabled or allows the user to enter a Gateway address when the Static Address Type is selected.

MAC Address – This read only field identifies the MAC address of the SECULIFE ESxtra.

Network Name – This identifies the SECULIFE ESxtra on the network. The default name is SECULIFE ESxtra _xxxx where "xxxx" is the SECULIFE ESxtra serial number. Network names must be unique for each device on a network. The network name is used when browsing the SECULIFE ESxtra on the network. For the example above, the SECULIFE ESxtra could be viewed in windows explorer by typing in \\ESxtra_1011 in the address field.

Remote Mode - This mode allows the SECULIFE ESXTRA to be controlled from a remote PC on a network. To activate Remote mode, connect the SECULIFE ESXTRA to the network. Then press the GO To Remote Mode button. The SECULIFE ESXTRA can guide the operator through the process of setting up the remote mode connection.
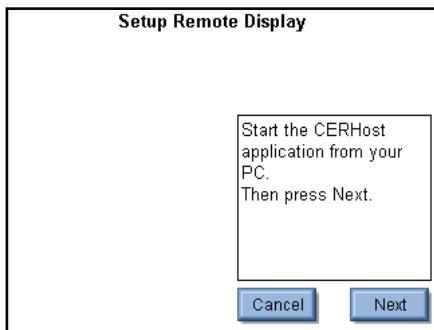
Step 1 – Start CERHost.exe   Step 2 Start Connection
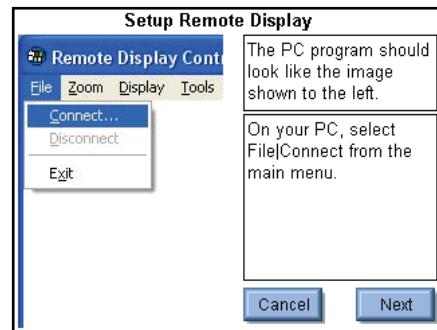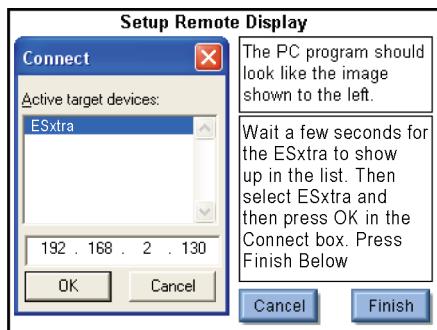
Step 3 Connect to ESxtra   Step 4 Blank ESxtra screen
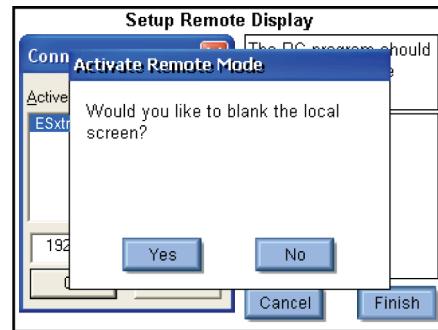
To return to local mode, press the Go To Local Mode button either in the remote PC display or on the SECULIFE ESXTRA.
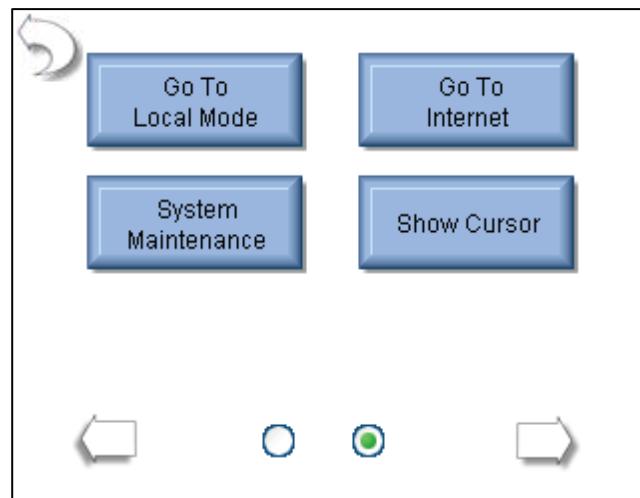
CERHost Configuration: The PC display may flicker or show lines in it based on the SECULIFE ESXTRA Operating mode. To fix this, go to the Config menu on the CERHost application under Tools Config and set the update to Whole Screen instead of Line by Line.
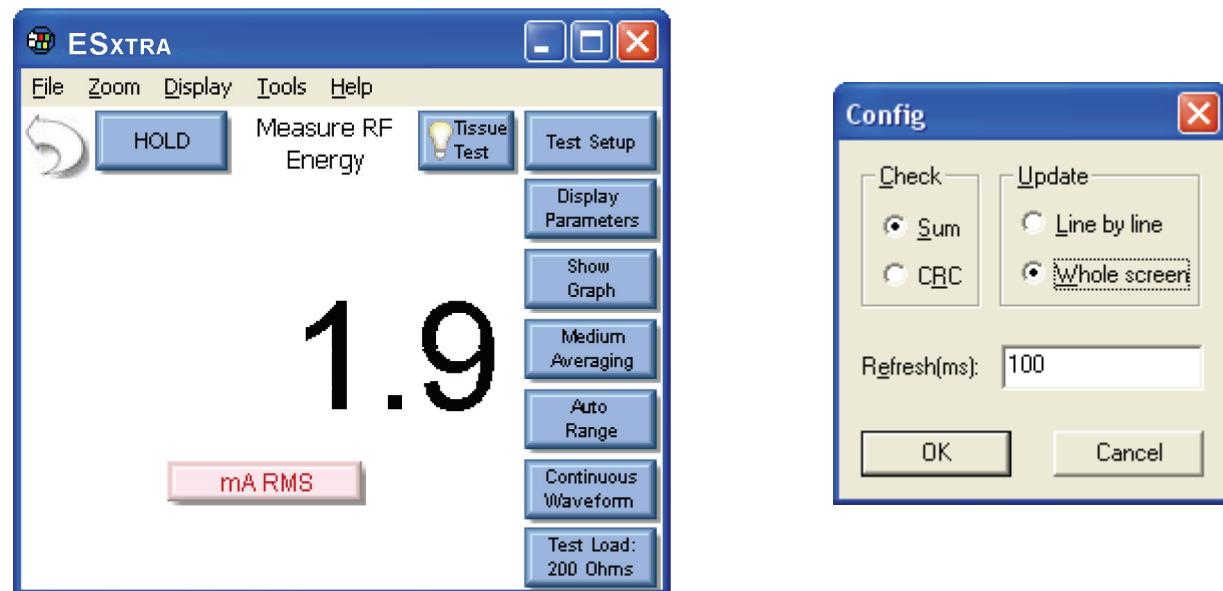
Go To Internet – This button can be used to open internet explorer or to simply validate that the network connection is functioning properly.

System Maintenance – This button is used by the manufacturer to calibrate and debug the SECULIFE ESXTRA.

Show Cursor – When using a PS/2 type mouse, the cursor will not be displayed automatically. This button is used to toggle the mouse cursor when using a PS/2 type mouse.

COMMON DIALOG BOXES

Five dialog boxes are used for common user interface functions. The dialog boxes on the

SECULIFE ESXTRA are File Open, File Save, Keypad, NumberPad, and Print.

File Open: To open any given file, browse to it in the File List and then either double click on it or click

on the file once and then on the OK button. Exit any time by pressing the Cancel button.

Drive Selection
Select from USB
Drives or local C:
Drive

Delete Button
Deletes selected
file or folder.

New Folder
Creates a new
folder in the
current directory.

Folder Up
Move Up one
folder in the file
structure.

Current Folder
Shows folder
being viewed

File List
Shows listing of
files and folders in
the current folder

File Name
Name of file to be
opened. Can be
entered with keyboard
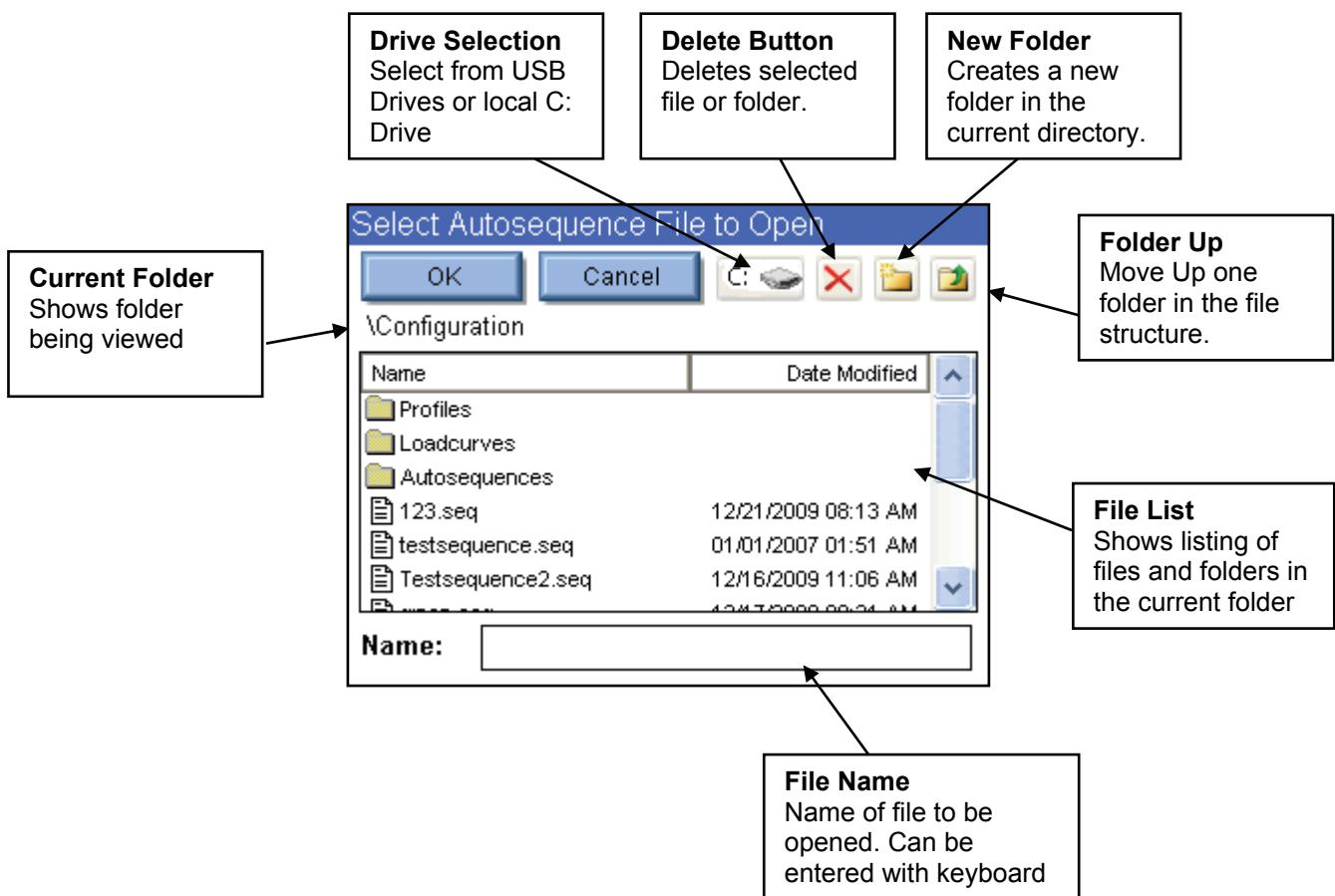
File Save: To save any given file, browse to the desired folder, then press on the file name box to open the keypad dialog box. Enter the desired file name and press the OK button. Exit any time by pressing the Cancel button.

Drive Selection
Select from USB Drives or local C: Drive

Delete Button
Deletes selected file or folder.

New Folder
Creates a new folder in the current directory.

Folder Up
Move Up one folder in the file structure.

Current Folder
Shows folder being viewed

File List
Shows listing of files and folders in the current folder

File Name
Name of file to be saved. Press here for on-screen keyboard.

Select Directory and Enter Filename

| OK | Cancel | C: | X | | |

\Configuration

Name	Date Modified
Profiles	
Loadcurves	
Autosequences	
123.seq	12/21/2009 08:13 AM
testsequence.seq	01/01/2007 01:51 AM
Testsequence2.seq	12/16/2009 11:06 AM

Name:

Keypad: This screen allows the user to enter alphanumeric data into the SECULIFE ESXTRA.
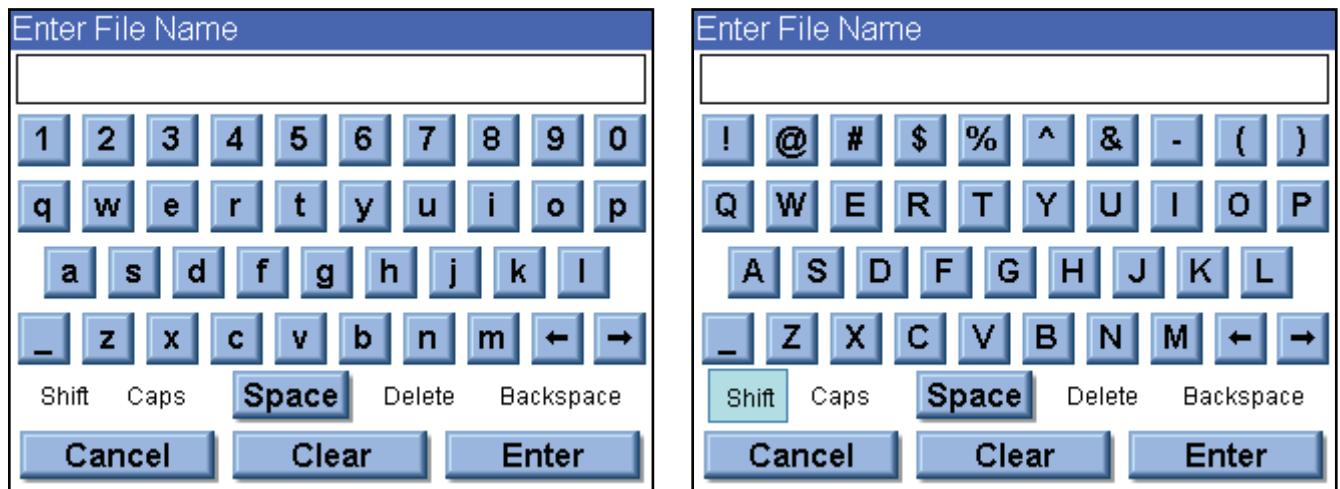
SHIFT – The shift key toggles between upper/lowercase characters and numbers/symbols for a single key entry.

CAPS – The caps key toggles between upper/lowercase characters and numbers/symbols until it is manually disabled.

Cancel – Exits the screen without returning any data.

Clear – Clears the current text entry box.

Enter – Exits the screen and returns whatever is in the text entry window.

An external keyboard may also be used to enter data into the keypad entry window. Pressing the Enter key on the keyboard is the same as pressing the Enter key on the screen.

Numpad: The numpad is used for numeric data entry.
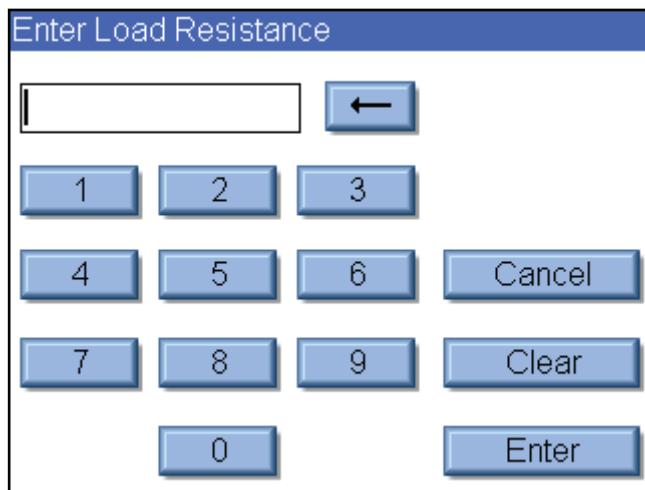
Back Arrow – Deletes a single digit from the entered number.

Cancel – Exits the screen without returning any data.

Clear – Clears the current data entry box.

Enter – Exits the screen and returns whatever is in the number entry window.

An external keyboard may also be used to enter data into the numpad entry window. Pressing the Enter key on the keyboard is the same as pressing the Enter key on the screen.

Print: The SECULIFE ESXTRA can print to any printer that supports PCL (printer control language). To date, only HP printers support this method. The SECULIFE ESXTRA can print to a local printer through USB or to a shared printer on the network.

Local Printing – Local printers are connected to the SECULIFE ESXTRA through a USB port. The following is an example configuration for local printing.
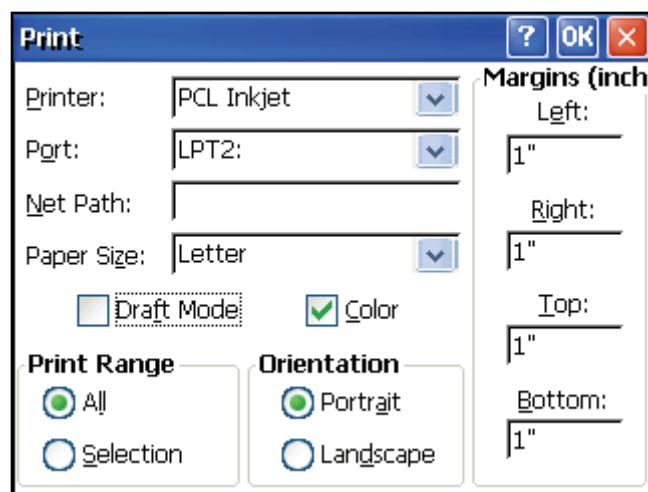
Printer – Select PCL Inkjet or PCL Laserjet based on the type of printer connected to the SECULIFE ESXTRA. Even if the printer name shows up in the list, i.e. OfficeJet H470, select the generic PCL Inkjet or Laserjet instead.

Port – Select LPT2: for local printing. Even though printing is done through the USB port, it is configured as LPT2, regardless of which physical USB port the printer is plugged into.

Net Path – This is unused for local printing and can be ignored.

Paper Size – Set to Letter for proper operation.

Draft Mode – This will print with a reduced quality but slightly faster.

Color – Only available for color printers.

Print Range – Leave setting at "All".

Orientation – Leave setting at "Portrait".

Margins – These are currently unused. The SECULIFE ESXTRA uses margins of 0.5 inches.

Network Printing – Local printers are connected to the SECULIFE ESXTRA through a USB port. The following is an example configuration for local printing.
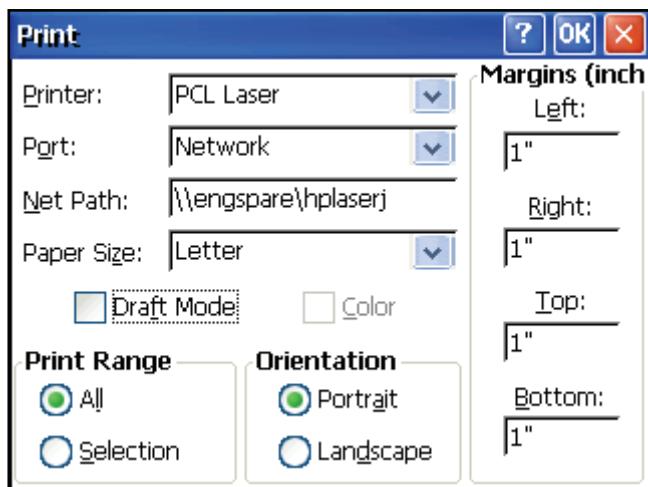
Printer – Select PCL Inkjet or PCL Laserjet based on the type of printer connected to the SECULIFE ESXTRA. Even if the printer name shows up in the list, i.e. OfficeJet H470, select the generic PCL Inkjet or Laserjet instead.

Port – Select Network for network printing.

Net Path – This is the network PC name and printer shared name, formatted as "\\PCname\PrinterShareName". To get the printer share name, open the printer properties on the PC the printer is connected to and select the Sharing tab.
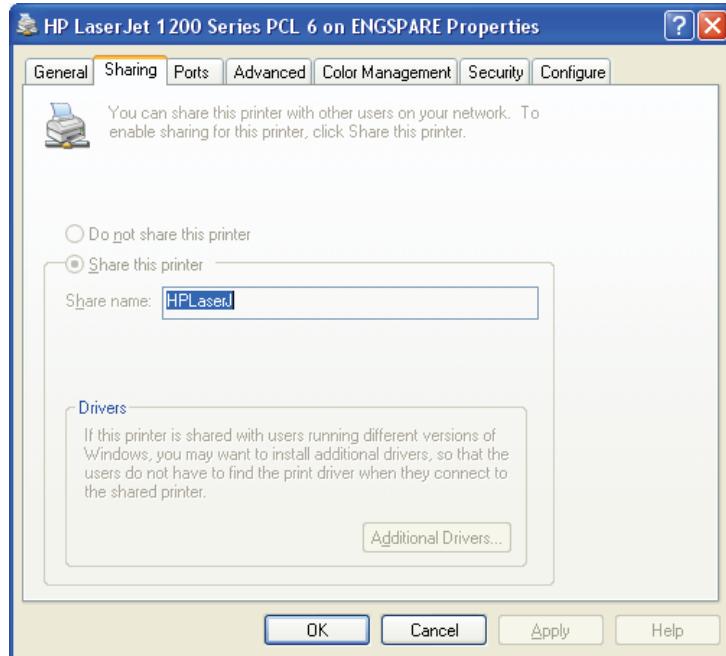
Paper Size – Set to Letter for proper operation.

Draft Mode – This will print with a reduced quality but slightly faster.

Color – Only available for color printers.

Print Range – Leave setting at "All".

Orientation – Leave setting at "Portrait".

Margins – These are currently unused. The SECULIFE ESXTRA uses margins of 0.5 inches.

The first time a network printer is used, you may be prompted for a username, password, and domain name.

KEYBOARD AND MOUSE

The SECULIFE ESXTRA is compatible with standard PS2 or USB keyboards and mice. When a USB mouse is connected to the SECULIFE ESXTRA, the cursor is automatically displayed on the screen. The external keyboard is required when configuring Autosequence Titles and User instructions. The external keyboard is also active any time numerical or text entry is required by the user.

BARCODE SCANNER

The SECULIFE ESXTRA is compatible with USB type barcode scanners. These scanners can be helpful when entering DUT information. They will act as keyboards that convert barcode data into text. When the SECULIFE ESXTRA is ready to accept the desired text, simply trigger the barcode scanner instead of typing in the barcode text.

ERROR MESSAGES

The SECULIFE ESXTRA continuously monitors for various system faults. If a fault occurs, the user will be notified by a warning message as shown below.
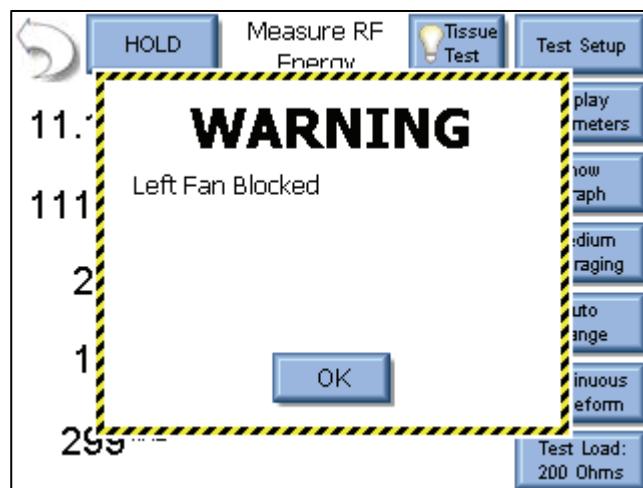
When the user presses the OK button, the warning message is cleared from the screen. After a failure has been detected, the main screen will display an icon indicating that faults are present, as shown below.
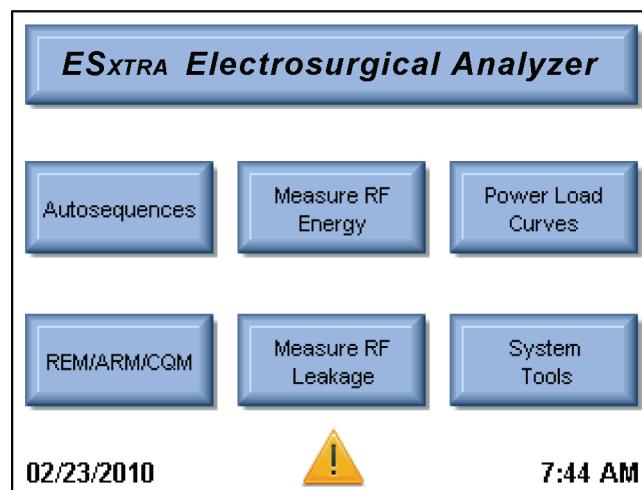
Pressing on the warning icon will display the active faults and the status of the faults. When a fault has been cleared, such as a blocked fan or system overtemp, pressing the Reset Cleared Faults button will remove the fault from the list. Once all faults are cleared, the warning icon will be removed from the main screen.
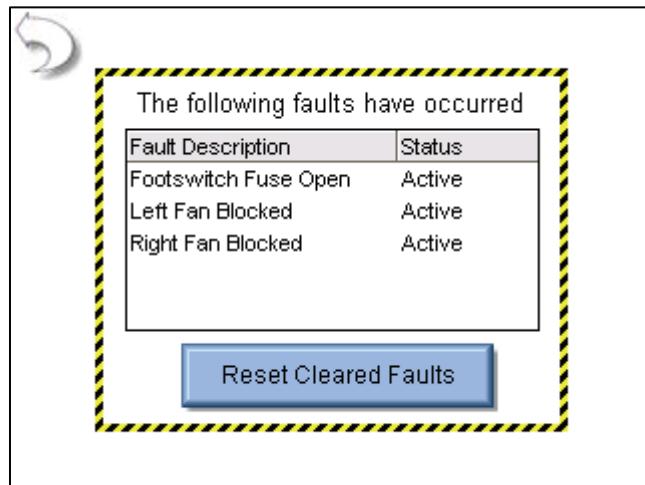
The following table shows all of the faults that are monitored by the system.

Message	Description	Recovery Action
Left Fan Blocked	The left fan is not spinning. Permanent damage or complete failure could occur.	Check the fan for obstructions. If nothing is found and the fan is not spinning contact GMC-I Messtechnik for Service
Right Fan Blocked	The right fan is not spinning. Permanent damage or complete failure could occur.	Check the fan for obstructions. If nothing is found and the fan is not spinning contact GMC-I Messtechnik for Service
System Overtemp	The internal temperature has exceeded normal operating conditions.	Stop activating the DUT, allow the system to cool for at least a half hour. If the problem persists, contact GMC-I Messtechnik for service.
Footswitch Fuse Open	The internal fuse protecting the power supply to the footswitch interface has opened.	Contact GMC-I Messtechnik for service.
Front USB Fuse Open	The internal fuse protecting the power supply to the front USB port has opened.	Contact GMC-I Messtechnik for service.
Side USB Fuse (Front) Open	The internal fuse protecting the power supply to the side USB port towards the front of the unit has opened.	Contact GMC-I Messtechnik for service.
Side USB Fuse (Rear) Open	The internal fuse protecting the power supply to the side USB port towards the rear of the unit has opened.	Contact GMC-I Messtechnik for service.
PS/2 Fuse Open	The internal fuse protecting the power supply to the PS/2 port has opened.	Contact GMC-I Messtechnik for service.

SYSTEM INPUTS AND OUTPUTS

SERIAL COMMUNICATION – There is a serial port on the side panel. The RS-232 Port is used to communicate with the DUT.

USB COMMUNICATION – There are two USB ports on the side panel and one on the front. The USB Ports are used to connect devices such as keyboards, mice, PCL printers, or flash drives.

ETHERNET COMMUNICATION – There is a 10/100 Ethernet port on the side panel. This is used for firmware updates or for connection to a LAN for data storage and remote control.

POWER SWITCH - The main power switch for the Analyzer is located on the front panel. When the switch is ON, the LED should be ON.

LINE POWER – A Kycon 3 pos locking connector is provided for the 12 VDC Universal Power Supply input. Two connectors are available, one on the side of the unit and one on the rear.

NOTE: Only one power connector should be used at any time.

The Universal Power Supply takes a Standard Power Adapter Cable with Small Standard Product Plug and Required International Connector (See Options Below).

BC20-20500
North America
Hospital Grade

BC20-20501
Japan

BC20-20502
United Kingdom

BC20-20503
Schuko-
Continental
Europe

BC20-20509
India/
South Africa

BC20-20510
Switzerland

BC20-20512
Italy

BC20-20516
Australia

Pick Your Country's
Connector from Above

to Connect to the
Universal Power Supply

Standard Power Cord

Standard Product Plug

DFA® TECHNOLOGY

DFA™ Digital Fast Acquisition Technology is a revolutionary new method of measuring ESU generator output power. A high-speed analog to digital converter is used to digitize the high frequency, high power output of the ESU generator. An RF Current Transformer is used to convert the current signal to a voltage signal, which is read by the a/d converter. By digitizing the signal a more accurate, frequency independent measurement can be made.

LIMITED WARRANTY

WARRANTY: **GMC-I MESSTECHNIK GMBH** WARRANTS ITS NEW PRODUCTS TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER THE SERVICE FOR WHICH THEY ARE INTENDED. THIS WARRANTY IS EFFECTIVE FOR TWELVE MONTHS FROM THE DATE OF SHIPMENT.

EXCLUSIONS: THIS WARRANTY IS **IN LIEU OF** ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF **MERCHANTABILITY** OR FITNESS FOR A PARTICULAR PURPOSE.

GMC-I MESSTECHNIK GMBH IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

NO PERSON OTHER THAN AN OFFICER IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR ASSUME ANY LIABILITY.

REMEDIES: THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY SHALL BE: (1) THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS OR PRODUCTS, WITHOUT CHARGE. (2) AT THE OPTION OF **GMC-I MESSTECHNIK GMBH**, THE REFUND OF THE PURCHASE PRICE.

SPECIFICATIONS

100 mV INPUT RANGE	
A/D Resolution	14 Bits
A/D Speed	64 MSPS
Voltage (RMS)	20 – 70.00 mV RMS
Input Resolution	0.01 mV RMS
Voltage (Peak, Peak - to – Peak)	100.0 mV
Resolution	0.01 mV
Frequency	50 kHz – 10 MHz
Accuracy	0.5 mV, < 50 mV, up to 1 MHz 1.0 mV, < 50 mV, 1 to 10 MHz 1% reading, > 50 mV, up to 1 MHz 3% reading, > 50 mV, 1 to 10 MHz
CALCULATED RANGES	
Current	700.0 mA RMS
Resolution	0.1 mA
mV Peak / Peak - to - Peak	0.0 to 1.0
Resolution	0.1
Wattage	999.9 Watts
Resolution	0.1 Watt
Crest Factor	1.4 to 500
Resolution	0.1

GMC-I Messtechnik GmbH

1000 mV INPUT RANGE	
A/D Resolution	14 Bits
A/D Speed	64 MSPS
Voltage (RMS)	2.0 – 700.0 mV RMS
Input Resolution	0.1 mV RMS
Voltage (Peak, Peak - to – Peak)	1000.0 mV
Resolution	0.1 mV
Frequency	50 kHz – 10 MHz
Accuracy	0.5 mV, < 50 mV 1% reading, > 50 mV, up to 1 MHz 3% reading, > 50 mV, 1 to 10 MHz
Maximum Input Voltage	3.3 V p-p Internally Protected
CALCULATED RANGES	
Current	7000 mA RMS
Resolution	1 mA
mV Peak / Peak - to - Peak	0.0 to 1.0
Resolution	0.1
Wattage	999.9 Watts
Resolution	0.1 Watt
Crest Factor	1.4 to 500
Resolution	0.1

TIMING MEASUREMENTS FOR Ton, Toff, Tcyc and % Duty Cycle	
Resolution	0.1 ms
Accuracy	+ 0.2 ms

Load Bank Specifications	
Maximum Current into/through Load Bank	5 Amps RMS
Internal Setup/Load Selection Relays	10kV, 5A rated Reed Relays
Internal Load Selection	
Internal Load Range	0 to 6400 ohms
Internal Load Resolution	1 ohm
Internal Load Accuracy	1% Non-inductive
Internal Load Power Ratings	1 ohm: 25W 2 ohm: 50W 4 ohm: 100W Remaining loads: 225W
Internal Load Resistor Manufacturer	Renfrew Electric
Internal Load Bank Recommended Duty Cycle	10 seconds on, 30 seconds off
Internal Load Cooling	Dual 120mm Variable Speed DC Fans controlled by Load Temperature or Input Power measurement
External Load Selection	
External Load Range	0 to 6400 ohms
External Load Resolution	1 ohms

Embedded Computer Module	
Screen size	5.7" QVGA (320*240 18 bit color) LCD
Touchscreen	4 wire resistive
Processor	AMD 500MHz GeodeLX
Memory	RAM - 512MB DDR2, upgradeable to 1GB HDD - 2 GB Compact Flash
External Ports	PS/2 Keyboard and Mouse 10/100 Ethernet port 3 USB 1 RS232
Operating system	Windows CE 6.0R2
External Device support	Most Windows supported USB flash disks, printers, keyboard/mouse, etc

| Power Supply	
Power Supply	Globtek GT-21097-5012
Output Voltage	12V
Maximum Output Current	4A
Maximum Output Power	50W
Input Voltage (VAC)	100-240 Volts AC, 50-60 Hz
Maximum Input Current	1.6A
Input Connector	Standard IEC inlet allowing for International power cord use

ESU Connections	
Input Connectors to Load Bank/Measurement Circuit	Color Coded CalTest 4mm Safety Banana Connectors
Oscilloscope Output	BNC jack
Footswitch Connector	Hypertronics 25 Pin Connector Mating Connector: D02PB2504NUT
Number of available footswitch controls	8, relay controlled

| ESU Analyzer Modes	
RF Measurement Mode	Allows use as a general purpose RF meter, including current, voltage, power and timing measurement
Load Curve	Allows user to automatically generate a power curve based on varying load, commonly seen in the generator data sheets
Leakage Test 1A	Tests the open circuit leakage of an Isolated Type CF generator. The test complies with IEC 601.2.2, sec. 19.101b, fig, 104 and sec. 19.102, adopted by ANSI/AAMI HF18-2001
Leakage Test 1B	Tests the open circuit leakage of an Isolated Type CF generator. The test complies with IEC 601.2.2, sec. 19.101b, fig, 104 and sec. 19.102, adopted by ANSI/AAMI HF18-2001
Leakage Test 2	Tests the leakage to ground of Earth-referenced Type BF generators. This test complies with IEC 601.2.2, sec. 19.101a, test 1, fig. 102, and sec. 19.102, adopted by ANSI/AAMI HF18-2001
Leakage Test 3	Tests the leakage to ground of Earth-Referenced Type BF generators. This test complies with IEC 601.2.2, sec. 19.101a, test 2, fig. 102, and sec. 19.102, adopted by ANSI/AAMI HF18-2001
CQM/RECQM Mode	Uses internal load bank as a variable resistor to test the Generator's CQM/RECQM circuit
Autosequence Mode	Allows user to follow a standard or custom defined protocol to sequentially buildup a test record, applicable to many manufacturer's recommended verification and calibration procedures

## New Features in Software Version 1.0.2.5

The main features are:

- Tissue response test mode
- Footswitch triggering in RF Measure and Leakage screens
- Autosequence Auto Advance mode
- Autosequence Auto CQM mode
- Autosequence Save results to PDF files
- RS-232 terminal window in system tools screen
- PC Remote control capability using USB null modem cable
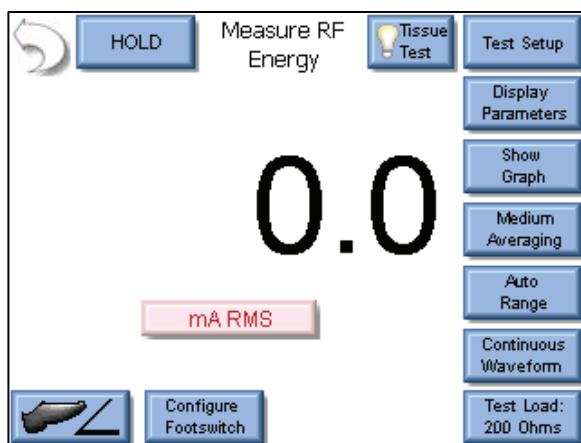
Tissue Test – This button is used to initiate the Tissue Test mode. This mode evaluates the tissue response function of the DUT. In this mode, the SECULIFE ESXTRA is configured for an external TRL-2420 lamp load. The SECULIFE ESXTRA is connected in series with the load as shown below.
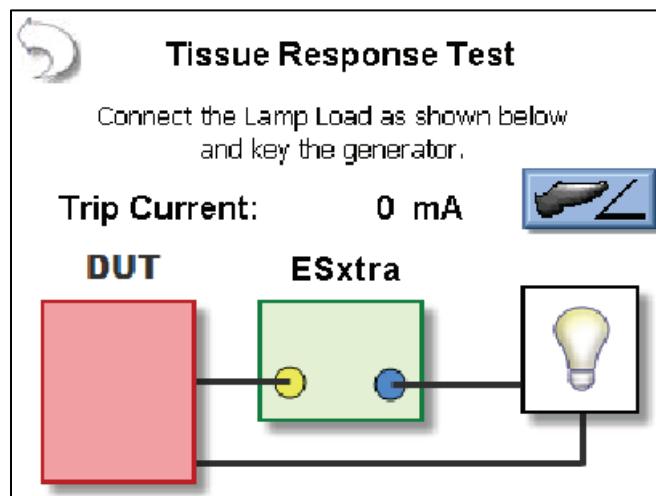
The Tissue Response Test will monitor the current in the load as the lamp heats up. When the current reaches the Tissue Response Trip point in the DUT, the output will automatically deactivate. At this point, the display will change to show the trip current as well as a graph of the current during the test.
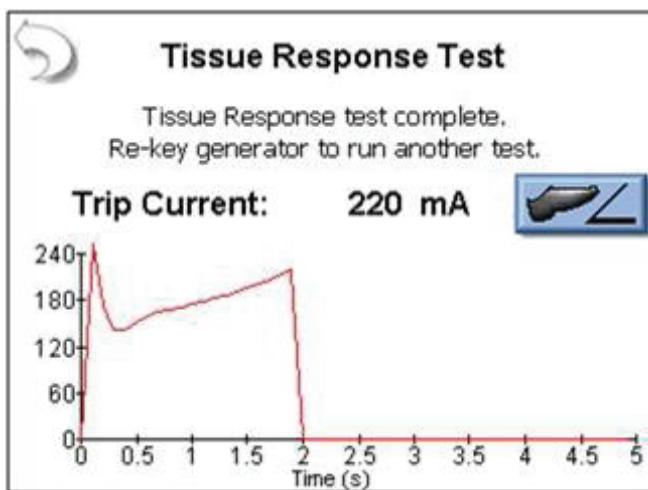
Configure Footswitch – This button opens the footswitch configuration menu that will select the footswitch output and duration that is used when the footswitch trigger button is pressed. To close the footswitch setup menu, press the Configure Footswitch button.
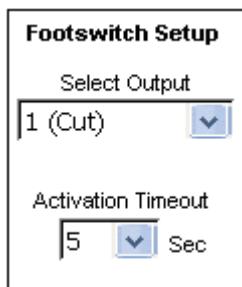
Activate Footswitch – This button is used to trigger the footswitch output for the duration that is configured in the Footswitch Setup menu. The footswitch can be deactivated before the activation timeout period by pressing the Activate Footswitch button a second time. While the footswitch output is active, the Activate Footswitch button will remain highlighted with a yellow background.
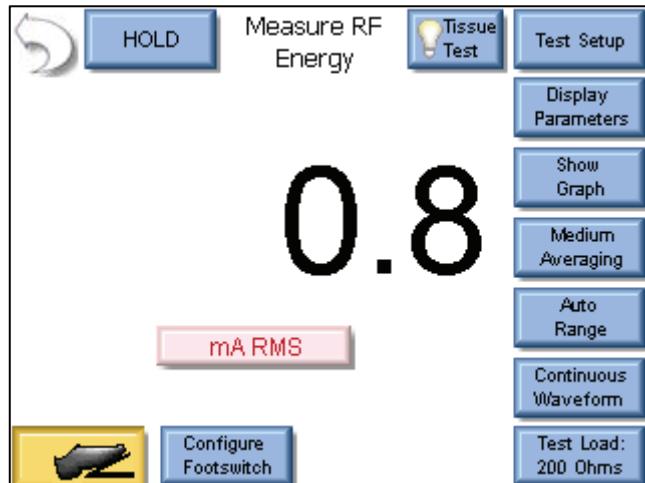

DUT Setup

For RF Energy / Leakage and Load Curve steps, the user needs to configure how the DUT will be activated. For these measurements, the DUT can be activated by the Operator or the SECULIFE ESxtra. As shown below. When Operator is selected, the user will be prompted when to activate or deactivate the ESU.
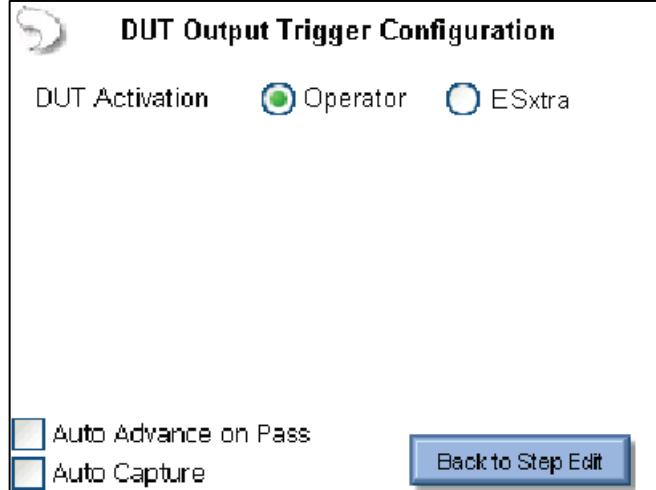
Auto Advance on Pass – This setting allows for automatically stepping through the autosequence if a measurement passes the tolerance limits that are configured for the selected step.

Auto Capture – When enabled, this setting will automatically capture and validate the DUT output when the current step is reached during the autosequence. If unchecked, the autosequence will show instructions to the user and the user must manually select the meter display and capture an RF measurement.

Auto CQM Step – Auto CQM steps allow for greater automation of the autosequence. Auto CQM steps can be configured as a single resistance test point or as an automatic sweep of CQM resistances where the CQM status is tested for normal or alarm conditions.
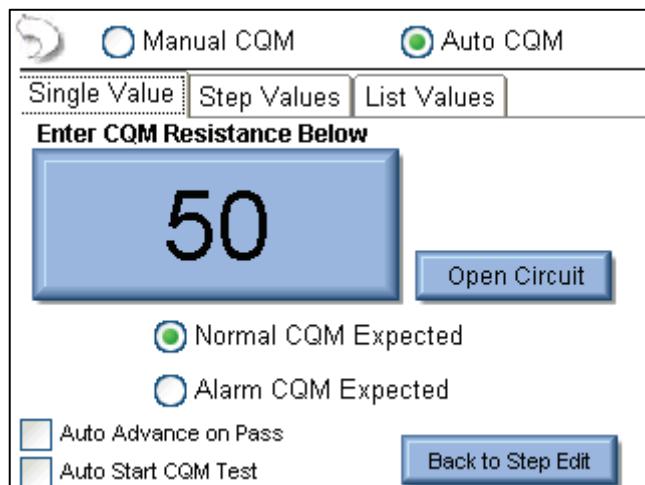
Auto Advance on Pass – This setting allows for automatically stepping through the autosequence if the CQM status matches the expected setting.

Auto Start CQM Test– When this setting is enabled the SECULIFE ESXTRA will automatically trigger the CQM state evaluation to determine if the step passes or fails. If this option is disabled, the operator will have to trigger the CQM test.

Single Value Tab - The single Value Auto CQM step (shown above) will apply a single resistance to the DUT CQM circuit and determine whether the step passes or fails based on the expected status.

Product Support

If required please contact:

GMC-I Messtechnik GmbH
Product Support Hotline
Phone +49 911 8602-0
Fax   +49 911 8602-709
E-Mail support@gossenmetrawatt.com

Service Center

Repair and Replacement Parts Service
Calibration Center *
and Rental Instrument Service
When you need service, please contact:
GMC-I Service GmbH
    Service Center
    Thomas-Mann-Strasse 20
    90471 Nürnberg • Germany
    Phone   +49 911 817718-0
    Fax   +49 911 817718-253
    E-Mail   service@gossenmetrawatt.com
    www.gmci-service.com
This address is only valid in Germany.
Please contact our representatives or subsidiaries for service in other countries.

***DKD** Calibration Laboratory
    for Electrical Quantities DKD – K – 19701
    accredited per DIN EN ISO/IEC 17025:2005

Accredited measured quantities: direct voltage, direct current -values, DC -resistance, -alternating voltage, -alternating current -values, AC active power, AC apparent power, DC power, -capacitance, -frequency and temperature