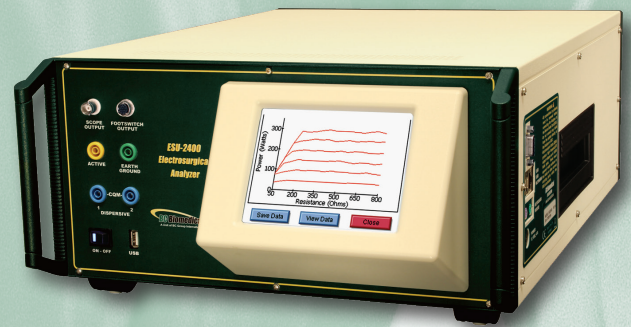


# ESU Analyzer Series



## Features - ESU-2400

- ◆ Automated One Button Force Triad Autosequence included
- ◆ Industry Standard RF Current Measurement
- ◆ DFA™ Technology Ultra High Speed Digitization of Complex RF Waveforms
- ◆ 1% Measurement Accuracy
- ◆ Continuous & Pulsed Output Waveform Compatible
- ◆ Embedded Real-Time Operating System with ¼ VGA Color Touch Screen Display
- ◆ Displays Up to 15 Different Measurement Parameters with User Selectable and Definable Screens
- ◆ Internal Precision Test Loads From 0  $\Omega$  to 6400  $\Omega$  in 1  $\Omega$  Increments
- ◆ External Test Load Compatibility
- ◆ Automated Power Load Curves with Multiple Power Settings Per Load Setting
- ◆ Automated User-Definable Testing Sequences
- ◆ Print test Reports to PDF format or USB Printer
- ◆ USB (3), RS-232, and Ethernet Communications Ports
- ◆ External Keyboard and Mouse Compatible Via Dedicated Ports
- ◆ Automatic or Manual Activation of ESU Generator During Power Load Curve Tests
- ◆ Remote Communications Capability with ESU Generators
- ◆ 100% Compatible with Covidien/Valleylab ForceTriad™, FT10™ and Ligasure™ Generators, Conmed System 5000™ Generators, and All Legacy Generators by Other Manufacturers
- ◆ REM/ARM/CQM Testing Via 500  $\Omega$  Adjustable Load in 1  $\Omega$  Increments
- ◆ RF Leakage Current Measurement
- ◆ Capture, Store, Print RF Waveform



## ESU-2400

The ESU-2400 Electrosurgical Unit Analyzer is a high-accuracy, true RMS RF measurement system 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 ESU-2400 provides an advanced low inductance internal load bank with a range of 0 to 6400  $\Omega$  in 1  $\Omega$  increments. It is microprocessor-based and utilizes a combination of unique hardware and software to provide accurate and reliable test results, even from “noisy” Electrosurgical Generator waveforms such as “Spray”. The DFA™ Technology utilized in the ESU-2400 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 ESU-2400, unlike most conventional ESU Analyzers, has internal high voltage setup relays to control the measurement path, allowing the user to switch between Power measurements, Leakage measurements, REM/ARM/CQM testing, or even run an autosequence that could include any or all of these tests – without even moving wires around.

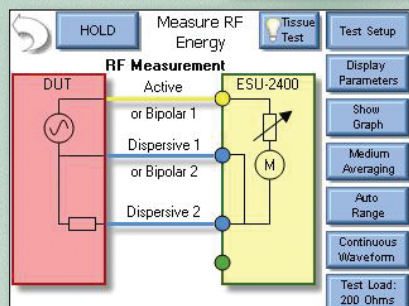
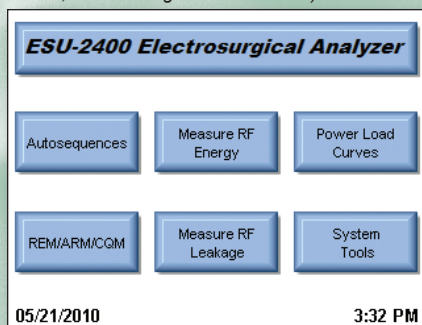
The current transformer internal to the ESU-2400 senses the RF current flowing through the internal test load and produces a ratiometric voltage, which is digitized and analyzed by the microprocessor. Combining the standard and low ranges of the ESU-2400 with the use of the current transformer, the user has full control over the ability to get high accuracy and high resolution readings from all types of Electrosurgical Generators.



## SCREEN VIEWS

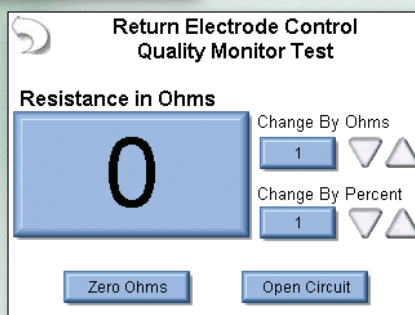
(NOTE: User can select measurement values & locations to be displayed on each screen choosing from RMS Current, RMS Voltage, RMS Power, Peak Voltage & Crest Factor)

Main Screen

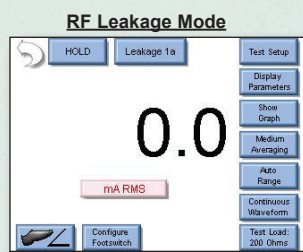
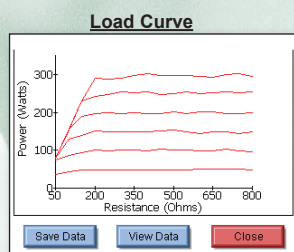


RF Measurement Mode

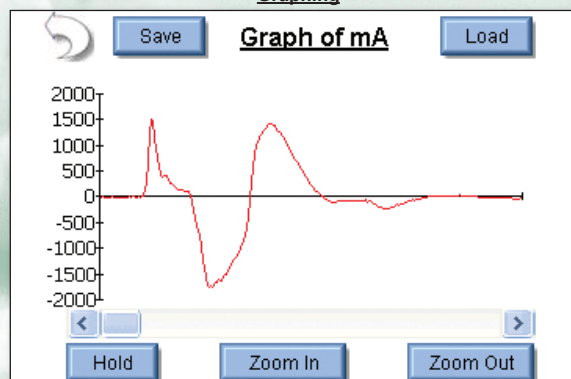
CQM Screen



ESU-2400 Graph Mode Example



On - Screen Graphing



## SPECIFICATIONS

MEASUREMENTS	
A/D Resolution	14 Bits
A/D Speed	64 MSPS
Bandwidth	50 kHz – 10 MHz
Measurement Accuracy	± 1% Reading
Current Range	2.0 to 700.0 mA RMS (Low Range) 20 to 7000 mA RMS (High Range)
Current Resolution	0.1 mA RMS (Low Range) 1 mA RMS (High Range)
Power Range (Watts)	500 Watts
Power Resolution (Watts)	0.1 Watts
Crest Factor Range	1.4 to 500
Crest Factor Resolution	0.1
Input Voltage Range	0.20 to 70.00 mV RMS (Low Range) 2.0 to 700.0 mV RMS (High Range)
Voltage Resolution	0.01 mV (Low Range) 0.1 mV (High Range)
mV Peak/Peak-to-Peak Range	0.0 to 1.0
mV Peak/Peak-to-Peak Resolution	0.1

Load Bank Specifications	
Internal Setup/Load Selection Relays	10kV, 5A rated Reed Relays
Internal Load Selection	
Internal Load Range	0 to 6400 Ω
Internal Load Accuracy	± 1% Non-inductive
Internal Load Power Ratings	1 Ω: 25 W 2 Ω: 50 W 4 Ω: 100 W Remaining Loads: 225 W
Load Bank Duty Cycle	10 seconds on, 30 seconds off
Load Cooling	Dual 120mm Variable Speed DC Fans
External Load Selection	
External Load Range	0 to 6400 Ω
External Load Resolution	1 Ω

SCREEN SIZE	5.7" QVGA 18 bit color touch screen
SETUP MEMORY	EEPROM, All Parameters
MEMORY RETENTION	10 Years w/o Power
OPERATING RANGE	15 to 30 °C (59 to 86 °F)
STORAGE RANGE	-20 to 60 °C (-4 to 140 °F)
CONSTRUCTION	Enclosure – Aluminum Face – Lexan, Back Printed
SIZE	7.8 x 15.0 x 22.5 inches 198.1 x 381 x 571.5 mm
WEIGHT	31 lbs. (14 kg)
CONNECTIONS	Input: I/O 4mm Safety Jacks 3xUSB, 1xSerial, 1xEthernet 1xPS/2 Keyboard/Mouse Output: 1xBNC Scope Hypertronics 25-pin Footswitch connector
POWER SUPPLY ADAPTER	Input: Universal 100-240 VAC, 50-60 Hz Output: 12 VDC (Specify power cord see page Z)

ESU Analyzer Series