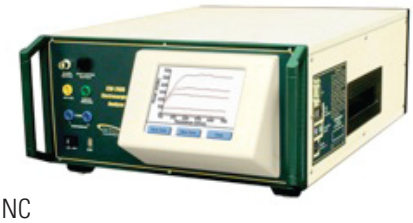
The ESU Analyzer® Evolution Continues



BY MICHAEL R. ERWINE, ESU ANALYZER PRODUCT MANAGER, BC GROUP INTERNATIONAL, INC

Every once in a while, a new product comes along that is so incredibly different from anything and everything else on the market that it makes you just stop in your tracks and take notice. Such is the intended destiny of the new BC Biomedical ESU-2400 Full-Featured Deluxe Electrosurgery Analyzer from BC Group International, Inc. The new ESU-2400 "boldly goes where no ESU Analyzer has gone before".

Offering a totally unprecedented precision non-inductive test load bank in the range of 1 to 6,400, in 1 increments, the ESU-2400 far surpasses any analyzer ever placed on the market. And if that's not enough (it certainly is today, but who knows what the electrosurgery generator manufacturers have in store for us just a few years from now), you can use an external test load of any value to meet your specific testing needs. The ESU-2400 even offers the ability to use an external "tissue response test" load so you can perform the very same dynamic tissue response tests as some of the world's leading manufacturers prescribe in their product service manuals.

Subscribing to the electrosurgery industry's long-standing standard of RF current measurement (as opposed to voltage measurement across a test load that changes its AC impedance with frequency), the new ESU-2400 employs an internal precision wide band current transformer (designed especially for our application by the leading designer and manufacturer of such transformers) to sense the RF current flow through the selected precision non-inductive test load. Utilizing Patent Pending DFA Technology®, the ESU-2400 aggressively samples the complex RF waveform at a 14-bit sampling rate with an A/D speed of 64 MSPS, collecting and analyzing 32,768 data samples from the RF waveform every 10th of a second.

Measurement parameters? How about having over fifteen (15) different RF measurement parameters available to you, including the frequency of the RF waveform? You can display a wide variety of parameters on the ESU-2400 data screen, from only one parameter, to all of them.

Accuracy? The new ESU-2400 has calibration level accuracy and can be used to not only perform routine field test procedures according to manufacturer service manuals, but it qualifies as a calibration level measurement instrument according to system accuracy requirements listed (typically listed as 1% of reading for the analyzer/metering device… with a 1% tolerance current transformer in the circuit as well) in most product service manuals by leading manufacturers of electrosurgery generators. This far surpasses any other analyzer on the market today.

What about RF measurement range? The new ESU-2400 offers the capability to measure RF current flow in the range of 0 to 7,000 ma (999 RMS Watts maximum as a calculated parameter based upon measured RF current and the value of the precision non-inductive test load selected)! It can easily handle procedures such as the Current and Voltage calibration of the Covidien/Valleylab Force Triad and Ligasure generators (as found in the published Service Manual for these generators), which call for the measurement of 5,500 ma of RF current flow. No other analyzer on the market today, other than the BC Biomedical ESU-2050 and ESU-2050P analyzers can handle this task. Even the "top of the line" analyzer offerings by other manufacturers typically top out at 2,200 ma of RF current flow.

FIGURE 1 - REM/ARM/CQM Screen on ESU-2400

REM/ARM/CQM testing with the new ESU-2400 is a breeze. You will no longer need dedicated external precision dummy loads or decade boxes to fulfill this important test requirement on your generators. Unlike other analyzers on the market today that limit REM/ARM/CQM test loads to values that are not 100% compatible with established generator manufacturer test protocols, the ESU-2400 offers you REM/ARM/CQM test load values from 0 to 500 in 1 increments. You can also easily program user-defined automated REM/ARM/CQM test protocols by manufacturer and model to cover the various test protocols needed to cover your fleet of electrosurgery generators.

The GUI (Graphical User Interface) of the new ESU-2400, along with its Windows® CE 6.0 operating system and Quarter-VGA color touch screen display make controlling the instrument and navigating through its menus and functions a real breeze. With the conveniently side-located dual PS/2 and USB ports for any Microsoft® supported keyboard and/or mouse, you now have unprecedented ease of system navigation and data entry. This makes the creation or editing of automated testing procedures within the ESU-2400

extremely efficient. You can even use the color touch screen to "sign" your name to a test protocol printout if you like.

Communications capabilities in the new ESU-2400 are also unprecedented among ESU analyzers. Sporting an RS232 port, three USB ports, and a 10/100 Mbps Ethernet connection, the ESU-2400 is poised to meet any and all communication demands well into the future. You can use the RS232 and USB ports to connect an external printer, save a test file to a USB thumb drive, or drive the ESU-2400 according to its industry standard SCPI remote control protocol, and even the VIPER protocol that is being utilized for remote communications capability by some of the industry's leading generator manufacturers. Why an Ethernet port? Have you taken a look lately at the communications ports on some of the latest generators by the leading manufacturers? You will find Ethernet there as well on some of them. Ethernet connectivity offers future capabilities like closed-loop communication between the ESU-2400 and the electrosurgery generator, where both instruments "talk" to each other, one can control the other, operating mode and measurement data is passed back and forth, etc. Imagine the capabilities that lie ahead through this level of functionality and communication. So what do you do with the ESU-2400 Ethernet port today? How about connecting to the Internet and downloading the latest firmware update or feature enhancement for your ESU-2400 for starters. You can even use the ESU-2400 to browse the Internet!

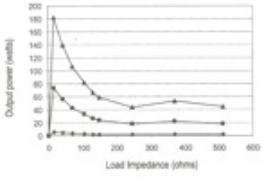


Figure 2 - Power Load Curve from Covidien/Valleylab Force Triad Service Manual

Power load curves have long been an established procedure in many international markets, especially Europe. They are also becoming a very popular test protocol in the U.S. Electrosurgery generator manufacturers typically publish power load curves in their product service manuals. An example is shown in Figure 2. Anyone that has tediously collected individual measurement data points across a sweeping set of test loads for a generator will quickly appreciate the automated power load curve capabilities of the new ESU-2400. Not only can you program an automated power load curve test in the ESU-2400, but you have full control over what loads are used in the range of 1 to 6400, in 1 increments. You can also program multiple power levels per test load step. A sample on-screen power load curve with multiple power settings per test load step is shown in Figure 3.

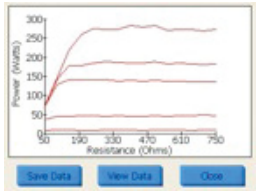


Figure 3 - Power Load Curve Test Displayed on ESU-2400

These power load curves can be printed, together with all of the individual measurement points listed in a data table, or they can be exported to a Microsoft® Excel compatible file. Automated power load curve testing can also be programmed to automatically key the generator output at each programmed step, or the user can maintain control with manual footswitch operation.

Have you ever wondered what the actual RF waveform coming out of your generator looks like? Is the waveform "clean" and does it really look like the one shown as an example in the generator service manual? Or does it contain irregularities that are symptomatic of the need for calibration or service of the generator output circuitry? You will not have a problem answering any of these questions with the ESU-2400. You can capture the complex RF waveform, store it, and even export it to a Microsoft® Excel compatible file, complete with a point by point graphical representation of up to 32,768 discrete data points.

"Automated testing" is a set of buzz words that so many customers ask if our products have. When it comes to the new ESU-2400, the answer is clearly "YES". The user has full control in creating automated testing protocols that can include scripted descriptive information, graphics support for picturing setups, taking individual readings, performing REM/ARM/CQM tests, implementing power load curve tests, performing RF leakage tests, etc.

Figure 4 - On-Screen Capture of RF Waveform on ESU-2400

As with our ESU-2050P analyzer, the ESU-2400 is compatible with generators that produce continuous as well as pulsed output waveforms. No other ESU analyzer on the market today can make this claim. So with all of these advanced level features, is the new ESU-2400 difficult to use? Not in the least. The Quarter-VGA color touch screen and Windows® CE 6.0 operating system put a familiar look and feel to the ESU-2400 for anyone that uses a PC. You don't even have to move a lot of cables around for different test setups. The internal switching front end of the ESU-2400 analyzer saves you a lot of time and energy connecting different cables in different ways for different tests.

So why has no other test equipment manufacturer ever offered such a full-featured ESU analyzer, with this breadth of functionality? The answer is really quite simple really. It's because no other test equipment manufacturer has seized the opportunity or undertaken the initiative to work closely with the world's leading electrosurgery generator manufacturers like BC Group International, Inc. has. Our widely adopted ESU-2050, ESU-2050P and ESU-2300 analyzers have helped our company establish the reputation as "a" major player in the ESU analyzer market, if not "the" major player. Nothing but good old fashioned hard work, and paying a lot of attention to what our customers (including some of the major worldwide manufacturers of electrosurgery generators) were asking for, have been the major ingredients towards bringing the ESU-2400 to market. The ESU-2400 clearly sets a new baseline and standard for full-featured ESU analyzers for years to come. MEDICAL DEALER

For additional product technical information, please feel free to call BC Group International, Inc. or send your e-mail inquiries to esu@bcgroupintl.com.