

4-KJ Capacitor Charging And Power Conversion Platform For Medical Lasers

[Advanced Energy Industries'](#) Excelsys FC4000 is a 4-kJ capacitor charging unit with an integrated configurable 800-W ac-dc power supply designed to power medical laser applications. The product enables faster charging at lower voltages for shorter treatment times, delivering up to 4 kJ with constant power over charge voltages from 250 to 1,000 Vdc.

In addition, the capacitor charger has a pulse-to-pulse repeatability of -2 to 2 V_{DC}, while also delivering up to 800 W from up to 10 isolated outputs that can be run in series and parallel for higher voltages and currents. The use of a single power supply for capacitor charging and system power reduces application development times and complexity, reduces size and weight by up to 30%, and simplifies compliance with safety and EMI standards (see the figure).

In aesthetic and surgical lasers, capacitors are used to produce high voltages and discharge to generate high-current pulses. Traditionally, this required a separate power supply. According to Advanced Energy, it was the first to offer an integrated platform providing both high-voltage inputs for capacitor charging and low-voltage ac-dc conversion for system electronics like touch panels, pumps and cooling elements. Part of the FlexiCharge series, the FC4000 now extends this technology leadership with a 60% increase to capacitor charging energy to meet the requirements for next-generation lasers.

"Next-generation laser, intense pulsed light (IPL) and pulsed power systems have stringent power and performance requirements, and we will continue to innovate and deliver systems that simplify development and accelerate time to market for medical OEMs," said Emdrem Tan, executive vice president of System Power at Advanced Energy.

Intelligent analog and digital control are available through the supply's PMBus with "set and forget" features and storage capabilities, which both speeds time-to-market and can be used to simplify system maintenance and servicing.

The FC4000 has an efficiency of 90% and is compliant with IEC60601-1 (3rd edition) and IEC60601-1-2 (4th edition) with MTBF greater than 900,000 hours. For enhanced reliability, level 4 input surge protection has been implemented with tracking and overvoltage protection. For more information, see the FC4000 [page](#).



Figure. For use in aesthetic and surgical lasers, the FC4000 4-kJ capacitor charging unit delivers exceptional pulse-to-pulse stability and incorporates an 800-W ac-dc supply with up to 10 isolated outputs for powering system electronics like touch panels, pumps and cooling elements.