

Power Solutions Provider Expands Customer Support With Facility For Testing And Customization

by David G. Morrison, Editor, How2Power.com

On June 25, power supply manufacturer Advanced Energy (AE) held a press event to introduce their Customer Experience Center (CEC) in Sharon, Mass. At this facility, the company offers free test and power supply customization services to both existing customers and potential customers, helping power supply users by performing pre-compliance EMC and safety testing of power supply products or their end systems, and troubleshooting of any subsequent test failures (Fig. 1). Meanwhile, at the same facility, AE engineers can provide customization of AE’s power supply products without NRE charges. All of these capabilities serve to speed the customer’s time to market, while building customer relationships.

Fig. 1. One of three customer-support facilities worldwide, Advanced Energy’s CEC in Sharon, Mass. provides pre-compliance EMC, safety and even firmware testing for power supplies or entire systems at no cost to existing or potential customers.

In addition, to highlighting these capabilities, the company also introduced their Medical Business Unit, which gives medical applications a special focus by separating product marketing and development for medical power supplies from the company’s broader Industrial Business Unit. The Denver, Colo.-based company also provided an overview of its product portfolio and corporate history, which includes many acquisitions of various power supply companies since its founding in 1981.

In his opening remarks at the press event, Shane Callanan, vice president, Engineering, explained the essential differentiator of AE’s new CEC, explaining, “We are solving the customer’s problems without the expectation of business.”

This activity includes adapting the company’s product designs to meet customer needs, especially in challenging areas such as medical. “For medical, standard product is never enough,” said Callanan. The challenge lies in defining customer needs “It’s all about knowing what customer problem we’re solving.”

He also discussed the motivations for creating a separate business unit for medical. “Medical and Industrial [AE business units] were once together. But there are different standards here. We can sell into both markets with the same design,” but then those designs must be adapted to the targeted markets (Fig. 2).

Advanced Energy – Your Proven Power Partner



High Voltage 60V to 60kV, Low Ripple, Isolated & Non-Isolated High Voltage Amplifiers	Medium Power AC/DC Up to 60V, Low Leakage current Digital & Analog Control B/BF/CF rated outputs	High Power Up to 24kW Single output High Efficiency Digital and Analog Control
Configurable AC/DC Up to 24kW configurable Up to 24 outputs Digital & Analog Control	DC/DC 0.6 to 48VDC Isolated & Non-Isolated Digital and Analog Control	RF 100kHz to 8MHz Fast rise and fall times Low Ripple & Precision Control
Open Frame AC/DC Single and Multi-output Convection and Fan cooled B/BF/CF rated outputs	Fanless Power up to 1000W Natural Convection 94% eff. Conduction cooled	External Power up to 240W Class I and Class II Low EMI
Mod. Std. Low MOQ Low/No NRE & Quick turn	Value Add Eng. Low MOQ Low/No NRE & Quick turn Local Engineering Support	Custom Eng. Low MOQ Low/No NRE & Quick turn Local Engineering Support

Dedicated AE Medical Business Unit »

Five acquisitions combining > 30 years of medical experience giving the broadest range of products, technologies and capabilities, serving the most demanding of medical and life science applications

Fig. 2. AE has grown its wide-ranging portfolio of medical power supply products in part through acquisitions of several companies.

Callanan presented a slide showing how the medical and industrial business units fit into the larger portfolio which includes semiconductor equipment, data center/computing and telecom and networking (Fig. 3). He noted that growth of the semiconductor equipment market has slowed, providing incentive to pursue new markets such as medical. Electrosurgery is one of the areas within medical that’s growing—a plenary by Daniel Friedrichs of Minotronics Medical at APEC 2024 shed light on this topic (see the reference)—and Callanan showed a slide with an overview of power supply needs in this area (Fig. 4).

Advanced Energy Markets and Products



MANY APPLICATIONS ACROSS MULTIPLE MARKETS				
SEMICONDUCTOR EQUIPMENT 	INDUSTRIAL 	MEDICAL 	DATA CENTER COMPUTING 	TELECOM & NETWORKING
PRODUCTS				
RF/DC PLASMA RF generators RF matching networks Remote plasma sources Pulsed DC generators 	HIGH VOLTAGE High voltage amplifiers High voltage power systems Electrostatic DC-DC board mounted 	LOW VOLTAGE AC-DC Bulk front ends Open frame Power shelves Fanless Configurable Conduction cool External & adapters 	DC-DC Low voltage Isolated High voltage Non-isolated DC-DC for BBUs Board mount PFC modules Power supplies 	SENSING / CONTROL SCR power controllers Gas sensing RF measurement RF measurement Fiber and non-contact temperature measurement Fiber Bragg Grating

Fig. 3. In addition to highlighting the capabilities of its CEC, AE used this press event to highlight its Medical Products business unit, which was spun out of its Industrial business unit. In addition to the low-voltage medical power supply products highlighted in this chart, the medical business also includes RF and high-voltage power supply products similar to those shown here from the Semiconductor Equipment and Industrial Business Units.

Electrosurgery | Overview

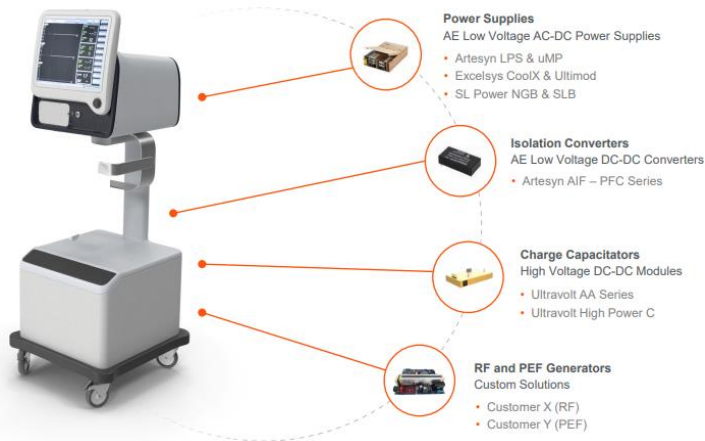



Fig. 4. Electrosurgery applications require a range of low-voltage and high-voltage power supply products as well as RF and pulsed electric field generators.

Returning to the subject of the CEC, Callanan noted that the company’s CECs keep customer product launches on track. “Many customers fall behind schedule during EMI testing.” So customers come to the CEC with their systems, where AE engineers perform pre-compliance EMI testing in a systematic way. While EMI/EMC is an area shrouded in mystery to many engineers, to those with experience “it’s not a black art—it’s physics.”

The slide in Fig. 5 shows the different types of EMI/EMC testing that AE engineers perform in the CEC as well as other thermal, safety and functional tests they can do. Furthermore, failure analysis is an important complement to these services. Repeating a key message of the day, Callanan added “We do all this testing for free.”



- Experienced staff to support fast problem identification & solutions saving customers tens of thousands of dollars
- Access to sophisticated EMC, Thermal and Electronic Test equipment saving thousands in rental and equipment fees
- Reduced time to market saving thousands in development time and opportunity loss
- Pre-compliance testing, typically costs around \$2,000 per day at test houses
- Peace of mind knowing you have an experienced partner to support you
- Confidence based on sound evidence and results
- Detailed reports to support decision making

© Advanced Energy Industries 2024

IEC61000 EMC DISTURBANCE TESTING

- IEC61000-3-2 AC line Harmonic Current Class A, B, C & D
- IEC61000-3-3 Voltage Fluctuations and Flicker
- IEC61000-4-2 ESD, up to 30kV
- IEC61000-4-3 RF Immunity testing 80-1000 MHz
- IEC61000-4-4 Electrical Fast Transients (EFT)
- IEC61000-4-5 Surge, up to 6kV / 3KA
- IEC61000-4-8 Mains Frequency Magnetic Field
- IEC61000-4-11 Supply Voltage Dips & Interruptions

EMI TESTING

- CISPR -11, 22, 15 (EN55011, 55015, 55022, 55032, FCC part 15) Conducted Emissions
- Radiated emissions investigation (Semi-Anechoic Chamber 3M RE capability)

DC LOAD EMULATION - Programmable loads to emulate complex system loads

THERMAL TESTS - IR Camera, Thermal & Humidity Chamber

SAFETY TESTS

- Hi-Pot and Ground Continuity Tests
- Leakage Current
- Detailed Functional Tests
- Future Analysis

FAILURE ANALYSIS

- Detailed Inspection and Failure Analysis
- Digital Imaging of defectives
- 8D Reports

DETAILED FUNCTIONAL TESTS

- Low Impedance 4.5KVA AC Source 0 -530VAC, 3 Phase Capability
- High Peak Inrush Current Testing
- Waveform Synthesis




Fig. 5. Test capabilities offered by AE’s CECs. In addition to the center in Sharon, Mass., AE has CECs in Little Cork, Ireland and Shanghai, China. These facilities have the capability to pass projects from one to another to take advantage of the different teams working in different time zones, accelerating completion of power supply testing and development projects on tight timetables.

Following Callanan's introduction, editors were treated to a lab tour, showcasing AE's "soup to nuts" test capabilities for safety and EMC testing. This even includes firmware testing to standards. A memorable element of this tour was the visit to the RF anechoic chamber, where specialized fixturing can support compliance testing of emissions and immunity at a systems level, for both radiated and conducted requirements.

Following the lab tour, members of the AE team presented case studies highlighting the experiences and accomplishments of the CEC.

For example, Karunakar ("KR") Polu, senior manager, engineering, product design, discussed AE's work with a developer of a mobile AED unit (automated external defibrillator). The customer partnered with AE to develop a power supply for this product. Because the product was expected to find use on planes, it needed to meet the RTCA DO-160G standard for airborne equipment as well as the more familiar IEC 60601 and 61000 standards. As Polu observed, through its early engagement with the customer, "we achieved a unique understanding and became equipped to test DO-160G, MIL and mobile applications."

Polu also discussed the company's efforts in modifying power supply products to meet customer requirements. Ultimately, this is a mutually beneficial activity for both AE and its customers. The CEC also helps customers with system integration.

In one case, the CEC tested a customer's product with AE's power products with the goal of improving performance and safety. As part of this effort, the CEC was able to modify the power supply unit at its Sharon facility, said Polu. This had the benefit of speeding product development for the customer.

"They gave us six weeks for testing, but we only took two weeks. And because we were giving them daily updates, the customer did not have to visit the CEC," said Polu. In line with earlier comments on the CEC, "All safety qualification & testing were conducted—at no cost to the customer," said Polu. One of the reasons AE can shorten product testing and development cycles is its ability to coordinate the activities of its three CECs across three time zones.

Polu described an example case: "We started testing on a project in Sharon, passed it to Shanghai at 6 pm and then passed it to Cork."

Although AE's operation in Sharon is relatively new as a CEC, it has some history of customer engagement behind it. AE first moved into the Sharon facility in 2019. At that time, two of AE's acquisitions, SL Power and Ault were doing custom design work for AE's customers. SL Power, which had acquired Ault years ago, and was acquired by AE in 2022, eventually moved into the Sharon facility.

For more information on the CECs, or to contact the company, see the [website](#).

Reference

"[Surgical Energy: Connecting Power Electronics to Patients – Literally!](#)" by Daniel Friedrichs, senior principal engineer, Minnetronix Medical, APEC 2024 plenary. As of this writing, a copy of his presentation and a video of his talk are posted on the APEC website at the link provided here.