

A NEW WAY TO TEST THE NEXT GENERATION OF **LOW-VOLTAGE SWITCHBOARDS**



ABOUT THE CUSTOMER:

Schneider Electric is a global leader in the digital transformation of energy management and automation.

CHALLENGE

Schneider Electric (SE) has revolutionized switchboard sourcing, installation, and maintenance with their new modular offer, FlexSeT. FlexSeT is designed to accelerate deployments for optimal efficiency that **reduces project risk, increases construction efficiencies, and dramatically shortens lead times**. SE's focus was to deliver the same **UL-listed** efficient products while reducing standard lead times from months to days. Significant simplifications to product design eliminated the need for inefficient manual processes. The kits that make up the product (in any variation) are flat-packed and sent to a partner's facility, where they are then assembled, and fully tested before delivery to the final installation site. Schneider Electric was looking for **an experienced test partner** to help ensure each unit meets all quality requirements and bring it to market.

RESULTS

AVERNA WORKED ALONGSIDE SCHNEIDER ELECTRIC TO HELP DEVELOP SEVERAL TESTERS TO **MAKE THEIR VISION A REALITY**. SEVEN SEPARATE SYSTEMS WERE DESIGNED FOR INDIVIDUAL COMPONENT KITS AS WELL AS ONE END-OF-LINE TESTER FOR USE ONCE THE SWITCHBOARD IS ASSEMBLED AT THE PARTNER'S SITE. BY HAVING THIS **GENERIC EOL TEST SYSTEM** AVAILABLE, SCHNEIDER ELECTRIC'S FLEXSET PARTNERS CAN SHIP **SMART INDUSTRIAL UL-LISTED EQUIPMENT** USING OFF-THE-SHELF PRODUCTS AND REDUCE CUSTOMIZATION COSTS. TODAY, SE'S PARTNERS LEVERAGE FLEXSET'S FLEXIBLE CONCEPT TO BUILD SWITCHBOARDS WITH THE COMPONENTS THEY REQUIRE, FOR DELIVERY **AS FAST AS 72 HOURS INSTEAD OF 3 MONTHS**.



The new generation of low-voltage switchboards.

THE AVERNA SOLUTION

With all components shipping separately to Schneider Electric business partners, seven separate component kit types were needed to test each one in their production line. These kit types include: **I-Line stack, Line-side bus, Load-side bus, Bridge, Instrument compartment, Backfed main, Plug-on neutral.**

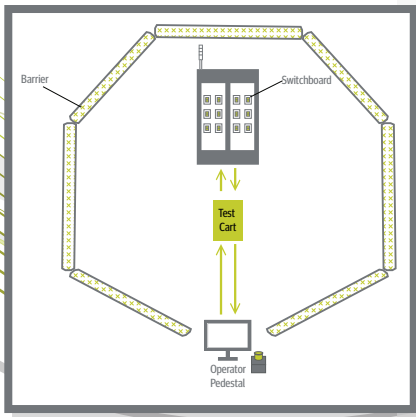
Each tester offers different variables based on Schneider Electric’s requirements. Tests include functional, continuity, and dielectric, as well as vision inspection for assembly validation.

The true cutting-edge differentiator of this project belongs with the low cost, highly repetitive, certified test cart Schneider Electric can now share with its partners, speeding up delivery and certification. After the components are received, it is the partner’s responsibility to assemble the complete switchboard. This is done with the assistance of an application developed by SE installed on a tablet. The app provides steps, instructions, and troubleshooting information along with direct wireless communication to the system. Once the switchboard is assembled, it is connected to Avera’s automated test cart. The wired connections are validated by the app.

A physical approach barrier is provided and once it is set up, a set of continuity tests and a series of dielectric tests are initiated remotely. There is a non-stop continuity loop through the Human–Machine Interface (HMI) console with the safety circuit. The system applies over 2,800 volts, so the continuity tests ensure that connections are made correctly while assuring the hipot tests won’t damage the equipment. The setup of the switchboard to the tester, including the barricade, takes no more than 20 minutes and the tests themselves will run as quick as 2 minutes. Once testing is complete, the results are automatically sent to UL for system certification for in-field use. Through this effort, Schneider Electric has been able to revolutionize the way to achieve UL certification, making it fast and efficient.

Prioritizing cybersecurity, firmware updates can only be performed with a signed certificate generated by Schneider’s own PKI toolkit. With more and more applications on the smart grid, a portion of this project was dedicated to penetration (pen) testing. Two weeks were spent trying to access both the system’s controller and the firmware.

The hardware and software are completely aligned throughout this program from the seven testers in the assembly line to the EOL testers onsite, at the partners’ facilities. Continuity is present through the entire production process. This system is a Schneider Electric branded product and is available for purchase by all registered partners through SE. The agility and flexibility of this system allows partners to test any variation of the FlexSeT product line for fast delivery and installation at their customer site. Delivering the high quality that you can always expect from a Schneider Electric product in a fraction of the lead time is a true innovation for the industry.



Typical test setup for FlexSet switchboard