Metrology Engineer Standardizes on Vitrek 4700 for HV Measurement Accuracy & Traceability

Legacy HV Test Tools Less Accurate and More Cumbersome

About Customer:
Ken Sams, Metrology & QC Engineer

Ken works for a leading global electrical insulation test equipment provider serving a wide range of industries including high power applications. The company provides critical electrical insulation measurement products, from insulation testers to dielectric breakdown testers. Ken's responsibility includes both internal quality and field service.

Challenge

Achieve high voltage measurement during production testing and calibration procedures, including specialized testing. In these challenging testing environments, even the smallest measurement errors can cost time and money and damage brand credibility.

Most standard digital multimeters(DMMs) only support up to 1,000 V DC or AC. Above that, technicians traditionally resorted to voltage dividers, which complicate measurements by introducing impedance concerns, divider inaccuracies and cumbersome non-linearity tables. Resistive and capacitive dividers often require reference tables and external computation to ensure traceable accuracy — introducing room for human error and slowing workflow.

Solution: The Vitrek 4700

Vitrek's 4700 system stores the calibration data in the probe itself.. The customer preferred the solution enough to install four Vitrek 4700 Precision High Voltage Meters and four high-voltage HVL-series Smart Probes™ (HVL-100 and HVL-150) for daily use by production and repair teams.

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Solution: The Vitrek 4700 (Continued)

The robust Vitrek 4700 solves the limitations of standard multimeters and dividers:

- **Direct ±0.03% accuracy:** from low voltage to 10,000 V
- **Probe intelligence:** HV Smart Probes™ extend measurement up to 140 kV DC
- **Frequency Bandwidth:** accurate down to 0.1 Hz
- **Ease of use:** intuitive color touch screen with AC/DC info and chart mode
- **Portability:** lightweight, compact and field ready (optional battery pack)
- **Automation Ready:** integrates via Ethernet, RS-232, or GPIB

"The Vitrek 4700 has direct measurement capabilities that are higher than most other metering solutions at the accuracy we need. And they store the divider ratio in the HV probes. This is amazingly convenient. It removes the inherent uncertainly that results when using an HV probe with an inexact divider ratio."

- Ken Sams, Metrology & Quality Assurance Engineer

Benefits & Results

Initially,adoption of the Vitrek 4700 faced resistance from veteran technicians familiar with divider-based workflows. However, after seeing the benefits — easy, intuitive interface, real-time crest factor display, built-in frequency readouts — they now rely on the 4700. The unit's compact size makes it ideal for the company's field techs, who can travel with it as carry-on luggage for critical service calls involving test systems up to 140 kV.

Higher efficiency and accuracy with probes

Traditional probes like the Fluke 80K-40 assume fixed divider ratios (e.g., 10,000:1), but those are only approximations. Vitrek's HVL probes record and communicate their exact calibration ratio directly to the 4700. This "plug and play" innovation significantly improves measurement accuracy, simplifies set up and reduces operator workload. For our customer, this feature was particularly valuable for servicing insulation testers and cable fault equipment — two product categories with output voltages ranging from 25 kV to 140 kV.

Low-frequency and niche application measurement

The customer's equipment includes low-frequency (VLF) devices operating at 0.1 Hz. However, typical DMMs are not specified at such frequencies. Their engineers wrote scripts to simulate waveform readings by averaging DC samples — a tedious, non-traceable workaround. With the Vitrek 4700, this process is replaced by direct, spec-rated measurements, dramatically improving efficiency and audit compliance.

Portability and ease-of-use

The 4700's user interface simplifies operations for technicians. Features such as real-time crest factor display, simultaneous AC/DC readout, and frequency measurement have also reduced reliance on manual calculations. As a result, accuracy, consistency, and technician satisfaction have all improved.

Calibration and support

The customer sends all Vitrek units back to the manufacturer for complimentary annual calibration. The turnaround time and support consistently meet their industrial lab's expectations. The units have become so essential to the company that work is scheduled around these annual calibration visits.

Streamline your operations while meeting the highest metrology standards for traceability, and accuracy with the Vitrek 4700.

To request a free application review visit www.Vitrek.com/freedemo.

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