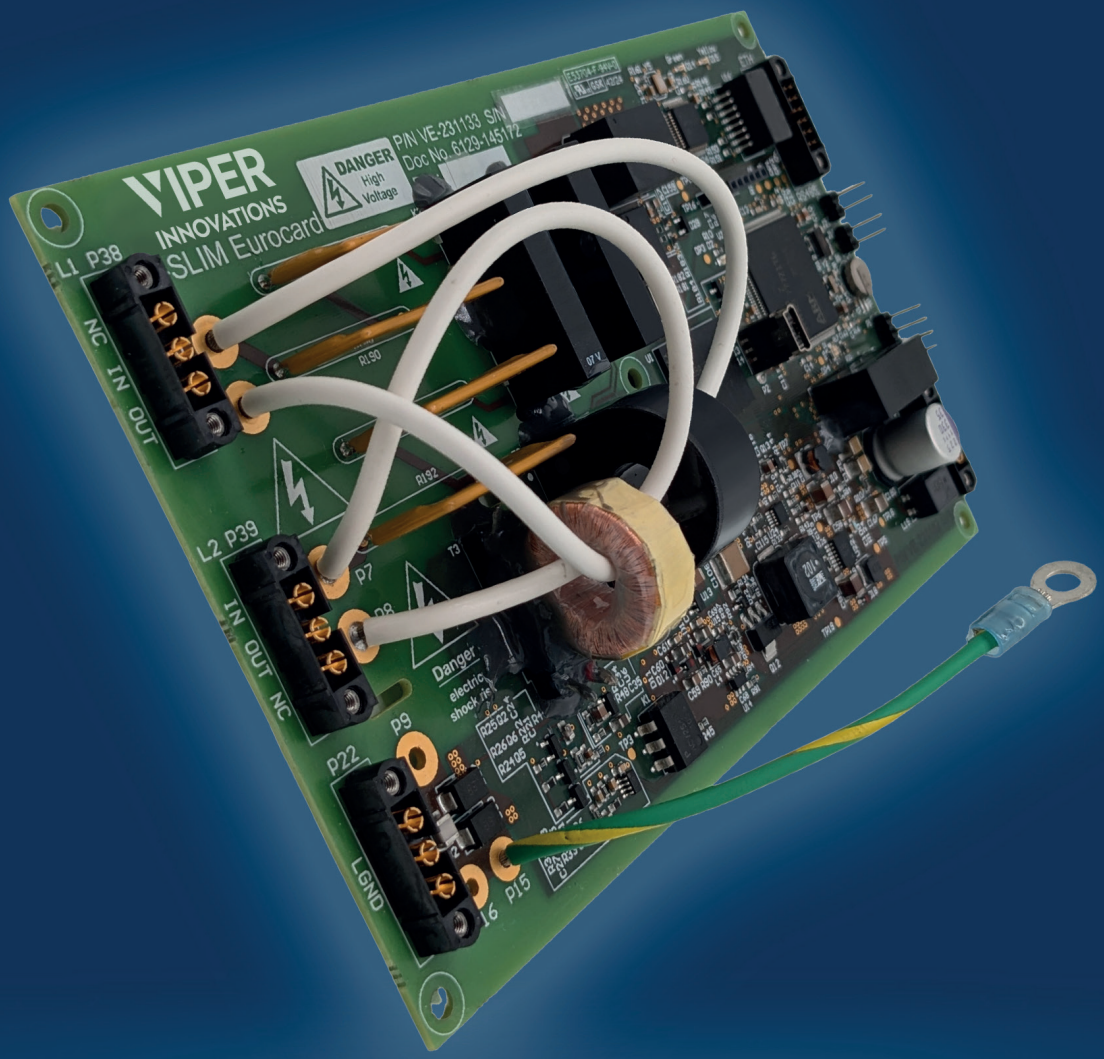
V-SLIM Eurocard



Technical Data Sheet

Subsea Line Integrity Monitor

INTELLIGENCE INSTALLED

A precise and accurate electrical cable integrity monitor for distributed ungrounded/floating electrical systems

V-SLIM Eurocard

The Problem:

Water ingress into subsea electrical cables is the dominant cause of electrical faults in subsea electrical systems. This results in an increase in leakage current, which triggers a low insulation resistance alarm. Continual insulation degradation eventually leads to failure of the circuit. Existing topside-located line insulation monitors only display a single insulation resistance result for the complete subsea system. When the insulation resistance drops, the topside monitor provides no information on the number of faults or their location. Identifying faults often requires a costly subsea fault-finding campaign, which may disrupt production and risks introducing new faults into previously functional connections. Even if the fault can be found and fixed, the entire process must be repeated each time a new fault occurs, providing no long-term added value.

Distribution systems that include subsea-deployed isolation transformer modules pose an additional integrity management challenge. In these systems, a topside-located line insulation monitor can only monitor up to the primary winding of the transformer, effectively covering the main umbilical only. Integrity monitoring of the electrical distribution equipment attached to the secondary side of the transformer, as is now commonly required by field operators, must be addressed by other means. A topside-located device cannot monitor the integrity of the secondary side of a transformer or utilise V-LIFE to recover low insulation resistance faults in that section.

The Solution:

The V-SLIM was initially developed to provide a solution for subsea located oil & gas production control systems but can also be applied to monitor other types of unearthed electrical systems.

The V-SLIM's unique ability to measure both total system insulation resistance and downstream insulation resistance provides operators with a comprehensive view of the electrical integrity of the distribution system. Installation of the V-SLIM at strategic locations, either as a retrofit or embedded within OEM equipment, allows for monitoring of degradation of the remote electrical distribution network as well as fault location using analytics.

When deployed as a standalone integrity monitor on the secondary side of an isolation transformer, V-SLIM fills the gap in critical integrity monitoring of the complete electrical system to provide information which cannot be obtained by a topside-located line insulation monitor. For subsea located systems, the V-SLIM can also be V-LIFE enabled allowing low insulation to be recovered even on systems with remote isolation transformers. This is particularly advantageous as infield umbilicals, electrical flying leads and other distribution equipment on the secondary side is difficult to fault find and costly to replace.

Key Features

- Measurement of total system insulation resistance and insulation resistance downstream of the unit
- V-LIFE - award-winning cable rejuvenation technology
- Built-in measurement of additional parameters including line voltage, current, frequency, and insulation capacitance
- Patented measurement technology allowing wires to be routed directly through the V-SLIM with no need for in-line switches or electronics
- Compatibility with AC or DC systems
- Compatibility with external IR verification testing activities
- Timestamped measurement data is logged to internal memory

Key Benefits

- Provides information to enable electrical fault location
- Minimises subsea intervention costs
- Mitigation of unplanned production loss
- Standardised single-height (3U) Eurocard format
- Easy PCBA securing via 5x fixing holes or by slotting the long edges into card guides

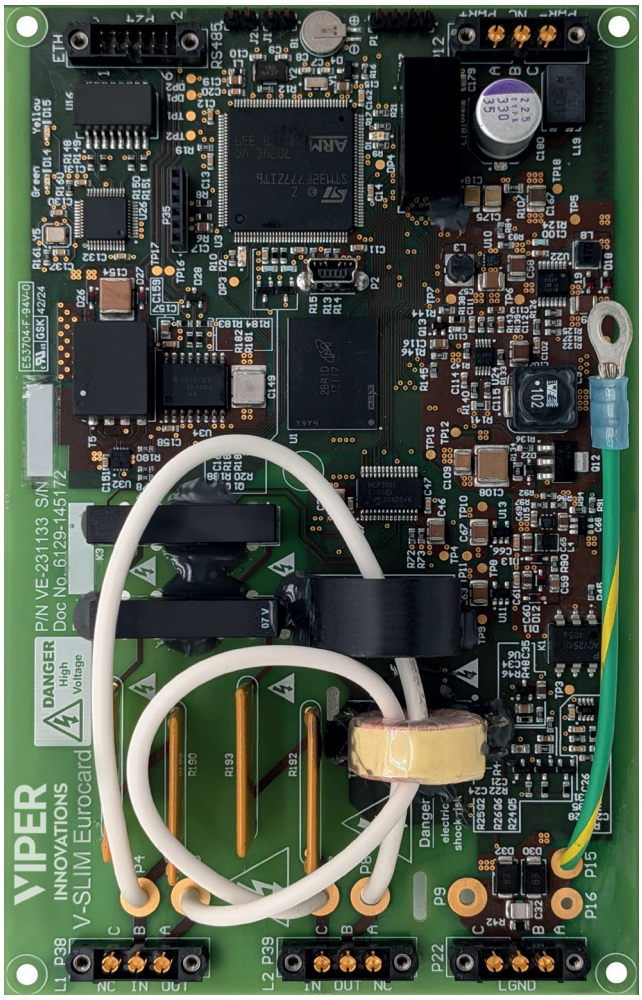
Ordering Codes

- VA-231690 (Functional tested and conformally coated PCBA)
- VA-231691 (VA-231690 including API 17F thermal ESS)
- VA-231907 (VA-231690 including API 17F thermal and random vibration ESS)

Alternative Product Variants

- V-SLIM Canister Variant

Product Compliance Marks



Qualifications

API STD 17F, 5th Edition
ISO 13628-6
BS EN IEC 61326-1
BS EN IEC 61326-2-4

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Electrical Specification

Power Supply
24 VDC Nominal, ± 20% tolerance

Power Consumption
2.5 W Typical
5 W Maximum

Line Rating
1000 V
Up to 11 A continuous

Overvoltage Category
CAT III
BS EN 61010-1 / IEC 61010-1
BS EN IEC 61010-2-030

Environment

Temperature Rating

Operating:	-20°C to +70°C
Transport:	-35°C to +85°C
Storage:	-35°C to +85°C

Pollution Degree
Pollution Degree 2
BS EN 61010-1 / IEC 61010-1
BS EN IEC 61010-2-030

Can be exposed to vacuum to facilitate dry Nitrogen purging.

Suitable for use in a 1 atmosphere Inert Gas.

Conformal coating applied in accordance with IPC-CC-830.

Measurement

Total Insulation Resistance Measurement Range
1 kΩ to 1 GΩ

Downstream Insulation Resistance Measurement Range
1 kΩ to 1 MΩ

Total Insulation Capacitance Measurement Range
0.1 µF to 150 µF

Downstream Insulation Capacitance Measurement Range
0.1 µF to 20 µF

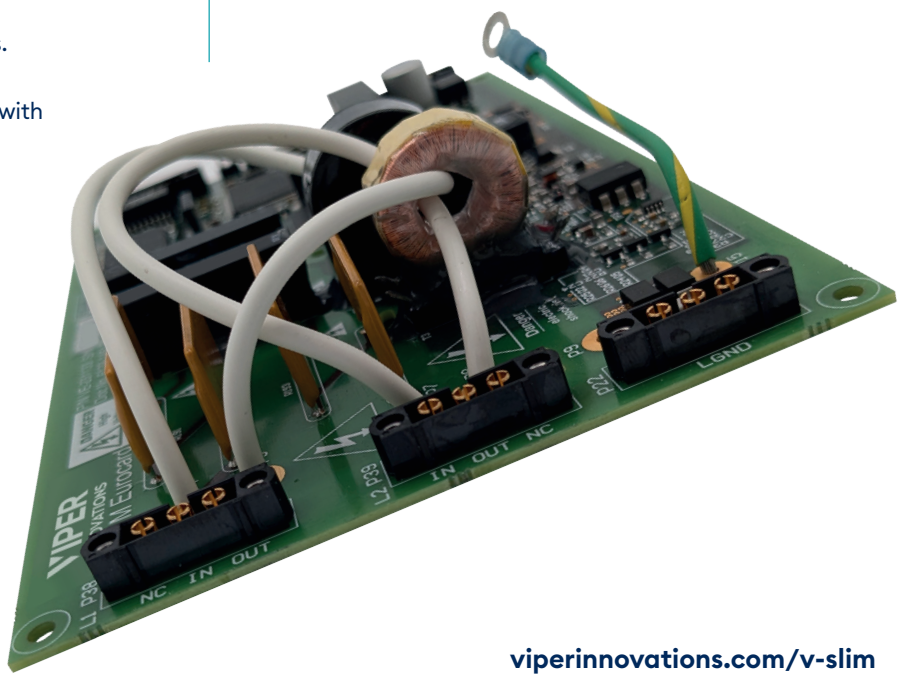
Line Frequency Measurement Range
47 Hz to 63 Hz @1% ± 0.5 Hz (True RMS)

Line Voltage (True RMS) Measurement
Up to 1000 V ± 3% ± 5 V

Line Current (True RMS) Measurement
Up to 11 A ± 1%

Data Storage

- Circular FIFO buffer
- Typical two-year data storage without overwrite @ one reading per minute



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Communications

Ethernet

- 10/100 Base TX Auto-Negotiation
- DHCP / Static (Configurable) IP Addressing
- Modbus TCP/IP, HTTP protocols supported
- Configuration and data reading

RS485

- 9600, 19200, 38400, 57600, 115200 bps
- Modbus RTU
- Data reading only

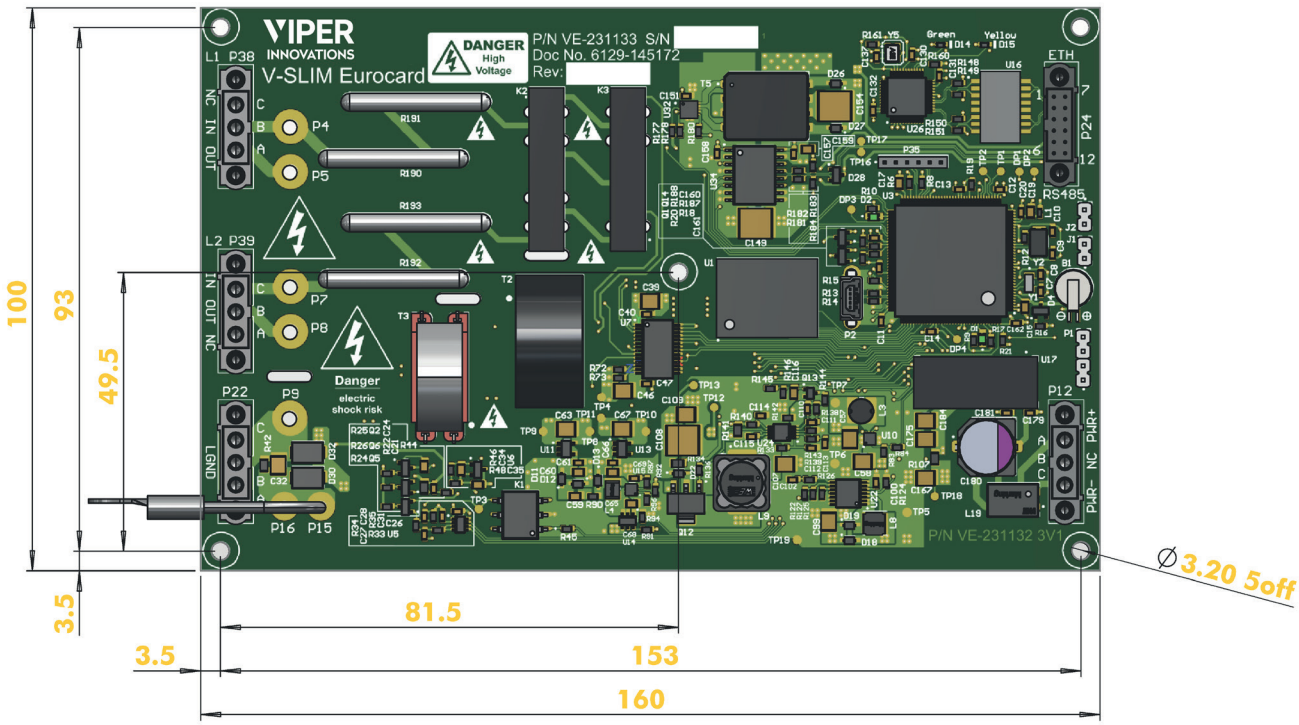
Mechanical

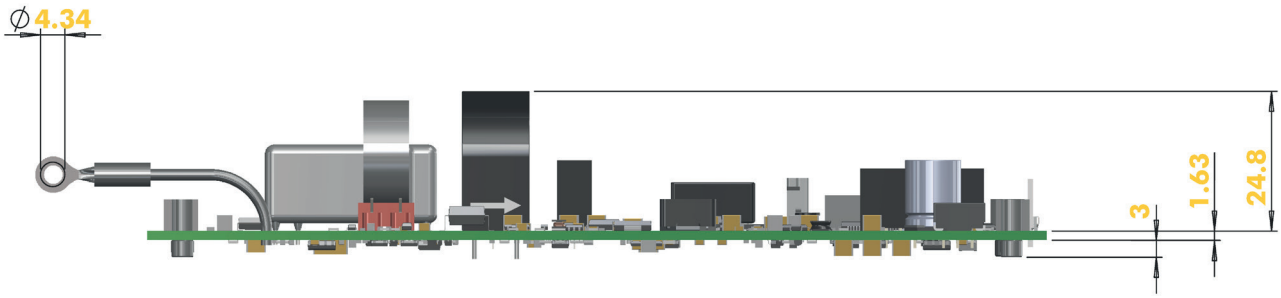
Weight

- 140 g

Dimensions

- See drawings below:





Note: All dimensions in mm

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Get in touch with one of our experts today and learn what V-SLIM can do for you.

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