INTRODUCING

V-LIM®

ELECTRICAL LINE INTEGRITY MONITORING MODULE

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2016

VIPER INNOVATIONS

www.viperinnovations.com

AWARD WINNING PRODUCTS & SERVICES TAKING OUT COST & INCREASING OPERATING EFFICIENCY

V-LIM®
A VIPER INNOVATION

A PRECISE & ACCURATE ELECTRICAL CABLE INTEGRITY MONITOR FOR UNGROUNDED/ FLOATING ELECTRICAL SYSTEMS

Long term operation and exposure to harsh environmental conditions causes insulation degradation in cables and other electrical equipment over time. With its precise and accurate measurements of Insulation Resistance, Capacitance and other advanced electrical parameters, **V-LIM** not only provides a better picture of the health of the system over time, but also provides opportunities to identify problems before they arise. This allows proactive and more cost effective intervention to be undertaken based on risk and asset condition assessments rather than relying on reaction to failures after they have occurred.

The **V-LIM** unit employs Digital Signal Processing techniques which facilitate trending and characterisation of the system condition with reliable fault disclosure over a wide measurement range. **V-LIM** is fully compatible with power transmission, communications as well as combined communications on powerline systems and is easily integrated into existing or new infrastructure via its convenient panel mounting arrangement.

V-LIM has two independently adjustable alarms and relay contacts set to predefined user-configurable thresholds. When the **V-LIM** detects that the IR has fallen below the thresholds, the alarms activate, and the relays operate. **V-LIM** offers an overall system condition as a standalone unit which can be interrogated using the module's touch LCD panel, or downloaded easily via USB A or B.

Additionally, **V-LIM** is **V-LIFE** ready - an exclusive feature for subsea applications which can be activated to increase the system IR and availability without the need for costly intervention or risk of introducing new faults.

V-LIM forms part of Viper Innovation's **V-IR** product line offers a granular view of the subsea electrical network, it's component and cable condition, as well as fault identification and location. **V-IR** uses the **V-LIM** along with subsea deployed **V-SLIM** modules to display the subsea network integrity on an interactive graphical user interface, reducing the reliance on vessel-based fault finding operations with divers or ROVs and supporting a move to condition and risk-based maintenance.

Key features

- Two separately configurable alarms with associated relay contacts to take desired action.
- Timestamped measurement data is logged to internal memory.
- Touchscreen LCD and web interface displays.
- Ethernet, RS485 Modbus and 4-20mA interfaces.
- Upload firmware and configuration settings from front panel USB interfaces via memory stick or service PC.
- Download data log to memory stick or service PC.
- Compatible with temporary application of external IR test unit without physical disconnection of **V-LIM.**
- Multiple user security levels supported for secure access.
- Built-in self-test.

Additional functions include

- **V-LIFE** cable remediation technology.
- **V-SLIM** integration for **V-IR** network condition monitoring.
- **V-NET** communications integrated for data recovery from **V-SLIM** modules.

Insulation monitoring standards

IEC 61557-1: 2007
IEC 61557-8: 2014

Notice
Product complies with Part 15 of the FCC rules, subject to the following two conditions: 1. The device may not cause harmful interference. 2. This device must accept any interference received, including interference that may cause undesired operation.

V-LIM
PRODUCT SPECIFICATION

Electrical

Supply Voltage:
85V to 264V AC, 47-63Hz
(100V to 240V AC, 50/60Hz1)
120V to 370V DC (140V to 335V DC1)

Power Consumption:
5W typical
14W maximum

Line Voltage:
Up to 1000V DC/ AC 47- 410Hz

Line Capacitance (operating):
Up to 500µF

Mechanical

Environmental:

Operating Temperature Range:	-20oC to +60oC (-4oF to 140oF)
Storage Temperature Range:	-40oC to +85oC (-40oF to 185oF)
Relative Humidity:	Up to 85% non-condensing
Pollution Degree:	BS EN 61010-1: 2010 Degree 2
Overvoltage Category:	BS EN 61010-1: 2010 CAT III
Measurement Category:	BS EN 61010-2-030:2010 CAT III

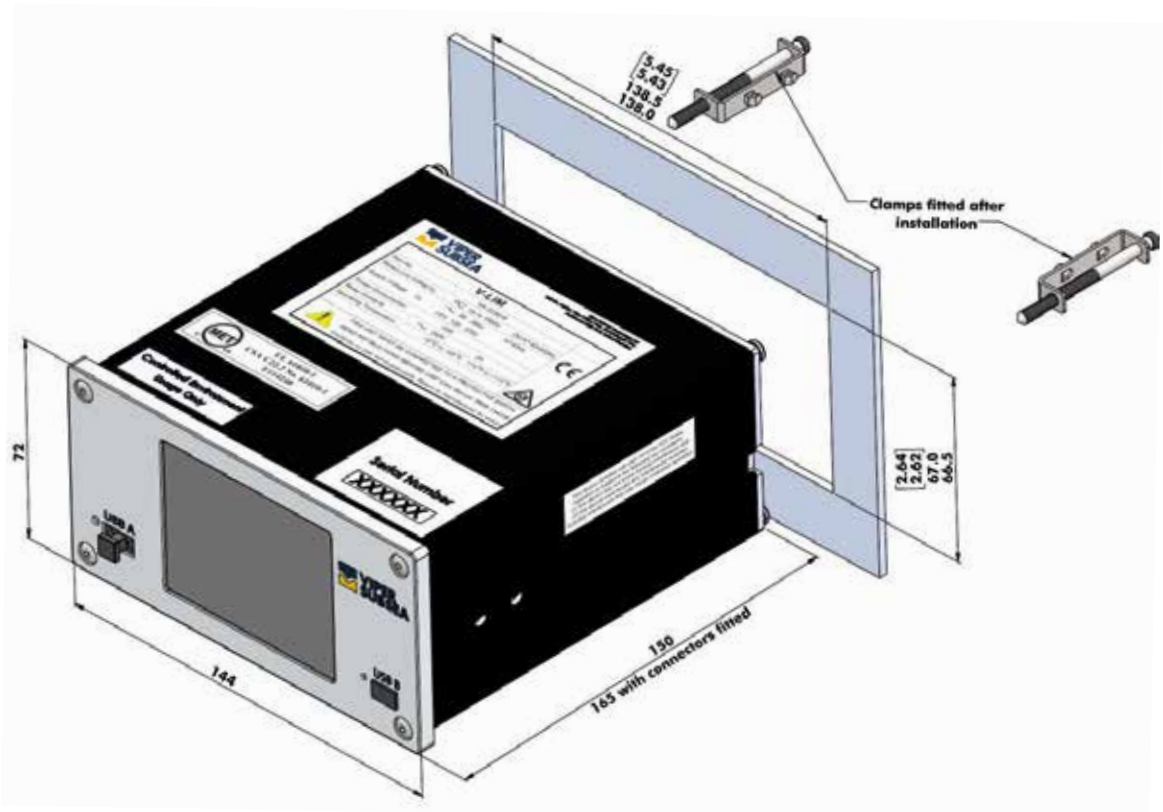
Packaging:
Dimensions: See diagram below (in millimetres [inches])
Weight: 0.8kg

Design Life
Minimum 15 years operation

Data Storage

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

Mounting Arrangement



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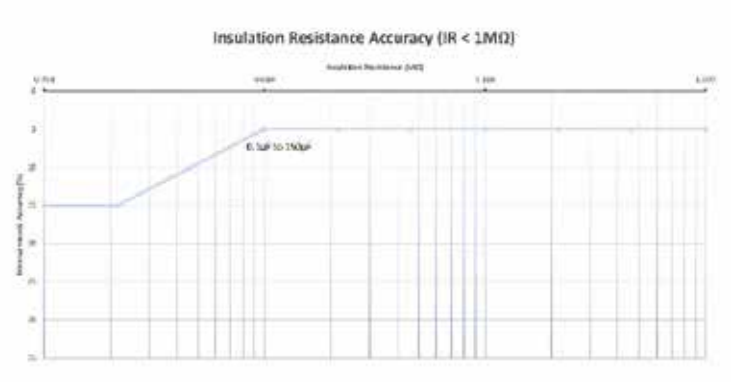
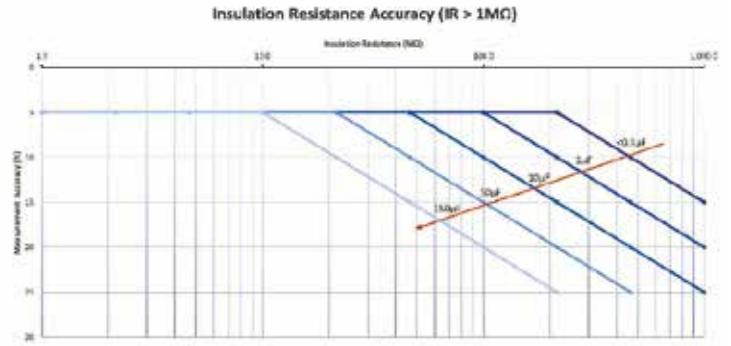
Measurement

Insulation Resistance:
1kΩ to 1GΩ @ see graphs below





Note:
Measurement accuracies are specified in the form ±XX% ±Y, where XX is the tolerance expressed as a percentage of measured value and Y is an offset errort

Response Value (Alarms)1:
1kΩ to 10MΩ

Insulation Capacitance:
0.1µF to 150µF @ ±25% ± 0.05µF

Line Voltage (True RMS):
50 to 1000V AC/DC @ ±3% ± 5V

Line Frequency:
DC, AC 47 – 410Hz @ ±1% ± 0.5Hz

Enhanced Measurement (Requires external coil)

Line Current (True RMS)
Line Power (True RMS)

Line Power Factor:
-1 to +1

1 Based on IEC61557-8 reference conditions

Interfaces

Connection:
- Pluggable screw terminal connectors
- RJ45 Ethernet
- RJ50 Remote Sensor [future option]

Alarms:
- 2 x Single pole volt-free changeover contacts 240V AC, 2A
- User configurable non-failsafe (default) and failsafe modes

Ethernet:
10/100 Base-TX Auto negotiation
DHCP / static (configurable) IP addressing
Modbus TCP/IP, HTTP protocols supported

RS485:
9600, 19200, 38400, 57600, 115200 bps
Modbus RTU
120Ω termination resistor may be connected via rear panel switches

Current Loop:
12V to 24V DC I/P voltage required
4mA (0Ω) to 20mA (max IR – configurable) O/P current, linear scaling. Configurable IR Ranges of
- 0-1MΩ
- 0-10MΩ
- 0-100MΩ
- 0-1GΩ

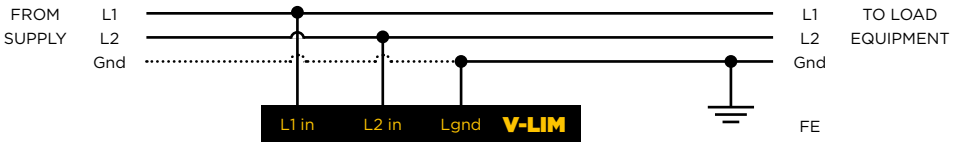
20mA (0Ω) to 4mA (10MΩ) O/P current, non-linear scaling for legacy systems

LCD:
640 x 480 touch screen

USB:
USB 2.0 Type-A data download and configuration update via memory stick
Mini USB Type-B laptop service port access

STANDARD LINE CONNECTION

Connection Method 1: Single Phase Connection

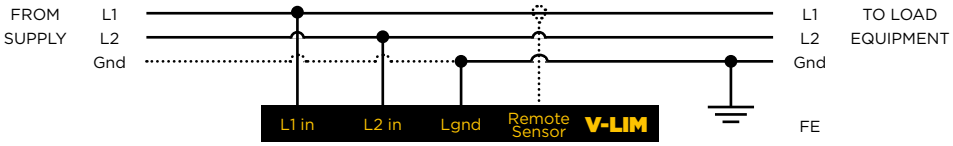


Description:
The V-LIM is connected to each line conductor (L1 and L2) and associated ground.

Measurements available:
- Insulation Resistance
- Insulation Capacitance
- Line Voltage
- Line Frequency

ENHANCED LINE CONNECTION

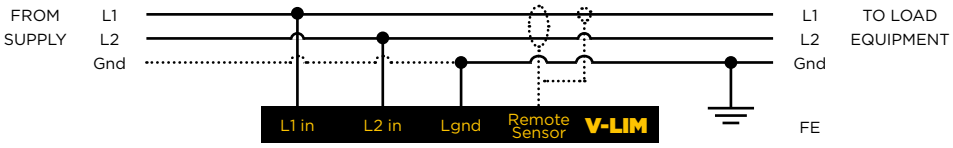
Connection Method 2: Enhanced Single Phase Connection [requires accessory]



Description:
The V-LIM is connected to each line conductor (L1 and L2) and associated ground. Measurement of additional parameters can be achieved through installation of a remote sensor.

Measurements available:
As per Connection Method 1, plus
- Line Current
- Power Factor
- Real RMS Power

Connection Method 3: Enhanced Single Phase Connection [requires accessories]



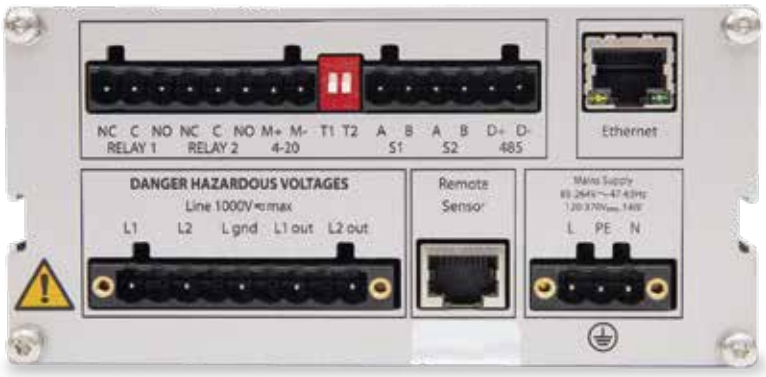
Description:
The V-LIM is connected to each line conductor (L1 and L2) and associated ground. Measurement of additional parameters can be achieved through installation of remote sensors

Measurements available:
As per Connection Method 1 & Connection Method 2 plus
- Directional Insulation Resistance (Upstream or Downstream)
- Directional Insulation Capacitance (Upstream or Downstream)

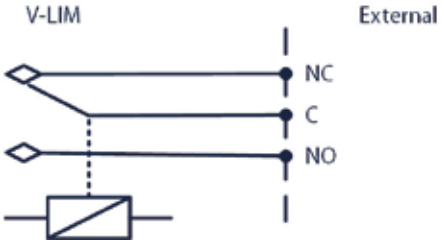
INTERFACES

Front Panel

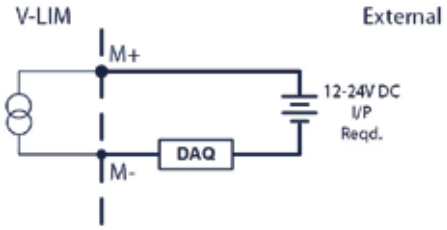
Rear Panel



Relay 1 & 2



Current Loop



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