

# V-LIM

## TECHNICAL DATA SHEET

[www.viperinnovations.com](http://www.viperinnovations.com)



## ELECTRICAL LINE INTEGRITY MONITORING MODULE

 **V-LIM**<sup>®</sup>  
A VIPER INNOVATION

## A PRECISE AND 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 offering a granular view of the subsea electrical network, its 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 functionally identical variants for different supply voltages, V-LIM and V-LIM 24V
- 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 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
- Facility to disconnect the V-LIM from the line monitored
- Cross talk immunity option. Enables multiple units to take accurate simultaneous measurements on adjacent cables. This option is also known as V-Net Sync
- Coupler Module connection capability for voltage >1kV
- Built-in self-test

### Additional functions include:

- V-LIFE cable remediation technology
- V-SLIM integration for V-IR network condition monitoring

### Insulation Monitoring Standards

- BS EN 61557-1, IEC 61557-1
- BS EN 61557-8, IEC 61557-8

### Product Marks



**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.



## Electrical

### Supply Voltage:

<b>VA-223619</b> 110V to 240V AC 140V to 335V DC ± 10% tolerance	<b>VA-223619-24V</b> 24V DC ± 20% tolerance
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### Supply Frequency:

<b>VA-223619</b> DC, 50/60Hz ± 6% tolerance	<b>VA-223619-24V</b> DC
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### Power Consumption

<b>VA-223619</b> 5W typical 14W maximum	<b>VA-223619-24V</b> 5W typical 8W maximum
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### Line Voltage

Up to 1000V DC / AC 47-410Hz

### Lin Capacitance (operating):

Up to 500µF

## Mechanical

### Environmental

Operating Temperature Range:	-20°C to +60°C (-4°F to 140°F)
Storage Temperature Range:	-40°C to +85°C (-40°F to 185°F)
Relative Humidity:	Up to 85% non-condensing
Pollution Degree:	BS EN 61010-1: Degree 2
Overvoltage Category:	BS EN 61010-1 CAT III (VA-223619) CAT I (VA-223619-24V)
Measurement Category:	BS EN 61010-2-030 CAT III
Additional Testing:	BS EN 60068-2-1 Test Ae BS EN 60068-2-2 Test Be BS EN 60068-2-78 Test Cab

### Packaging:

Dimensions: See diagram below  
Weight: 0.8kg

### Design Life:

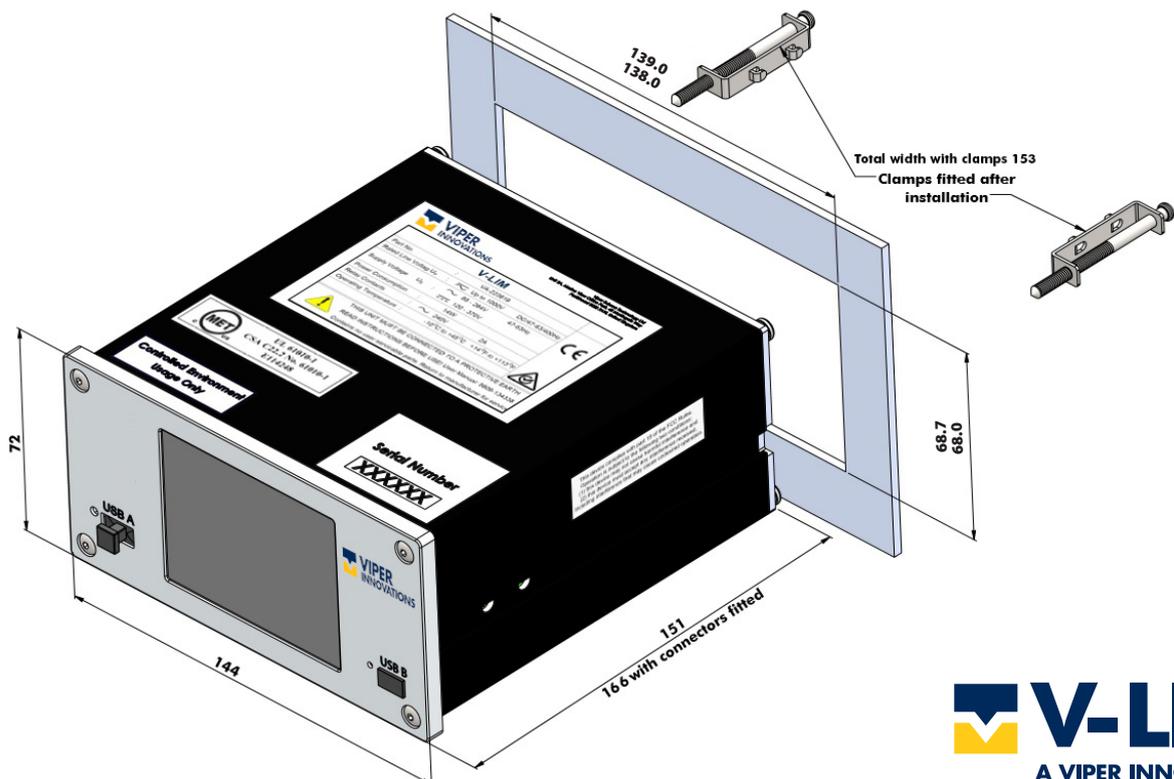
Minimum 15 years operation

## Data Storage

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

## Mounting Arrangement

Dimensions in mm

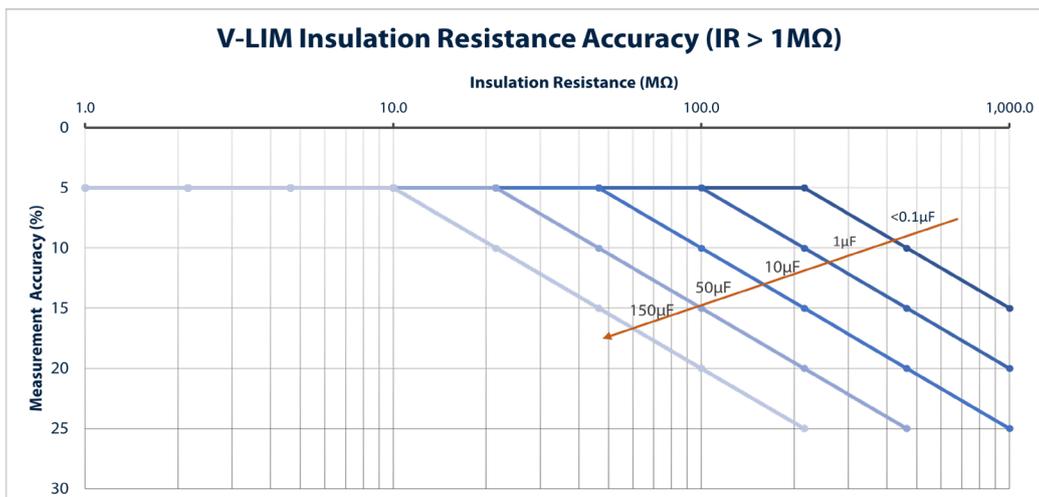
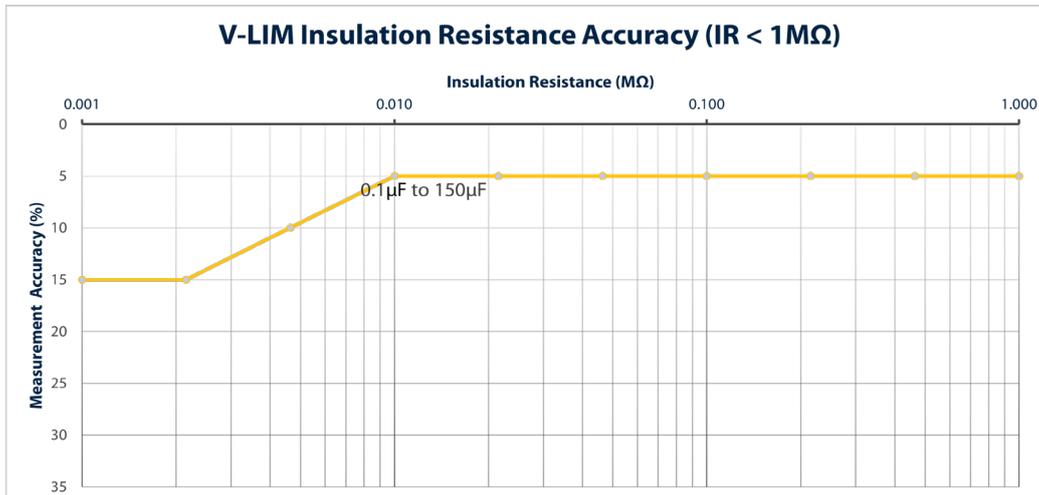


## Measurement

### Insulation Resistance:

1kΩ to 1GΩ\* @ see graphs below

\* The maximum IR changes depending on the measurement profile selected. When **V-LIFE** is enabled, the IR range is between 10kΩ and 500MΩ.



**Note:** Measurement accuracies are specified in the form  $\pm YY\% \pm 1k\Omega$ , where YY is the tolerance expressed as a percentage of measured value from the graph above on the Y axis.

**Enhanced Measurements:**  
**(Requires split line current transformer VA-229986)**  
 Line Current (True RMS): 0-20A AC @  $\pm 5\%$   $\pm 50\text{mA}$

**Response Value (Alarms)<sup>1</sup>:**  
 1kΩ to 10MΩ

**Insulation Capacitance:**  
 0.1 μF to 150 μF @  $\pm 25\%$   $\pm 0.05\mu\text{F}$

**Line Voltage (True RMS):**  
 50 to 1000V AC/DC @  $\pm 3\%$   $\pm 5\text{V}$

**Line Frequency:**  
 DC, AC 47 – 410Hz @  $\pm 1\%$   $\pm 0.5\text{Hz}$

<sup>1</sup> Based on IEC61557-8 reference conditions

## Interfaces

### Connection:

- Pluggable screw terminal connectors
- RJ45 Ethernet
- RJ50 Remote Sensor [option for enhanced measurements]

### Alarms:

- 2 x Single pole volt-free changeover contacts compatible with signals up to 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

### USB:

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

### Current Loop:

12V to 24V DC input voltage required.

Multiple configurable Linear IR Ranges:

- 0Ω (4mA) - 1GΩ (20mA)
- 0Ω (4mA) - 500MΩ (20mA)
- 0Ω (4mA) - 100MΩ (20mA)
- 0Ω (4mA) - 10MΩ (20mA)
- 0Ω (20mA) - 10MΩ (4mA) Inverted
- 0Ω (4mA) - 1MΩ (20mA)
- 0Ω (20mA) - 1MΩ (4mA) Inverted
- 0Ω (4mA) - 100kΩ (20mA)

Two configurable non-linear IR ranges for Legacy systems.

### Digital Switch Input:

- 2 x volt-free digital switch inputs
- Configurable trigger modes (NO/NC) and 5 different functions

### LCD:

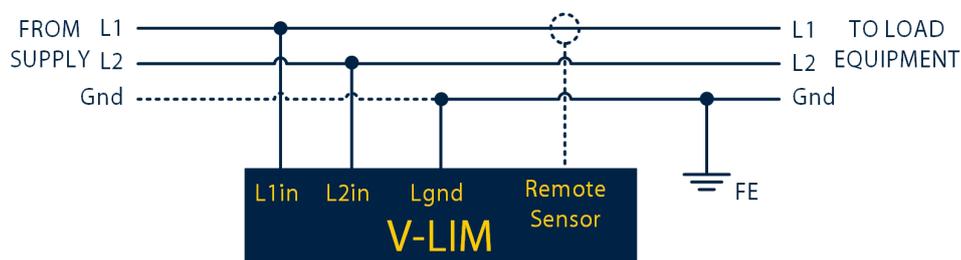
640 x 480 touch screen

### Order Codes:

- VA-223619 **V-LIM (V-LIFE capable)**
- VA-223619-24V **V-LIM 24V (V-LIFE capable)**
- VA-229986 Split Line Current Transformer (optional)

Full list of installation accessories is available upon request.

## Standard Line Connection



### Description:

The **V-LIM** is connected to each line conductor (L1 and L2) and associated ground. Measurement of optional parameter (Line Current) can be achieved through installation of a split line current transformer connected to the remote sensor port.

Refer to the **V-LIM** Installation and Operating Manual for more detailed information.

### Measurements available:

- Insulation Resistance
- Insulation Capacitance
- Line Voltage
- Line Frequency
- Line Current (Optional)



For more information visit:  
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