

JOIN THE REVOLUTION

to prevent signal failures

CableGuardian



CableGuardian is the *only* product to offer proactive monitoring, detection and location of both insulator and conductor faults on live signalling power systems as specified in Network Rail specification NR/L2/SIGELP/27725.

Developed in collaboration with Network Rail, **CableGuardian** supports the ambitions to reduce maintenance costs and time-related infrastructure failures, to reduce the frequency and duration of service affecting failures and to improve the overall asset management process.

The **CableGuardian** system consists of multiple sensor units distributed across principal supply points (PSPs) and functional supply points (FSPs) each measuring multiple electrical parameters and communicating via a secure internet connection to a cloud-hosted data storage and analytics system. This system analyses the sensor data, providing continuous monitoring of the live system and indicating the location of any cable or conductor faults without the need to down-power the system, reducing the frequency and duration of trackside fault-finding campaigns.

CableGuardian provides monitoring at a cable section level, as defined in NR/L2/SIGELP/27725, breaking away from the traditional limitations of insulation monitoring devices which offer only a single insulation resistance measurement for the complete circuit or, at best, feeder level monitoring. Additionally **CableGuardian** is *the* technological alternative to the 5 yearly manual cable testing requirements in NR/L2/SIGELP/50000. Empowering the rail industry to move from the uncertainty of periodic electrical network testing, to a real-time condition based approach.

Key benefits:

- Fewer boots on ballast fault finding and cable testing
- Quickly and accurately locate cable faults and cable theft
- User friendly web portal for fault diagnosis and location
- Analytics facilitate proactive rather than reactive maintenance
- Permits a move from a frequency based inspection regime to one driven by actual asset condition and performance
- Reducing risks to trackside personnel and the general public

“I am hugely excited about the opportunities this technology will bring to us.”

Network Rail

“This is the technology that I have been waiting years for.”

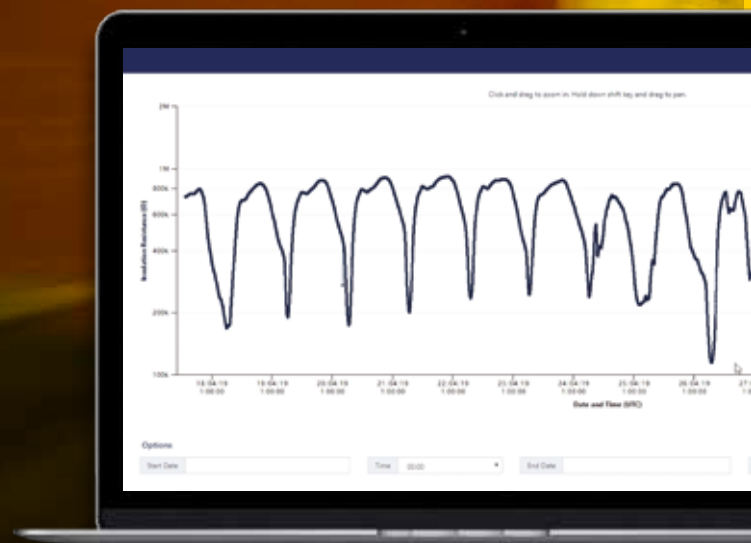
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Enabling live system testing

CableGuardian's capability for continuous monitoring of both the cable insulation and the copper or aluminium cores offers a technological alternative to the intrusive periodic cable testing requirements of NR/L2/SIGELP/50000.

Key advantages of CableGuardian over manual cable testing:

- In addition to the cables, **CableGuardian** monitors and tests all of the components connected to the system (e.g. transformers, connectors, switches, bus bars, etc). These components may have inherent insulation faults of their own which are undisclosed by the traditional manual cable testing methods.
- **CableGuardian** continuously monitors and tests the system whilst it is powered rather than having to switch off the system to perform the traditional manual cable testing.
- **CableGuardian** provides continuous 24/7 IR monitoring and trending plus core-core open/short circuit monitoring rather than a snapshot single measurement in time.
- **CableGuardian** is non-intrusive, requiring no disconnection of cables or other equipment to perform its measurements, resulting in less trackside excursions and 'boots on ballast'. This also eliminates the risk of faults being introduced when the cables are reconnected.
- **CableGuardian** permits a move from a frequency based inspection regime to one driven by actual asset condition and performance.



CableGuardian
- helping passengers to arrive on time.

 **CABLE
GUARDIAN**[®]
A VIPER INNOVATION



Monitor >

The role of the CableGuardian unit

The **CableGuardian** units are the “eyes and ears” of the monitoring system. The unit is installed as part of a kit with the necessary measurement coil harness, power cable and communications antenna (if using cellular communications).

How many will I require?

The number of units depends on the Tier of monitoring as defined in NR/L2/SIGELP/27725 that is required by the asset owner, for Tier 1 systems it also depends on the feeder layout and resolution of fault location desired. Our expert team can review your requirements and provide a tailored **CableGuardian** system proposal.

Diagnose >

Tier 3 Monitoring:

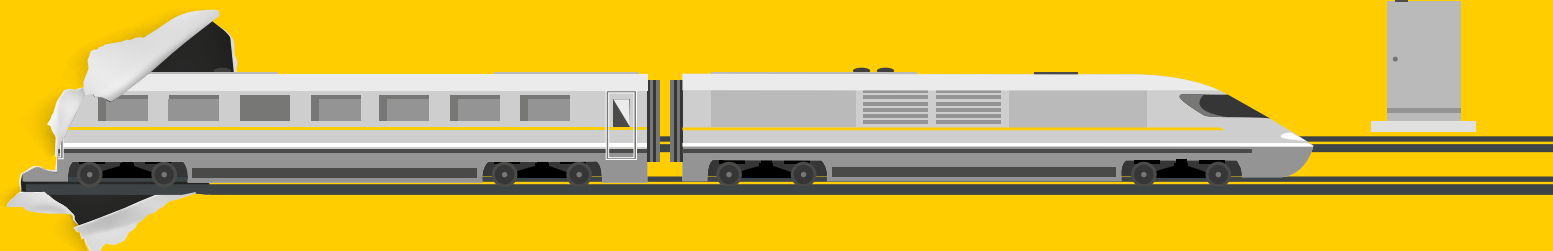
A single **CableGuardian** in the PSP monitors all connected feeders and returns the IR value of the complete system.

Tier 2 Monitoring:

The IR of each feeder is monitored individually from the PSP. IR faults can be attributed to an individual feeder.

Tier 1 Monitoring:

Multiple **CableGuardian** units are installed on each feeder. The measurements from each **CableGuardian** unit are sent to the analytics package which resolves for the IR of each cable section between adjacent **CableGuardian** units. Each **CableGuardian** unit monitors for open circuits or short circuits using ground-breaking Spread Spectrum Time Domain Reflectometry (SSTDTR) and reports the results to the analytics package.



Real-time visibility over electrical system integrity



Recover >

The CableGuardian Web Portal

Results and information from the analytics package are made available via the **CableGuardian** web portal which is accessible from any internet connected device using the necessary secure login information. The portal has an intuitive user interface – results can be seen at a glance and historic trends of integrity data can be easily produced by the user. The portal is also designed to be fully compatible with the Network Rail Intelligent Infrastructure.

Fault alert & escalation process

The **CableGuardian** system has configurable alarm and pre-alarm settings for the key parameters that are monitored, with the default settings being those contained within the Network Rail Standards. Alarm and pre-alarm settings are visually represented within the **CableGuardian** portal and are simultaneously sent to Network Rail's Intelligent Infrastructure system using the current standard RS485 interface.

Additionally, Viper Innovations has worked collaboratively with Network Rail and has proven that this data can be directly passed from the **CableGuardian** Cloud to the Network Rail RADAR Cloud when this technology is released by Network Rail.

With **CableGuardian** you don't have to wait for an alarm or even a pre-alarm in order to act and keep your Signalling Power System fully operational. It is possible to set alarm and pre-alarm values for each Sub-Network Section (this could be an entire feeder, part of a feeder, right down to an individual cable), which will also be visible within the portal.

By setting these Sub-Network Alarm Thresholds above the Network value it is possible to create an advanced warning of potential faults or long-term degradation long before they become an emergency.





**Combining innovation &
experience to add real value**

For more information or to book a demo, visit
cableguardian.viperinnovations.com

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