



Datasheet



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The Cotec C31

The Cotec C31 is the only live line tester on today's market which has been designed solely for the electrified railway industry.

Introduced in 2000 the C31 Live Line Tester established itself as the 'work horse' of the UK Rail network, it is fully compliant with all British and EU standards.

Live Line Indicators (LLI's) only indicate the presence or absence of a voltage above or below a fixed threshold by a red or green light, this limits their usefulness. As a resistive tester the Cotec C31 displays the actual voltage present on the OLE, as well as indicating a live or safe condition by red – green lights.

The Cotec C31 LLT is two independent testers within one body. Each one is galvanically isolated from the other so that if one circuit should fail then the other indicator can be trusted to keep operating. Having two independent measuring elements, the user can be sure of the indicated condition as each one confirms the other.

The first is a passive circuit that is powered by the OLE voltage itself, which drives the meter pointer to indicate the precise voltage. The second is an active circuit which is battery powered and it controls the Red – Green lamp voltage indication. It also performs a system check, a lamp test and battery test every time the tester is turned on, and it warns if the calibration certificate is out of date, and it logs test activity for diagnostic purposes.

The C31 LLT is robust, some of the first batch of C31 testers made 20 years ago are still in use today, proving the C31 is a good investment financially as well as an investment in safety.

The Cotec C31e is the latest embodiment of this proven design, offering users the ultimate intergrated Live Line Testing System.

All C31 LLTs can be upgraded to the 'e' version, so purchasers have no reason to delay buying decisions.

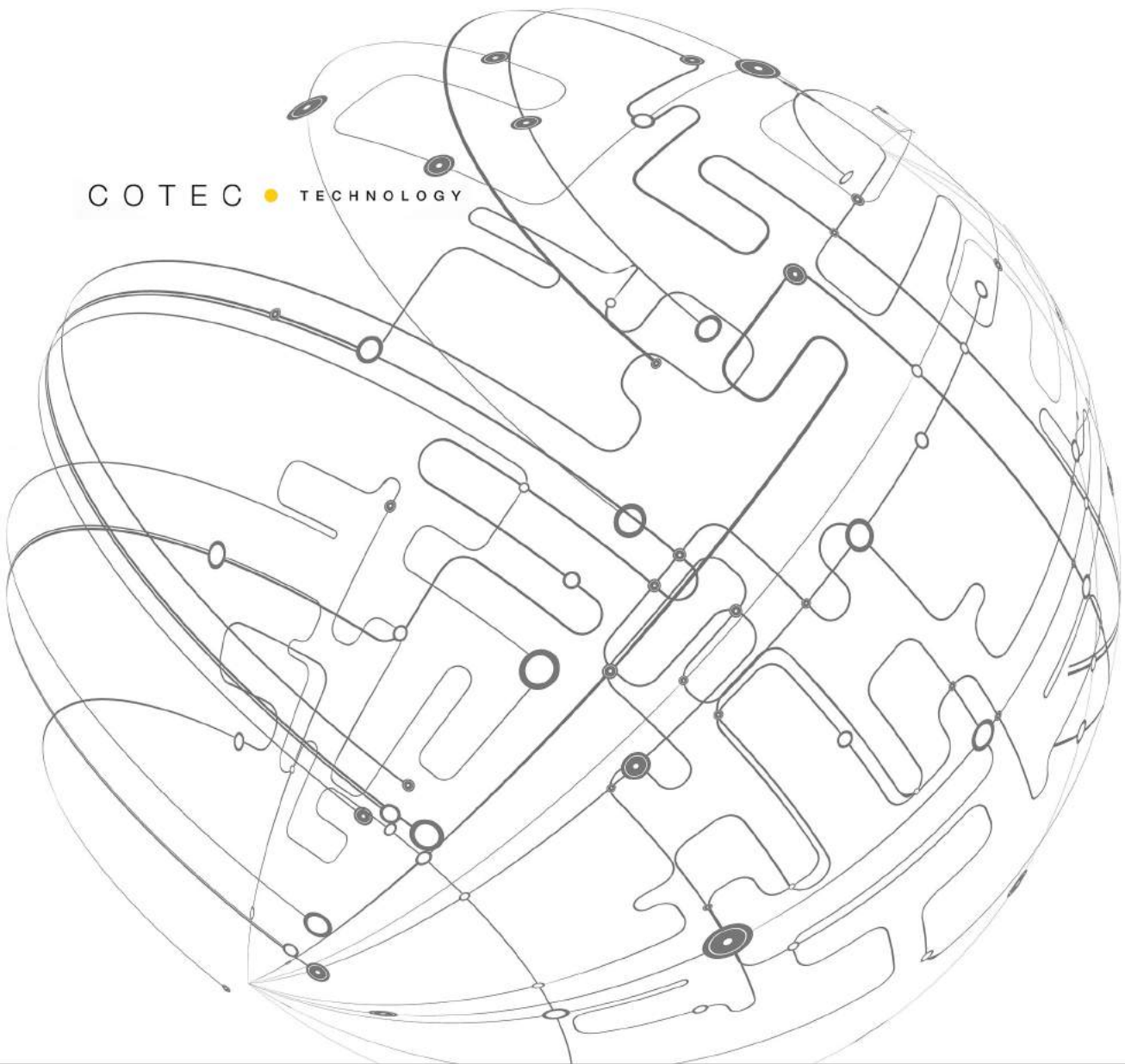


C31_e Development

The Cotec C31_e (under development, release date - November 2020), provides access to the tester's internal activity log. It has brought the C31's pre-existing communications up to date to reflect the use of modern Bluetooth and 4G/5G mobile devices.

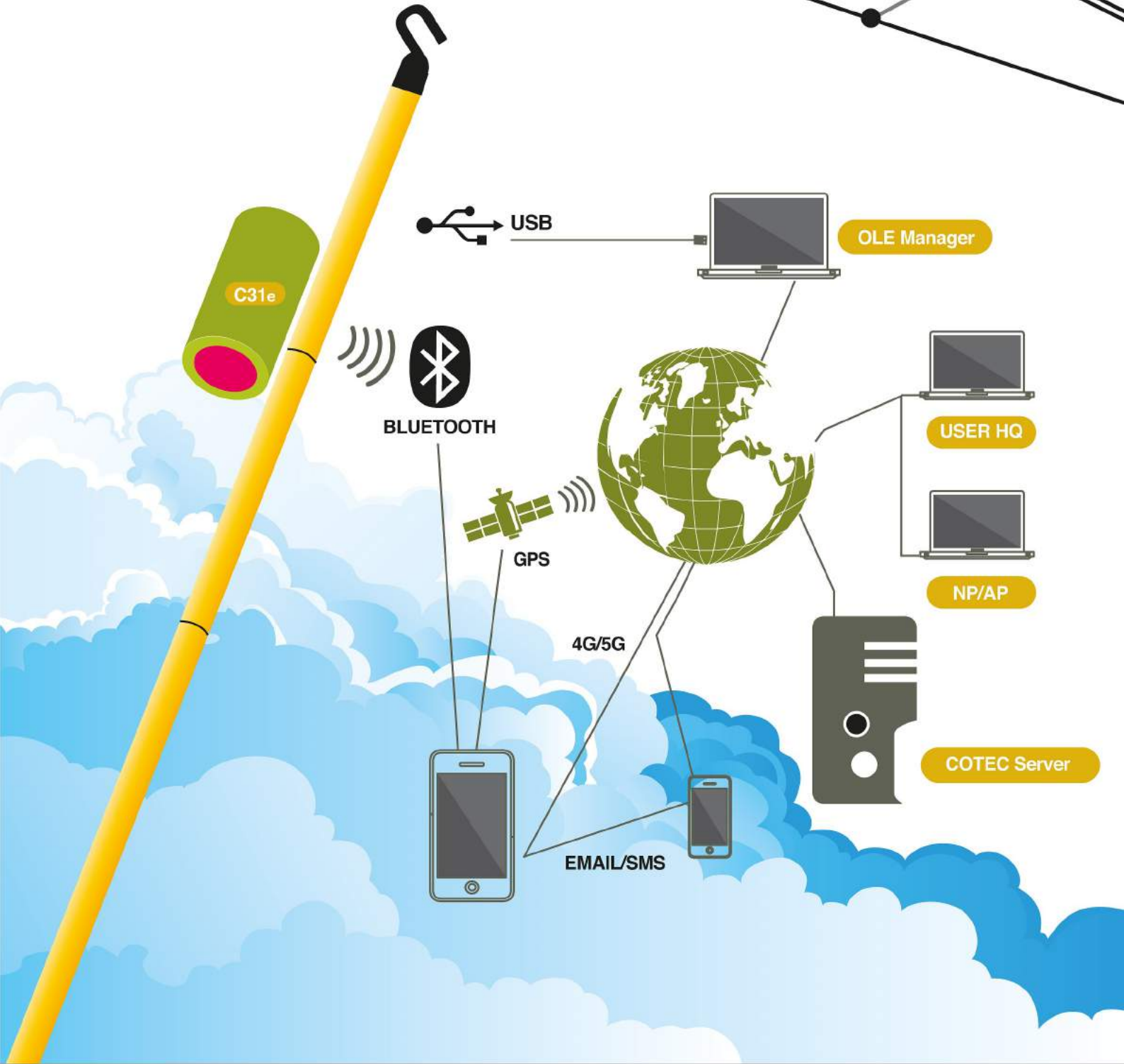
It offers companies secure real time test activity data and GPS location, which can be stored or re-transmitted, either directly by SMS or email, or via mobile data to the Cotec server which can be accessed via the Internet by clients for reporting and QA audit purposes.

C O T E C ● T E C H N O L O G Y



Networking

Real Time Auditing



C31e Application

In recognition of the need for improved auditing of Live Line testing activities on the OLE, Cotec has made use of the C31 tester's datalogging capability which has previously been limited to diagnostic usage and calibration functions. In the years since the C31 LLT was first introduced, huge changes have taken place in communications, connectivity, mobile data and the powerful features of android phones and tablets.

By equipping the C31 auxiliary board with Bluetooth and USB interfaces, the Cotec tester offers users an unparalleled end-to-end test solution for real time isolations supervision and auditing, with all the safety benefits that presents, not to mention savings on the high cost of repairs due to isolations and earthing incidents and associated transport system downtime.

Greater accountability within the workforce heightens productivity and improves worker's adherence to safe practices at the trackside, both of which should deliver a return on the financial investment in the proposed system with the Cotec C31e LLT at its heart.

No special equipment is required by the user. All that is required on site is an App to be installed on an Android phone or tablet equipped with Bluetooth and GPS. Mobile Internet data, although useful is not essential for the system to work. Live test data is transmitted to the user's handheld device for greater clarity and more detailed visual presentation of information, measured values and warnings.



C31e Application

The following data can be delivered:

Date and time of switch on
Time of volts first detected
value of voltage detected (peak and lowest)
Test duration
C31 LLT serial number
C31 LLT calibration cert date status
C31 diagnostic status [OK, low battery level, system fault etc.]

Data originating from the Android device is as follows.

GPS location **
Rail infrastructure ID
AP/NP details
Job details
Permit number **
Unique test number

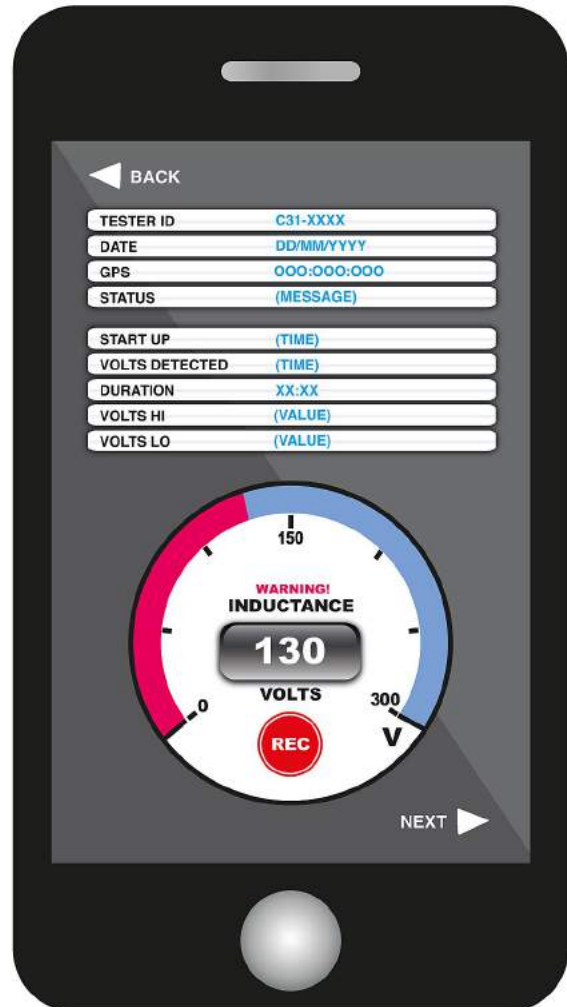
This list is under review

** retransmitted back to the C31 for internal storage.

The resulting test data is logged both inside the C31e and in the Android device, which can be retransmitted from the Android device in a variety of formats. Exactly how the data is used, by whom, and where it goes to is open to discussion with the end user and customisation is possible.

* all stored data is secure from unauthorised interference and can be accessed directly via USB, as well as via the wireless Bluetooth connection.

The Original C31 PCB which is approved and well proven is completely untouched, so the detection and indication circuit is unchanged.



Documentation

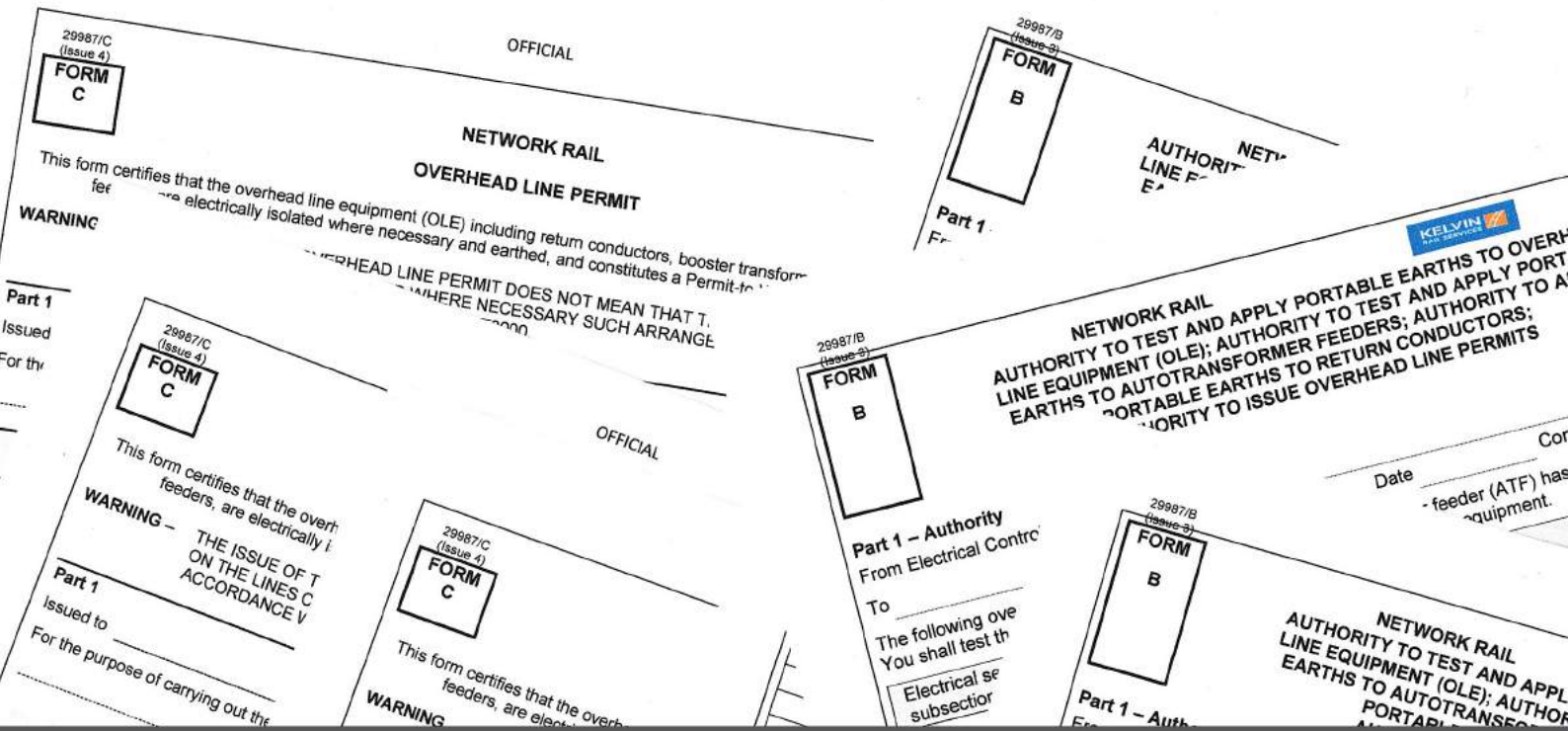
Safety procedures and permit to work systems are only ever as good as how well they are implemented, documents alone do not promote safety. Regular auditing is one way to ensure their efficacy, monitoring compliance and highlighting any changes required as a constant cycle of improvement.

OLE maintenance and construction activities create a lot of documentation related to isolations and earthing, which require tests to be performed under strict criteria. Nobody would deny the importance of proper isolation test procedures, without which the level of risk to life and equipment would be far too great.

And yet accidents and near misses still occur all too frequently, causing injury to personnel and costly damage to the OLE. This is often due to human error, bad testing practices or even a failure to perform the tests at all.

The introduction of 'test before touch' as a safety initiative increased the number and frequency of tests many fold.

The C31e datalogger LLT supports a secure automated paperless test auditing system under development by Cotec Technology which will greatly improve the oversight of all live line testing activity, aiding identification of non-compliance for quality assurance and safety audit purposes.



Safety Benefits

Safety benefits include:

- monitoring workforce testing activity to ensure that tests are being carried out in accordance with established procedures.
- Improved worker location and isolated section verification.
- Real time test status reporting by NP to ECO.
- Reduced incidents involving accidental electrocution injuries or near misses.
- Greatly improved inductance warning, and effective test before touch performance.
- Mobile App provides greater clarity for Nominated Person & Authorised Person.

Other benefits:

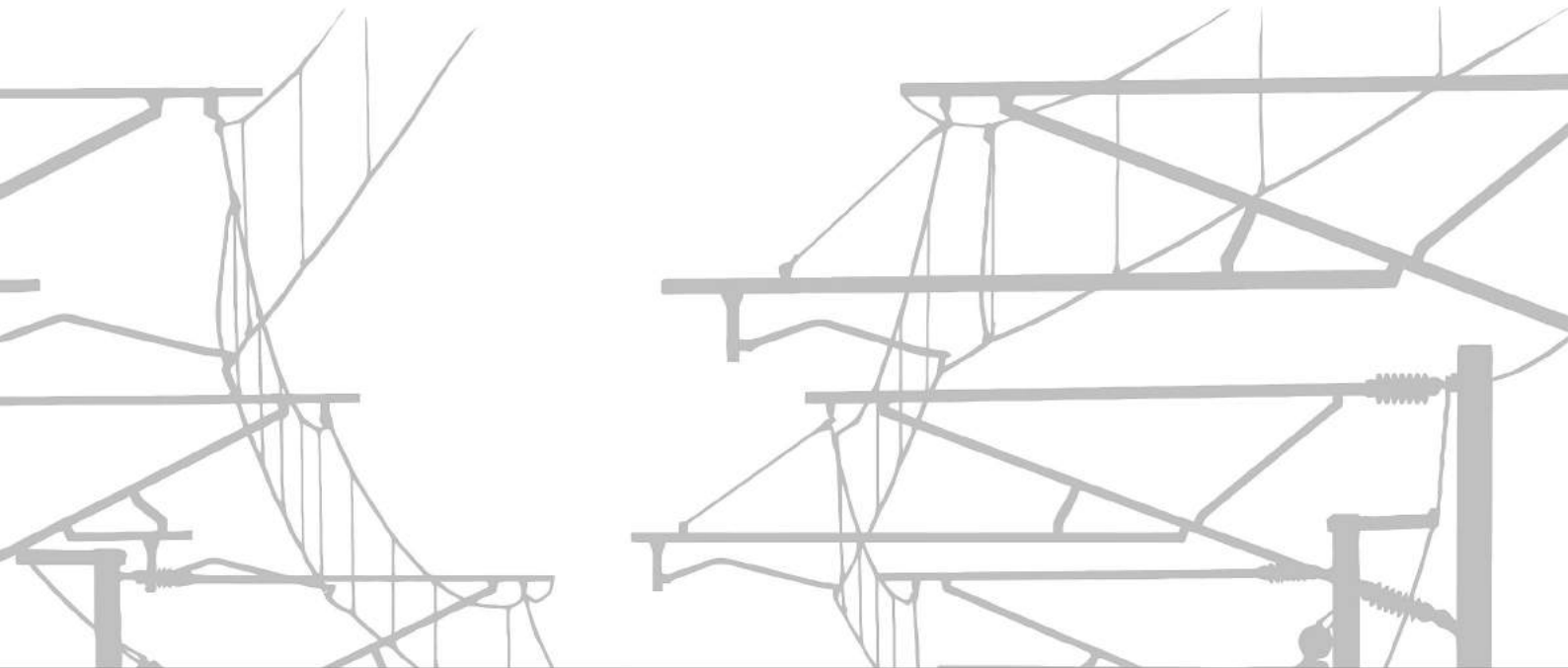
- Reduction of costly damage to the OLE and switchgear by accidental earthing incidents.
- Improved safety audit provided by the Cotec C31e software, which offers an integrated test and documentation system, end to end.
- Recorded data aids incident investigation

Throughout industry, greater accountability has a well proven effect on safety by monitoring performance to reinforce safe practices, discouraging short-cuts due to time constraints or peer pressure.



Specifications

Certified to BS EN 61243-2	Resistive type Live Line Indicators >1KV AC
Certified to BS EN 50121-1	Electromagnetic Compatibility (Railway applications)
Network Rail RT/E/PS/00003	Resistive type Live Line Indicators
Environmental	Wet weather - Class D-==
Voltage level indication	0 – 30 KV Analogue Dial indicator
Induced Voltage level indication	Yes
Live line indication	Red – Green superbright LEDs
OLE Line powered	Circuit 1 analogue
Battery powered	Circuit 2 digital
Battery - NiMh	> 250 tests
Rechargeable	Yes
Accuracy greater than:	2 % Analogue dial 1 % LEDs
LED indication	Red light warning – LIVE 11.0 KV ±500V
Inductance Warning	Yes > 60V AC
DC Blocking	Yes
Sound	No
Calibration	12 months
Weight	3.2 Kg
HV Probe length	1.2 M
Auto shut off	Yes (5 mins)
Range	30 KV nominal Rated 40 KV max
Datalogger	Yes
Communication	Bluetooth + USB



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