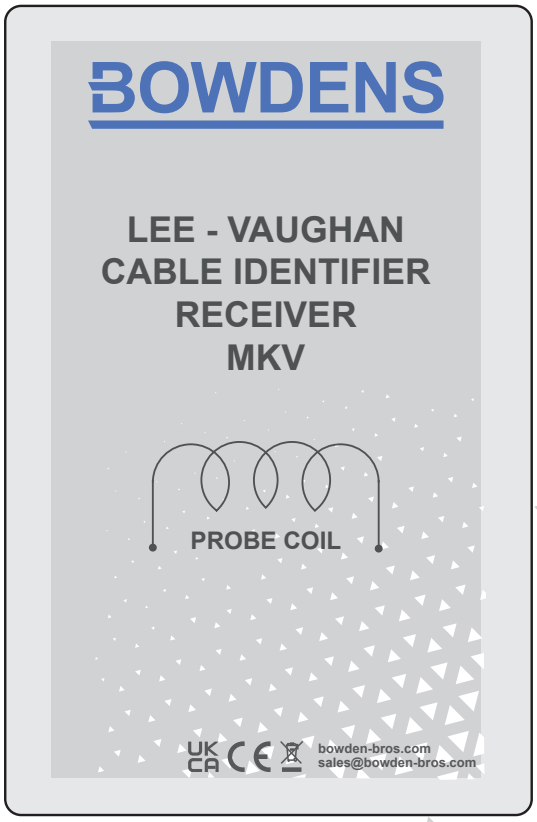
BOWDENS

LEE VAUGHAN
CABLE IDENTIFIER
MKV



FOR THE IDENTIFICATION OF A SINGLE CABLE IN A RUN OF MULTIPLE CABLES

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1.0 OVERVIEW

The MKV Lee Vaughan Cable Identifier will give an accurate and positive identification of high voltage power cables prior to spiking or commencing work. It is easy to use and is quicker to identify cables that might have presented a problem in the past. The MKV is particularly beneficial in situations where one of several cables in a trench needs to be identified. It has been developed for use by electricity distribution system engineers and complies with relevant CE legislation. The MKV visually and audibly identifies from the rise and fall of an induced signal due to the 'lay' of the cable cores. It is conveniently housed in a fitted carry case and consists of a transmitter and receiver, each powered by four AA battery cells.

The MKV consists of a sturdy plastic carrying case, foam-fitted to house the transmitter, receiver, headset, connecting cable with clips and a remote roving coil which allows access to tightly bunched cables. The transmitter is in a strong plastic case with spring loaded output connection terminals. The transmitter emits an interrupted signal that when fed into the cable, can be picked up by the receiver at the identification point. The unit has a selectable power output which gives four times the power compared to the MKIV. The MKV has a modulated (1.6kHz) or continuous tone option and improved 'noise' suppression to minimise induced pick up in adjacent cables for easier detection of the 'lay' of the target cable. When the unit is in operation a red LED flashes at the interrupt frequency.

The receiver is housed in a similar case to the transmitter and requires the same type of battery. It contains a coil for signal pickup and an amplifier with gain control for the meter and headset. To help conserve the battery life, an interlock is arranged to disconnect the battery when the headset plug is removed from its socket.

WARNING: The cable to be identified must be de-energised and discharged.

2.0 OPERATION

TRANSMITTER SET UP

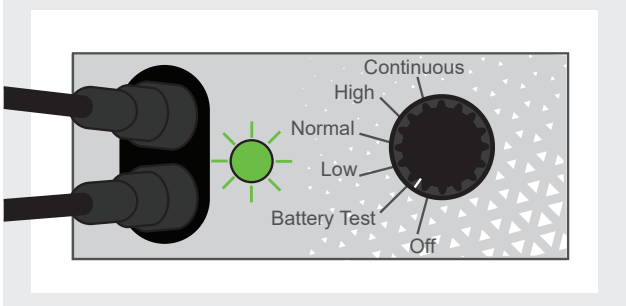
Two cores of the cable at the remote end must be shorted together, and the transmitter connected to the same two cores at the supply end using the cable connectors supplied. When the transmitter is turned on using the rotary selector switch, the first position performs a battery test. The battery condition is shown on the LED.

SWITCH POSITION 1 - BATTERY TEST

LED

Battery condition good.

Battery condition around 70% good life remaining on low power



Solid red
Battery condition 30%
Change if continuous use is envisaged. OK for short periods on low power

Flashing red
Battery condition <30% and should be changed

POSITION 2
Low power output signal, modulated at 1.6kHz. The LED will flash red. Low power can be used for short cable runs (less than 100m) and will give greater battery life.

POSITION 3
Normal power output signal, modulated at 1.6kHz (cable length 100m to 5 km). The LED will flash red.

POSITION 4
High power Output signal, modulated at 1.6kHz and can be used on long cable runs (5km to 10 km) where the medium output signal is insufficient. The LED will flash red. Battery life will be considerably reduced with continuous operation on high power.

POSITION 5
Continuous signal (not modulated) which automatically selects normal power output. The LED will remain solid red.

The transmitter should be switched on and low, normal or high selected. The LED will flash red. Plug in the headphones to the receiver (the unit will not function without the jack plug engaged) and rotate the volume control. On approaching the transmitter, the characteristic ‘Bleep Bleep’ will be heard and the meter will respond at the same frequency. Connect the test lead to the transmitter terminals and short the crocodile clips together, the signal from the receiver heard in the headphones should increase. Follow the instructions in the case but if in doubt, change the batteries.

CAUTION: The Electricity Supply Safety Rules should be observed when using this instrument.

TRANSMITTER POWER OPTIONS
The operator can now select the power output and tone requirement to suit the cable length and application. On short cable lengths, low power should be selected to minimise any noise induced in adjacent cables. Normal power is the equivalent to the output of the MKIV instrument. For long cables (10km) maximum power should be used to give a clear signal at the point of identification. All of these power settings have a modulated signal at 1.6kHz frequency. The final position on the selector switch gives a continuous tone, but because of the increased demand on the battery, this option automatically selects the normal power option.

Although the battery life is improved by a factor of three when compared to the MKIV on the same power output, because the power output has increased by a factor of four times, when the MKV is used on maximum power or on continuous tone, the battery life will be much shorter. Typically a new set of batteries will give 10 hours continuous use on either of these settings.

CAUTION: The Electricity Supply Safety Rules should be observed when using this instrument.

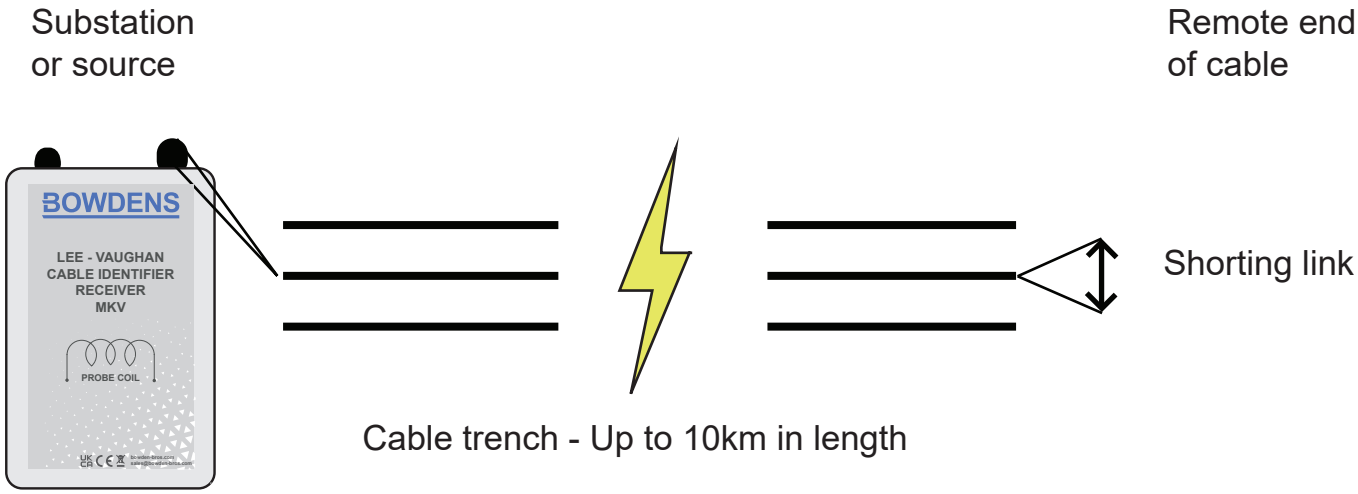
RECEIVER SET UP

Plug the headphones into the top jack plug, next to the On/Off volume knob. The receiver will not turn on unless the headphones are plugged in. Decide whether it will be easier to hold the receiver box in hand to identify the cable, or use the remote coil, which is especially useful for confined spaces. The remote coil plugs into the side of the receiver, and automatically cuts off the internal coil. The receiver can be checked by approaching the transmitter with either coil, and the signal will be heard.

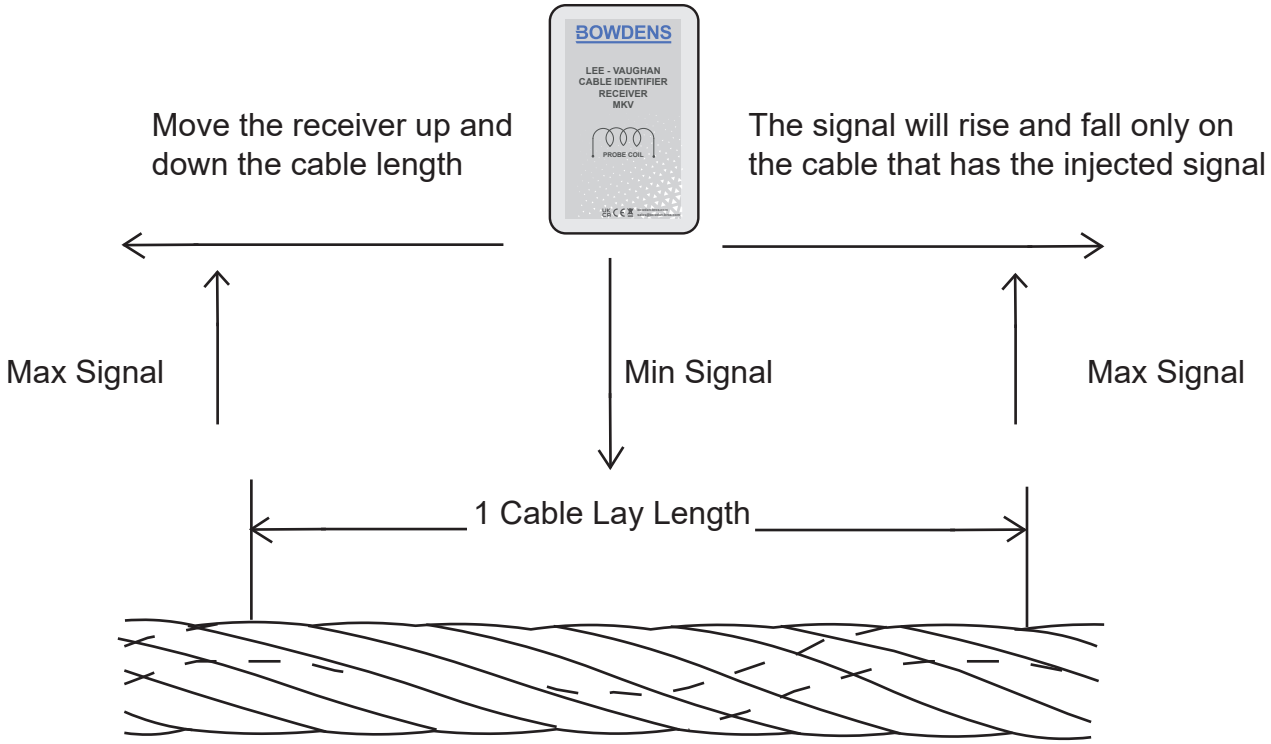
At the point of identification, the volume control can be set to maximise the signal reception. The receiver being held at right angles to the cable, traverse the cable up and down over a length of approximately one metre, and listen to the rise and fall of the signal due to the ‘lay’ effect of the cores which are twisted over each other. The effect can also be observed on the receiver meter. If the target cable is tightly bunched with other cables in a trench, the remote roving coil can be used, by plugging the jack plug into the side of the receiver. This coil allows easy access around the cable.

For a positive identification of the target cable, the rise and fall must be experienced. Some induced pick up may appear in adjacent cables, but although detectable by the receiver, will not exhibit the rise and fall characteristics. Following identification, when the headphones jack plug is removed, the receiver is automatically switched off. The transmitter must be turned off before storing back in the case.

Three HV or LV cables lay in a trench. The middle cable is the target cable to be identified. Firstly the cable must be made dead, and discharged from capacitive charge. The transmitter is connected to two cores of the cable at the substation or source end of the cable. The same two cores must be shorted at the remote end of the cable using the shorting link.



The signal in the headphones will rise and fall with the lay of the cores.



Adjacent cables may pick up a small amount of inducted signal, but the signal will not rise and fall, this will only happen with the target cable to which the transmitter is connected.

Where access to cables is very tight, the roving coil can be plugged into the side of the receiver and used to good effect.

3.0 POWER SUPPLY

Batteries must be fitted to both the transmitter and receiver before use. For either unit remove the cover on each, and carefully insert four new ‘AA’ size cells (not supplied), observing the polarity marked on the casing. Replace cover.

4.0 SPECIFICATION

TECHNICAL DATA

Transmitter I Receiver: 175 x 95 x 45mm
Carrying Case: 395 x 300 x 110mm approx
Weight including carry case and batteries: 2.22kg

Transmitter

Power Source: 4 x AA Standard alkaline Batteries
Battery Test: LED indication for loaded battery
Tone Frequency: 1.6kHz
Tone Style: Modulated or continuous

Power Output
At 1Ω impedance: At 1Ω impedance 0.5W High
At 10Ω impedance: At 10Ω impedance 0.09W High
Typical Cable Lengths: Low power up to 1km (depending upon impedance)
Mid power up to 5 km (depending upon impedance)
High power >10 km (depending upon impedance)

RECEIVER

Power Source: 4 x AA standard alkaline batteries
Pick up Coil: Fixed within body of receiver
Volume Switch: To maximise the pick up signal
Visual Indicator: Simple centre biased meter to detect rise and fall of signal
Headphones: Mono 64Ω with jack plug
Auto-power Down: On removal of headphones

ANCILLARY

Connection Cable: 1.2m with heavy duty crocodile clips

Specification subject to change without notice

VERSION 1.0

RELEASE 22.05.24