

# Using VisNet<sup>®</sup> Hubs to locate LV faults

## Background

The energy sector is currently undergoing era-defining challenges with decarbonisation and decentralisation movements. Electricity is quickly becoming the fuel for not only our household appliances, but also our heat and transport too. Consequently, the low voltage (LV) network that connects us to the grid has more responsibility than ever before. Ensuring a robust LV network has therefore never been more important.

LV networks are ubiquitous in modern life, spanning through most roads and pavements wherever electricity is required. Such an expansive system of assets is inherently susceptible to a range of faults, originating from environmental damages, to aging equipment. Such faults can lead to customers going off supply and network operators incurring regulatory penalties, notwithstanding the cost of finding and fixing the fault to restore supplies.

This case study outlines how VisNet<sup>®</sup> Hubs can be used to locate faults on the LV network, which leads to shorter repair times and ultimately outlines the importance of network monitoring.

EA Technology have developed the VisNet<sup>®</sup> Hub monitoring platform, which provides measurements and insights into LV distribution systems. The VisNet<sup>®</sup> hardware is complemented by a software package, enabling network operators to visualise and manage their LV networks in real-time. Alarms, historical data, and the dynamic status of equipment for the entire LV network can be managed from one web application.

## Our Approach

Network operators have historically dealt with faults by reacting to off supply customer calls. Once they know customers are off supply, depending on the severity of the fault, it can take many hours to find and fix. VisNet<sup>®</sup> Hubs offer a modern solution to this perpetual problem by using network data to pinpoint the location of faulty assets, thereby aiding the engineers to locate the fault more expediently.

Once installed at LV substations, VisNet<sup>®</sup> Hubs collect a range of network data. When a fault occurs on the network, unique events are automatically detected by the VisNets; these events are in the form of fault waveforms.



*An example of predicted and measured fault location.*

With knowledge that a fault has occurred, and a fault waveform has been generated, this can be used to determine where on a cable circuit the fault is located.

The network cable records provide the geometry, length, and type of LV cables, enabling us to map an impedance-to-fault measurement directly on to the records. The result of which estimates how far the fault is down the cable. By comparing this length to the geometry of the cable, we can estimate the location of the fault; this is demonstrated in the figure above.

With the fault located on paper, the last piece of the puzzle is for a network engineer to act. An experienced fault engineer on the ground can use the information to its full potential and locate the fault in a much shorter time period.

## Client Benefits

In this case study we have demonstrated how VisNet<sup>®</sup> Hubs can locate faults on the LV network, leading to faster repair times. However, this process would not be possible without accurate LV cable records and experienced fault engineers in the field.

Moving forward, reducing fault repair times has never been so important as the LV network continues to power our homes, businesses and is now being asked to support a whole range of low carbon technologies being connected, such as electric vehicles, photovoltaics, and heat pumps etc.

VisNet<sup>®</sup> Hub will provide LV network operators the visibility required to get the lights back more quickly in times of fault. If you would like to know more about the VisNet<sup>®</sup> Hub and its many capabilities, please click [here](#).

# Global Footprint

At EA Technology we specialise in asset management solutions for owners and operators of power network assets.



**Founded in 1966 we have over 50 years' experience in the industry and 6 regional offices around the world to support our global customer base.**

We work with a lot of our clients on a long-term basis to help them safeguard their power networks.

We advise our clients on strategy and implementation of a range of technology solutions to manage power assets, delivering maximum life and minimise cost.



Safer, Stronger, Smarter Networks

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