

THE APPLICATION
OF TECHNOLOGY



T-P23
LV Cable
Fault Locator

Kehui International



Kehui International,
Hertford, UK

The word Kehui, literally means the Application of Technology in the Chinese language. This phrase perfectly defines the company's commitment to technological innovation, which it achieves whilst striving for the highest levels of quality.

The company was founded in 1991, utilising the best of Asian and European expertise to develop its range of cable and transmission line fault locators, as well as equipment for the automation of electrical distribution systems and its range of switched reluctance motors.



Kehui factory,
Zibo, China

T-P23 Low Voltage Fault Locator

The T-P23 will find the location of all types of low voltage cable fault, without the need to disconnect the consumers. If a fault is suspected on an LV cable, due to a blown fuse or customer complaints, the device is connected to the cable at the substation or at an intermediate location, such as a link box. It allows a local or remote operator to perform Time-Domain Reflectometry (TDR) testing on any combination of phases. A 3-channel transient recorder is included to record the 3-phase voltages of the faulty cable, so that the exact nature and behaviour of intermittent faults can be identified. The signals acquired by the transient recorder are also used to detect voltage distortion, which triggers the TDR system.

In addition to its use as a TDR, quasi-synchronous Travelling Wave Fault Location can be performed using two T-P23 units. The 3 phase voltage recordings from any two, or more, T-P23 units can also be used for Fault Location using the Voltage Gradient method.

Fault location can be accomplished on site, however by providing total control from remote locations the T-P23 can be connected to a faulty cable by field staff unfamiliar with the analysis of TDR waveforms - the expertise in interpretation being provided by a centrally located specialist. This is particularly beneficial if the equipment has to be left on-site awaiting the recurrence of an intermittent fault.



Benefits of the T-P23

- Locates all LV cable faults including transient and intermittent faults
- Measurement on live cables without disconnecting the consumer
- Local Bluetooth® control from portable PC and Android phone or tablet
- Remote control over the internet using integral GSM/GPRS modem
- Automatic remote notification of trigger and access to records
- Self-powered from the supervised cable, through the test leads

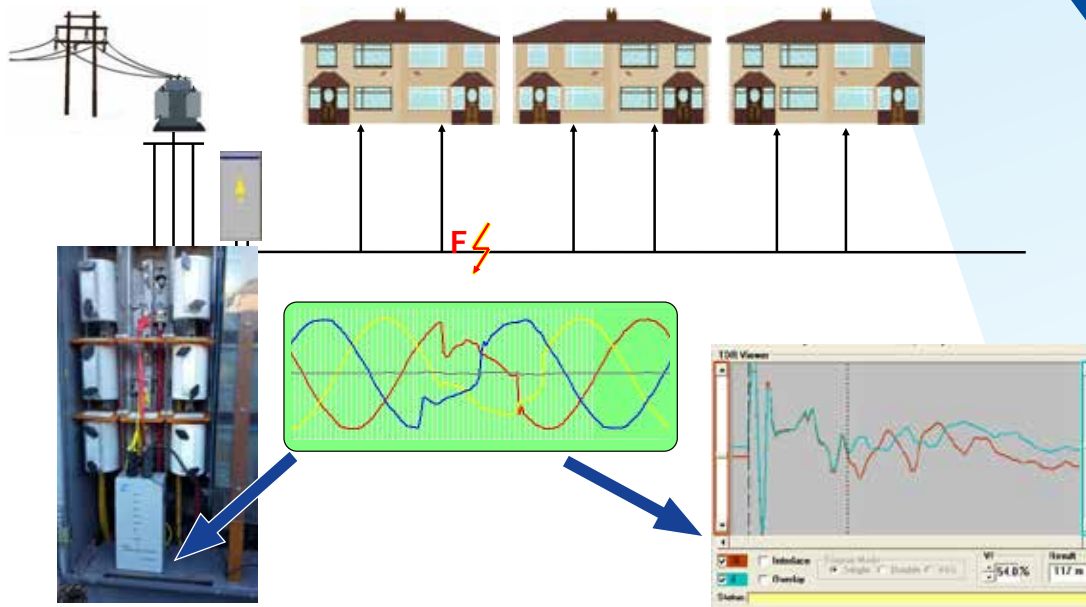


T-P23 Hardware

The T-P23 is connected to the system with fused crocodile clips or 4mm plugs which can be used with adapted fuse mounts and link box covers. The device requires one phase to be live to provide power.

Local communication of data is made using Bluetooth to a local laptop or tablet PC. Remote communication is provided through a built-in SIM card and the external antenna.

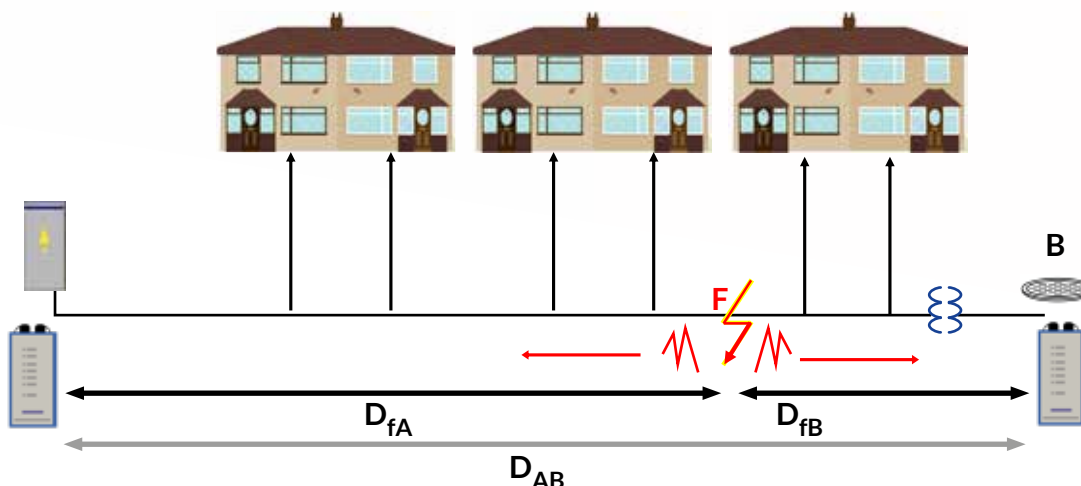
T-P23 Application



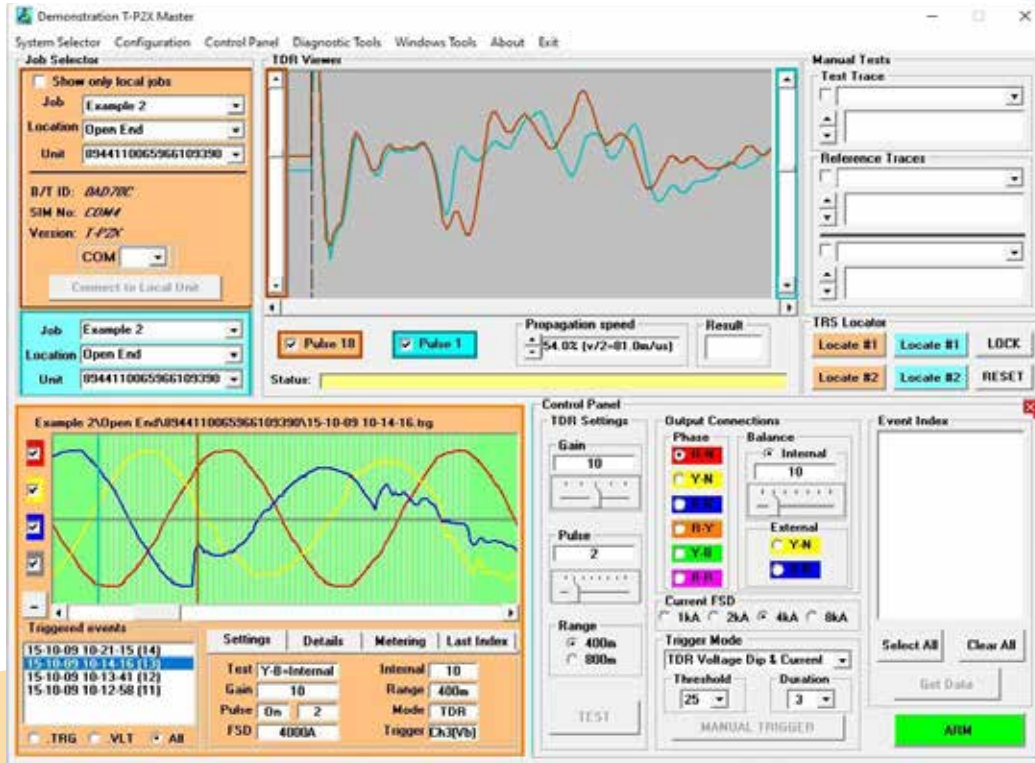
The diagram shows a single ended system with T-P23 mounted in a fuse pillar. When the fault occurs, pre- and post-fault waveforms are saved together with data from the TDR pulses injected in to the system. The TDR trace during the fault and the one during healthy operation can be compared; where they deviate represents the fault position. Moving the cursor to the deviation will calculate the distance based on the velocity of propagation of the TDR pulse in the cable.

The single-ended system requires an open end to prevent the TDR pulse travelling back in to the busbar and causing confusion with multiple reflections from the other cables on the network. This can be achieved by positioning the unit at the end of the cable, removing fuses (as long as the system can be back-fed to maintain supply), or using a blocking coil and recloser unit in series with the cable under test. The blocking coil has inductance that prevents the passage of high-frequency TDR pulses but has no effect on the consumer supply.

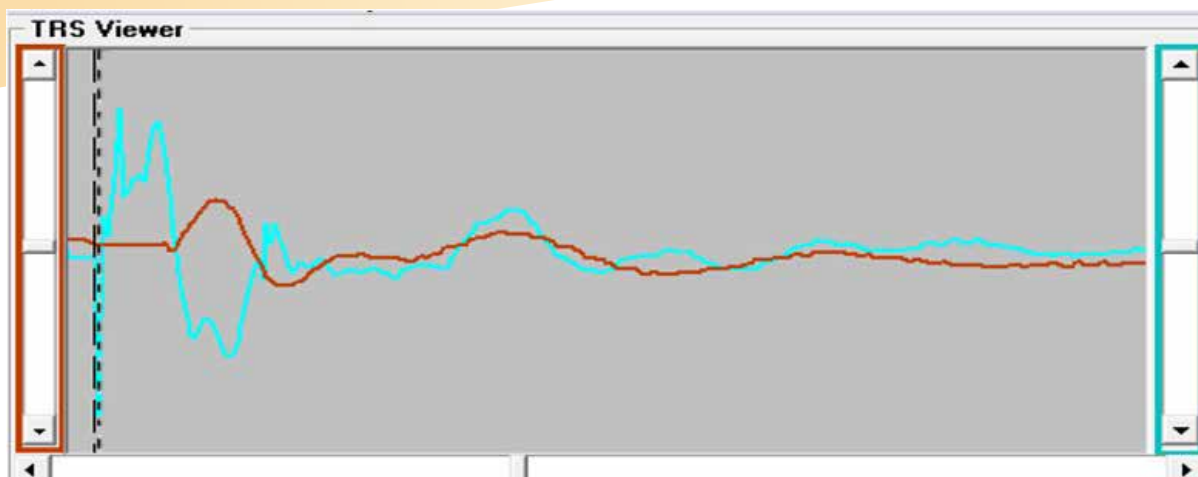
Using two T-P23 units in a quasi-synchronous travelling wave fault location scheme removes the need for the open end, increases the range of the system from 800m to 1.6km and provides two results giving greater accuracy.



T-P2X Master Software



The T-P2X master software enables the 3-phase results from the T-P23 device or devices to be analysed in order for the distance to the fault to be identified. In TDR mode the fault position is indicated by the deviation in the TDR traces from the healthy and faulted parts of the voltage waveform. In the TRS mode, the software allows the waveforms from the devices at either end of the cable to be synchronised and the distance to the fault is determined by measuring to the point at which the pulse is identified (shown in brown below).



Specifications

Event storage

- The last 20 triggered events
- 16 pre-trigger TDR waveforms
- 48 post-trigger TDR waveforms

Dimensions: 240mm x 120mm x 60mm

Weight: 1kg

Environmental Protection:

- ABS Housing IP65
- Connectors IP65



Standard Accessories

- Three-phase fused test lead with crocodile clip and 4mm plug connector options
- Maintenance cable with mains plug
- GSM/GPRS antenna
- T-P2X MASTER Remote control and fault location software (see below)

Optional Accessories

iHost® licence for remote communication (iHost® is a trademark of Nortech Management Ltd.)

SIM Card (This may have to be provided by the customer for network compatibility)



Controller unit for downloading data on site (alternative to laptop PC)



T-MU1 Marker unit with fused leads and crocodile clips for calibrating the velocity of propagation by applying a disturbance at a known point on the network and comparing reading on the T-P23 with the actual distance.



T-SU1 Signal booster for extending the range of the system in TRS mode



Selection of link box covers with 4mm sockets for ease of connection



Set of 4 G-clamps with 4mm sockets for alternative busbar connection



Selection of fuse mounts provided with 4mm sockets



Kehui International Ltd.

2 Centrus, Mead Lane
Hertford SG13 7GX
United Kingdom

Tel: +44 (0) 1920 358990 | Email: info@kehui.com | www.kehui.com