



Advanced Test Equipment Rentals
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UltraTEV Monitor™

complete asset monitoring and alarm system

For 24/7 monitoring of Partial Discharge (PD) activity in all substation assets – including cables

www.eatechnology.com

PRODUCT CODE: UTM

Delivering Innovation in **Power Engineering**

benefits

Comprehensive PD monitoring enables:

- Early identification of asset deterioration
- Measurement and analysis of PD activity to identify faults BEFORE they lead to failures
- Valuable information provided on the actual condition of assets
- More effective asset management, reliability, efficiency and safety, at lower cost

features

The most comprehensive PD monitor ever developed for:

- Detection
- Measurement
- Monitoring
- Recording
- Analysis

fact: 85% of disruptive substation failures are PD related

fact: The UltraTEV Monitor™ is the most powerful PD monitoring solution available AND a complete substation management system

The UltraTEV Monitor™ is a step change in the management of substations, based on its ability to measure and analyse the actual condition of all their assets simultaneously

third generation technology

The UltraTEV Monitor™ is the product of EA Technology's unique experience as a pioneer of measuring and interpreting Partial Discharge (PD) activity, gained over more than 35 years.

first generation TEV instruments

EA Technology's PD Monitor™ was one of the first transportable PD instruments to record activity by measuring Transient Earth Voltage effects using multiple probes: and the first to provide precedence measurement over all of its channels.



second generation Ultrasonic + TEV instruments

Combining ultrasonic and TEV measurement in single instruments like the UltraTEV Plus+™ has transformed the ability to detect and measure PD activity.



third generation multiple sensor systems

The UltraTEV Monitor™ is the first of the new generation of asset management SYSTEMS, combining the functions of multiple PD instruments in a single package.



UltraTEV Monitor™

the total asset management system

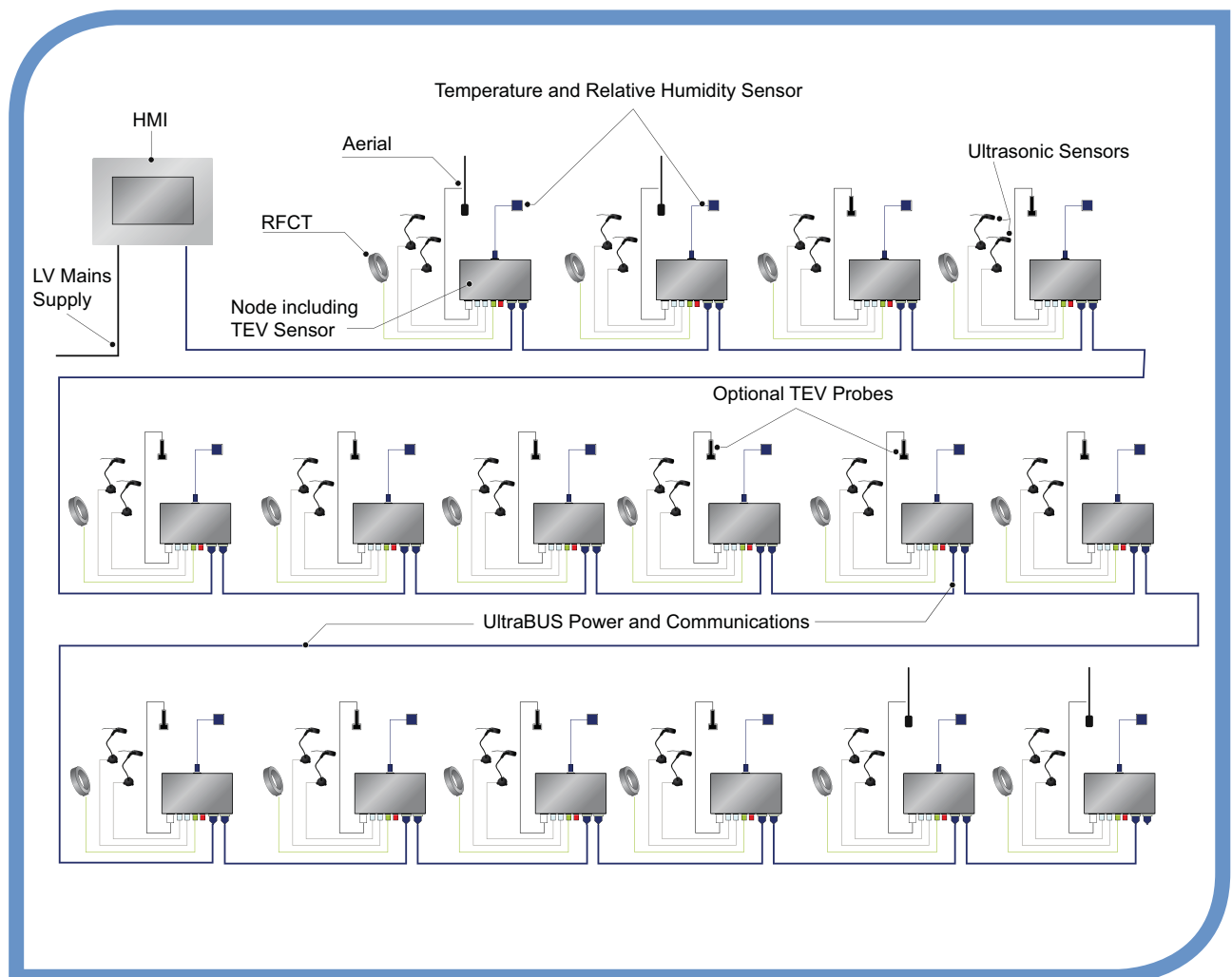
The UltraTEV Monitor™ is a fully integrated, modular asset management system. It comprises multiple sensor nodes linked to a central processor which has communications capability over multiple networks.



multiple assets

The web-enabled UltraTEV Monitor™ can support and process condition data from up to 250 measuring points simultaneously, maintaining accurate precedence between them.

The scalable nature of the system makes it equally suitable for large or small substations, continuously monitoring all types of MV and HV assets including cables.



A typical UltraTEV Monitor™ installation, with 16 measurement nodes.

The ability to factor in environmental conditions greatly enhances the accuracy of the UltraTEV Monitor™

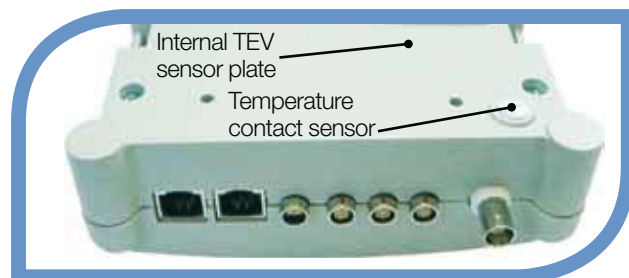
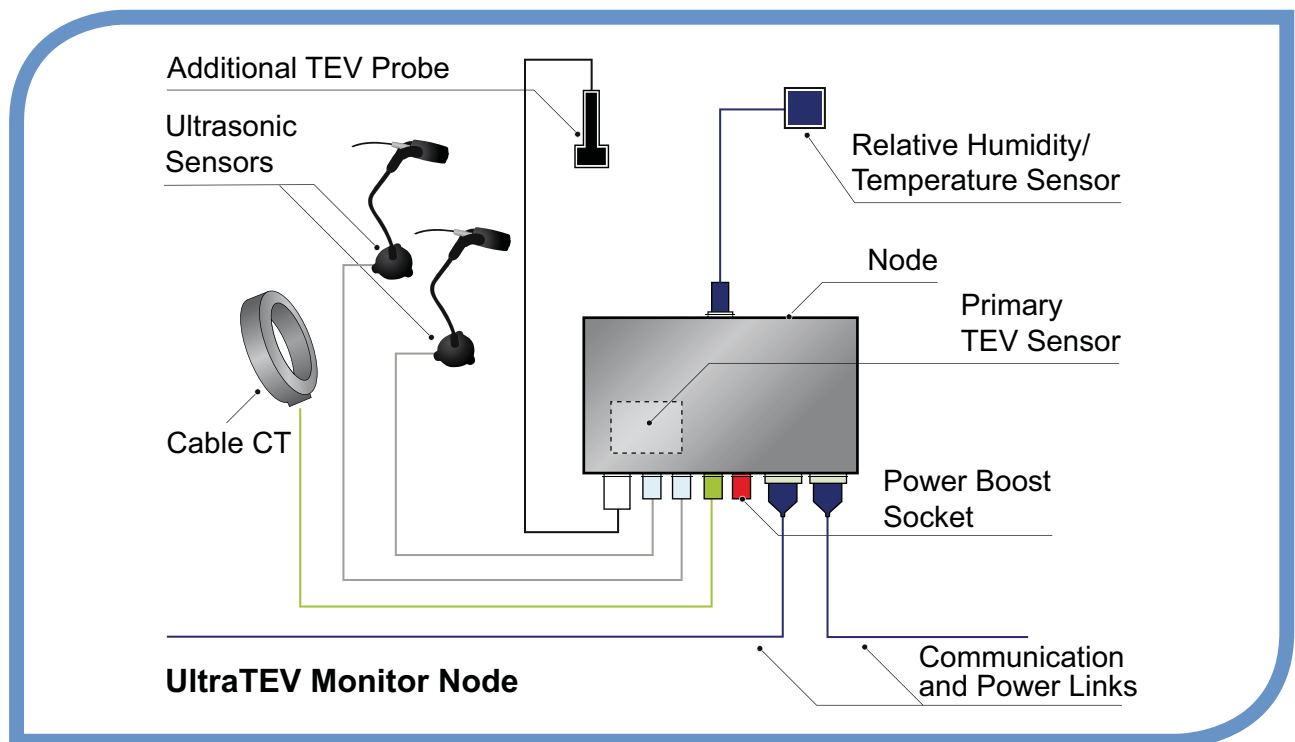
multiple sensors

Each UltraTEV Monitor™ measurement node is capable of measuring PD activity and the environmental factors which affect it in FIVE ways:

- TEV** Built-in TEV sensor, plus additional plug-in TEV probe
- Ultrasonic** Via plug-in external sensors
- Temperature** Built in contact sensor, plus plug-in external sensor
- Humidity** Via plug-in external sensors
- RFCT** Cables are monitored via plug-in Radio Frequency Current Transformer (RFCT)



Options include (from top left): ultrasonic microphone, contact ultrasonic sensor and plug-in TEV probe



Underside of UltraTEV Monitor Node



Additional temperature/humidity sensor

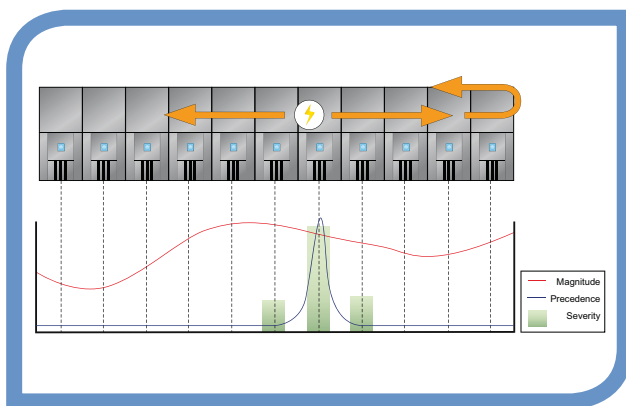


PD activity in cables is monitored using Radio Frequency Current Transformer (RFCT)

The system's wide range of capabilities make it exceptionally good value: it is effectively several complete instruments in a single substation management package

PD monitoring

The UltraTEV Monitor™ employs precedence detection from several measurement points, to measure the magnitude, location and severity of PD activity.



PD Detection

Continuously checks for the presence of PD activity on the surface of insulation internal to components and in cables

PD Location

Uses time-of-flight measurement to a resolution of 0.33ns (nanosecond) to locate the source of PD activity to within 10cm. Earlier systems were only accurate to within 60 cm

PD Measurement

Measures the magnitude and severity of PD activity at up to 250 measurement points simultaneously.

PD Monitoring

Monitors changes in PD activity over time, including environmental factors (noise, temperature and humidity) to eliminate false readings

PD Recording

Records PD activity in all assets being monitored over time

PD Analysis

Analyses and reports on PD activity over time

PD Alarms

Automatically transmits alerts by email or optional SMS when PD activity reaches a critical level on any component being monitored. Also tracks trends in PD activity and warns when rates of change exceed specified parameters

Single cable networking makes installation and expansion easy and flexible

UltraBUS™ networking

The UltraTEV Monitor™ is the first system to deploy EA Technology's new UltraBUS™ networking solution.

The UltraBUS™ carries data and power over a single cable, which makes the whole system easy and neat to install. It also enables measurement nodes and sensors to be added or moved whenever needed.



web-based interface

The UltraTEV Monitor™ software is built around Microsoft Windows® and all communications are web-based. This makes the system 100% compatible with standard PCs and laptops using industry standard web browsers.

In PD Alarm mode, the system automatically transmits alerts of critical activity by email and/or optional SMS to nominated users.

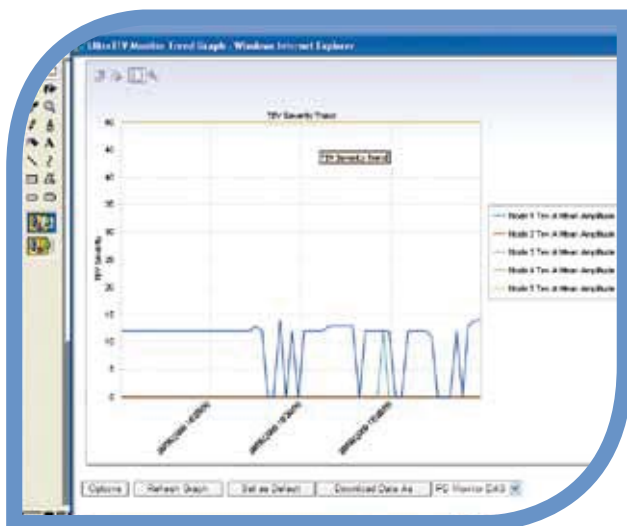


automatic analysis

The system's hub features a powerful processor running purpose-built suite of analytical software.

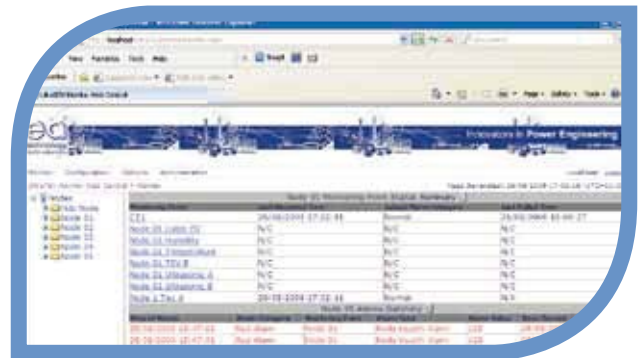
Every channel of every measurement node is monitored individually and continuously, so data on the condition of each asset being monitored is accurate and complete.

The hub automatically records and analyses PD data and converts it into web-based management information which is easy to read.



accessible information

Authorised users can interact with the system and view reports anywhere, any time, over the internet or company IT / telecommunications networks.

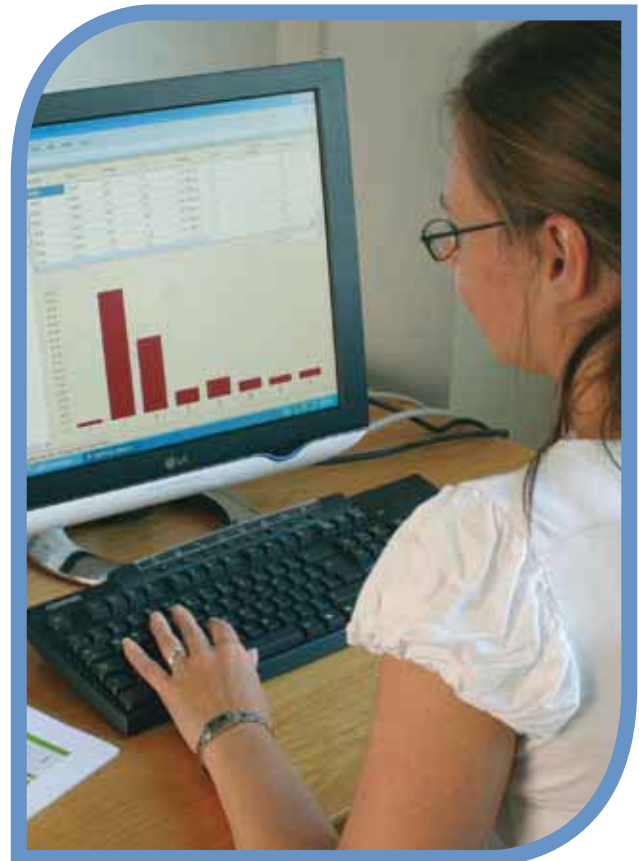


All reports are viewable as interactive web pages in any browser.

expert interpretation

Users have the option of interpreting their own data on PD activity using the analysis and reporting features built into the software.

Alternatively, they can use EA Technology's own PD specialists to monitor the system online, anywhere in the world, and receive expert management reports and recommendation.



specification

UltraTEV Monitor Node

TEV	
Measurement Range	0 – 60 dBmV
Pass Band	3 to 80 MHz
Maximum Sensitivity	1mV
Pulse Polarity	Positive or negative
Resolution	1 dB
Accuracy	±1 dB
Precedence Resolution	1ns
Number of Channels	Up to 50 measuring points per string (maximum of 5 strings)
ULTRASONIC	
Measurement Range	-7 dBµV to 68dBµV
Resolution	1 dB
Accuracy	±1 dB
Transducer Sensitivity	-65 dB (0dB = 1volt/µbar rms SPL)
Transducer Centre Frequency	40 kHz
Transducer Diameter	16mm
Number of Channels	2
INDICATORS	
Power LED	Bi-colour Red/Green LED
Status LED	Bi-colour Red/Green LED
TEV State	Bi-colour Red/Green LED
Ultrasonic State	Bi-colour Red/Green LED
Cable PD State	Bi-colour Red/Green LED
CONNECTORS	
Power and Comms Signals	2 off RJ45
External TEV Sensor	1 off BNC socket
Ultrasonic Sensor	2 off 5-pin Lemo socket
Cable PD Sensor	1 off 3-pin Lemo socket
Relative Humidity Sensor	1 off micro USB
Aux Power Connector	1 off 2-pin Lemo socket
ENVIRONMENTAL	
Operating Temperature	0 – 50 degrees C
Humidity	0 – 90% RH non-condensing
IP Rating	53
DIMENSIONS	
Size	155 x 135 x 55mm
Weight	0.45kg
POWER SUPPLIES	
Low Voltage DC	48V, 80 mA
EMC	
Safety Class	SELV
EMC Immunity	Industrial Levels
EMC Emissions	Industrial Levels

specification

UltraTEV Monitor Hub

description

The Hub is available as either a wall-mounted unit or within a portable enclosure. Rack-mounted or other custom styles can be provided at extra cost.

- Provides power and communications to the Nodes
- Communicates via the Web, SMS, and email (chargeable option, subject to customer IT infrastructure)
- Receives, collates, and analyses data from the Nodes
- Can support up to 50 TEV measuring points per 'string'
- Can support up to 5 'strings'
- Produces customisable data display screens
- Indicates location and severity of all PD activity
- Performs trend analysis on selectable data inputs
- Multiple configurable alarms
- Multiple I/O ports for additional monitoring applications

models

Portable enclosure	Rack-mounted
Wall-mounted Cabinet	Custom-style

CONNECTORS	
Nodes	RJ45 Connector
Ethernet	RJ45 Connector, 10/100/1000mb
USB	2 off USB Type-A Sockets
Power Inlet	3-pin IEC Connector
ENVIRONMENTAL	
Operating Temperature	0 – 50 degrees C
Humidity	0 – 90% RH non-condensing
IP Rating	30
DIMENSIONS	
Size	155 x 135 x 55mm
Weight	0.45kg
POWER SUPPLY	
Voltage	100-240V AC 47-63Hz
Power	200 Watts
Fusing arrangements	Node Supply internally fused Mains Supply fused 2A Antisurge (T) fuse for 230V 3A Antisurge (T) fuse for 115V
NODE POWER SUPPLY	
	48V, maximum 3A
EMC	
Safety Class	I
EMC Immunity	Industrial Levels
EMC Emissions	Industrial Levels

The UltraTEV Monitor™ is more than a fault detection and alarm system. It's a complete management system that gathers detailed information on the condition of assets

valuable condition data

The UltraTEV Monitor™ is much more than a fault detection and alarm system. It is the most powerful tool ever developed for collecting and recording information on the condition of large numbers of assets.

The system provides operators with the information they need to implement full condition-based asset management techniques.

The ability to gather data on the condition of assets is a key part of the process of upgrading to Condition Based Risk Management™ (CBRM). This is EA Technology's market-leading methodology, based on applying a Health Index to each asset and factoring in both the probability and consequences of their failure: an approach which is proven to improve asset reliability, availability and safety, whilst reducing the overall costs of asset maintenance and replacement.

driven by customer need

The addition of the UltraTEV Monitor™ to our portfolio is the direct result of listening carefully to what customers require from a new asset management system.

global support

The UltraTEV Monitor™ can be supplied and supported anywhere in the world, through our network of international sales offices and distribution partners. We provide excellent lifetime support for this system including:

- Installation and commissioning
- Training
- Lifetime technical support
- Online data analysis and reports



To find out more, why not see the Podcasts at: www.eapodcasts.com

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Improving Network Performance



Facilitating Low Carbon Energy



Delivering New Technology



Developing Your Team



Communicating the Message