PDtect®4-surveyor

Vehicle-mounted radiometric PD detection and location system suitable for air-insulated substations. Bespoke ultra-high-speed recording unit is powered from vehicle 12 Vdc system. Analysis software run on a client supplied laptop presents graphical data to the user and records results.

PDtect® technology

The Elimpus PDtect® series of radiometric PD locators detect the presence of partial discharge (PD) through the reception of radio frequency impulses emitted from stressed insulation. Due to the ultra-high bandwidth (0.01 – 0.75 GHz) and ultra-high speed sampling rate (1.5 G samples per second), the locator is able to determine the direction of arrival of a PD impulse by tracing its propagation across a four antenna array. Thus, by computer analysis of the recorded signals, the source of the PD can be located and its severity assessed.

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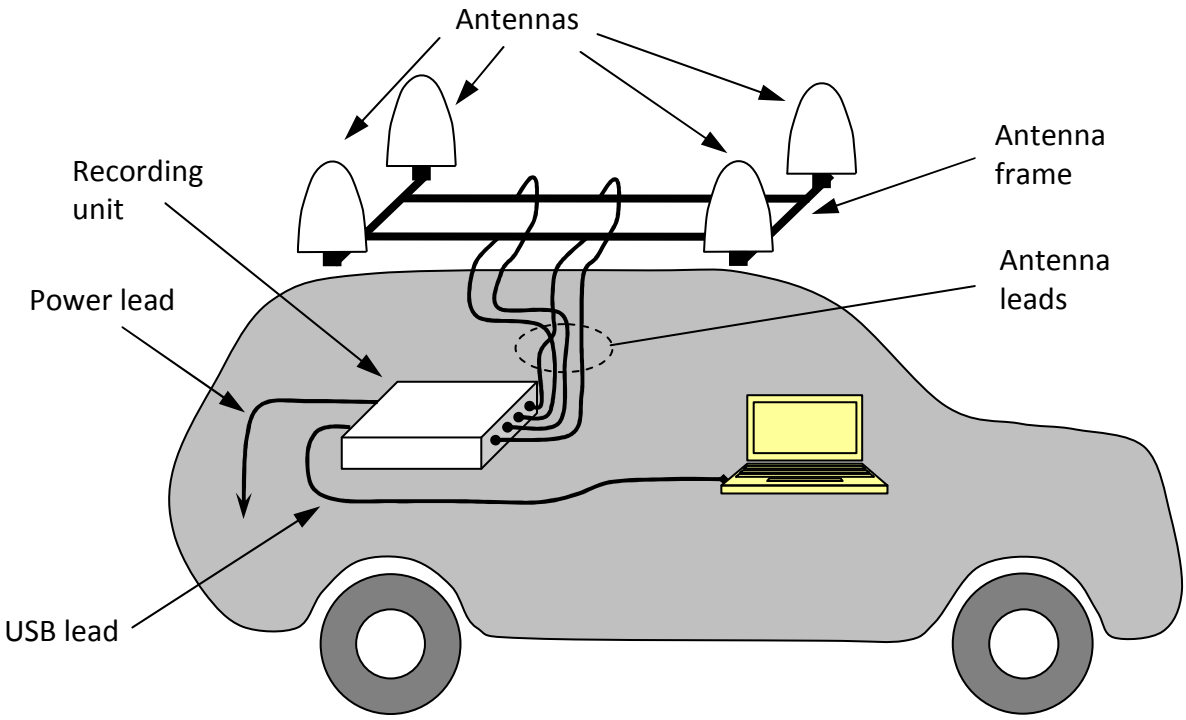
Registered in Scotland No. SC 314847

PDtect®4-surveyor – an introduction



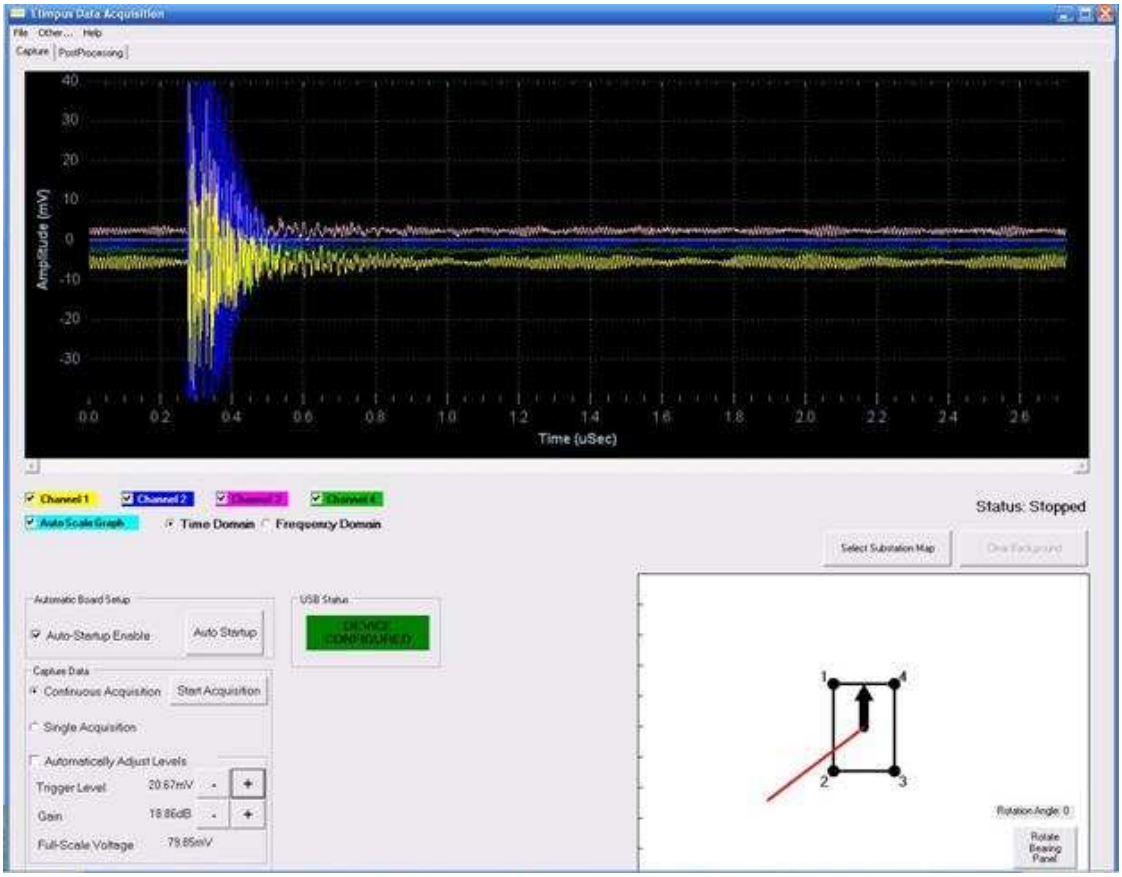
PDtect®4-surveyor overview

The PDtect®4-surveyor brings the benefits of Elimpus' PDtect®4 technology to a mobile platform which can be rapidly deployed and easily manoeuvred within the substation environment. PDtect®4-surveyor can be fitted onto any vehicle that has roof bars or rails to mount the 4 antenna frame; the recording unit and laptop computer are located within the vehicle interior. Once fitted PDtect®4-surveyor allows PD detection/location close to high-voltage equipment from any position that is accessible by the vehicle. In common with all PDtect®4 series products, PDtect®4-surveyor requires no electrical or physical contact in the substation, thus making the measurement process simple and safe. The component parts of PDtect®4-surveyor are supplied in a rugged flight case which can withstand the rough conditions associated with site work. Assembly of PDtect®4-surveyor onto the target vehicle can be achieved in, typically, 20 minutes.

PDtect®4-surveyor – main features

The salient features of PDtect®4-surveyor are:

- Modular array frame of dimensions 1.125 x 1.42 m.
- Easily assembled for site use.
- All component parts are lightweight for easy handling.
- The ultra-high-speed recording unit can be powered from a standard vehicle 12 Vdc outlet.
- Signal processing performed on a standard laptop computer (not supplied) via USB connection.
- The PDtect®4-surveyor software displays the PD signal waveform and bearing.
- PD data recorded to laptop hard-disk for later analysis.
- PDtect®4-surveyor packs into a 0.8 x 0.52 x 0.31 m flight case.



Screenshot of PDtect®4-surveyor software

PDtect®4-surveyor – component parts

Component parts of PDtect®4-surveyor:

1. Antennas (4 off)
2. Frame (1 off; consists of 6 pieces)
3. Frame/roof bar connectors (4 off)
4. Recording unit (1 off)
5. Antenna connection leads (4 off)
6. Power lead, 12 Vdc (1 off)
7. Power supply, 110-230 Vac/12 Vdc (1 off)
8. USB connection lead (1 off)
9. Flight case (1 off)

Not included:

- Vehicle
- Roof bars
- Laptop computer

Layers of flight case

PDtect®4-surveyor – photographs

Four antenna array and frame fitted to the roof of the vehicle. The frame is clamped onto roof bars which are, in turn, are clamped onto the vehicle's roof rails. Note that PDtect®4-surveyor does not include the roof bars. The total weight of the frame and the antennas is 8 kg.

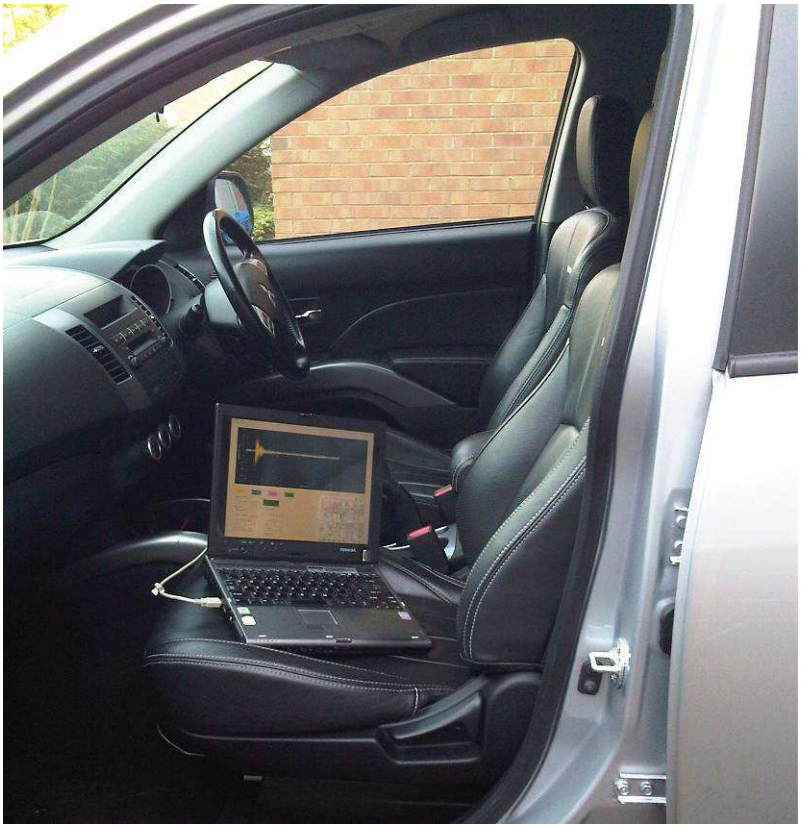
Fitting between the array frame and the roof bars. U-bolts hold the roof bar to the frame via brackets. The brackets can be adjusted to roof bar spacings between 0.6 and 1.1 m.

In this vehicle it was convenient to locate the recording unit in the cargo area to the rear. Connections to the recording unit are:

- Antenna leads – there are 4 of these; they are coloured blue.
- USB lead – this is the light grey cable.
- Power lead – this is the black lead.

The black power lead fits into a standard vehicle 12 Vdc power outlet.

In this vehicle, it was convenient to route the antenna leads through the rear windows – 2 leads on each side of the vehicle.



Laptop running the PDtect®4-surveyor software. The laptop is connected to the recording box via the light grey USB cable.

PDtect®4-surveyor – specifications

Array	Array dimensions	1.125 x 1.42 m
	Antenna type	Monopole
	Array weight (frame + 4 antennas)	8 kg
Recording box	Weight	2.5 kg
	Supply voltage	12 Vdc
	Current drawn	2.5 A nom, 4A max
	Number of channels	4
	Sampling rate per channel	1.5 GSps
Roof bar attachments	Minimum roof bar spacing	0.6 m
	Maximum roof bar spacing	1.1 m
	Nominal roof bar width	32 mm
	Nominal roof bar height	22 mm
	Maximum roof bar width	70 mm
	Maximum roof bar height	40 mm
Leads	Antenna lead length	4 m
	USB lead length	5 m
	Power lead length	4 m
Flight case	Weight empty	11 kg
	Weight fully packed	23 kg
	Dimensions (w x d x h)	0.8 x 0.52 x 0.31 m
Certification	Tested to IEC61010-1:2001, CE marked	
Environmental	Operating temperature range	0°C to +40°C
	Storage temperature range	-10°C to +50°C