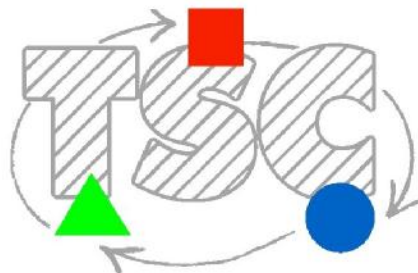
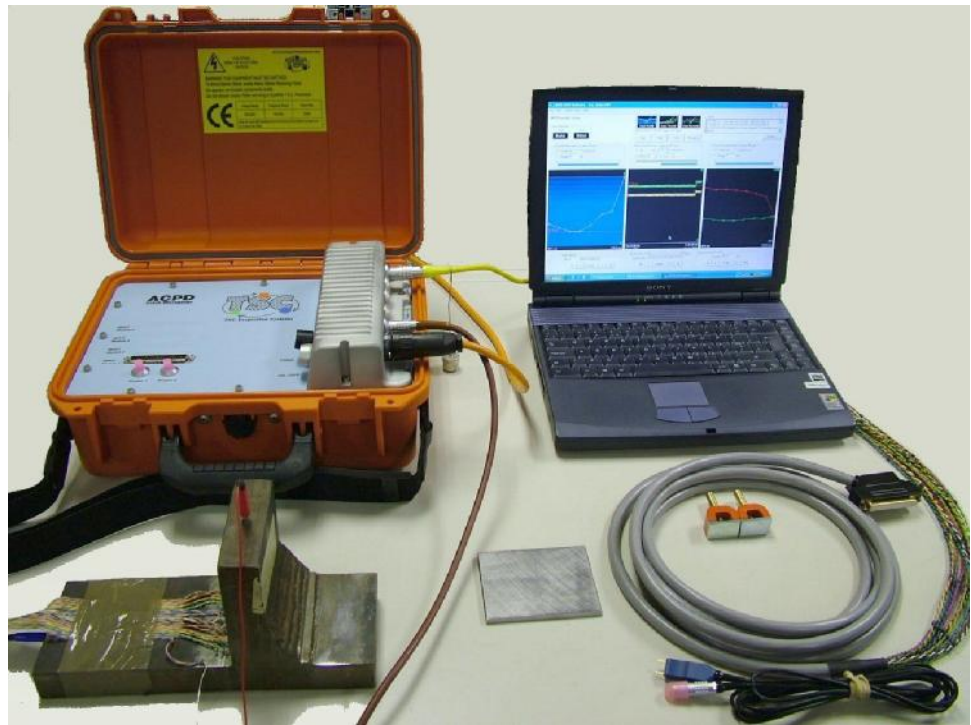
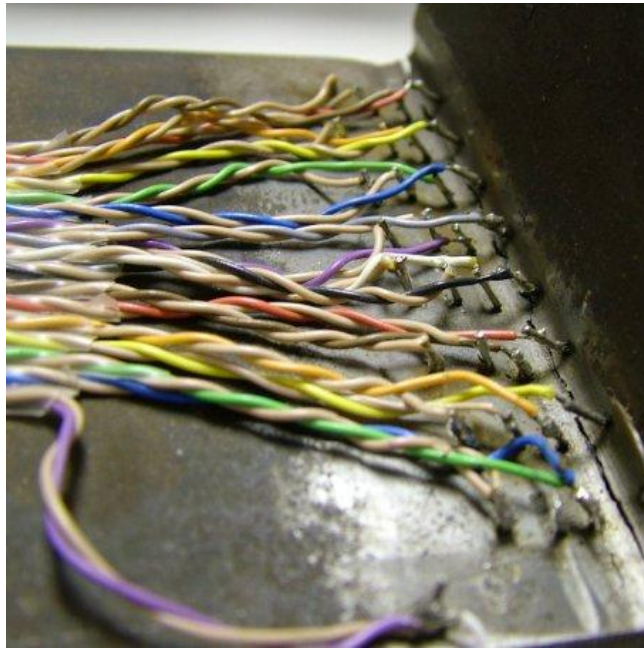


ACPD CRACK MICROGAUGE Mk IV

PRODUCT INFORMATION





The MkIV instrument represents a significant advance in a.c. potential drop (ACPD) inspection and monitoring technology and is suitable for single channel or multi-channel operation.

TSC staff have worked with ACPD for over 30 years, and the new instrument builds on previous ACPD instruments such as the U7, U8, U9 and U10, but in a smaller, lighter, more rugged package. In particular the use of solid state electronics provides significant benefits over earlier models.

The probes and instrument have been developed to minimise spurious signals from induction effects leading to more reliable and repeatable measurements.

The hardware developments make use of state of the art low noise analogue electronics and the control system has been developed using the very latest Windows software techniques.

The system provides:

- On site crack depth profile measurement using a hand-held probe.
- Long-term crack growth monitoring using multiple fixed or movable array probes.
- Rugged unit, IP54 rated.
- Windows software for ease of operation and compatibility with other Windows applications.
- Full data storage for back-up, off-line view and audit purposes.

SYSTEM SPECIFICATION

Unit Weight:	10kg
Unit Size:	360 x 290 x 165 mm
Serial Communications Cable up to:	30 metres
Operating Temperature:	-20° + 40°C
Environment Protection:	IP54 rated
Array Support:	up to 64 voltage input channels (i.e. 32 depth measurements) in groups of 16, and up to 4 current outputs
Power Supply	110-120VAC or 220-240VAC mains (user to specify)
Resolution	12-bit low-noise A/D converter (so 40 digit change in 2000 gives resolution of 0.1mm in crack depth).
Accuracy	Typically +/- 5% in crack depth.

PROBES

Manually deployed probes with twin sprung pointed contacts.

- Standard probe spacing = 10mm; other spacings also available (down to 2.5mm, which allows measurement on cracks as short as 5mm surface length). Standard cable length = 3m; other lengths available on request.

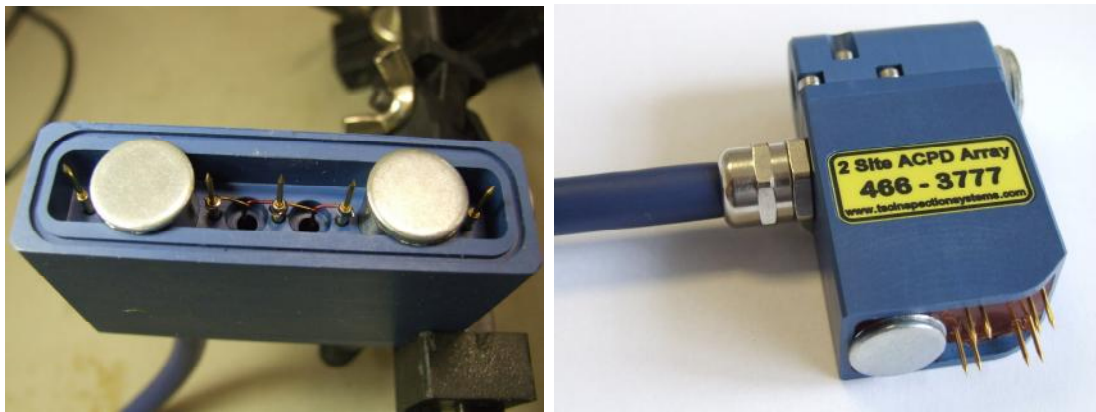


Multi-way cables, containing screened twisted pairs.

- Standard cable = 34 way, 3m length, (i.e. 17 pairs for 16 voltage measurements and one earth connection – suitable for making 8 crack depth measurements). Supplied with plug for connection to one input module at one end, bare wires for soldering to spot-welded pins at the other end. Other lengths available on request.

Magnetically-attached probes for monitoring are also available.

- Type 441 Self-contained probe containing three sprung pins 10mm apart for voltage measurements, and two more further apart for current input, the probes are designed to monitor a single crack depth on a flat surface without the need for spot-welding. The probe contains two magnets for fixing to a steel sample and is sealed for use outdoors.
- Type 466 Small footprint mini-array designed to be placed side by side to cover a complete weld with 10mm spacing between readings. Contains two pairs of twin sets of sprung pins 10mm apart. The probe contains two magnets for fixing to a steel sample, with one magnet moveable to allow deployment on flat butt welds or T-butt welds. Requires separate current input.



Type 441 probe (prior to potting wiring) Type 466 probe (magnet in T-butt position)

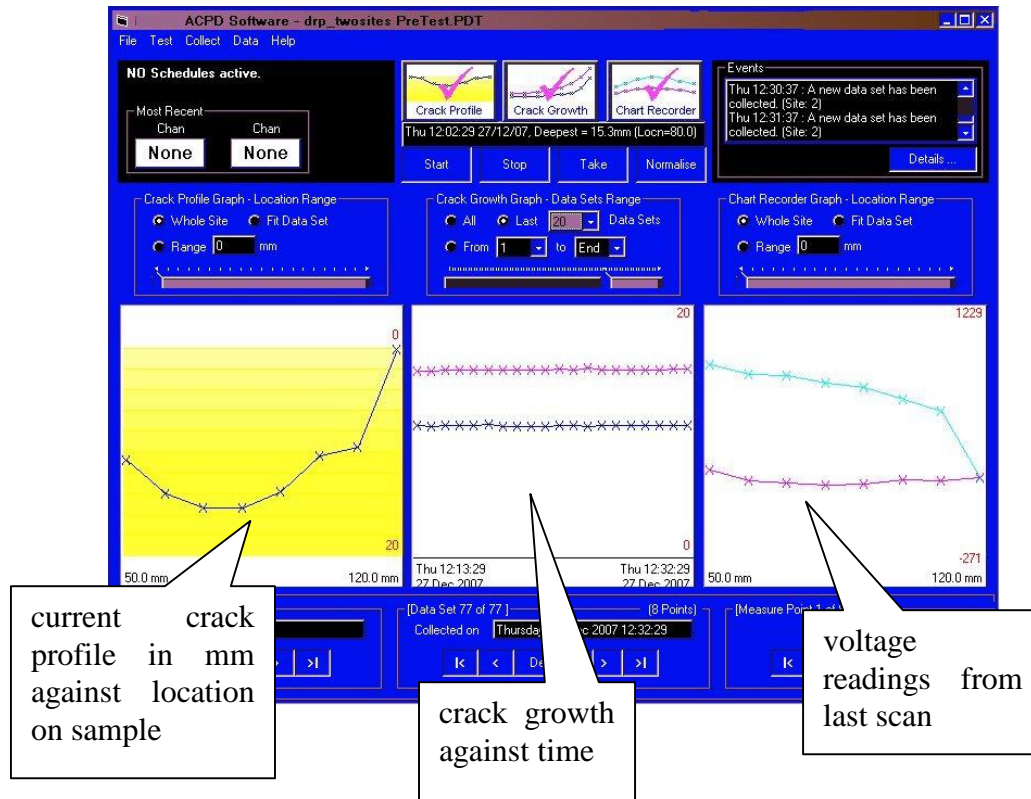
SOFTWARE

The Mk IV operates with TSC's LIMOS software which contains the following features

- Operates in Windows 2000 or later environment.
- Independent scheduling of data collection for multiple crack sites
- Graphics display of data for crack depth profile, crack growth rate and probe voltages (depth range 0.1 to 99.9mm).
- Full control of data sets in view, including zooming in to areas of interest.
- Automated storage of data onto hard disk.
- Full system status reports for checking hardware.
- Alarms available to trigger on crack depth or voltages.
- Data export to Windows Excel spreadsheets.

- Allows off-line review and analysis of data as originally collected.
- Operating procedure available in on-line Windows help file.

(not actual colours - screenshot below is a negative image for clarity)



AVAILABILITY

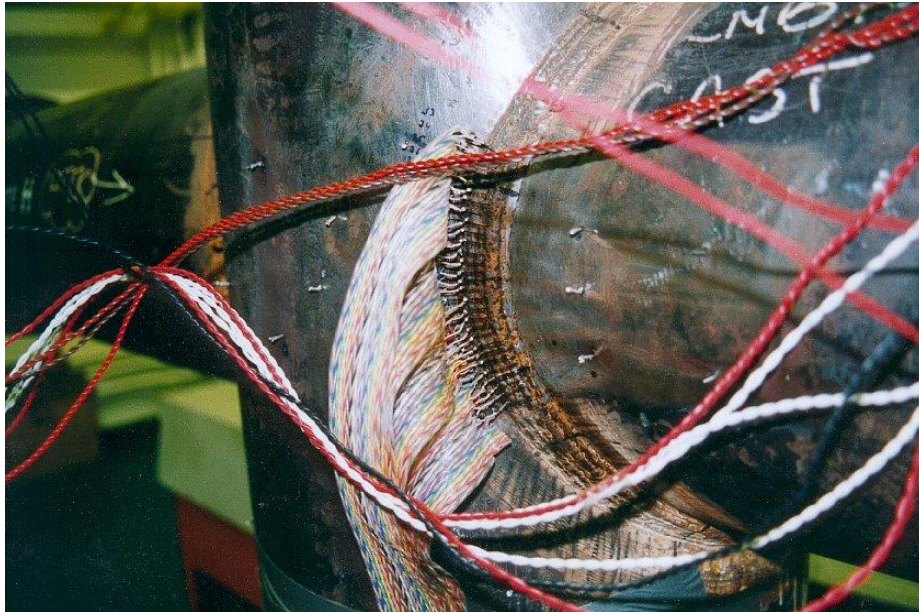
The Mk IV Portable ACPD Crack Microgauge is available from TSC worldwide through our network of agents and distributors. Details of these can be found on our website

BACKGROUND TO ACPD

Alternating Current Potential Drop (ACPD) is an electromagnetic crack sizing technique and relies on the fact that an alternating current flowing in a thin skin on the surface of a component will be disturbed by the presence of a crack. A current is injected (or sometimes induced) into the component in such a way as to flow perpendicularly across the crack. A series of voltage measurements are then taken both across and adjacent to the crack, using either a single moveable probe (for on-site inspection) or a series of fixed probes (for monitoring). The ratio between the voltages measured across the crack and adjacent to it can be related to the extra path length taken by the current around the crack faces, from which the crack depth can be calculated.

Using an alternating, rather than direct, current, means that the currents are concentrated in a thin layer at the specimen surface. One advantage of this is that much lower currents are required so there is no complication arising from the specimen heating up. Another advantage is that the 2D nature of the

electric fields allows theoretical modelling of the current flows, even over complex structures, which results in improved depth sizing accuracy.



BACKGROUND TO COMPANY

Established in 1984, TSC are leaders in the application of ac field measurement techniques to industrial applications. Advances in ACPD technology were made by TSC staff, working at University College London in the early 1980's. The crack sizing accuracy was also improved by theoretical studies at the same time. TSC staff also include mechanical and civil engineers specialising in structural inspection and structural integrity assessment. TSC are therefore in a unique position to understand their customers' needs and provide the complete solution.

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Please Note: As part of its continuing programme of product improvement, TSC reserve the right to alter specifications without prior notice.

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