FO*system*

FOS4

## Fibre optic transmitter/receiver FOT4/FOR4

The ICM*acoustic* system comprises of FOT4 transmitter units and FOR4D receiver units. Each channel acts as an independent transient recorder with its own storage and settable acquisition speed and storage depth. The sampling rate is 20 Msample/sec. and, hence, sufficient to acquire the pointing vector of the incoming acoustic wave, when using a two dimensional three-sensor configuration.

The modular system accepts up to twelve optical channels and comes with a high-speed USB controller interface to communicate with, e.g,, a notebook. The FOS4 system has an additional signal output on the rear side and can be used as a digital isolated amplifier without the use of any software. In combination with the ICM*acoustic* software, the FOS4 system is a powerful tool to locate partial discharge in distributed power transformers.


ICM*acoustic* software
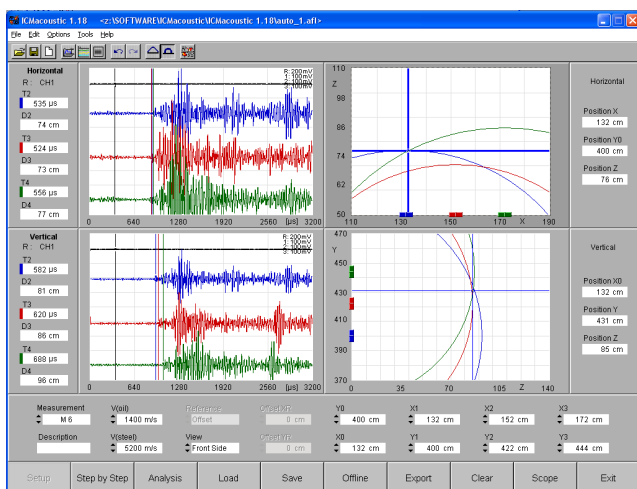
Measurement panel for horizontal (top) and vertical triangulation (bottom)

The ICM*acoustic* software offers full remote control of the FOS4 system and offers additional features like averaging, trigger logic, single sequence, etc. It is designed for the acoustic location of partial discharge within transformers with the triangulation method. The basic idea is to reduce the PD location to a 2D-"flat problem". I.e., first, to horizontally position three sensors on a line to get the horizontal position of the layer (see upper graph of the software's measurement panel, left). In this window the position of the sensors are entered and assigned to their channel. In a second step the sensors are placed on a vertical line at the found horizontal position. In the lower graphs the sensor positions are entered accordingly.

If this measurement indicates a deviation of the vertical position used for the first measurement, the results are automatically corrected by "tilting" the layer. Alternatively, the horizontal step can be redone at the now found vertical position.

Finally, the defect's x/y/z coordinates give the found location along with a 3D graph (see right-hand graph). To simplify reporting, traces, sensor positions, and location result is compiled to a readily formatted graph available for copy/paste into report documents. All measurements, settings, and positions are stored in a file and can be reloaded for later revision or reporting.
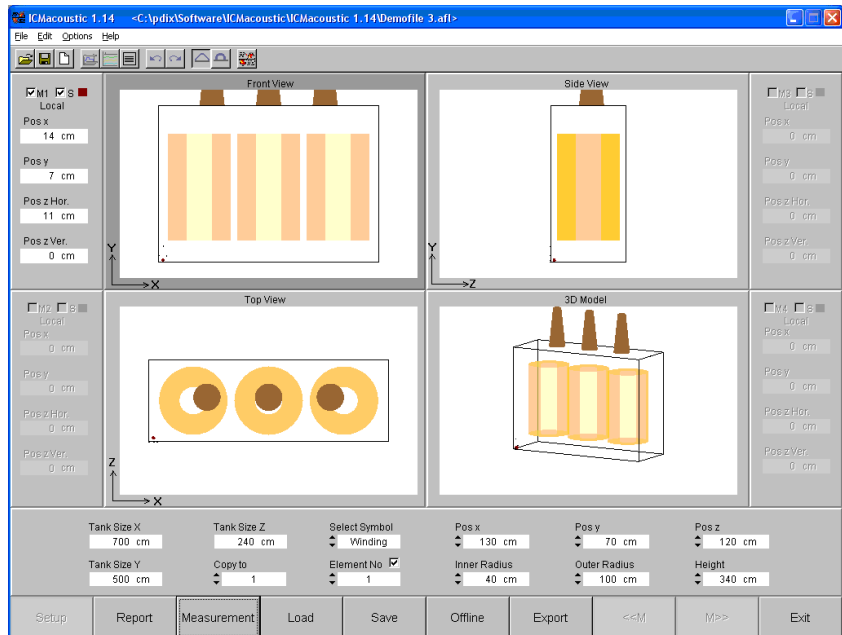
Analysis panel for visualisation of the found location(s)

FOT4A   **Digital optical transmitter and acquisition unit**

Bandwidth:	200 Hz–2 MHz
Conversion:	20 MSamples
Input:	BNC 50 Ω/1 MΩ // 40 pF
Ranges:	20 mV–2 V (20mV-40mV-0.1V-0.2V-0.4V-1V-2V)
Supply:	NiMH battery for up to seven hours of continuous operation; recharge cycle: three hours
	Built-in supply for acoustic sensors (28 V DC)

FOR4D   **Receiver unit**

Internal FIFO storage
Configurable trigger logic

Mains supply:	85–264 V AC, 47–440 Hz	(automatic)
Line fuse:	1.6 A	(time-lag)
Power requirements:	Approx. 20 VA	
Connections:	USB 2.0, 15 V charge outlets, signal output on rear side	

Operation temperature:	10–40°C	(non-condensing)
Size (W x H x D):	236 x 133 x 300 mm^3	
Weight:	Approx. 4.5 kg	

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Product information and design is subject to changes without no-