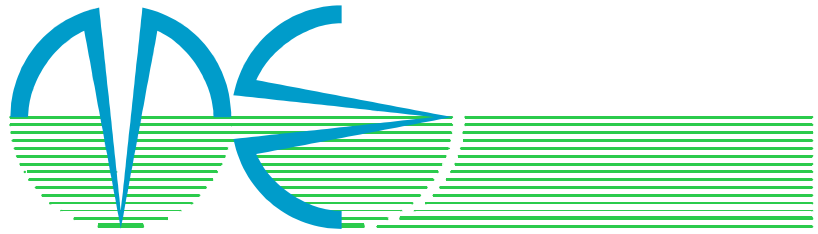


# Miniature Pipe Profiling Sonar

## Model 2512USB



The Model 2512 Pipe Profiling Sonar provides an acoustic method for profiling the interiors of liquid filled pipes or boreholes. This method does not require draining of the pipes as with camera surveys and provides accurate quantified data which can not be obtained from a camera display alone.

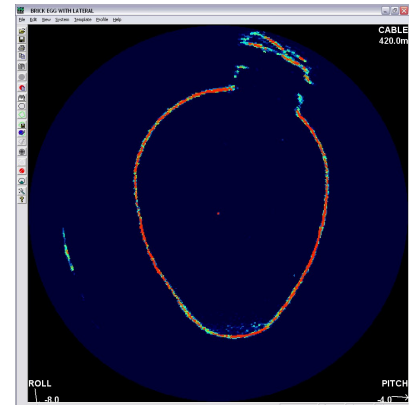
The equipment comprises of an underwater Scanning Unit (which may be skid, float, tractor or ROV mounted) and a compact USB interface Unit. To complete the system a "Windows" P.C. with a USB port is required to run the 2512 system software.

The Scanning Unit is a rugged stainless steel cylinder with a pressure balanced Peek transducer housing at one end, and the umbilical cable connector at the other. The standard Scanning Unit is rated at 100m operational depth. Two lead-acid batteries could be used to power the Scanning Unit together with a notebook P.C. for a completely portable solution. Internal Pitch and Roll sensors display, in analogue and digital form, the orientation of the sonar in the pipe.

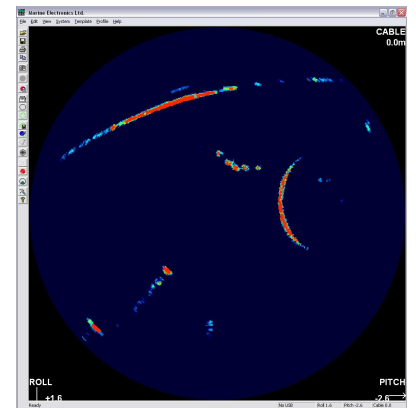
The USB Interface Unit connects to either a USB1.1 or USB2.0 port on a host P.C. running under the "Windows" operating system. (Win'98 upwards is supported). The USB Interface has inputs for a cable payout encoder so that the distance travelled may be displayed to 0.1m resolution allowing accurate determination of where flaws exist in the pipe relative to the deployment position. The USB Interface is self-powered from the P.C.

### FEATURES INCLUDE

- Real Time continuous scanning over a full 360° in 1 second
- Windows user-friendly software with USB hardware minimises training time
- Direct capture to Hard Disk for high resolution image save and restore
- Dual tracking cursor for accurate on-screen measurements
- 360° Internal Pitch and Roll sensors
- Quadrature and compatible cable counter interfaces built in
- 500m cable drive as standard, fibre-optic system optional
- Automatic profile detection and output in ASCII format for import into third party 3D modelling software



Data View



High resolution image capture



AC-DC Power Supply with USB Interface Unit



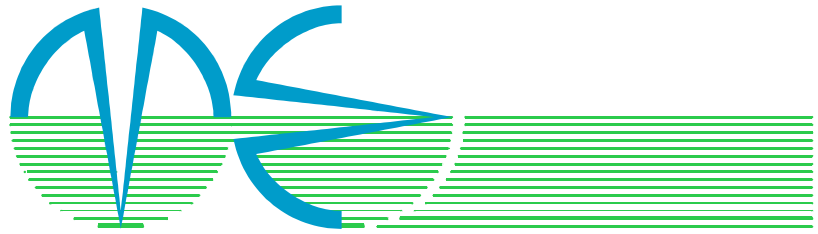
Stand-alone USB Interface Unit



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# Miniature Pipe Profiling Sonar

## Model 2512USB



The resolution and update speed of the Model 2512 Pipe Profiling Sonar is second to none in the field of mechanically scanned sonar's. The 2MHz acoustic signal is amplified and logarithmically compressed prior to being digitised by a Flash A/D converter.

The angular resolution of the system is 0.9° which gives 400 sectors per revolution. For each sector the data is over sampled and peak detected to arrive at 250 range cells.

The digitally generated graphics display uses 256 colours to represent the signal amplitude. At a minimum full-scale range of 125mm this gives a range resolution of 0.5mm and at 2m range the resolution is 8mm.

The acoustic beamwidth of 1.8° ensures that the finest detail from the pipe surface is recorded. Pitch and Roll sensors inside the scanner record the attitude of the sonar to a resolution of 0.1°.

The sonar has been engineered for extended operations in hostile environments. The transducer and drive motor are totally enclosed in an oil-filled pressure balanced housing which is hermetically sealed from the stainless steel electronics pod.

The system has many applications other than inside pipes where short range high precision measurements are required with a rapid screen update.

### Marine Electronics Model 2512 Pipe Profiling System

#### Software Features

<i>Display Modes:</i>	Polar - full 360° coverage Sector - 30° to 270° arc width at 30° to 330° centre angles in 30° steps
<i>Range Settings (mm):</i>	125, 187, 250, 375, 500, 750, 1000, 1500, 2000
<i>Range Settings (in):</i>	5, 7.5, 10, 15, 20, 30, 40, 60, 80
<i>Range Resolution:</i>	1/250 of full scale range eg. 0.5mm at 125mm
<i>Minimum Range:</i>	50mm
<i>Angular Resolution:</i>	0.9 degrees
<i>Tx Pulse Length:</i>	Variable 4usec to 20usec
<i>Display Resolution:</i>	400 sectors of 250 range cells
<i>Colour Control:</i>	8bit multiple palettes with min, max and step control to optimise dynamic range
<i>ASCII Output:</i>	NMEA style profile string via RS232
<i>Autostart:</i>	May be used autonomously without keyboard, mouse or display for remote data capture when it is not possible to use a cable
<i>Viewer Program:</i>	A separate viewer program is available to allow clients to post process and print stored images
<i>Operating System:</i>	Windows '98, ME, 2000, NT, XP

#### Options Include:

- AC to DC power Supply with USB Interface Unit
- Cable drum with slip rings (various lengths)
- Fibre-optic drive modules for extended cable length
- Float Assembly

#### Underwater unit

<i>Acoustic Frequency:</i>	2MHz
<i>Beam Width:</i>	1.8 degrees conical
<i>Receiver:</i>	Logarithmic
<i>Bandwidth:</i>	500kHz
<i>Pitch/Roll Sensors:</i>	Micromachined accelerometers resolution 0.1 degrees
<i>Power Requirements:</i>	+14VDC at 1A maximum
<i>Overall Length:</i>	178mm
<i>Diameter:</i>	50mm
<i>Finish:</i>	Stainless Steel 316 with Peek transducer housing
<i>Operating Depth:</i>	100m
<i>Operating Temp:</i>	0 to + 40 degrees C
<i>Storage Temp:</i>	-20 to +70 degrees C
<i>Weight in Water:</i>	0.4 kg
<i>Weight in Air:</i>	0.75 kg

#### USB Interface

<i>Protocols:</i>	USB 1.1 and USB 2.0
<i>Cable Payout Input:</i>	+5V Quadrature or Pearpoint
<i>Power Requirements:</i>	+5VDC at 200mA typical (self-powered from USB port)
<i>Dimensions:</i>	Width: 110mm Depth: 165mm Height: 35mm



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