

# [ A1220 MONOLITH ]

## EyeCon

RF PATENT NO.2082163 DE 10 2006 029 435 A1 US 7,587,943 B2

### LOW-FREQUENCY FLAW DETECTOR FOR CONCRETE

Low-frequency ultrasonic flaw detector A1220 MONOLITH is suitable for solving of thickness measuring and flaw detection tasks of constructions from concrete, rocks, asphalt, etc.

Uniqueness of the device is that it can test objects using echo-method at one-side access, which makes it possible to inspect the functional structures, such as buildings, bridges, tunnels, etc.

One of the main advantages of the device is that the testing is performed without using any contact liquid, because of the dry-point-contact (DPC) transducers used in antenna array. The surface of testing doesn't need to be prepared preliminarily which makes the inspection process simple and fast.



## AREAS OF APPLICATION

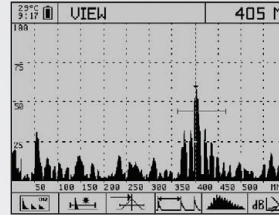
- Thickness measuring of constructions from concrete.
- Searching for foreign inclusions, cracks and pores inside of constructions from concrete, stone, plastics and alike materials at one-side access to the object of testing
- Analysis of the internal structure of large-grained materials

## DESCRIPTION

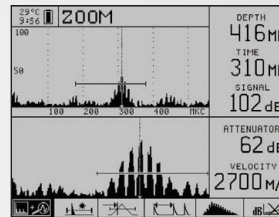


A1220 MONOLITH consists of electronic unit with a screen and a keyboard and a 24 element matrix antenna array, working on the principle of double-crystal transducer. The antenna array elements are spring-loaded, which allows to test uneven surfaces.

## OPERATION MODES

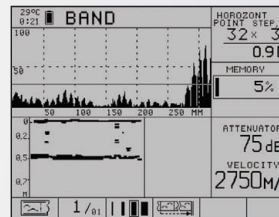


following parameters is displayed on the screen: latency, distance, signal amplitude or gain.



### ZOOM mode

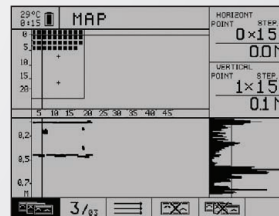
The feature of this mode is the increased quantity of displayed numeric parameters and measurement results on the device screen, and two display windows, showing the signals: general and zoomed signal.



### BAND mode

This mode is intended for displaying the results as a cross-section of an object, perpendicular to the surface, while scanning an antenna array along one line with fixed scan step.

The cross-section on the screen is shown as a binary image, black colour marks areas where signal level is higher than the threshold and the other areas stay white. BAND building is convenient when testing an extensive object along one line. The option of getting results in colour mode and in half-tone mode is available while data processing on an external PC using special software.



### MAP mode

MAP mode is intended for forming a number of cross-sections images of the test object perpendicular to the surface while scanning with an antenna array along marked lines with a fixed step, in other words a number of parallel bands of limited length. An image of the internal structure can be received when scan step is fixed vertically and horizontally.

## FEATURES

The device can display the results in various forms:

### In A-scan form:

It is a traditional form of signal display. Display of a signal in form of an A-scan is convenient for measuring thickness of the object, flaw searching and analysis in selected areas of the object.

The fully digital tract of the device provides signals display both in detected form and as a radio signal, which is particularly important for data analysis. This gives additional opportunities to interpret the signals, such as differentiate useful signals from noise, various reflectors, and so on.

### In B-scan form:

The display of test results as a cross-section of test object which is perpendicular to the entry surface and parallel to scanning direction.

B-scan allows getting a more complete image of the internal structure of an object.

In spite of its multifunctionality A1220 MONOLITH is simple to setup and use, because of its intuitive interface and the icon menu, which provide fast access to the main settings and functions of the device. The ergonomical design of the flaw detector and its small weight (just 650 grams with a built-in battery) and a set of «hands-free» straps make the device a convenient instrument for working in hard-to-reach places. All of the test results are saved into nonvolatile memory of the device and can be transferred to external PC for further handling, analysis and backup.

### DELIVERY KIT

- A1220 MONOLITH – ultrasonic flaw detector with rechargeable battery
- Antenna array M2502 0.05A0R100X60PS
- LEMO-LEMO cable, double, 1.2 m
- Charging device
- Power adapter with a cable
- USB connection cable
- Case
- Travel bag

### The delivery kit can additionally contain the following:



Dry-point-contact (DPC) transducers for through and surface sounding of the object.

- S1802 0.05A0D2PS (shear waves; operating frequency 50 kHz)
- S1803 0.1A0D2PL (shear waves; operating frequency 100 kHz)



Liquid contact transducers for through sounding:

- S0205 0.025A0D25CL – (longitudinal waves; operating frequency 25 kHz)
- S0206 0.05A0D25CL – (longitudinal waves; operating frequency 50 kHz)
- S0208 0.1A0D25CL – (longitudinal waves; operating frequency 100 kHz)

## SPECIFICATION

Maximum deepness of the echo-signals visualization (at transversal wave testing)	2150 mm
Maximum length of the signal realizations, visible on the device's screen	1600 $\mu$ s
Maximum measured thickness of concrete (in concrete grade M400)	600 mm
Minimal diameter of flaw in form of an air cylinder	12 mm
The error of measurements of flaw location thickness and depths	10 %
Time of one measurement processing and writing the result in memory	10 sec.
The number of single A-scans, that can be written into memory	200
Maximal length of a single B-scan (BAND mode)	10 m
Maximal area of inspecting surface (MAP mode)	10 m <sup>2</sup>
Material velocity range	1000 – 9999 m/s
Amplitude of the zonding signal	20, 100, 200 V
The form of the zonding signal	Meander, 0,5-5,0 periods
The frequency of zonding signals	1 – 50 Hz
Receiving bandwidth	10 – 300 kHz
Gain setup range	from 0 to 106 with step of 1 dB
The quantity of the programmable points of DAC function	32
DAC function setup range	30 dB
Installable sweep length	150, 300, 450, 800, 1100, 1600 $\mu$ s
Threshold of sweep delay setting	0 – 120 $\mu$ s
Threshold of flaw detection signalizator	0 – 100 % of vertical screen scale
Discreteness of time range change	0,1 $\mu$ s
Power source	Built-in battery
Time of device operation from the battery without indicator lighting	14 h
Battery charging time	3 h
Operating temperature range	from –20 to +45 °C
Display type	LC with lighting (320 x 240)
Electronic unit size	250 x 120 x 40 mm
Electronic unit weight	750 g
Size of M2502 antenna array	140 x 88 x 74 mm
Weight of M2502 antenna array	750 g