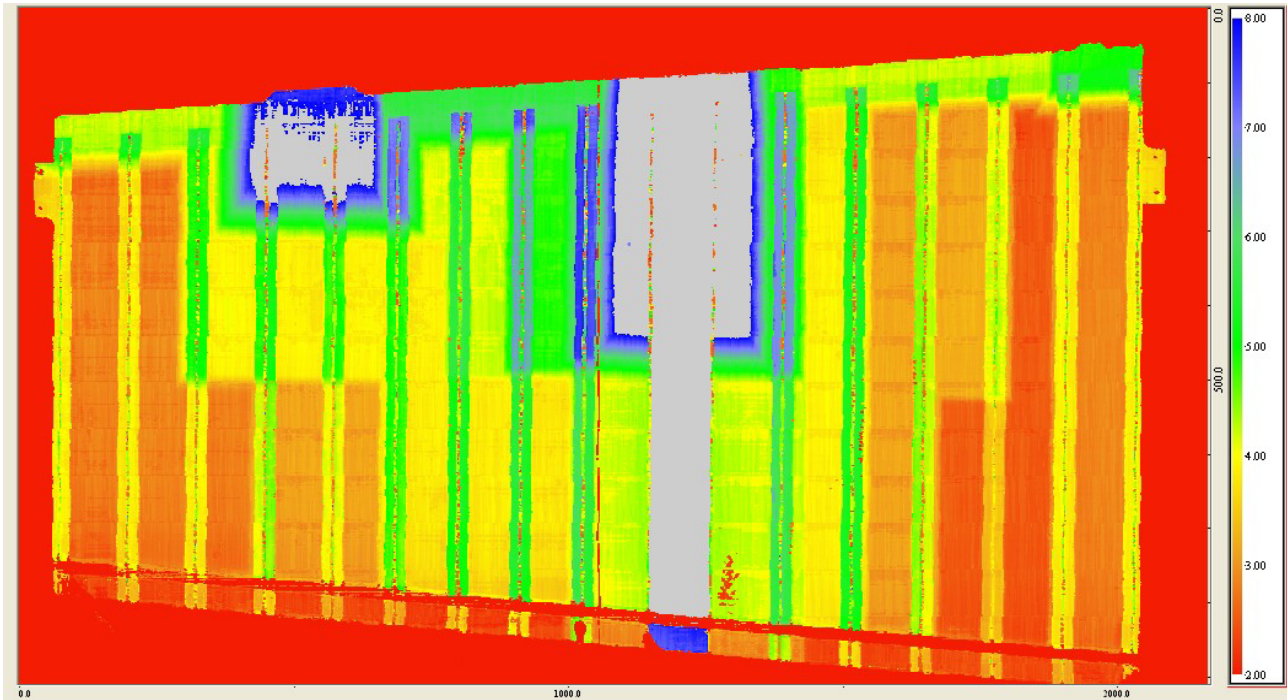


PHASYS phased array system

A completely new phased array for systems use from USL

Drives up to 128 element arrays with active elements in modules of 32

Designed specifically for use in automated high speed scanning systems

USL's conventional ultrasonic systems are in widespread use throughout the world, in applications which demand high sensitivity, exceptional signal to noise ratio and immunity to external noise. They are used in production applications working round the clock, where high reliability is taken for granted.

We have now extended our capability with a new phased array electronics system—PHASYS. This means that we can provide the best solution with optimum performance for your application, from a choice of single channel, multiplexed multi channel and now phased array electronics. Furthermore we can incorporate all these choices in a single inspection system if required, so you can benefit from the particular advantages of each method.

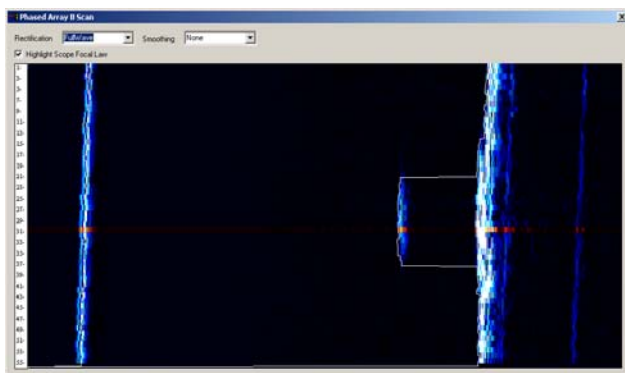
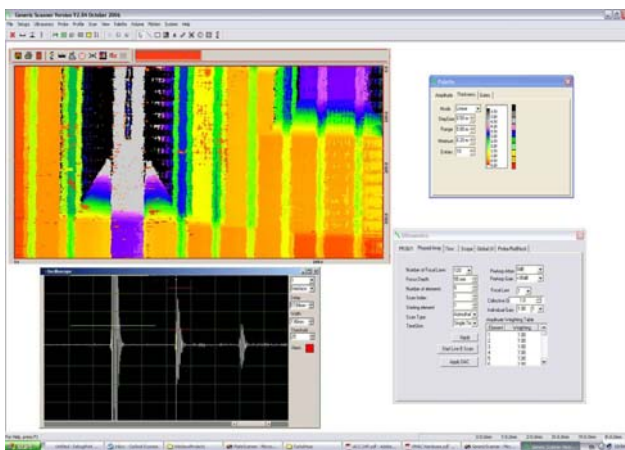
The new PHASYS system is optimised for systems applications, such as high speed inspection of composite panels and metal plates. High material throughput is accomplished by the use of a wide array probe for electronic scanning in the “Y” direction, coupled with mechanical scanning in the “X” direction and a large Y index.

In its simplest configuration it is used with array probes of 32 elements, with 1 to 32 active. By adding extra 32 channel modules, arrays with up to 128 elements are used. If necessary all 128 elements can be active.

The inspection speed is further enhanced by the ability to fire more than one group of elements in an array simultaneously, where the physics of the application allows it. Inspection of thin materials using relatively short water paths is one such example.

C scan inspection coverage of at least 1m² minute can be achieved using a 1mm index in both X and Y directions. Whilst this may not be as high as that available from systems using multiplexed paintbrush probes, it gives better spatial resolution and defect sizing, with improved C scan imaging.

Software is integrated into standard USL suites, giving active B and C scan displays as shown below.



Specification

Format 19" rack mount (3U)
Power input 110/240V single phase

Features

Number of full aperture channels 1 to 128
 No of active elements 1 to 128
 Beam steering Arbitrary
 Dynamic focussing Yes
 Linear scanning Yes, with active aperture of 1 to 32 elements

Pulser

Pulse type Negative square wave
 Pulse width 12 nsec to 250nsec
 Pulse amplitude 250V variable
 Rise/fall time 5 nsecs typical
 Output impedance 10 ohms max
 PRF 20kHz
 Correction Individual element sensitivity correction

Receiver

Type Linear and log
 Input impedance 50/200 ohms
 Gain range 100dB total
 DAC range 60dB max (at min gain)
 Bandwidth 30MHz
 Filters – Band pass 0.2 – 2 MHz
 1 – 4 MHz
 2 – 8 MHz
 4 – 15 MHz
 8 – 32MHz in Narrow and Wide band ranges. Centre frequency programmable in 60 steps.
 Low pass 15, 10, 5, 3.5 MHz
 Input noise 2.7nV/√Hz
 Crosstalk -50dB at 17MHz

Digitiser

Sampling rate 100MHz minimum
 A/D resolution 8 bits

Software

The control software is built into standard USL suites for scanning systems, with the operator setting up functions such as number of transmit and receive elements, focussing depth range and indexing increments. The displays during scanning include A scan, active B scan for the electronic scan and continuous C scan imaging during mechanical scanning of the array, using multiple amplitude and time gates.

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