'da Vinci' Series
Ultrasonic Flaw Detectors

☑ **Ideal for Flaw Detection**

☑ **Ideal for Weld Examination**

☑ **Ideal for Corrosion Survey**

Dear NDT Users,

Greetings to all!

As many of you are already aware, Modsonic has over a period of last 25 years dedicatedly pursued design and manufacturer of portable Ultrasonic Testing Equipment. Starting with the analogue type MSL Series of Ultrasonic Flaw Detectors to microprocessor based Gallileo Series; Modsonic eventually moved to digital technology in their Einstein Series Ultrasonic Flaw Detectors. Einstein flaw detector is not only the highest selling in India but has earned for itself a name in many parts around the world. More than 3500 units of Einstein flaw detectors are in use in India and world over, leading us to a position of unquestioned leadership. In India Einstein flaw detectors have become synonymous with Ultrasonic Testing.

Obviously not resting on its laurels, Modsonic design team put in relentless efforts for two years and brought out two new modes viz ' da Vinci alpha ' and ' da Vinci delta ' under the new ' da Vinci ' Series Ultrasonic Flaw Detectors . These two new variants possess remarkable features providing NDT users an attractive option as compared to other products from international manufacturers. The design philosophy of 'da Vinci 'flaw detectors was guided by our single-track motto of 'Simplifying NDT '. In the following data sheets you would get a glimpse into the many outstanding features 'da Vinci 'flaw detectors offer. In case of any queries, please feel free to contact us. We would be more than willing to come and showcase a demo and provide you with the quotes at your convenience.

As this world gets increasingly complex, our endeavour at 'Simplifying NDT 'is the greatest source of delight for team Modsonic.

Thank you for your patronage.

Deepak Parikh
(Managing Director)

'da Vinci' Series

Ultrasonic Flaw Detectors

GAIN SCROLL KNOB
Separate Scroll knob to adjust Gain of the equipment for the analog control feeling.

dB STEP KEY
0.1 dB smallest step for fine setting to 12 dB largest for coarse adjustment.

KEY LOCK FUNCTION
After settings up the machine pressing the lock key deactivates scroll knob and the keys. This avoids any accidental alternation of the calibration.

FREEZ/PEAK FREEZ MODE
Any A-Scan pattern can be temporarily saved on the display by pressing the Freeze Key. It helps evaluation and enables saving the data permanently in the memory.

I/O CONNECTORS
Splash proof Charger socket USB client and USB HOST VGA o/p connector and i/o connector for encoder connection.

CONNECTORS
Factory optional LEMO(size1) or BNC connectors.

LED INDICATORS
Two separate indicators for Monitor Gate a and Gate b. REJ indicator lights up when "Reject" is activated.

PARAMETER SCROLL KNOB
Scroll knob to adjust selected parameter of the equipment for the analog control feeling.

PARAMETERS KEY
Selected parameters value can be adjusted by pressing key or by parameter scroll knob

GAIN KEY
Separate key for the Gain adjustment. Gain can be adjusted using key or Scroll knob.

HOT KEY MODE
When hot key is pressed simultaneously it enables coarse/rapid adjustment of any parameter.

MENU KEYS
For direct selection of any of the three menus and sub-menus.

da Vinci delta
ULTRASONIC FLAW DETECTOR
ALARM   REJECT

SCAN MD
FREERUN

CURSOR
327

TOFD
ANALYZE

GAIN 1
81.0 dB

0.00   T=19.6   SPa0.00   95.00
DUAL
DISPLY CONFIG ACAL   MISC   TOFD

Battery Compartment with quick release fastners

Neck Strap for hands free use

Carrying handle

On the stand

Test Range Starts from 2.5mm (in steel) Better resolution / accuracy on lower thicknesses.

Measurement resolution is 0.01mm. Ideal for thickness survey / corrosion monitoring.

Thickness management software with 2D, 3D grid array with custom point selection and with suitable data transfer software. Thickness gauging allowing arrangement of the evaluation results into a database file organized as either 1D (Sequential), 2D (X, Y), 3D (X, Y, Z), or 4D (X, Y, Z, No of points) array.
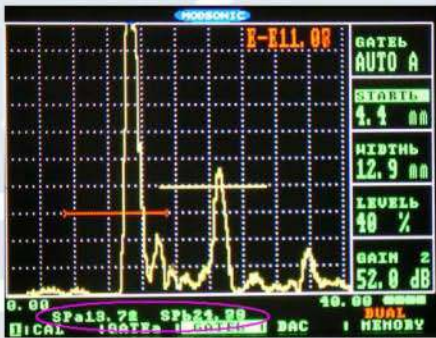

A-Scan, B-Scan and TOFD data display on screen.

Dual Independent gates with different colours for two separate measurements.

Auto track gate and Echo to Echo measurement suitable for interface trigger measurement in immersion testing as well as through coating thickness measurement, Oxide scale thickness measurement.

RF display for very high degree of measurement accuracy.
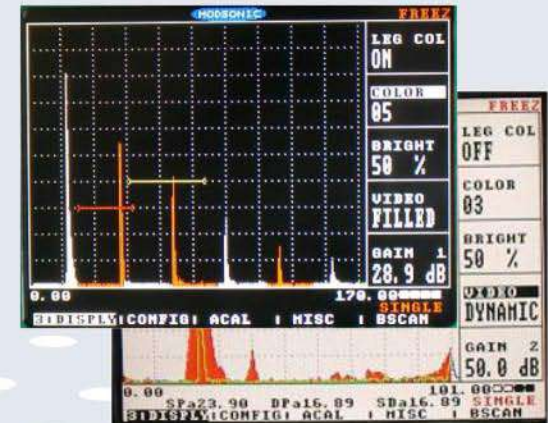
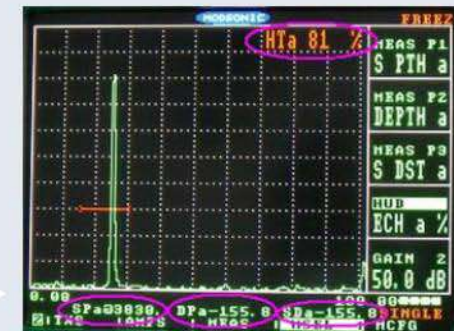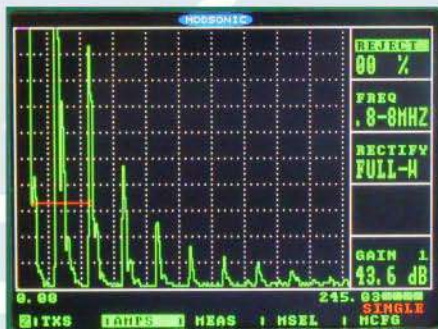Color coded Skip/Leg for easy interpretation during weld inspection.

Peak Freeze/Active Echo Dynamic defect characterizations.

Tuned Amplifier four bands for better signal to Noise ratio.
(a) 0.2 MHz to 1 MHz. (b) 0.5 MHz to 4 MHz.
© 0.8 MHz to 8 MHz. (d) 2 MHz to 20 MHz.

Frequency down to 200KHz for checking composites and highly attenuative materials.

Probe frequency upto 20MHz for testing on low thickness and better sensitivity.

Low PRF upto 4 Hz to avoid ghost/Phantom echo in attenutive and large parts.

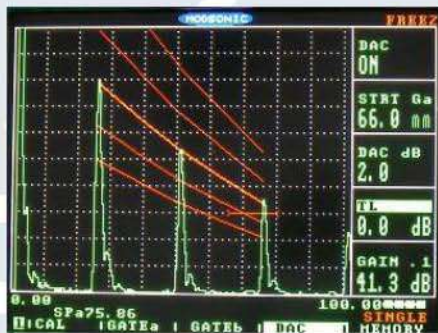Auto calibration for rapid calibration for the unknown velocity.

Simultaneous display of four measurement values on the display.

Dynamic DAC curves which allow change of Test Range and Gain after plotting them and additionally +/-dB multiple curves can be plotted to meet industries standards. Calculates signal amplitude as a percentage or dB difference of the DAC curve level (ASME, ASME-3 or JIS) and displayed on the screen. An alarm can be activated when a gated signal intercepts the curve.

DGS (Distance Gain Size)/AVG Option displays a curve for a particular equivalent reflector size(ERS) as a function of the distance from the probe to the reflector for the standard 18 narrowband probes and in addition custom probe can be also configured. The ERS (equivalent reflector size) function automatically calculates the corresponding equivalent size of the gated signal.
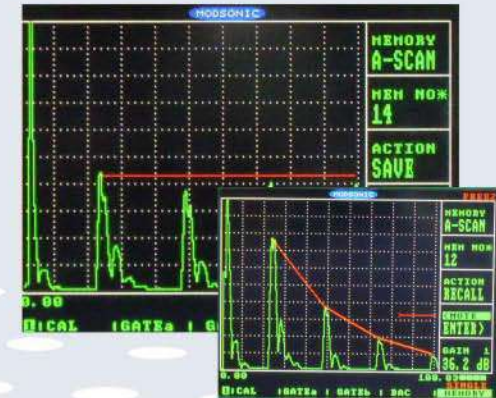
TCG (Time Corrected Gain). It brings echo signal to same height as per DAC curve plotted. So echo attenuation due to depth/distance gets compensated and echo height remains proportional to the reflector size.
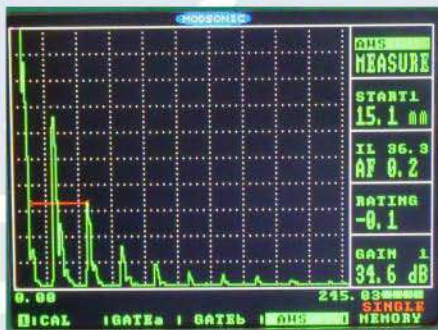
AWS Provides a dynamic reflector "indication rating" for various AWS weld inspection applications. This allows for a more efficient inspection by eliminating manual calculations.

VGA Option provides an easy way to connect to a PC monitor or LCD projector for viewing by large audience or training purpose.

Simple operation with fast rotary knob adjustments; gain is always directly accessible with the left- hand rotary knob, parameter value is accessible with right -hand rotary knob which is lockable to avoid unintentional alteration of setting.

'da Vinci' Series

Ultrasonic Flaw Detectors — High end Features & Applications

MODSONIC®
(SINCE 1987)
Simplifying **NDT**
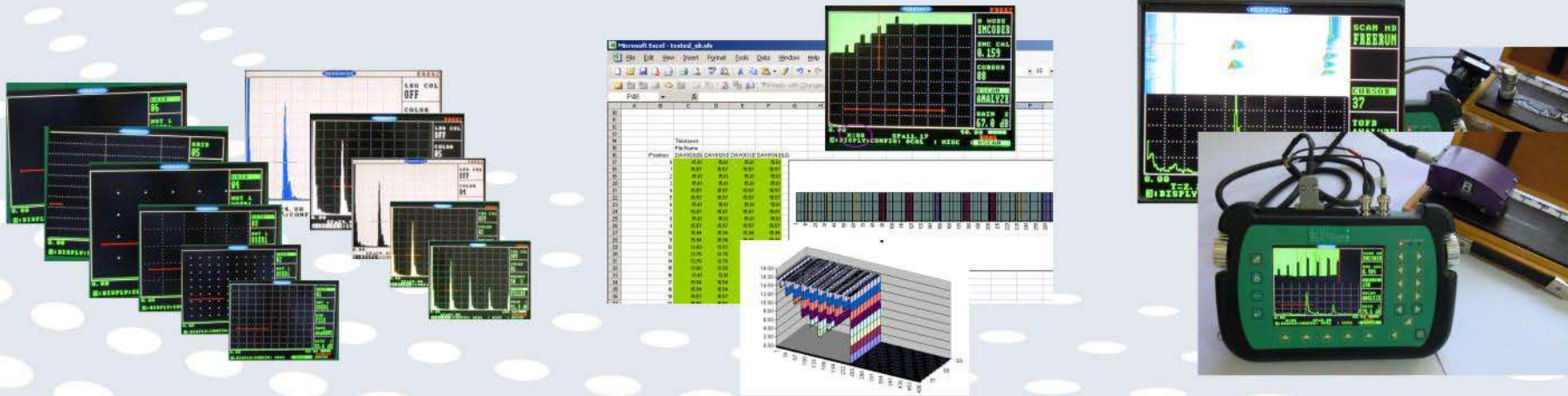
>> Different Grid Layouts.

>> Different Color Set-ups

Thickness Profile B-Scan imaging and recording is performed through continuous capturing of wall thickness readings along probe trace. It represents cross section of the test object. Captured file can be stored internally in equipment it self or directly in USB drive so virtually there is unlimited storage. Captured data can be transferred to Microsoft Excel sheet and it directly plots C-Scan graph from the multiple B-Scan data files acquired.

For Straight Line Scanning and Recording B-Scan imaging:
B-Scan data collection mode based on time or True to location mode using incremental encoder interface is possible.

Color coded B-Scan for easy weld defect interpretation and suitable for data recording.

'da Vinci' Series

Ultrasonic Flaw Detectors — High end Features & Applications

MODSONIC®
(SINCE 1987)
Simplifying NDT
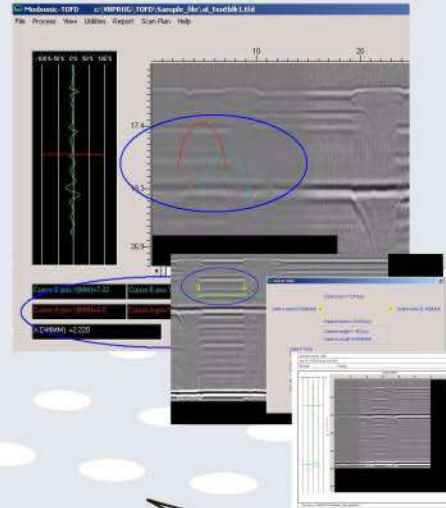
Single channel ToFD in lieu of Radiography: It displays A-Scan, D-Scan image, position on the screen. Generated data Scan file gets stored in external USB Drive and post processing can be done on Computer using supplied analysis software.

Post processing analysis software:
>> Removal of Lateral/Backwall echo to improve surface resolution.
>> Straightening of the D-Scan image.
>> Linearisation of D-Scan image.
>> Parabolic/Normal cursors for the measurement.
>> Signal amplitude correction.
>> Contrast/Brightness variation.
>> File Splitting/Merging.
>> Report Generation.
>> Scan Plan preparation.

IP Sealing:

All the mating joints are gasketed for protection against water splash and dust.

Specification of 'da Vinci' alpha (Sheet 1)

Test Range	: 2.5mm to 10 meter (0.100 in to 400 in) (longitudinal waves in steel). Fine mode it is adjustable in minimum step of 0.01mm (0.001 in).
Velocity	: 1000 met./sec to 15,000 met./sec (40 in/millisec to 600 in/millisec). In Hot Key mode it has preset values. Fine mode it is adjustable in steps of 1met/sec (1 in/millisec).
Delay	: Variable from -10 to 2000 mm (-0.3 to 30 in).
Gain	: 100dB calibrated gain adjustable in 0.1, 0.5, 1, 2, 6 or 12 dB step.
Rejection	: 0 to 100%FSH with LED indicator.
Rectification	: Full-wave rectified, Half wave -ve, Half wave +ve and RF mode.
Frequency	: It has tuned amplifier with four bands : a) 0.2 MHz to 1 MHz b) 0.5 MHZ to 4 Mhz c) 0.8 MHz to 8 MHz d) 2 MHz to 20 MHz.
Linearity deviation	: Vertical: ± 3%,Horizontal:±0.5%.
Test Modes	: Pulse echo and Transmit/Receive.
Transmitter	:Transmission pulse Negative spike .(Pulse Rise Time < 10ns) and with selectable high (300 Vp) or low (250Vp) power .
Damping	: Damping high/low is selectable. (High =45 ohms, Low=345 ohms)
Connectors	: BNC or LEMO (Size 1) factory optional.
Freeze/Peak Freeze	: A-Scan freeze, Peak Freeze, Echo dynamic available. In Peak freeze it holds peak amplitude pattern which is useful for angle beam probing to locate peak signal.
Monitor	: Dual gate with threshold adjustable in 1% of Screen height with,+ve/-ve Logic, Gate Expand, Interface trigger modes.
Gate Expand	: Expands Range to width of the gate.

A-Scan memory	: 500 Trace Patterns can be stored (with Note/Detail) which can be recalled, printed or transferred to PC via USB. Unlimited no of A-Scan can be directly stored in USB Disk with auto file naming.
Calibration Set-up	: 50 different calibration set-ups can be Stored and Recalled.
T-LOG	: 20,000 readings can be stored in 20 different files. Five different Types of file templates for file creation. Stored readings can be recalled/transferred to PC via USB.
DAC	: Dynamic DAC curve can be Digitally plotted (Smooth parabolic curve) on screen with selectable additional offset curves from 0 to14 db in 0.1db selectable steps . DAC curve can be set as flaw monitor gate. DAC curve can be plotted using minimum 2 to maximum 10 points.
TCG	: After plotting DAC, TCG(Time Corrected Gain) can be activated. This brings all echo signals to equal height irrespective of depth.
AWS	: Built-in Software for evaluation of defect in accordance with AWS standards.
DGS	: Defect size evaluation based on18 predefined probe data and one custom probe set-up per memory location. Defect size is directly displayed in ERS value. (Equivalent Reflector Size).
Digital Readout	: Thickness/Depth can be displayed in digital readout when using a normal probe and Sound path, Surface Distance and Depth of echo signals of GATEa / GATEb are directly displayed when angle probe is in use. Measurement point can be selected to be Peak or Flank. Echo height, ERS value, dB diff of DAC/DGS curve to signal height, Echo height respect to DAC in terms of percentage or in dB can be measured, T-minimum, Travel distance can be measured when encoder is connected and time of travel during Freerun B-Scan.
Measurement Unit	: Metric or British unit of measurement is selectable.

Specification of 'da Vinci' alpha (Sheet 2)

Software	:	dVaSoft Interface software for transferring A-Scan/BScan/T-LOG from da Vinci alpha to PC. is supplied with da Vinci alpha.
Printer Attachment	:	USB Printer (PCL3 compatible) can be directly attached to da Vinci alpha for printing of stored A-Scan waveform with calibration data and note detail.
Display	:	High brightness active matrix Color TFT LCD Display. Display area 320 x 240 pixel (117 x 88 mm). Five different colors and Grid scheme options. Color leg facility for angle probe for easy interpretation of skip distance.
Full Screen	:	By pressing Enter Key for a few seconds A-Scan can be displayed in Full Screen area.
Reference A-Scan	:	Reference A-Scan pattern of standard test object can saved and Recalled in the background for easy comparison during testing.
Video Output	:	VGA video signal output for monitor/projector connection.
PRF	:	4Hz To 500Hz. Selection in 10 scalable steps. PRF can go down up to 4Hz when PRF is selected to 1 and Maximum achievable coupled to range when PRF is selected to 10.
Update Rate	:	60 Hz.
Power	:	Lithium-Ion Battery pack 10.8 VDC, 7.8 AH, gives 8 hours Continuous operation from fully charged battery. Battery with the charge indicator/fuel gauge indicator. da Vinci alpha can also operate on 6 nos. of C type dry cells.
Battery Charger	:	Input voltage 100 to 240 VAC / 50 Hz.
Temperature	:	0 to 55º C.
Size	:	170 x 260 x 110 mm (HxWxD).

Weight	:	2.1 kg. with Battery.

Additional Specification in da Vinci delta

B-Scan memory	:	50 B-Scan Patterns can be stored (with Note/Detail) which can be recalled, or transferred to PC via USB. Unlimited no of B-Scan can be directly stored in USB Disk with auto file naming.
Color coded B-Scan	:	In real time display color coded B-Scan as well as it display live A-Scan. Captured B-Scan gets stored in external USB pen drive.
TOFD Display	:	In Real-time RF A-Scan and TOFD D-Scan. After collecting data, stored data/A-Scan pattern can be reviewed using cursor.
Recording	:	Free Run or with positional encoder for actual location.
Record Length	:	1000mm test length with collection step of 1mm. Each A-Scan with 500 point depth.
IO Port	:	Optical Encoder can be connect to 'da Vinci' delta for positional detail. It can be used for Encoded B-Scan.
Data Storage	:	Each Scan file is stored in external USB storage device with auto file naming.

TOFD Data Analysis Software features

>> For improvement of near and far surface resolution lateral and Backwall echo can be removed.
>> TOFD data linearization.
>> Straightening of TOFD data using apex matching technique or by manually shifting of A-Scan is possible.
>> Contrast setting of D-Scan image is possible for easy interpretation.
>> Defect marking on D-Scan image.
>> D-Scan data zooming control.
>> All A-Scan data can be exported to Excel for further analysis.
>> Multiple file joining and splitting of file is possible.

'da Vinci' Series

Ultrasonic Flaw Detectors

Comparison Chart of 'da Vinci' alpha and 'da Vinci' delta

Features	'da Vinci' alpha	'da Vinci' delta
Test Range 0-2.5mm to 10,000 mm	Yes	Yes
Gain 100dB adjustable in step of 0.1,0.5,1,2,6 or 12 dB step	Yes	Yes
TX power Hi/Low selectable	Yes	Yes
Damping Hi/Low selectable	Yes	Yes
Amplifiers with Frequency Band selection	Yes	Yes
Monitor Dual gate	Yes	Yes
DAC /TCG	Yes	Yes
AWS	Yes	Yes
DGS/AVG	Yes	Yes
A-Scan Memory 500 Trace pattern internally	Yes	Yes
T-LOG with grid configuration, 20,000 readings internally	Yes	Yes
USB pen drive interface	Yes	Yes
Screen Size QVGA (117x88mm)	Yes	Yes
VGA port for external Monitor/Projector connection	Yes	Yes
8 hours continuous operation from fully charged battery	Yes	Yes
B-Scan Memory 50 B-Scan internally	No	Yes
Color coded B-Scan	No	Yes
TOFD data acquisition	No	Yes
TOFD Data analysis Software	No	Yes
Encoder Interface	No	Yes