Utilizing the very latest technologies, immersion inspection allows for internal and flaw detection. Parts are submerged in water which acts as a coupling medium for the ultrasonic probe. Internal and external inspection for defects or thickness measurement is very accurately carried out via the inspection software. Subsurface flaws, disbands, cracks and other irregularities can be analyzing for size, thickness, depth and other quantitative features.

- High speed low vibration Linear Motor
- Offline analysis for virtual re-scanning of parts that are no longer available
- Multi Axis scan options (X, Y, Z 1&2, Gimbal 1&2, Swivel 1&2 and Turntable)
- Contour following for inspection of curved parts
- Squirter transducer holder available
- Real-time A, B & C-scans
- Simultaneous Multi-zone inspection
OKOS Digital Imaging System

ODIS Acoustic Microscopy software with rich technical content is built on industry feedback. It includes both time domain and frequency domain imaging in real-time. Advanced analysis is provided through quantitative tools for measurement and classification of parts.

The Analysis version of ODIS allows non-scanning computers to virtually re-scan, view, and analyze data.

### Defect Detection
- Multiple Zones
- Near Surface
- Sub Surface
- Inside Part

### Advanced Software
Controls for Engineers

### Metals & Alloys

### Turbine Blades

### Composites
NDT-CF 300
Multi Axes NDT Scanner Compact Footprint

Ultrasonic NDT Inspection of

- Hard-cutting materials
- Composites
- Custom alloys
- Solder joints
- Plastics
- Printed circuit boards
- Turbine blades

- X, Y and Z linear axes
- Scan Envelope 300 mm x 300 mm x 150 mm
- Optional Turntable
- Optional Through Transmission Yoke
- Optional Gimbal
- 360 Degree view acrylic tank
- Optional linear servo on X axis

- 12-bit dynamic range instrumentation
- High gain Pulser/Receiver
- Hardware TGC/DAC control
- Application-specific transducers
- Full-featured NDT scanning software
- Off-line Analysis

Defect Detection
- Multiple Zones
- Near Surface
- Sub Surface
- Inside Part
ODIS WinSAM is the latest Acoustic Microscopy software with rich technical content built on current platforms and industry feedback.

It includes **both** time and **frequency domain** Imaging in real-time. The software provides advanced analysis through quantitative tools for measurement and classification of parts.

- Multi Axis scan options
- Highly customizable software
- A, B and C-scans
- Contour following
- Off-line analysis
- Virtual rescanning
VUE 250-P

SCANNING ACOUSTIC MICROSCOPY
Semiconductor Package Failure Analysis
voids · disbonds · cracks · delamination · internal defects

Included Software Modes:
- Basic (user friendly)
- Advanced (detailed analysis)
- Offline Analysis (virtual scanning)

Real-time
A-Scan & A-Scan Capture

Frequency Domain Imaging (FFT)

Advanced Time-of-Flight & Thickness Measurements

Multi-Gating

Virtual Rescanning

Thickness Measurements

B-Scan & SLICE

C-Scan with Multi-gate, SALI, & SALI Groups

Scan Math Before and After Reflow Characterization

Threshold Mapping (post processing)

Cluster Analysis (post processing)

3D Imaging

Real-time

Void Gating (real-time)
**WORKSPACE**

**OKOS Digital Imaging System (ODIS)**

ODIS is the latest Acoustic Microscopy software with rich technical content built on current platforms and industry feedback. It includes both time domain and frequency domain imaging in real-time. Advanced analysis is provided through quantitative tools for measurement and classification of parts. The Analysis version of ODIS allows non-scanning computers to virtually scan, view, and analyze data for simultaneous real-time analysis or post collection review. Previously undetected flaws can now be imaged with poled peak analysis.

Application Specific Transducers

for the highest quality resolution. Multiple transducer designs for enhanced scan capability.

**SPECs**

**Maintenance Free Scan Axis**
- Motor: Linear Servo
- Max Velocity: 500 mm/s
- Accuracy & Repeatability: +/- 1.0 micron
- Scan Envelope: 250 mm

**Low Maintenance Step Axis**
- Step Envelope: 150 mm

**Low Maintenance Focus Axis**
- Focus Envelope: 35 mm

**Dimensions**
- 0.64 m x 0.61 m x 0.5 m (WDH)
- 52 kg

**Customer Interface**
- Dual 22" HD LED Monitors

**Fixtures**
- Tray Fixture
- Optional Through Transmission Bracket
- LED illumination

**Instrumentation**
- Digital Pulser Receiver
- Up to 4 GHz Digitizer

**Scan Area**
- Partial JEDEC Tray

**Counterfeit Detection**
**Product Reliability**
**Process Validation**
**Vendor Qualification**
**Product Inspection**
**Quality Control**
**Failure Analysis**
**R&D**

**Application Specific Transducers**

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TEL +1 703 880 3039
FAX +1 240 235 7277
www.okos.com
info@okos.com
Easy Identify Delamination Detection

Virtual Rescanning
Pass/Fail scan sorting
Flatness Measurements
Multi-Gating

Included Software Modes:
Basic (user friendly)
Advanced (detailed analysis)
Production (automated scanning)
Offline Analysis (virtual scanning)

Real-time A-Scan & A-Scan Capture

Frequency Domain Imaging (FFT)

B-Scan & SLICE

C-Scan with Multi-gate, SALI, & SALI Groups

Scan Math Before and After Reflow Characterization

3D Imaging

Advances Time-of-Flight & Thickness Measurements

Threshold Mapping (post processing)

Cluster Analysis (post processing)

Void Gating (real-time)

SCANNING ACOUSTIC MICROSCOPY
Semiconductor Package Failure Analysis
voids · disbands · cracks · delamination · internal defects

VUE 400-P

**OKOS Digital Imaging System (ODIS)**

VUE 400-P imaging power surpasses modern standards delivering premium FA Lab features to semiconductor fabrication facilities. ODIS is the latest Acoustic Microscopy software with rich technical content built on current platforms and industry feedback. It includes both time domain and frequency domain imaging in real-time. Advanced analysis is provided through quantitative tools for measurement and classification of parts. The Analysis version of ODIS allows non-scanning computers to virtually scan, view, and analyze data for simultaneous real-time analysis or post collection review. Previously undetected flaws can now be imaged with poled peak analysis. Supplied with your choice of Windows 7 or 8.

**Application Specific Transducers** for the highest quality resolution. Multiple transducer designs for enhanced scan capability.

**Counterfeit Detection**
**Product Inspection**
**Product Reliability**
**Quality Control**
**Process Validation**
**Failure Analysis**
**Vendor Qualification**
**R&D**

**Clean Room Ready**

**Dimensions**
0.9 m x 0.86 m x 1.18 m (WDH)
227 kg
The USIP40 is a precision, multi-channel inspection platform that can be configured as a remote ultrasonic unit, an integrated rack-mountable instrument, or as a portable battery-powered instrument. All USIP 40 versions take advantage of the same basic ultrasonic hardware, graphical user interface, and application specific software tools.
Performance and Productivity by Design.

The USIP 40 delivers precision, multi-channel ultrasonic testing performance you can rely on. It is available with up to ten ultrasonic channels and comes in three different package options – a remote ultrasonic unit, an integrated rack-mount instrument, or a fully portable, battery-powered instrument. All of these versions utilize the same core electronic hardware and Graphical User Interface. When you combine its outstanding ultrasonic performance with optional application specific imaging and analysis tools, you can see that the USIP 40 is the ultimate solution for your current and future inspection needs.

The Ultimate Inspection Confidence

Application specific GUI

The USIP 40 takes full advantage of its Microsoft Windows™ based operating environment. Each of its instrument functions is designed as a separate plug-in. This allows the operator to set up a customized display showing the right information for a particular application. Several levels of graphical user interface can be created with their own password protection to control access to specific functions.

EchoMAX

Screen update rates on digital instruments are not able to keep up with the pulse repetition frequency of high performance ultrasonic instruments. As a result, previous digital flaw detectors had difficulty displaying an alarmed defect’s actual A-Scan. GE’s exclusive EchoMAX technology is designed to overcome this issue and offers the ultimate in A-Scan display for reliable echo visualization by completely digitizing the A-Scan of each ultrasonic pulse. The EchoMAX uses advanced algorithms to capture and display the exact A-Scan of every alarm condition, ensuring real time visual alarm verification. The operator can be confident to never miss a shot and has the ability to pass a defect standard through at full test speed.

Multi A-Scan

With the USIP 40’s Multi A-Scan feature, you can view up to ten channels of ultrasonic data on the same screen simultaneously. Each A-Scan can be controlled independently with different gain, range and delay and include up to four colored bar gates. Because each window is independent, the operator can size the A-Scan as large or small as required for easy viewing. The Multi A-Scan feature also allows you to simultaneously display two A-Scans from the same cycle using different display ranges. You can now display an overall A-Scan and zoom in to inspect details at the same time.

Multi-Cycle operation

A USIP 40 can be provided with up to 10 ultrasonic channels depending on inspection needs. In addition to this channel flexibility, the USIP 40 provides up to 20 separate ultrasonic setups (cycles) to automatically drive single or multiple channels complete with DAC or TCG compensation during an inspection sequence. As each cycle is independent, gain and gate positions can be varied between cycles. This allows the operator to carry out multiple tests using a single probe.
Feature Summary

- Up to 10 ultrasonic channels
- Up to 20 kHz PRF
- Aero version qualified to GE and RRAE specifications
- Independent pulser and receiver for each channel
- 20 Programmable cycles for multi-zone inspection
- EchoMAX A-Scan display function
- View up to 10 A-Scans at once
- Available strip chart, C-Scan imaging, and TOFD weld inspection software
- Interface gate synchronizing for surface following
- Back-wall echo attenuator
- Direct 3-axis encoder input
- Automatic Gain Control
- User configurable in English, French, German, Spanish, Japanese, Chinese

Wide Fields of Application

**Aerospace**
The USIP 40 Aero configuration is qualified to GE DFO P3TF22, P3TF30, P3TF35, and RRAE RPS705 specifications for jet engine component inspections. USIP 40 instruments are also extensively used for airframe composite inspection by leading aircraft manufacturers.

**Automotive**
Used in conjunction with Ultraproof imaging software, the USIP 40 is the perfect instrument for inspecting pistons and other safety critical parts. Configured in this way, the USIP 40 provides visualization and recording of alarm outputs as well as automatic evaluation and reporting of single flaws, interacted flaws, and total numbers of flaws per part and per batch.

**Pipe and tube**
With the appropriate probe holders and imaging software, the USIP 40 is easily set up for weld inspection, multi-channel flaw detection and wall thickness measurement.

**Plate and billet**
Combining inspection productivity and coverage requires multiple inspection channels. The 10-Channel USIP 40 fills this need in both manual and automated inspection environments.

**Roll testing**
The multi-channel USIP 40 combined with C-Scan imaging provides rapid scanning of industrial rollers. GE’s K-Scan software knits multiple ultrasonic channels to form one continuous C-Scan. In combination with the USIP 40’s 20,000 Hz PRF, this package is perfect for high-speed defect evaluation and sizing.

**Vessel weld inspection**
Combined with Ultramap Weld software, the USIP 40 can be configured to perform multi-channel inspections of welds on pressure vessels to ASME Case 2235 utilizing both Time of Flight Diffraction (TOFD) and pulse-echo B-Scan imaging and data archiving tools.
**USIP 40**

**Number of Channels**
Up to 10 Channels in Maximum 20 Cycles

**Pulse Repetition Freq.**
4 to 20000 Hz, Proportionally Divided for Each Cycle

**Pulser**
Spike Pulse 100 V, 400 V / Charging Capacitor, 1 nF, 220 pF / Rise Time, 10 ns

**Wide-Band Filter (-3 dB)**
0.2 – 30 MHz / 10 – 30 MHz / 1 – 10 MHz

**Narrow-Band Filter**
1 / 2.25 / 5 / 10 / 15 MHz

**Gain**
0 – 110 dB, in 0.5 dB Steps

**Fine Gain Setting**
1 dB, Continuously Variable in 10 Steps

**Rectifier**
Full-Wave, Negative, Positive Half-Wave, RF Mode

**Reject**
Linear, 0 – 80 % Screen Height

**TCG**
44 dB with Maximum 12 dB/μs

**DAC/TCG**
DAC or TCG with up to 16 Reference Echoes per Cycle, Multiple DAC Mode with up to Four Additional Curves at Variable Spacing from the Reference Curve, Individual Curves for Each Cycle Possible

**Backwall Echo Attenuation**
Full Dynamic Range of 110 dB

**Sound Velocity**
500m/sec - 20000m/sec (0.02 inch/sec - 0.78 "/sec)

**Digital Upsampling**
400 MHz, 9 bits

**A-Scan Display**
512 or 1024 Pixels, Range: 4.5 mm - 15 m in 0.1 mm Increments (0.1" - 590" in 0.004" Increments). Display Start with Initial Pulse or Interface Echo

**Evaluation Gates**
Four (Interface, A, B, C) Color Coded and Independent per Cycle, Coincidence or Anticoincidence Logic Selectable, Flow Suppression per Counter (1 – 16), Trigger: Initial Pulse or Interface, Width 0.1 mm - 15 m in 0.1 mm Increments (0.003" - 590" in 0.004" Increments), Start 0.0 mm - 15 m in 0.1 mm Increments (0" - 590" in 0.004" Increments)

**Amplitude Resolution**
0.5 % of Display Range

**Thickness Resolution**
2.5 ns Corresponding to 0.007 mm (0.000275") at Sound Velocity of Steel

**Thickness Measurement Modes**
Measurements Selectable between Initial Pulse or Interface Echo and Gates A, B, or C or between Gates A and B. Start/Stop at Zero Crossing, Flank or Peak Echo Including Tolerance Monitor with 4 Thickness Values Min and Max per Cycle

**Data Output**
Measurement Readings Output as Max Amplitude or Min/Max Thickness Value. Alarm Output Amplitude Threshold or Min/Max Thickness Value

**Analog Outputs**
10 User-Programmable for Measurement Readings (Active/Min/Max), Wall Thickness/Echo Amplitude 0 to 10 V, 12 Bit Resolution

**Alarm Outputs**
16 User-Programmable for Cycle and Threshold, for Flaw Threshold via TTL (Coincidence/Anticoincidence), for Thickness Tolerance Monitor via TTL with Range Overflow and Underflow

**Test Data Release**
4 User-Programmable Inputs for Each Test Channel

**Encoder Inputs**
3 Inputs for Quadrature or Pulse/Direction Encoders, Compression of Ultrasonic Data on Path Grid

**Units**
mm, inch, μs

**Operator Interface Languages**
User Configurable in English, German, French, Spanish, Chinese and Japanese

**Interconnects**
Probes: Lemo 00 or BNC; RF Output: Lemo 00; I/O: 25-pin Sub D; 37-pin Sub D; Sync: 9-pin Sub D; Video: VGA Out 15-pin Sub D; Rack and Portable Configuration also Include - Mouse and Keyboard: PS2 (Rack only); Serial Interface: 9-pin Sub D; 2 x USB

**Network**
Box with Ethernet – TCP/IP, 100 MBytes

**Mains Operation**
Rack and Box via Internal Power Supply (85 – 265 VAC); Power Consumption 40 W (Rack), 24 W (Box). Portable Version via External Power Supply (85 – 265 VAC), Battery Operation. Two Li-Ion Battery Packs (Hot Swap), 10.8 V, 7.2 Ah ea, 3.25 h Operation, 70 W During Charging

**Operating Temperature**
0 - 40° C (32 F - 104 F)

**Size (HxWxD) and Weight**
Rack: 310 mm x 450 mm x 375 mm (12.2" x 17.7" x 14.75") (7U), 16.5 kg (36.36 lb)
Box: 125 mm x 450 mm x 430 mm (4.9" x 17.7" x 16.9") (3U), 7 kg (15.4 lb)
Portable: 390 mm x 374 mm x 150 mm (15.3" x 14.7" x 5.9"), 8.2 kg (18.1 lb)
Incl. 2 Li-Ion Batteries

GE Inspection Technologies: productivity through inspection solutions
GE Inspection Technologies provides technology-driven inspection solutions that deliver productivity, quality and safety. We design, manufacture and service Ultrasonic, Remote Visual, Radiographic and Eddy Current equipment and systems. Offering specialized solutions that will help you improve productivity in your applications in the Aerospace, Power Generation, Oil & Gas, Automotive or Metals Industries.

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