Enhanced Inspection Productivity with On-Device Guided Workflows

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GE Measurement & Control
Imagination at work.
Today, NDT inspections are more critical than ever.
More demanding inspections require advanced NDT procedures…including…

⚠️ Improved inspection efficiency

⚠️ Better inspection repeatability

⚠️ Digital capabilities for data storage
New NDT industry realities…

AGING WORKFORCE
High degree of expertise loss across industry.

INCREASED COMPLIANCE
Enhanced safety regulations.

MORE PRODUCTIVITY
Increased requirements and expectations for output.
Weighed down by legacy inspection processes…

- Detailed, paper-based inspection procedures
  - Translation of lab PoD to field PoD
  - Need for multiple inspector levels to review data
  - Hundreds of inspection procedures
  - Periodic updates
  - PC based print outs
  - Difficult to keep up and maintain

- Inconsistent results
  - Hard-to-use inspection devices
  - Complex interfaces
  - Hard to maneuver
  - Difficult for non-experts
Weighed down by legacy inspection processes…

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Unique Challenge Within Aerospace Applications…Version Control, Distribution and Control of Inspection Procedures/AWD’s…
Mentor EM
Eddy current expertise with guided on-device inspection workflows
THE POWER OF WORKFLOW

On-device workflow procedures

Assist the inspection (and the inspector)

Compliment paper procedures
THE POWER OF WORKFLOW
Simply Select the Workflow

Easy customization of the user interface
Assist NDT training

Simplify complex inspections
Easy Customization of the User Interface
Easy Customization of the User Interface

1. Put probe in position 1
2. Set balance point to 30% FSH and 80% FSW
3. Rotate LO horizontal left
4. Use 0.024” to 0.032” shim
5. Adjust gain & phase until signal with and without shims is the same screen height

GO TO INSPECTION PROCEDURE
Easy Customization of the User Interface
THE POWER OF WORKFLOW
Assist NDT Training
Increase Inspector Confidence

Guided NDT Training
• Compliment lecture with guided hands-on practical training

• Step-by-step directions with Live Lissajous to validate set-up and calibration
• Figures to illustrate probe positioning & signal response
• Videos to illustrate probe scanning and experiential knowledge
• Links to training documents
Lab Exercise # 3
Manual crack detection with absolute pencil probe

You will need the following items:
- Mentor EM
- Absolute probe
- Microdot - Lemo probe cable
- 3 notch Aluminum test block

Connect the probe to the Mentor EM
Click on Lissajous icon on right to adjust parameters
Adjust Mentor parameters to meet the probe specifications
Set inspection frequency to 200 kHz

Setting Up the Mentor for Crack Detection
1. Balance the probe on 'clean' metal
   Using menu or finger gestures...
2. Rotate phase so lift-off signal is at 9 o'clock position
3. Move probe zero to bottom right of screen;
   20% full screen height (FSH) and 20% full screen width (FSW)
4. Set 0.040" crack signal to 80% full screen height (FSH); use independent X and Y Gain controls if required
Simplify Complex Inspections
Convert Lengthy Procedure to Guided

Sliding Probe Inspection of Lap Splice
• Dual frequency eddy current with sliding probe
• Mix to ‘remove’ fastener signal

Guided inspection
Live Lissajous with step-by-step directions
Figures to illustrate probe positioning and signal response
Simplify challenging dual frequency Mix set-up and calibration
TRANSFORMING INSPECTION TECHNOLOGIES
Simplify Complex Inspections
Description of Inspection and Required Tools

Sliding Probe Inspection of Lap Splice
- This inspection procedure is for cracks in the skin along the row of fasteners in the lap splice.
- This procedure can be used on fuselage skins with anodized fasteners.
- This procedure is done from the external side of the airplane at the lap splices.
- This procedure uses a sliding probe and impedance plane instrument that can operate in the dual frequency mode.

The following products are required for this inspection:

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<th>Description</th>
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<tr>
<td>EC Instrument</td>
<td>GEIT Mentor EM-0082</td>
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<tr>
<td>Dual Element Sliding Probe</td>
<td>GEIT 379-010-300</td>
</tr>
<tr>
<td>EC Probe Cable</td>
<td>GEIT 640-016-153</td>
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<tr>
<td>Standard</td>
<td>GEIT 078-040-041</td>
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Ensure all products have a current calibration sticker.
Simplify Complex Inspections
Step-by-Step Procedure with Live Lissajous

Quick Link to Procedure Figures for Probe Positioning and Reference

Real Time Live Lissajous
1. Put probe in position 1, BAL
2. Slide the probe slowly left along the rivet line to position A
3. Freeze, then use pinch and swipe gestures on one of the strip charts to zoom in on the indication from a good rivet - not the rivet at position A. Indication should appear similar to the reference below
4. Tap CAL
THE POWER OF WORKFLOW
Mentor Create Software

- PowerPoint type tool to generate on-device inspection workflows
- Insert photos, procedures, and videos on device for reference while setting up, acquiring data, or analyzing data
- Limit range of adjustments available to the operator, minimizing error opportunities

Use as a conventional EC flaw detector in Expert Mode, or switch to Workflow On-Device mode for guided procedures
THE POWER OF WORKFLOW
Mentor Create for Rapid Generation of Workflows
How Do We Value Workflows and Remote Collaboration within Your Aerospace Applications?

Detailed, paper-based inspection procedures

Inconsistent results

Hard-to-use inspection devices

Unique Challenge Within Aerospace Applications…Version Control, Distribution, Control and Disposal of Inspection Procedures/AWD’s…

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- Difficult for non-experts
INSTANT COLLABORATION WITH INSPECTION WORKS

Real-time access to knowledge from off-site experts

More accurate and efficient inspections

Real-time sharing of inspection data
• Connect with experts in real-time using a wireless network
• Share screens to make calls, add comments, annotate screens and more
• Troubleshoot issues with complex inspections on the spot, without leaving the inspection site
NDT Solution Center

- An online library of custom workflow applications created by experts for specific applications and companies
- Ensure everyone has access to the latest inspections
- Workflows available for purchase and download
- Easy upgrade process
Mentor EM: The solution for accurate inspections

**INDUSTRY KNOWLEDGE**
Access to expert knowledge (on-device workflows, collaboration)

**IMPROVED ACCURACY**
Improved PoD, and consistent inspection procedures

**PEACE OF MIND**
Conduct consistent inspections with less risk/failure

**MORE PRODUCTIVITY**
Less-skilled people can conduct inspections—with less setup/configuration time

**CUTTING-EDGE TECHNOLOGY**
An innovative technology with remote collaboration and Predictivity™
Backed by a history of excellence and innovation
GE Measurement & Control

• Largest supplier of Nondestructive Testing (NDT) products and services worldwide
• Made up of trusted heritage companies
• Only company offering solutions for all NDT technologies:
  • Eddy Current
  • Remote Visual Inspection (RVI)
  • Ultrasound
  • Radiography
  • Metrology
Mentor EM: The highlights

- Industry defining signal-to-noise ratio improves Probability of Detection (PoD)
- Customize on-device workflows to optimize inspection
- Instantly connect with other NDT experts
- Immediately access your service bulletins
- High-resolution display for easy signal interpretation
- Industrial touchscreen for rapid inspection setup
- Use the touchscreen while wearing gloves
The details: Product Specifications

- Two probes with independent generators
- Multiple frequencies for each probe input
- Frequency range of 10 Hz to 6 MHz
- Compatible with GEIT/Hocking and other manufacturer’s eddy current probes
- High-resolution display with touchscreen controls
- Wi-Fi enabled with “Remote Desktop” capability
- 6 Bluetooth ports, plus USB and LAN ports
- Screen and user interface fully customizable using Mentor Create software