Menu Directed Inspection

User's Manual

Menu Directed Inspection

Version 2.0

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Chapter 1. About Menu Directed Inspection (MDI)

Chapter 2. Pre-Inspection Planning

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Typographical Conventions

- **Note** *paragraphs provide information that provides a deeper understanding of the situation, but is not essential to the proper completion of the instructions.*

- **Important** *paragraphs provide information that emphasizes instructions that are essential to proper setup of the product. Failure to follow these instructions carefully may cause unreliable performance.*

- **Caution!** paragraphs provide information that alerts the operator to a hazardous situation that can cause damage to property or equipment.

- **Warning!** paragraphs provide information that alerts the operator to a hazardous situation that can cause injury to personnel. Cautionary information is also included, when applicable.

Safety & Regulatory Issues

For detailed information on safety and regulatory issues, refer to the user's manual for your specific GEIT VideoProbe.

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Chapter 1.   About Menu Directed Inspection (MDI)

1.1   Overview

To use the GEIT *Menu Directed Inspection* (**MDI**) application effectively, three general steps must be completed. As illustrated in *Figure 1* below, these steps are:

• Pre-Inspection
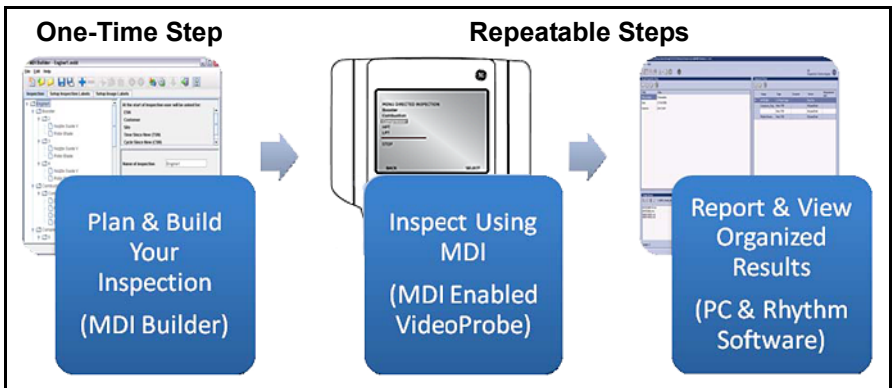
• Inspection

• Post-Inspection

Figure 1: MDI Workflow Overview

Proceed to the next page for a more detailed description of the above steps.

1.2   Pre-Inspection: Plan & Build your Inspection

Using the *MDI Builder* application on your PC allows you to turn your inspection plan into a digital map that can be loaded onto your GEIT *VideoProbe*. You can use the MDI Builder application to define the specific information that you want to capture during inspection.

The file created using the MDI Builder may be used multiple times on your VideoProbe. For example, if you create an inspection plan for a CFM56 engine, you can use that plan to perform multiple inspections on multiple CFM56 engines. For more information on building your inspection plan, refer to *"Pre-Inspection Planning" on page 3*.

1.3   Inspection: Use MDI on the VideoProbe

After you have built an inspection plan, you need to load the file onto your GEIT VideoProbe. You can then use the digital inspection plan to ensure that you are capturing all of the data that you intended to capture. Once you have completed your inspection, you can automatically generate an inspection report on the VideoProbe. For more information on using *Menu Directed Inspection*, refer to *"Inspection Procedures" on page 19*.

1.4   Post-Inspection: Report & View the Inspection Results

After completing your inspection, the inspection results can be found in files on your PC. These files have names that indicate their content. Each completed inspection creates a unique file folder on your PC that contains your results. Each such inspection folder includes all of the information required to use the GEIT *Rhythm* data management software. For more information on working with *Menu Directed Inspection* reports, refer to *"Post-Inspection Reports" on page 25*.

Chapter 2. Pre-Inspection Planning

2.1 Mapping Your Inspection

To begin using *Menu Directed Inspection*, you need to think about your inspection as a multi-level process. Each inspection defined using *Menu Directed Inspection* consists of both *"study level"* information and *"inspection point level"* information. These are defined as follows:

- **Study Level Tags** - This is the information captured at the beginning of each inspection. The study level tags are printed on the cover page of all reports generated by the *Menu Directed Inspection* software.

- **Study Level Information** - This information is specific to a particular inspection occurrence. Some examples of study level information are: *Date*, *Inspector Name*, *Inspection Location*, and *Asset Serial Number*. You can use the *MDI Builder Software* on your PC to define the specific information that you want to capture every time the MDI is run on a VideoProbe.

- **Inspection Point Level Tags** - This is the information that is associated with each image within reports generated by the *Menu Directed Inspection* software.

- **Inspection Point Level Information** - This information is specific to images captured during your inspection. Typically, the information describes the location of an inspection point within an asset. Some examples of inspection level information are: *Section*, *Component*, *Detail*, *Tube Number* or *Weld Number*. You can use the *MDI Builder Software* on your PC to define the specific information that you wish to capture.

- **Characterization** - This information provides specific characterization to a particular part or defect. Some examples include crack, dent, pit or corrosion.

- **Reference Material** - This is one or more documents that will be referenced during an inspection. Examples include manuals, TILs, Service Bulletins, sample images of good/bad parts or sample images of defects.

Note: Characterization*, Reference Material *and some reporting options are available on the XLG3 and XL Go+ only.*

2.2   Using MDI Builder Software

To map out your inspection, use the MDI Builder software on your PC, as described in the following sections.

2.2.1   Toolbar Buttons

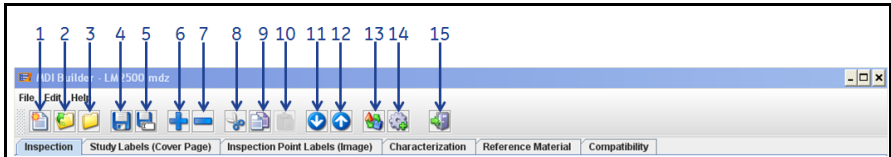The toolbar buttons in the MDI Builder software are shown in *Figure 2* below.

Figure 2: MDI Builder Toolbar Buttons

1.   Create a New MDI File

2.   Open an Existing MDI File

3.   Close the Open MDI File

4.   Save

5.   Save As

6.   Add an Inspection Point

7.   Delete the Selected Inspection Point

8.   Cut the Selected Inspection Point

9.   Copy the Selected Inspection Point

10. Paste an Inspection Point from Memory

11. Move the Selected Inspection Point Down One Level

12. Move the Selected Inspection Up Down One Level

13. Reset the Filenames and Annotations for the Entire Inspection Tree

2.2.1   Toolbar Buttons (cont.)

14. Generate Multiple Inspection Points Based on a Pattern

15. Exit the MDI Builder Application

2.2.2   Setup Tabs

The multiple setup tabs available in MDI Builder software allow you to modify the *Study Level* and *Inspection Point Level* tags that label your inspections and images, as well as setup *Characterizations* and *Reference Material*.

2.2.2a   Inspection Tab

The *Inspection* tab (see *Figure 3 on page 6*) displays your inspection tree as you build it. When an inspection point is selected, you can see the defined *Label* that you associated with that point, the *Inspection Point* definition, the *Filename* generated by the inspection point, and the annotation generated by the inspection point.

If the selected level of your inspection tree is not the final level, the contribution to filename and contribution to annotation will be displayed. This is because only the final levels of the inspection tree define the full filename and *Annotation* that is used within your inspection.
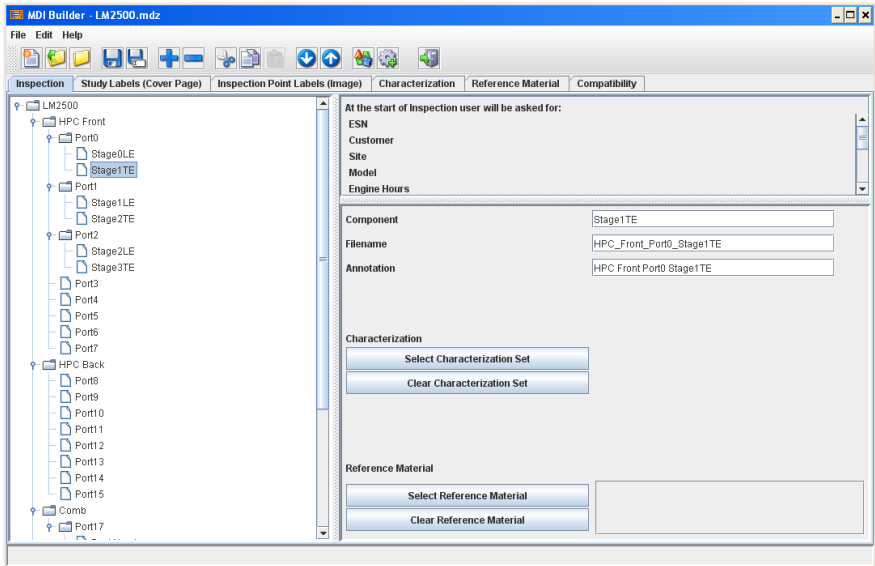
2.2.2a   Inspection Tab (cont.)

Figure 3: MDI Builder - Inspection Tab

For example, the highlighted inspection point in *Figure 3* above is part of a multi-level inspection. *"Gear Box"* is the first level, *"1st Planet Stage"* is the second level, and *"Planetary Pinions"* is the third level. These levels are used as illustrated below to construct the filename and annotation associated with the highlighted inspection point.

Gear Box – 1st Planet Stage – Planetary Pinions

Level 1   Level 2   Level 3
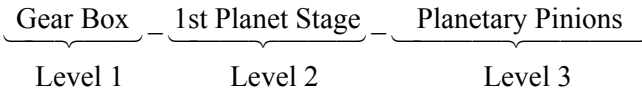
Note: *A maximum of 1500 inspection points are allowed, and a maximum of five inspection levels are allowed.*

2.2.2b   Setup Inspection Labels Tab

The *Setup Inspection Labels* tab, as shown in *Figure 4* below, displays the labels specific to a particular inspection occurrence for the information you wish to capture. When performing an inspection on a VideoProbe, the user is asked to enter the information for each label defined in this tab. The information is then displayed on the cover page of all reports generated by the *Menu Directed Inspection* software.
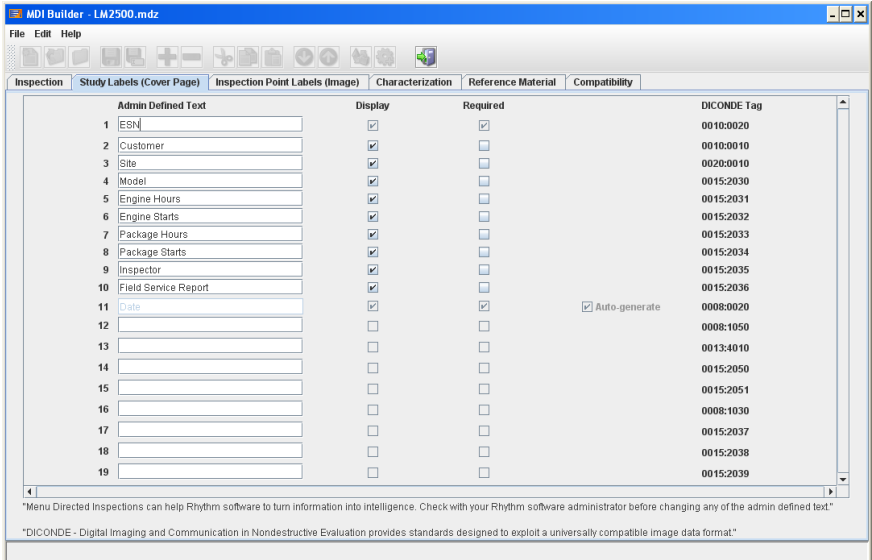

Figure 4: MDI Builder - Setup Inspection Labels Tab

Note: *A maximum of 19 Inspection Labels are allowed.*

2.2.2c   *Setup Image Labels Tab*

The *Setup Image Labels* tab, as shown in *Figure 5* below, displays the text used to label the different levels of your inspection tree. Each inspection point has a specific label that corresponds to each image within the reports generated by the *Menu Directed Inspection* software.
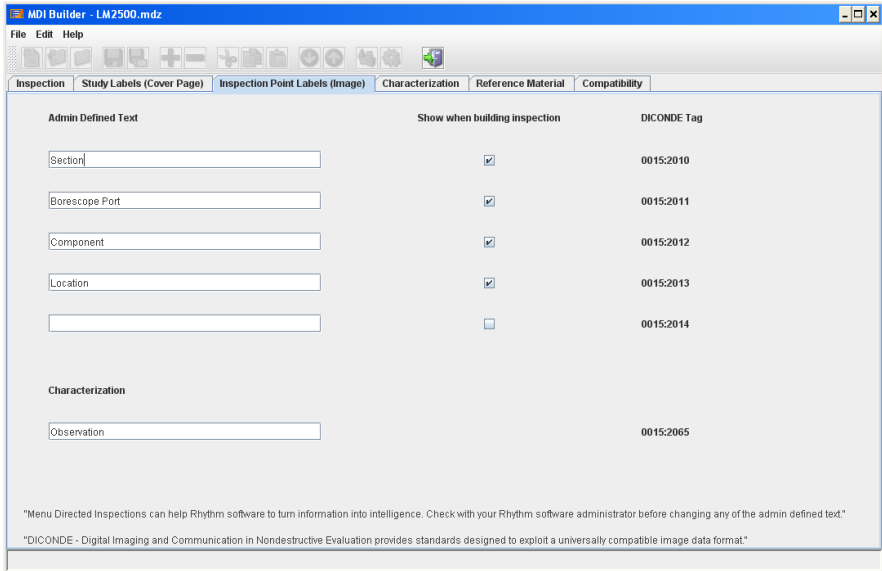

Figure 5: MDI Builder - Setup Image Labels Tab

Note: *Characterization's default label is "Characterization". You may customize it to be "Observation", "Defect ID", or another identifier.*

2.2.2d   Characterization Tab

The *Characterization* tab, as shown in *Figure 6* below, displays the *Characterization Sets* that have been created for an inspection.
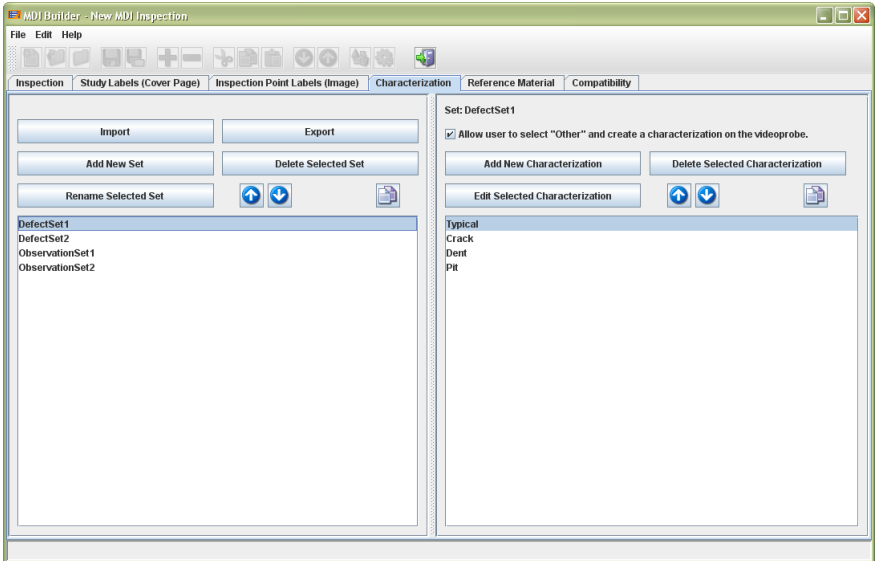

Figure 6: MDI Builder - Characterization Tab

Note: *A maximum of 50 characterization sets are allowed per inspection, and a maximum of 50 characterizations are allowed per set. It is best to organize the characterizations by placing the most common characterizations at the top of the list.*

• Allow "Other"

To allow the VideoProbe operator to enter a characterization not already associated with an inspection point, check the box next to *Allow user to select "Other" and create a characterization on the VideoProbe*.

• Import/Export

To save characterization sets for use in a future MDI file, the option to import or export is available on the *Characterization* tab.

2.2.2e   Reference Material Tab

The *Reference Material* tab, as shown in *Figure 7* below, displays jpg, bmp or pdf documents that will be referenced during an inspection.

The current reference material size is displayed in this tab. Use the chart below to keep your reference material within the recommended limits.
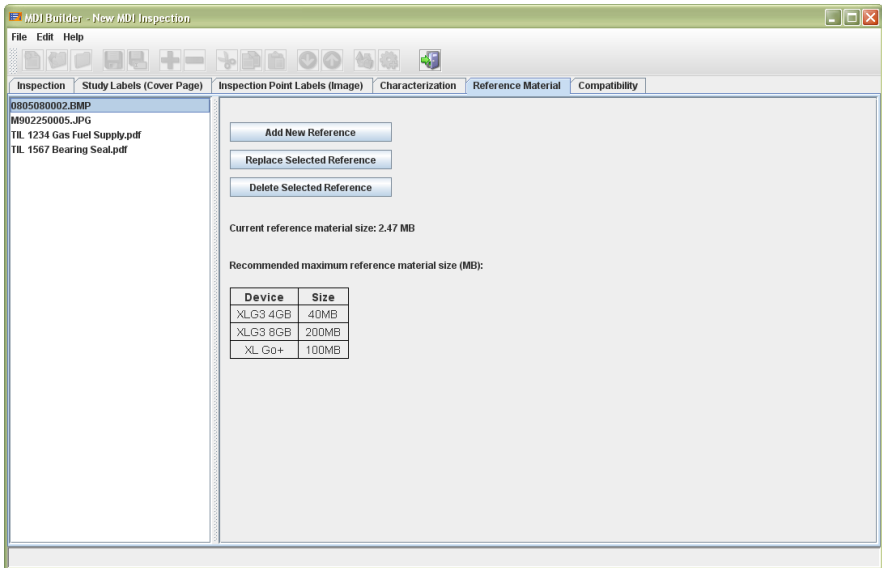

Figure 7: MDI Builder - Reference Material Tab

Note: *A maximum of 50 pieces of reference material are allowed per inspection. Use the compatibility tab for acceptable file types for your VideoProbe.*

2.2.2f   Compatibility Tab

The *Compatibility* tab, as show in *Figure 8* below, displays the features available for different configurations of GE VideoProbes. Use this tab to ensure you have built a MDI inspection that is compatible with your VideoProbe.
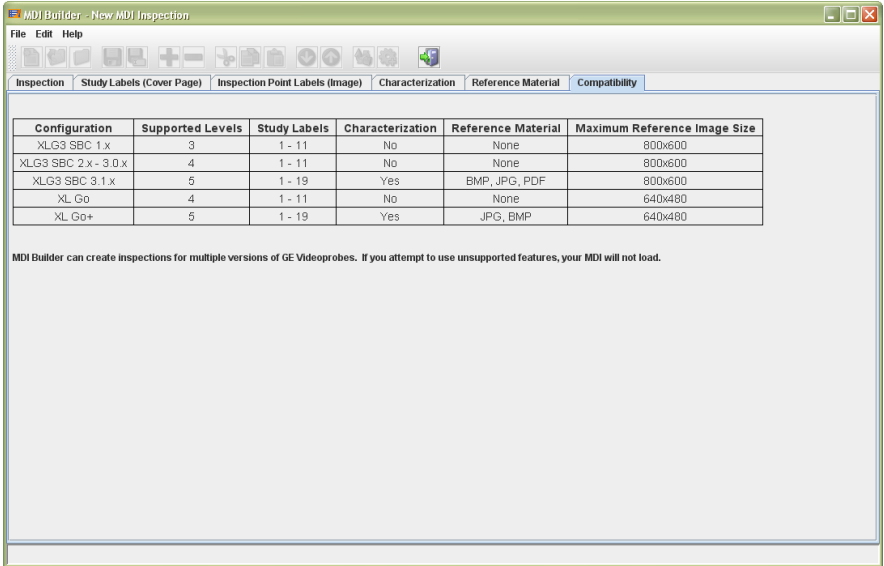

Figure 8: MDI Builder - Compatibility Tab

2.3 Building Your First MDI Inspection

When you first open the MDI Builder software, you should go to the *Inspection* tab and do the following (see *Figure 9* below):

1. Name your inspection.

2. Add your first inspection point.

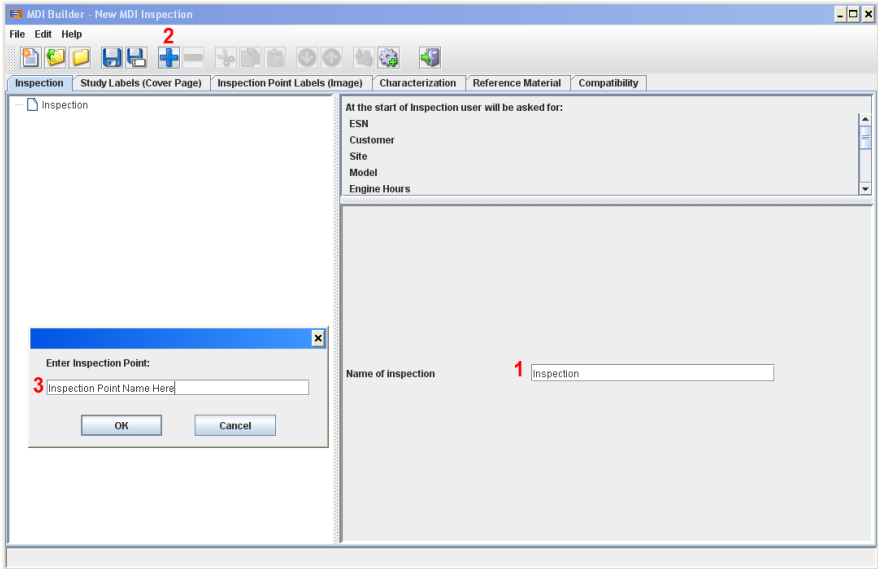**3.** Name your first inspection point.

Figure 9: Entering Your First Inspection Point

2.3.1   Adding Inspection Points

You may add inspection points as sub-levels to any existing inspection points, in a manner similar to bulleted lists with sub-bullets. To do this, select an existing inspection point and add a new inspection point. As shown in *Figure 10* below, your new inspection point is added as a sub-level of the existing inspection point.
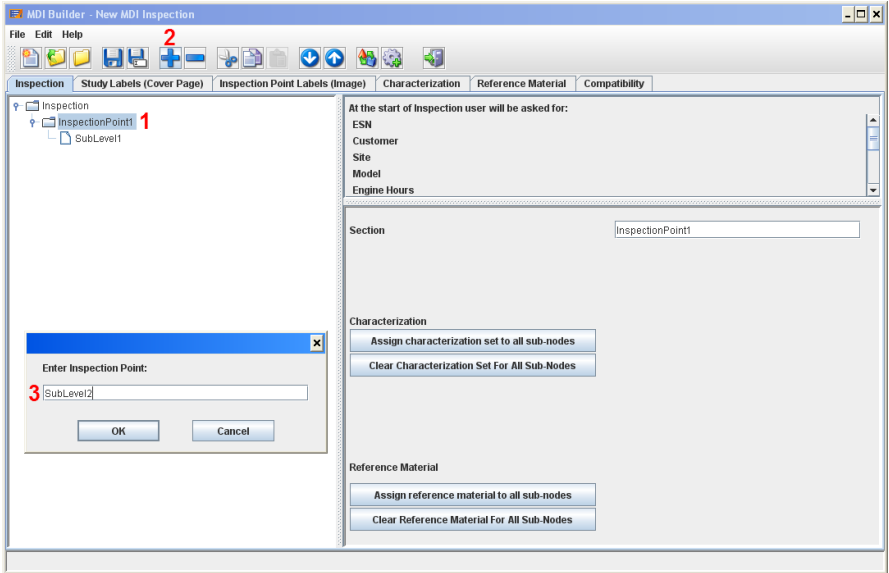

Figure 10: Adding Sub-Level Inspection Points

2.3.1   Adding Inspection Points (cont.)

Continue to add inspection points until you have completely documented your inspection process. When complete, you should have an inspection tree with multiple levels and multiple inspection points, similar to the tree shown in *Figure 11* below.
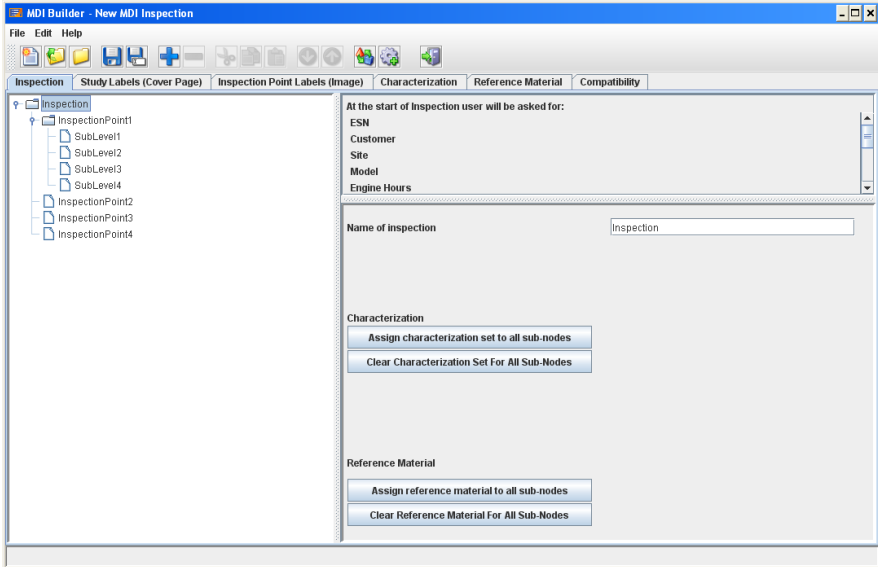

Figure 11: Typical Completed Inspection Tree

Note: *It is recommended that you save your MDI files on external media, so that they may be loaded onto a VideoProbe easily. For advanced methods of building an inspection, refer to* "Tips & Tricks" on page 29.

2.3.2   Assigning Characterization Sets

To assign a *Characterization Set* to an inspection point, click on the inspection point then click on *"Select Characterization"* (see *Figure 12* below). To assign a *Characterization Set* to sub-levels of an inspection, click on the top-level folder then click on *"Assign characterization set to all sub-nodes"*.
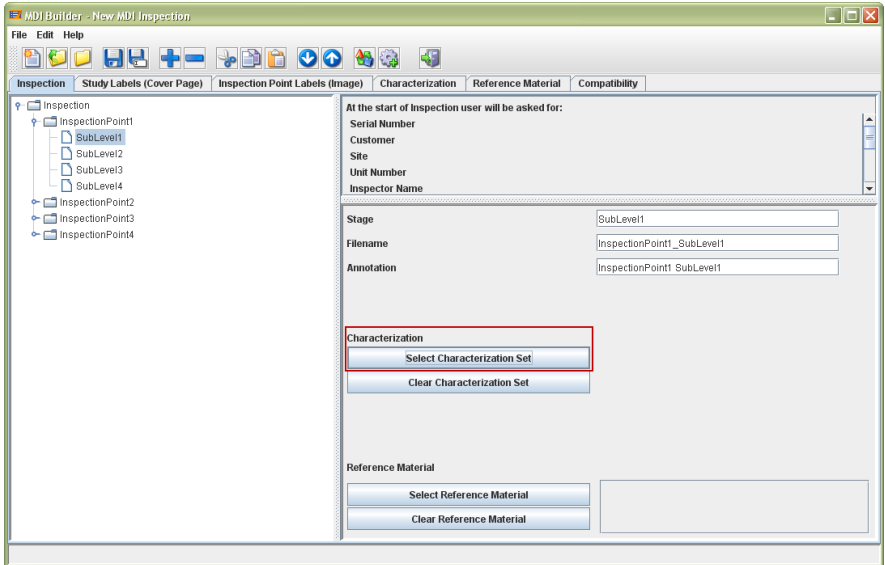

Figure 12: Assigning Characterization Sets

2.3.2   Assigning Characterization Sets (cont.)

To require a VideoProbe operator to assign a *Characterization* before proceeding to the next inspection point, check the box next to *"Characterization is required on VideoProbe"* (see *Figure 13* below).
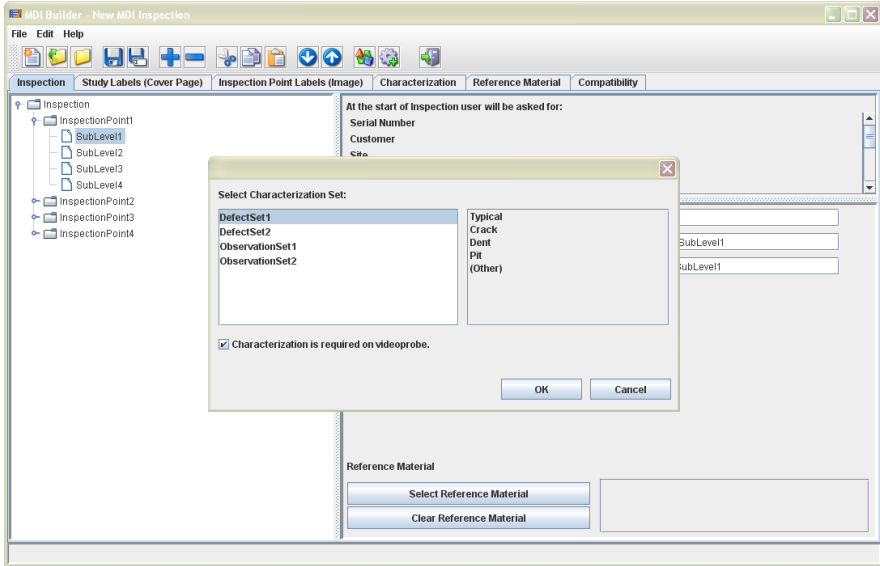

Figure 13: Requiring a Characterization

2.3.3 Assigning Reference Material

To assign *Reference Material* to an inspection point, click on the inspection point
then click on *"Select Reference Material"* (see *Figure 14* below). To assign
Reference Material to sub-levels of an inspection, click on the top-level folder then
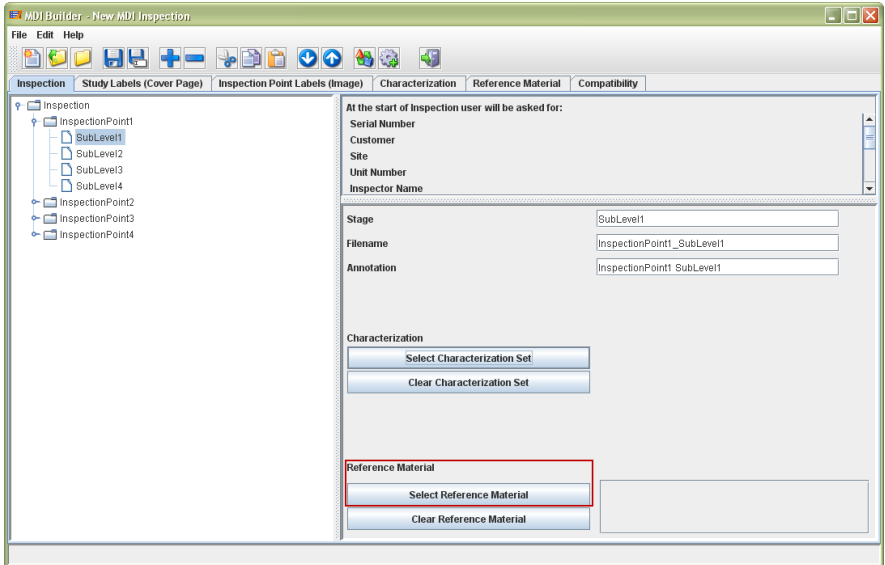click on *"Assign Reference Material set to all sub-nodes"*.

Figure 14: Assigning Reference Material

2.3.3   Assigning Reference Material (cont.)

To assign a certain page of a pdf, type the page number into the box next to the reference pdf (see *Figure 15* below). If using more than one page, separate the page numbers by a comma.
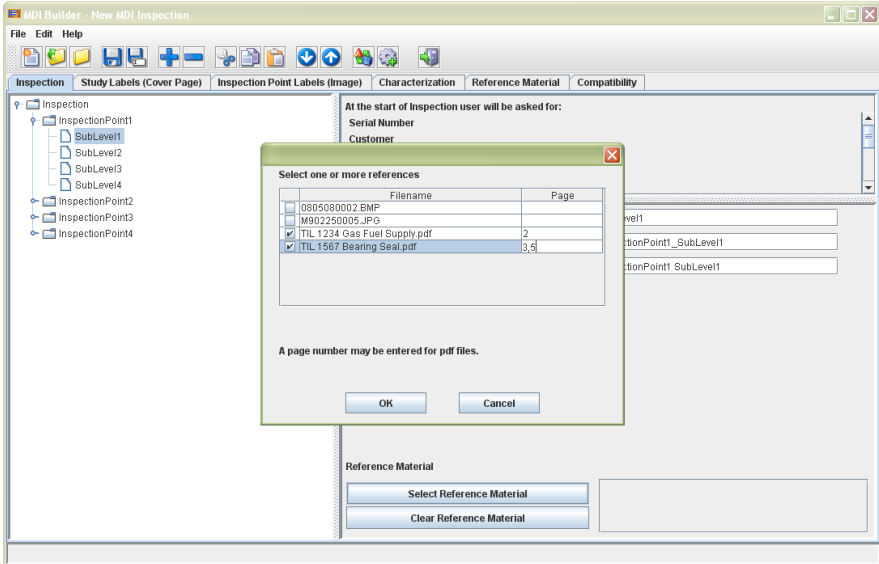

Figure 15: Assigning Pages from a PDF File

Chapter 3. Inspection Procedures

3.1 Loading and Unloading Inspections

To load or unload a *Menu Directed Inspection* on a VideoProbe, proceed to the section below for your GEIT VideoProbe model.

Note: *MDI inspection files have the file extension of .mdz. A maximum of five MDI inspection files may be loaded on a VideoProbe at any given time.*

3.1.1 XLG3

Use the following menu to load and unload MDI inspections on the **XLG3** VideoProbe:

MENU>SETUP>SYSTEM>MDI

3.1.2 XL Go

Use the following menu to load and unload MDI inspections on the **XL Go** VideoProbe:

LIVE MAIN MENU>SETUP>SYSTEM TOOLS>MDI

Note: *On the XL Go, the* **LIVE MAIN MENU** *is accessed using a joystick press or by holding the* GOTO MENU *button, which is the right* Soft Key *in live mode, for five seconds.*

3.2   Performing an Inspection

To perform an MDI inspection on a VideoProbe, proceed to the appropriate section for your GEIT VideoProbe model.

3.2.1   XLG3

To perform an inspection on the XLG3 VideoProbe, follow the instructions in the following sections.

3.2.1a   Starting an Inspection

To start an inspection using MDI, select the following menu option:

MENU>MENU DIRECTED INSPECTION>(INSPECTION NAME)

3.2.1b   Entering Study Level Information

At the start of an MDI inspection, you are prompted to enter the study level information and to select the PC drive that will be used to save your inspection results. You can use either the on-screen keyboard or an external USB keyboard to enter your information on the VideoProbe.

Note: *For a list of supported keyboards, see your VideoProbe user's manual.*

3.2.1c   Selecting an Inspection Point

At this time, a list of your inspection points, which is organized by level, is displayed. To select the desired level, press either the Enter button or the Trigger. Continue to navigate through the inspection levels until you have reached the desired inspection point.

To view *Reference Material* associated with this inspection point press and hold the menu key. Alternatively, go to the following menu:

MENU > (INSPECTION NAME) > REFERENCE MATERIAL

When you see the annotation for the selected inspection point at the top of your screen, you may save an image or video of that inspection point. To select a different inspection point, do either one of the following:

- Hold the BACK button for two seconds

- Select **MENU>(INSPECTION NAME)>LIST**

3.2.1d   Saving an Image

To save an image of the selected inspection point, press the SAVE button. During the save process, the following options are available:

- **Required Characterization** - If Characterization is required, the characterization set list will appear before the save menu. An option must be selected to move forward.

- **Save** - This option saves the image with the associated MDI data and filename.

- **Save with Flag** - This option saves the image with "-FLAG" appended onto the filename. If you use this option, you can then generate a report that includes only the flagged images.

- **Characterization** - This option allows you to assign characterization to this image.

- **Add Comments** - This option allows you to save comments along with the image. When generating a report, these comments are associated with the specific image.

Images saved using MDI are located in the inspection folder created at the beginning of the inspection. They are given file names based on your designated inspection points, and have meta data associated with them to ensure that they communicate with data management software such as GEIT *Rhythm*.

3.2.1e   Recording a Video

To record a video of the selected inspection point, press the RECORD button.

Videos recorded using MDI are located in the inspection folder created at the beginning of the inspection. They are given file names based on your designated inspection points.

3.2.1f   Stopping & Resuming an Inspection

To *stop* an inspection, which may be resumed or finished at a later time, go to the inspection list (see *"Selecting an Inspection Point" on page 20*) and select STOP.

To *resume* a previously stopped inspection, go to the following menu:

MENU>MENU DIRECTED INSPECTION>RESUME

Then, you may either resume the last inspection or browse for a previous inspection to be resumed.

3.2.2   XL Go

To perform an inspection on the XL Go VideoProbe, follow the instructions in the following sections.

3.2.2a   Starting an Inspection

To perform an inspection using MDI, select the following menu option:

LIVE MAIN MENU>MDI>(INSPECTION NAME)

3.2.2b   Entering Study Level Information

At the start of an MDI inspection, you are prompted to enter the study level information and to select the PC drive that will be used to save your inspection results. You can use either the on-screen keyboard or an external USB keyboard to enter your information on the VideoProbe.

Note: *For a list of supported keyboards, see your VideoProbe user's manual.*

3.2.2c   Selecting an Inspection Point

At this time, a list of your inspection points, which is organized by level, is displayed. To select the desired level, either press the right Soft Key or use the Joystick to navigate left or right. Continue to navigate through the inspection levels until you have reached the desired inspection point.

To view *Reference Material* associated with this inspection point, go to the following menu:

GOTO MENU > (INSPECTION NAME) > REFERENCE MATERIAL

When you see the annotation for the selected inspection point at the top of your screen, you may save an image or video of that inspection point. To select a different inspection point, go to the following menu:

GOTO MENU>(INSPECTION NAME)>CONTINUE

3.2.2d   Saving an Image

To save an image of the selected inspection point, press the ENTER button and then select SAVE. During the save process, the following options are available:

- **Required Characterization** - If Characterization is required, the characterization set list will appear before the save menu. An option must be selected to move forward.

- **Save** - This option saves the image with the associated MDI data and filename.

- **Save with Flag** - This option saves the image with "-FLAG" appended onto the filename. If you use this option, you can then generate a report that includes only the flagged images.

- **Characterization** - This option allows you to assign characterization to this image.

- **Add Comments** - This option allows you to save comments along with the image. When generating a report, these comments are associated with the specific image.

Images saved using MDI are located in the inspection folder created at the beginning of the inspection. They are given file names based on your designated inspection points, and have metadata associated with them to ensure that they communicate properly with data management software such as GEIT *Rhythm*.

3.2.2e   Recording a Video

To record a video of the selected inspection point, hold the RECORD button for two seconds.

Videos recorded using MDI are located in the inspection folder created at the beginning of the inspection. They are given file names based on your designated inspection points.

3.2.2f   Stopping & Resuming an Inspection

To *stop* an inspection, which may be resumed or finished at a later time, enter the following key strokes:

GOTO MENU>(INSPECTION NAME)>STOP

To *resume* a previously stopped inspection, enter the following key strokes:

LIVE MAIN MENU>MDI>RESUME>(INSPECTION NAME)

Then, you may either resume the last inspection or browse for a previous inspection to be resumed.

Chapter 4. Post-Inspection Reports

4.1 Generating a Report

After completing your inspection, you are ready to generate an MDI report. For instructions on this procedure, go to the appropriate section below for your GEIT VideoProbe model.

4.1.1 XLG3

Use the following menu to generate a report on the **XLG3** VideoProbe:

> **MENU>MENU DIRECTED INSPECTION>**
> **GENERATE REPORT>(DRIVE)>(INSPECTION NAME)**

4.1.2 XL Go

After completing your inspection, you can automatically generate an MDI report on the XL Go VideoProbe in MS Word format by entering the following key strokes:

> **GOTO MENU>(INSPECTION NAME)>REPORT**

Note: *Reports can be customized with cover pages, end notes, different image options, etc. (see* "Customizing MDI Reports" on page 26*).*

After designating your preferences for *Report Name*, *Images to Include*, *Image Layout*, *Cover Page*, and *End Note*, press ENTER to generate your report.

Note: *For more information see* "Tips & Tricks" on page 29. *Reports generated on the XL Go are saved as executable files (*.exe). To convert these to MS Word documents, simply run the executable file on your PC.*

4.2 Customizing MDI Reports

On both the XLG3 and the XL Go VideoProbes, you can customize your inspection report by specifying the following parameters:

- **Report Name** - Override the automatic inspection report file name.

- **Include Images** - Select either all images or only flagged images to be included in the inspection report.

- **Image Layout**

    - **Images with Details** - Include a table of information about the image in the report.

    - **Images Only** - Include only images and file names in the report.

    - **Image Size** - Select one of the following image sizes to be included in the inspection report:

        - Extra Small

        - Small

        - Medium

        - Large

    - **Image Layout** - Select one of the following image layouts to be used in the inspection report:

        - Image right of text

        - Image left of text

        - Image above text

        - Image below text

4.2   Customizing MDI Reports

- **Cover Page** - Select the cover page to be included in the inspection report.

  - **FACTORY DEFAULT** - Use the factory default settings for all parameters.

  - **BROWSE** - Select an MS Word document to be used as your inspection report cover page.

- **End Note** - Select the pages to be included as the last pages of the inspection report

  - **NONE** - Don't include any custom features in your inspection report.

  - **BROWSE** - Select an MS Word document to be included as your inspection report end note.

[no content intended for this page]

Chapter 5. Tips & Tricks

The information in this chapter is intended to provide you with information to help you use all of the MDI software features more effectively and more efficiently.

5.1 Generating Multiple Inspection Points

You can add multiple inspection points, based on a pattern, at one time by using the *Advanced Add* toolbar button highlighted in *Figure 16* below.

Figure 16: The *Advanced Add* Toolbar Button

To use this feature, you must first choose the *pattern* to be used for your inspection points. As shown in *Figure 17* below, the fields for *Text1* and *Text2* are repeated for each inspection point, while the *+n* field is incremented after each inspection point is added.

Figure 17: Advanced Add Data Entry Window

5.1 Generating Multiple Inspection Points (cont.)

As you enter your inspection point pattern in the *Advanced Add* window (see *Figure 17 on page 29*), the inspection points are added to the inspection tree, as shown in *Figure 18* below.
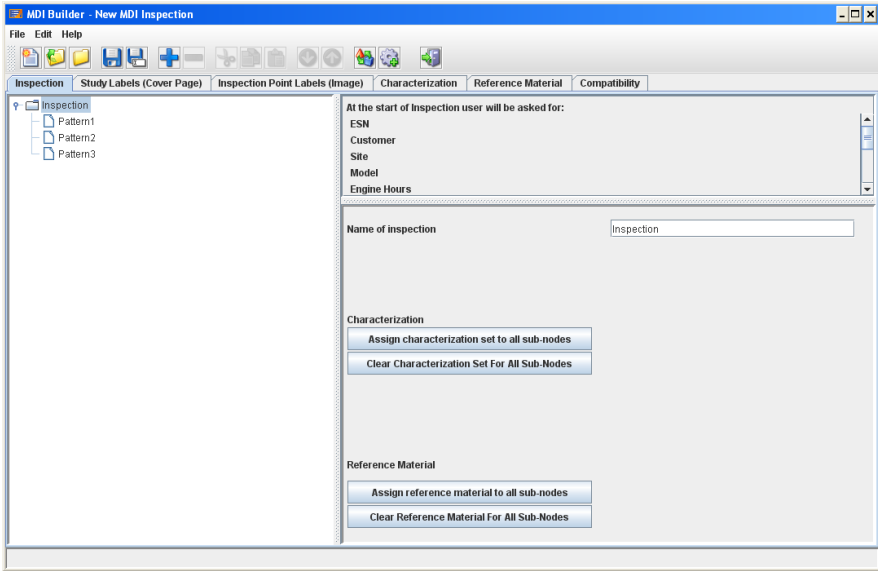
Figure 18: Inspection Tree with New Points Added

5.2   Resetting Filenames and Annotations

MDI Builder automatically constructs your file names based on the structure of your inspection tree. For example, in *Figure 19* below the first level of the inspection tree is *"InspectionPoint1"* (**1**) and the highlighted second level is *"SubLevel2"* (**2**). The automatic file name for this inspection point is *"InspectionPoint1_SubLevel2XXX"* (**3**) and the automatic annotation is *"InspectionPoint1 SubLevel2"* (**4**).

The MDI Builder gives you the option of changing the automatic text strings by overriding the *"Filename"* (**3**) and/or *"Annotation"* (**4**) fields.
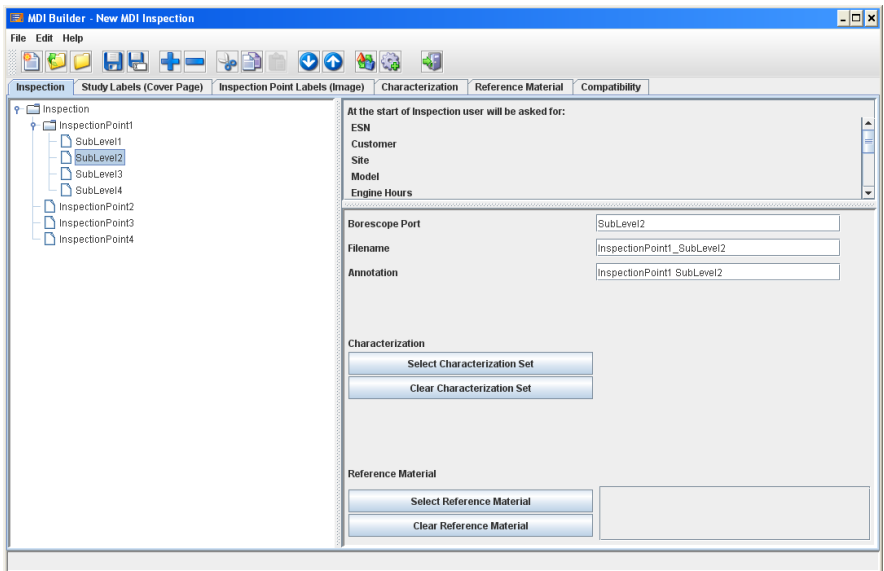
Figure 19: Automatic Filenames and Annotations

5.2   Resetting Filenames and Annotations (cont.)

If you have changed your filenames and/or annotations but later decide that you prefer the automatic text strings, simply select the *Reset Filenames/Annotations* toolbar button highlighted in *Figure 20* below.

Figure 20: The *Reset Filenames/Annotations* Toolbar Button

Selecting the *Reset Filenames/Annotations* toolbar button opens a window similar to *Figure 21* below. Then, select *"Filenames"* or *"Annotations"* or *"Both"* to reset the desired text strings.
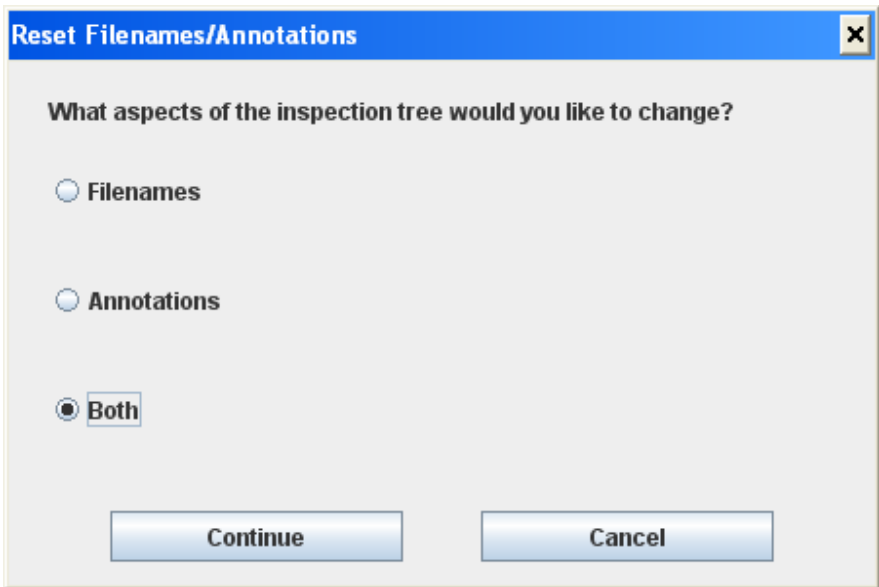
Figure 21: Reset Filenames and Annotations

5.3   Changing the Language

MDI Builder comes pre-loaded with eleven languages. To change the language used, select the following menu:

File>Languages>(Language Name)

When the above menu is selected, a window similar to *Figure 22* below opens. Simply choose the desired display language on the drop-down list.
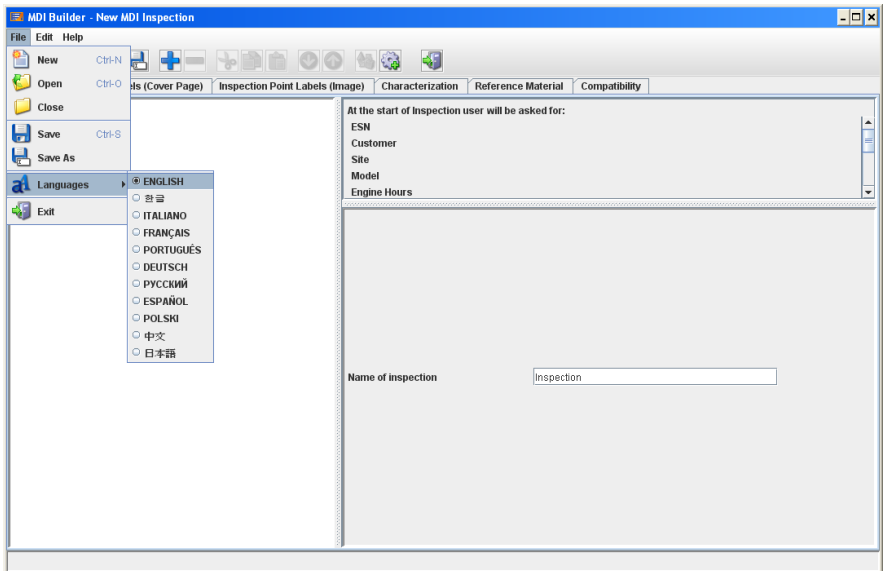
Figure 22: List of Available Languages

Note: *For the language change to take place, you must restart the MDI Builder application.*

IMPORTANT: *Remember to save your inspection before restarting the MDI Builder application.*

5.4 Expanding or Collapsing the Inspection Tree

To quickly expand or collapse your inspection tree, select one of the following menu options (see *Figure 23* below):

Edit>Expand Inspection Tree or **Edit>Collapse Inspection Tree**
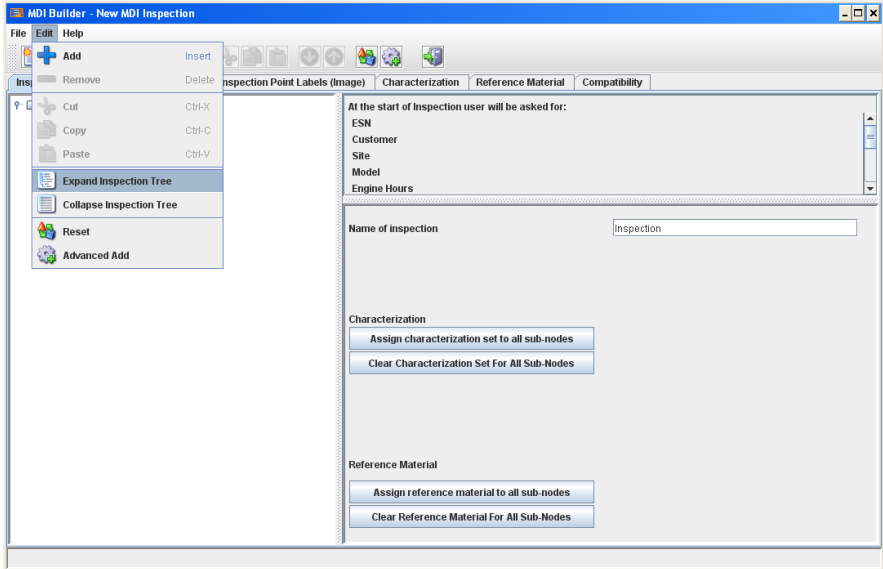
Figure 23: The *Expand/Collpase Inspection Tree* Menu

5.5   Designating Study Labels as Displayed/Required

You may designate your *Study Labels* as *Displayed* and/or *Required* using the *"Study Labels (Cover Page)"* tab in the MDI builder.

If the label highlighted in *Figure 24* below is not *Displayed*, an inspector will not see this as a field while using MDI on the VideoProbe. If a label is *Required*, an inspector will need to populate this field before continuing with their inspection on the VideoProbe.
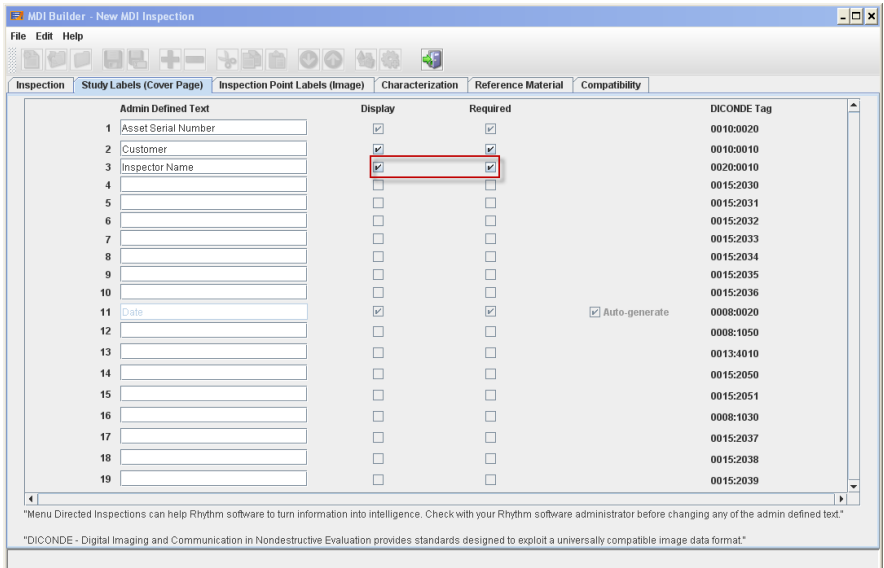
Figure 24: MDI Builder - Study Labels (Cover Page) Tab

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