

Coupling Telelogic DOORS with NI Requirements Gateway

This document describes how NI Requirements Gateway interfaces with Telelogic DOORS. Use this document to familiarize yourself with the default DOORS Basic and DOORS Advanced types in Requirements Gateway and how to capture requirements information from and create objects in a DOORS database using Requirements Gateway. Refer to Chapter 10, *Using NI Requirements Gateway with Telelogic DOORS*, of the *Getting Started with NI Requirements Gateway* manual for more information about the elements of the DOORS Basic and DOORS Advanced types and for a tutorial about using DOORS with Requirements Gateway.



Note Known issues exist between DOORS 8.0 and Requirements Gateway. If you are using DOORS 8.0, National Instruments recommends installing the 8.0.5 or later patch.



Note Requirements Gateway supports only DOORS 9.0 on Windows Vista.

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DOORS Elements

A DOORS module contains a tree of objects similar to numeric headings in a Microsoft Word document. An object specifies header text, contains descriptive text, and contains a unique ID within the module. Each object in a module can define its own attribute values. The data types for attributes include Boolean, numeric, date, and string values.

The DOORS types in Requirements Gateway associate objects with requirements by creating an XML intermediate file that Requirements Gateway can analyze. The intermediate file adds information to the DOORS objects to identify traceability information in Requirements Gateway.

Traceability elements in Requirements Gateway correspond to elements of DOORS modules in the following ways:

- **Section**—Equivalent to the hierarchy level of objects.
- **Macro-requirement**—Equivalent to the hierarchy of objects. Any object can be a requirement.
- **Requirement**—Equivalent to objects, if specific attributes match criteria that the DOORS types in Requirements Gateway define.
- **Entity**—Similar to objects, in which a DOORS Extension Language (DXL) rule is defined to validate that at least one out-link is attached to the objects.
- **Reference**—Equivalent to in-links and out-links for objects that represent requirements. In-links and out-links for objects that do not represent requirements are equivalent to link elements in Requirements Gateway.
- **Attribute**—Equivalent to attributes of objects.
- **Reference attribute**—Equivalent to typed in-links or out-links.
- **Link**—Equivalent to in-links and out-links for objects that do not represent requirements.
- **Text**—Equivalent to the text of objects.

Using the DOORS Types

Requirements Gateway includes the following default types for analyzing DOORS modules:

- **DOORS Basic**—Uses a Requirement Boolean object attribute to determine if objects in modules are requirements. In addition, the type uses the ID of the object as the requirement identifier.
- **DOORS Advanced**—Uses the value of the ObjectType object attribute in DOORS to determine if objects in modules are requirements. In addition, the type uses the value of the ReqID object attribute as the requirement identifier.

Refer to the [Creating Custom DOORS Types](#) section of this document for more information about creating custom DOORS types.

Selecting a DOORS Module to Analyze

When you add a DOORS document to a Requirements Gateway project, you must specify the DOORS module to include in the document. Click the **File Browse** button in the File or Directory column on the project pane of the Configuration dialog box to launch the Select DOORS module dialog box, as shown in Figure 1. Use this dialog box to log in and navigate to a DOORS database to select a module.

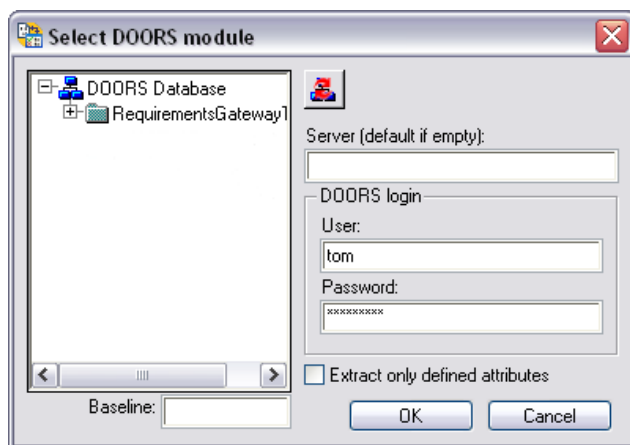


Figure 1. Select DOORS Module Dialog Box

The Select DOORS module dialog box contains the following options:

- **Database Tree**—Lists the modules and projects in the targeted DOORS database.

- **Update DOORS Tree**—Updates the tree view with any new modules or projects added to the DOORS database externally from Requirements Gateway since you launched the Select DOORS module dialog box.
- **Server (default if empty)**—The path to the server that contains the target DOORS database if the server is different from the current server that hosts the Requirements Gateway application. Leave this control empty if the server is the same as the current server.
- **DOORS login**—Contains the following options for accessing the database:
 - **User**—Username for accessing the database.
 - **Password**—Password for the specified username.
- **Extract only defined attributes**—Specifies to extract only the attributes from objects that the type defines to improve performance when collecting data from DOORS.
- **Baseline**—The baseline you want to extract from the DOORS database.

Variables of the DOORS Types

When you add a DOORS Basic or DOORS Advanced document to a project, document variables become available on the Document Details pane of the Project pane of the Configuration dialog box. Select a variable from the **Variable** ring control, as shown in Figure 2.

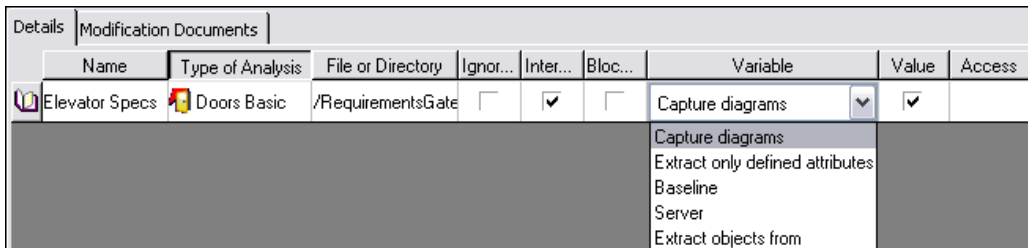


Figure 2. Document Details Pane for a DOORS Basic Document

The DOORS types include the following variables:

- **Capture diagrams**—Specifies to import DOORS images. Enable the option in the **Value** column to activate this variable.

You can import a DOORS image only if you paste the image in the Object Text control of the Object Properties dialog box. Right-click an object and select **Properties** from the context menu to launch the Object Properties dialog box.

- **Extract only defined attributes**—Specifies to extract only the attributes from objects that the type defines to improve performance when collecting data from DOORS. Enable the option in the **Value** column to activate this variable.
- **Baseline**—Specifies the baseline you want to extract from the DOORS database. Enter the baseline in the **Value** column. You can also specify a baseline for a database in the **Baseline** control in the Select DOORS module dialog box.
- **Server**—Specifies the server you want to consider for the DOORS database. Enter the server name in the **Value** column. You can also specify a server for the database in the **Server** control in the Select DOORS module dialog box.
- **Extract objects from**—Specifies that you want to use a DXL regular expression to extract objects from a DOORS module. Enter the DXL regular expression in the **Value** column. When a parent object satisfies requirements, all sub-objects are extracted. Refer to DOORS documentation for more information about DXL expressions.

Intermediate File

The DOORS types capture the content of a DOORS module and generate an XML intermediate file that contains the following information:

- A root `<Object>` tag for a DOORS object, with `id`, `number`, and `Element_Identifier` XML attributes.
- An `<Attribute>` tag that is a child of the `<Object>` tag. The intermediate file includes an `<Attribute>` tag for each attribute of the DOORS object. The `<Attribute>` tag includes `name` and `value` XML attributes.
- A `<Text>` tag for the text of a DOORS object.
- An `<In-link>` tag for an in-link of a DOORS object, with `linkModule` and `source` XML attributes.
- An `<Out-link>` tag for an out-link of a DOORS object, with `linkModule` and `target` XML attributes.
- A `<Picture>` tag for a diagram. The text contained in a `<Picture>` tag is the binary code for the image file.

The XML structure is the same for all DOORS documents.

Creating Custom DOORS Types

The organization and format of the module data might not adhere to the format that the default DOORS types require. You can create a custom type for capturing information from DOORS modules with alternate formatting for traceability information by duplicating the default DOORS Basic or DOORS Advanced type and modifying the duplicate. Refer to Chapter 5, *Customizing Types*, of the *Getting Started with NI Requirements Gateway* manual and Chapter 2, *Customizing Types and Type Elements*, of the *NI Requirements Gateway Customization Guide* for more information about creating custom types.

Selecting a Conversion Tool

When you create a custom DOORS type, you must select a conversion tool from the **Convert tool** ring control on the Analysis tab of the Types pane of the Configuration dialog box. The intermediate file that a custom DOORS type generates must conform to the format that the conversion tool expects.

You can select from the following conversion tools:

- **Doors**—Captures traceability information from DOORS modules in an ASCII intermediate file instead of in the default XML intermediate file.
- **DoorsXML**—Captures traceability information from DOORS modules in an XML intermediate file. The default DOORS types use this conversion tool.

Custom Examples

The DOORS example project, located in `<Requirements Gateway Public>\Examples\Doors\DOORS Example.rqt`, contains four DOORS documents that use the DOORS Basic type, DOORS Advanced type, and two custom DOORS types, respectively. Use this example to familiarize yourself with the XML tags, attributes, and values that the DOORS types expect. You can also refer to `DOORS Example Overview.doc`, located in the example project directory, for more information about each document in the DOORS example.

Exporting to DOORS

You can export traceability information from external source documents that cover requirements specified in a DOORS module into a separate DOORS module.

Complete the following steps to export elements from a source document to DOORS.



1. Launch DOORS and log in to the database. Your user login must have the authority to create projects.
2. In the Requirements Gateway main window, select the document that you want to export to DOORS and click the **Export Document to DOORS** button, shown at left, on the toolbar in the main window to launch the Export document to DOORS dialog box. You can also right-click the selected document and select **Tools»Export Document to DOORS** from the context menu.
3. In the **Source** tree view, select the elements that you want to export. The Source tree view displays the first two levels of the hierarchy of the selected document.
4. In the **Types** control, select the specific element types that you want to export. The Types control displays a section of the elements selected in the Source list.

If you deselect an element in the Source tree view, Requirements Gateway does not export these elements, even if you select the element type in the Types control.

5. In the **Target** control, select a location in the DOORS database in which to save the source document information.
6. Specify a module name in the **New module** control. The default name is the name of the document defined on the Project pane of the Configuration dialog box for the source document.
7. Specify a prefix in the **Prefix** control if you want the object identifiers in the new module to use a specific prefix.

Figure 3 shows an example of a completed Export document to DOORS dialog box for a LabVIEW document.

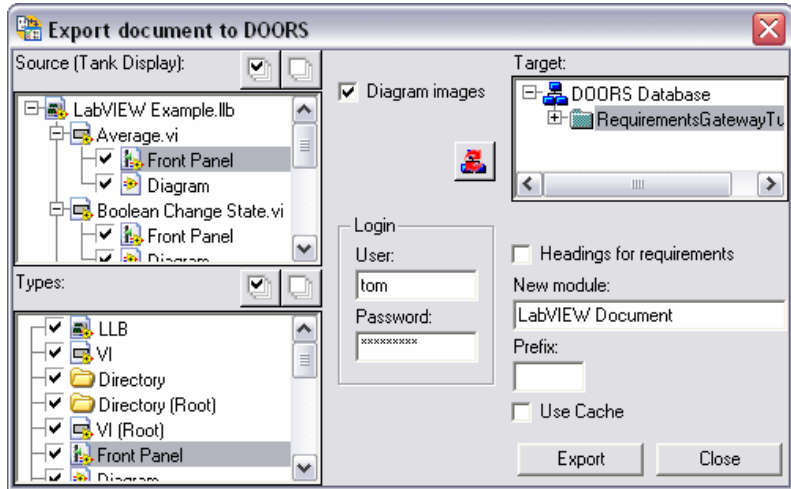


Figure 3. Completed Export Document to DOORS Dialog Box

8. Click **Export** to begin exporting.

Before exporting the elements to DOORS, Requirements Gateway launches a confirmation dialog box that lists the new elements to export to DOORS, as shown in Figure 4.

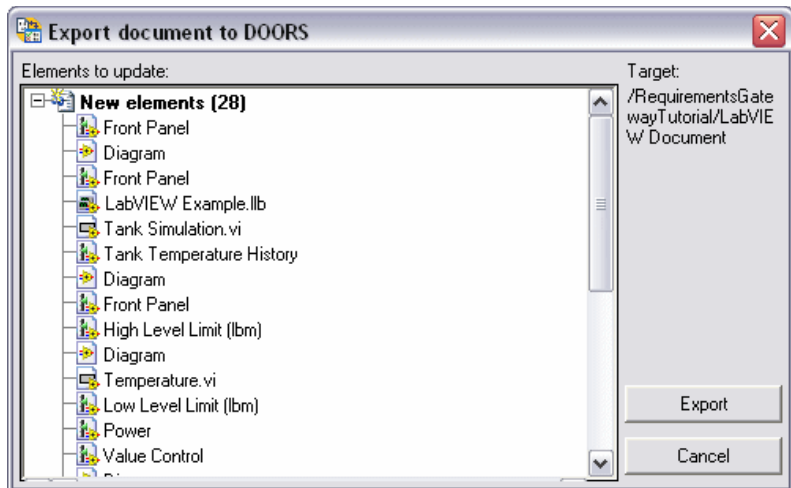


Figure 4. Confirmation for Export Document to DOORS

The first time you export a document, the Elements to update control lists the contents of the document under the New elements item.

9. Click **Export** again to finalize the export operation.
10. Click **OK** when Requirements Gateway displays a prompt that states that the operation completed.
11. Click **Close** to close the Export document to DOORS dialog box.

In DOORS, double-click the module name you specified in step 6 to display the module in the Formal Module window, as shown in Figure 5. The content of the module mirrors the traceability information that Requirements Gateway displays.

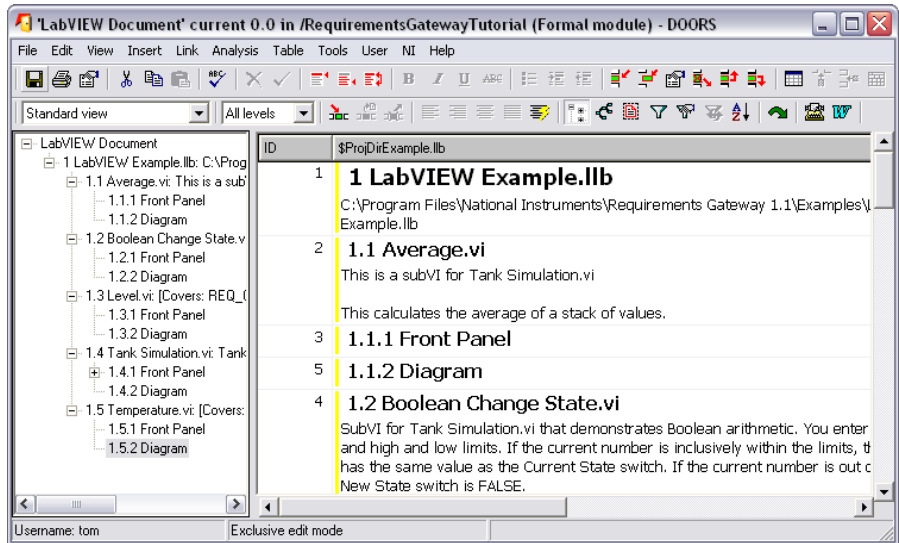


Figure 5. DOORS Formal Module Window

National Instruments recommends that you modify a source document element in the native editing environment, not in the corresponding DOORS module. For example, modify a LabVIEW document in LabVIEW, not in the DOORS module. DOORS erases any changes you make to objects in DOORS that you exported from Requirements Gateway when you export the same project again.

In the Formal Module window, select **Edit»Attributes** to launch the Columns and Attributes window for the module, which displays a list of all attributes for the imported DOORS module. Requirements Gateway creates Element Identifier, Element Label, and Element Type attributes for the module, as shown in Figure 6.

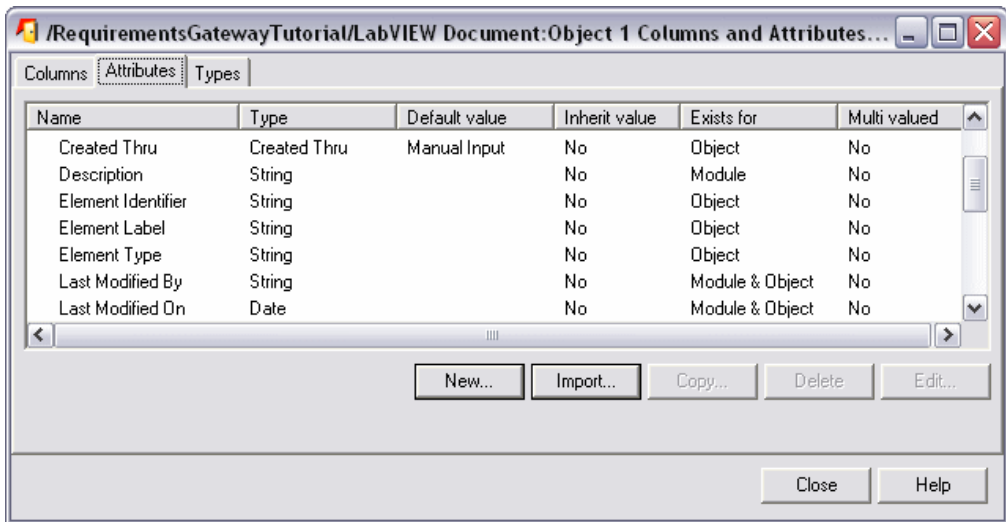


Figure 6. Columns and Attributes Window

National Instruments recommends that you do not edit these elements. Requirements Gateway uses these attributes to manage objects.

You can add attributes that you define to DOORS modules that you create. Select **New** in the Columns and Attributes window to launch the New Attribute dialog box, in which you can specify a new attribute to add to the module.

Additional links can originate from or lead to this module. Requirements Gateway does not modify the links.

Traceability and Links

When you export Requirements Gateway documents to DOORS, DOORS creates link modules to help you manage the traceability to and from the source document module in DOORS. DOORS creates link modules for each reference or link element that the source document type defines. For example, when you export a LabVIEW document, DOORS creates link modules for each reference or link element that the LabVIEW type defines.

DOORS displays the new link modules in the list view of all the modules in the database. The Name column displays the name of the module, and the Type column identifies the module as a link module.

Keep the following caveats in mind when you export references and links to DOORS:

- DOORS does not create link modules if reference or link information that the type defines does not exist in the source document. For example, if you define a reference element named Implements for a type, but the Requirements Gateway project does not contain any Implements references, DOORS does not create the corresponding Implements link module.
- If you create links inside DOORS between a module and a covering document previously exported from Requirements Gateway, the new reference information appears when you next reload the DOORS module in Requirements Gateway.
- If you used the Graphical View to create internal references, Requirements Gateway exports the coverage links to DOORS as link modules. Refer to the *NI Requirements Gateway Help* for more information about using the Graphical View to create internal references.

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