Honeywell

Experion PKS

Qualification and Version Control User Guide

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R210
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Notices and Trademarks

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About This Document

Revision Notes

The following list provides notes concerning all revisions of this document.

Doc ID	Rel ID	Date	Notes
EP-DCX253	R210	10/25/04	Initial Release

References

The following list identifies all documents that may be sources of reference for material discussed in this publication.

Document Title	Doc ID

Contacts

World Wide Web

The following lists Honeywell's World Wide Web sites that will be of interest to our industrial automation and control customers.

Honeywell Organization	WWW Address (URL)
Corporate	*http://www.honeywell.com*
Automation & Control Solutions	*http://www.acs.honeywell.com*
International	*http://www.honeywell.com/Business/global.asp*

Telephone

Contact us by telephone at the numbers listed below.

	Organization	Phone Number	
United States and Canada	Honeywell International Inc. Automation & Control Solutions	1-800-223-8947 416-502-5200 1-800-822-7673	Sales Canada Tech. Support
Asia Pacific	Honeywell Ltd. Hong Kong	852-2331-9133	
Europe	Honeywell Ltd. Brussels, Belgium	32 2-728-2704	
Latin America	Honeywell International Inc. Sunrise, Florida U.S.A.	954-845-2600	

Symbol Definitions

The following table lists those symbols used in this document to denote certain conditions.

Symbol	Definition
	**ATTENTION:** Identifies information that requires special consideration.
	**TIP:** Identifies advice or hints for the user, often in terms of performing a task.
	**REFERENCE -EXTERNAL:** Identifies an additional source of information outside of the bookset.
	**REFERENCE - INTERNAL:** Identifies an additional source of information within the bookset.
CAUTION	Indicates a situation which, if not avoided, may result in equipment or work (data) on the system being damaged or lost, or may result in the inability to properly operate the process.
	**CAUTION**: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. **CAUTION** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	**WARNING**: Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death. **WARNING** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	**WARNING, Risk of electrical shock:** Potential shock hazard where HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 VDC may be accessible.

Symbol	Definition
	**ESD HAZARD:** Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices
	**Protective Earth (PE) terminal:**. Provided for connection of the protective earth (green or green/yellow) supply system conductor.
	**Functional earth terminal:** Used for non-safety purposes such as noise immunity improvement. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national local electrical code requirements.
	**Earth Ground. Functional earth connection.** NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.
	**Chassis Ground:** Identifies a connection to the chassis or frame of the equipment shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.

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Qualification and Version Control System

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Qualification and Version Control System Overview

The Qualification and Version Control System (QVCS) provides version management for all tagged objects and a customer defined lifecycle management.

Lifecycle management is used:

- to define the qualification states objects will go through from inception to decommissioning,
- for the approvals required to move from one qualification state to another, and
- to control what qualification state a strategy must be in to be downloaded into a control execution environment such as the C200 controller.

In addition, the QVCS maintains a version repository of each object and provides an audit trail and compare capability for all configuration changes.

When the QVCS option is enabled by the license, the system will restrict certain engineering actions like modifications and controller loads. An object needs to be checked into the QVCS system and assigned to an appropriate qualification state to allow load to a controller. Before modifications can be made an object needs to be checked out once it is under version control.

The QVCS Manager, launched from Control Builder, enables checking out objects, checking in objects, viewing version properties, performing Administrative tasks like viewing Version System Logs, configuring Electronic signatures. Revert Label specific operations can be performed, like Label Maintenance, Applying/Removing Revert Labels to Objects and Reverting to Version/Label.

QVCS Manager, the main interface of the Qualification and Version Control System, is tightly coupled to the instance of the Control Builder, which launched it. Typical use includes launching QVCS Manager after selecting one or more Strategies/User Templates in Control Builder. All the selected objects are then displayed in the QVCS Manager where Version Control specific operations may be performed. All version control operations are performed in QVCS Manager only.

QVCS concepts:

- Qualification life cycle – capability to enforce GAMP guidelines regarding control system development.
- Objects definition – all tagged objects in the Experion PKS Control Builder such as CM, SCM, CPM, CEE, IOLIM, FIM, IO, etc.

- Version repository – the QVCS maintains a repository with all versions of each configured object.
  - Check-out – means locking a particular version of an object in the QVCS and allowing it to be changed by a single user.
  - Check-in – to place a new or modified object under version control.
  - Audit trail – a log of all QVCS interactions for audit purposes.
  - Revert – the retrieval of a specific version of an object or set of objects.
  - Revert Label – a means to identify a set of unique objects that should always be used together to perform a certain control function.
  - QVCS administration – all tasks that are required to initially setup and maintain the Qualification and Version Control system.
  - Fallback state – defines the qualification state the object will revert to after it has been modified and checked back into the QVCS.
  - Restricted signing state – this option allows the implementation of the four-eye GAMP principle (Good Automation Manufacturing Principles). The user who made the qualification transition to the state indicated by the restricted signing state cannot make the qualification state transition to the qualification state on which this restricted signing state is defined.

The following windows are available through QVCS Manager:

- Manager Window – Main View
- Manager Window – Query View
- Versions Window
- History Window
- Qualification and Version Control System Log Window

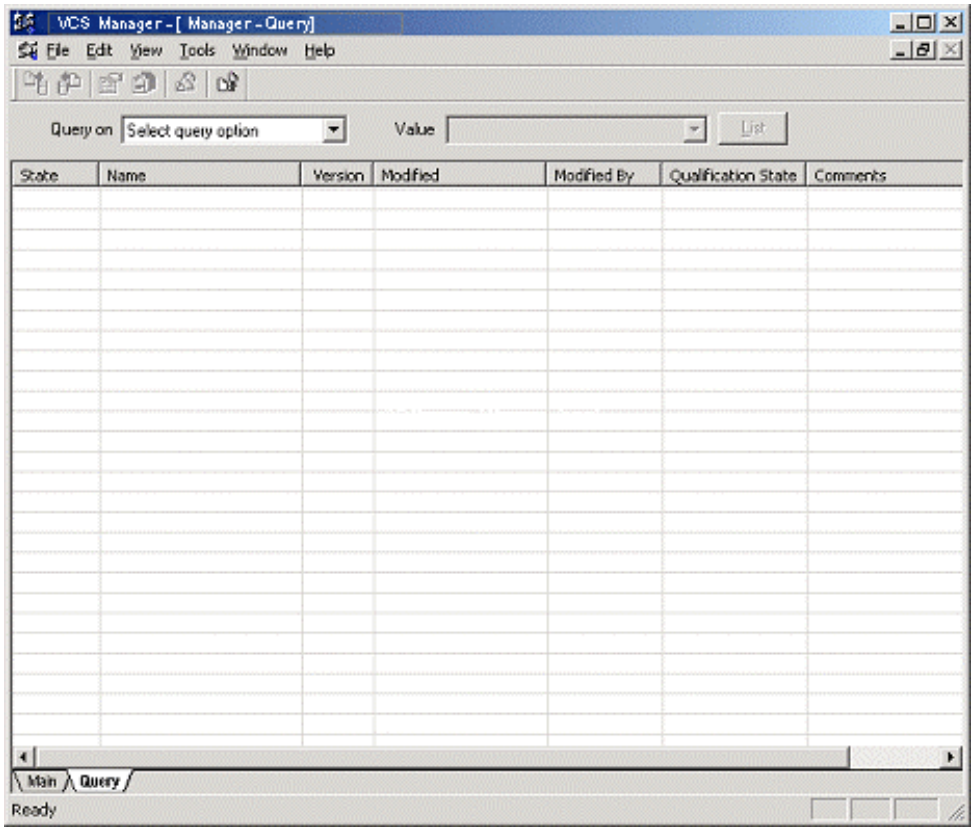
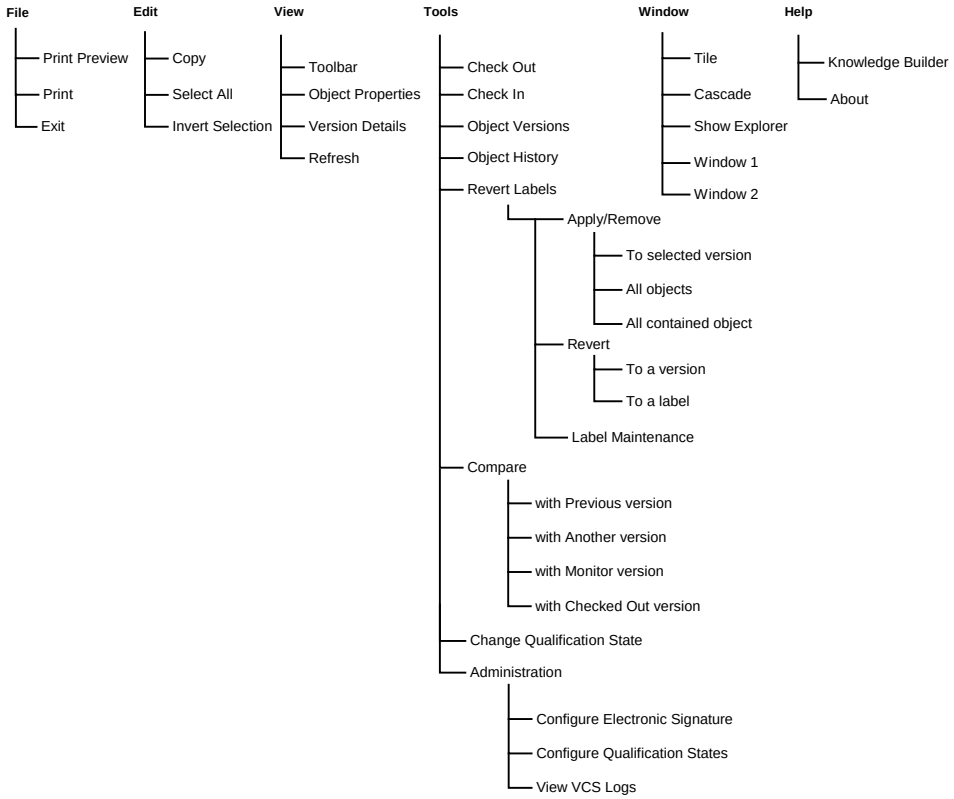


Figure 1 QVCS Main Window

QVCS Manager Menus



Menu Name	Menu Item	Description
File	Print Preview	Shows the preview of the contents of the active window that will be printed to the printer.
	Print	Prints the current active window contents. Brings up the Print dialog box to choose the printer and the contents are printed.
	Exit	Closes the QVCS Manager.

Edit	Copy	This menu is active only when the Versions Window is selected, and copies the contents of the Version Information text window to the clipboard.
	Select All	Selects all items in the active window.
	Invert Selection	Inverts the selected items in the active window. All selected items in the list are unselected, and the rest are selected.
View	Toolbar	Shows/hides the QVCS toolbar.
	Object Properties	Shows the Properties Dialog of the selected object.
	Version Details	Loads the details of the version to the Versions Window.
	Refresh	Refreshes the active window.
Tools	Check Out	Shows the Check Out dialog for all selected objects.
	Check In	Shows the Check In dialog for all selected objects.
	Object Versions	Shows the Versions Window for the selected objects.
	Object History	Shows the History Window for the selected objects.
	Revert Labels	Apply/Remove Labels: • To selected version: Applies/removes the labels to the selected version of the objects only. Shows the Apply/Remove Labels to Version dialog • All objects in project tree: Applies/removes the labels to the current version of all objects in the project and library trees. Shows the Apply/Remove Labels to All dialog. • All contained objects: Applies/removes the labels to all of the contained objects. Shows the

		Apply/Remove Labels to Contained dialog. Revert: • To a version: Applies Revert to Version to selected objects. Shows the Revert to Version dialog. • To a label: Shows the Revert to Label dialog. Label Maintenance: Shows the Revert Label Maintenance Dialog.
	Compare	With Previous Version: Compares the selected object version with the previous object version. With Another Version: Compares the selected object version with another object version. With Monitor Version: Compares the selected object version with the monitor object version. With Checked Out Version: Compares the selected object version with the currently checked out version of the object in the Project/Library tree in Control Builder.
	Change Qualification State	Shows the Change Qualification State dialog for the selected object.
	Administration	Configure Electronic Signature: Shows the Configure Electronic Signature dialog. Configure Qualification States: Shows the Qualification State Configuration dialog. View QVCS Logs: Shows the Qualification and Version Control System Log Window.
Window	Tile	Tiles all opened windows.

	Cascade	Cascades all opened windows.
	Show Manager	Brings the Manager window to the front of all other windows.
	Window 1…n	Lists all open MDI windows
Help	Knowledge Builder	Launches the Knowledge Builder and activates the main QVCS page. Selecting the F1 key will also launch Knowledge Builder.
	About	Shows the About dialog.

QVCS Manager Toolbar

The toolbar provides fast and easy access to frequently used functionality. Below is the list of toolbar items and the functionality associated with it. Click on the toolbar button to invoke the function.

Table 1 Toolbar Icons and Their Functions

Toolbar Icon	Tool Tip	Menu Item
	Check Out	Tools->Check Out
	Check In	Tools->Check In
	Object Properties	View->Object Properties
	Object History	Tools->Object History
	Compare Previous	Tools->Compare->with Previous version
	Revert	Tools->Revert Labels->Revert->To label

Using QVCS Manager

ATTENTION

Prior to using QVCS, the users must be defined on the Operator Configuration window in Station.

Launching QVCS Manager from Control Builder

Manager can be launched from the Control Builder using the options shown below.

- Launch from the Control Builder Tools Menu:
  Tools -> QVCS Manager
- Launch from the Project Tree:
  Right-click context menu -> QVCS Manager

If the Qualification and Version Control System is not licensed, the menu item will not be available.

You can close the QVCS Manager by closing the instance of the QVCS Manager or the Control Builder.

Manager Window

The Manager window is the main window of the QVCS Manager and is activated when the application is launched. This window contains 2 views: Main View and Query View.

Main View

The Manager Main view lists all the objects selected in the Control Builder when the QVCS Manager is launched from the Control Builder. For example, if the example_cascade and example_motor strategies were selected in the Control Builder and QVCS Manager was invoked, the display would be as shown in the Figure below.

The list does not automatically refresh when new objects are selected in the Control Builder. To update the list, return to Control Builder, select the new objects to be shown, and launch the QVCS Manager again. All basic QVCS operations on the object can be performed from the Main view. The operation can be invoked from the menu, toolbar or the right-click context menu.

The main window will show the list of selected objects and their version attributes in the object list.

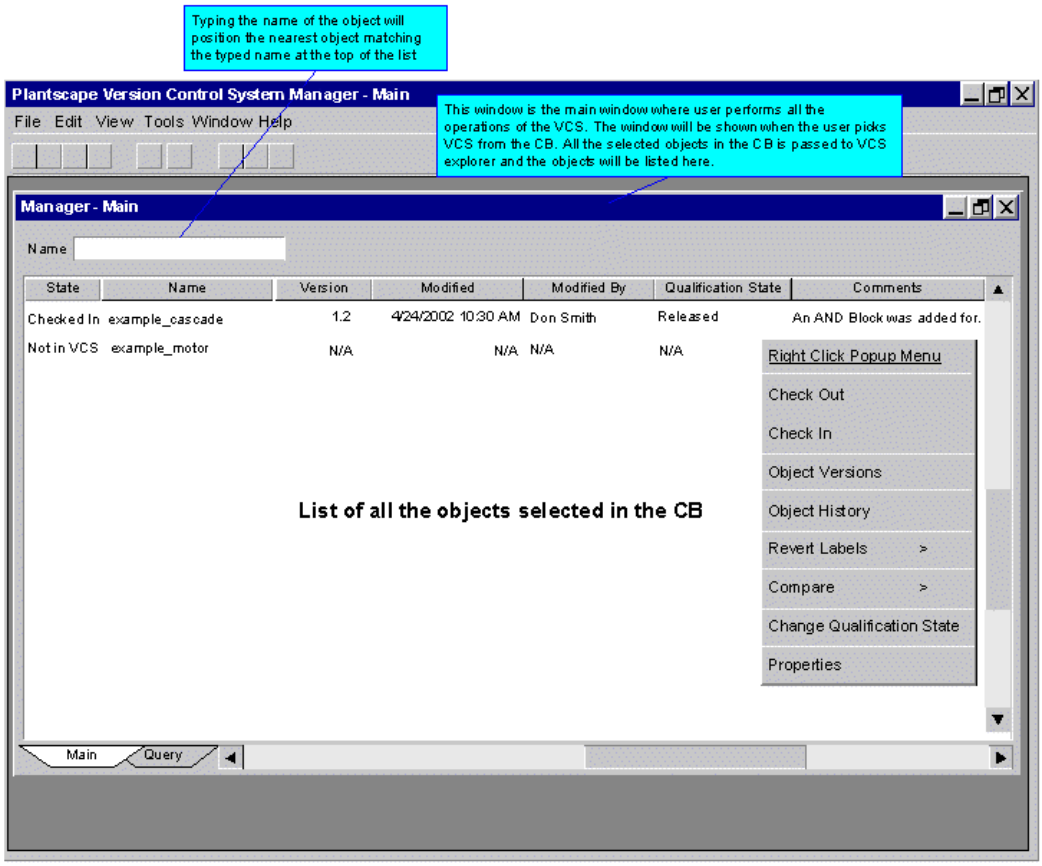


Figure 2 Manager Window - Main View

Object List

- The objects selected in Control Builder will be listed in Alphabetical Order using the Object name.
- Clicking on the column name will sort the list in the column, and the sort order will toggle between ascending and descending.
- The object in the list can be selected using the standard item selection procedure of windows common list control (i.e. Click, Shift + Click, Ctrl+Click)
  - Multiple objects can be selected in the list
  - Right-mouse click will bring up the Context menu

Positioning to the Nearest Object Name

- Type the name of the object in the Edit box. The list will bring the nearest object to the top of the list that matches to the typed name.
- This functionality will work only if the objects are sorted on the name of the object otherwise the feature is disabled.

Right-click Context Menu

The context menu contains options to:

- Check-in
- Check-out
- View object version
- View object history
- Change qualification state
- View object properties
- Perform Revert Label operations
- Compare versions

Query View

The Manager Query view lists the objects based on a query, no Control Builder object selection is required. The operation can be invoked from the menu, toolbar or the right-click menu. The contents of the window can be printed by selecting File -> Print from the drop-down menu.

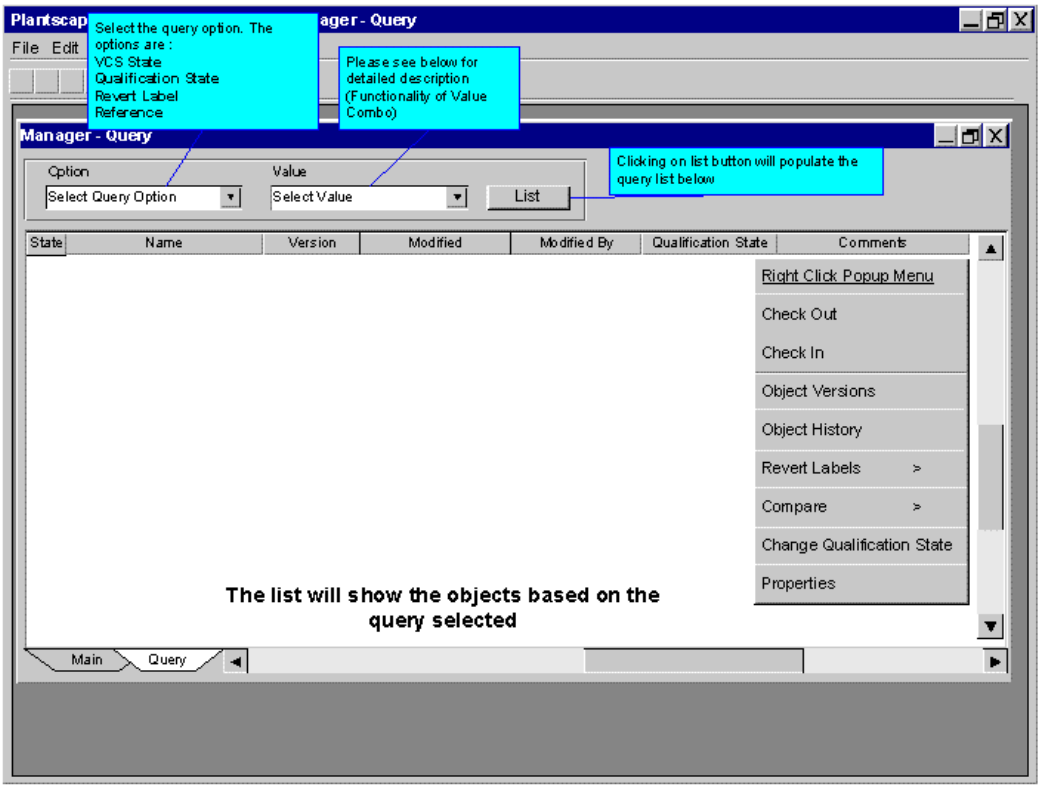


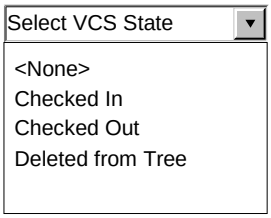
Figure 3 Manager Window - Query View

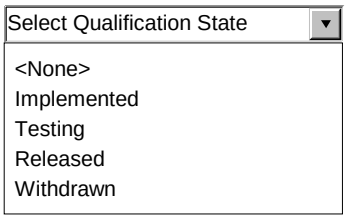
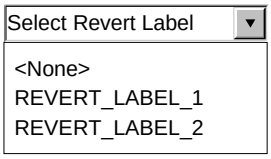
Query List

- The objects based on the query will be listed in Alphabetical Order using the Object name.
- Clicking on the column name will sort the list on the particular column and the sort order will toggle between ascending and descending.
- The object in the can be selected using the standard item selection procedure of windows common list control (i.e. Click, Shift + Click, Ctrl+Click).
- Multiple objects can be selected in the list.
- Right-mouse click will bring up the Context menu.

Forming and Executing the Query

- The Options combo box will show four options for the query.
  - QVCS State
  - Qualification State
  - Revert Label
  - Reference
- The available values will be filled based on the selection in Options combo.

State	Available values
If QVCS State is selected, the pre-defined QVCS states will be listed.	

State	Available values
If Qualification State is selected, the customer defined qualification states will be listed.	
If Revert Label is selected, the customer defined Revert Labels defined in the QVCS will be listed.	
If the Reference is selected, the object name must be entered manually to find references.	

- After selecting the query option and the value for the query, clicking on the List button will populate the query list based on the query

Context Menu

The context menu will have options to:

- Check-in
- Check-out
- View Object Version
- View Object History
- Change Qualification State
- View Object Properties
- Perform Revert Label operations and Compare versions

Versions Window

The versions window is used to view all the versions of the object. For each selected object a separate Versions window is opened. Two version window instances for the same object cannot be opened.

In the version detail view, the version information of the object can be viewed in the version detail view on the right side, and different versions of the object can be compared.

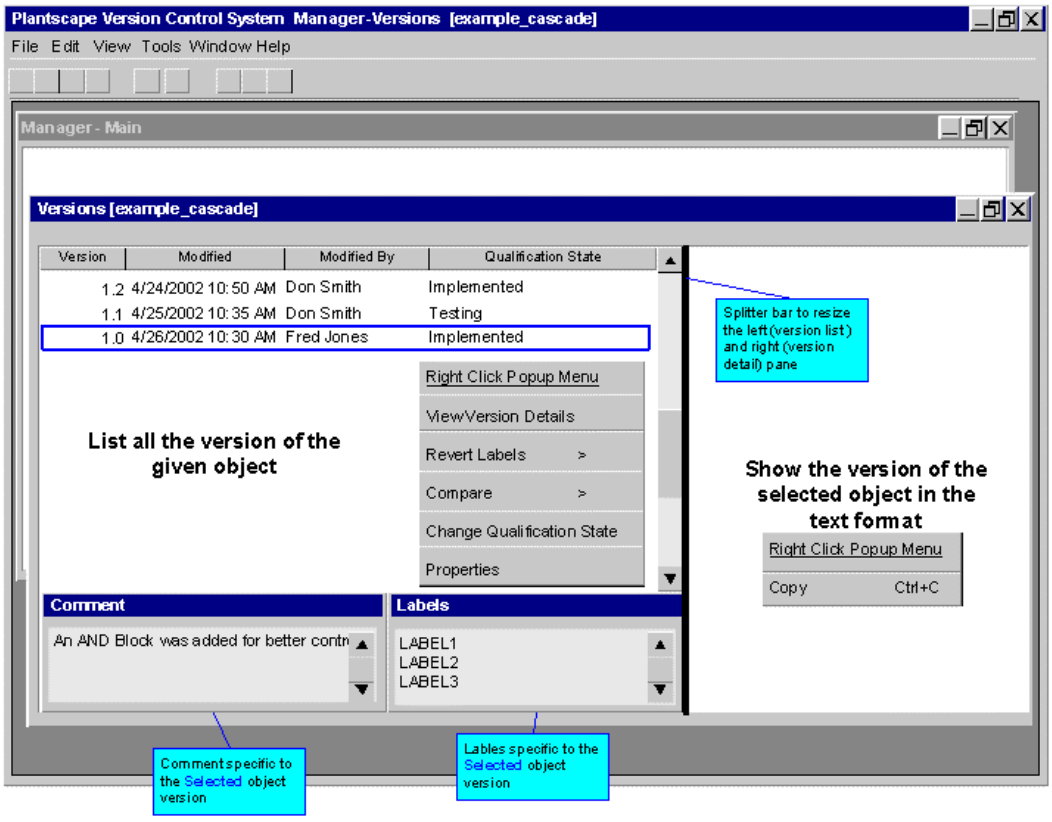


Figure 4 Versions Window

Using the Versions Window

Opening the versions window

Select the object in the Main or Query View -> select the Tools drop-down menu -> select Object Versions.

Comparing versions

Compare version with previous version

Step	Action
1	Select a version in the list by clicking on it.
2	Select Compare from the drop-down menu -> select With Previous Version. This will launch the Diff Tool to compare the versions of the object.

Compare version with another version

Step	Action
1	Select a version in the list by clicking on it.
2	Select Compare from the drop-down menu -> With Another Version.
3	The mouse cursor will change. Select another version to compare by clicking on it. This will launch the Diff Tool to compare the selected versions.

Compare version with monitor version

Step	Action
1	Select a version in the list by clicking on it.
2	Select Compare from the drop-down menu -> With Monitor Version. This will launch the Diff Tool to compare the selected versions.

Compare version with checked-out version

Step	Action
1	Select a version in the list by clicking on it.
2	Select Compare from the drop-down menu -> With Checked-out Version. This will launch the Diff Tool to compare the selected versions.

Viewing object version in text format

Step	Action
1	Select a version in the list by double-clicking on it, or selecting “View Version Details” in the context menu.
2	The information of the selected version is loaded into the version details view.

Changing view size

Use the splitter bar to change the size of the view by dragging horizontally.

Printing version information

In the Versions view: Select the File drop-down menu -> select Print.

History Window

The History window will display the set of logs associated with the selected object. For each selected object a separate History window is opened. Two history window instances for the same object cannot be opened. The history can be filtered based on the query.

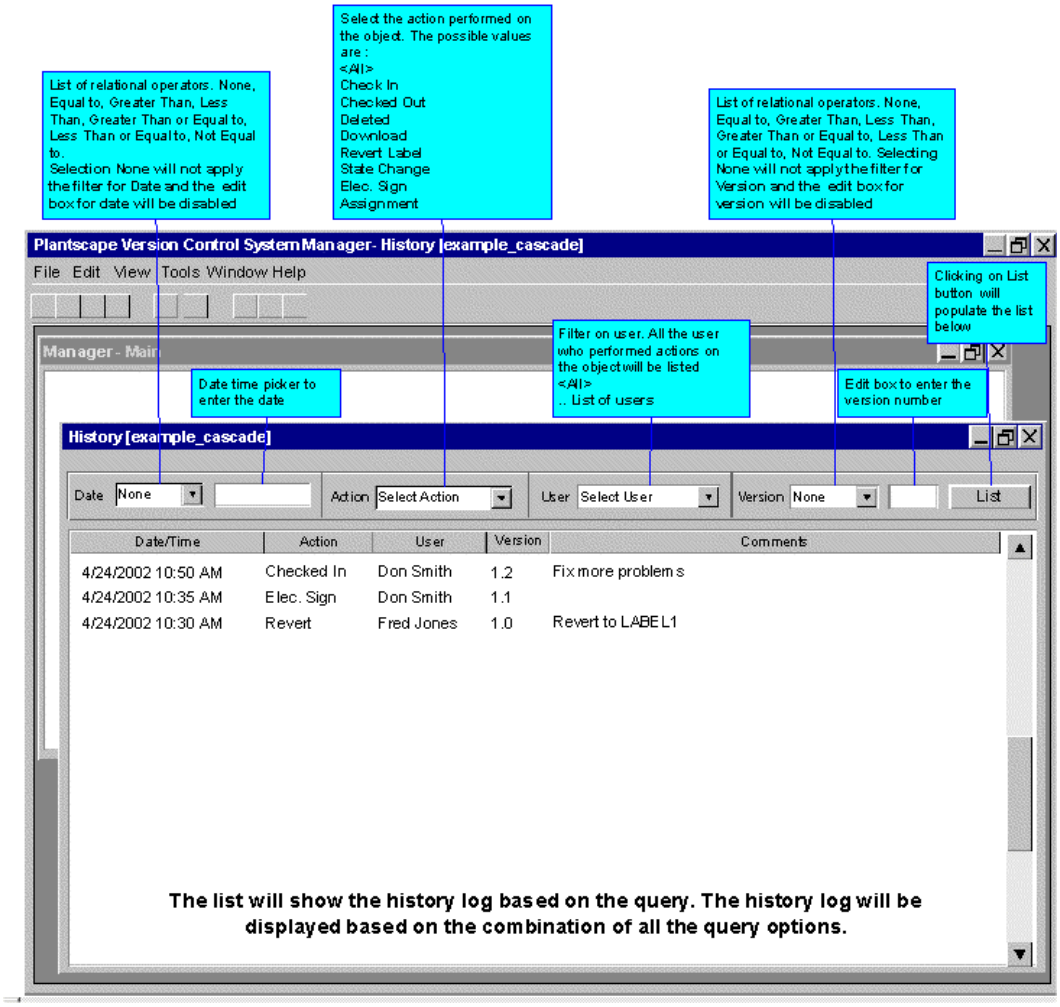


Figure 5 History Window

Using the History Window

Opening the history window

Select the object in the Main or Query View -> select the Tools drop-down menu -> select Object History.

Printing the history

In the History view: Select the File drop-down menu -> select Print.

Filtering the history logs

Step	Action	
1	Select the filtering options provided in the window. For example, to filter logs with respect to:	
	Date:	Select the relational operator from the combo adjacent to the date label and select the date from the date time picker.
	Action:	Select the actions listed in the combo adjacent to the action label.
	User:	Select the particular user from the list of users in the combo adjacent to the user label.
	Version:	Select the relational operator from the combo adjacent to the version label and enter the version number in the edit box provided.
2	Click on the List button and the logs will be populated matching the condition of the query. All the query options will be **AND**ed to generate the result of the query.	

Log Window

The QVCS log window displays any logs that have been generated by the QVCS. These include administrative logs, operational logs and object version specific logs. Only one instance of this window can be opened. The log entries can be filtered based on different query options.

Note: Administrative privileges are required to access this window.

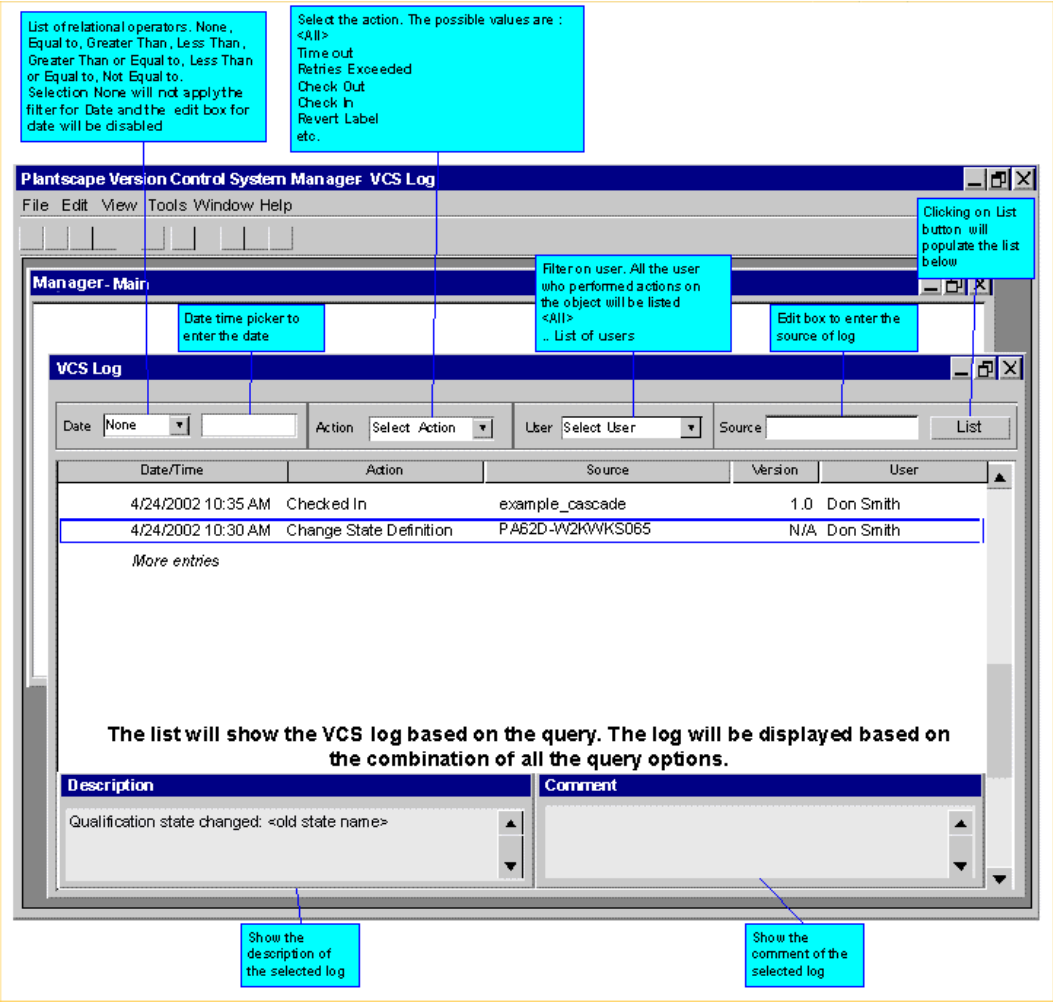


Figure 6 Log Window

Logs List

- The logs list shows all logs generated by the QVCS.
- The logs are arranged in the reverse chronological order, latest log first.
- The description and the comment of the selected log item is shown in the edit boxes provided below the list
- Clicking the column name will sort the list on the particular column and the sort order will toggle between ascending and descending.
- The Description and comment of the selected history log are shown in the Description and Comment windows respectively.

Using the Log Window

Opening the log history window

Select the Tools drop-down menu -> select Administration -> View QVCS Logs.

Printing the log history

Select the File drop-down menu -> select Print.

Filtering the history logs

Step	Action	
1	Select the filtering options provided in the window. For example, to filter logs with respect to:	
	Date:	Select the relational operator from the combo adjacent to the date label and select the date from the date time picker.
	Action:	Select the actions listed in the combo adjacent to the action label.
	User:	Select the particular user from the list of users in the combo adjacent to the user label.
	Source:	Enter the source (object name/workstation name) in the edit box provided adjacent to the source label.
2	Click on the List button and the logs will be populated matching the condition of the query. All the query options will be **AND**ed to generate the result of the query.	

Check-in Dialog Box

Checking-in an object is to take the current image of an object as it exists in the ERDB (as existing in the Project and Library tree of the Control Builder) and to store the image in the QVCS. When an object is checked-in, it becomes read-only and cannot be modified.

As shown in the figure below, the Check-in dialog box displays the objects to be checked-in. Comments for Check-in, Revision Type and the Revert Label(s) are entered into the dialog box. Clicking “OK” checks-in the selected objects.

Note: The Check-in option is only available to those objects that are new or checked-out. The relevant menu items and toolbar icons are enabled only for objects that are not in QVCS yet or were previously checked-out.

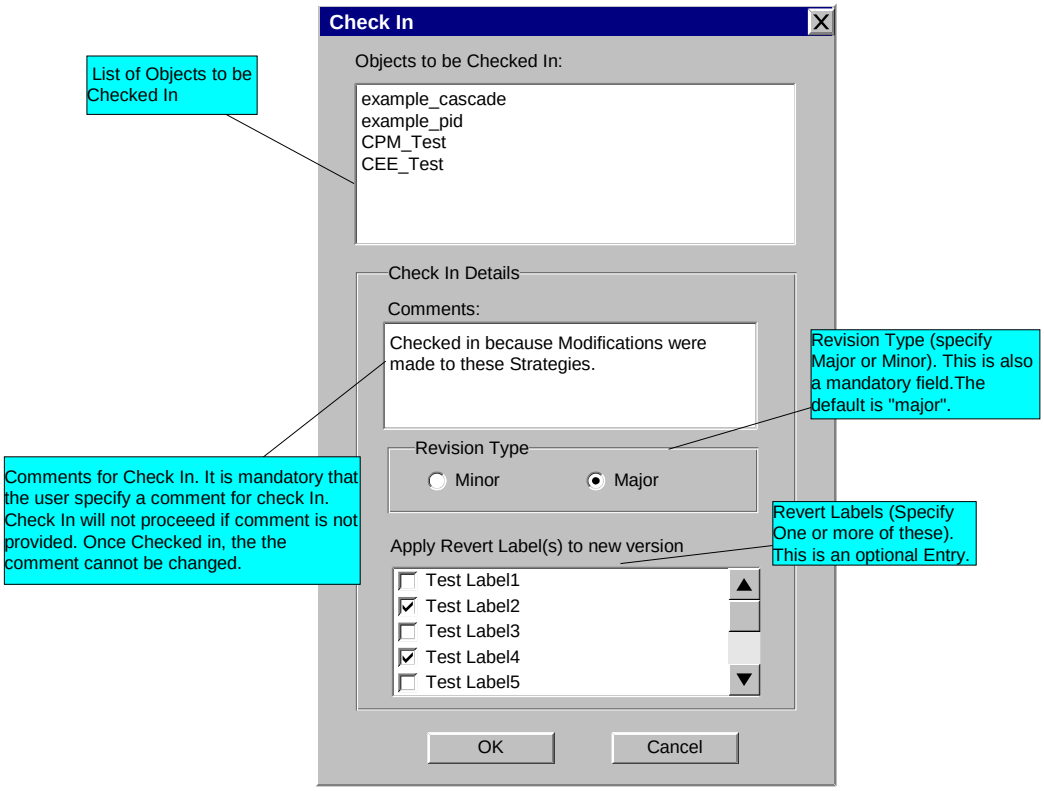


Figure 7 Check-in Dialog Box

Using the Check-in Dialog Box

Invoking the check-in dialog box

The check-In dialog box can be invoked from the QVCS Manager Main Window, Query Window, and the Versions Window. To invoke the check-in dialog:

- Select one or more new and/or checked-out object(s) -> from the Tools drop-down menu, click on Check-in.
- Select one or more new and/or checked-out object(s) -> click the “Check In” icon on the toolbar.
- Select one or more new and/or checked-out object(s) -> right-click and select Check-in.

Object to be checked-in

- The list of objects selected for check-in is displayed in this list.
- The check-in details such as comments, revision type, and revert labels will be applied to all the objects in the list.

Entering comments

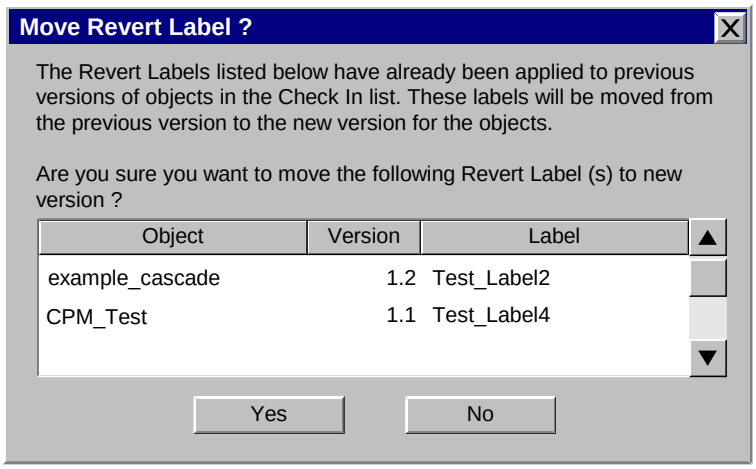
- Enter the check-in comment in the Edit box provided.
- Check-in comments are mandatory.

Entering revision type

- Revision types can be specified as Major or Minor by selecting the appropriate check-box. The revision type will determine the increment of the version number. The version number is incremented with +1 for a major change and with +0.01 for a minor change. Major is the default.

Revert Label

Step	Action
1	All the existing user defined revert labels in QVCS are displayed in the list with checkboxes against them.
2	As an option, select one or more revert labels for the check-in versions of the object by selecting the checkboxes. The selected labels are applied to the new version of the objects.
3	If any of the selected labels have been applied on another version of any of the selected objects for check-in, then a message that the labels will be moved to the newer version of the object(s) is shown.



4	If the Yes button is clicked, the check-in operation is initiated. If the No button is clicked, the check-in dialog will remain to allow modifications to the revert labels.

Check-out Dialog Box

Check-out marks a specific version of an object in the Qualification and Version Control System as editable. Check-out takes the contents of a particular version from the Qualification and Version Control System to the ERDB and subsequently to the Project and the Library trees of the Control Builder. The monitor side of the control builder is not affected and will always show the version of the object that is loaded to the controller.

The Check-out dialog box displays objects and the corresponding versions being checked-out. Optional check-out comments may be entered here. Clicking the OK button initiates the check-out.

Note: The Check-out option is only available to those strategies that are checked-in. The relevant menu items and toolbar icons are enabled only for objects that were previously checked-in.

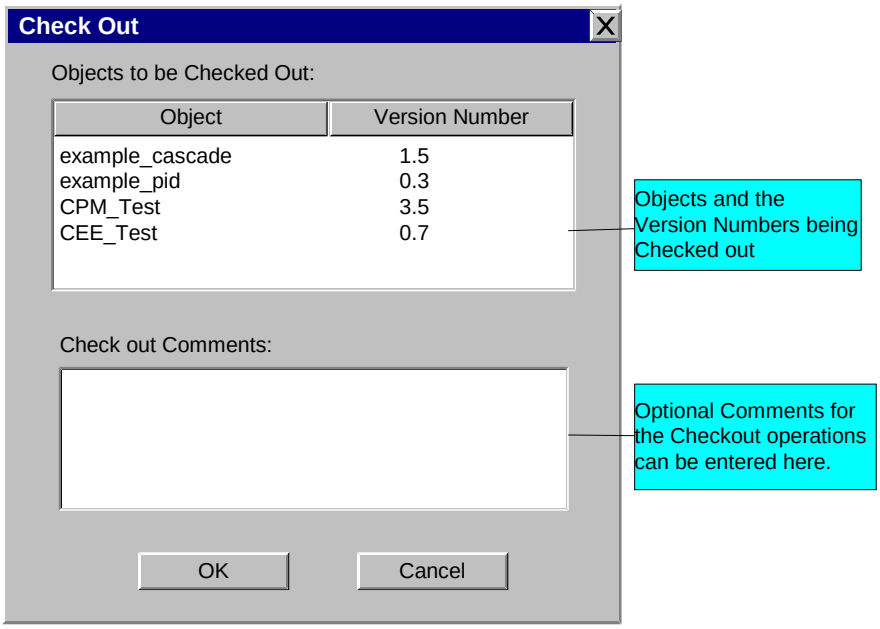


Figure 8 Check-out dialog box

Using the Check-out Dialog Box

Invoking the check-out dialog box

The check-out dialog box can be invoked from the QVCS Manager Main Window, Query Window and the Versions Window. To invoke the Check-out Dialog:

- Select one or more object(s) -> in the Tools drop-down menu select Check-out.
- Select one or more object(s) -> click the Check-out icon in the toolbar.
- Select one or more object(s) -> right-click and select Check-out.

Entering comments

- Enter the check-out comment in the Edit box provided.
- Check-out comments are optional.

Properties Dialog Box

To view the properties of any particular version of an object, invoke the Properties dialog box. The Properties dialog box permits changes to the qualification state and the revert label for the currently selected version of the object. All other information in the dialog box is read-only.

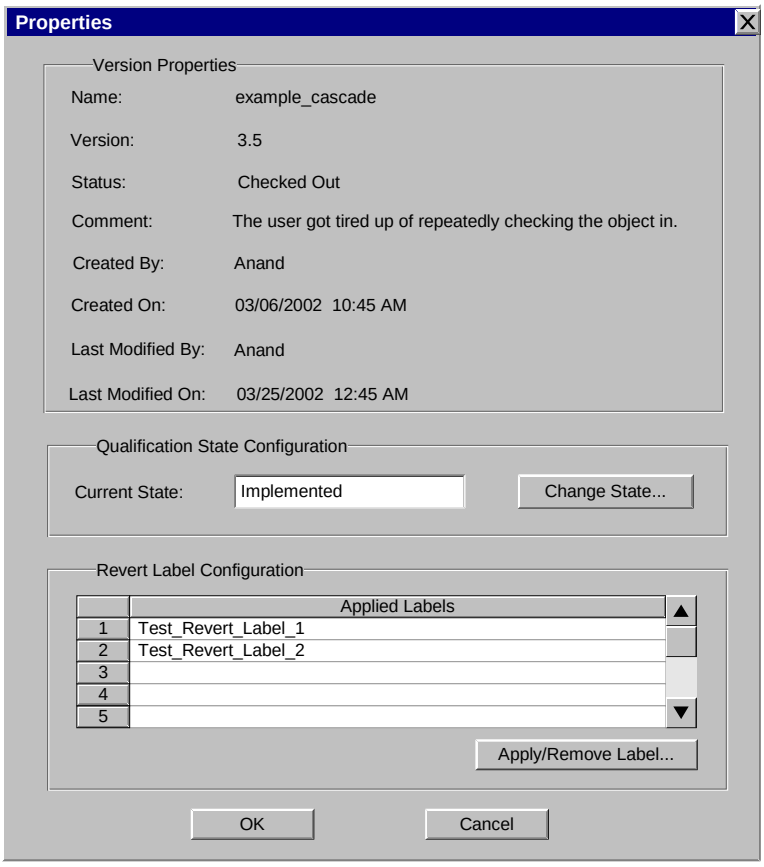


Figure 9 Properties Dialog Box

Using the Properties Dialog Box

Invoking the properties dialog box

The Properties dialog box can be invoked from the Manager Main window, Manager Query Window and the Versions Window in the QVCS Manager. To invoke the Properties dialog box:

- Select a particular version in the window -> in the View drop-down menu, select Object Properties.
- Select a particular version in the window -> select the Object Properties icon from the toolbar.
- Select a particular version in the window -> right-click and select Object Properties.

Version properties

Version specific properties like object name, version, status, comment, object creation details, and modification details are shown in the Version Properties field.

Change qualification state

- The current qualification state for the object version is displayed in the edit box.
- To change the qualification state click the Change State button, invoking the Change Qualification State dialog box.

Revert labels

- The list of current applied revert labels for the object version are displayed in the list.
- To apply/remove revert labels click the Apply/Remove Label button., invoking the Apply/Remove Labels to Version dialog.

Properties in Control Builder

The Properties Dialog also forms a part of the Control Builder Configuration Forms for Tagged Objects as shown in the figure below.

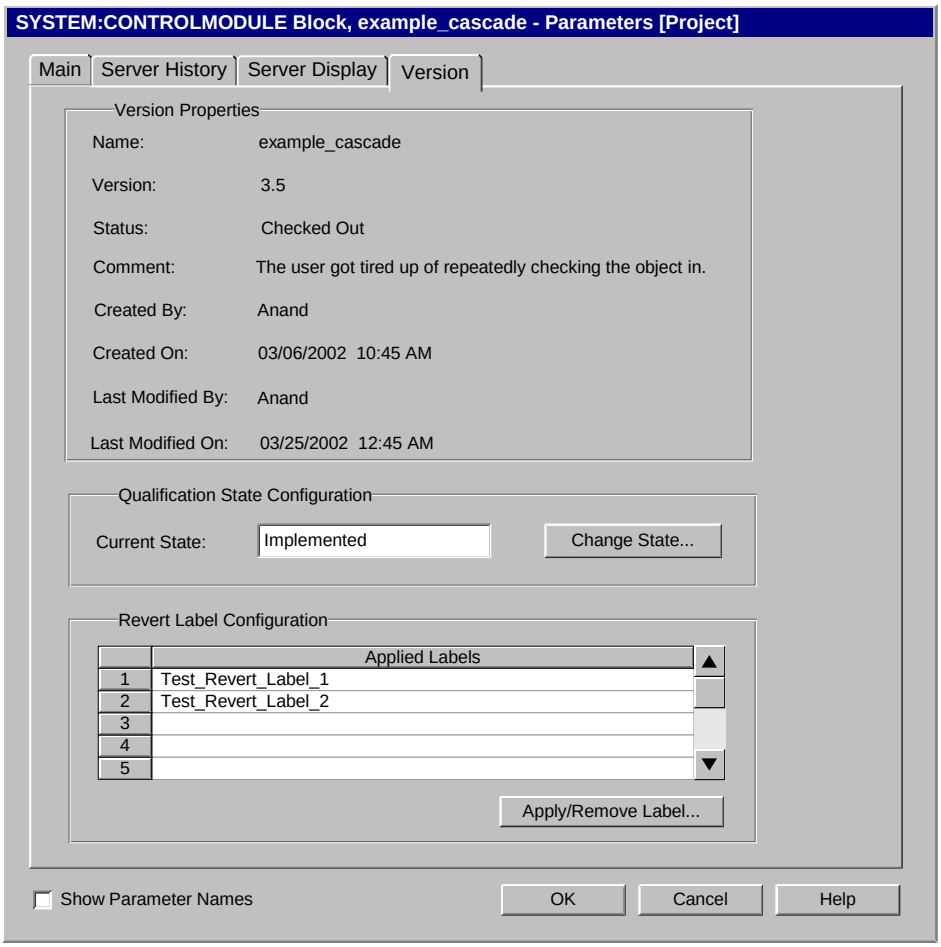


Figure 10 Properties dialog as part of Control Builder Configuration Forms for Tagged Objects

Qualification State Configuration Dialog Box

In the Version Control System, the qualification state refers to the stages a control strategy may pass through as part of the qualification process for the strategy. For example, Implemented, Testing, Released, and Decommissioned may be defined as states that are important for tracking the control strategy qualification process. The control strategy would go through these different phases as it is developed and refined. It may be necessary for the control strategy to go through certain phases for it to be termed "qualified". For example, it may be necessary that the control strategy be "Implemented", that "Testing" be performed on it and that it be "Released".

The Qualification State configuration dialog provides an option to define the configuration states and to manage the qualification life cycle transition. Administrative privilege is required to access this dialog box. The dialog box can be used to add, modify and delete the configuration states. Qualification life cycle transition states can be specified and electronic signature requirements defined for the state transitions.

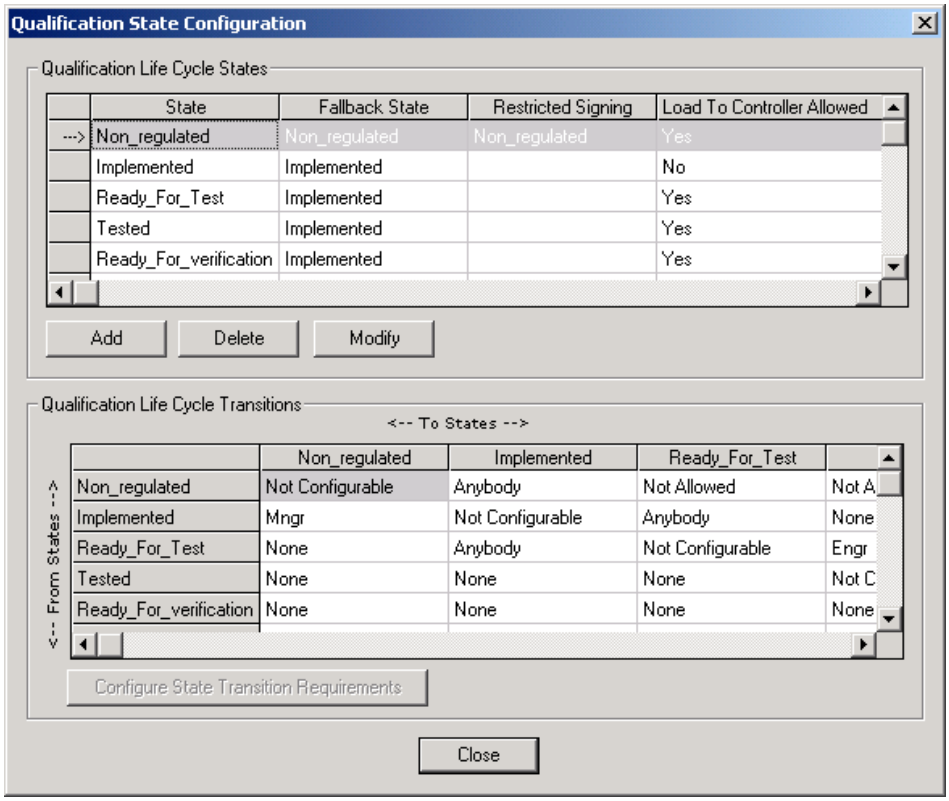


Figure 11 Qualification Life Cycle Configuration

Qualification Life Cycle States Grid

The grid shows the list of:

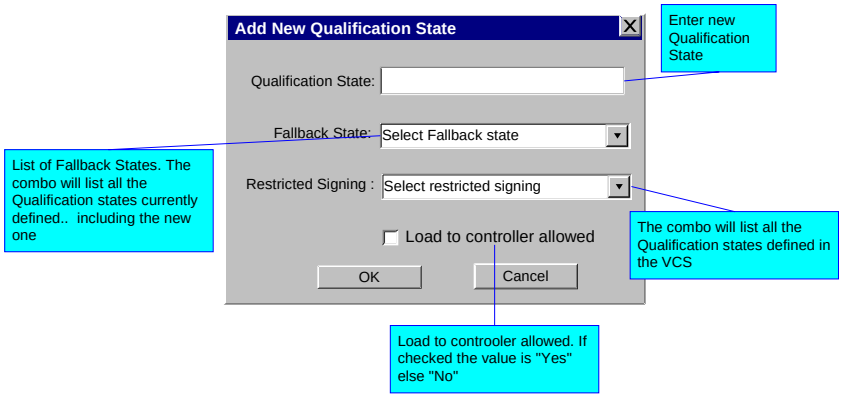
- defined qualification states – stage that the control stratgey passes as part of customer's qualification process
- the corresponding fallback states – state that an object is placed when it is checked in the VCS.
- restricted signing states – is only used if signing is required to make a state transition, and
- load to controller allowed options – means object in the project tab has been loaded

The rows are sorted in the order they are defined. For example, if the state Implemented is specified, then Testing, the state Implemented will occupy the first row followed by the state Testing in the second row.

Using the Qualification State Configuration Dialog Box

Adding qualification state

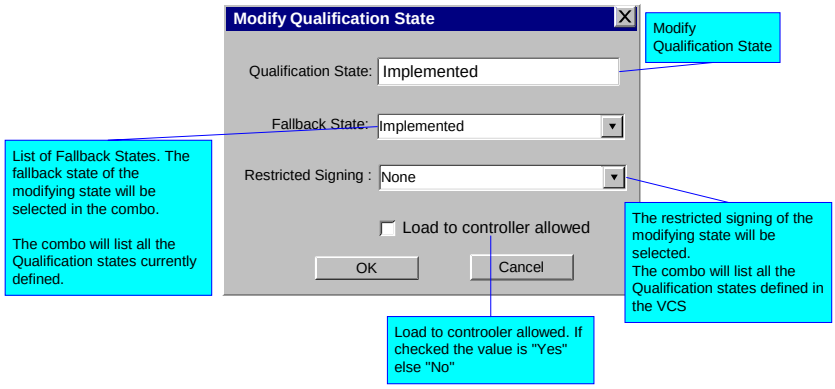
Step	Action
1	Click on the Add button in the Qualification State Configuration dialog.
2	The dialog prompt to enter the new Qualification State will be displayed.



3	Enter the new qualification state in the edit box provided.
4	Select the Fallback State. The combo lists all the Qualification states currently defined in the QVCS, including the new state.
5	Select the restricted signing state. The combo lists all the Qualification states currently defined in the QVCS.
6	Check/Uncheck the Load to Controller Allowed check-box to determine whether the load to controller will be allowed.
7	Click the OK button to add the qualification state to QVCS. Select Cancel to discard the operation.
8	After the OK button is selected, the Qualification Life Cycle States grid is refreshed to reflect the addition.

Modifying Qualification State

Step	Action
1	Click the Modify button in the Qualification State Configuration dialog box.
2	The current highlighted state will be selected for modifying, and the Modify Qualification State dialog box will appear.

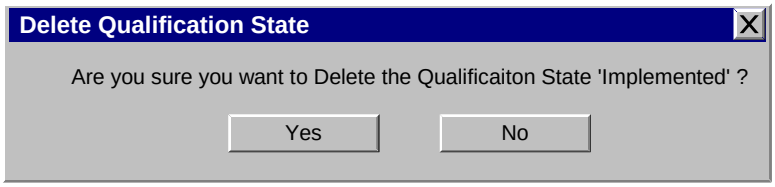


- The edit box shows the Qualification State that is being modified.
- The Fallback State combo-box will select the fallback state of the qualification state being modified.
- The Restricted Signing combo-box will select the restricted signing state of the qualification state that is being modified.
- The Load to Controller Allowed check-box is checked/unchecked depending on the setting of the qualification state being modified.

3	After editing the fields, click the OK button to save the changes to QVCS. Click the Cancel button to discard changes.
4	After the OK button is selected, the Qualification Life Cycle States grid is refreshed to reflect the modifications.

Deleting Qualification State

Step	Action
1	Click the Delete button in the Qualification State Configuration dialog box.
2	The current highlighted row is selected for deletion.
3	The Delete Qualification State box will appear to confirm the delete operation.



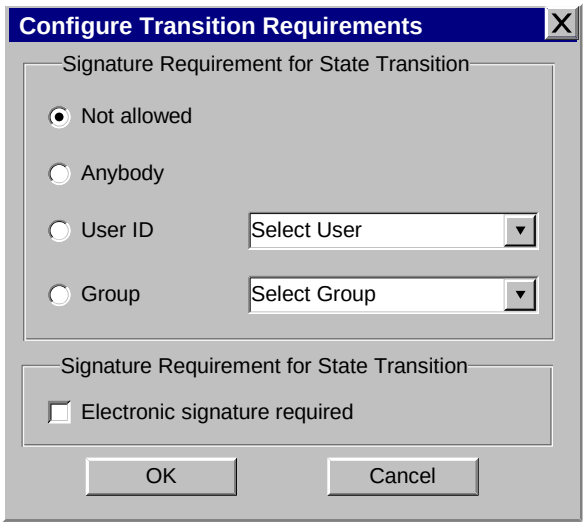
Click on Yes to delete the Qualification State from the QVCS. Click on No to discard the operation.

4	If the Yes button is selected the Qualification Life Cycle States and Qualification Life Cycle Transition grid are refreshed to reflect the deletion.

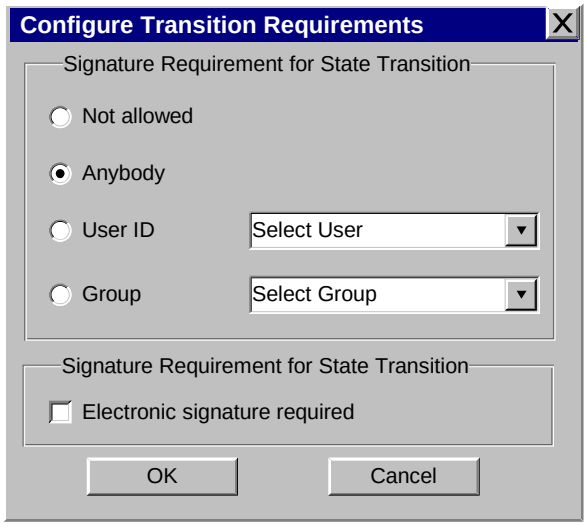
Qualification life cycle transitions grid

- The defined Qualification States are shown in the first row and the first column of the grid.
- There are as many rows and columns as Qualification States defined.
- An electronic signature can be configured for state transitions between the various states. For example, configuring an electronic signature is desired for transition from Implemented to Testing, choose the cell with the row corresponding to the Implemented state and the column corresponding to the Testing State. Then click the Configure Transition Requirements button.
- State transitions for diagonal elements in the grid are not possible. These diagonal cells are grayed out in the grid and editing is not possible in these cells.

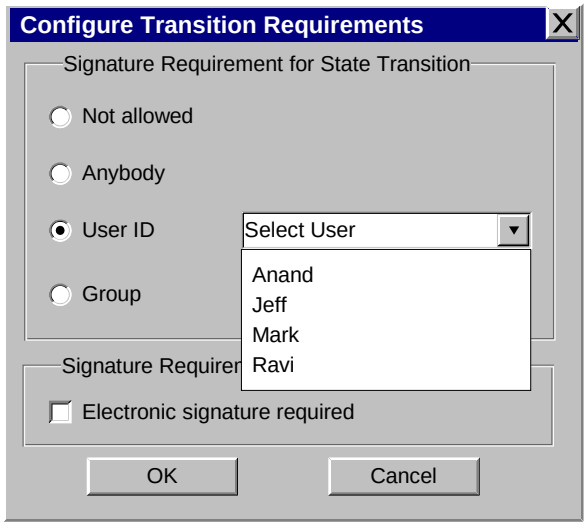
Configuring state transition requirements

Step	Action
1	Select the cell the Transition Requirement will be configured for.
2	Click the Configure Transition Requirement button to invoke the Configure Transition Requirements dialog box. The current state transition requirement values will be shown. The signature requirement for the state transition can be specified from the following four options: 1. **Not Allowed** - the state transition is not allowed between states.  2. **Anybody** - any user can change transition state.

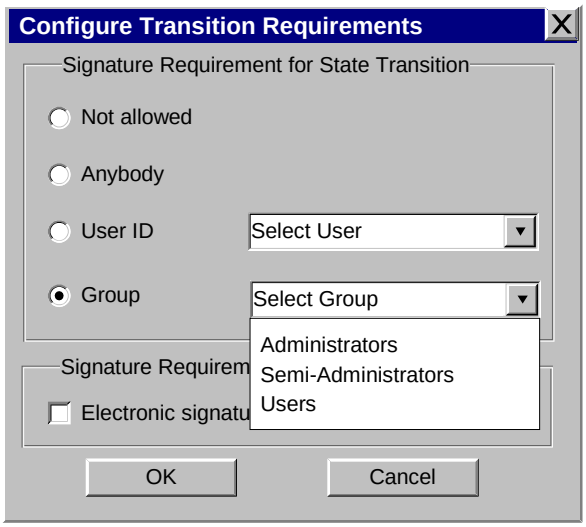
Step	Action



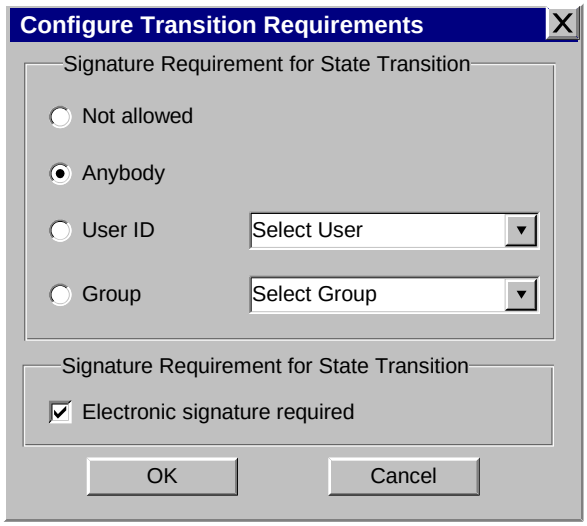
3. **User ID** - only the specified user can change transition state. The list of users is shown in the combo-box. Select one of the users from the list as shown below.



Step	Action
	4. **Group** - only the users belonging to the specified group can change transition states. The list of groups is shown in the combo-box. Select one of the groups from the list as shown below.



3	Check the Electronic Signature Required checkbox to require an electronic signature when the qualification state transition occurs. This checkbox is active only when a state transition is allowed, i.e. the state transition can be performed by Anybody, User ID, Group.

Step	Action
	

Configure Transition Requirements
Signature Requirement for State Transition
Not allowed
Anybody
User ID
Select User
Group
Select Group
Signature Requirement for State Transition
Electronic signature required
OK
Cancel

Change Qualification State Dialog Box

The Change Qualification State dialog box is invoked as part of Qualification state transitions explained in previous section, to accommodate transitioning for one qualification state to another. The object, its current version and qualification state are displayed with an option to change the qualification state. The combo box will only list those qualification states that are allowed according to the transition matrix.

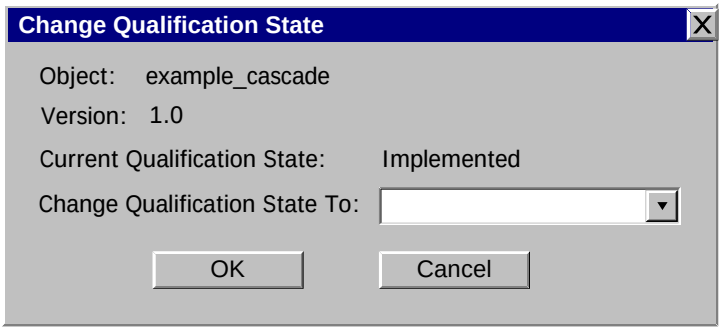


Figure 12 Change Qualification State dialog box

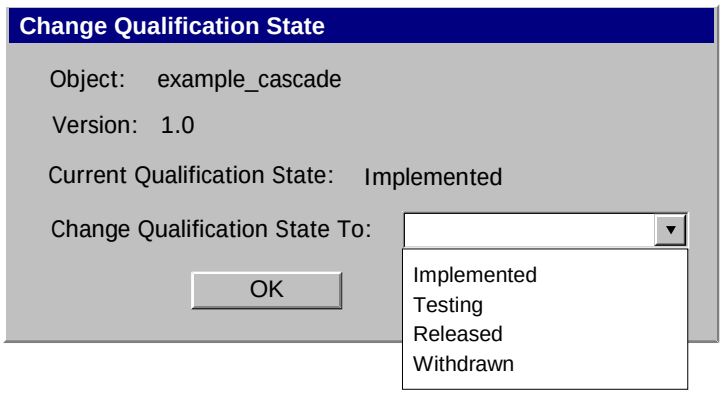


Figure 13 Change Qualification State dialog box with List expanded

Using the Change Qualification State Dialog Box

Invoking change Qualification State

The Change Qualification State dialog box is invoked from the Manager Main Window, Query Window, Versions Window and Properties Dialog. To invoke the dialog box::

- select a particular object version -> from the Tools drop-down menu, select Change Qualification State, or
- select a particular object version -> right-click and select Change Qualification State, or
- the dialog can also be invoked from the Properties dialog box by clicking the Change State... button, or
- using the configuration forms in Control Builder.

Changing the qualification state

Step	Action
1	Select one of the Qualification states listed in the combo box.
2	Click the OK button.

Configure Electronic Signature Dialog Box

For some Qualification state transitions, the QVCS may require verification of the action by validating the electronic signature associated with the operation. To validate the Electronic signature, the Electronic Signature component is invoked, requesting the User Name and Password. These must be entered within the number of attempts and time allowed.

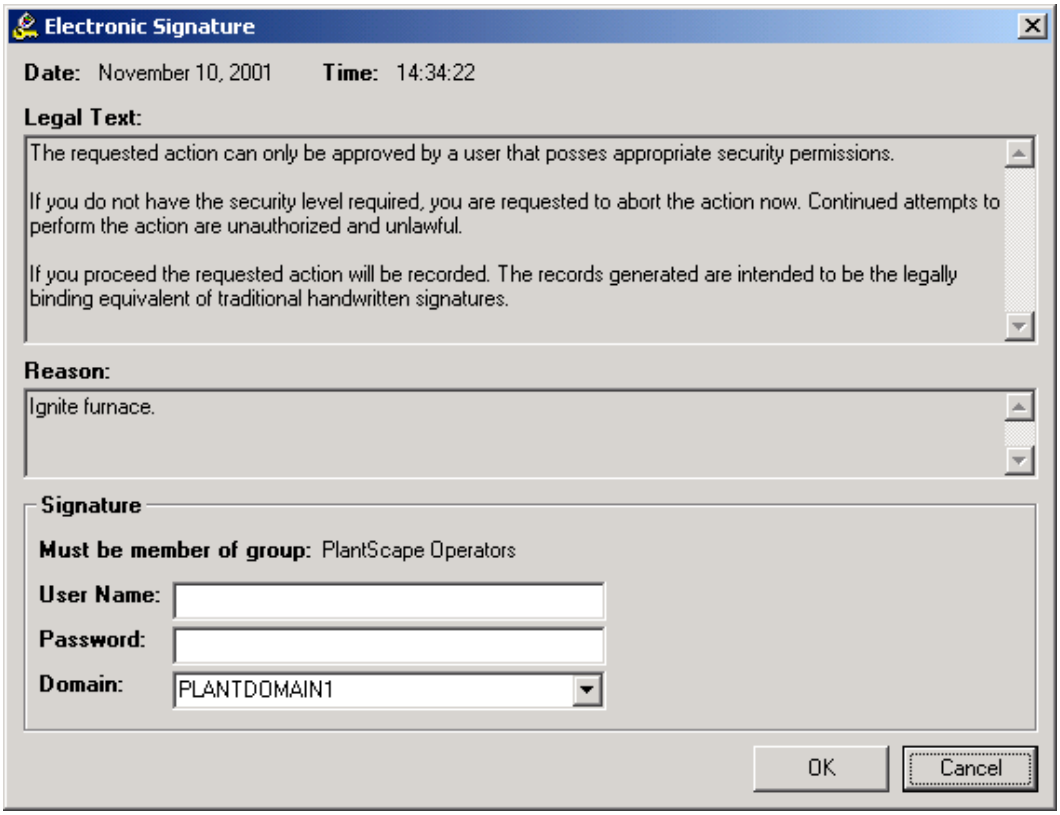


Figure 14 Electronic Signature dialog box

The time-out period can be configured using the Configure Electronic Signature dialog box shown below. Signature Requirements for Revert Operations can also be configured with the help of this dialog box.

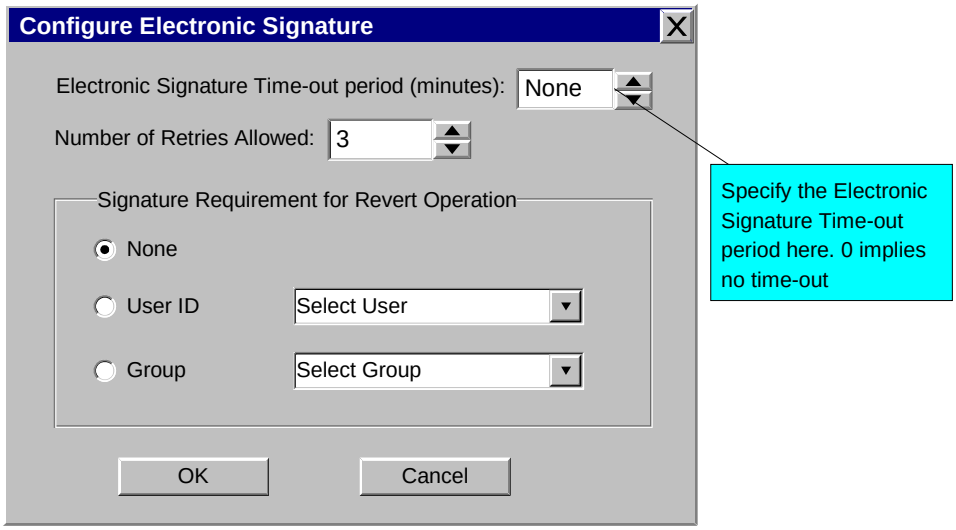


Figure 15 Configure Electronic Signature dialog box

Using the Electronic Signature Dialog Box

Invoking the configure electronic signature dialog box

QVCS Administrator privileges are required to configure Electronic Signatures. This option is enabled during the launch of QVCS Manager when the User ID supplied by Control Builder confirms Administrator privileges. Administrator privileges are confirmed, the Electronic Signature Configuration Utility can be invoked. To invoke the utility from the QVCS Manager main menu:

Step	Action
1	From the Tools drop-down menu, select Administration -> Configure Electronic Signature.
2	Configure the time-out period, number of retries and signature requirements for Revert operations. • **Electronic Signature Time-out Period**: Enter the time-out period in the edit box provided, specified in minutes. The spin control can be used to increase/decrease the time-out period. The minimum value for the time-out period is None (0), indicating no time-out. • **Number of Retries**: Enter the number of retries in the edit box provided. The spin control can be used to increase/decrease the number of retries. The minimum value for the number of retries is 0, requiring the correct user ID and password to be entered correctly in the very first attempt. • **Signature Requirement for Revert Operation:** Revert Operations can be specified to require authentication using three options: None, User ID, and Group. – The default is None, allowing anyone to perform Revert Operations with no signature required. – The User ID option enables a List Box to specify who can authenticate Revert Operations with a signature required. – The Group option enables the List Box to specify a group the user must belong to in order to authenticate Revert Operations. An electronic signature will be required.
3	Click OK when complete.

Revert Level Maintenance Dialog Box

Revert Label Maintenance is used to add, delete, and modify revert labels. The Revert Label maintenance dialog displays a list of the current labels and allows for their modification.

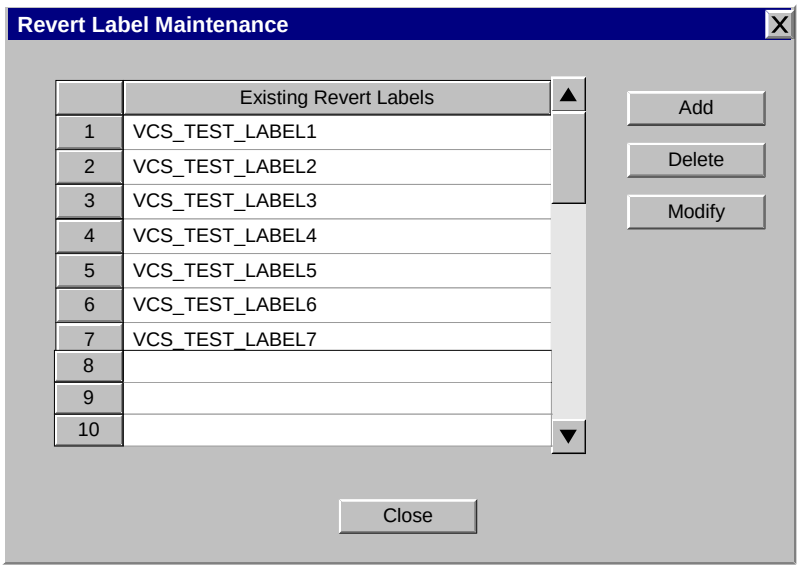


Figure 16 Revert Label Maintenance dialog box

Using the Revert Level Maintenance Dialog Box

Invoking the revert level maintenance dialog box

To invoke the Revert Label Maintenance dialog box:

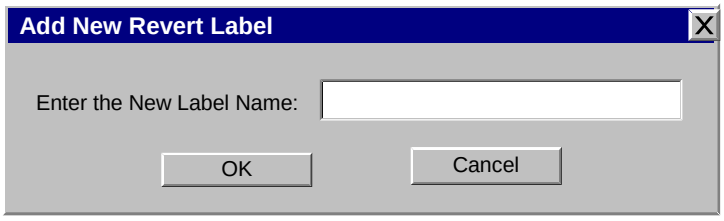
- From the Tools drop-down menu, select Revert Labels -> Revert Label Maintenance.
- Select Labels -> Revert Label Maintenance from the drop-down context menu.
- Click the Label Maintenance… button from the Apply/Remove Revert Labels dialog boxes.

Existing revert labels list

- All revert labels defined in the QVCS are listed in alphabetical order.
- The list of revert labels is sorted by clicking the “Existing Revert Labels” heading. Sort order toggles between ascending/descending.
- Only a single label can be selected from the list for delete and modify operations.

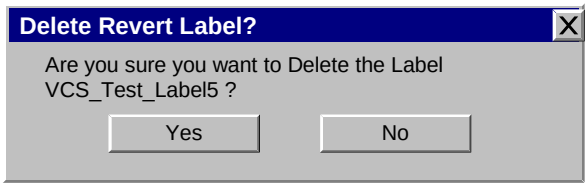
Adding a new revert label

Step	Action
1	Click the Add button in the Revert Label Maintenance dialog box to invoke the Add Revert Label dialog box.
2	In the edit box, enter the new label to be added to the list of QVCS revert labels. The new label name must be unique, at least one character in length and contain no spaces. It is not case sensitive.
3	Click the OK button to add the new label to the list of QVCS revert labels.



Deleting a revert label

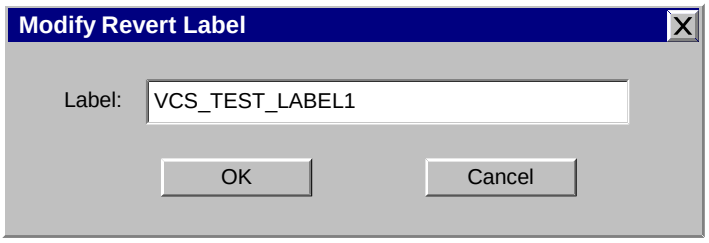
Step	Action
1	Select a revert label in the “Existing Revert Labels” list.
2	Click the Delete button in the Revert Label Maintenance dialog to invoke the Delete Revert Label Confirmation dialog box.



3	Click the “Yes” button. The selected revert label is removed from the list of QVCS revert labels.

Modifying a revert label

Step	Action
1	Select a revert label in the Existing Revert Labels list.
2	Click the Modify button in the Revert Label Maintenance dialog to invoke the Modify Revert Label dialog box.



3	The selected revert label from the “Existing Revert Labels” list is shown in the edit box, where it may be edited. The new label name must be unique, at least one character in length, and contain no spaces.
4	Click the OK button to modify the label.

Apply/Remove Labels to Version Dialog Box

Apply/Remove Revert Labels to Version dialog box displays the object and its version number. The list box on the left displays the Revert Labels assigned to the existing version, and the list box on the right shows all the Revert Labels in the Qualification and Version Control System.

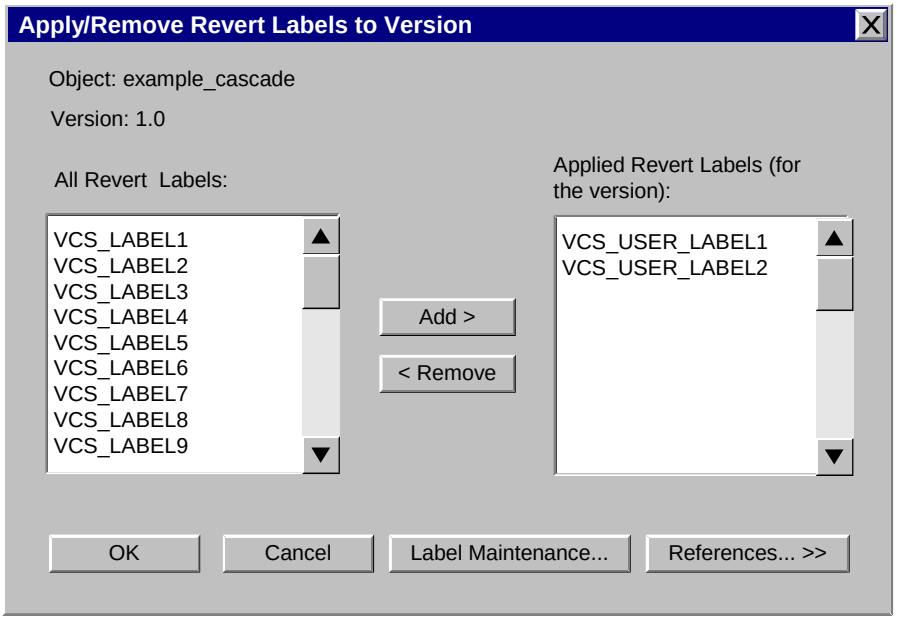


Figure 17 Apply/Remove Revert Labels to Version

Using Apply/Remove Labels to Version Dialog Box

Invoking the apply/remove revert labels to version dialog box

The dialog box can be invoked from the Manager Main Window, Query Window and the Versions Window. To invoke the dialog box:

- Select a particular version in the window and in the Tools drop-down window, select Revert Labels -> Apply/Remove -> To Selected Versions.
- Select a particular version in the window, right-click and select Labels -> Apply/Remove -> To Selected Versions.
  - The selected object and its version number are displayed.
  - There are two list boxes:
    - The All Revert Labels (left side) list box shows all the Revert Labels in the Qualification and Version Control System.
    - The Applied Revert Labels (right side) list box displays the Revert Labels assigned to the existing version.
  - The labels applied to the object version are not shown in the "All Revert Labels" list box.

Adding a revert label to the existing version

- To add another Revert Label to the existing version, select a revert label in the All Revert Labels list box and click the Add button.
- Multiple revert labels can be selected in the list using the <Ctrl> and <Shift> keys.
- When the Add button is selected, the label(s) is removed from the All Revert Labels list box and added to the Applied Revert Labels list box.
- **The added labels are not applied to the object version at this time.**

Removing a revert label from the existing version

- To remove revert label(s), select the existing revert label(s) in the Applied Revert Labels list box and click the Remove button.
- Multiple revert labels can be selected in the list using the <Ctrl> and <Shift> keys.
- When the Remove button is selected, the label(s) is removed from the Applied Revert Labels list box and added to the All Revert Labels list box.

- **The added labels are not removed from the object version at this time.**

Applying/removing labels on the object version

- Click the OK button to apply/remove Revert Labels to the object version.
- If any labels are removed from other versions of the objects currently in the Control Builder project and library trees then the confirmation dialog will display a list of these objects indicating version number and assigned label.

  Note: The Labels are applied/removed only when the OK button is clicked, not when the Add or Remove button is clicked.

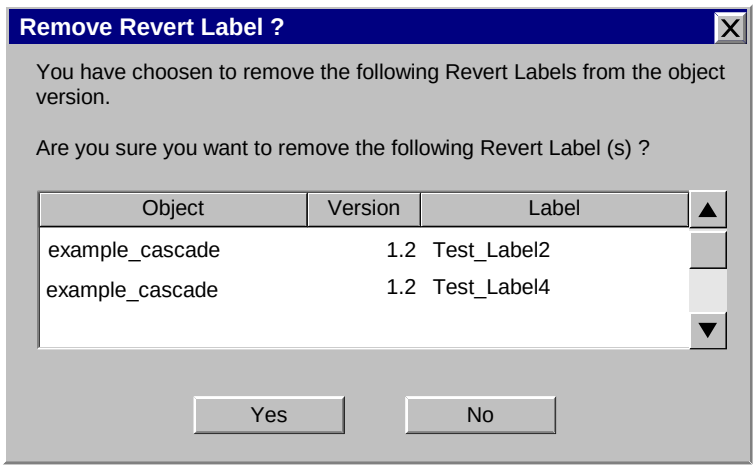


Figure 18 Remove Revert Label Confirmation Dialog

Label maintenance

Step	Action
1	Click the Label Maintenance… button to bring up the Revert Label Maintenance dialog box.
2	Add/delete/modify the existing QVCS revert labels.
3	On return from the Label Maintenance dialog box, the existing lists of labels are refreshed to reflect the changes made to the revert labels.

Viewing references

- Click the References…>> button to bring up the modified Apply/Remove Revert Labels dialog box.

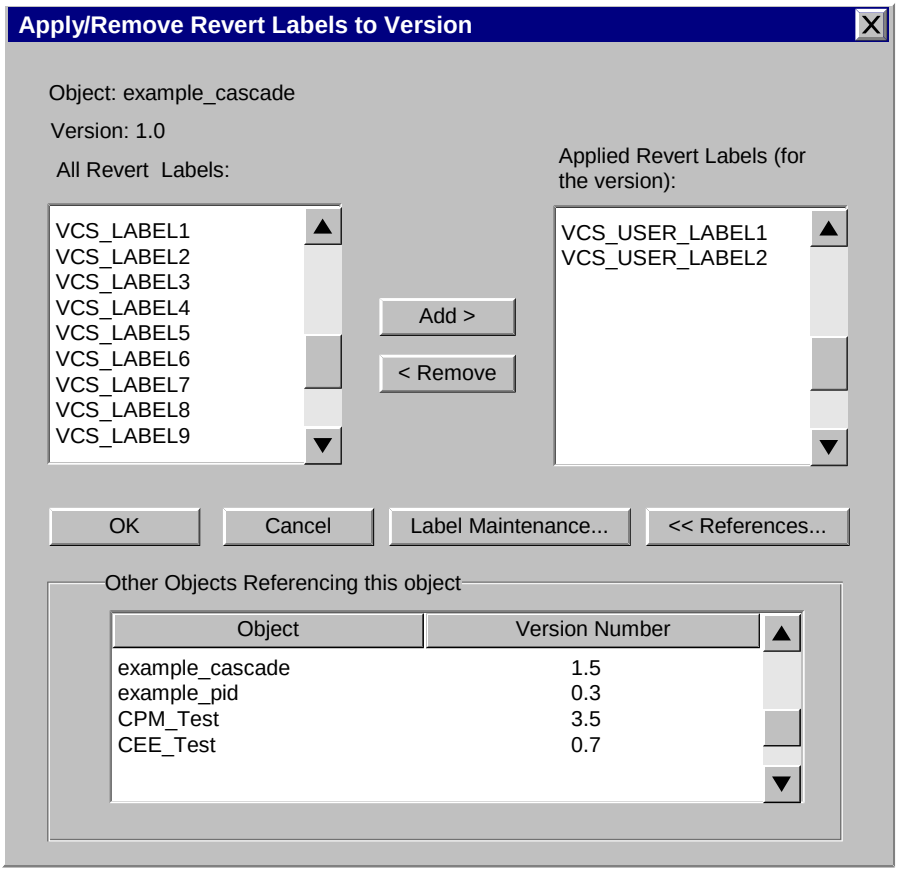


Figure 19 Apply/Remove Revert Label Dialog showing Objects Referencing the selected object version.

- A list of all other objects, and their versions, that refer the selected object version are displayed in a list.
- The References…>> button text reverts to << References….
- Click << References… button to restore the dialog box in Figure 17.

Apply/Remove Revert Labels to Contained Dialog Box

The Apply/Remove Revert Labels to Contained dialog box displays the selected Object and its contained objects, and the current versions of these objects in the ERDB. Also shown are the lists of existing Revert Labels for the object, its contained objects, and all the Revert Labels in the QVCS database. In this context, contained refers to hierarchical objects like Hierarchical Control Modules and to contained through assignment like objects that are assigned to a specific controller.

For the example given below, when a Revert Label is applied, it is applied to CPM_Test version 1.5, CEE_Test version 1.9 and example_cascade version 0.8. If any label(s) is removed, the selected Revert Label(s) is disassociated from any versions it was assigned to. For example, if the QVCS_USER_LABEL1 was assigned to CPM_Test version 1.2, CEE_Test version 1.0 and example_cascade version 0.9, it is disassociated from those versions of the objects.

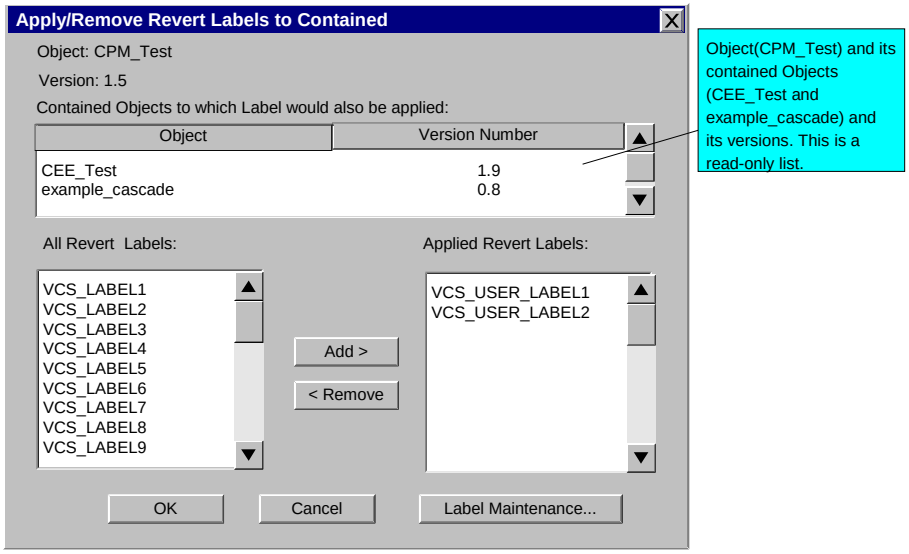


Figure 20 Apply/Remove Labels to Contained dialog box

Using Apply/Remove Revert Labels to Contained Dialog Box

Invoking the apply/remove revert labels to contained dialog box

The dialog box can be invoked from the Manager Main Window, Query Window and the Versions Window. To invoke the dialog box:

- Select a particular version in the window and in the Tools drop-down menu, select Revert Labels -> Apply/Remove -> All Contained Objects.
- Select a particular version in the window and right-click, selecting Labels -> Apply/Remove -> All Contained Objects.

Applying/removing the revert labels to contained objects

- The selected object and its contained objects with their version numbers are displayed in a list box below the label: Objects to which the labels would be applied.
- There are two list boxes
  - The All Revert Labels (left side) list box shows all the Revert Labels in the Qualification and Version Control System.
  - The Applied Revert Labels (right side) list box displays the Revert Labels assigned to the selected object and its contained objects.
- The labels, which are applied to the selected object and its contained objects version, are not shown in the All Revert Labels list box.
- If any labels are removed from other versions of the objects currently in the Control Builder project and library trees then the confirmation dialog will display a list of these objects indicating version number and assigned label.

Adding a revert label to existing objects

- To add another Revert Label to existing objects, select a revert label in the All Revert Labels list box and click the Add button.
- Multiple revert labels can be selected in the list with the help of the <Ctrl> and <Shift> keys.
- When the Add button is selected, the label(s) is removed from the All Revert Labels list box and added to the Applied Revert Labels list box.
- **The added labels are not applied to the contained objects at this time.**

Removing a revert label from existing objects

- To remove revert label(s), select existing revert label(s) in the Applied Revert Labels list box and click the Remove button.
- Multiple revert labels can be selected in the list with the help of the <Ctrl> and <Shift> keys.
- When the Remove button is selected, the label(s) is removed from the Applied Revert Labels list box and added to the All Revert Labels list box.
- **The removed labels are not removed from the contained objects at this time.**

Applying/removing labels of contained objects

- Click the OK button to apply/remove Revert Labels to the contained objects.
- If any labels are removed from other versions of the objects currently in the Control Builder project and library trees then the confirmation dialog will display a list of these objects indicating version number and assigned label.

Label maintenance

- Click the Label Maintenance… button to open the Revert Label Maintenance dialog box. Add/delete/modify the existing QVCS revert labels.
- After closing the Label Maintenance dialog box, the existing lists of labels are refreshed to reflect the changes made to the revert labels.

Apply/Remove Labels to All Dialog Box

The Apply/Remove Revert Labels to All dialog box is used to apply/remove Revert Labels to all the objects in ERDB. This dialog box displays what can be done with this Interface. Applying a Revert Label to All is chosen, the current version of all the objects in ERDB would be associated with the selected Revert Label. As shown in the figure below, the edit box on the left displays the existing Revert Label(s) defined in the Qualification and Version Control System database. If one of these Revert Labels is selected and Remove option chosen, the versions of the objects associated with this Revert Label are disassociated from the Revert Label.

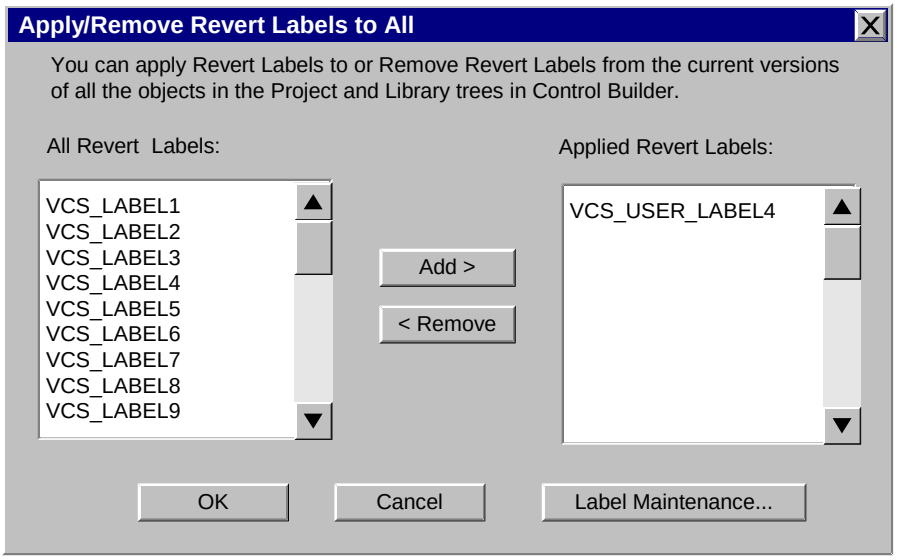


Figure 21 Apply/Remove Revert Labels to All

Using Apply/Remove Revert Labels to All Dialog Box

Invoking the apply/remove revert labels to all dialog box

This dialog box can be invoked from the Manager Main Window, Query Window and the Versions Window. To invoke the dialog box:

- Select a particular version in the window and from the Tools drop-down menu, select Revert Labels -> Apply/Remove -> All Objects.
- Select a particular version in the window and right-click, selecting Labels -> Apply/Remove -> All Objects.

Applying/removing revert labels to all

There are two list boxes:

- The All Revert Labels (left side) list box shows all the Revert Labels in the Qualification and Version Control System.
- The Applied Revert Labels (right side) list box displays the Revert Labels assigned to all the objects in the project and library trees in Control Builder.

The labels, which are applied to all the objects in the project and library trees in Control Builder, are not shown in the “All Revert Labels” list box.

If any labels are removed from other versions of the objects currently in the Control Builder project and library trees then the confirmation dialog will display a list of these objects indicating version number and assigned label.

Adding a revert label to all

- To add another Revert Label to the objects, select a revert label in the “All Revert Labels” list box and click the Add button.
- Multiple revert labels can be selected in the list with the help of the <Ctrl> and <Shift> keys.
- After selecting the Add button, the label(s) is removed from the All Revert Labels list box and added to the Applied Revert Labels list box.
- **The added labels are not applied to the objects in the Control Builder project and library trees at this time.**

Removing a revert label to all

- To remove revert label(s), select existing revert label(s) in the Applied Revert Labels list box and click the Remove button.
- Multiple revert labels can be selected in the list with the help of the <Ctrl> and <Shift> keys.
- After selecting the Remove button, the label(s) is removed from the Applied Revert Labels list box and added to the All Revert Labels list box.
- **The removed labels are not removed from the objects in the Control Builder project and library trees at this time.**

Applying/removing labels to all in Control Builder project and library trees

- Clicking the OK button will apply/remove Revert Labels to the objects in the Control Builder project and library trees.
- If any labels are removed from other versions of the objects currently in the Control Builder project and library trees then the confirmation dialog will display a list of these objects indicating version number and assigned label.

Label maintenance

- Click the Label Maintenance… button to bring up the Revert Label Maintenance dialog. This may be used to add/delete/modify the existing QVCS revert labels.
- After closing the Label Maintenance dialog box, the existing lists of labels are refreshed to reflect the changes made to the revert labels.

Revert to a Version Dialog Box

The Revert to a Version dialog box displays the object name, its ERDB version and allows a revert version to be selected.

- In this scenario, the dialog includes a message stating that the current version in ERDB is replaced with the selected version.
- The dialog displays the object name and its ERDB version.
- The Version list (left side) box displays all versions of the object.
- The Revert labels (right side) list box displays all labels from the selected version in the Version list box.

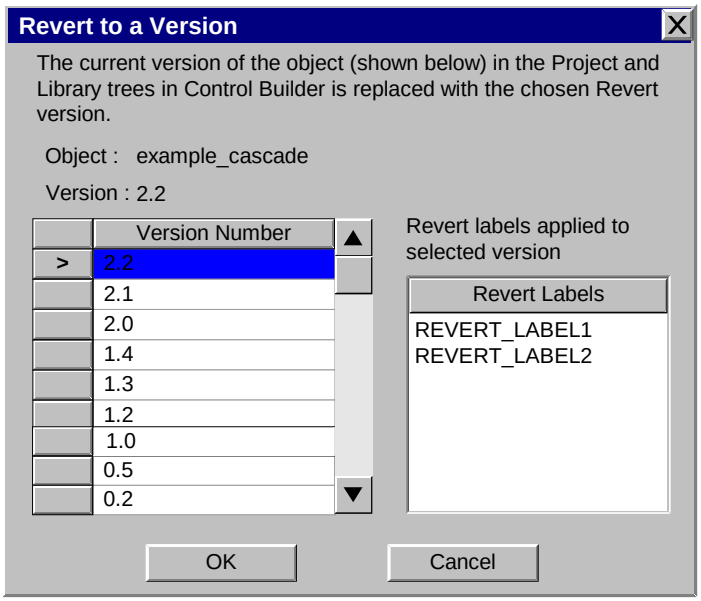


Figure 22 Revert to a Version Dialog Box

Using the Revert to a Version Dialog Box

Invoking the revert to a version dialog box

This dialog box can be invoked from the Manager Main Window, Query Window and the Versions Window. To invoke the dialog box:

- From the Tools drop-down box, select -> Revert Labels -> Revert -> Revert to Version.
- Select the Revert To Version icon from the toolbar.
- Select Revert Labels -> Revert -> Revert To Version menu item from the drop-down context menu in all the QVCS Manager windows.

Reverting to a version

- Select the version from the Version list box. In this scenario, the current version of the object as existing in ERDB is replaced by the selected Version. This action will not affect the version of the object on the monitor side of Control Builder.
- Clicking the OK button will initiate the reversion process

Revert to Label Dialog Box

The Revert to Label dialog box includes a message stating that all the current object versions in ERDB will be replaced with the versions of the objects under the chosen Revert Label.

In this example, object1 version 2.0, object2 version 2.9 and object3 version 0.9 are assigned a revert label RVRT_LBL1. When this dialog is invoked and Revert to Label RVRT_LBL1 is chosen from the Combo Box, the current versions of the objects object1, object2 and object3 in ERDB are replaced with RVRT_LBL1 versions; namely version 2.0, version 2.9 and version 0.9 for object1, object2 and object3 respectively. The Control Builder may have other objects also apart from the three mentioned above. Those objects are left untouched.

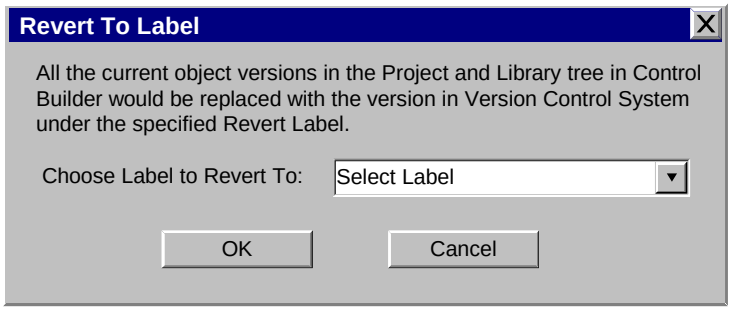


Figure 23 Revert to Label Dialog Box

Using the Revert to Label Dialog Box

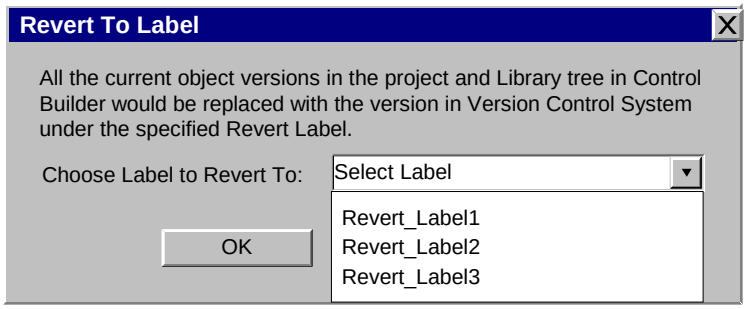
Invoking the revert to label dialog box

This dialog box can be invoked from the Manager Main Window, Query Window and the Versions Window. To invoke the dialog box:

- From the Tools drop-down menu, select Revert Labels -> Revert -> Revert To Label.
- Select Revert Labels -> Revert -> Revert To Label menu item from the drop-down context menu in all the QVCS Manager windows.

Reverting to a label

- Provides information that all the current object versions in ERDB would be replaced with the versions of the objects under the chosen Revert Label.
- A Revert Label can be chosen using the Combo box, which lists all the revert labels defined in the QVCS as shown below.



- Click the OK button to initiate the reversion process

Relaxed Loading Support for QVCS

Relaxed Load Function

About relaxed load function

If your are using a licensed Qualification and Version Control System (QVCS) application in your Experion PKS system running software version R101 or higher, the relaxed load function lets you load an object that has not yet been checked in to QVCS to a controller.

ATTENTION

Once an object is "checked in" to QVCS, it must pass the QVCS loading restrictions before it can be loaded to a controller.

Typical relaxed load functional scenario

The following table outlines the stages in a typical development and testing scenario that uses the relaxed load function. This scenario assumes that you are familiar with the Control Builder application, have a QVCS license, and are running Experion PKS software version R101 or higher.

Stage	Description
1	Create the execution environment.
2	Create a control strategy
3	Assign the control strategy to the execution environment.
4	Load the execution environment and the control strategy to the controller.
	**TIP** This is considered a relaxed load, since neither the execution environment nor the control strategy is checked in to QVCS.
5	Test the control strategy to determine if it is executing correctly.
6	If control strategy executes correctly, go to Stage 7. If control strategy does not execute correctly, make changes as required and

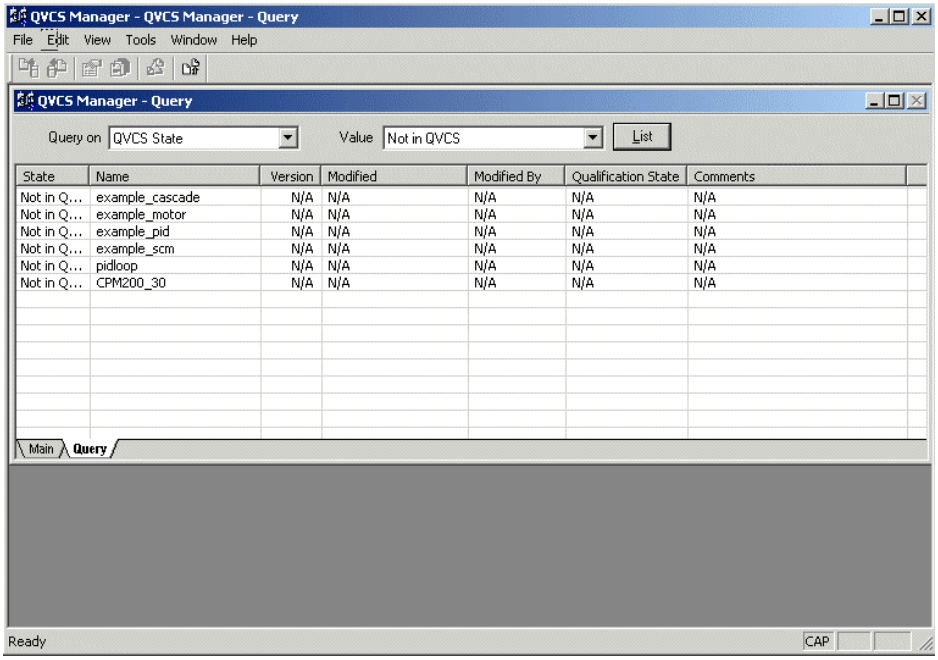
Stage	Description
	repeat Step 5.
7	Check in the control strategy and execution environment to QVCS.
8	Make any qualification state transitions as defined by the site's Standard Operating Procedure (SOP).
	**ATTENTION** The user is responsible for making sure that the process control system that is loaded has been **qualified** and that it contains no non-QVCS objects. The Query dialog of the QVCS Manager provides a **Not in QVCS** query and a **Loaded, not in QVCS** query, so users can quickly determine the status of their system.
9	Load the execution environment and control strategy with the QVCS version in the desired qualification state to the controller.
10	If problems exist, use QVCS Manager to check out the problem object, make the necessary change in Control Builder, and check it into QVCS. With object in required qualification state, load it to the controller.

Initiating queries for non-QVCS objects

The following table outlines the typical steps for checking the state of the control system for any non-QVCS objects. The illustrations used are for example purposes only.

Step	Action
1	Click Tools->QVCS Manager to launch the Manager.
2	Click the Query tab.
3	Click the down-arrow button to the right of **Query on** field and select **QVCS State** from the shortcut menu.
4	Click the down-arrow button to the right of **Value** field and select **Not in QVCS** from the shortcut menu.
5	Click the **List** button and view the results of the query in the dialog.

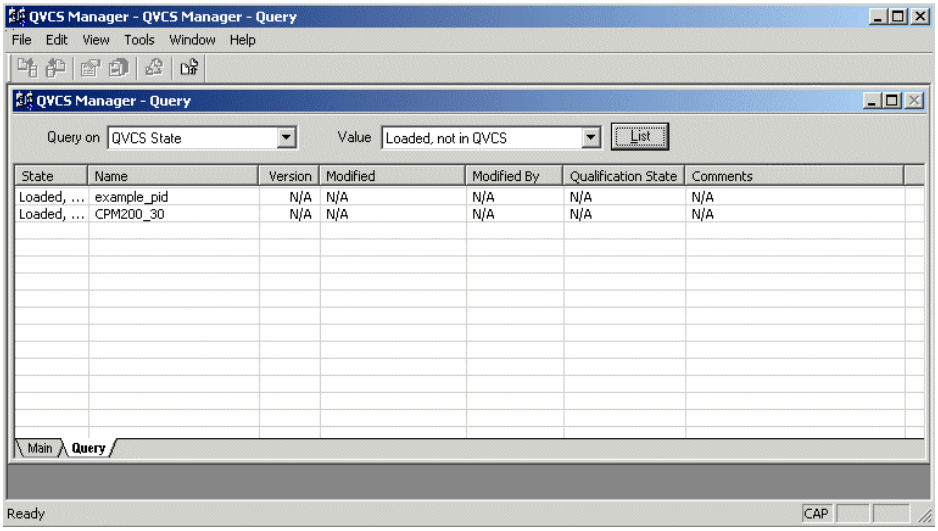
Step	Action



6 Click the down-arrow button to the right of **Value** field and select **Loaded, not in QVCS** from the shortcut menu.

7 Click the **List** button and view the results in the dialog.

Step	Action



TIP

You can use common Windows-based shortcut keystroke functions such as Shift + Click and Ctrl + Click to select all or only selected objects in the list to be checked in at one time.

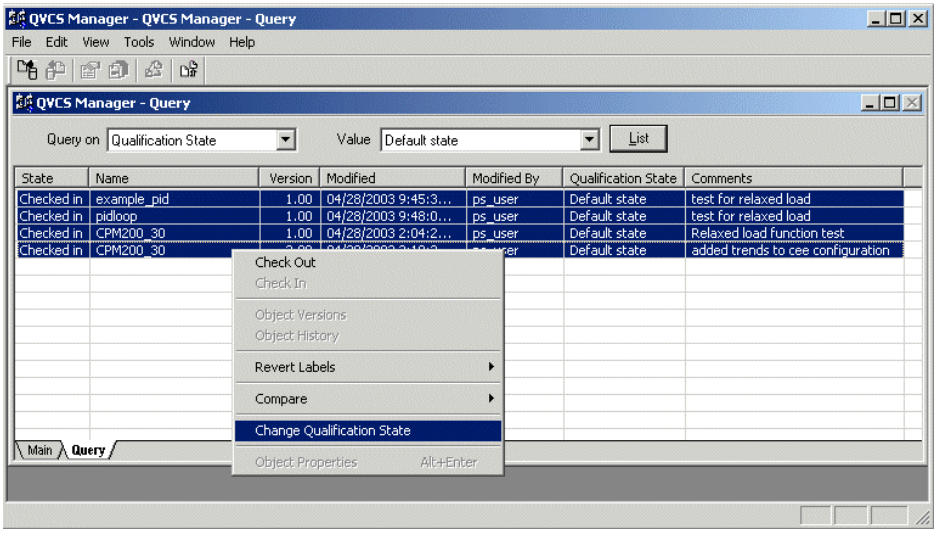
10	This completes the steps for using QVCS queries to find non-QVCS objects in your control system.

Making multiple object qualification state transitions

The following table outlines the typical steps for making qualification state transitions for multiple objects. The illustrations used are for example purposes only.

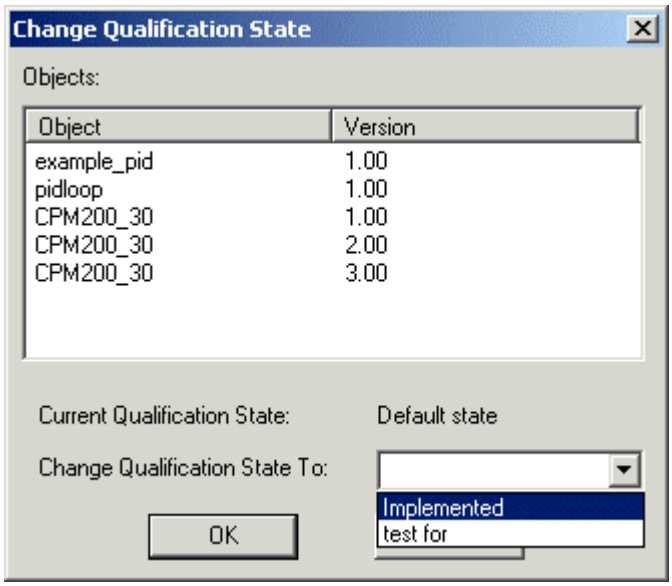
Step	Action
1	Click Tools->QVCS Manager to launch the Manager.
2	Click the Query tab.
3	Click the down-arrow button to the right of **Query on** field and select **Qualification State** from the shortcut menu.
4	Click the down-arrow button to the right of **Value** field and select **Default**

Step	Action
	State or other desired state from the shortcut menu.
5	Click the first object in the dialog list and Shift + Click the last object in the list to select all the objects.
6	Click Tools->Change Qualification State or right click and select Change Qualification State from the shortcut menu.



7	Click the down-arrow button to right of **Change Qualification State To** field and select the desired state from the shortcut menu.

Step	Action



8 Click the OK button to initiate qualification state change validation.

ATTENTION

- If any validation fails, none of the qualification states for any of the object versions will be updated. Check displayed error message(s) to identify the source of the validation failure(s).
- If an electronic signature is configured for the requested transition, a single signature dialog is displayed and the same signature is applied to all of the transitions. A log entry, including applicable associated electronic signature log entry, is generated for each object in the list.

9 The qualification states for the selected objects are changed.

10 This completes the procedure.

Version Difference Tool (Diff Tool)

The Qualification and Version Control System (QVCS) provides a method for tracking and comparing changes that are made to control strategies between versions. The QVCS Version Difference Tool (Diff Tool) can be used to view and compare differences between versions of a QVCS object. The Diff Tool functionality is included when a QVCS license is purchased.

A difference operation is typically performed on two versions of single object. The Diff tool shows the differences between the two versions, highlighting additions to the strategy in green, modifications in blue, and deletions in red.

The Diff Tool also provides functionality for searching for next/previous difference, finding text in the version window, printing and help.

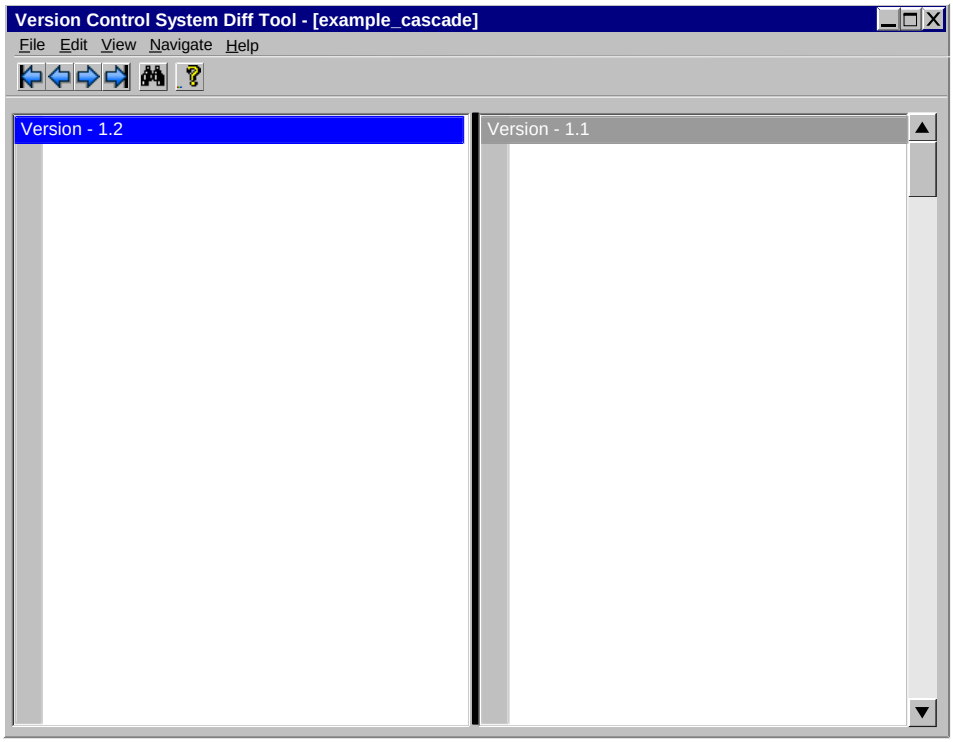


Figure 24 Diff Tool User Interface

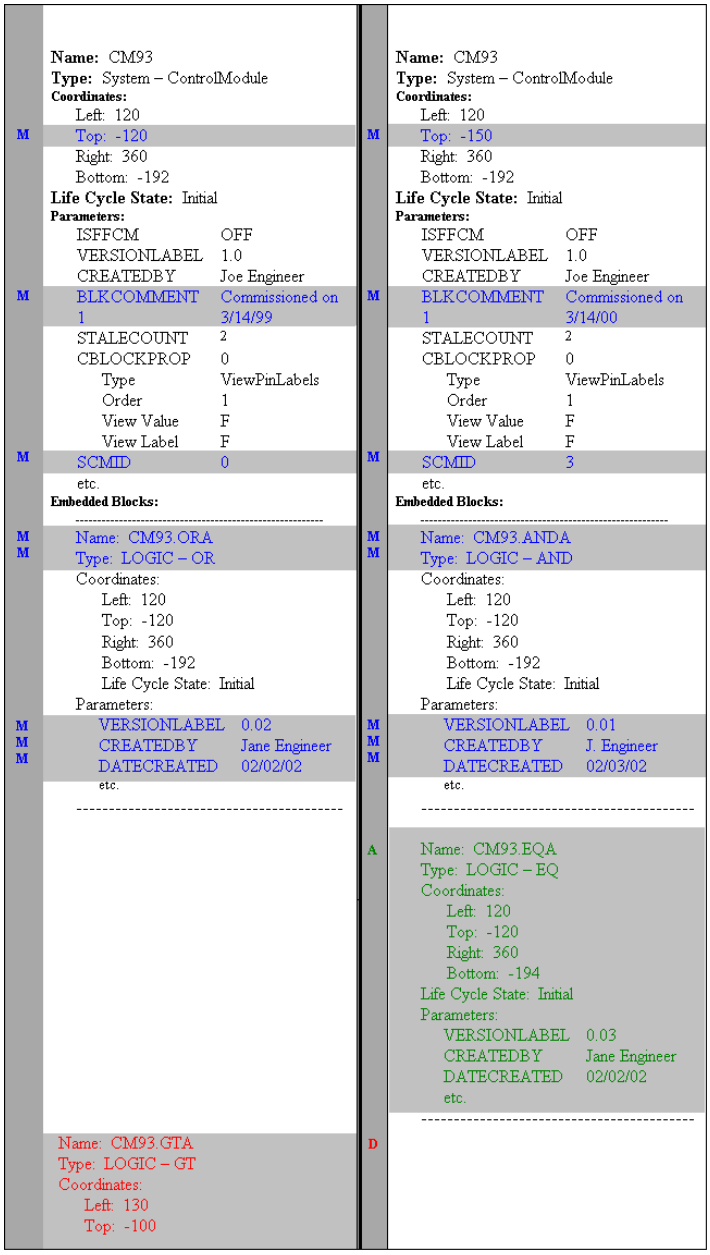


Figure 25 Diff Tool – Difference Between Two Versions

Diff Tool Toolbar

The toolbar provides fast and easy access to the some of the frequently used functionality. Below is the list of toolbar items and the functionality associated with it. The user could click on the toolbar button and invoke the function.

Table 2 Diff Tool Toolbar

Toolbar Icon	Tool Tip	Menu Item
	First difference	Navigate->First difference
	Previous difference	Navigate->Previous difference
	Next difference	Navigate->Next difference
	Last difference	Navigate->Last difference
	Find	Edit->Find
	Help	Help->Knowledge Builder

Using the Diff Tool

Invoking the Diff Tool

The Diff Tool is invoked from the QVCS Manager by selecting the menu items: Compare -> With Previous Version/With Another Version/With Monitor Version/With Checked Out Version.

- The version number being compared is shown in the title of the version window.
- If the version being compared is the Monitor version, then the title will display the text Version – Monitor.
- If the version being compared is the Checked-out version, then the title will display the text Version –Checked-out.

Reading the differences

- The block items modified between the versions are shown in BLUE with the text **M** next to them.
- The block items added between the versions are shown in GREEN with the text **A** starting at the block definition.
- The block items deleted between the versions are shown in RED with the text **D** starting at the block definition.
- If the versions being compared are identical, then a dialog indicating this situation is displayed.

Scrolling the difference windows

- There is one scroll bar for scrolling.
- Both windows are synchronized with respect to the scroll bar position. For example, change in the scroll bar position will produce an equal delta in both the windows.

Resizing an individual version window

- A splitter bar separates the two version windows.
- Windows are resized using the splitter bar.

Printing the difference output

To print the difference output, select the print button. If printing to a non-color printer, only the M, A, and D markings will denote the changes between versions.

QVCS Troubleshooting

Error Handling Overview

The error message box displays what operation has failed. The contents of the error message box vary depending on the context.

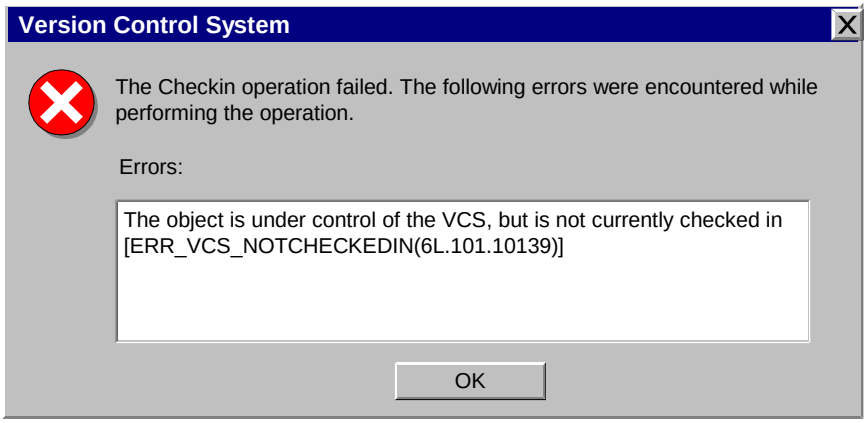


Figure 26 Error Message Box

QVCS Error Messages

QVCS configuration tips

- Configure users before deploying and using the QVCS system.
- Define and configure the qualification lifecycle before developing objects, avoid making changes to the lifecycle as much as possible (define behavior on deleting adding etc of qualification states).
- If the QVCS system is used in a non-regulated industry and the main goal is to have version control of objects then define only one qualification state, for example the ‘default’ state and allow this state to be loaded to the controller. This will basically eliminate the qualification lifecycle.
- A double signature for a certain qualification state transition as part of the lifecycle definition can be accomplished by defining two subsequent qualification states. Each state change to be performed by a different user/group with electronic signature enabled. The restricted signing state of the second qualification state (which corresponds with the second signature) should be set to the qualification state of the first qualification state signature (which corresponds with the first signature).

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