Symbols

Using Symbols

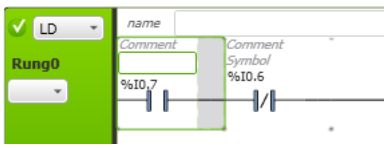
Symbols are a way of naming objects and making them easier to identify. If an object has an address of %I0.7 it is impossible to determine what that object does without referring to the documentation for the application. If the object is also given the symbol "Start_Button", anyone looking at the program will have a good idea what that object is supposed to do.

Choosing meaningful symbols can help to make the program self-documenting as they will describe what each object does. Usually a good name for the output object will also help to identify what the entire rung does.

Symbols (cont.)

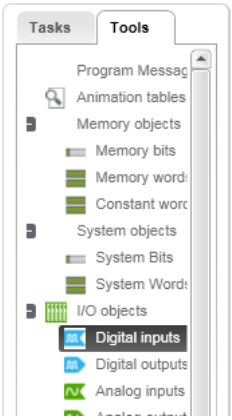
How to Add Symbols

In the ladder editor, double-click the word "Symbol" above an object. This will open a dialog box and the symbol can be entered.

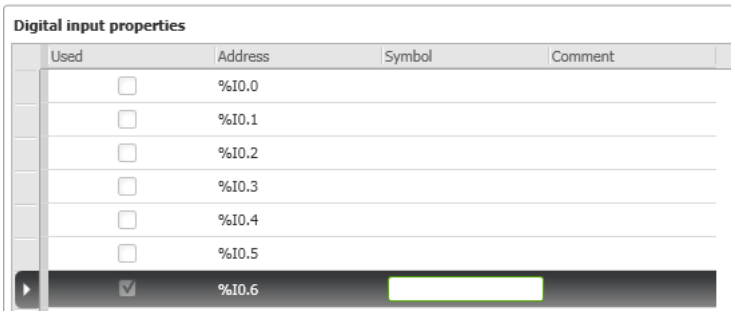


The symbol can contain letters numbers and the underscore character. Spaces are not allowed.

Alternatively, the object property box can be displayed at the bottom of the screen by selecting Tools in the Module Programming Tree and selecting the appropriate input or output type.



Double-clicking the Symbol column of the row containing the object will open a dialog box which will also allow the symbol to be entered.



When the symbol has been entered, the Apply button must be clicked to accept the changes. This allows multiple symbols to be entered before accepting the change.

A different method of entering multiple symbols will be explored in the next section.

Exercise - Adding Symbols to Objects

Learning Outcomes

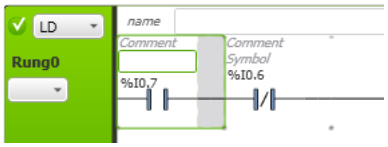
By the completion of this exercise you will:

- Be able to add symbols to the program to identify objects

Skip this exercise if you have already completed the exercise in the eLearning - this is a repeat of that exercise.

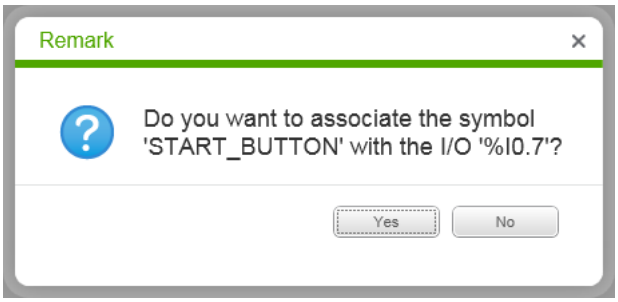
1 Add symbols to the four objects contained in the program.

i. In the ladder editor, double-click the word "Symbol" above the first contact.



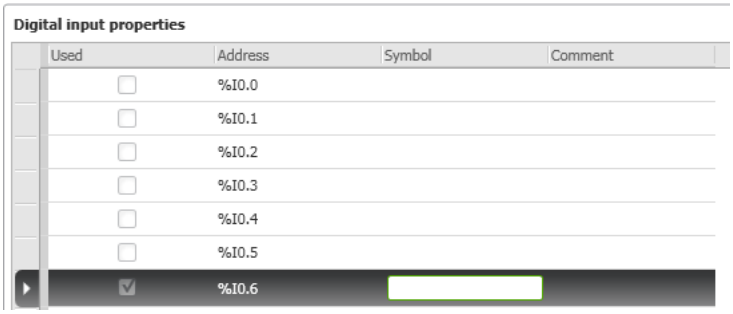
Enter the symbol `START_BUTTON` and press **Return**.

A message will appear asking if you want to associate the symbol "START_BUTTON" with the I/O %I0.7.



Click the **Yes** button to confirm.

ii. At the bottom of the screen, double-click the Symbol column of the row containing %I0.6.



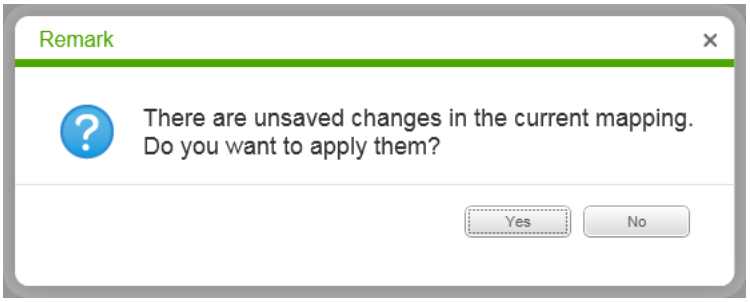
Enter the symbol `STOP_BUTTON`. Click the **Apply** button in the bottom right hand corner to accept the change.

Exercise - Adding Symbols to Objects (cont.)

iii. In the **Module Programming Tree**, select the **Tools** Tab. Under **I/O Objects** select **Digital outputs**.

iv. Double-click the Symbol column of the row containing %Q0.6 and enter the symbol "CONVEYORS_RUNNING". Do not click the **Apply** button.

v. In the Module Programming Tree select another section such as Analog Inputs. The following message will be displayed.



This ensures that any unsaved changes will not be lost if you forget to apply the changes and try to navigate away from the page.

vi. Click the **Yes** button to apply the changes the change.

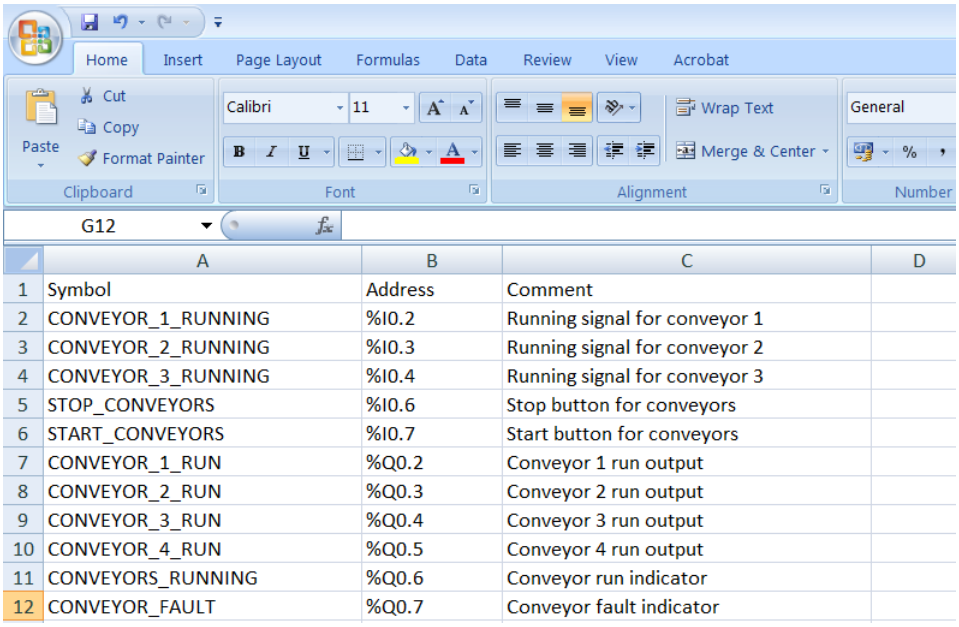
vii. Save the application.

Symbols (cont.)

Exporting and Importing

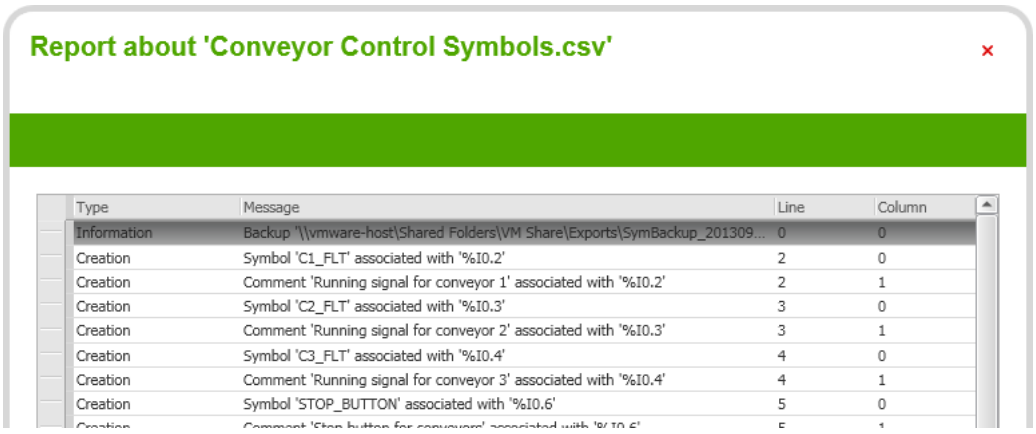
Exporting and importing provide an easy way of editing symbol names and descriptions outside SoMachine Basic.

The symbols can be exported to a .csv file; either comma separated or semi-colon separated. This file can then be opened in Microsoft Excel and edited, allowing all the features of Microsoft Excel to be used to edit the list.



	A	B	C	D
1	Symbol	Address	Comment	
2	CONVEYOR_1_RUNNING	%I0.2	Running signal for conveyor 1	
3	CONVEYOR_2_RUNNING	%I0.3	Running signal for conveyor 2	
4	CONVEYOR_3_RUNNING	%I0.4	Running signal for conveyor 3	
5	STOP_CONVEYORS	%I0.6	Stop button for conveyors	
6	START_CONVEYORS	%I0.7	Start button for conveyors	
7	CONVEYOR_1_RUN	%Q0.2	Conveyor 1 run output	
8	CONVEYOR_2_RUN	%Q0.3	Conveyor 2 run output	
9	CONVEYOR_3_RUN	%Q0.4	Conveyor 3 run output	
10	CONVEYOR_4_RUN	%Q0.5	Conveyor 4 run output	
11	CONVEYORS_RUNNING	%Q0.6	Conveyor run indicator	
12	CONVEYOR_FAULT	%Q0.7	Conveyor fault indicator	

When the editing is complete, the file can be saved to .csv format and imported back into SoMachine Basic. The Import will check whether the symbol already exists and if not, import the symbol into the application. If the symbol already exists then it will be ignored. The description however, will be replaced if it already exists. A report will show the actions carried out by the import process.

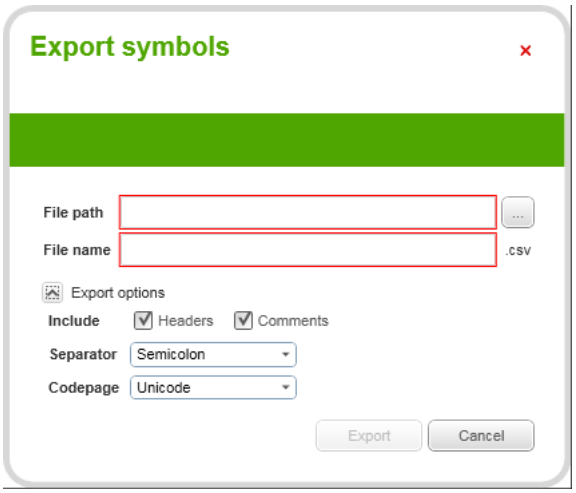


Type	Message	Line	Column
Information	Backup '\\vmware-host\Shared Folders\VM Share\Exports\SymBackup_201309...	0	0
Creation	Symbol 'C1_FLT' associated with '%I0.2'	2	0
Creation	Comment 'Running signal for conveyor 1' associated with '%I0.2'	2	1
Creation	Symbol 'C2_FLT' associated with '%I0.3'	3	0
Creation	Comment 'Running signal for conveyor 2' associated with '%I0.3'	3	1
Creation	Symbol 'C3_FLT' associated with '%I0.4'	4	0
Creation	Comment 'Running signal for conveyor 3' associated with '%I0.4'	4	1
Creation	Symbol 'STOP_BUTTON' associated with '%I0.6'	5	0

Symbols (cont.)

How to Export Symbols

To export a list of symbols, click the **Export** button. The following dialog box will appear: If the export options are not shown, click the down-arrow button to the left of Export options.

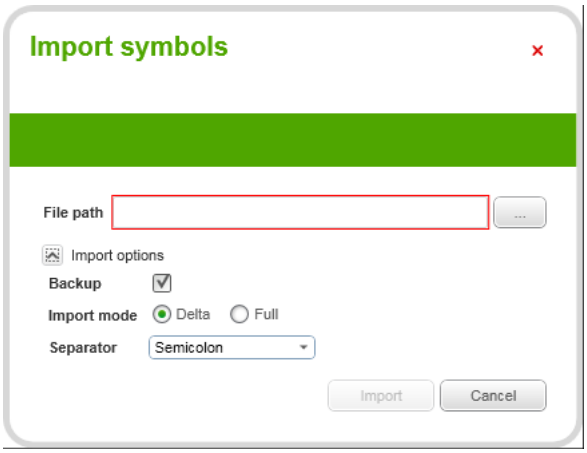


Enter the path and filename and choose the export options:

- Whether to include headers and comments
- Whether to use a semicolon or comma separator
- Whether to use Unicode or ASCII

How to Import Symbols

To import a list of symbols, click the **Import** button. The following dialog box will appear:



Enter the path and filename and choose the import options:

- Whether to create a backup first
- Whether to import only changes or import all items
- Whether to use a semicolon or comma separator
- Whether to use Unicode or ASCII

Exercise - Exporting and Importing Symbols

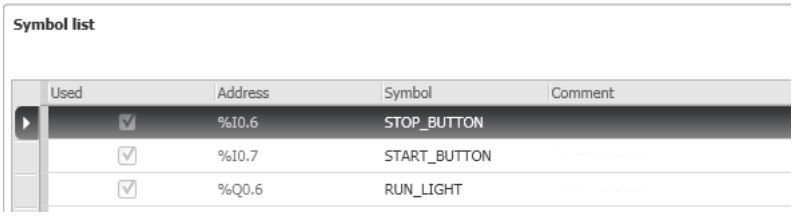
Learning Outcomes

By the completion of this exercise you will:

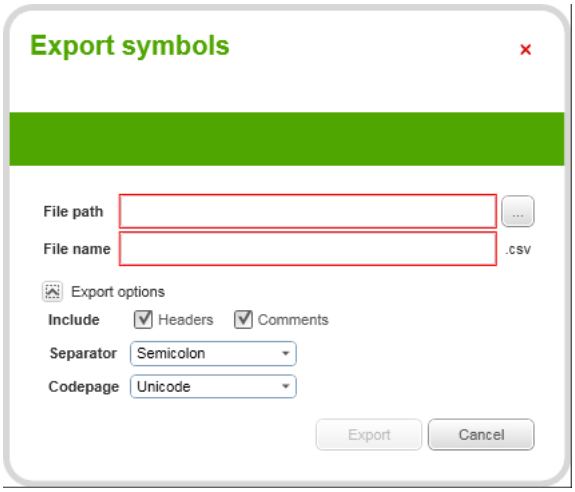
- Be able to export symbols to a .csv file
- Be able to import symbols from a .csv file

1 Export the symbols to a .csv file

i. In the **Module Programming Tree**, under **Software Objects** select **Symbols List.** A list of the currently configured symbols will be displayed.



ii. Click the **Export** button above the list of symbols. The following dialog box will be displayed. If the Export options are not displayed, there will be a Down Arrow button to the left of "Export options". Click this **down arrow button** to display them.



iii. Click the **ellipsis button** to the right of the File Path entry box and choose the desktop.

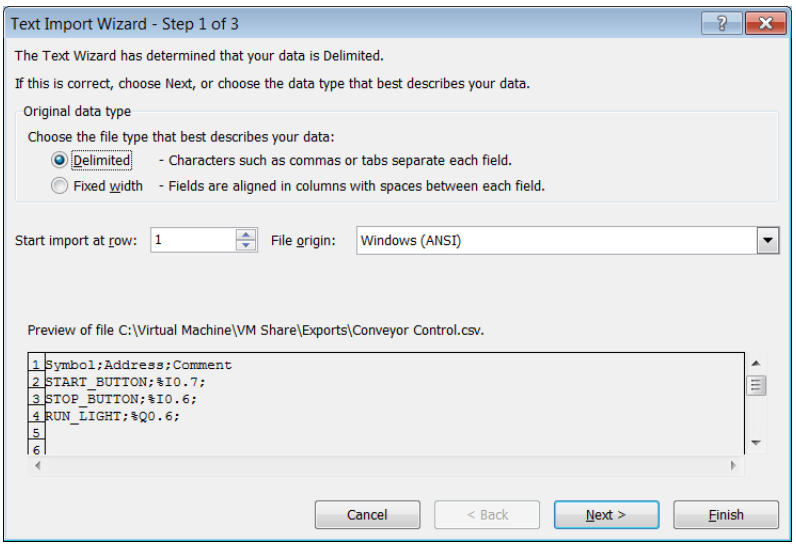
iv. Enter `Conveyor Control` for the filename.

v. Click the **Export** button to export the file.

Exercise - Exporting and Importing Symbols (cont.)

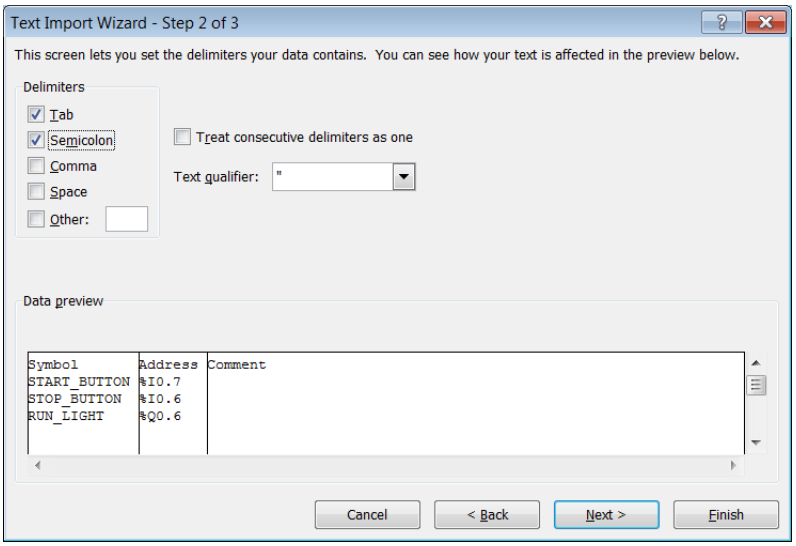
2 Edit the exported symbols file in Excel.

i. Start Excel and open the symbols file that is on the desktop. If the file was saved to a different location in the previous step, open it from there. The import wizard will be automatically displayed.



Click the **Next** button to go to page 2.

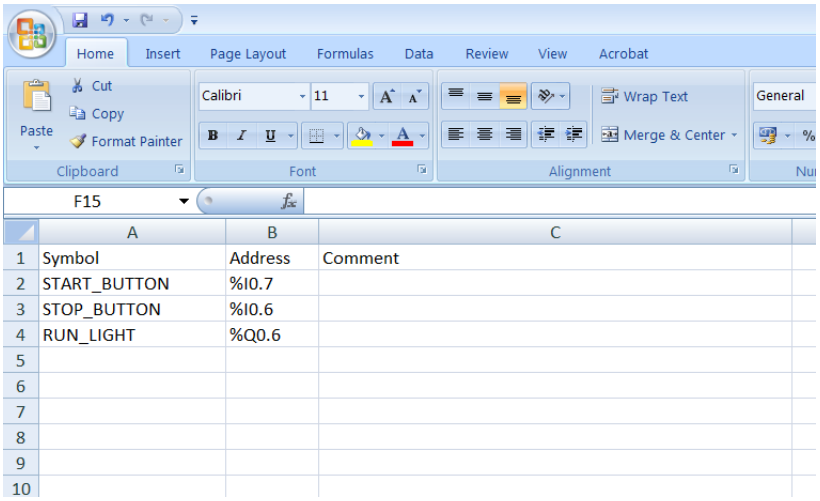
ii. On page 2 of the wizard, ensure that the **Semicolon** tickbox is selected.



Click the **Finish** button to complete the import process.

Exercise - Exporting and Importing Symbols (cont.)

iii. Excel will display the symbols in three columns of the spreadsheet; Symbol, Address and Comment



	A	B	C
1	Symbol	Address	Comment
2	START_BUTTON	%I0.7	
3	STOP_BUTTON	%I0.6	
4	RUN_LIGHT	%Q0.6	
5			
6			
7			
8			
9			
10			

iv. Edit the spreadsheet to contain the following entries:

	A	B	C
1	Symbol	Address	Comment
2	C1_FLT	%I0.2	Running signal for conveyor 1
3	C2_FLT	%I0.3	Running signal for conveyor 2
4	C3_FLT	%I0.4	Running signal for conveyor 3
5	STOP_BUTTON	%I0.6	Stop button for conveyors
6	START_BUTTON	%I0.7	Start button for conveyors
7	C1_SPD	%IW0.0	Conveyor 1 speed sensor
8	C1_RUN	%Q0.2	Conveyor 1 run output
9	C2_RUN	%Q0.3	Conveyor 2 run output
10	C3_RUN	%Q0.4	Conveyor 3 run output
11	RUN_LIGHT	%Q0.6	Conveyor run indicator
12	FLT_LIGHT	%Q0.7	Conveyor fault indicator
13	RUN_RELAY	%M100	Conveyor run relay
14	C1_STOPR	%M101	Conveyor 1 stop sequence
15	C2_STOPR	%M102	Conveyor 2 stop sequence
16	C3_STOPR	%M103	Conveyor 3 stop sequence
17	C1_FLTR	%M105	Conveyor 1 fault relay
18	C2_FLTR	%M106	Conveyor 2 fault relay
19	C3_FLTR	%M107	Conveyor 3 fault relay
20	STOP_RELAY	%M109	Stop sequence relay
21	VS_OK	%M120	Variable Speed OK
22	VS_HIGH	%M121	Variable Speed high
23	VS_LOW	%M122	Variable Speed low
24	VS_LO_SP	%MW1	Variable speed conveyor low setpoint
25	VS_HI_SP	%MW2	Variable speed conveyor high setpoint

Exercise - Exporting and Importing Symbols (cont.)

v. Save the spreadsheet as a .csv file called **Conveyor Control Symbols**.

If a message is displayed about compatible features, click the **Yes** button to save the file.

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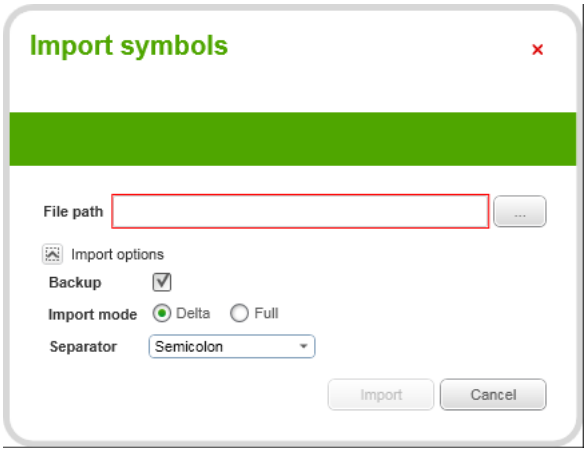
3 Import the .csv file into SoMachine Basic.

i. In the SoMachine Basic Symbols List view, click the **Import** Button.

The project must be saved before the symbols file can be imported. If the following message is displayed, the project has not been saved.

Click the **OK** button, save the project and then click the **Import** button again.



ii. Click the **ellipsis** button to the right of the File Path and navigate to the desktop. Select the file called Conveyor Control Symbols.csv. If the file was saved to a different location in the previous step, open it from there.

iii. If the Import Options are not displayed, there will be a Down Arrow button to the left of "Import Options". Click this **down arrow button** to display them. Drop down the **Separator** selection box and choose **Comma**.

(Excel will use the comma separator by default unless a different separator has been chosen in the Excel options)

iv. Click the **Import** button to begin the import process.

Exercise - Exporting and Importing Symbols (cont.)

v. When the import has completed, a window will open showing the report for the import. Review the report for any errors.