

## Chapter 9

# Installation Validation Tool for Installation Qualification (IQ)

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### Introduction

The Installation Validation Tool for Installation Qualification (IQ) may be used to validate that the software is installed completely and correctly. The tool can also be used to verify that no files have been changed since the software was installed.

The Installation Validation Tool compares all **PASS** installation files against factory requirements and reports if any required files or folders are missing or invalid. Summary and detailed validation reports are created and displayed in the Output Window. If all files and folders pass installation qualification, then you can be certain that the software is installed correctly.

If at any time you begin to experience any type of issues with the software, we suggest that you run the Installation Validation Tool to verify that all of the required files are present and that none have changed or become corrupted.

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### The Tool Window

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#### Loading the Tool Window

You can load the Installation Validation Tool for Installation Qualification (IQ) window from within **PASS** using the menu by selecting **Tools**, then **Validation and Qualification (IQ/OQ)**, and then clicking **Installation Validation Tool for Installation Qualification (IQ)**.

The tool window can also be loaded from the **PASS** Home window procedure tree by selecting **Tools**.

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#### Tool Window Options

The following components are included on the Installation Validation Tool for Installation Qualification (IQ) window.

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##### Select Installation Validation Reports to Display

Various checkboxes are available that allow you to limit the output in the report. These choices do not affect the validation performed—only the output. If you choose to include the files and folders that passed validation in the report, the output may be quite long.

## Installation Validation Tool for Installation Qualification (IQ)

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### Run Validation

Click the Validate Installation button to run the validation. The tool runs through each file in the installation, so this step may take some time depending on the speed of your computer.

### Installation Validation Progress

This box displays the progress and information about the validation as it proceeds. You can copy the information from this box after selecting contents by right-clicking and selecting “Copy” or by typing Ctrl-C on the keyboard.

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## File Validation

PASS installation files are first validated for existence and then for integrity using unique **checksum** values. A checksum (sometimes known as a hash sum) is a short cryptographic value derived from a block of digital data. Each file has a unique checksum signature that is recorded when the files are packaged during creation of the setup file. If the installation is successful and all files are as they were when they were packaged, the checksum value will match the checksum value that was originally recorded. The installation validation tool first determines whether each required file is present and then compares the actual and expected official checksum values to determine the integrity of the file.

### Validation Results

The three possible validation results for each file are

- **Missing**  
A file is reported as “Missing” if it does not exist. If any files are reported as missing, you should repair the installation using the setup file.
- **Failed**  
A file is reported as “Failed” if it exists but it’s actual checksum does not match the official checksum. If any files are reported as failed, you should first delete the file(s) and then repair the installation using the setup file.
- **Passed**  
A file is reported as “Passed” if it exists and it’s actual and official checksum values match exactly.

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## Folder Validation

PASS installation folders are validated for existence. Folders do not have checksum values.

### Validation Results

The two possible validation results for each folder are

- **Missing**  
A folder is reported as “Missing” if it does not exist. If any folders are reported as missing, you should repair the installation using the setup file.
- **Passed**  
A folder is reported as “Passed” if it exists.

## Reports

The results of the installation qualification are presented in various reports created in the Output Window. The reports are always formatted in the landscape page orientation and the lists are output in small font because of the length of file names (the page orientation and small font size cannot be changed—they override the system orientation and font size).

### Report for Complete Installation with No Errors

The following report is representative of a valid, complete, and functioning **PASS** software installation.

#### PASS 16 Installation Qualification (IQ) Results Summary

Date & Time	6/5/2018 3:00:03 PM		
Product Version	16.0.1		
Installation Path	C:\Program Files (x86)\NCSS\PASS 16\		
Validation Source File	C:\Program Files (x86)\NCSS\PASS 16\PASS 16 File List.txt		
Computer Name	JOHN-DESKTOP		
OS Name	Microsoft Windows 10 Pro		
Licensed User	John Doe		
Organization	XYZ Inc.		
License Key	xxxx-xxxx-xxxx-xxxx-1A2B		
License Type	Professional License		
Files Checked	1564		
Passed	1564/1564	(100%)	
Failed	0/1564	(0%)	
Missing	0/1564	(0%)	
Folders Checked	5		
Passed	5/5	(100%)	
Missing	0/5	(0%)	

Normal Completion  
Run Time = 4.081 seconds

#### Failed Files

[No Required Files Failed Checksum Validation]

#### Missing Files

[No Required Files were Missing]

#### Missing Folders

[No Required Folders were Missing]

#### Passed Files

##### File

C:\Program Files (x86)\NCSS\PASS 16\NCSS1.dll  
C:\Program Files (x86)\NCSS\PASS 16\PASS 16 Help System.exe  
C:\Program Files (x86)\NCSS\PASS 16\PASS 16.exe  
C:\Program Files (x86)\NCSS\PASS 16\AxInterop.AcroPDFLib.dll  
C:\Program Files (x86)\NCSS\PASS 16\Extreme.Numerics.Net35.dll  
C:\Program Files (x86)\NCSS\PASS 16\FarPoint.CalcEngine.dll  
C:\Program Files (x86)\NCSS\PASS 16\FarPoint.Excel.dll  
C:\Program Files (x86)\NCSS\PASS 16\FarPoint.Localization.dll

##### Official Checksum

9kVKNWml/h9TsqAfawhbswQxitA=  
MP1qIRxiUWg0xM61OEy074ZnvqI=  
ZccbX7QsqGr9YypZlAnglb1pBMw=  
5yMUBXL+OTX8RUOT2Xye5kWUIBY=  
ilAQdvxJnjvBbcfOsA+W6m8Aeds=  
rR8Zq2HnNOFkuwNS5dD4RbsVx8w=  
POuAHEGi/3VauhF8oNJAwwzQTjcQ=  
j6l42DHb8OgF1XyIPKF3O/+wFLM=

##### Actual Checksum

9kVKNWml/h9TsqAfawhbswQxitA=  
MP1qIRxiUWg0xM61OEy074ZnvqI=  
ZccbX7QsqGr9YypZlAnglb1pBMw=  
5yMUBXL+OTX8RUOT2Xye5kWUIBY=  
ilAQdvxJnjvBbcfOsA+W6m8Aeds=  
rR8Zq2HnNOFkuwNS5dD4RbsVx8w=  
POuAHEGi/3VauhF8oNJAwwzQTjcQ=  
j6l42DHb8OgF1XyIPKF3O/+wFLM=

[Report Continues for Several Pages]

## Installation Validation Tool for Installation Qualification (IQ)

## Passed Folders

## Folder

C:\Users\John\AppData\Roaming\NCSS\PASS 16\Settings\  
 C:\Users\John\AppData\Roaming\NCSS\PASS 16\Temp\  
 C:\Users\John\AppData\Roaming\NCSS\PASS 16\Temp\txjunk\_Images\  
 C:\Users\John\Documents\PASS 16\Procedure Templates\Autosave\  
 C:\Users\John\Documents\PASS 16\Macros\

The first report provides information about your computer, your **PASS** installation and license information, and a summary of the file and folder validation results. The reports that follow list any files that failed checksum validation, any files or folders that were missing, a list of all files that passed checksum validation, and a list of required folders that are present. In this case, no files were missing or invalid and no folders were missing.

## Report for Corrupted Installation with Various Errors

The following report is representative of a corrupted **PASS** installation with several errors.

### PASS 16 Installation Qualification (IQ) Results Summary

Date & Time	6/5/2018 3:08:02 PM	
Product Version	16.0.1	
Installation Path	C:\Program Files (x86)\NCSS\PASS 16\	
Validation Source File	C:\Program Files (x86)\NCSS\PASS 16\PASS 16 File List.txt	
Computer Name	JANE-DESKTOP	
OS Name	Microsoft Windows 10 Pro	
Licensed User	Jane Doe	
Organization	XYZ Inc.	
License Key	xxxx-xxxx-xxxx-xxxx-8A9B	
License Type	Professional License	
Files Checked	1564	
Passed	1531/1564	(97.89%)
Failed	1/1564	(0.06%)
Missing	32/1564	(2.05%)
Folders Checked	5	
Passed	4/5	(80%)
Missing	1/5	(20%)

Normal Completion  
 Run Time = 4.081 seconds

### Failed Files

File	Official Checksum	Actual Checksum
C:\Program Files (x86)\NCSS\PASS 16\PASS 16.exe	ZccbX7QsqGr9YypZIAnGlB1pBMw=	CZIIlQMD16zK1devkjbUdl6DYA=

### Missing Files

File	Official Checksum	Actual Checksum
C:\Program Files (x86)\NCSS\PASS 16\NCSS1.dll	9kVKNwml/h9TsqAfawhbswQxitA=	
C:\Program Files (x86)\NCSS\PASS 16\PASS 16 Help System.exe	MP1qIRxiUWg0xM61OEy074ZnvqI=	
C:\Program Files (x86)\NCSS\PASS 16\AxInterop.AcroPDFLib.dll	5yMUBXL+OTX8RUOT2Xye5kWUIBY=	
C:\Program Files (x86)\NCSS\PASS 16\Extreme.Numerics.Net35.dll	iIAQdVxJnjvBbcfOsA+W6m8Aeds=	
C:\Program Files (x86)\NCSS\PASS 16\FarPoint.CalcEngine.dll	rR8Zq2HnNOFkuwNS5d4RbsVx8w=	
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.	.	

[Report Continues]

### Missing Folders

## Folder

C:\Users\Jane\Documents\PASS 16\Macros\

## Installation Validation Tool for Installation Qualification (IQ)

Passed Files		
File	Official Checksum	Actual Checksum
C:\Program Files (x86)\NCSS\PASS 16\HelpIndex\PASS16_ChapterIndex.txt	PexQ02XfkfMXRRqxxYkwXHC7gVE=	PexQ02XfkfMXRRqxxYkwXHC7gVE=
C:\Program Files (x86)\NCSS\PASS 16\HelpIndex\PASS16_GroupIndex.txt	ccdL0oP5YJJWdCWMXegYH0/O1fE=	ccdL0oP5YJJWdCWMXegYH0/O1fE=
C:\Program Files (x86)\NCSS\PASS 16\HelpIndex\PASS16_Index.txt	f09joEO8AUfSbrqtzizQ0lGalnM=	f09joEO8AUfSbrqtzizQ0lGalnM=
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[Report Continues for Several Pages]		
Passed Folders		
Folder		
C:\Users\Jane\AppData\Roaming\NCSS\PASS 16\Settings\		
C:\Users\Jane\AppData\Roaming\NCSS\PASS 16\Temp\		
C:\Users\Jane\AppData\Roaming\NCSS\PASS 16\Temp\bxjunk_Images\		
C:\Users\Jane\Documents\PASS 16\Procedure Templates\Autosave\		

In the case of this **PASS** installation, there is one file with an invalid checksum, 32 missing files, and 1 missing folder. The user should repair the installation and run the validation tool again.