INTRODUCTION

OptoTagPreserve™ is a command-line tool that can archive and restore tags and values in PAC Control™ strategies running on a *groov*® EPIC processor (GRV-EPIC-PR1), PAC R-series or S-series controller, or on SoftPAC™.

One of the most popular uses for OptoTagPreserve is to preserve a strategy's tag values, and then restore the values after updating firmware on a processor or a controller. Updating firmware erases battery-backed data—including persistent variables and variables initialized on strategy download. OptoTagPreserve helps to get your system back on line more quickly following a firmware update.

You can also use OptoTagPreserve to:

- Save a backup copy of strategy tags and data.
- Create "templates" of variables to copy to other strategies and other controllers.
- Recover from an accidental erasure of the processor's or controller's data.
- Transfer strategy configuration between controllers, including *groov* EPIC® processors.

Additional OptoTagPreserve features let you:

- Save archive files in OptoScript™, XML, binary obfuscated, or init.txt (PAC Control's output download) format.
- Create the data as a series of XML files for export to external systems.
- Define a subset of tags to be archived.
- Protect binary-formatted archive files with a password.

For details, see "Command-Line Reference" on page 6.

OptoTagPreserve archives and restores:	
32-bit Integer variables	32-bit Integer tables
64-bit Integer variables	64-bit Integer tables
32-bit Float variables	32-bit Float tables
String variables	String tables

It does not archive or restore:
Pointer variables
Pointer tables
Up timers
Down timers or I/O Communication handles

NOTE: In this document, the words "directory" and "folder" are synonymous.

WHAT YOU'LL NEED

This technical note assumes you know how to:

- Use PAC Control and:
  - for *groov* EPIC processors, use *groov* Manage.
  - for SNAP PAC controllers and SoftPAC, use PAC Manager™.
- Configure and use a *groov* EPIC processor or SNAP PAC controller.
- Use the Command Prompt window in Microsoft® Windows®.

In addition, you'll need:

- A *groov* EPIC processor, SNAP PAC R-series or S-series controller, SoftPAC software-based programmable automation controller. (There is no minimum firmware requirement.)
- A computer with:
  - .NET Framework 4.0 or higher installed on your computer.

   - One of the following operating systems:
     - Microsoft Windows 10 Professional (32-bit or 64-bit).
     - Windows 7 Professional (32-bit or 64-bit).

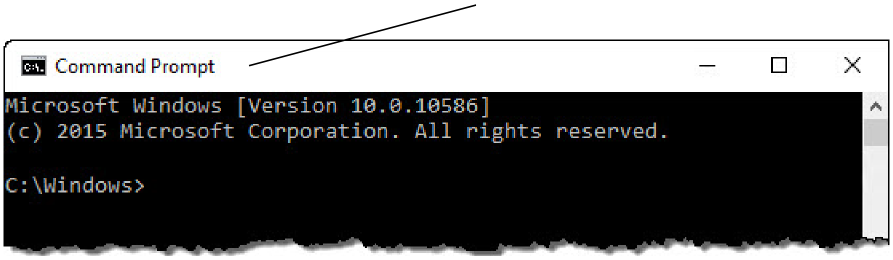
To find out what version of .NET Framework is on your computer:

a. Open the Command Prompt window.

To open the Command Prompt window, on your keyboard, press the Windows Start key ⊞, type **`Command Prompt`** and then press the Enter key.

Note the space between "Command" and "Prompt."

The Microsoft Command Prompt window



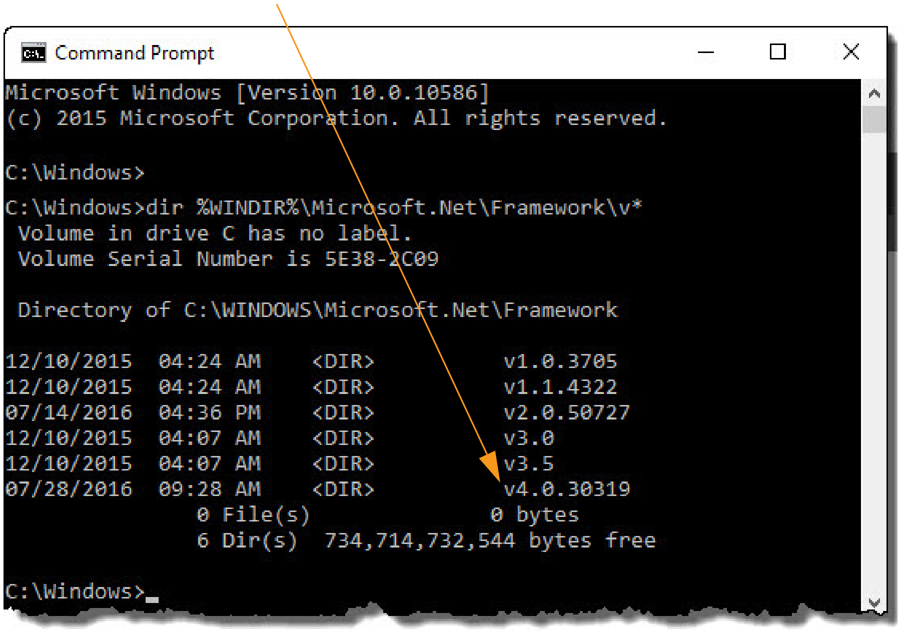
```
Microsoft Windows [Version 10.0.10586]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Windows>
```

b. In the window, type `dir %WINDIR%\Microsoft.Net\Framework\v*` and then press Enter.

If "v4" is displayed in the response, your computer has the minimum required version of .NET Framework.

If your computer doesn't have .NET v4 or higher, ask your IT department for assistance.

This computer has .NET version 4 (as well as other versions of .NET).



```
Microsoft Windows [Version 10.0.10586]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Windows>
C:\Windows>dir %WINDIR%\Microsoft.Net\Framework\v*
 Volume in drive C has no label.
 Volume Serial Number is 5E38-2C09

 Directory of C:\WINDOWS\Microsoft.Net\Framework

12/10/2015  04:24 AM    <DIR>          v1.0.3705
12/10/2015  04:24 AM    <DIR>          v1.1.4322
07/14/2016  04:36 PM    <DIR>          v2.0.50727
12/10/2015  04:07 AM    <DIR>          v3.0
12/10/2015  04:07 AM    <DIR>          v3.5
07/28/2016  09:28 AM    <DIR>          v4.0.30319
               0 File(s)              0 bytes
               6 Dir(s)  734,714,732,544 bytes free

C:\Windows>_
```

c. To close the Command Prompt windows, type `exit` and then press Enter.

USING OptoTagPreserve

This section shows you how to use OptoTagPreserve commands to upload and restore a strategy's tag values when upgrading firmware. In this example, the Upload command:

- Uploads all supported controller tags and tag values from a controller to an archive file.
- Saves the file in binary format and obfuscates it (so the file can't be easily read).
- Stores the file in the folder where you performed the command.
- Names the file based on the controller's IP address and the date and time that the archive was created. The archive's file extension is ".tagarchive".

For more ways to use OptoTagPreserve and its optional arguments, see "Command-Line Reference" on page 6.

In the instructions, the term "controller" refers to either a *groov* EPIC processor, SNAP PAC R-series or S-series controller, or a SoftPAC software-based programmable automation controller.

In This Section

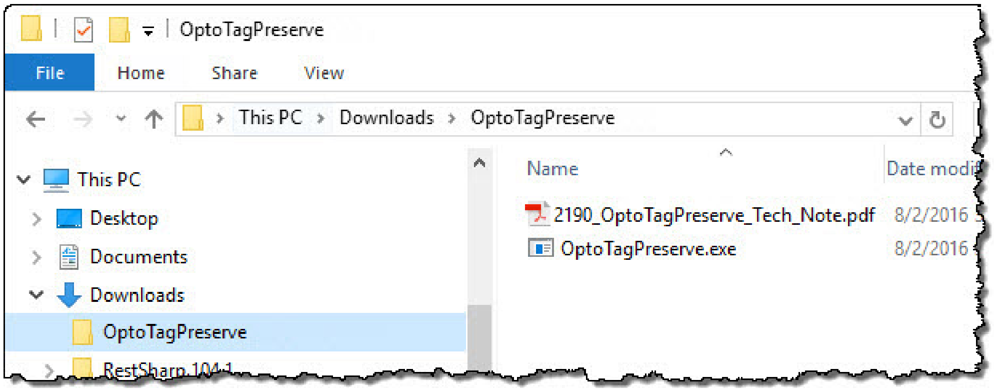
Step 1: Install OptoTagPreserve and Upload Tag Values

IMPORTANT: You must stop the PAC Control strategy before uploading or restoring tag values. If the strategy is running, the restored values can cause unpredictable results. For instance, if your strategy is counting products when you upload tag values, the counting process may not work properly with the values you restore. Similarly, variables that are derived from the RTC (real time clock) could be restored to the wrong time if they aren't reinitialized properly in the strategy.

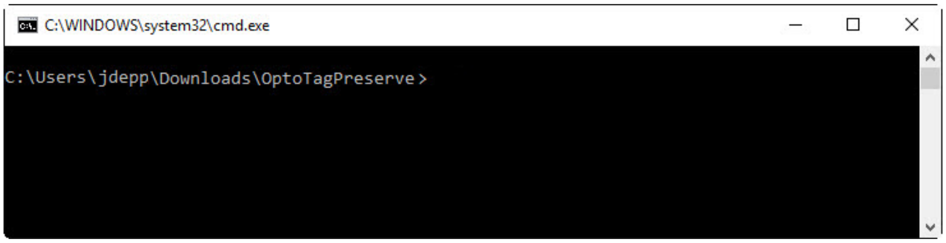
To install and use OptoTagPreserve:

1. Download the OptoTagPreserve zip file from the Opto 22 website, and then extract the contents to a folder on your hard drive.
2. In File Explorer, navigate to the folder where you extracted the OptoTagPreserve files.

   In our example, we extracted the files in the Downloads folder.


OptoTagPreserve
File
Home
Share
View
This PC › Downloads › OptoTagPreserve
This PC
Desktop
Documents
Downloads
OptoTagPreserve
RestSharp.104.1
Name
Date modi
2190_OptoTagPreserve_Tech_Note.pdf 8/2/2016
OptoTagPreserve.exe 8/2/2016

3. Open a Command Prompt window in OptoTagPreserve's folder:



```
C:\Users\jdepp\Downloads\OptoTagPreserve>
```

4. Enter an OptoTagPreserve command to upload the tags and tag values from the strategy in your PAC controller.

   The minimal Upload command syntax is:

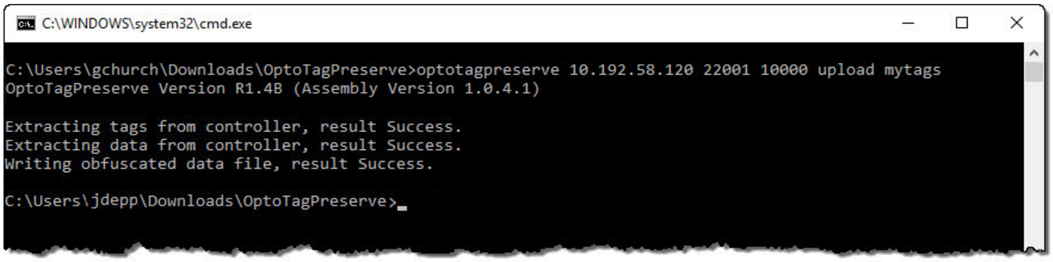
   OptoTagPreserve *controller's_IP_address TCP_port timeout_in_ms* **upload** *project_name*

   The command, "OptoTagPreserve," is not case-sensitive. Note the spaces between each parameter. OptoTagPreserve prepends the project name to the archive filename. (The project name can be anything you choose.)

   Example: `OptoTagPreserve 10.999.98.120 22001 10000 upload mytags`

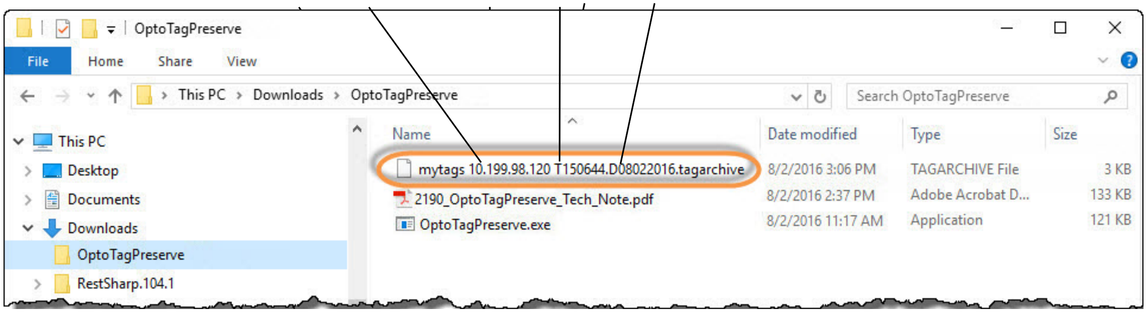
   NOTE: To submit a command in the Command Prompt window, type the command, and then press Enter.

If the values in the example were real, the result in the Command Prompt windows would be:



```
C:\Users\gchurch\Downloads\OptoTagPreserve>optotagpreserve 10.192.58.120 22001 10000 upload mytags
OptoTagPreserve Version R1.4B (Assembly Version 1.0.4.1)

Extracting tags from controller, result Success.
Extracting data from controller, result Success.
Writing obfuscated data file, result Success.

C:\Users\jdepp\Downloads\OptoTagPreserve>_
```

The archive file would look something like this in File Explorer:


Controller's IP address

Time and date the archive file was created

Name	Date modified	Type	Size
mytags 10.199.98.120 T150644.D08022016.tagarchive	8/2/2016 3:06 PM	TAGARCHIVE File	3 KB
2190_OptoTagPreserve_Tech_Note.pdf	8/2/2016 2:37 PM	Adobe Acrobat D...	133 KB
OptoTagPreserve.exe	8/2/2016 11:17 AM	Application	121 KB

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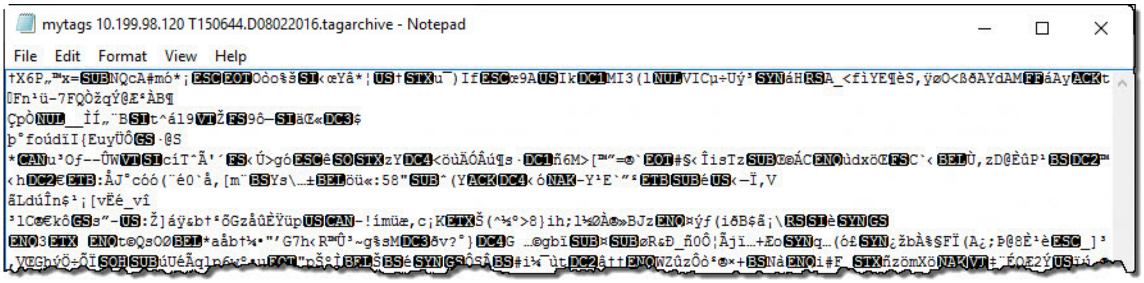
And if you tried to open the archive file, it would look something like this:


mytags 10.199.98.120 T150644.D08022016.tagarchive - Notepad
File Edit Format View Help

Step 2: Update Firmware and Download Strategy

1. Update the controller's firmware:
   - To update a *groov* EPIC processor's firmware, use *groov* Manage. For instructions, see "Applying Maintenance to a *groov* EPIC Unit" in form 2267, the *groov* EPIC User's Guide.
   - To update a SNAP PAC S- or R-series or SoftPAC controller's firmware, use PAC Manager. For instructions, see form 1704, the PAC Manager User's Guide.
2. Use PAC Control to download the strategy. For details about PAC Control, see Opto 22 form 1700, the PAC Control User's Guide.

   For SNAP PAC controllers, you can also use PAC Terminal™ to download a strategy download (.cdf) file to the controller.

   REMEMBER: Don't start the strategy until you complete Step 3!

Step 3: Restore Tag Values and Run Strategy

1. In the Command Prompt window, enter an OptoTagPreserve command to restore the tags and tag values to your PAC controller.

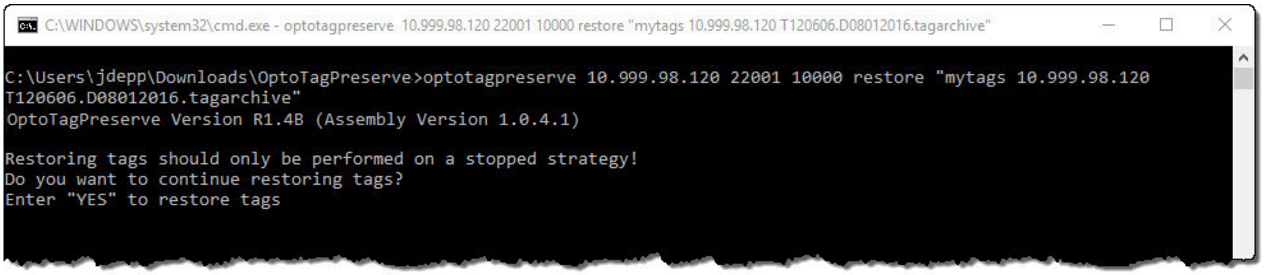
   The minimal Restore command syntax is:

   OptoTagPreserve *controller's_IP_address TCP_port timeout_in_ms* **restore** "*archive filename*"

   Note the spaces between each parameter and the double-quotes around the filename.

   Example:

```
OptoTagPreserve 10.999.98.120 22001 10000 restore "mytags 10.999.98.120 T120606.D08012016.tagarchive"
```


C:\WINDOWS\system32\cmd.exe - optotagpreserve 10.999.98.120 22001 10000 restore "mytags 10.999.98.120 T120606.D08012016.tagarchive"

```
C:\Users\jdepp\Downloads\OptoTagPreserve>optotagpreserve 10.999.98.120 22001 10000 restore "mytags 10.999.98.120
T120606.D08012016.tagarchive"
OptoTagPreserve Version R1.4B (Assembly Version 1.0.4.1)

Restoring tags should only be performed on a stopped strategy!
Do you want to continue restoring tags?
Enter "YES" to restore tags
```

2. If you're *sure* that you want to restore the data values to your controller, type YES at the prompt, and then press Enter. (Note that "YES" must be in capital letters.)

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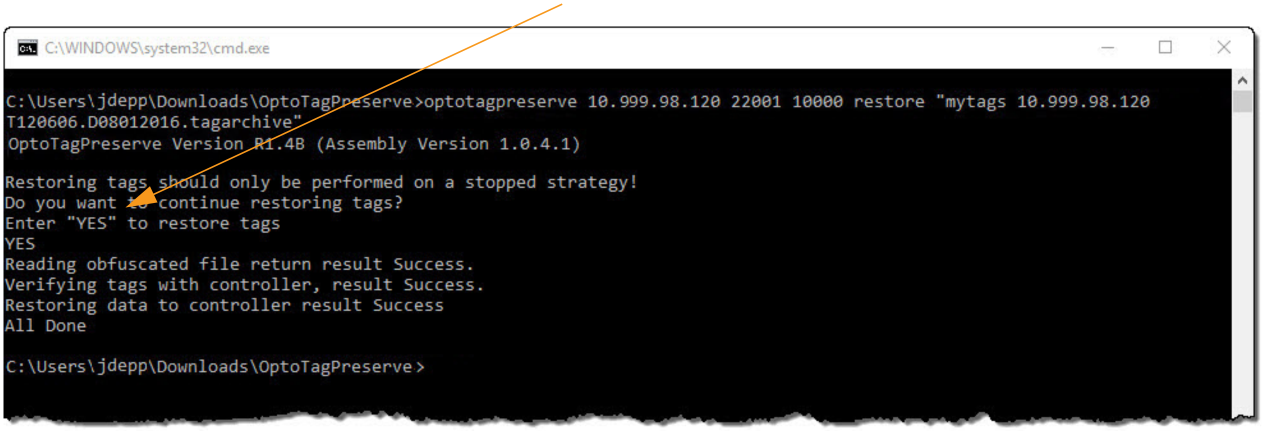
If the values in the example were real, the result in the Command Prompt windows would be:



To restore the archive file, type YES and press Enter.

```
C:\Users\jdepp\Downloads\OptoTagPreserve>optotagpreserve 10.999.98.120 22001 10000 restore "mytags 10.999.98.120
T120606.D08012016.tagarchive"
 OptoTagPreserve Version R1.4B (Assembly Version 1.0.4.1)

Restoring tags should only be performed on a stopped strategy!
Do you want to continue restoring tags?
Enter "YES" to restore tags
YES
Reading obfuscated file return result Success.
Verifying tags with controller, result Success.
Restoring data to controller result Success
All Done

C:\Users\jdepp\Downloads\OptoTagPreserve>
```

COMMAND-LINE REFERENCE

This section describes OptoTagPreserve's command syntax and arguments.

Command-Line Syntax

OptoTagPreserve *IP_address TCP_port timeout_in_ms* { **upload** | **restore** } *project_name* [**-i**] [**-c**] [**-o** *password*] [**-x**] [**-s** *"tag list path and filename"*] [**-STOP**] [**-SILENT**] [**/?**]

Required Arguments

IP_address	Controller's IP address For an upload, this is the IP address of the controller that contains the tags and values; for a restore, this is the IP address of the controller that will get the tags and values. Note that you can restore the tags and data from one controller to a different controller. (Beginning with R1.6, you can specify a hostname instead of the IP Address.)
TCP_port	Controller's host port. Typically, the value is 22001.
timeout_in_ms	Timeout value in milliseconds. Minimum value is 10000.
{ **upload** | **restore** }	**upload** retrieves tags and data from a controller. **restore** restores tag data to a controller
project name	For uploads, this is a user-defined string that OptoTagPreserve uses as a part of the archive filename. For restores, this is the name of the archive file *without* its file extension.

Optional Arguments

Important Notes

- To enable file saving in init.txt, OptoScript, or XML format, the source controller's PAC Control strategy must contain a 32-bit integer variable named "AllowTagUploadsForThisStrategy". (Note that the variable's name is case-sensitive.) This tag grants permission for OptoTagPreserve to access the controller's inventory of tags.

- Command-line options and the password argument are case-sensitive.

Option	Used with	Description
-i	Upload	Stores data in PAC Control’s “after download” init.txt format. The archive file can also be downloaded to the controller using PAC Terminal. For details about init.txt files, see “Creating an Initialization File” in Opto 22 form 1700, the PAC Control User’s Guide. *NOTE*: Does not save string values that are in binary format in the controller. Instead, saves the tag name and, for the value, writes a comment to say the data is in binary format. Archive file extension: .inittxt
-c	Upload	Stores data in PAC Control’s OptoScript format. *NOTE*: Does not save string values that are in binary format in the controller. Instead, saves the tag name and, for the value, writes a comment to say the data is in binary format. The OptoScript code can be pasted into a PAC Control strategy and used to configure default values. Archive file extension: .optoscript
-o *password*	Upload and Restore	Stores data in binary obfuscated format. When using this option, a password is required. If the password has spaces, the entire password must be enclosed in double quotation marks; for example: `-o “my secret password”` Files that have been uploaded with this option can be restored only by using this option with the password. Archive file extension: .obfuscated
-x	Upload and Restore	Stores or restores data in XML format. You can parse the generated XML to create XML files, and then use OptoTagPreserve to write the values to a control strategy. Archive file extension: .xml

-s *tag list*	Upload	Stores only the tags (and associated values) provided in the tag list argument. When using this option, the tag list’s filename is required. If the filename or path has spaces, the argument must be enclosed in double quotation marks; for example:
		`-s “my list of tags.txt”`
		The tag list must be a comma-separated text file that contains tagnames and their tag types.The form of the tag list file is
		case-sensitive_tag_name,case-sensitive_tag_type
		Note the comma separating the arguments.
		Note that the variable name is on the left side of the comma.
		Examples demonstrating all supported tag types:
		`myi64t,integer64table`
		`myi32t,integer32table`
		`myf32t,float32table`
		`mystringtable,stringtable`
		`myint64,integer64`
		`myint32,integer32`
		`myfloat32,float32`
		`mystring,stringvariable`

-SILENT	Upload and Restore	Prevents OptoTagPreserve from requesting user input on restore. (Useful when OptoTagPreserve is called from a script or batch process.)
/?	N/A	Displays Help

EXAMPLES

In the examples, the data is uploaded from and restored to the controller at IP address 1.2.3.4, port 22001. The timeout is 10 seconds.

Upload Examples

```
OptoTagPreserve 1.2.3.4 22001 10000 upload filename
```

Creates an archive file in binary format. Because no output format options were used in the command, the filename will be prepended with “filename”, followed by the time and date of the file creation. The file extension will be “.tagarchive”.

```
OptoTagPreserve 1.2.3.4 22001 10000 upload save -x
```

Creates an archive file in XML format. Archive file will be named “save.xml”.

```
OptoTagPreserve 1.2.3.4 22001 10000 upload save -o "Open Sesame" -i -c
```

Creates three archive files:

- Format: Password-protected binary obfuscated. Password is “Open Sesame”—double quotation marks are required when the password includes a space or other command-line special character (such as periods). Archive filename will be “save.obfuscated”.

  To restore, the restore command must include the -o option and password.
- Format: PAC Control init.txt format. Archive filename will be “save.inittxt”.
- Format: OptoScript. Archive filename will be “save.optoscript”.

```
OptoTagPreserve 1.2.3.4 22001 10000 upload mytaglist -s mylistoftags.txt
```

Creates an archive file containing only the tags and values in the tag list named “mylistoftags.txt.” Archive file will be prepended with “mytaglist” followed by time and date. File extension will be “.tagarchive”.

Restore Examples

```
OptoTagPreserve 1.2.3.4 22001 10000 restore “pacdata 5.6.7.8 T141901.D05132016”
```

Restores the archive file named “pacdata 5.6.7.8.1 T141901.D05132016.tagarchive.” Double-quotation marks are required because the filename includes a space and periods.

Note that when the command does not include a file format option (-x or -o), OptoTagPreserve uses the .tagarchive file that matches the project name.

Also note that the archive file is being restored to a controller that is different from the one used to create the archive file.

```
OptoTagPreserve 1.2.3.4 22001 10000 restore pacdata -x -STOP
```

Restores the archive file named pacdata.xml. Attempts to stop the controller (if running) before restoring tags and values.

```
OptoTagPreserve 1.2.3.4 22001 10000 restore pacdata -o “Open Sesame” -SILENT
```

Restores the archive file named pacdata.obfuscated that was created with password “Open Sesame”. Because the -STOP option is not used, data is restored to the controller whether the strategy is running or not. In this example, -SILENT is used to prevent an interruption in the script that calls the OptoTagPreserve command.

TROUBLESHOOTING

TagUploadBlocked and TagRestoreBlocked

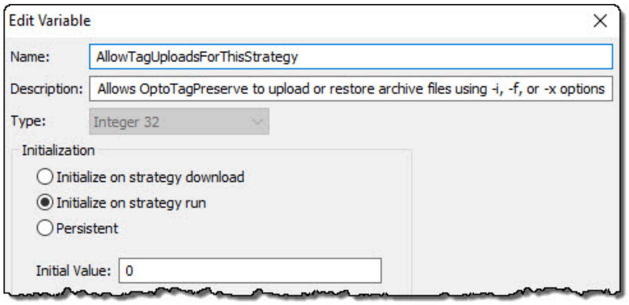
These errors can have two causes:

- An error in an argument or option
- Command includes a file format option (-i, -c, or -x) but the strategy does not include the AllowTagUploadsForThisStrategy numeric variable.

Solutions

Verify the arguments and options in your command and try again.

Add a numeric AllowTagUploadsForThisStrategy variable to your strategy. This variable allows OptoTagPreserve to access the strategy's tags and values.



Name: AllowTagUploadsForThisStrategy

Description: Allows OptoTagPreserve to upload or restore archive files using -i, -f, or -x options

Type: Integer 32

Initialization

○ Initialize on strategy download
● Initialize on strategy run
○ Persistent

Initial Value: 0

OptoTagPreserve hangs

If OptoTagPreserve does not respond within the timeout time, press Ctrl+C to stop the process.

Solution

This error is typically caused by:

- An invalid argument or option. Verify the arguments and options in your command and try again.
- A slow or "spotty" connection.

Opto 22 Product Support

For additional help, contact the Opto 22 Product Support desk at 800-835-6786 (toll-free in the U.S. and Canada) or 951-695-3080, or email us at support@opto22.com.