

***GROOV* SERVER FOR WINDOWS USER'S GUIDE**

groov SERVER FOR WINDOWS USER'S GUIDE

Form 2078-161215—December 2016

OPTO 22
Automation made simple.

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groov Server for Windows User's Guide
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1: Getting Started

Welcome

With *groov* Server for Windows you can easily build your own mobile operator interfaces—your own mobile apps—to monitor and control all kinds of automation systems and equipment.

groov Server for Windows includes *groov* Build for building operator interfaces and *groov* View for using them. Although this *groov* software is stored and served on a Windows PC, any computer with a modern web browser can be used to build interfaces. These operator interfaces can then be viewed on almost any mobile device or computer regardless of its manufacturer or operating system, including smartphones, tablets, PCs, and even web-enabled high-definition televisions.

Once installed, *groov* Server runs as a service on the server computer. This means that it starts when Windows does, and it continues to run in the background as long as Windows is running. In order to build or use *groov* interfaces on any device, this PC must be on and *groov* Server must be running.

For instructions to build and use interfaces, see [form 2027](#), the *groov* User's Guide.

Try Before You Buy

A fully functional version of the software-based *groov* Server for Windows is available to download and try so you can see system data on a smartphone, tablet, or other mobile device. Connect to a Modbus/TCP device, SNAP PAC controller, or *groov* Data Store; or use the built-in Data Simulator to evaluate *groov* without connecting to a live machine or system.

If you want to connect to real data from an OPC UA server and don't have one, Kepware Technologies' KEPServerEX communication platform is also available for download and trial (www.kepware.com). It also operates for two hours without a license key.

Download and install *groov* Server for Windows from groov.com. Simple instructions walk you through software setup, connecting to one or more systems, and building a simple interface so you can quickly see realtime data on a mobile device.

NOTE: You must log onto your computer as an administrator to install groov Server for Windows.

groov Server operates for two hours without a license key. You can restart it as needed. When you purchase *groov*, the project you built during the trial will continue to work.

For Help

If you have questions about using *groov* Server and you cannot find the answer you need in this document or in the *groov User's Guide*, please contact Opto 22 Product Support.

Phone:	800-TEK-OPTO (800-835-6786 toll-free in the U.S. and Canada) 951-695-3080 Monday through Friday, 7 a.m. to 5 p.m. Pacific Time
Fax:	951-695-3017
E-mail:	support@opto22.com
Website:	www.opto22.com

What You Will Need

To install and run *groov* Server for Windows you'll need:

- A PC on the same network as your control device, with one of the following Microsoft® operating systems. If you're using an OPC UA server, *groov* can be on the same computer or a separate computer.
 - Windows® 10 Professional (32-bit and 64-bit)
 - Windows 8.1 Professional (32-bit and 64-bit)
 - Windows 7 Professional (32-bit and 64-bit)
 - Windows Server 2012 and 2012 R2
 - Windows Server 2008 R2
- NOTE: .NET Framework 3.5 or greater is required for all operating systems. Use the "Add roles and features" option for Windows Server 2012.*
- A minimum of 250 MB available disk space to install *groov* Server for Windows. Additional disk space is required to create projects. (Projects may be created on this PC or on a different computer.)

Setting Up *groov* Server

Setting up *groov* Server for Windows is a four-step process: activate *groov*, download software, install software, and download and apply your License File. *All steps except installing software require Internet access.*

If the PC where you plan to install *groov* Server has Internet access, do all steps on that PC. Start with "[Step 1. Activate *groov*](#)" on page 3.

If the PC where you will install *groov* Server does not have Internet access, you can use another PC to activate and download files. However, to download the License File, you need to

know a MAC address on the PC where *groov* Server will be installed. To get it, go to the server PC and open a Command Prompt. Type `ipconfig /all` and look for "Physical Address." It will be a hex value with 12 digits separated by hyphens into groups of two (example: 02-D0-65-1F-B7-20). Write it down, go to the PC with Internet access, and follow the procedures starting with "Step 1. Activate *groov*" on page 3.

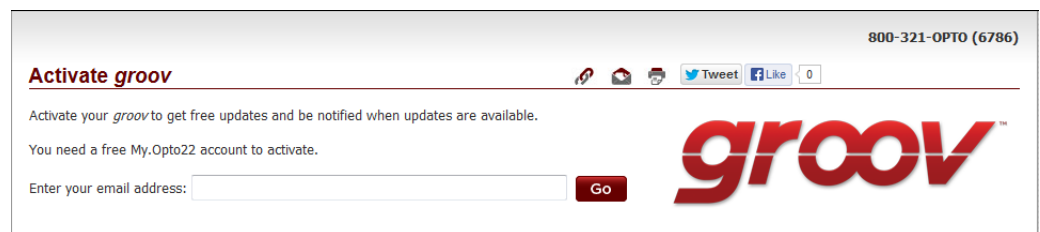
Multiple *groov* Server installations. If you plan to install *groov* Server on multiple PCs, here are some important things to know:

- The software download file is the same for all *groov* Servers for Windows, so if you are downloading from one PC and then installing on multiple other PCs, you only need to download the software once.
- Each *groov* must be individually activated using its Activation Key, because each purchase of *groov* is a separate installation.
- Each *groov* requires its own License File, which is tied to a MAC address for the PC on which it's installed. If you download multiple License Files, you can tell them apart by the MAC address in the filename. Make sure the correct License File goes on each server PC.

Step 1. Activate *groov*

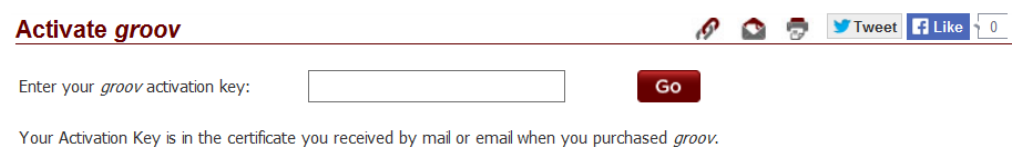
*NOTE: If you already have the *groov* Server Installation File, skip to "Step 3. Install Software" on page 4.*

1. Open a web browser (Firefox or Chrome recommended). Go to activate.groov.com.



2. Log in using your email address and your My.Opto22 password.

You may have set up your free My.Opto22 account when you purchased *groov* Server. If you don't have a My.Opto22 account, enter your email address and other information, and the account will be created.



3. Enter the Activation Key you received via mail or email when you purchased *groov* Server. Click Go.

Your *groov* is activated.

Step 2. Download Software


Click Download *groov* Software and save the file to your computer. (Or click Show next to your *groov* in the list, and download the *groov* Server Installation File.)

(Optional) If you already know the MAC address of the PC where you're installing *groov* Server, you can also get your License File now. To do so, enter it in the MAC address field, click Go, click Get License File, and save the file to your PC.

Step 3. Install Software

NOTE: You must log in as an administrator to install groov Server for Windows.

1. On the PC where you want to install *groov* Server, double-click the *groov* Server installation file and follow the onscreen instructions.
2. When asked whether to open port 443 (needed to access *groov*), check the box to open it unless you need to use a different port or want to open it manually. (See [page 29](#) for instructions.)

groov Server begins running as soon as it is installed. You can tell it's running by the *groov* Monitor icon  in the system tray. The little green arrow means it's running.

Step 4. Start *groov* and Install the License File

1. If you haven't already started *groov*, in your web browser type: `https://localhost`
Make sure you include the `s` in `https` as the `s` indicates a secure connection.
If you're not on the PC that's running *groov* Server for Windows, type `https://` plus the hostname or IP address of the *groov* Server computer.
2. When your browser connects to *groov* for the first time, accept the *security warning*. This is normal behavior for *groov*. Your *groov* data is protected by the Secure Socket Layer 256-bit encryption, so you can safely accept the warning.



For Chrome: Click "Proceed anyway."



For Firefox:

- a. Expand "I Understand the Risks."
- b. Click Add Exception to open the Add Security Exception dialog box.
- c. Select "Permanently store this exception."
- d. Click Confirm Security Exception.

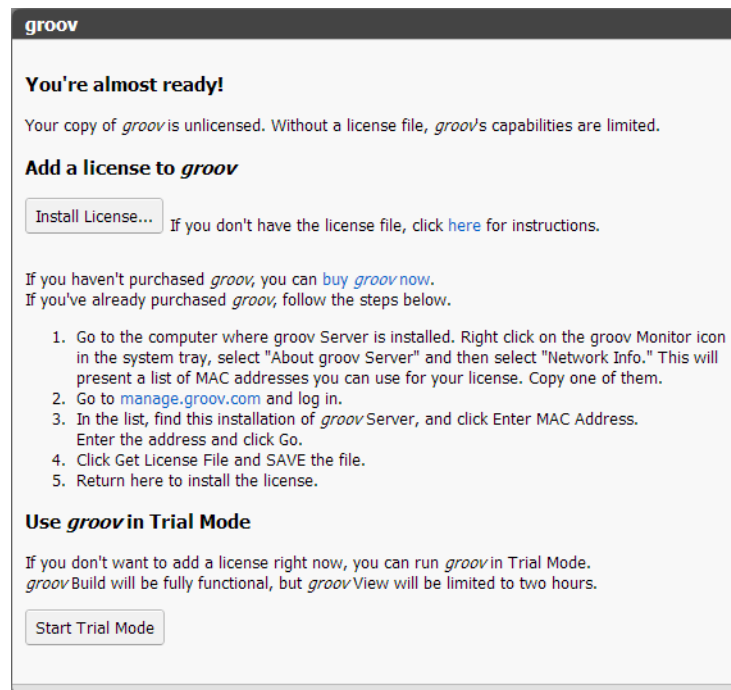


For Safari: Click Continue.




For Internet Explorer: Click "Continue to this website (not recommended)."

- When prompted to add a license file to *groov*, click the word “here” and follow the onscreen instructions.



- After you have saved the license file on your PC, come back to the Licensing dialog box and click Install License.
- Browse to the license file, then click Open.

If you have any trouble opening *groov*, check the *groov* Monitor icon  in the system tray (lower right corner of the screen) to make sure *groov* Server is running. If you don't see it, click the Show Hidden Icons arrow. For more about *groov* Monitor, see [Chapter 3: Maintenance and Troubleshooting](#). If *groov* Server does not start, see [Chapter 3: Maintenance and Troubleshooting](#).

If *groov* Server is running but *groov* Build does not open, see Troubleshooting in [form 2027](#), the *groov* User's Guide.

- Continue with “[Create a New Username and Password](#)” on page 5.

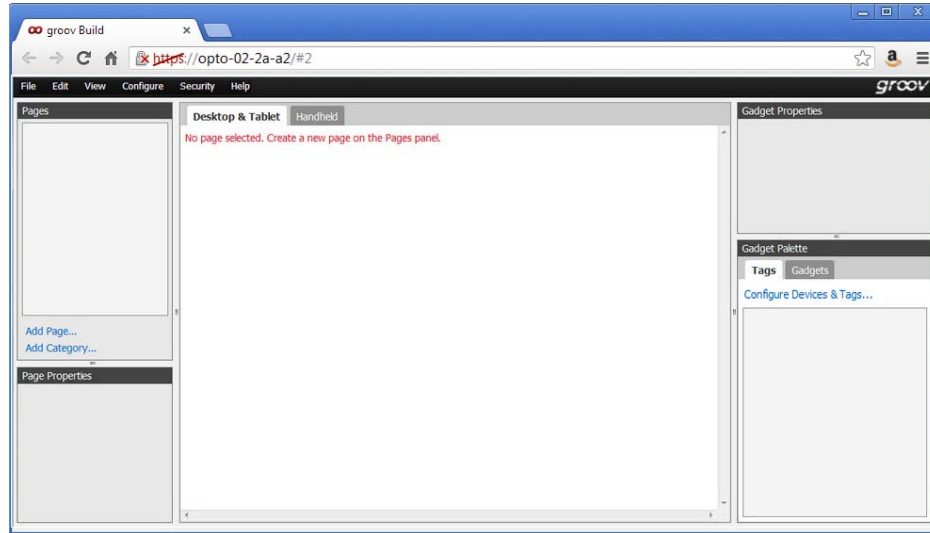
Working with *groov*

Create a New Username and Password

Follow the on-screen instructions to create an administrator username and password for *groov* Build. If the security warning appears again, accept it. Write down your Username and Password, and keep it in a safe place. **There's no way to retrieve login information**, and you will need it each time you log in.

CAUTION: *If you lose your login information, you will not be able open your project. There is no password recovery option! To log in to groov again you'll need to erase your project and start over. See "Erasing Your groov Project" on page 31.*

After you have completed the instructions in **Welcome to groov**, groov Build opens in your web browser.

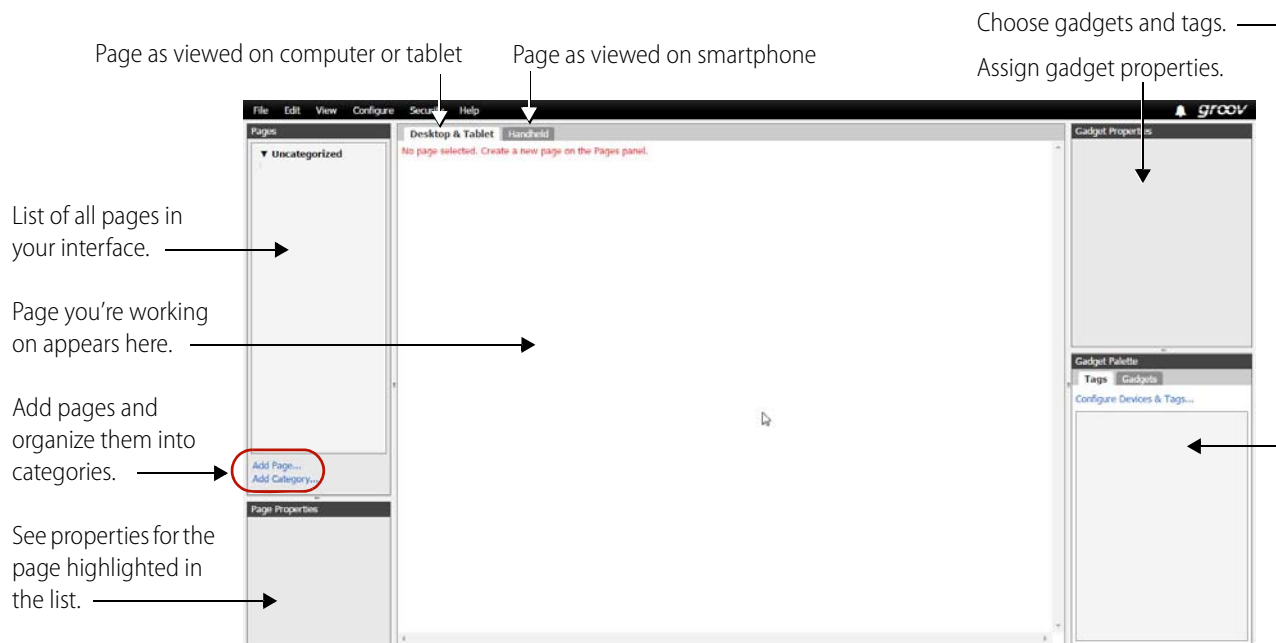


Build a Sample Project

To get started, let's build a page using tags in the Data Simulator and then view it on the computer. Here's what we'll do:

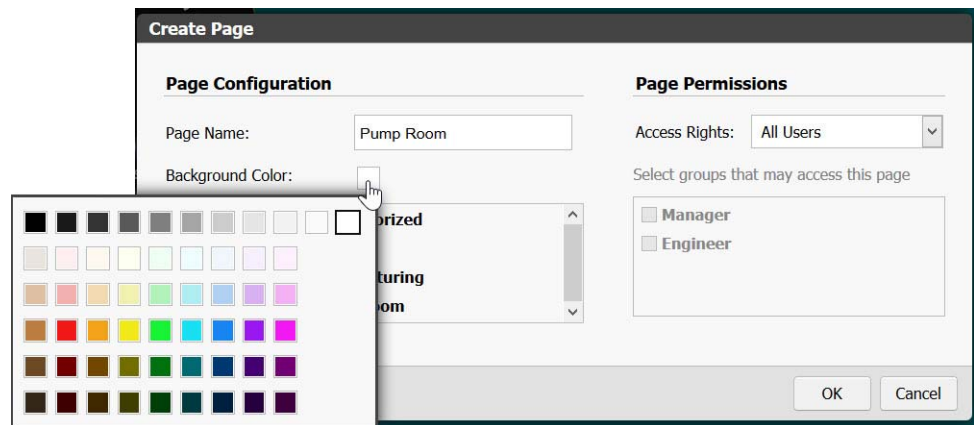
- Add a page
- Add device tags
- Add gadgets
- Save the project
- View the project on your computer
- Explore

When groov Build opens, you see the workspace where you'll build your operator interface:



Add a Page

1. In the Pages panel on the left side of the workspace, click Add Page.

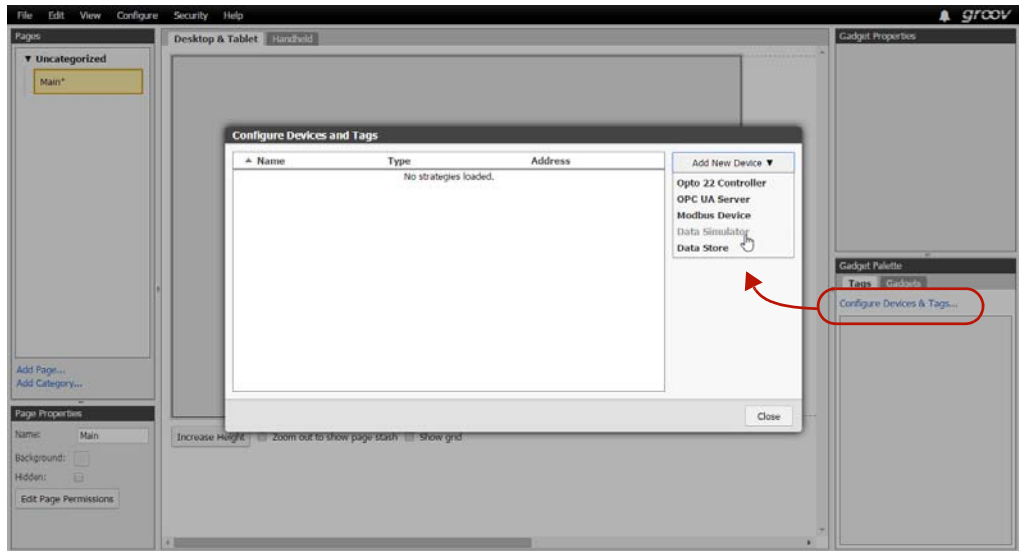


2. Give the page a name and click the color block to choose a background color. For now, leave the page as Uncategorized and leave Access Rights as All Users. Click OK.

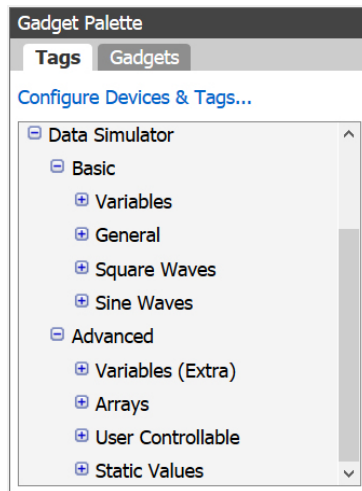
The blank page appears in the center of the workspace.

Add Device Tags

1. In the Gadget Palette panel (lower right), click Configure Devices & Tags.

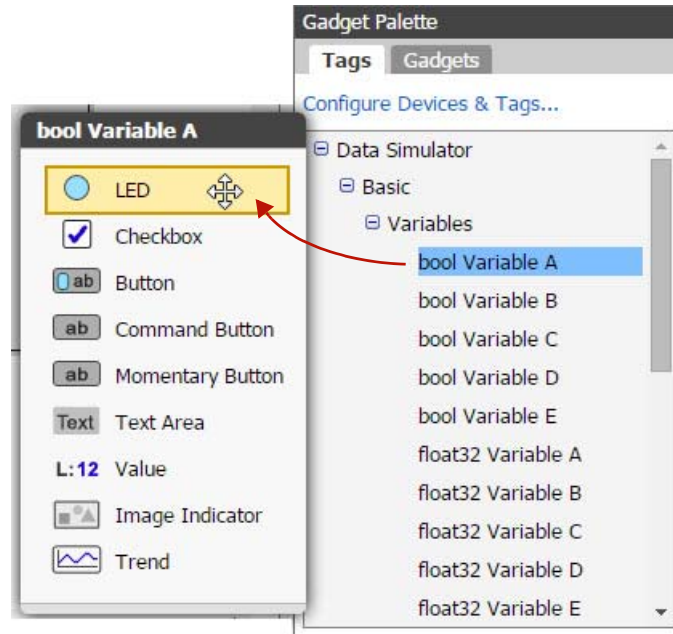


2. Click Add New Device and then choose Data Simulator.
The Data Simulator appears in the device list.
3. Click Close, and notice that Data Simulator now appears in the Gadget Palette. Click the plus sign next to Data Simulator and other plus signs in the tree to see the tags in the device.

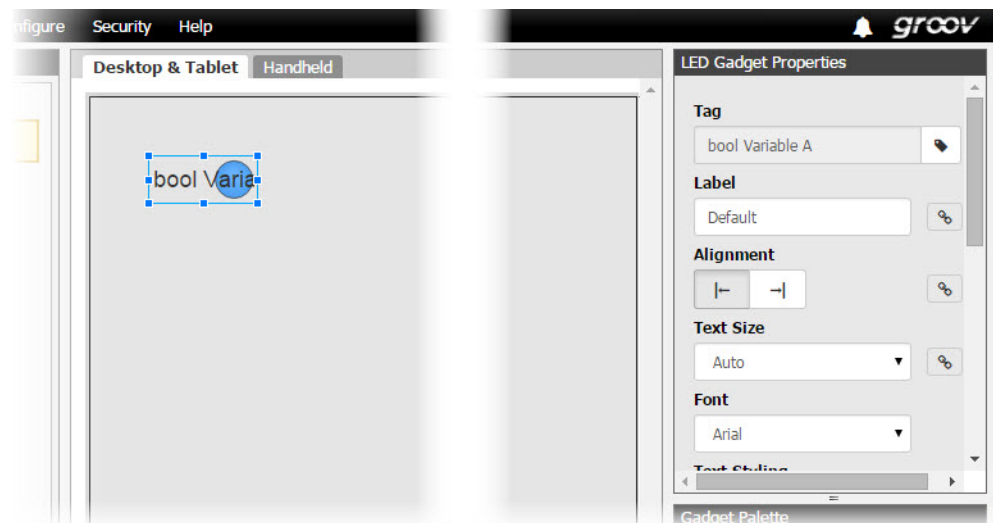


Add Gadgets

1. Expand the tree to find *bool Variable A*. Click this tag.
A list appears showing all the gadgets that work with this tag.




2. Click the LED gadget and drag it to the page you're building.
3. Click the gadget to highlight it and notice that properties appear in the Gadget Properties panel (upper right).

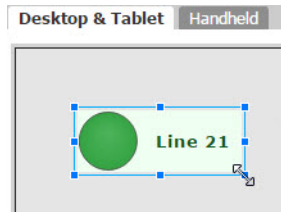


4. Scroll down to see all the possible properties you can choose and adjust. Enter the following properties and watch how the LED gadget changes after each one.

Property	You choose...	Result
Label	Line 21	Tag name is replaced with label.
Alignment	Right	Label moves to right of gadget.

Property	You choose...	Result
Text Size	12	Label text becomes smaller (default is 16 pixels).
	Click 	Button changes to show link broken. This means that the label text size you just chose (12) will affect only the Desktop & Tablet view, not the Handheld view.
Font	Verdana	Font on the label text changes.
Text Styling	B	Label text is boldfaced (thicker).
Colors	Text: Deep Green	Text changes color.
	Background: Pale Green	Light green background appears in gadget area.
Graphic Size	Uncheck Auto and choose 6	LED becomes larger.
On/Off Colors	True: Dark Green	LED color changes.
	False: [Leave as is]	No change

- Notice that part of the LED and its label text are hidden. Use your mouse to grab a corner handle on the gadget and pull it out so everything is visible.

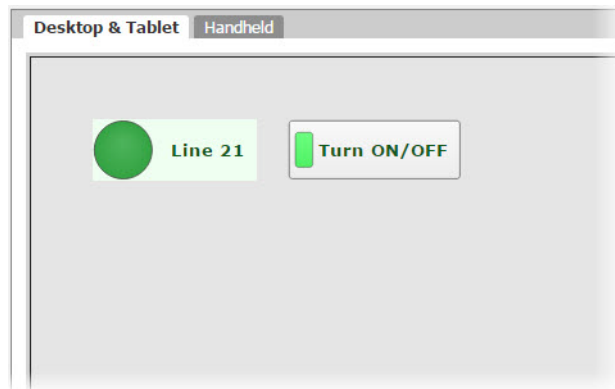


- In the Gadget Palette, click *bool Variable A* again. Click Button and drag it to the page, next to the LED. Click to highlight it. In the Gadget Properties area, enter the following:

Property	You choose...	Result
Confirm Writes	Check the box	When someone pushes this button, they'll be required to verify the button's action before it happens.
Display Mode	[Leave as Button]	No change
Label	Turn ON/OFF	Button text changes.
Text Size	12	Text becomes smaller.
Font	Verdana	Text font changes.
Text Styling	B	Text is boldfaced.
Colors	On indicator: Green	LED embedded in the button changes color.
	Off indicator: [As is (black)]	No change.
	Text: Deep Green	Text color changes slightly.
	Button: White	Button color changes.

- With the button highlighted, adjust its handles so it's about as large as the LED gadget. Make sure you can see all the text.

Your page now looks something like this:



Save the Project

From the File menu, choose Save All Changes and Switch to *groov* View.


View the Project on your Computer

Your saved project opens in *groov* View.



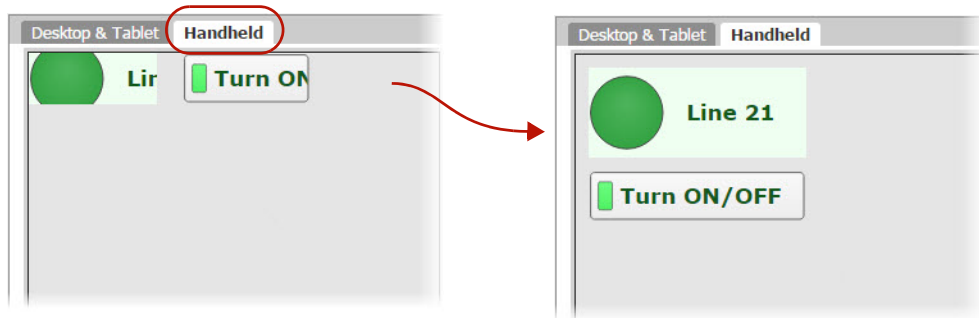
Try it out! Click the button and see what happens.

Explore

1. Go back to *groov* Build by clicking the gear icon in the upper-right corner of the window  and choosing Switch to *groov* Build.
2. Click the Handheld tab, just above your page in the center of the workspace.

While you were building your page in the Desktop & Tablet tab, *groov* automatically put the same gadgets in the Handheld tab, which shows the page layout for a smartphone. However, you may want the page to look different on a phone. Maybe some data or controls are more important and should be at the top of the page. Or maybe some don't need to be on the phone at all. In this tab you can resize, rearrange, change, or delete gadgets to suit your needs.

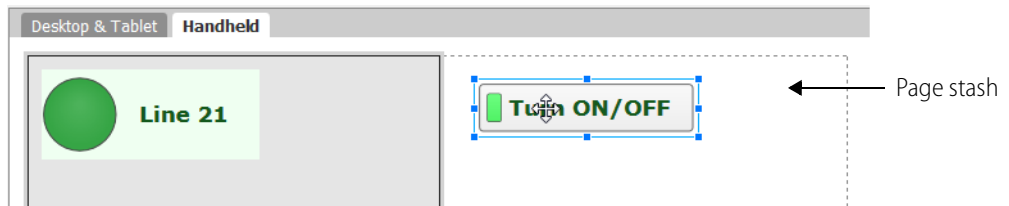
3. Click to highlight each gadget and change its size and position the way you want.



Remember that you made the text size smaller (12 instead of 16) for both the LED and the button? You also broke the link between the two views for that property, which means you changed it for one view only. So the text is smaller for Desktop & Tablet, but for Handheld it remains at the default of 16.

You can make the two views different in other ways as well. For example, suppose you want smartphone users to be able to see the status of Line 21 but not be able to turn it on or off. You can stash the Turn ON/OFF button so it's not visible in the Handheld view.

4. In the Handheld tab, notice the area off to the right of the page with a dotted line around it. Drag the Turn ON/OFF button into this area, which is called the page stash.



The button will still be shown on a computer or tablet but will not be visible on a smartphone. You can also stash gadgets in the Desktop & Tablet tab if you don't want them to appear on these devices, so you can customize the view on large and small devices.

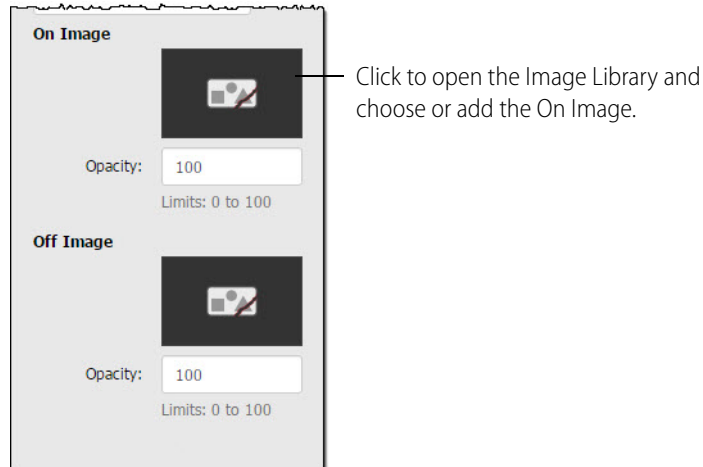
Now let's explore some more.

Images

When we added the Turn ON/OFF button, one of the properties was Display Mode. Let's take another look at that now.

1. In the Desktop & Tablet tab, select the Turn ON/OFF button and look in the Properties panel.
2. For Display Mode, choose Image.

As you can see, instead of a simple button, you could skin the button with images: one image indicates that the button is On and the other that it is Off.



3. Click a broken image to open the Image Library, where you can add images to your project. All the images for your *groov* project are stored in the Library. You can add and delete images. You can use the same image in multiple places, and if you change it, it's automatically updated everywhere it's used. Compatible file types for images are BMP, GIF, PNG, JPG, and SVG. For more on the Image Library, see the [groov Build and View User's Guide](#). Here's what the Image Library looks like before you've added any images:



4. For now, click Cancel to exit the Image Library. In the Properties panel, change Display Mode back to Button.

Round Gauge

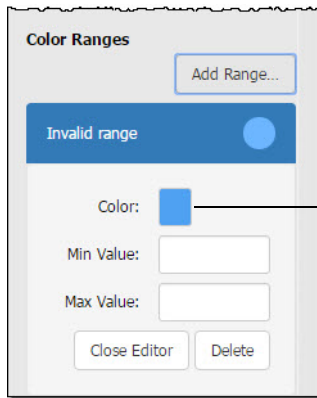
Let's look at a gauge.

1. In the Gadget Palette, expand the tag tree again. Under Basic > Variables, choose *float32 Variable A*. In the gadget list, click Round Gauge and drag it to your page.
2. Highlight the new gadget and look at its properties. To understand all the options, see "Gadget Reference" in the [groov Build and View User's Guide](#). But for now, change only the following:

Property	You choose...	Result
Range	Min value 0, Max value 100	The gauge changes to show 0-100.

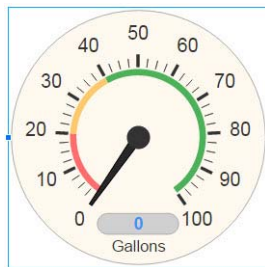
Property	You choose...	Result
Units	Gallons	"Gallons" appears below the numeric value on the gauge.
Precision	0	Value will be shown in whole numbers (no digits after the decimal point).
Colors	Needle: Black Background: Dark Orange	Colors change on the gauge.

3. Scroll down to Color Ranges and click Add Range.



4. Click the blue rectangle and choose Red. Enter Min Value 0 and Max Value 20.
5. Click Add Range again. For Color, choose Orange. Enter Min Value 20 and Max Value 40.
6. Click Add Range again. For Color, choose Dark Green. Enter Min Value 40 and Max Value 100.

Your gauge now looks like this:



This gauge is easy for an operator to understand at a glance. Anything in the green range is OK, but if the needle dips down into the red, you have a problem.

The numeric value appears in blue at the bottom of the gauge.

What's Next?

Now that you have an idea of what *groov* can do, you're ready to work on your real project. See the [groov Build and View User's Guide](#) (form 2027) for much more information, including:

- Adding the devices you want to monitor and control
- Choosing gadget properties
- Setting up authorized user accounts
- Logging events and sending notifications

2: Using an SSL Certificate

groov uses an SSL certificate to encrypt communications and prove *groov*'s identity to client browsers. An SSL certificate contains the server name, the name of the organization that controls the server, and digital signatures of organizations that vouch for the authenticity of the certificate. The certificate is digitally signed either by a *certificate authority* (CA) or it is *self-signed*.

The default certificate type (a self-signed certificate) and configuration will cause your web browser to issue an untrusted site warning when accessing *groov*. To avoid the warning you can install the self-signed certificate in all the browser certificate stores used to access *groov*. However, whether or not the certificate is installed in the certificate stores, communication is always encrypted.

Here's a comparison of the certificate types:

	Self-Signed Certificate (default)	Self-Signed Certificate installed on all browser certificate stores	CA-Signed Certificate
Best Use	For one or two <i>groovs</i> and a small set of client browsers that remain pretty much the same, and users who trust that your certificate is valid	Same as default, plus it avoids seeing the untrusted site warning from the browser	Use with a system with many <i>groovs</i> , or the set of browsers that will access <i>groovs</i> is unknown or changes frequently, or users who will not trust your self-signed certificate
Cost	Free	Free	Public CA-signed certificates cost anywhere from \$9 to \$100 or more per year
Ease of Configuration	Easiest configuration	Must install in the browser certificate store for every browser that accesses the server	More complex initial configuration because a certificate authority signature must be obtained
Untrusted Site Warning	Browser raises untrusted site warning. (But communication is still encrypted.)	No untrusted site warning from browser	No untrusted site warning from browser. Trusted by all major browsers.
Trust Level	Trusted by those to whom the <i>groov</i> administrator has demonstrated the validity of the certificate (e.g. by providing the certificate thumbprints).	Trusted by those who trust the <i>groov</i> administrator enough to install or let him or her install the certificate in their browser certificate store	Trusted by everyone

If you are using a **self-signed certificate**, see ["Using a Self-Signed Certificate"](#) on page 16.

If you are using a **CA-signed certificate**, see ["Using a CA-Signed Certificate"](#) on page 22.

Using a Self-Signed Certificate

A self-signed certificate encrypts communications, but does not include a digital signature from a commercial CA. It is free and easy to configure, but if you want to avoid having your users see an untrusted site warning every time they use *groov*, you must install the self-signed certificate in the browser certificate store for every browser that will access *groov*. This type of certificate is a good solution for a small set of *groovs* and a small set of client browsers that you can configure.

Follow these steps to create and install a self-signed certificate:

[“Step 1: Create a Self-Signed Certificate and Private Key” on page 16](#)

[“Step 2: Add the Self-Signed Certificate to the Browser Trust Store on Client Computers” on page 18](#)

[“Step 3: Install a SSL Certificate on Mobile Devices” on page 21](#)

Step 1: Create a Self-Signed Certificate and Private Key

Follow the steps below to generate the following components required to configure self-signed certificate SSL communication.

- **Private Key:** This must be kept secret and never shared. Keep a copy of it in a safe and secure place.
- **Signed Certificate:** Contains identification information, the public key, and a digital signature. Identification information includes the server name and the name of the organization that controls the server. The self-signed certificate is digitally signed by the Private Key to establish authenticity. The certificate is automatically installed on the *groov* Server.

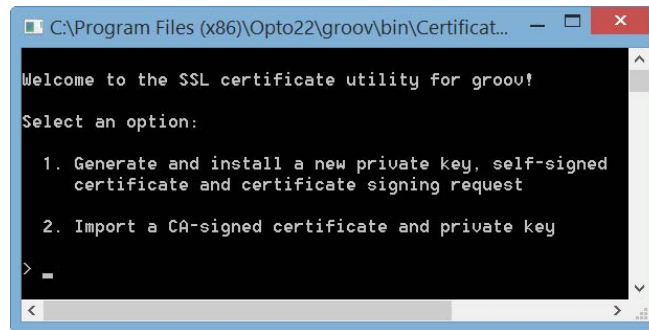
Creating a self-signed certificate also generates in the *groov* folder a certificate-signing request (.csr) file that you can use to get an SSL certificate from a Certificate Authority. See [“Using a CA-Signed Certificate” on page 22](#).

NOTE: You must have administrator privileges to use the SSL Certificate utility.

To generate a private key and self-signed certificate:

1. On the computer where *groov* Server is installed, do one of the following:
 - For Windows 7 and Windows Server 2008, choose Start > All Programs > Opto 22 > groov > groov SSL Certificate.
 - For Windows 8, click the *groov* SSL Certificate utility metro tile.
 - For Windows Server 12, navigate to the directory where *groov* was installed (C:\Program Files (x86)\Opto22\groov, by default). The SSL Certificate Utility is in the “bin” folder. Start the utility.

The utility opens in a DOS window.



2. Enter 1 and press RETURN.
3. Enter the information requested by the onscreen instructions, including the following.

Server Name—Enter the fully qualified hostname of this *groov* Server that client browsers will use to access *groov* (i.e. the hostname and domain name, such as *mobilehmi.mydomain.com*.) The server name may contain letters a–z (case insensitive), digits 0–9, or a hyphen (-). No other characters are allowed. The server name must not start with a hyphen.

Example:

If the URL you will use to access *groov* in client browsers is

<https://process1.acme.com>

enter `process1.acme.com`

Example:

If the URL client browsers will use to access this *groov* Server is

<https://mobilehmi.mydomain.com>

enter `mobilehmi.mydomain.com`

Department: Use this field to differentiate between divisions within an organization. For example, “Engineering” or “Manufacturing.” If applicable, you can enter the DBA (doing business as) name in this field.

Organization: The legally registered name of your business. The listed organization must be the legal registrant of the domain name in the certificate request. If you are enrolling as a small business or sole proprietor, please enter the certificate requester’s name in this field, and the DBA (doing business as) name in the Organizational Unit field.

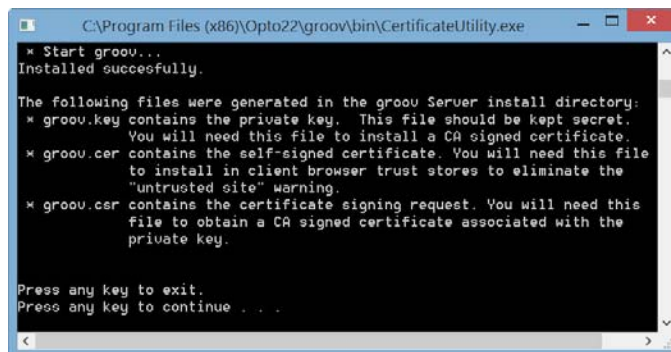
City or Location: Name of the city or locality where your organization is located. Please spell out the name of the city or locality. Do not abbreviate.

State: Name of state, province, region, territory where your organization is located. Please enter the full name. Do not abbreviate.

Two-Letter Country Code: The two-letter International Organization for Standardization (ISO-) format country code for the country in which your organization is legally registered. See <http://www.digicert.com/ssl-certificate-country-codes.htm> for a list of codes. For example, the code for the United States is US.

Days until expiration: Enter the number of days before the certificate is expired and has to be replaced. We recommend 3560 (10 years).

The utility will stop *groov* Server, install the new private key and certificate, and then restart *groov* Server. When successful, the following message appears.



```

C:\Program Files (x86)\Opto22\groov\bin\CertificateUtility.exe
* Start groov...
Installed successfully.

The following files were generated in the groov Server install directory:
* groov.key contains the private key. This file should be kept secret.
  You will need this file to install a CA signed certificate.
* groov.cer contains the self-signed certificate. You will need this file
  to install in client browser trust stores to eliminate the
  "untrusted site" warning.
* groov.csr contains the certificate signing request. You will need this
  file to obtain a CA signed certificate associated with the
  private key.

Press any key to exit.
Press any key to continue . . .
  
```

The following files are created and placed in the directory where *groov* was installed (C:\Program Files (x86)\Opto22\groov, by default).

- **groov.key** (private key)
- **groov.cer** (self-signed certificate)
- **groov.csr** (certificate signing request)

4. Press any key to exit.

Step 2: Add the Self-Signed Certificate to the Browser Trust Store on Client Computers

To prevent the untrusted site warning in browsers, the self-signed certificate must be added to the trust store for each browser used to access *groov*. This step describes how to add the self-signed certificate on a computer. See the section below for the client computer's operating system.

["Windows" on page 18](#)

["OS X" on page 20](#)

If you want to add a self-signed certificate on a mobile device, see [Step 3](#).

Windows

Internet Explorer & Chrome

1. In Windows file explorer, browse to the *groov.cer* file you created previously. See ["Step 1: Create a Self-Signed Certificate and Private Key" on page 16](#).

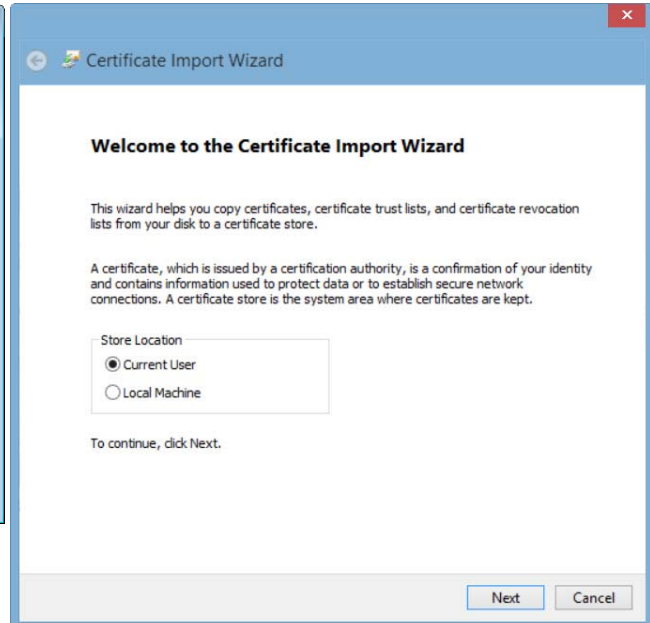
This file is available in the directory where *groov* was installed (C:\Program Files (x86)\Opto22\groov, by default).

2. Right-click on the certificate file *groov.cer* and choose Install Certificate to open the Certificate Import Wizard.

Windows 7



Windows 8



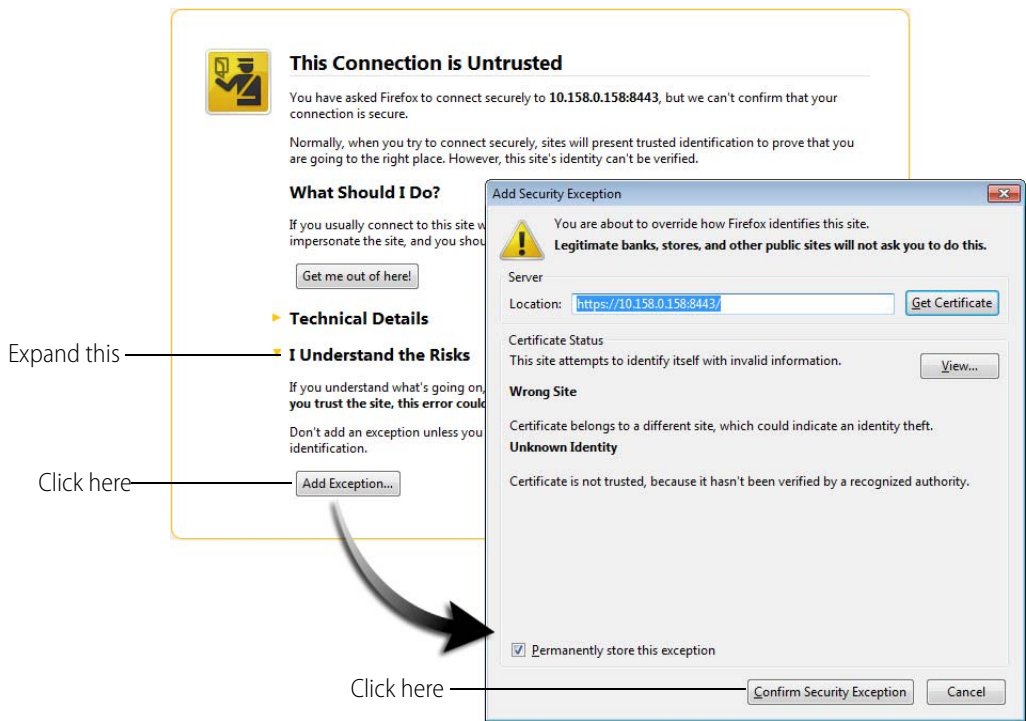
3. (Windows 8 only) If you are administrator of local machine, choose the Local Machine certificate store so this certificate will be trusted by all user accounts. Otherwise it will only be trusted by the current user account.
4. Click Next.
5. Select "Place all certificates in the following store."
6. Click Browse to open the Select Certificate Store dialog box.
7. Select Trusted Root Certification Authorities, then click OK.
8. Click Next.
9. Click Finish.
10. A security warning alerts you that certificate installation is a risk if you don't trust the certificate.
11. Click Yes to affirm that you trust the self-signed certificate.
12. To verify the certificate was installed correctly, open Internet Explorer or Chrome and enter the hostname specified on the certificate. If the browser does not generate an untrusted site warning, the certificate was installed correctly.

Firefox

The self-signed certificate is added to the certificate store by adding a security exception. Firefox will present several warnings about creating a security exception for a self-signed certificate, but because you created and control the private key and certificate and installed the private key on the server, you can trust the certificate identifies your server.

1. Open Firefox and enter `https://<server name>`
A warning appears that says, "This Connection is Untrusted."
2. Expand "I Understand the Risks."
3. Click Add Exception to open the Add Security Exception dialog box.
4. Select "Permanently store this exception."

5. Click Confirm Security Exception.

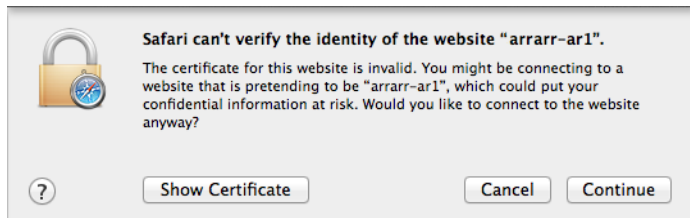


6. To verify the certificate was installed correctly, open Firefox and enter the hostname specified on the certificate. If the browser does not generate an untrusted site warning, the certificate was installed correctly.

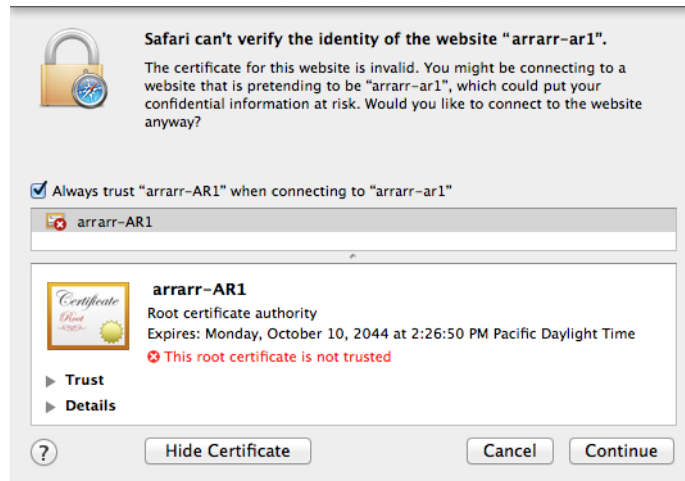
OS X

Safari and Chrome

1. Open Safari and enter https://<server name> to open this dialog box:



- Click Show Certificate to reveal the full details:



- If the certificate looks good to you, check the "Always trust <server name> when connecting to <server name>" and click Continue. You will be asked to provide your password to authorize the addition of this certificate to your keychain, after which the browser and the Hosted Projects window will accept the SSL certificate as valid.
- To verify the certificate was installed correctly, open a browser and enter the hostname specified on the certificate. If the browser does not generate an untrusted site warning, the certificate was installed correctly.

Step 3: Install a SSL Certificate on Mobile Devices

When you open the operator interface in a browser on a smart phone or tablet a security warning will appear unless you have installed a self-signed or third-party SSL certificate. See the section below for the device's operating system.

- ["iOS Devices" on page 21](#)
- ["Android Devices" on page 22](#)

iOS Devices

- Email the *groov.cer* file you created previously (see ["Step 1: Create a Self-Signed Certificate and Private Key" on page 16](#)) to an email account accessible from iOS.
This file is available in the directory where *groov* was installed (C:\Program Files (x86)\Opto22\groov, by default).
- On the iOS device, open the email message containing *groov.cer*.
- Tap on *groov.cer*
- A message appears, "The authenticity of <server name> cannot be verified..."
- Click Install.
- Click Install Now.
- Click Done.

8. To verify the certificate was installed correctly, open a browser and enter the hostname specified on the certificate. If the browser does not generate an untrusted site warning, the certificate was installed correctly.

Android Devices

1. Email the *groov.cer* file you created previously (see [“Step 1: Create a Self-Signed Certificate and Private Key” on page 16](#)) to an email account accessible from Android.

This file is available in the directory where *groov* was installed (C:\Program Files (x86)\Opto22\groov, by default).

2. On the Android device, open the email and click the *groov.cer* file to install the certificate.
3. When prompted for a certificate name, type in a name. Make sure “Credential use:” is set to “VPN and apps.”
4. Click OK.
5. To verify the certificate was installed correctly, open a browser and enter the hostname specified on the certificate. If the browser does not generate an untrusted site warning, the certificate was installed correctly.

Using a CA-Signed Certificate

If *groov* is installed on a network that is exposed to the Internet, Opto 22 strongly recommends obtaining an SSL certificate from a third-party vendor called a certificate authority. When installed on *groov* and the devices that access *groov*, the certificate validates the connection between the user and *groov* Server, and it alerts users if they are re-directed to another *groov* Server on a different network.

So long as you stay connected directly to *groov* on a secure connection (using https) you are protected from a man-in-the-middle attack.

The cost of a certificate from a certificate authority ranges from free to \$300 or more, depending on the features and company you buy them from. Please work with your IT department if you choose this option.

Creating a self-signed certificate generates in the *groov* folder a certificate-signing request (.csr) file that you can use to get an SSL certificate from a Certificate Authority.

NOTE: You must have administrator privileges to use the SSL Certificate utility.

Follow these steps to create a certificate signing request (CSR) and install a CA-signed certificate:

[“Step 1: Create a CSR”](#) (see [page 23](#))

[“Step 2: Obtain a CA-Signed Certificate”](#) (see [page 24](#))

[“Step 3: Install the CA-Signed Certificate on the Computer”](#) (see [page 25](#))

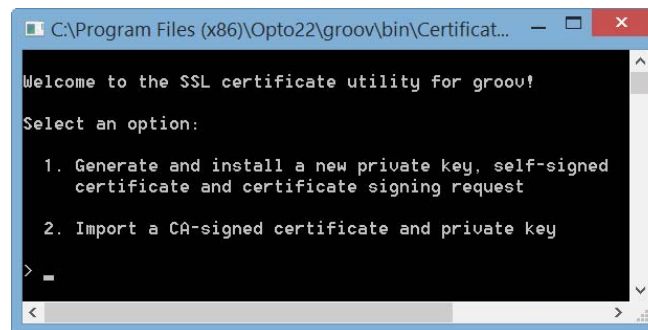
Step 1: Create a CSR

IMPORTANT: This procedure will create and install a new private key on the groov Server.

You will send the CSR to the Certificate Authority (CA) of your choice. The CA verifies the identification information and signs the CSR, which then becomes a CA-signed Certificate.

To create a certificate signing request (CSR), you'll use the SSL certificate utility to generate a self-signed certificate. This will also generate the CSR.

1. On the computer where *groov* Server is installed, do one of the following:
 - For Windows 7 and Windows Server 2008, choose Start > All Programs > Opto 22 > groov > groov SSL Certificate.
 - For Windows 8, click the *groov* SSL Certificate utility metro tile.
 - For Windows Server 12, navigate to the directory where *groov* was installed (C:\Program Files (x86)\Opto22\groov, by default). The SSL Certificate Utility is in the “bin” folder. Start the utility. The utility opens in a DOS window.



2. Enter 1 and press RETURN.
3. Enter the information requested by the onscreen instructions, including the following.

Server Name—Enter the fully qualified hostname of this *groov* Server that client browsers will use to access *groov* (i.e. the hostname and domain name, such as *mobilehmi.mydomain.com*.) The server name may contain letters a–z (case insensitive), digits 0–9, or a hyphen (-). No other characters are allowed. The server name must not start with a hyphen.

Example:

If the URL you will use to access *groov* in client browsers is

<https://process1.acme.com>

enter process1.acme.com

Example:

If the URL client browsers will use to access this *groov* Server is

<https://mobilehmi.mydomain.com>

enter mobilehmi.mydomain.com

Department: Use this field to differentiate between divisions within an organization. For example, “Engineering” or “Manufacturing.” If applicable, you can enter the DBA (doing business as) name in this field.

Organization: The legally registered name of your business. The listed organization must be the legal registrant of the domain name in the certificate request. If you are enrolling as a small business or sole proprietor, please enter the certificate requester's name in this field, and the DBA (doing business as) name in the Organizational Unit field.

City or Location: Name of the city or locality where your organization is located. Please spell out the name of the city or locality. Do not abbreviate.

State: Name of state, province, region, territory where your organization is located. Please enter the full name. Do not abbreviate.

Two-Letter Country Code: The two-letter International Organization for Standardization (ISO-) format country code for the country in which your organization is legally registered. See <http://www.digicert.com/ssl-certificate-country-codes.htm> for a list of codes. For example, the code for the United States is US.

Days until expiration: Enter the number of days before the certificate is expired and has to be replaced. We recommend 3560 (10 years).

The utility will stop *groov* Server, install the new private key and certificate, and then restart *groov* Server. When successful, the following message appears.

```

C:\Program Files (x86)\Opto22\groov\bin\CertificateUtility.exe
* Start groov...
Installed successfully.

The following files were generated in the groov Server install directory:
* groov.key contains the private key. This file should be kept secret.
  You will need this file to install a CA signed certificate.
* groov.cer contains the self-signed certificate. You will need this file
  to install in client browser trust stores to eliminate the
  "untrusted site" warning.
* groov.csr contains the certificate signing request. You will need this
  file to obtain a CA signed certificate associated with the
  private key.

Press any key to exit.
Press any key to continue . . .

```

The following files are created and placed in the directory where *groov* was installed (C:\Program Files (x86)\Opto22\groov, by default).

- **groov.key** (private key)
- **groov.cer** (self-signed certificate)
- **groov.csr** (certificate signing request)

4. Press any key to exit.

Step 2: Obtain a CA-Signed Certificate

A **CA-signed certificate** contains identification information, the public key, and a digital signature. Identification information includes the server name and the name of the organization that controls the server. The certificate is digitally signed by a CA to establish authenticity. The Certificate is installed on the computer where *groov* Server for Windows is installed.

When you apply for an SSL certificate from a certificate authority, you will need to send them a Certificate Signing Request (CSR). If you have not yet created a CSR file, see “[Step 1: Create a CSR](#)” on [page 23](#).

When filling out a form for a certificate authority, keep in mind that an SSL certificate can be used with any operating system. If you are asked to select an operating system, you can select “other” if that is an option, but it’s OK to select some other operating system.

1. Provide the text to the certificate authority in whatever form they require, whether it’s a text file or just text pasted into a text field.
2. Finish the transaction with the certificate authority and receive your new SSL certificate.

Step 3: Install the CA-Signed Certificate on the Computer

1. On the computer where *groov* Server is installed, do one of the following:
 - For Windows 7 and Windows Server 2008, choose Start > All Programs > Opto 22 > groov > groov SSL Certificate.
 - For Windows 8, click the *groov* SSL Certificate utility metro tile.
 - For Windows Server 12, navigate to the directory where *groov* was installed (C:\Program Files (x86)\Opto22\groov, by default). The SSL Certificate Utility is in the “bin” folder. Start the utility. The *groov* SSL Certificate utility opens in a DOS window.

```

C:\Program Files (x86)\Opto22\groov\bin\Certificat...
Welcome to the SSL certificate utility for groov!
Select an option:
  1. Generate and install a new private key, self-signed
    certificate and certificate signing request
  2. Import a CA-signed certificate and private key
> _
  
```

2. Enter 2 and press RETURN.
The following message appears.

```

Sometimes the CA signed certificate is signed with an intermediate
certificate instead of a root certificate. In this case all
intermediate certificates in the chain of trust between your
certificate and the root certificate should be gathered into
one chain file and installed on groov Server.
Install a chain file? [y/n]: _
  
```

3. If you are unsure, enter *n*.
A prompt says, “Provide the path and file name of the private key file.”
4. Enter the path and file name of the *groov.key* file if it’s the currently installed key.
A prompt says, “Provide the path and file name of the certificate file.”

5. Enter the path to the CA-signed certificate file.

For example, `C:\Certificates\sub.class1.server.ca.pem`

When the operation has finished, a message says "Installed successfully."

3: Maintenance and Troubleshooting


Starting and Stopping *groov* Server

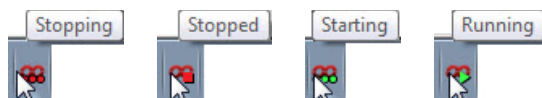
groov Server must be running on the Windows computer where it's installed in order for anyone on any device to use *groov* for building or viewing operator interfaces.

If you need to stop *groov* Server or start it again, you can use the Windows control panel or *groov* Monitor. *groov* Monitor is a utility that starts with *groov* Server but runs independently from the service and lets you see information about it.

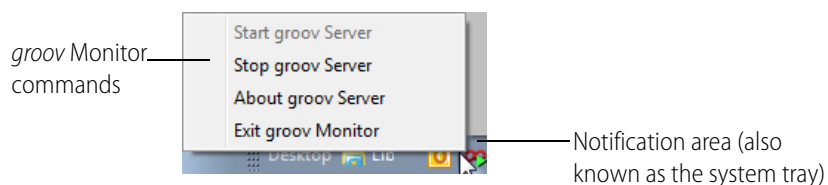
NOTE: You must have administrator privileges to use groov Monitor.

To use *groov* Monitor:

1. In the Windows notification area of the taskbar, find the *groov* Monitor icon . (If you don't see it, click the Show Hidden Icons arrow.)
2. To check whether *groov* Server is running or stopped, look at the icon or hover over it.



3. For other options, right-click the icon. Use the commands as follows:

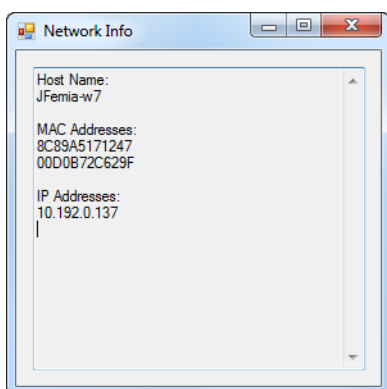


Start groov Server and **Stop groov Server** affect the *groov* Server service.

About groov Server shows *groov* Server's version number and other information.



Click **Network Info** to see hostname, MAC addresses, and other information helpful for using *groov*:



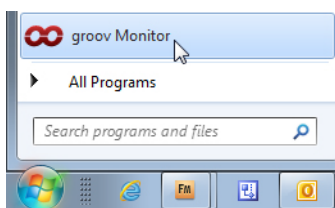
Host Name—Typically part of the URL when you access *groov* from another computer or from a tablet or smartphone. You open a web browser and type `https://` plus this hostname.

MAC Address—Use one of these to get your *groov* Server License File, which is required to use *groov*. See steps on [page 2](#).

IP Address—If your network does not use hostnames, you may access *groov* from another computer/tablet/smartphone by opening a web browser and typing `https://` plus the IP address.

Exit groov Monitor closes *groov* Server Monitor only. The icon disappears. Exiting *groov* Server Monitor does *not* affect the *groov* Server service. If the service is running, it will continue to run after you exit Monitor.

To start *groov* Server Monitor again, click “groov Monitor” in the Windows Start menu.



If *groov* Server is stopped, starting the monitor will *not* start the service. To start the service again, use *groov* Monitor’s Start command.

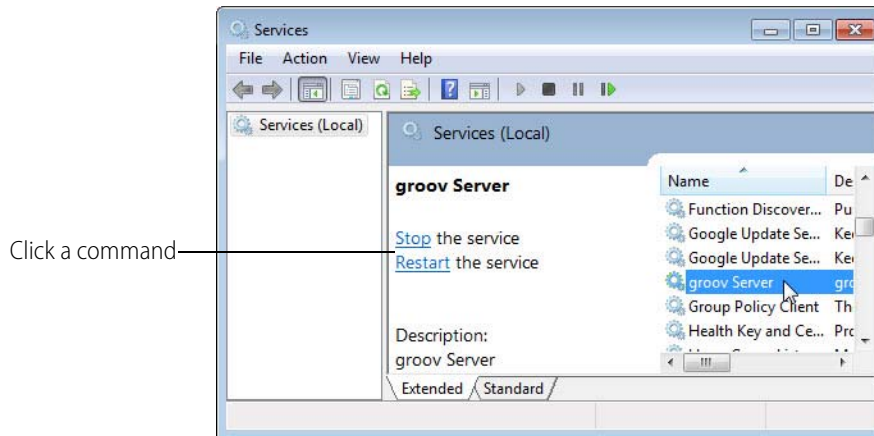
You can also stop, start, or restart *groov* Server in the Windows control panel:

1. Open the Windows Control Panel and click Administrative Tools.

In Windows 7, if the control panel is viewed by category, Administrative Tools is in the System and Security group.

2. Double-click Services.
3. Select *groov* Server.

4. Click the command you want to use.



Changing and Opening the *groov* SSL Port

By default *groov* communicates on port 443. If 443 is not available, 8443 is used.

Changing the *groov* Port

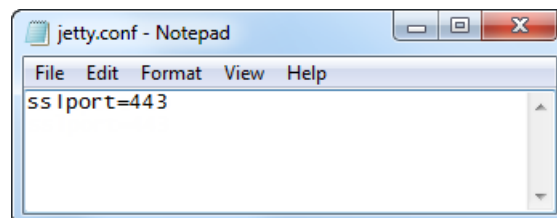
If you want to change the SSL port number, first consult with your IT manager. If you change the port, you will need to use the following format when connecting to *groov* Server:

`https://localhost:port`

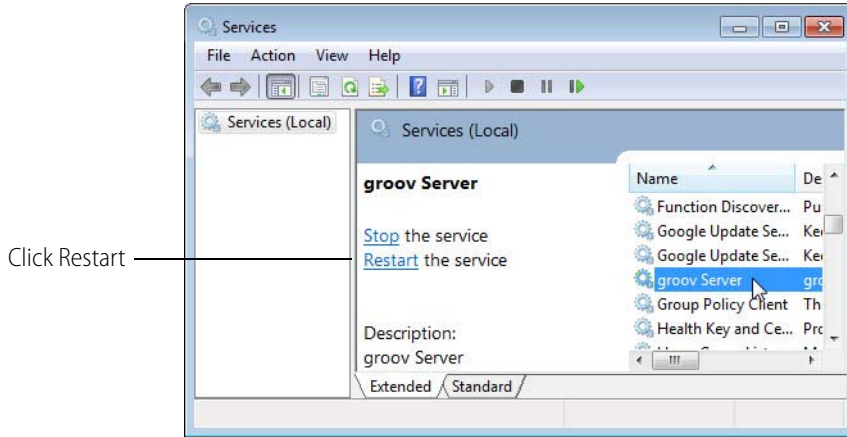
where *port* is the new port number. For example if the new port number is 888, you enter `https://localhost:888`

To change the SSL port, follow these steps:

1. In Notepad or a similar program, open the `jetty.conf` file installed on the *groov* Server computer. Find the file in the directory where *groov* was installed (C:\Program Files (x86)\Opto22\groov\jetty, by default).



2. Change only the port number.
3. Save and close the file.
4. Restart *groov* Server:
 - a. Open the Windows Control Panel and click Administrative Services.
 - b. Select *groov* Server.
 - c. Click Restart.



Manually Opening Ports

When you install *groov* Server, you're given the option to have the *groov* SSL port 443 opened automatically. If you didn't choose this option, you'll need to open the port manually. Steps may vary depending on your version of Windows.

1. On the computer where *groov* Server is installed, choose Start > Control Panel > Windows Firewall.
2. Click Advanced Settings.
3. Create an Inbound Rule for the Program *groov*. (By default, *groov* is installed in C:\Program Files (x86)\Opto22\groov).
4. Restart *groov* Server (see ["Starting and Stopping groov Server" on page 27](#)).

Getting *groov* Updates

Because you have activated *groov*, you are eligible to receive updates. Updates add new capabilities and fix issues that may arise.

Each *groov* installation is treated independently, so you must activate each one; updates are valid for a specific *groov* installation only.

To install an update, download the update file and then run the installation.

If updates are available, an updates icon appears next to the *groov* logo in the upper-right corner of *groov* Build. Click the updates icon (or select Help > Check for Updates).



The Check for Updates dialog box tells you what kind of updates are available. Follow the onscreen instructions to download an update file or view a list of updates on the latest *groov* readme.

Another way to check for updates is to go directly to manage.groov.com. If there is an update available for your *groov*, download the file. To install an update for *groov* Server for Windows, double-click the downloaded update file and run the installation.

Before updating the application, make sure to save any changes in your project so that they will still be there after the update takes effect.

Erasing Your *groov* Project

If you've forgotten your password and can't log in, or if you just want to start your project over again from scratch, you can delete the project as follows. Also see the next section, "[Backing Up and Restoring Your Project](#)."

1. Stop *groov* Server for Windows.
For help, see "[Starting and Stopping groov Server](#)" on page 27.
2. Navigate to the *groov* installation directory.
Usually this is C:\Program Files (x86)\Opto22\groov.
3. Find the project file named *project.grv*.
4. *If you are sure you don't want to keep the project*, delete the project file. Otherwise, archive the project by moving or renaming the project file.
5. Restart *groov* Server.

Backing Up and Restoring Your Project

You should back up *groov* frequently because there is no automatic backup. During backup, your project is saved to a file on your computer.

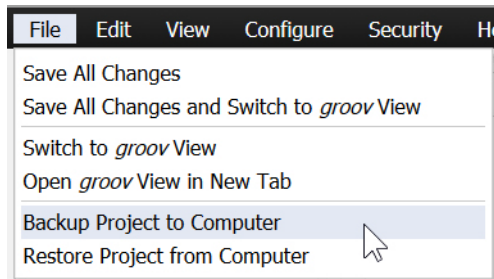
IMPORTANT: *Your groov project files are not encrypted or masked in any way. This means that most of the project information in them (except for the groov User passwords) can be read, including the following:*

- *SMTP account info (including password)*
- *User email accounts (does not include the groov User passwords, which are securely encrypted before being stored)*
- *Device addresses*
- *Tag address information (PAC tag names, Modbus addresses, OPC node-id, etc.)*

Opto 22 recommends that you secure your backup files using file- or disk-based encryption provided either by the operating system or other software/hardware.

Also, be aware that if you send project files to Opto 22, our personnel will have access to the information listed above.

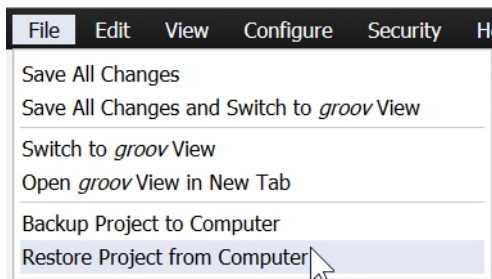
To back up your project, select File > Backup Project to Computer. A backup file is saved to the Downloads folder on your computer.



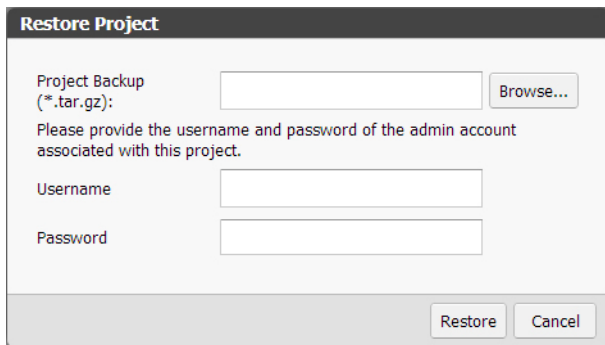
To restore your project from a backup file:

CAUTION: Only restore your project if you have to. You will lose all work done since the last backup, and all users will be logged out.

1. Select File > Restore Project from Computer.

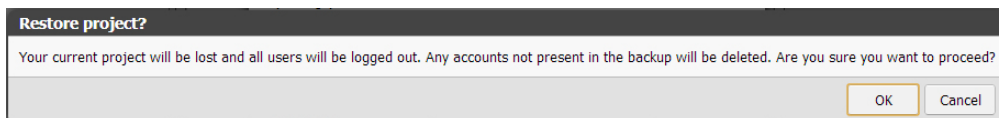


2. In the Restore Project dialog box, browse to your Download folder to locate the tar.gz backup file.



3. Enter the username and password for the Admin account.
4. Click Restore.

The following warning appears.




5. If you are sure you want to proceed, click OK.

When the restoration process is complete, the restored project opens in *groov* View.

Troubleshooting

***groov* Server doesn't start**

groov Server normally starts as soon as it is installed, even though no window opens. Check to see if the *groov* Monitor icon  is in the system tray. (If you don't see it, click the Show Hidden Icons arrow.) Hover over the icon with your mouse to see *groov* Server status.

If status shows "Stopped," right-click the icon and choose Start *groov* Server from the popup menu. If the status shows "Running," try stopping *groov* and then starting it again.

If you can't find the icon, from the Start menu choose "groov Monitor." See ["Starting and Stopping groov Server" on page 27](#) for more information.

If *groov* Server fails to start, there might be a conflict with another service running on your computer. In this case, you might need to change the SSL port *groov* Server uses to run. To change the port number, first consult with your IT manager, and then follow steps in ["Changing the groov Port" on page 29](#).

The following command can be run at a command prompt to see what application (if any) is listening on port 443:

```
netstat -a -n -p tcp -b
```

Cannot read or write to a Modbus/TCP device OR the data doesn't make sense

Modbus/TCP devices, though based on a standard protocol, may be set up differently from one another. Some use zero-based addressing and some use one-based addressing. Some devices don't support all Modbus functions. Modbus/TCP devices also vary in the way they present float data. And device documentation sometimes doesn't specify how the device is set up.

If you're having trouble reading or writing to your device, or if the data is clearly wrong, you probably need to change settings for your Modbus device. In *groov* Build, choose Configure > Devices and Tags and locate your device in the list. Follow instructions in the [groov Build and View User's Guide](#) to understand and change settings. You may need to try different combinations of settings to see what works.

Problems with *groov* Build or *groov* View

See the Troubleshooting chapter in the [groov Build and View User's Guide](#). To open the user's guide in *groov* Build, choose it from the Help menu.

For Help

Product support for *groov* Server is free. See ["For Help" on page 2](#) for contact information.

