

Survalent.

Training Manual

SurvalentONE SCADA System Level 1

Module 4 – Capturing Point Behavior in a Map

Revision 01



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Document Control

Revision	Date of Issue	Author(s)	Reviewer(s)	Brief Description of Change
01	Sept 1, 2022	Duke Hoang		Updated screenshots.

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Module 4 – Capturing Point Behavior in a Map

Introduction

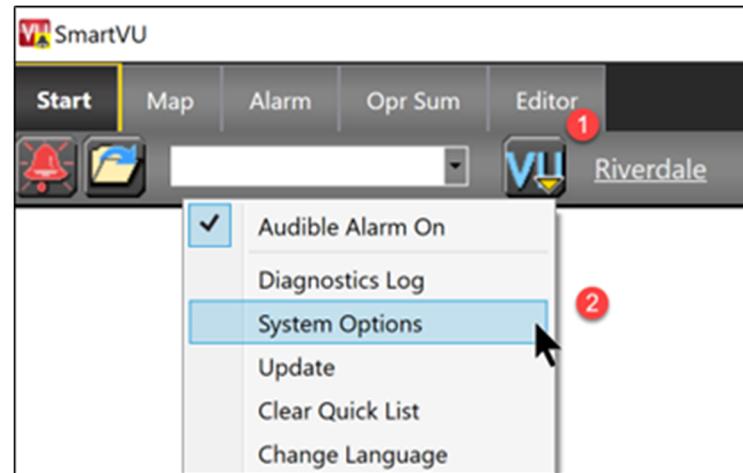
In the last module, we created a status and an analog point. We could get information from the points and issue controls to the status point using Point Viewers.

Point Viewers contain information for all the points in the system but they are text based and it's hard to monitor all the crucial points when they are laid out in text format.

This module is all about copying the point information to the Riverdale map we started in Module 2. Graphically representing the points in SmartVU allows SCADA Operator to quickly detect changes in point values and statuses.

WmpServer.EXE

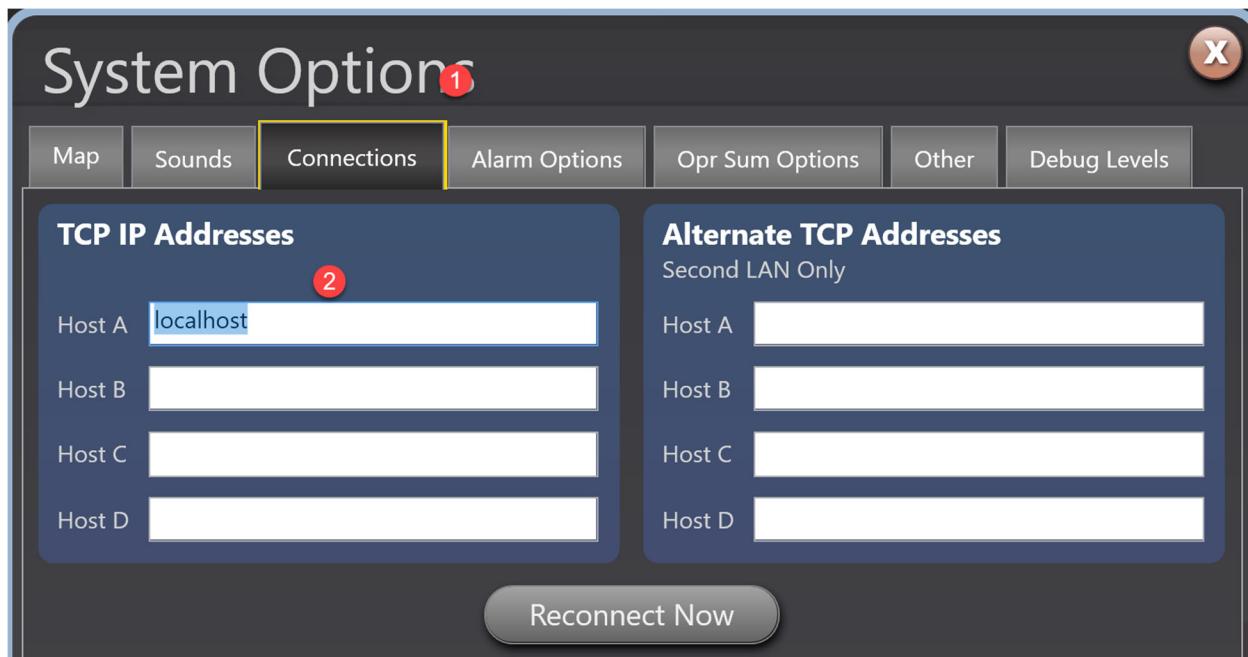
If we open SmartVU and click on the VU menu (1), we will launch System Options (2).



4.1 System Options

Going further, we can click on Connections and find that SmartVU knows where the server is located. In our case, it's the address localhost.

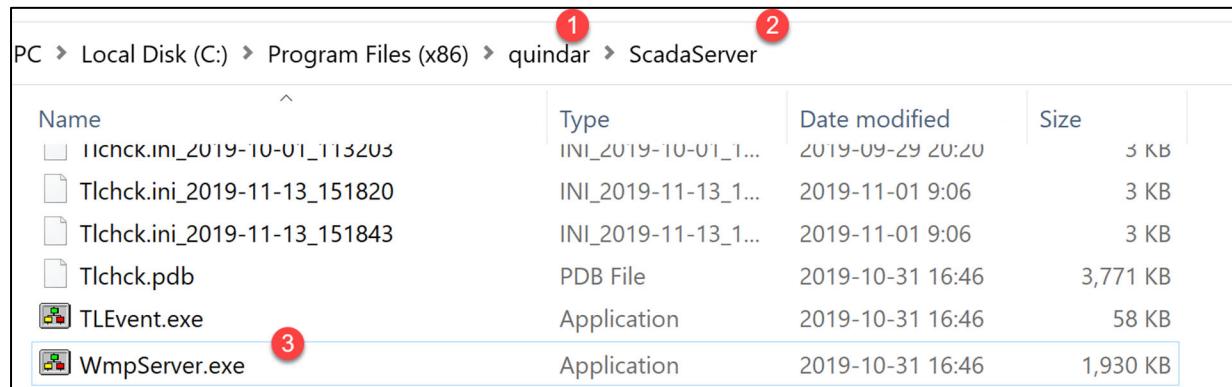
Note: We also covered that if SmartVU can't launch due to a Connections issue, we can configure connections using a file called wvsetup.exe.



4.2 Connections Settings

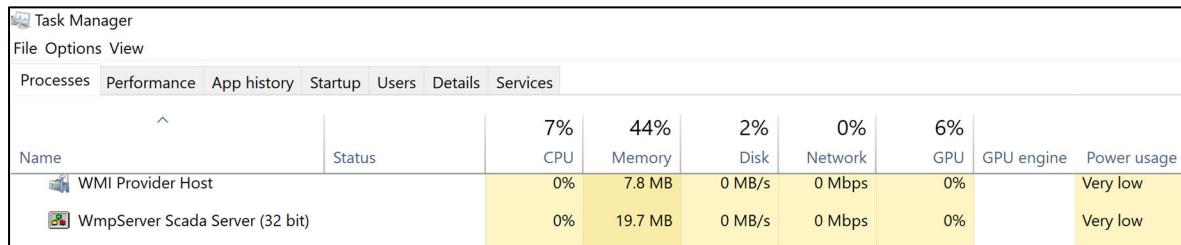
Therefore, we see the connection (1) has been established between SmartVU and the Server (2). However, an application is also needed to transfer the live data to the map. The application is called WmpServer.exe.

WmpServer.exe (3) is located in the ScadaServer (2) folder (under Quindar(1) folder). For newer installation, it can be located c:\Program Files(x86)\Survalent\ScadaServer



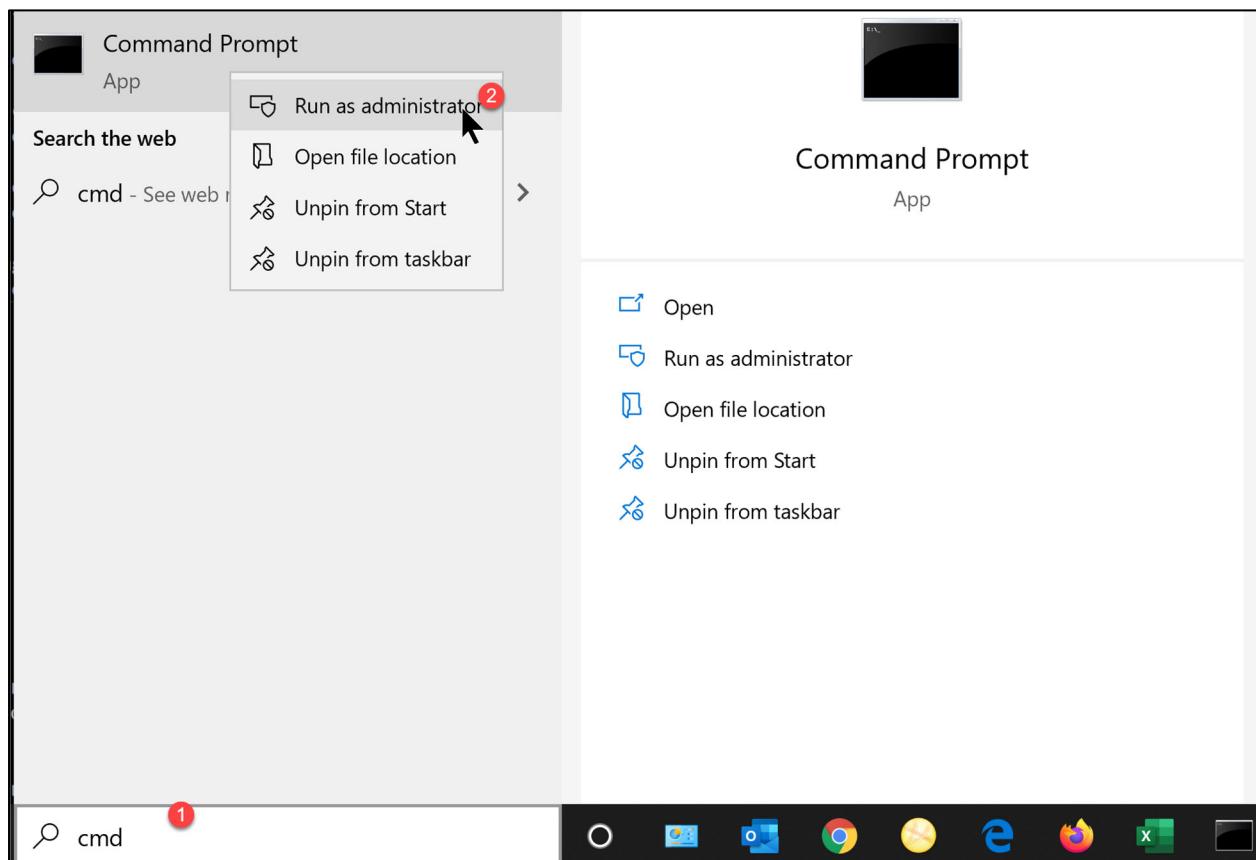
4.3 Location of WmpServer.exe

If you were to look into the Task Manager (Background Processes) on a computer hosting the server files, you will see WmpServer.exe is continually running (see Image 4.4 on the following page).



4.4. WmpServer Running in Background

Sometimes you will find that SmartVU is not running due to a rare instance of another Windows program using the same port numbers as WmpServer.exe. Usual port numbers used for WmpServer are in the 23600 range. To see port number usage, run (1) the Windows Command Prompt (CMD) in Administrator mode (2).



4.5 Running CMD in Admin Mode

Run the command as shown in Image 4.6.

C:\ Administrator: Command Prompt

Microsoft Windows [Version 10.0.18363.476]

(c) 2019 Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>netstat -ab | more

4.6 Command to Check Ports

Upon running the program, we see that WmpServer.exe has access to ports 23600 and 23608.

Administrator: Command Prompt		
TCP	0.0.0.0:16992	Bruce-lap:0
[LMS.exe]		LISTENING
TCP	0.0.0.0:23600	Bruce-lap:0
[WMPSERVER.EXE]		LISTENING
TCP	0.0.0.0:23608	Bruce-lap:0
[WMPSERVER.EXE]		LISTENING
TCP	0.0.0.0:23655	Bruce-lap:0
[SCADASERVER.EXE]		LISTENING

4.7 WmpServer Has Found Ports to Use

Status Symbol PMacros

With SmartVU connecting to the server and with WmpServer.exe running, we should be able to represent points on the map. In order to do this, we turn static elements such as the symbols we drew in Module 2 into programmable elements called Pmacros.

The first one we will look at is called a Status Symbol Pmacro. As the name suggests, these will only work with Status points and they will only work using symbols created using SmartVU to represent the point.

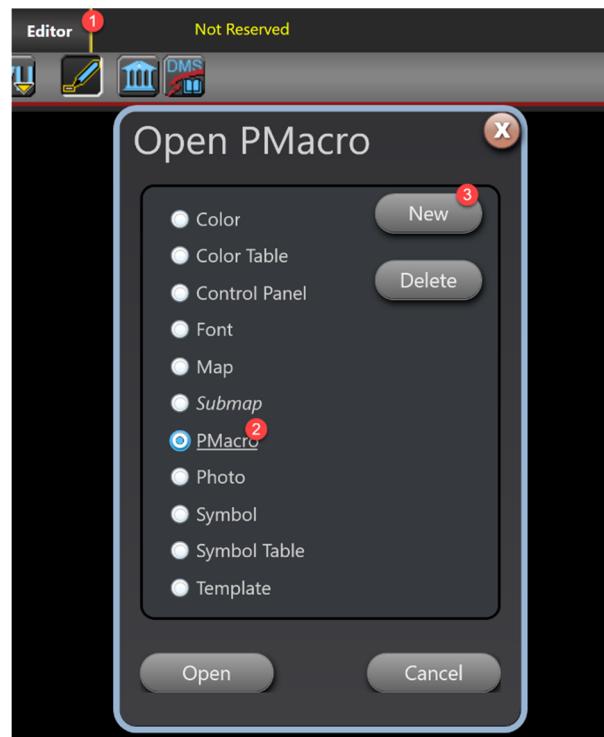
In other words, we created 4 symbols in module 2 to represent:

1. Open Device
2. Closed Device
3. Open Device requiring Acknowledgement.
4. Closed Device requiring Acknowledgement.

A Status Symbol Pmacro will ensure the right symbol appears on the map.

To begin creating our Pmacro:

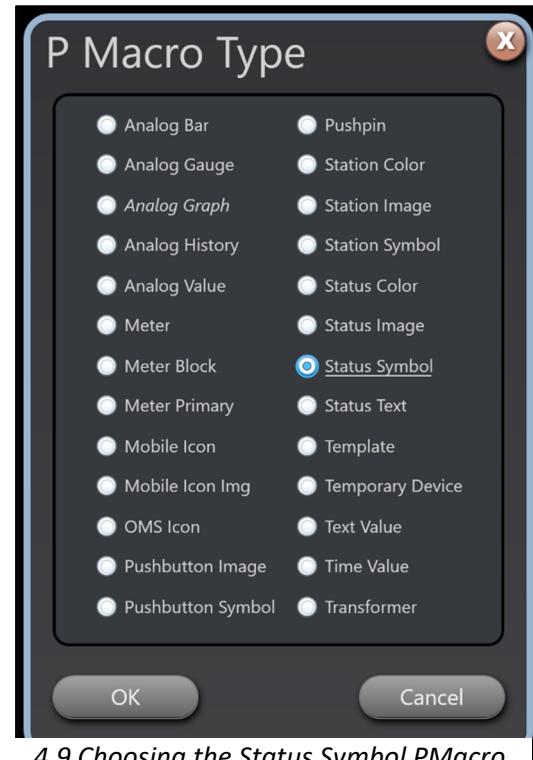
- Click Editor (1) to go into Edit view.
- Select PMacro (2).
- Click New (3).



4.8 Creating a New PMacro

PMacros transfer point data collection and controls into a colorful, user-friendly interface. They are a crucial component in the map so it's not surprising that there are so many from which to choose.

Make sure to choose Status Symbol before clicking OK because it looks very close to Station Symbol which we will be covering later in this section.



4.9 Choosing the Status Symbol PMacro

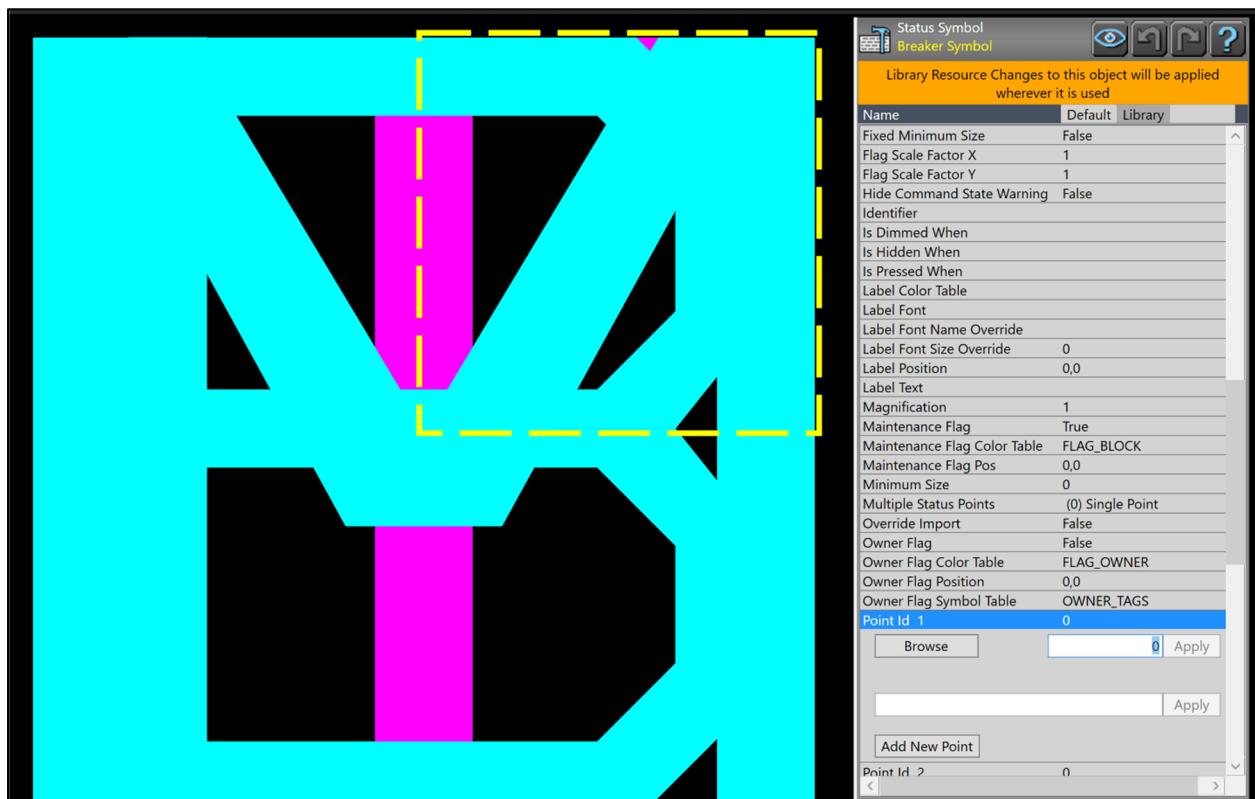
The next step is to name our Pmacro.

Click OK and click the selections enabling you to Reserve the Pmacro.



4.10 Providing a name for the PMacro

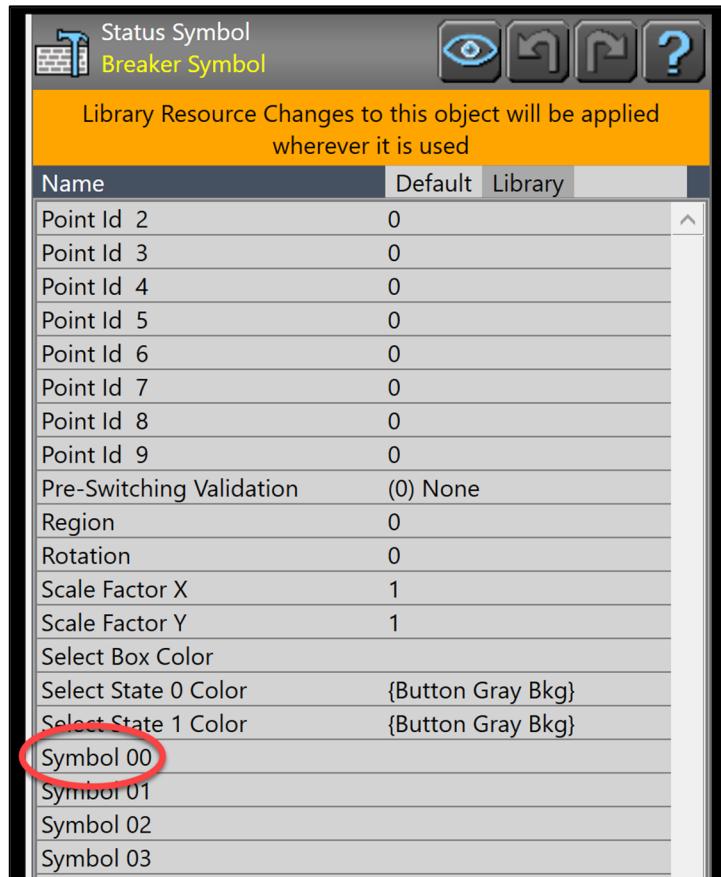
Next, you'll see a screen with numerous options.



4.11 PMacro Configuration Screen

The good news is that it's not necessary to fill in all the options on the right side. Scroll down the right side with your mouse until you see Symbol 00.

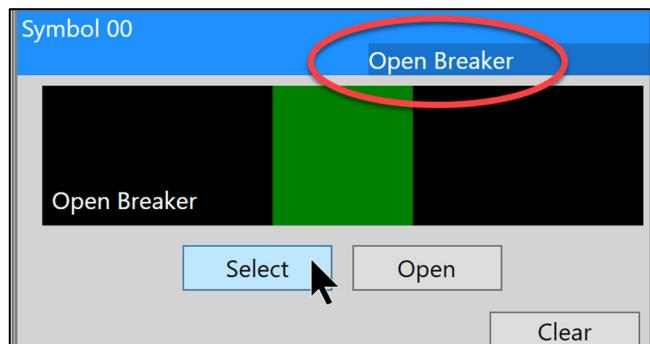
Click on Symbol 00.



4.12 Locating Symbol 00

When you click on Symbol 00, you are asked to select a symbol.

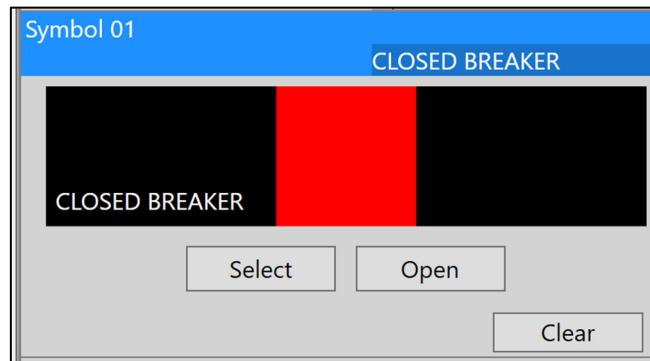
Choose the symbol you want to use to represent the breaker when it's in State 0 (open). Recall we created a Symbol called Open Breaker.



4.13 Selecting a Symbol for State 0

You will find Symbol 01 directly below Symbol 00.

Here you will select a symbol to represent State 01 (closed).

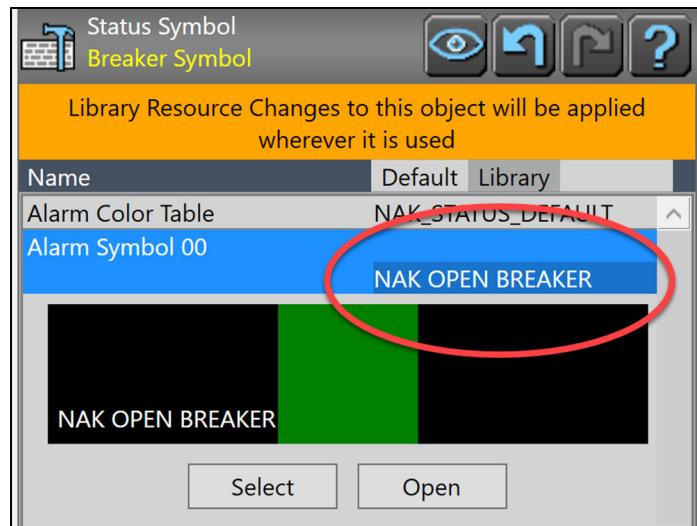


4.14 Selecting a Closed Breaker to Represent State 01 (Closed)

We will not be using symbols for States 2 and 3 as our breaker is just designed to show 2 states (0 and 1).

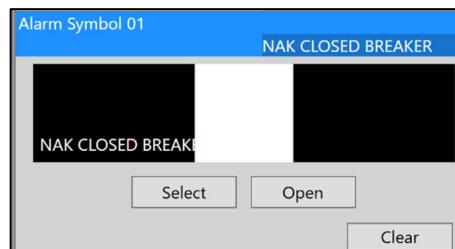
If we move up the fields on the right side, we will find Alarm Symbol 00 near the top.

The symbol that we choose for here is one that we want to represent that the breaker is open but no one yet has acknowledged the state.



4.15 Choosing a Symbol to Represent Open but Not Acknowledged

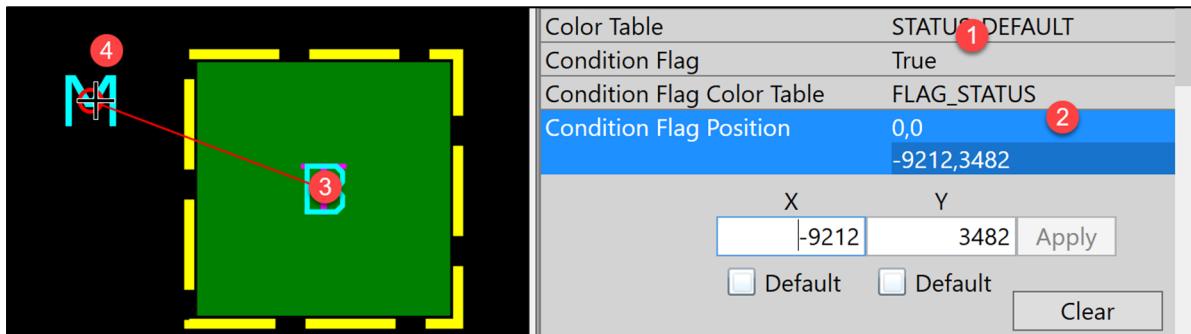
Directly below Alarm Symbol 00 is Alarm Symbol 01. Here, we want to add a symbol that represents a Close Breaker requiring acknowledgement.



4.16 Closed Breaker Requiring Acknowledgement

Let's zoom out a significantly on the left side.

What we see is that the large green area is one of our breaker symbols with some symbols in the middle.



4.17 Zooming Out from the Image

- Look for the Condition Flag field (1) and note that it is set to True (aka it is active)
- Click on the Condition Flag Position (2).
- A very small symbol appears in the middle of the symbols (3).
- Drag the circle outside of the breaker and note that it's a letter M (4).

These 4 steps ensure that the Condition of the point will be visible when it's required. E.g. M for manually overridden or F for Failed Telemetry.

You will not see these letters in the map unless they have been called upon by alarm blocks, manual sets, and tag applications.



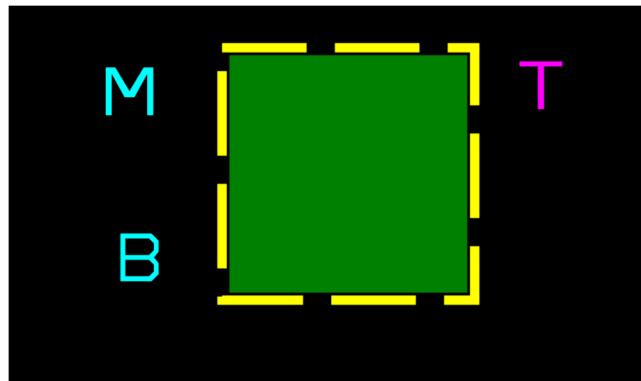
Exercise

In-class exercise: Repeat the 4 steps for:

Maintenance Flag (shows a B meaning alarms have been blocked).

Tag Flag (shows a T meaning the point has been tagged e.g. Full Tag or Hold Open).

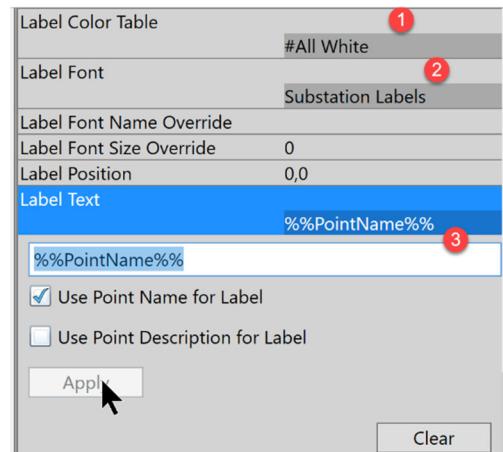
Upon completing this exercise, your Pmacro should appear similar to the one below.



4.18 Condition (M), Maintenance (B), and Tag (T) Flags Positioned.

There are three other settings we can select at this time.

- We created a font called Substation Labels that we can use for a Label Font (2).
- We can also choose #All White (1) for the color (it's actually a Color Table and we will discuss these in more detail later in this section).
- We can click Use Point Name for Label (3) to create a script that will automatically add the point name.



4.19 Two More General Settings

We are ready to save our PMacro. You may wonder why we didn't configure more settings:

- We didn't attach this PMacro to a point in the database.
- We didn't position the label

The reason we did not set these is because of a warning atop the PMacro configuration fields (on next page).

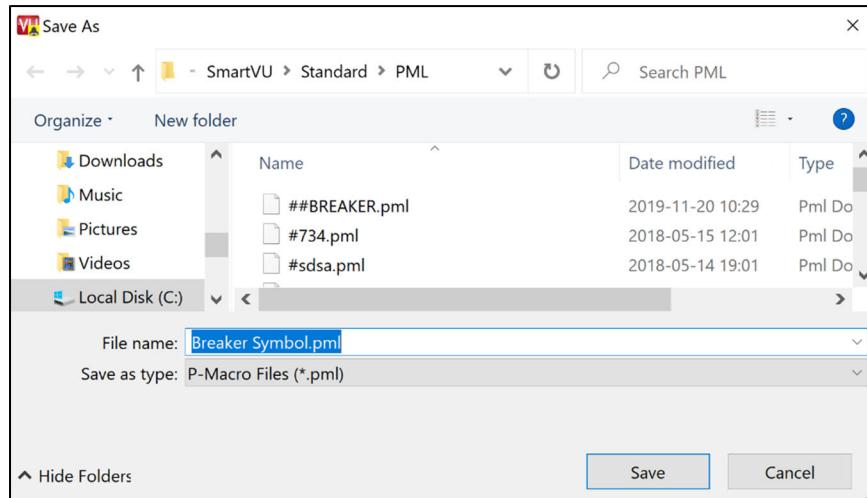


4.20 General Settings Only

The box is advising us that changes in the library are universal. The settings we enter in the library will impact every Breaker Symbol PMacro deployed in the map.

Applying specific settings is done elsewhere as we'll see later in this section.

Let's save the PMacro now. Note that, as with all visual elements, it ends up in the Standard Folder. The specific file type is PML (PMacro Library).



1.21 Saving our PMacro

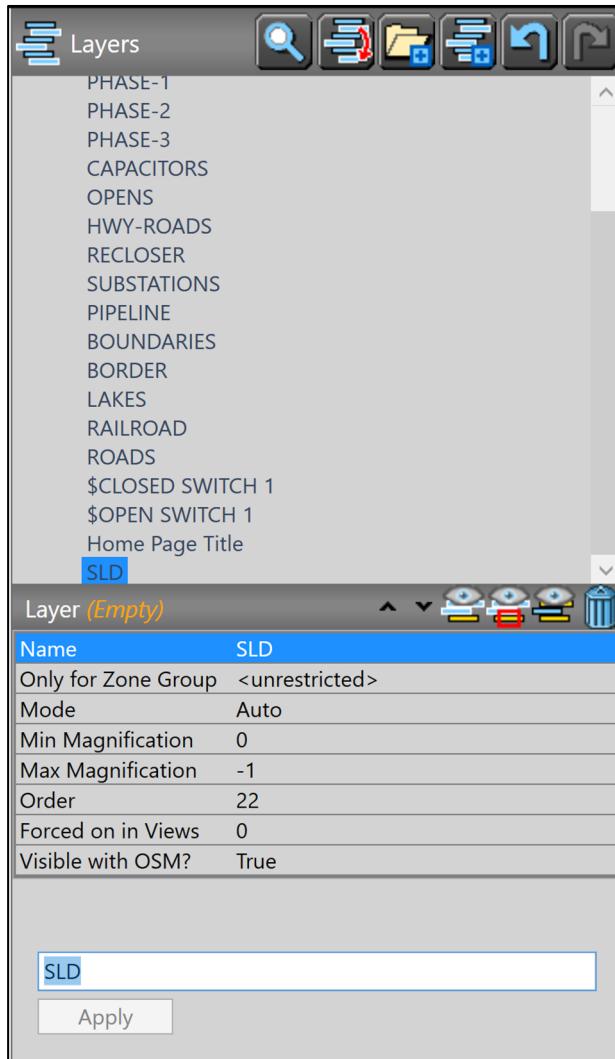
Adding and Test our Status Symbol PMacro



Exercise

In-class exercise: In the second module, we created a layer for the Home Page Title. Recall that layers are used for the purpose of customizing what the user sees. The process of making layers disappear and reappear is called decluttering.

For this exercise, create a new layer called SLD (Single Line Diagram). We will use this layer for substation map elements.



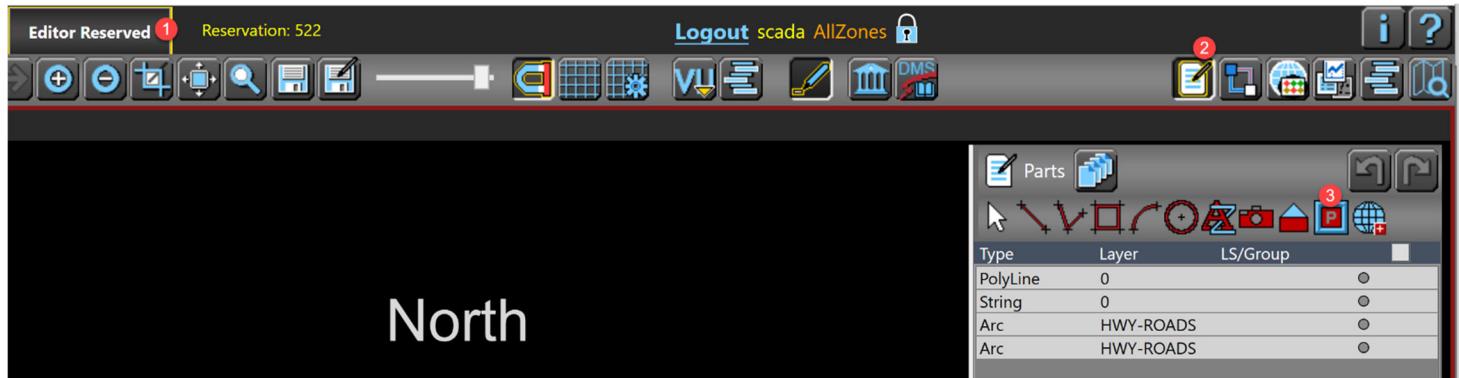
4.21B Reviewing Layer Creation

Let's continue by opening our Riverdale map and moving to the North View we created in Module 2.



4.22 Current North View

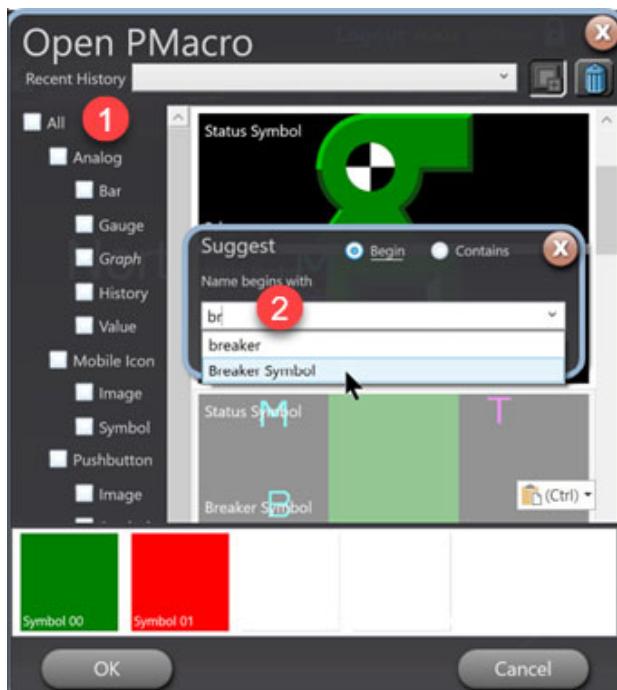
We add a PMacro to the map by making sure we are in Editor mode (1). Select Edit Views (2) and then click on the image of the letter P (3).



4.23 Preparing to Add a PMacro to the Map

To avoid having to search through all the PMacros, there are two things we can do:

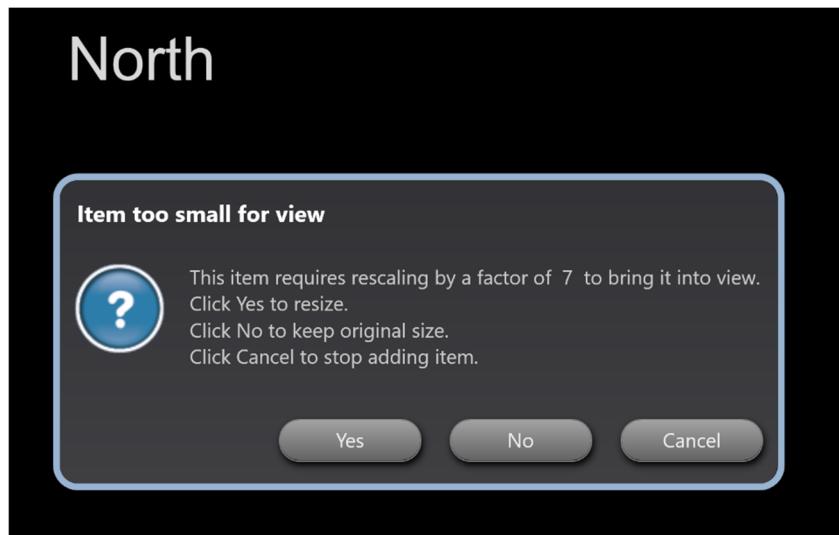
1. Clear the ALL checkbox (1) and check only the Status Symbol box. The number of PMacros we have to search is now much smaller.
2. If you know the name of the PMacro, just start typing it anywhere on the screen (2) and a Suggest window will appear that will let you click on your PMacro.



4.24 Preparing to Add a PMacro to the Map

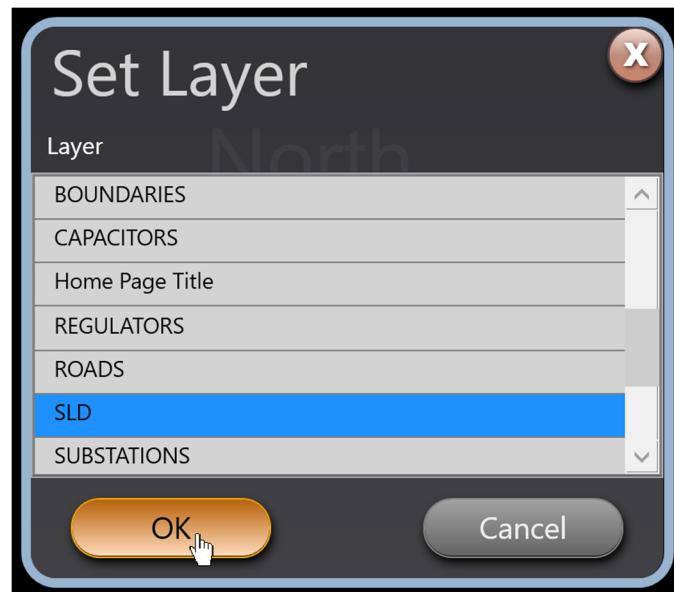
Click anywhere on the map to add the PMacro.

Usually you will see a warning that the symbols of the PMacro won't fit nicely into the magnification setting. The system makes a recommendation and we will accept. It's a matter or preference and you may find you prefer to not take the recommendation as you gain experience.

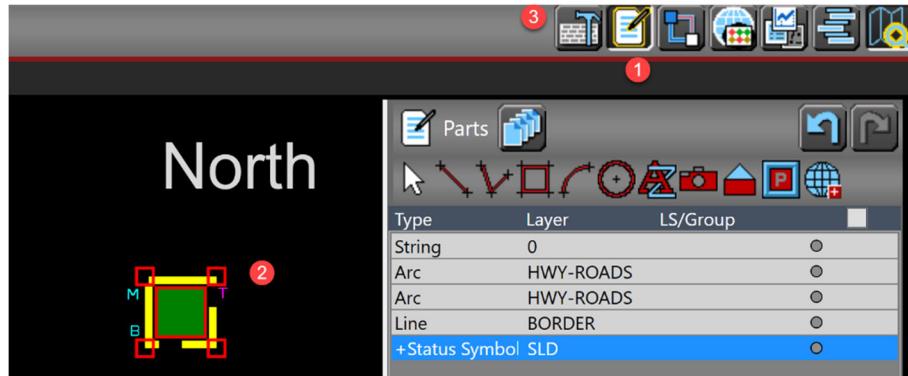


4.25 Accept System Offer to Resize the PMacro Symbols

Next, we will be asked which layer to use for this PMacro. Please select our new SLD Layer.



4.26 Selecting a Layer



4.27 PMacro on the Map

The PMacro appears on the map but it's not connected to any point in the database. To make a connection:

- Make sure the Edit Parts (1) button is selected.
- Click on the PMacro (2).
- Click the button with a Hammer (3) on it. This button is the PMacro Resources button but many people just call it The Hammer.

After clicking on the PMacro Resources button, we see the PMacro settings.

This image is almost the same as in Image 4.12 from The Library. There is, however, one major difference. Can you spot the difference?

Name	Default	Library	Override
Point Id 2	0		
Point Id 3	0		
Point Id 4	0		
Point Id 5	0		
Point Id 6	0		
Point Id 7	0		
Point Id 8	0		
Point Id 9	0		
Pre-Switching Validation	(0) None		
Region	0		
Rotation	0		
Scale Factor X	1		
Scale Factor Y	1		
Select Box Color			
Select State 0 Color	{Button Gray Bkg}		
Select State 1 Color	{Button Gray Bkg}		
Symbol 00	Open Breaker		
Symbol 01	CLOSED BREAKER		
Symbol 02			
Symbol 03			

4.28 PMacro Resources

You're correct if you answered that the difference is the amber warning in the Library. A change in the Library will impact all present and future deployed breakers.

Since the same warning does not appear when we click PMacro Resources, any changes we make to the PMacro is only going to impact the PMacro that we just added and clicked.

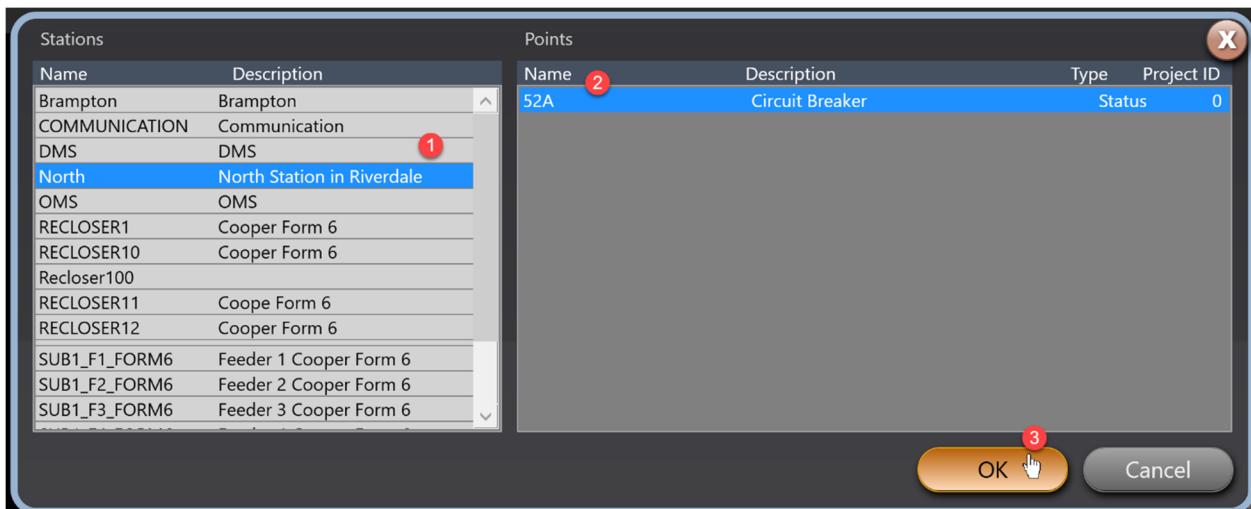
Note that PMacro Resources defaults to the Point ID 1 field.

This is because matching the PMacro to the database is a required step in order to activate the PMacro.

Click Browse to proceed.

The screenshot shows the 'PMacro Resources' dialog box. At the top, there are tabs for 'Status Symbol', 'Breaker Symbol', and three icons: 'Default', 'Library', and 'Override'. The 'Override' tab is selected. Below the tabs is a table with two columns: 'Name' and 'Value'. The first row shows 'Owner Flag Symbol Table' with the value 'OWNER_TAGS'. The second row shows 'Point Id 1' with the value '0'. To the right of the table are 'Browse' and 'Apply' buttons. Below the table is a large empty text input field and a 'Add New Point' button at the bottom.

4.29 Matching the PMacro to the Database

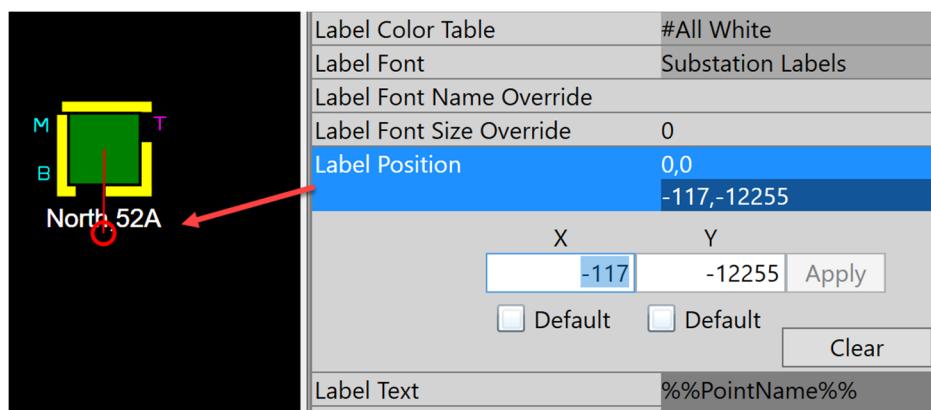


4.30 Selecting the Point

Here we select the Station (1) and point (2) we want to match to our PMacro. Click OK (3) to complete the process.

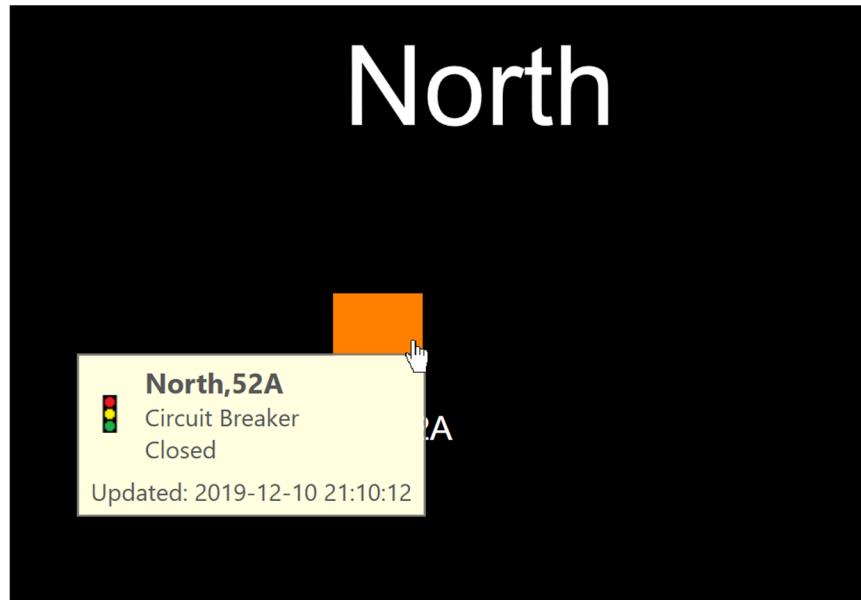
We also can now set the Label Position. It's usually best to set the position in the individual PMacro Resources because the labels may have to be adjusted in the Single Line Diagram. Some conductors connect may connect to the PMacro at the top and some may connect at the sides.

However, if you know that the label will always appear at the bottom, it would be better to set the position in The Library.



4.32 Setting the Position

Save the changes and let's look at what we have in the map. Below, notice that when we hover over the PMacro, we are getting its status.

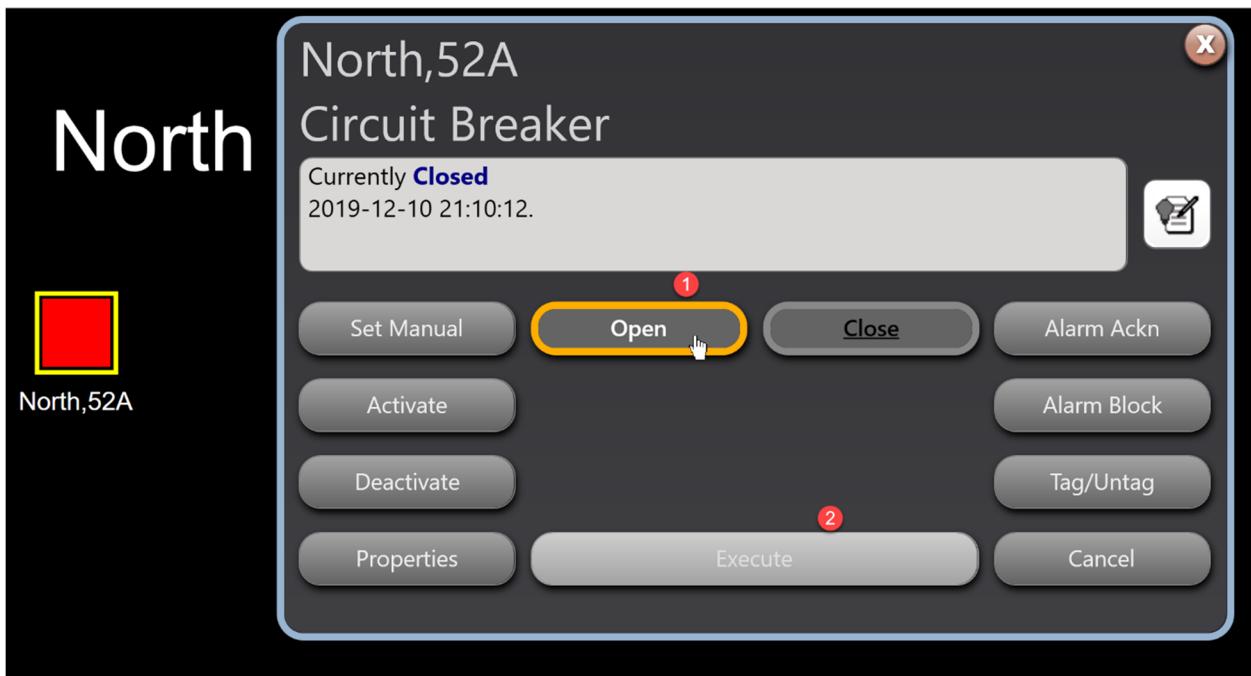


4.33 PMacro in the Map

Let's test and see if we can issue Open and Close commands. We start by clicking on the point to bring up a Dialogue Box.

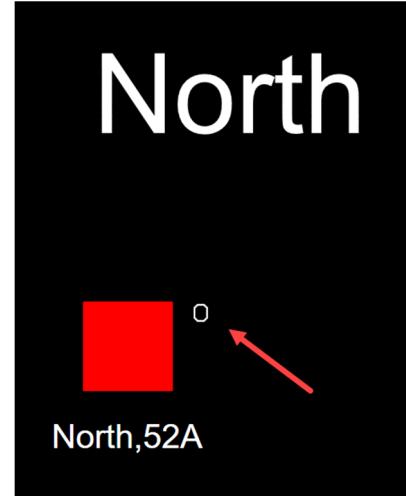
If your breaker is closed, click the Open (1) command and Execute (2).

If it's open, click Close and Execute.



4.34 Changing the State

You may see some quick status indicators such as X for Executing or O for Opening or C for Closing.



4.35 Breaker is Opening



Exercise

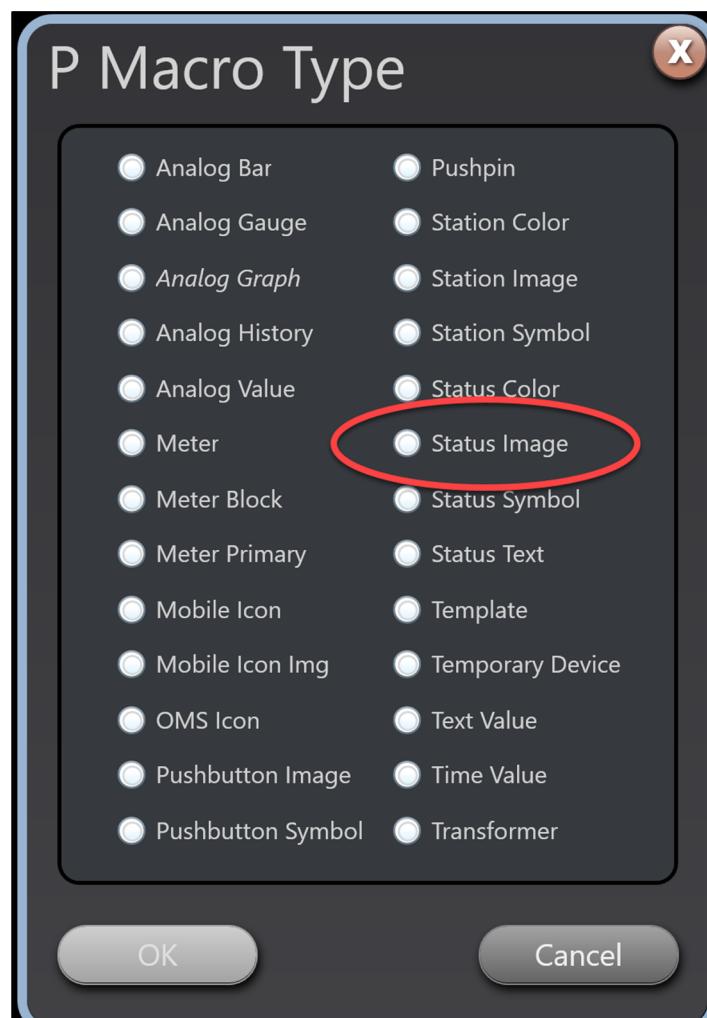
In-class exercise: Confirm your Status Symbol PMacro is working correctly by testing out the other 8 functional buttons in the dialogue box.

Note regarding Status Image PMacros

We have just created and tested a Status Symbol PMacro. In the next sections we will be looking at Status Text PMacros and Status Color PMacros.

There is a fourth Status PMacro known as a Status Image PMacro; however, we won't be covering it for two reasons.

1. It's similar to the Status Symbol PMacro but, instead of 4 symbols, you would place 4 image files (jpeg, gif, png, bmp) in the BMP folder and set them up just like we did the 4 symbols.
2. It's not as commonly used as the Status Symbol PMacros.

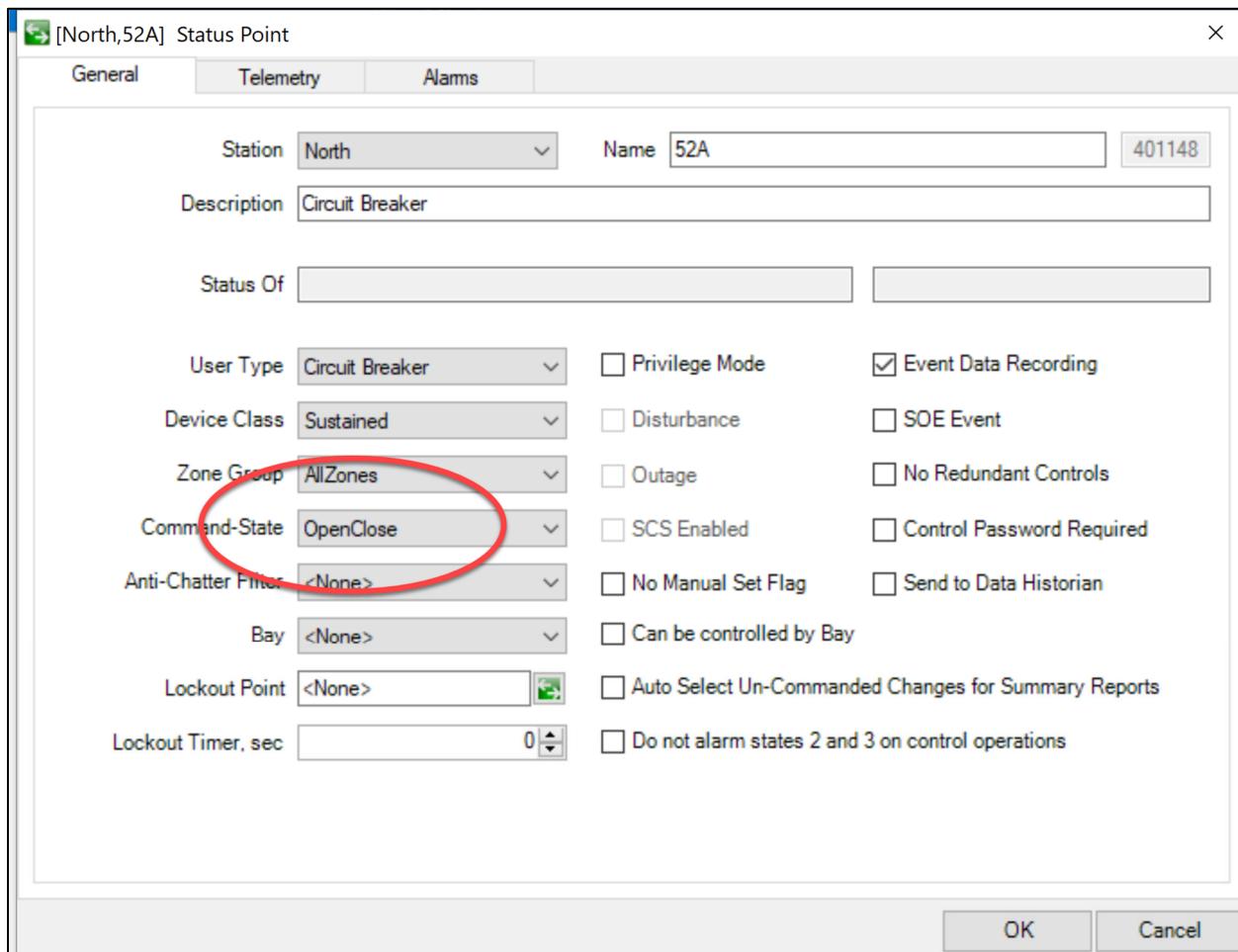


4.36 Status Image PMacros

Status Text PMacros

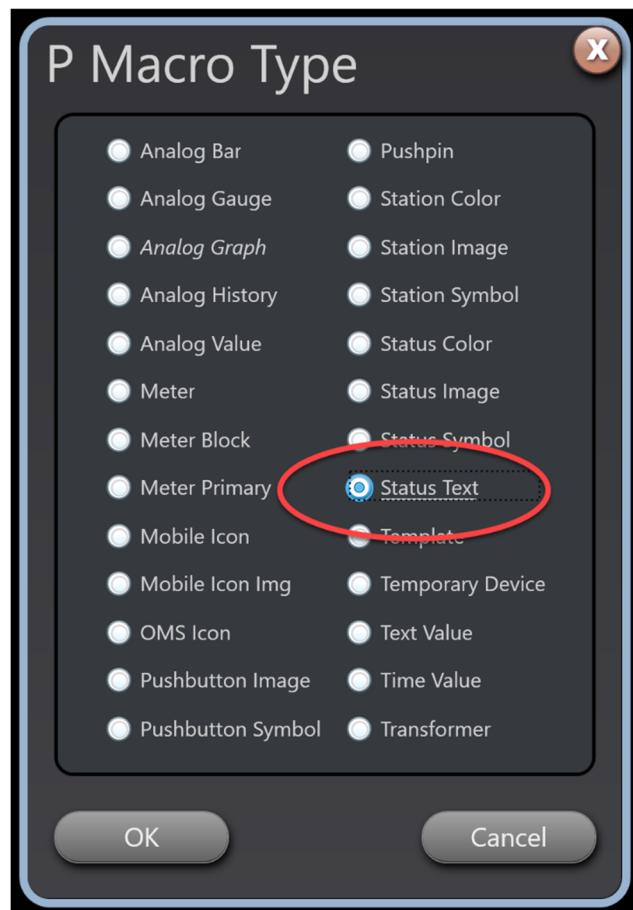
Status Text PMacros are commonly used because they work well with other Status PMacros and also because they provide words in addition to colors to assist the 5% of the population afflicted with color blindness.

Before starting, the text used for Status Text PMacros gets pulled from the State String we selected for the point when we used STC Explorer to create the point in Module 3.



4.37 Command State Forming the Basis for Status Text PMacro

The process for creating a new Status Text PMacro is the same as creating a Status Symbol PMacro with the exception of choosing Status Text PMacro instead of Status Symbol.



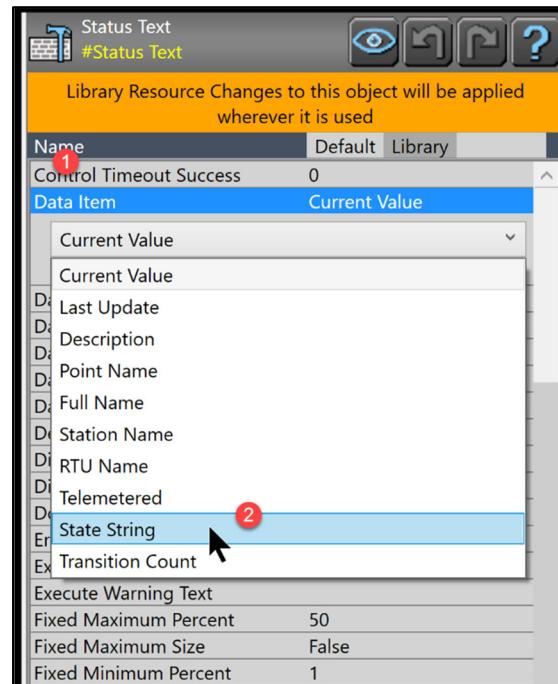
4.38 Creating a Status Text PMacro



4.39 Naming the Status Text PMacro

As mentioned in the last page, it's most common to use text associated with the State String.

It gets configured by clicking on Data Item (1) and then selecting State String (2).



4.40 Selecting State String for the Text

We also can associate the text with colors. Recall our discussion in Module 2 about Color Tables. Color Tables are sets of colors. The color seen by the Operator is dictated by the logic in the programming. For example, below is the Normal Color Table we created.

We were careful to match our Color 1 (0) with our Open Color and Color 2 (1) with our Closed color.

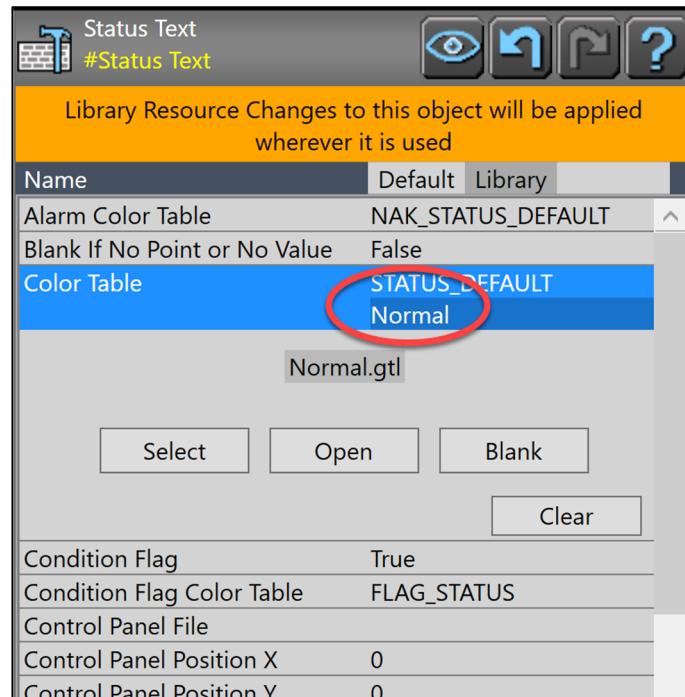


4.41 Color Table We Created

The reason for the care was that we are going to use the Normal Color Table in this PMacro.

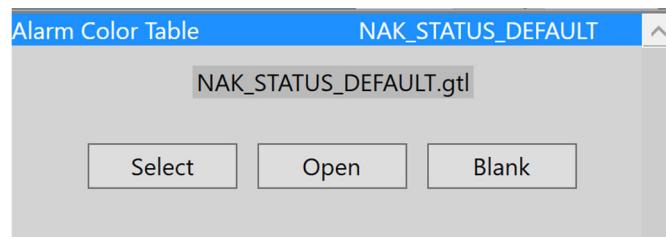
This PMacro has been developed so that the text associated with State:

- 0 will be colored with the Open Color.
- 1 will be colored with the Closed Color.



4.42 Applying the Normal Color Table

We also created a NAK Color Table. It was exactly like the Normal Color Table except the colors were flashing. We created in accordance with this setting which is how we want the text to appear if the point is in an unacknowledged state.



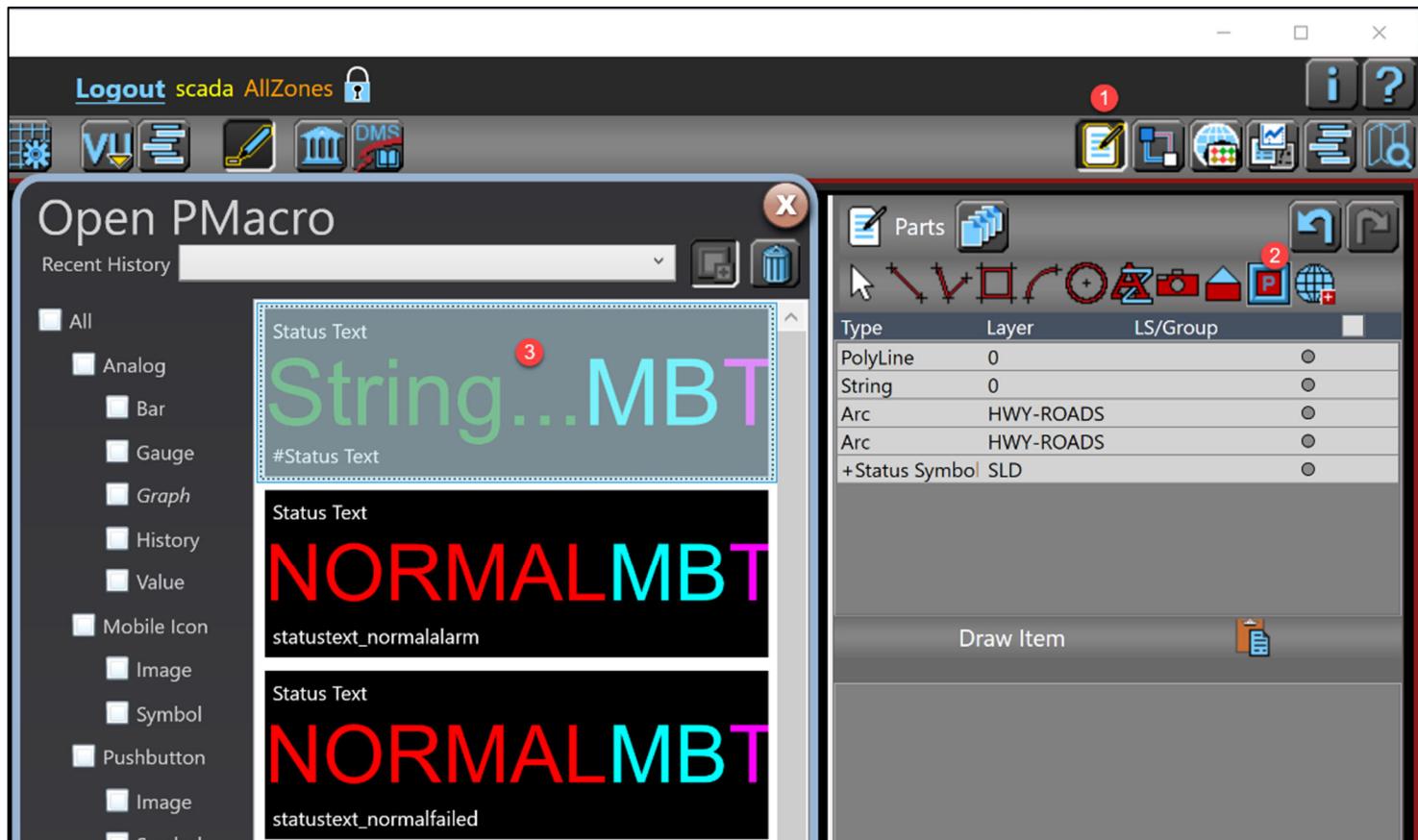
4.43 Applying NAK Color Table to Unacknowledged Alarms

Now that we have applied the State-String and two Color Tables, we can save our Status Text PMacro.

To add our Status Text PMacro to the map:

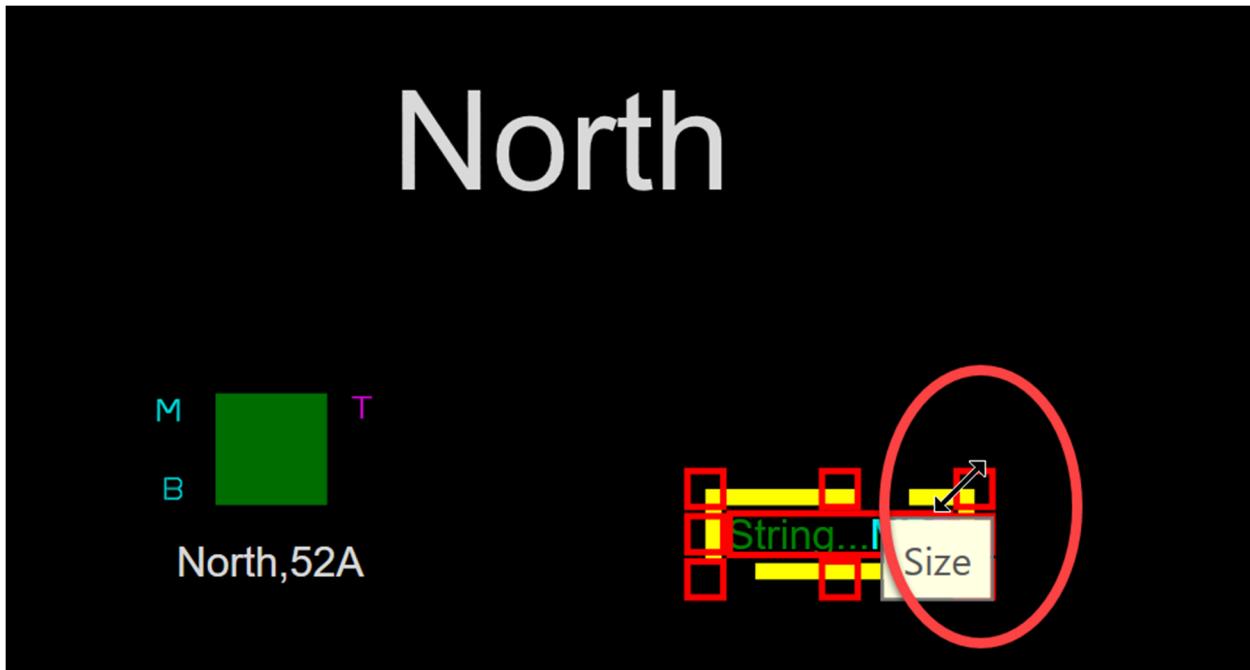
- Select Edit Parts (1).
- Click the PMacro icon (2).
- Select our Status Text PMacro and click OK (3).

Remember to accept the size changes suggested by the system and to use our SLD Layer.



4.44 Adding our Status Text PMMacro to the Map

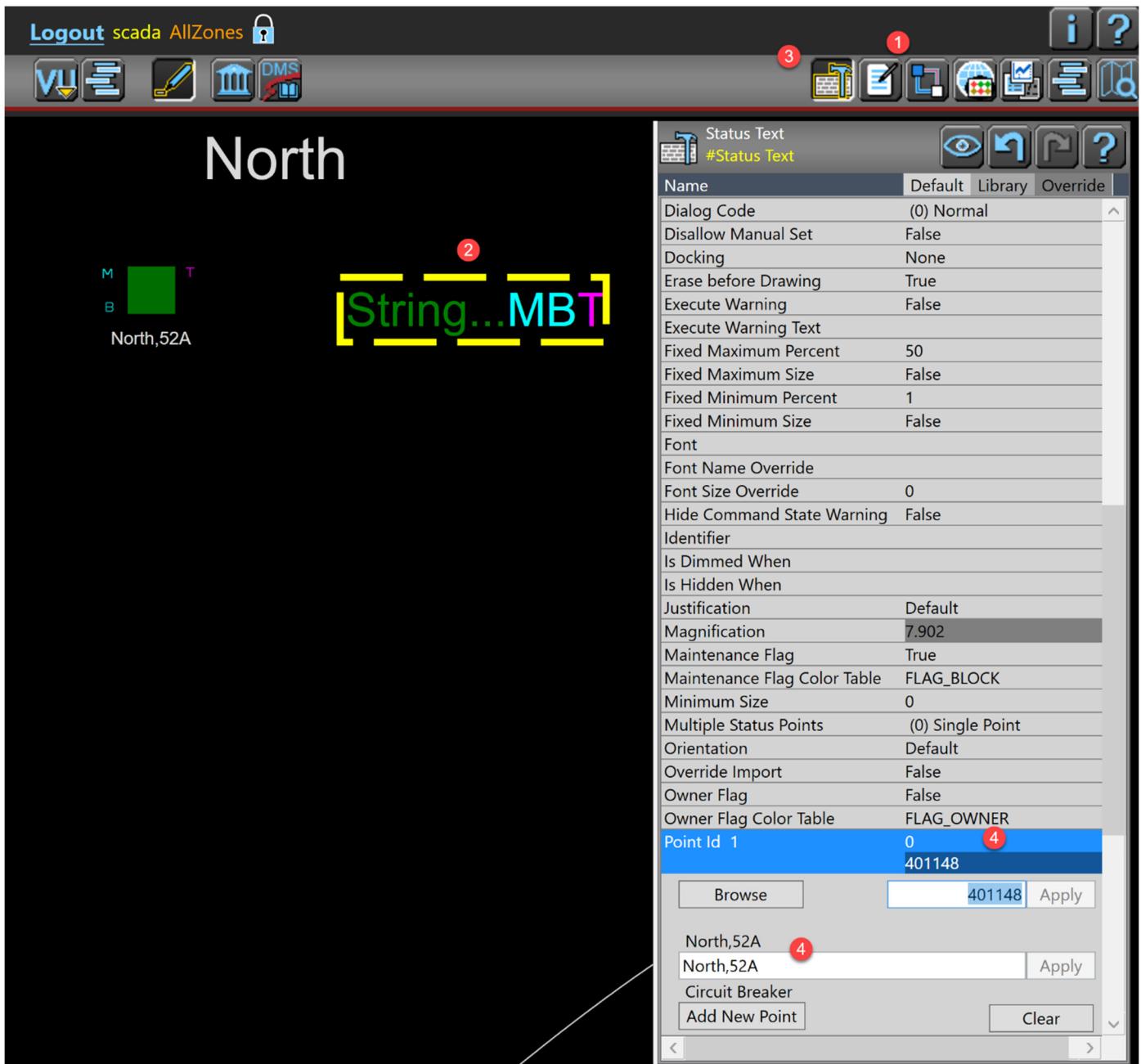
If the PMacro seems too small, you can grab one of the corners to make it a little bigger.



4.45 Resizing the Status Text PMMacro

We are now ready to add our point to the map:

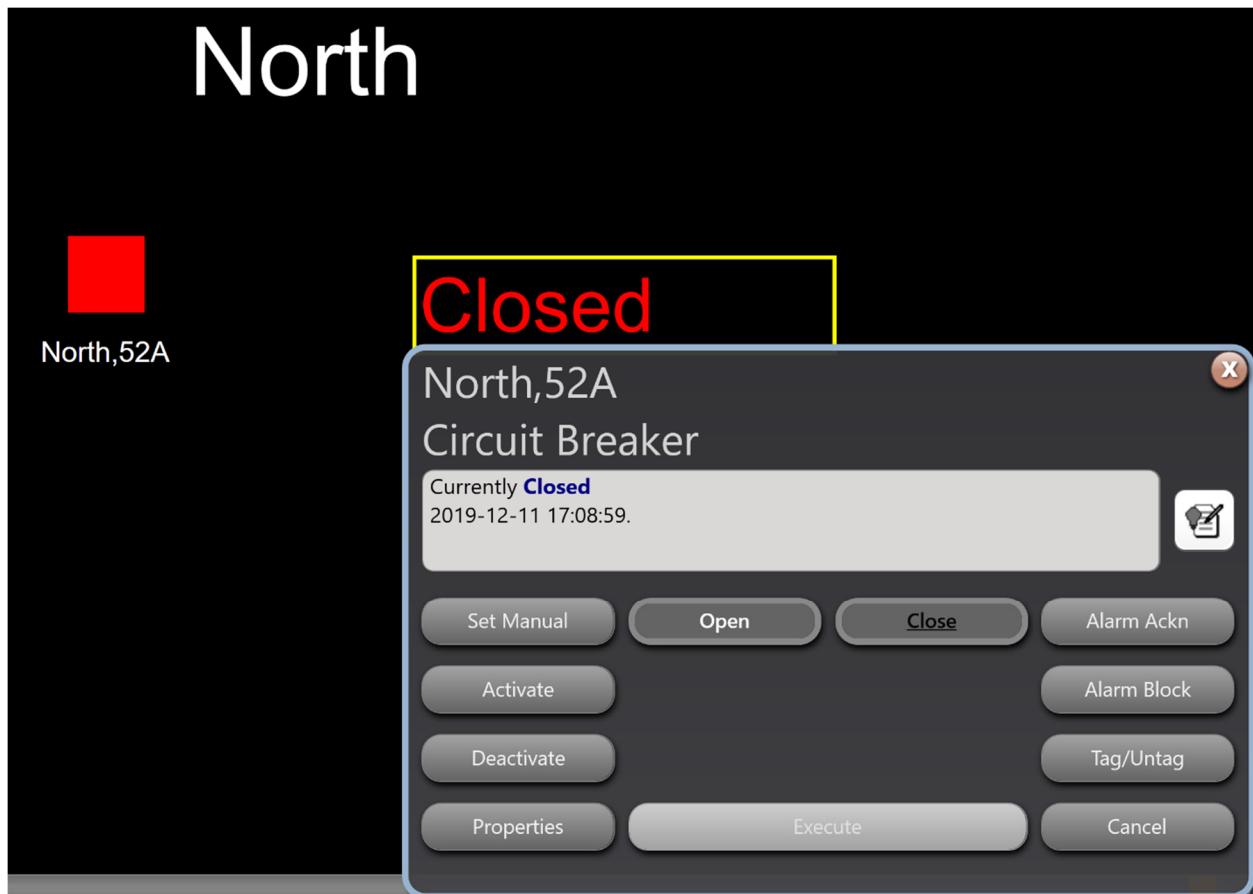
- Start in Edit Parts (1)
- Select the PMacro (2)
- Click on the PMacro Resources Button (3), this is known also as “The Hammer”.
- Connect it to the same point North,52A point (4).



4.46 Adding the PMacro to the Map

When we look at the new PMacro in the map view, we see that it functions exactly the same as the symbol PMacro.

The only difference is that the new PMacro uses words to tell the story and the Status Symbol PMacro uses symbols.



4.47 Working Status Text PMacro

Status Color PMacros

The main function of a PMacro is to represent the condition of the point in a colorful and/or graphical manner (e.g. Open? NAK? Tagged?):

- Our Status Symbol PMacro used 4 different symbols to show the conditions.
- Our Status Text PMacros used colors and words to show the conditions.
- Image Symbol PMacros are similar to Status Symbol PMacros except they used computer files (e.g. jpeg, gif, png, bmp).

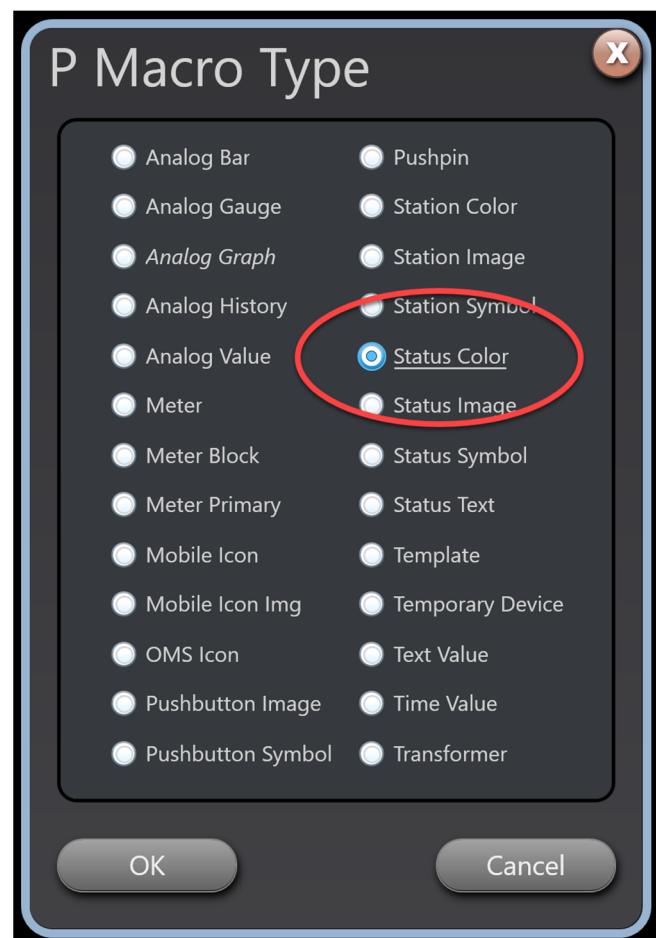
We will now look at the Status Color PMacro which is gaining in popularity.

The Status Color PMacro would never be used **with** the Status Symbol PMacro or the Status Image PMacro. These three PMacros all use pictorial elements to represent the device. The Status Text PMacro works well with all 3.

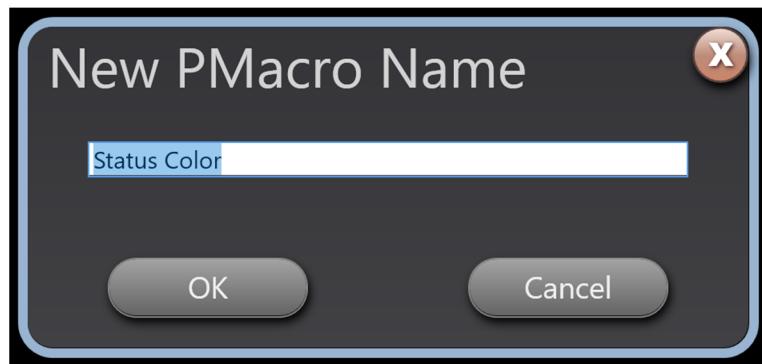
As the name suggests, the Status Color PMacro works with some neutrally colored element which changes color in accordance with a color table. The advantage here is that only one symbol needs to be created and managed.

Recall that, in module 2, we created a breaker but the color we chose for it was called a dynamic color. This forms the basis of the Status Color PMacro.

We choose Status Color when we create our new Status Color PMacro.

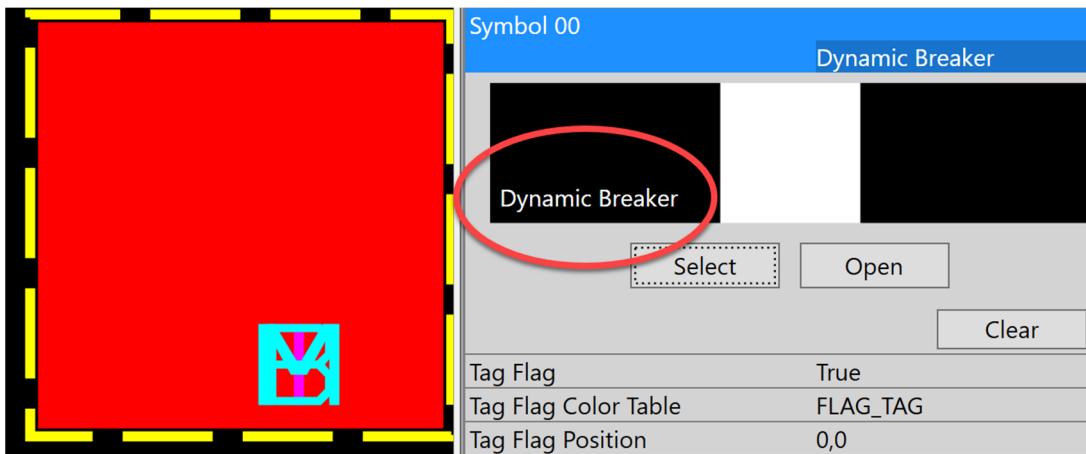


4.48 Creating a Status Color PMacro



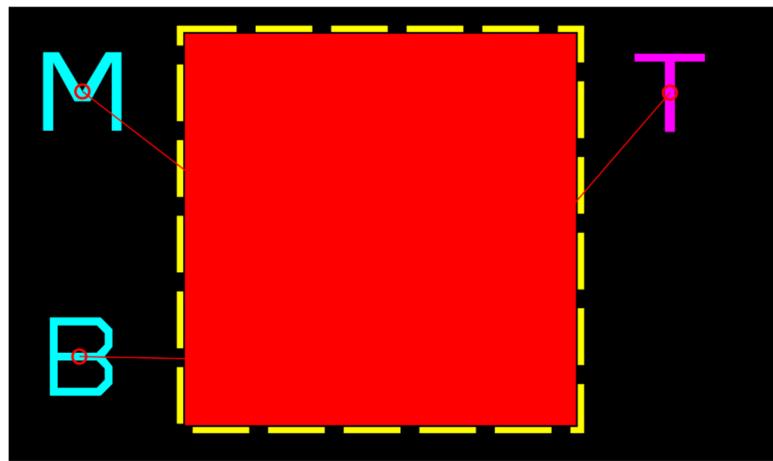
4.49 Naming our Color PMacro

You will see the main difference when you start looking for fields to assign symbols. There is only 1 field – Symbol 00 – and we assign our dynamic breaker to this field.



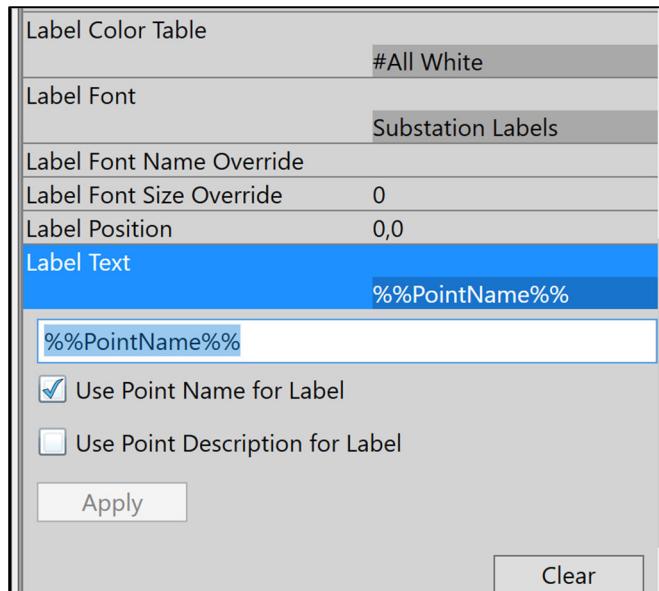
4.50 Only One Symbol Required for Status Color PMacro

Recall that we set flags for our Status Symbol PMacro. It's the same process here.



4.51 Setting the Flags for our Status Color PMacro

For the Status Symbol PMacro, we were able to set most of the label settings in the library. This is the same for the Status Color PMacro.



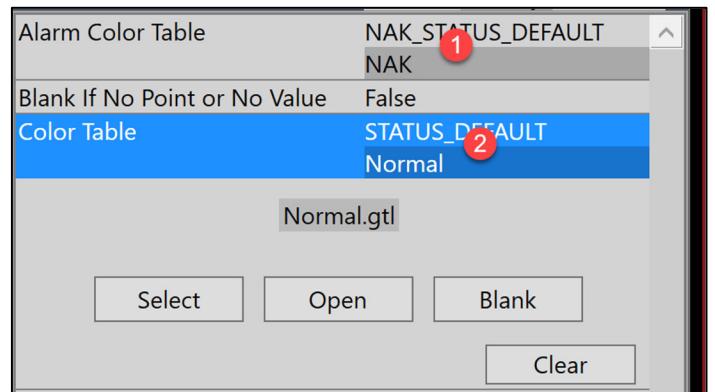
4.52 Adding Labels

Note: The reason there is a Label Color Table is that it is possible to have the labels change color. By using a table with only the color white, we are saying we just want white and we don't want the label to change color.

Since we are using Color Tables, we should put in the Color Tables we created for Open, Closed, and NAK scenarios. Recall that they worked well for our Status Text PMacros because our color tables lined up with State 0 and State 1 scenarios.

Let's apply our NAK table to the Alarm Color Table field (1).

Our Normal table (2) should be applied to the Color Table field.

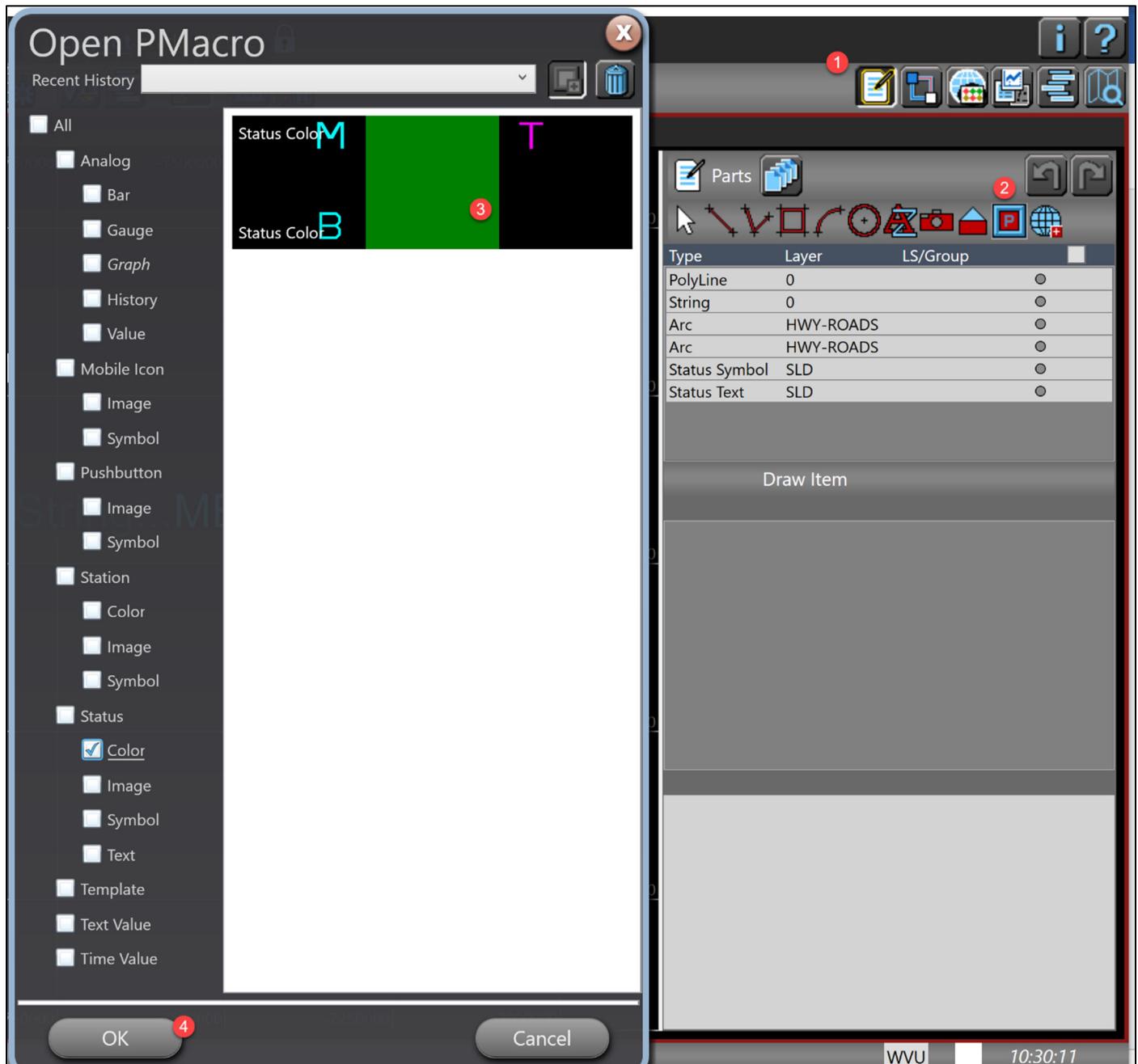


4.53 Applying our Color Tables

We can now Save our Pmacro and then add it to the map. Remember the following steps:

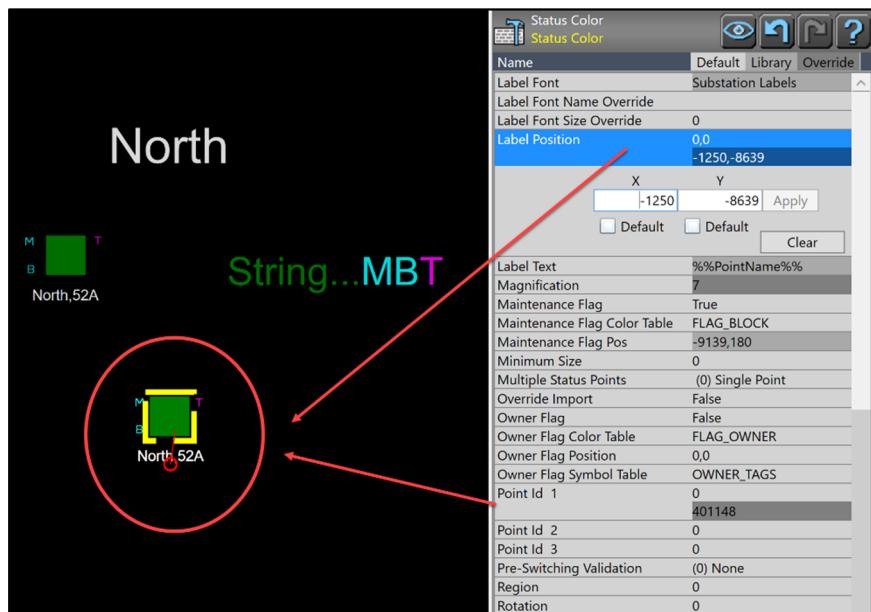
- Start off in Edit Parts (1).
- Choose the P icon (2).
- Find our Status Color PMacro (3).
- Click OK (4) and drop it on the map.

Use the same answers about (Yes) and layer (SLD) as we have in the past.



4.51 Adding our Status Color PMMacro to the Map

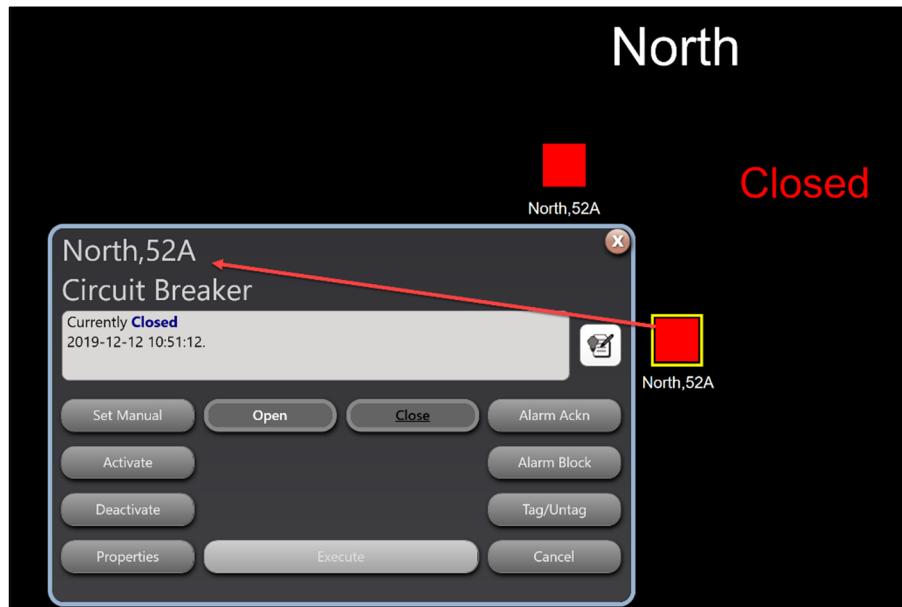
Next, we use the PMMacro Resources (Hammer) button just like we did for Status Symbol PMMacros. This is where we enter the specific settings for this device in the North Station. We must line up this PMMacro with the North,52A point and also set the label.



4.52 Applying Specific Settings for the North,52A

Our Status Color PMacro should function in co-ordination with the Status Text PMacro.

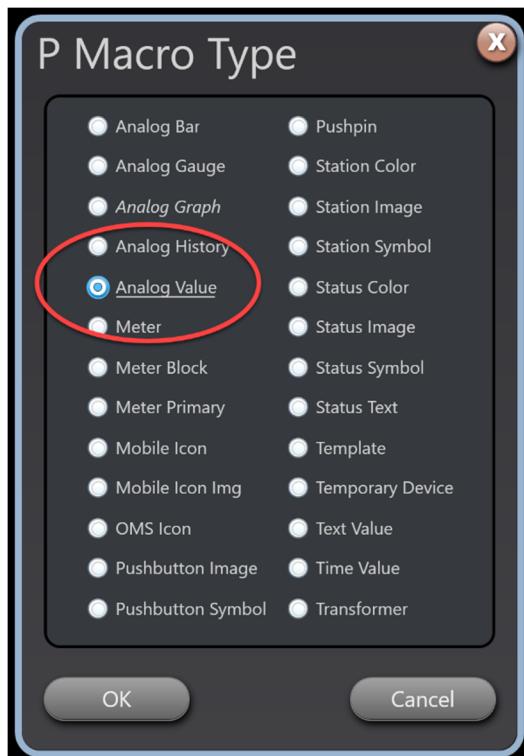
Any differences between our Status Color PMacro and our Status Symbol PMacro should be negligible.



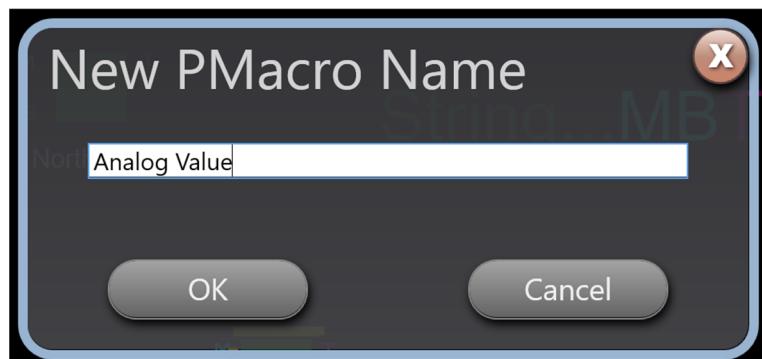
4.53 3 Different Types of Status PMacro on Map for Same Point

Analog Value PMacros

In Module 3, we created an analog point and simulated values for it. To see these values in a map, we create an Analog Value PMacro.



4.54 Creating an Analog Value PMacro



4.55 Naming our Analog Value PMacro

Because individual status changes don't have to be defined, you will find that there is not as much configuration for Analog PMacros.

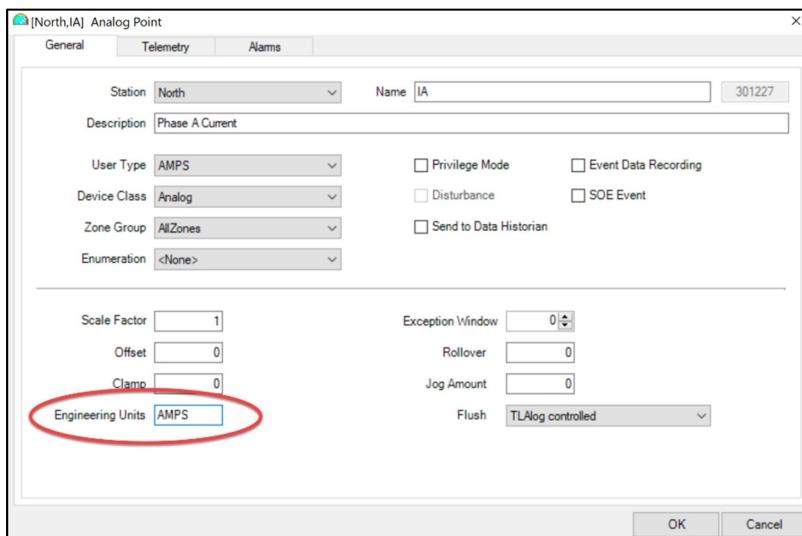
Two changes we made below are:

- Setting the precision (1) to 0 instead of the default 3 changes a value from appearing as 65.321 to appearing as 65.
- Changing the Units Flag to True (2) changes a value from appearing as 65 to appearing as 65 AMPS if AMPS was entered when the point was defined (see image 4.57)



4.56 Making Widespread Changes in the Library

The most obvious information we want to get from analog points is their present value; however, an Analog PMacro can also be configured to obtain most of the fields that we used to configure the point (e.g. Engineering Units).



4.57 Many types of Information can be Included in an Analog Value PMacro.

We can now save our Analog PMacro but don't close it yet.

Image 4.57 explains that many types of information can be included in an Analog PMacro and it shows

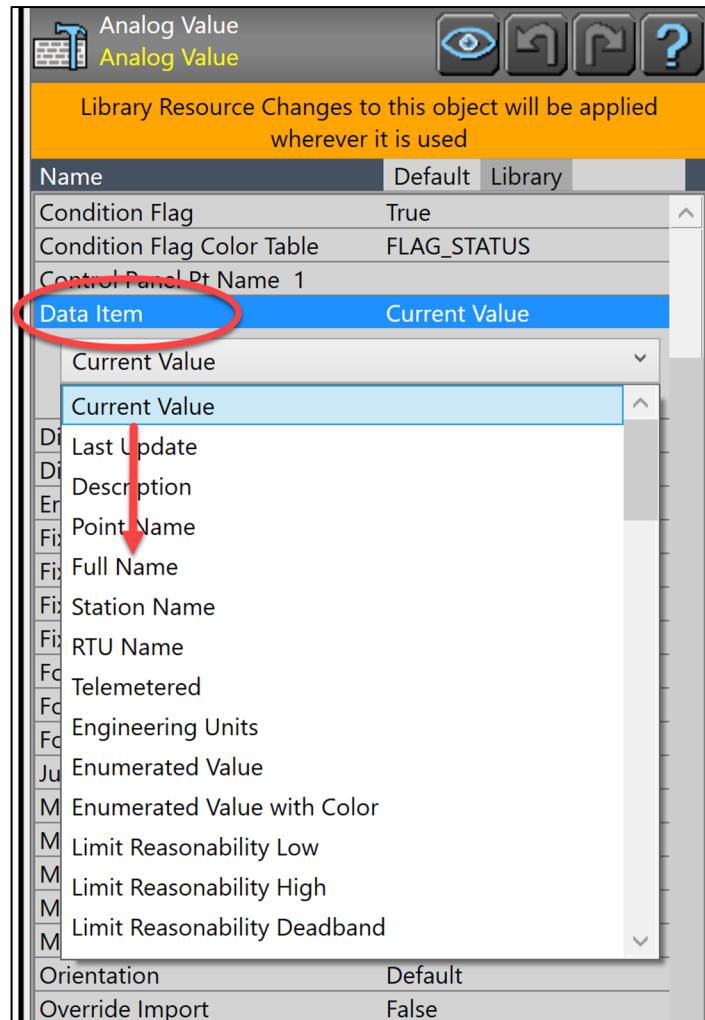
Engineering Units as an example. On the next page, we will demonstrate that even names can be captured.

Keeping our Analog Value PMacro open, look for a field called Data Item.

By default, the data item is the Current value (e.g. 63 AMPS); however, any of the fields in this box can be used. Instead of Data Item, let's click on Full Name.

By clicking Full Name, we should expect to see North,52A instead of the value when we place this PMacro on the map.

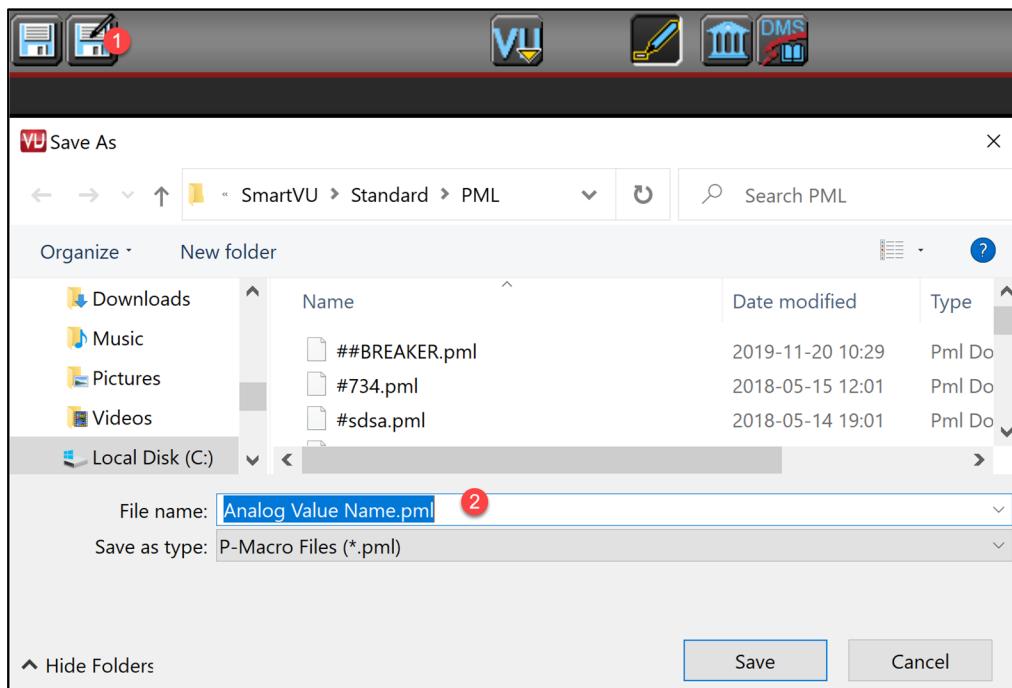
Remember the field called Units Flag in Image 4.56? We must change it to False or else this PMacro will appear as North,52A AMPS.



4.58 De-selecting Current Value

We can now use "Save As" for these modifications (please see image on next page).

- Select "Save As" (1) and be careful to not click on Save.
- Let's call it Analog Value Name (2).



4.59 Saving the Modified PMacro

When we look in the library, we should have two new Analog Value PMacros. The Analog Value PMacro should give us the value of a point and the Analog Value Name PMacro should show the full name of a point.

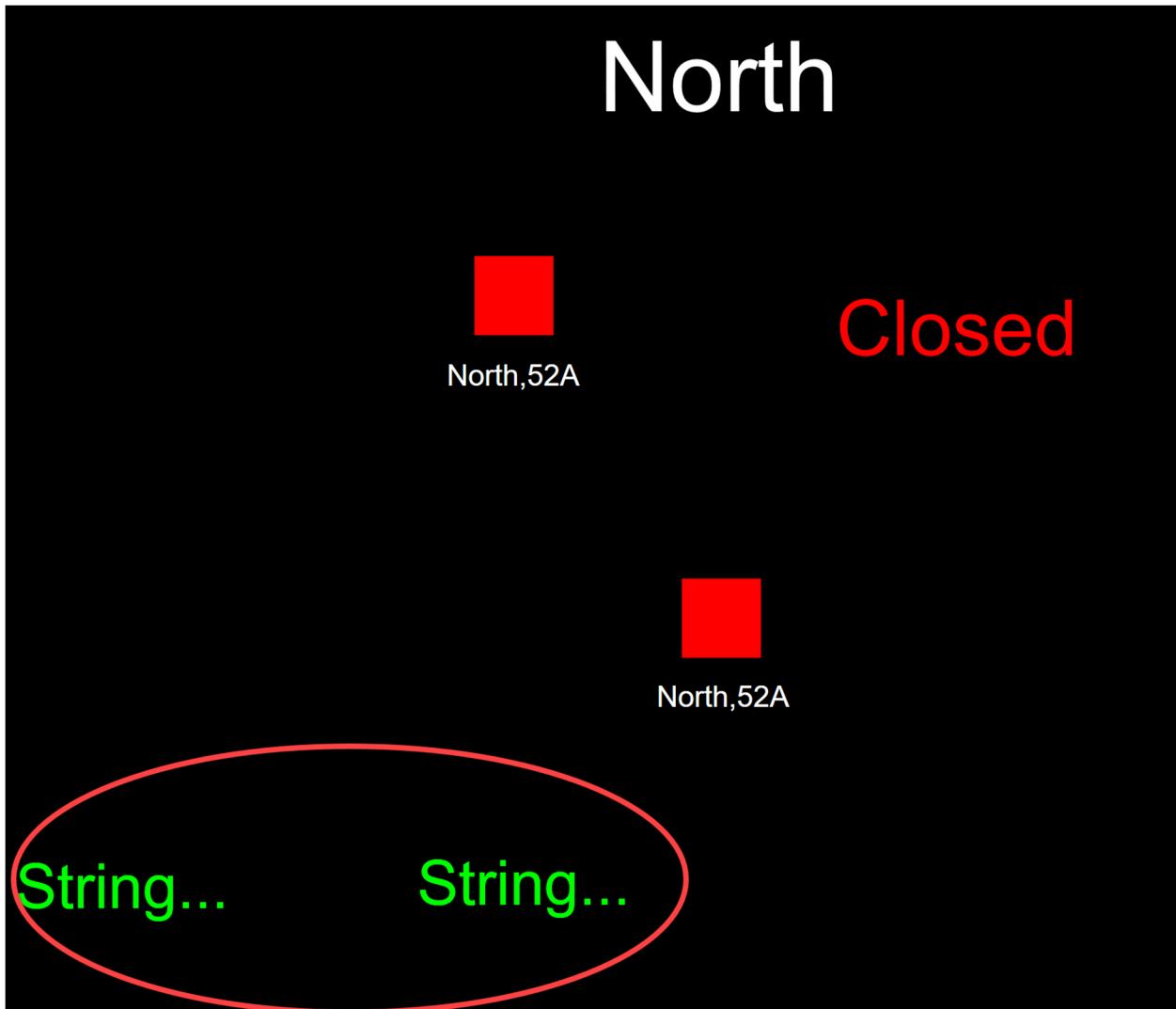


4.60 Two New Analog Value PMacros

Let's add our two new Analog PMacros to the map. Place them side by side and resize if necessary. The Analog Value Name PMmacro should be placed first with the Analog Value PMmacro following it.

Don't worry if the sizes are not exact, we will be learning about tools that can make them the same size

with appropriate spacing.



Just as we did with the Status PMacros, connect these PMacros to the point we created called IA. Your result should be similar to the one in 4.62.



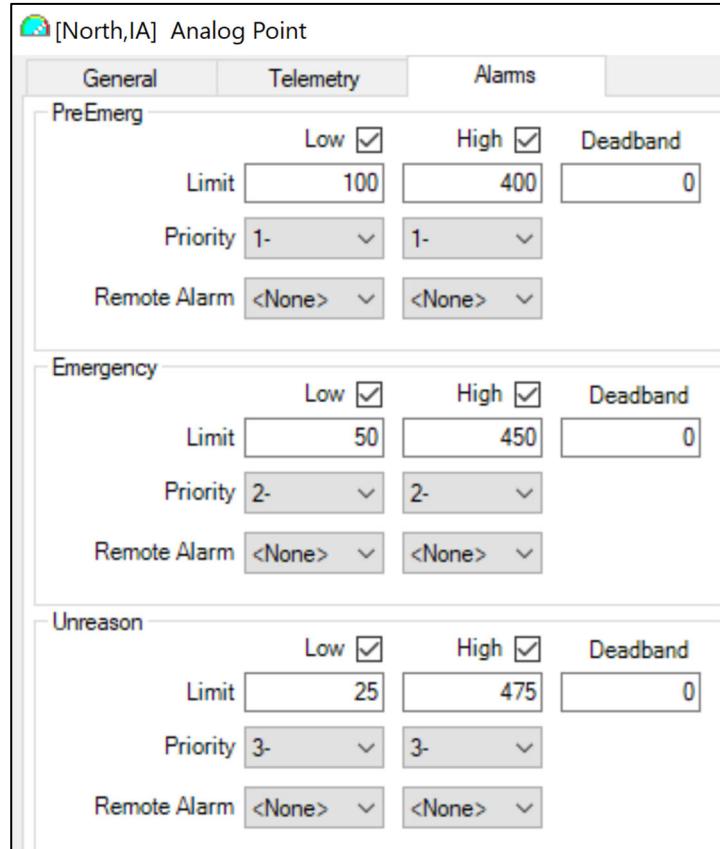
4.62 Two Analog PMacros Connected to Same Point

Some of you will have different colors than the green showing above and some of you will have flashing colors. The colors are dependent on the Alarms we have set and the Alarm tables in the PMacro. Let's have a look at how we set the Alarms in the last module. This was done in STC Explorer:

We set the alarms on this point with the assumption that values between 100 and 400 were good.

However, a value

1. ≤ 100 raises a Pre-Emergency warning.
2. ≥ 400 raises a Pre-Emergency warning.
3. ≤ 50 is an Emergency.
4. ≥ 450 is an Emergency.
5. ≤ 25 is Severe.
6. ≥ 475 is Severe.

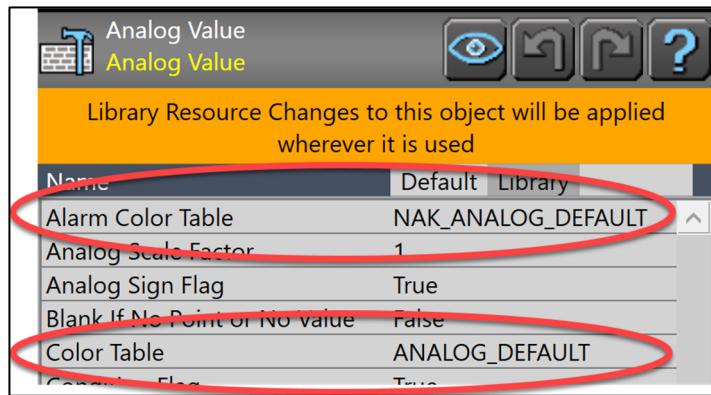


4.63 Alarm Settings for North,IA.

The Analog Value PMacros have settings that correspond to these Alarm values.

Upon going to the Library and opening up our Analog Value PMacro, you will see that two color tables have been configured.

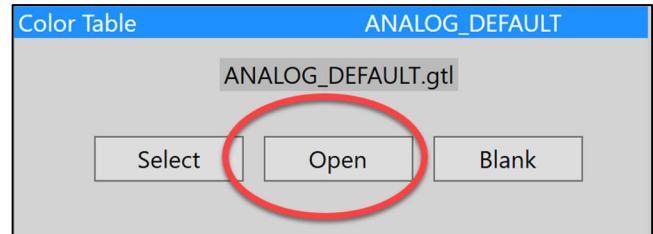
The ANALOG_DEFAULT and NAK_ANALOG_DEFAULT color tables were pre-entered by Survalent but clients can edit or create their own tables if desired.



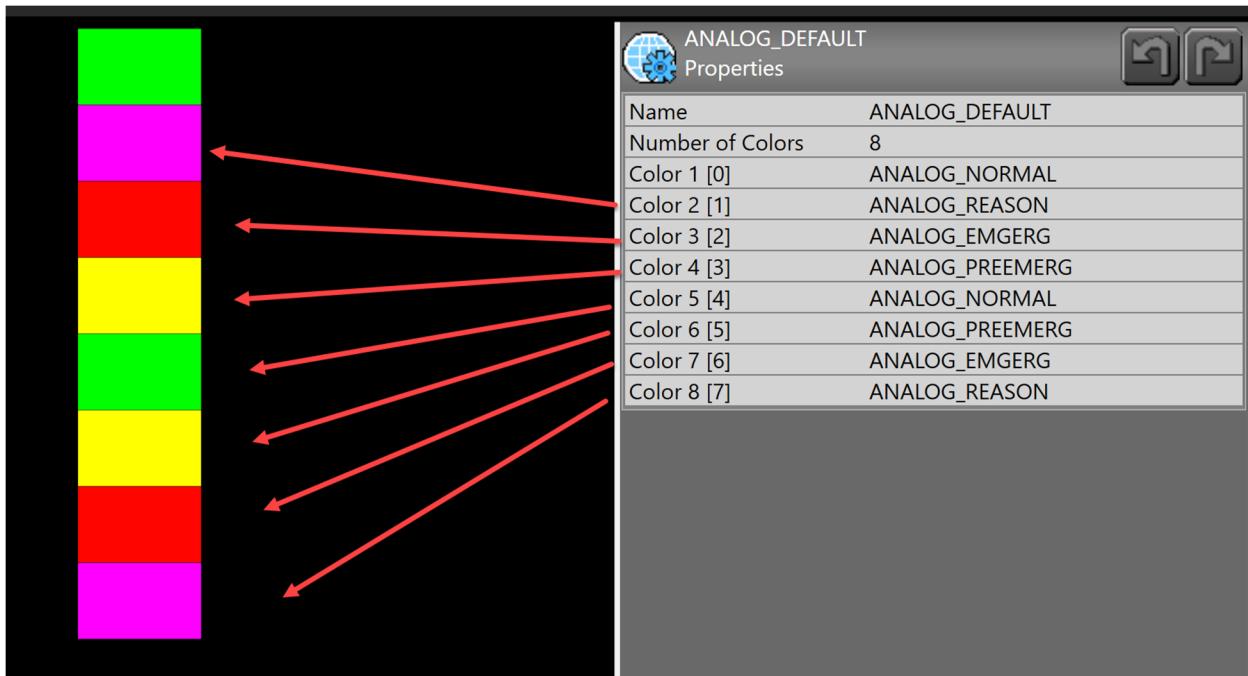
4.64 Preset Color and Alarm Color Tables

Let's look at them closer.

Click on Color Table and select Open. Note that you can select a different table here or even elect to have no colored alarms.



4.65 Opening the Color Table



4.66 Colors for Analog Point Alarms

Referring back to Image 4.66:

1. Color 5 [4] as being in that acceptable range of 101-399. The color of the value is green.
2. Once the point hits 400, the alarm color moves to Pre-Emergency shown by Yellow or Color 4 [3].
3. Once the point hits 100, the alarm color moves to Pre-Emergency shown by Yellow or Color 6 [5].
4. If the point goes up to 450, the alarm color goes to Emergency shown by Red or Color 3 [2].

5. If the point goes down to 50, the alarm color goes to Emergency shown by Red or Color 7 [6].
6. If the point goes up to 475, the alarm color goes to Unreasonable shown by Fuchsia or Color 2 [1].
7. If the point goes down to 25, the alarm color goes to Unreasonable shown by Fuchsia or Color 8 [7].
8. Color 1 [0] is not performing any function.

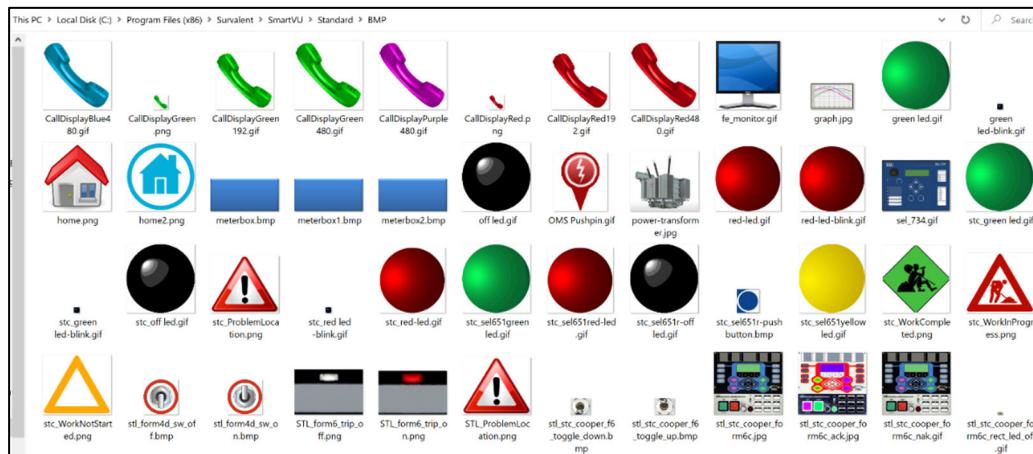
Pushbutton PMacros

The PMacros we have set up in the previous sections directly tied to points. Pushbutton PMacros do not get tied to points. They get tied to system functions.

They can be configured from symbols that we draw in SmartVU or they can be configured from image files. For this example, we will use an image file.

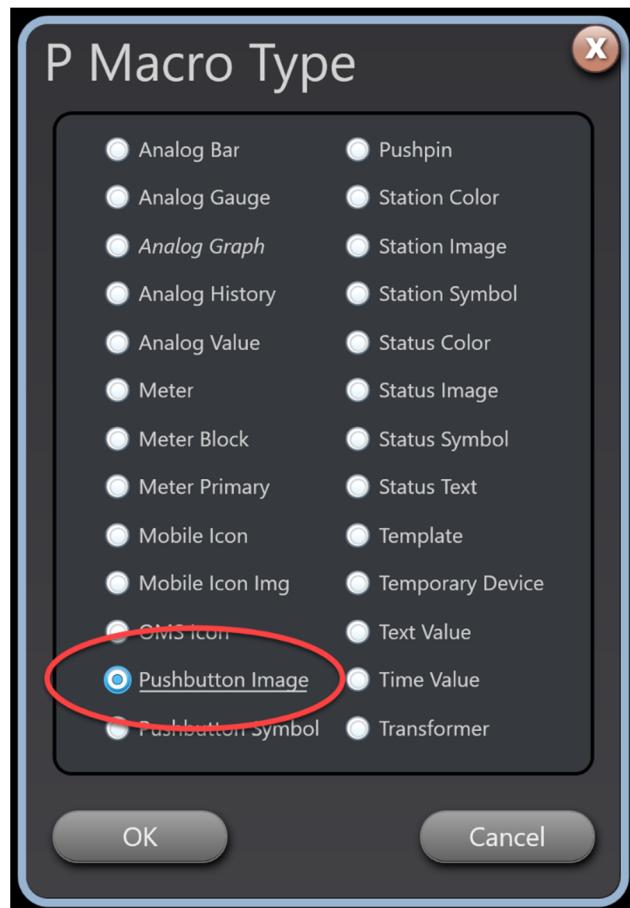
Images that we use must be located in the SURVALENT – SMARTVU – STANDARD - BMP folder. So, if you have a file you want to use, place it in that folder before proceeding. Let's say we want to create a button that will take us back to our home page. We can use one of the images that look like a house.

Note: It's true that a home button already exists on the SmartVU toolbar; however, at this point, we don't have too many other examples. In addition, understanding how a Pushbutton for Views gets set up will be very handy when making Navigational Templates in future modules.

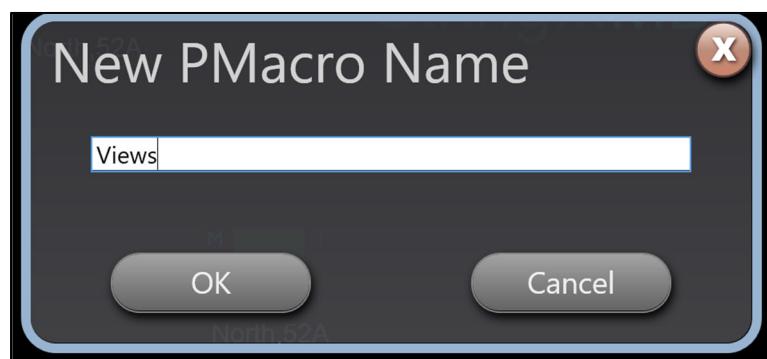


4.67 Before Image Files can be Used, They Must be Placed in BMP Folder.

As with any other element we create, you would start in Edit mode and then click on the Library and choose to create a new PMacro.

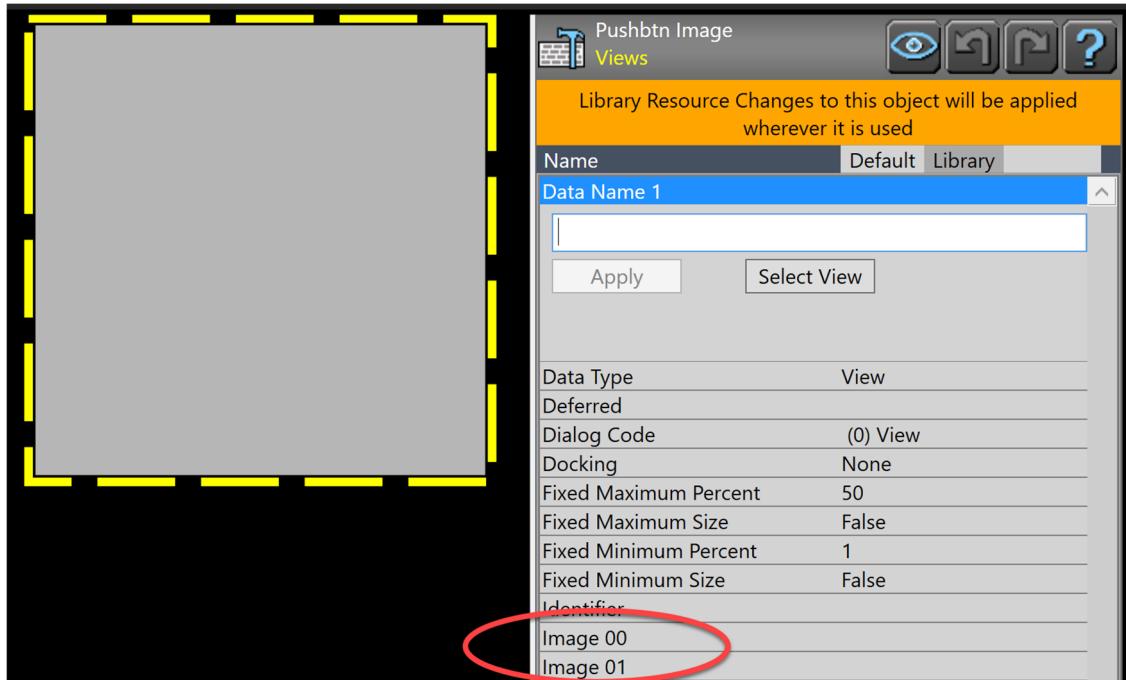


4.68 Creating a Pushbutton Image PMacro

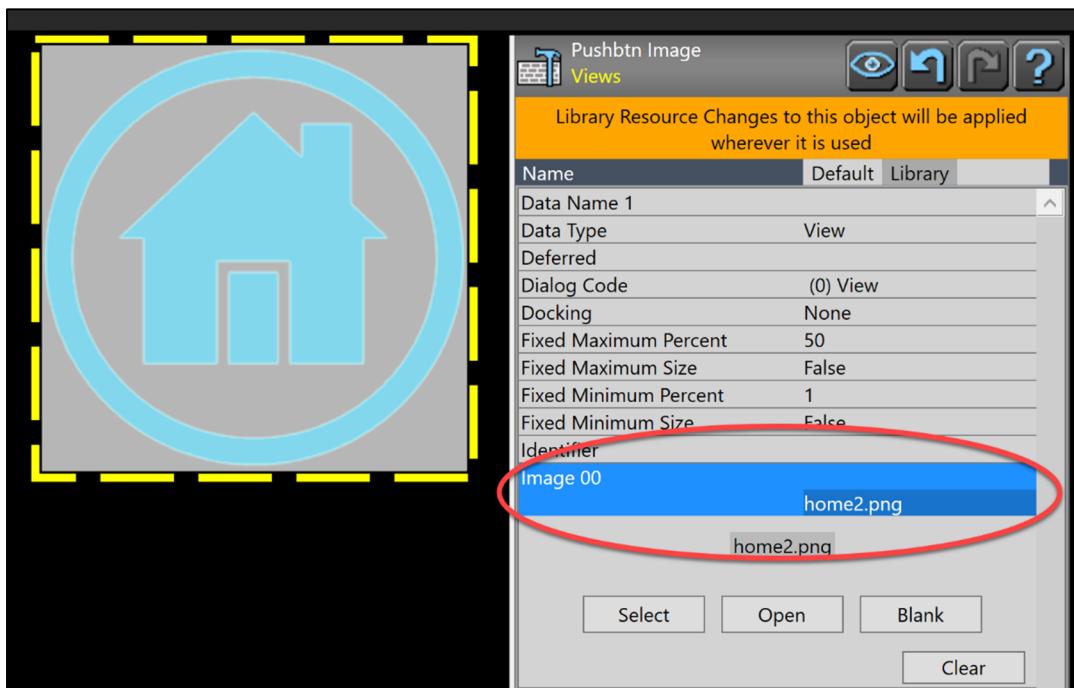


4.69 Naming our Pushbutton PMacro

Image 00 is where we will define our image. Sometimes Image 01 gets used to give a pushed in button effect; however, setting Image 01 is not necessary.



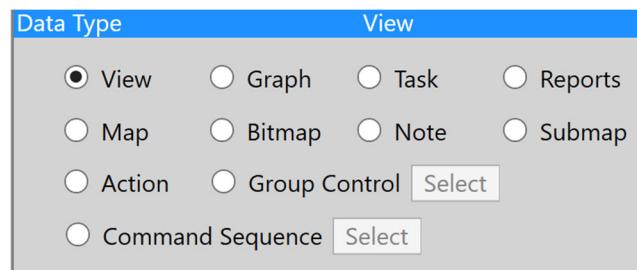
4.70 Image 00



4.71 Home2.PNG Selected

The image appears faded until we define the button's function.

To begin defining the function, click the Data Type field. View is the default function but the button can be programmed for other functions.



4.72 Possible Functions for the Button

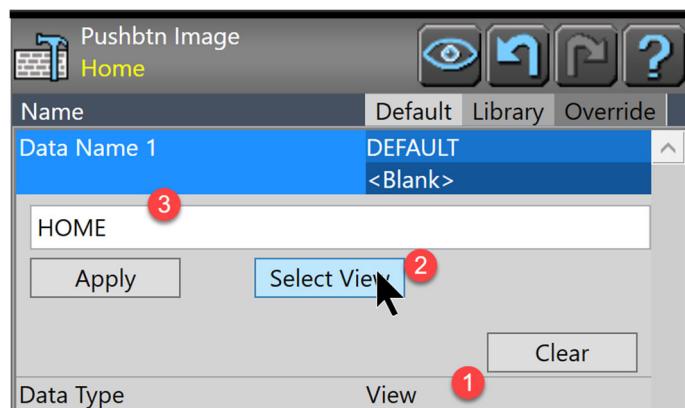
List of items from image 4.72:

- View lets the button take the user to different views.
- Graph will create a button that makes a graph appear.
- Tasks are used for advanced functions such as controlling Scans, Data Exchange Servers, and Managing Multiple Command Sequences.
- Reports will make a report appear.

- Map will pop up another map.
- Bitmap will pop up an image.
- Notes will make a shortcut to popping up notes.
- Submap will pop up a submap.
- Action is currently not in use.
- Group controls will create a button that can act upon multiple points.
- Command Sequence will run a Command Sequence.

For our purpose, we:

- Choose View from Data Type (1).
- Click the Select View (2) button.
- Choose the Home View (3).



4.73 Configuring our Pushbutton PMacro

We can now save the PMacro and apply it to the map.



4.74 Pushbutton PMacro Added to Map

Confirm that your Pushbutton PMacro takes you to the Home Page.

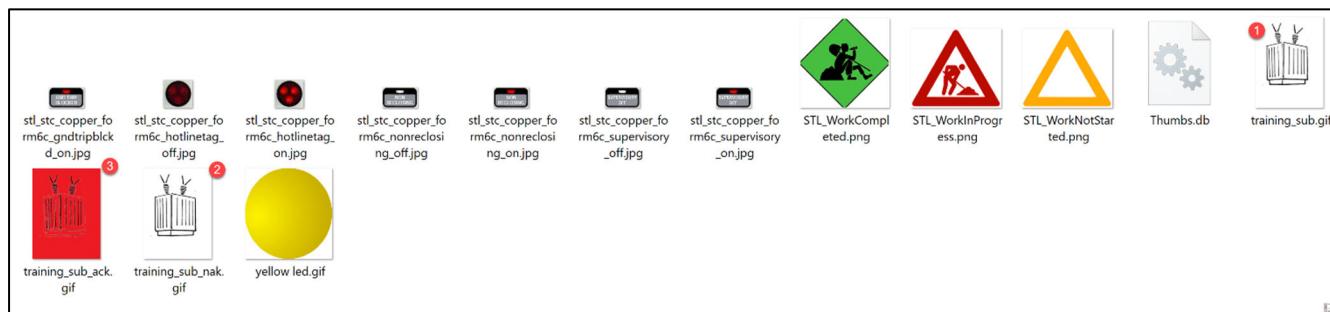
Station Image PMacros

It would also be nice to set up a Pushbutton Image PMacro to take the end user to the North Substation. However, a better choice would be to create something called a Station Image PMacro. A Station Image PMacro is the better choice because, in addition to taking a user from the Home Page to the North Substation, it also will quickly indicate if there are any alarms outstanding in the North Substation.

Although a Station PMacro can be configured in a variety of ways, one of the most popular ways of doing it is to represent the North Substation with 3 different images. You can set a:

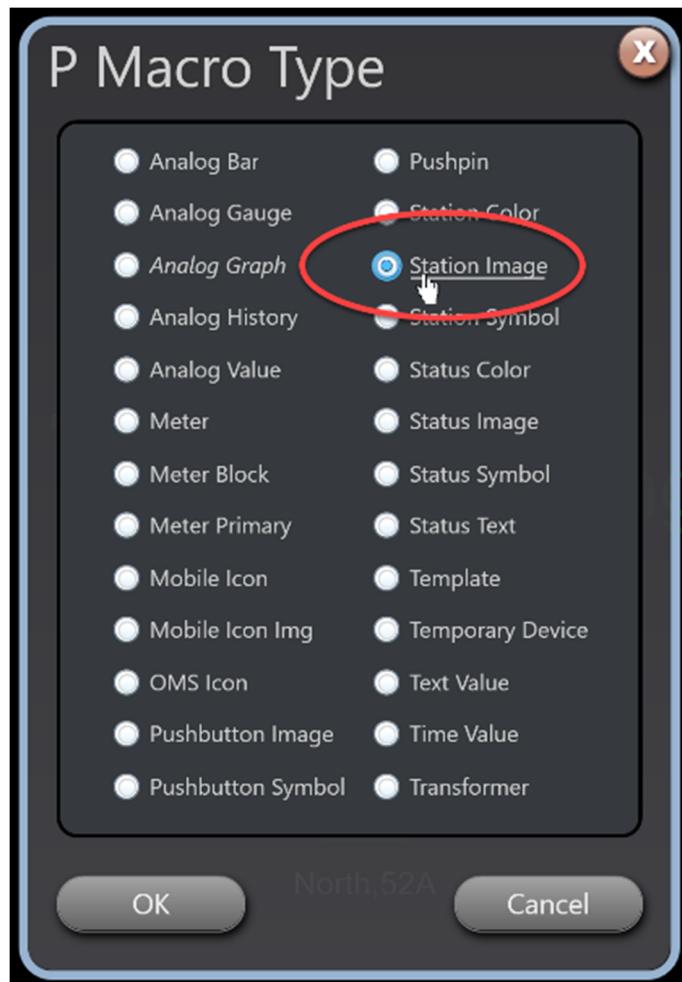
- Simple plain image if there are no outstanding alarms (1).
- Flashing image if there are acknowledged alarms (2).
- Colored image if there are acknowledged alarms that have not returned to their normal state (3).

Looking in the BMP folder, we do have 3 images that will serve our purpose.



4.75 Images for Stations

In the Library, specify that we are going to create a Station Image PMacro (careful, Station and Status are similar looking words).



4.76 Creating the Station Image PMacro



4.77 Naming our Station Image PMacro

Let's start by defining the Images.

The numbers represent Acknowledged Alarm Priorities. We have not set any priorities higher than 4 so we do not need to configure anything higher than 4.

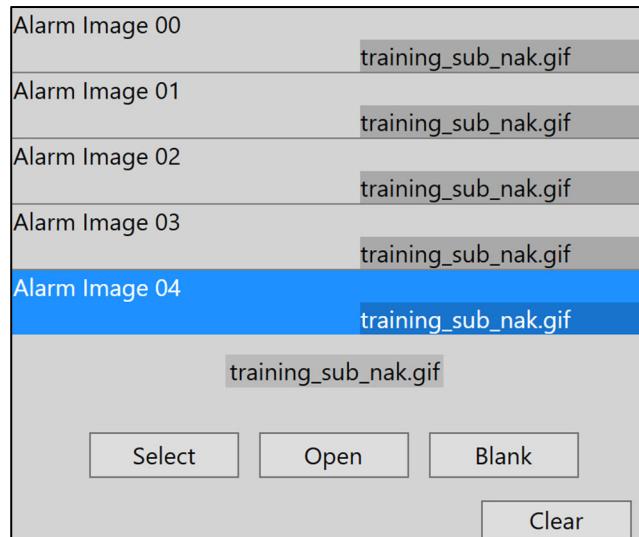
Next, we match the priority with the gif image.

A priority of 0 means everything is working well – we will use the plain white image.

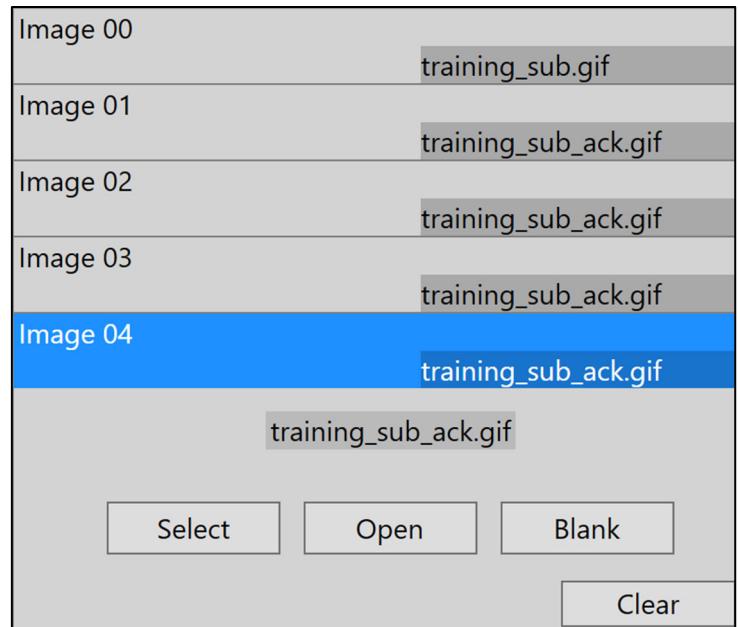
For priorities 1-4, we will use the ack (red) image. You could use a different color for each priority but it may be too much for your team of operators to track.

The Alarm Images represent unacknowledged alarms for each priority. We will use the flashing image for each one.

Once again, we could use different images for each priority but it would asking your team to keep track of all the different images.

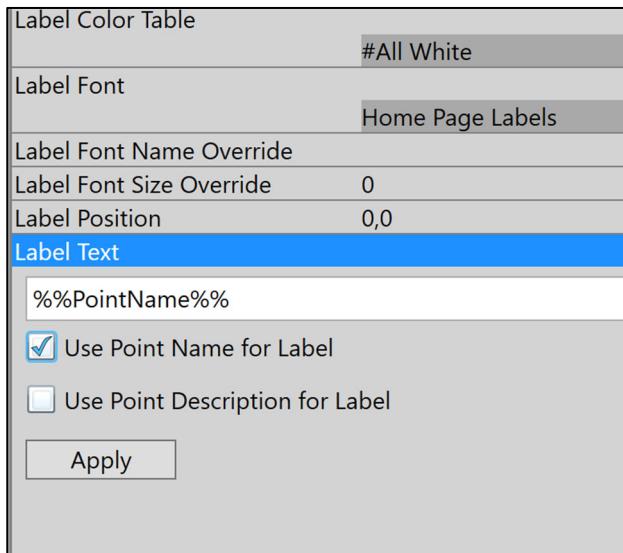


4.78 Matching Images to Alarm Priorities



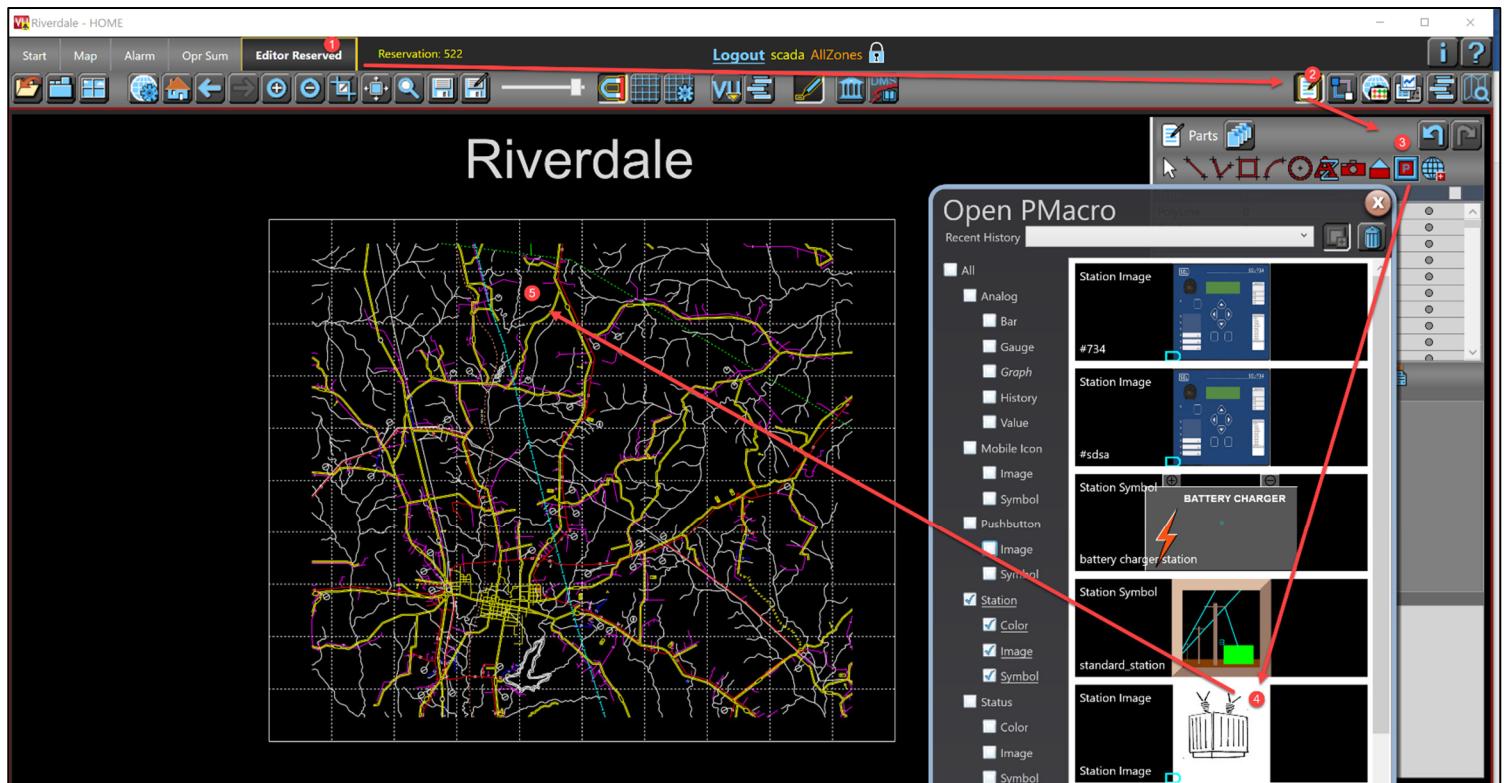
4.79 Setting the Unacknowledged Alarm Images

With the exception of positioning, we can also set our labels.



4.80 Setting the Labels

We can now save our PMacro. We will link it with the North Station when we apply it to the map.



4.81 Placing Our Station PMacro on the Map

To set our Station Image PMacro on the map:

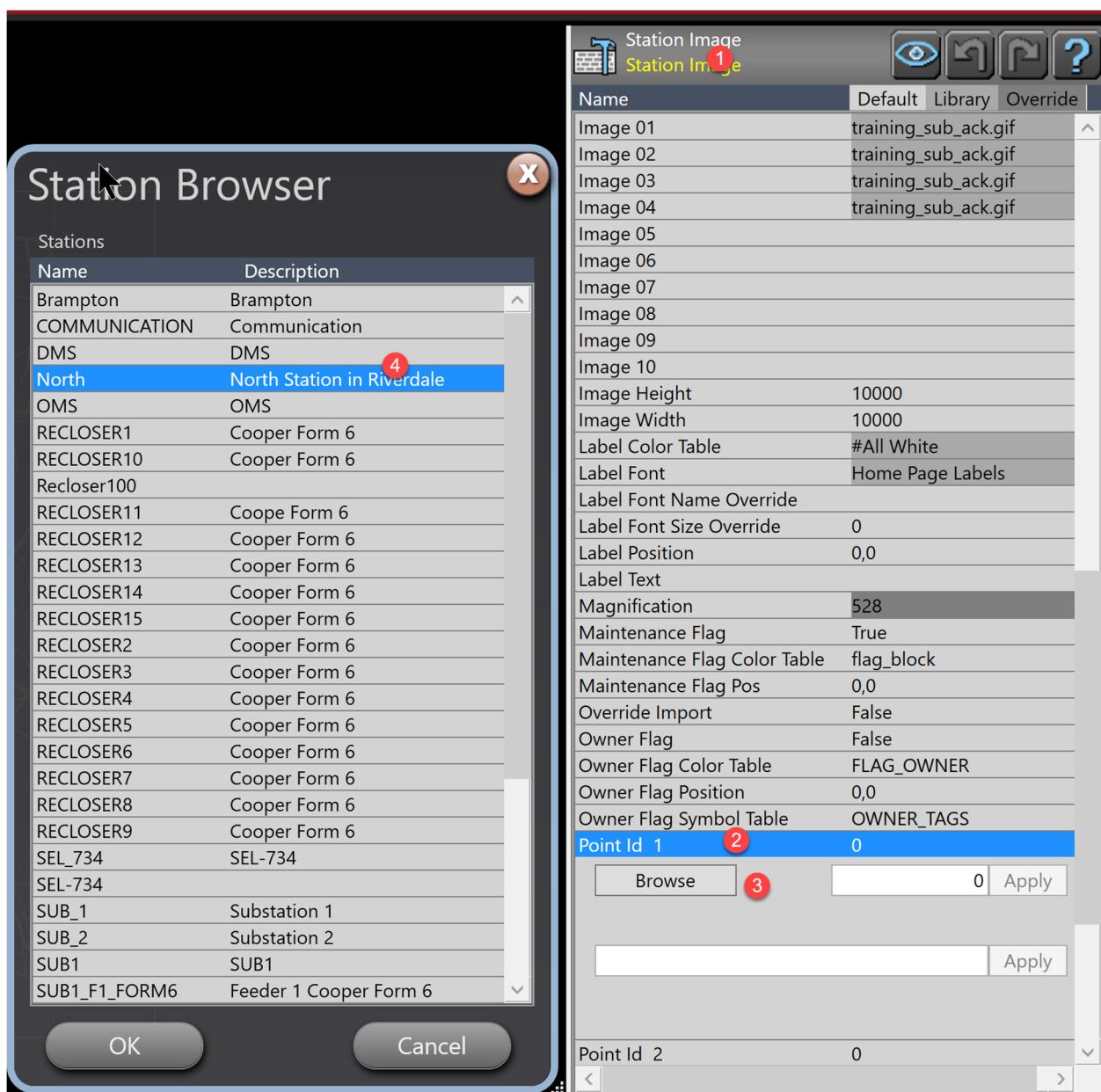
- Make sure we're still in Editor (1).
- Make sure we're on Edit Parts (2).
- Click the P for PMacro (3).
- Select our PMacro (4).
- Place it where the North Station exists (5).

Please use the Home Page Title Layer that we created.

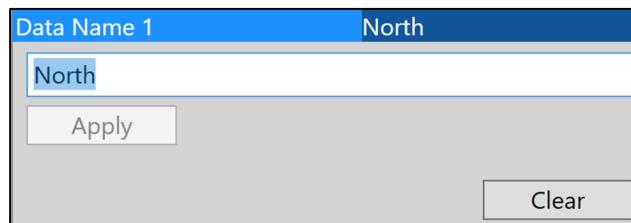


4.82 PMacro Placed on Map

In PMacro Resources (1), we need to link (3) the image (2) to the North Sub Station (4) and Link the Data Name to the North View.



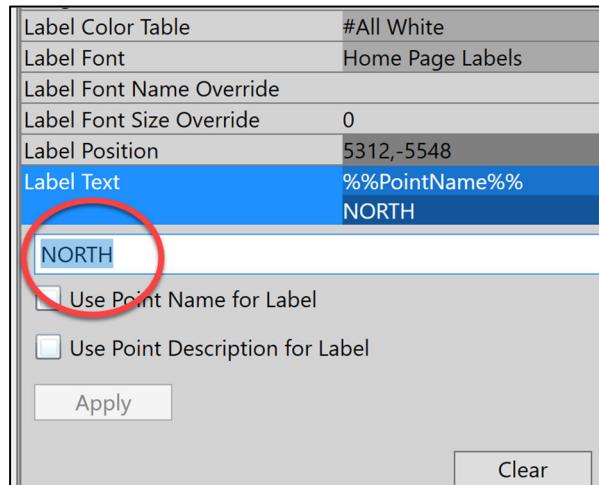
4.83 Linking the PMacro to the North Sub



4.83B Linking to the North View

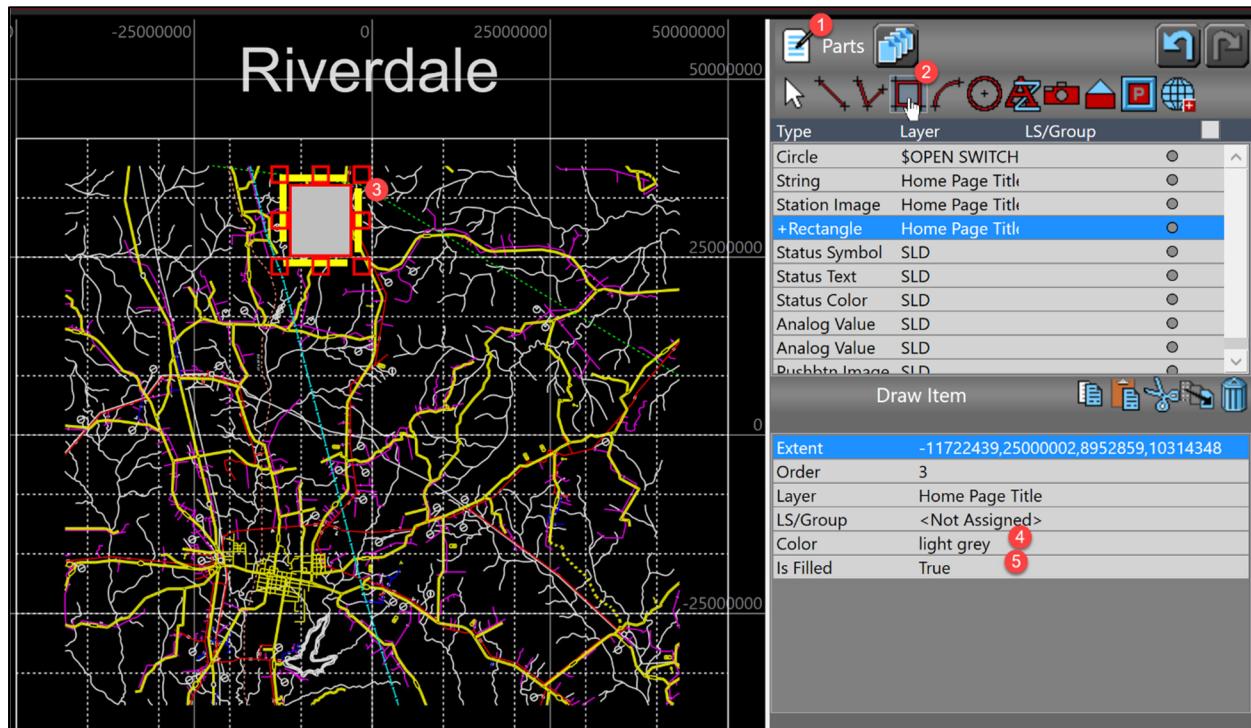
Also, while we are in PMacro Resources, we can position the label.

Note, if the Label is not showing due to the Station not being a true point, you can enter the name of the station as shown on the next page.



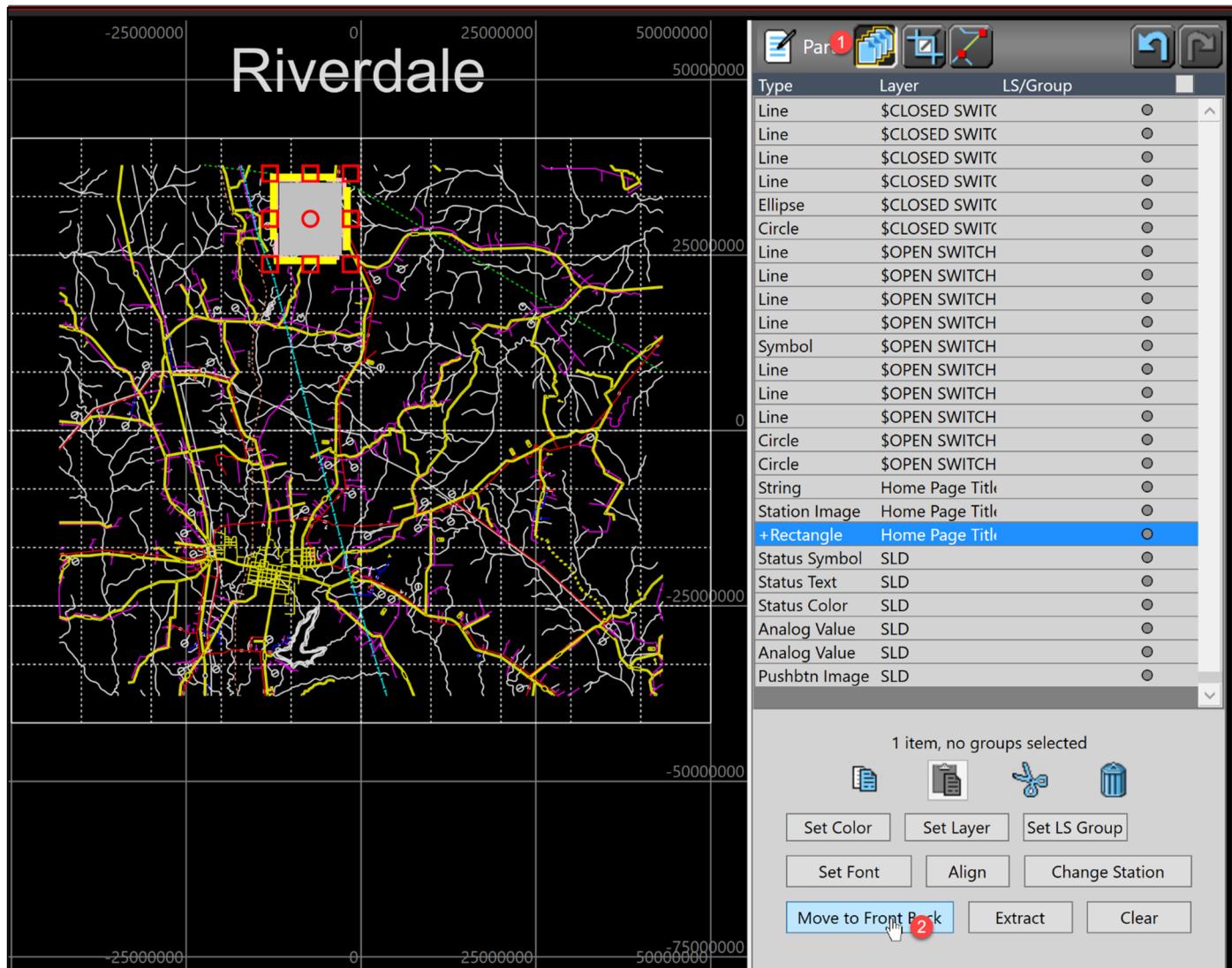
4.84 Forcing the Name of the Substation

Looking at the PMacro, it seems our label is hard to see due to all the other layers. We don't really want to turn off the layers at this magnification so we can create (1) draw a square (2) over top of the station (3) and choose a color (4) that will make our label stand out (5).



4.85 Covering Up the PMacro

Next, click the Multiple Selection Tool (1) and then click Move to Front Back (2).



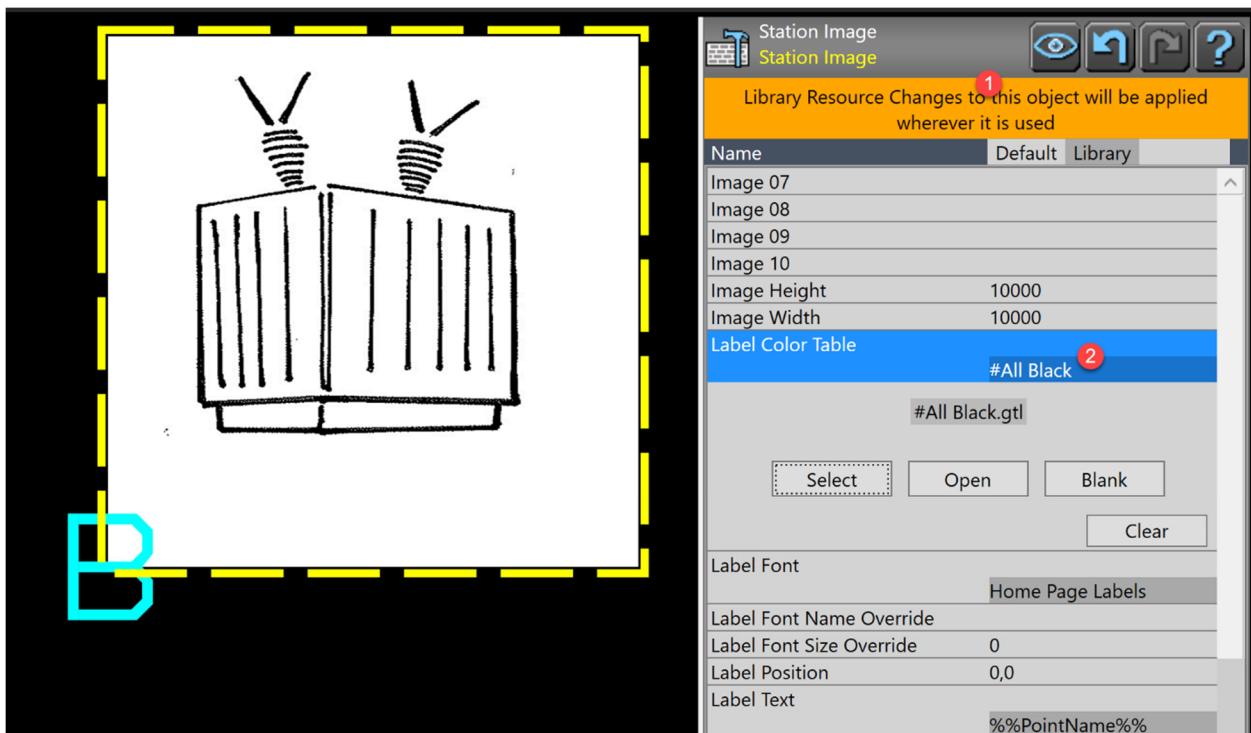
4.86 Multiple Selection Tool

By clicking Back, we will move the rectangle behind the PMacro.



4.87 Moving the Square Behind the PMacro

If you still find the label to be hard to see, you can go back to the Library (1) and change the label to black (2). We should do this in the library because it is the source and we will want our labels to be consistent when we add more stations.



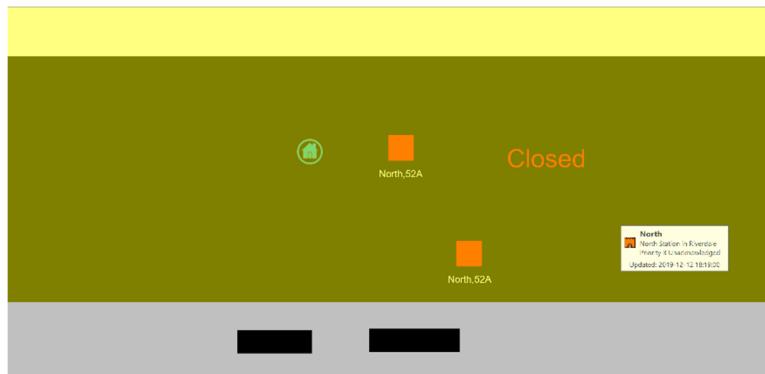
4.88 Back to the Library

Editing in the Library makes immediate changes when we go back to the map.



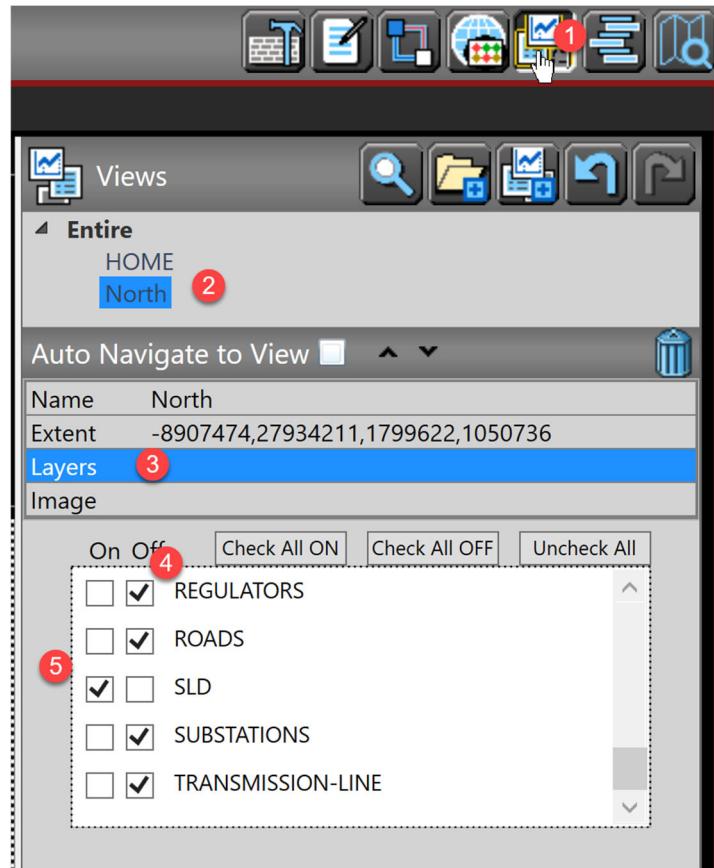
4.89 Easier to See Label Now

You will notice that, when clicking on the North Station icon, the North Station will not look nice!



4.84 Distorted North Station After Station PMacro Added

The Station PMacro totally dominates the smaller station. The solution is to turn off layers in the North View.



This is done in Edit view:

- Select Views (1).
- Pick the North View (2).
- Click on Layers (3).
- Turn all the Layers off from the North View (4).
- BUT Leave the SLD Layer on (5).

This will alleviate the problem of the Station PMacro dominating the view.

4.84A Adjusting the Layers in a View



Exercise

In-class exercise: Test your Station PMacro.

Does it flash when there are Unacknowledged Alarms in the North Station?

Does it remain red in color when the alarms get acknowledged?

Is it white when there are no alarms active and no unacknowledged alarms?

We have completed this module with the common PMacros. For our next module, we will be working with database points.