

**Survalent.**



# SurvalentONE SCADA IED Wizard + Control Panels

# Welcome!

- Welcome to the SurvalentONE IED Wizard + Control Panels Course!
- This course aims to provide you with a comprehensive and fundamental understanding of IED Wizard and its connection with control panels essential for installing complex devices efficiently.
- In this session, we'll introduce core concepts through practical, hands-on exercises.

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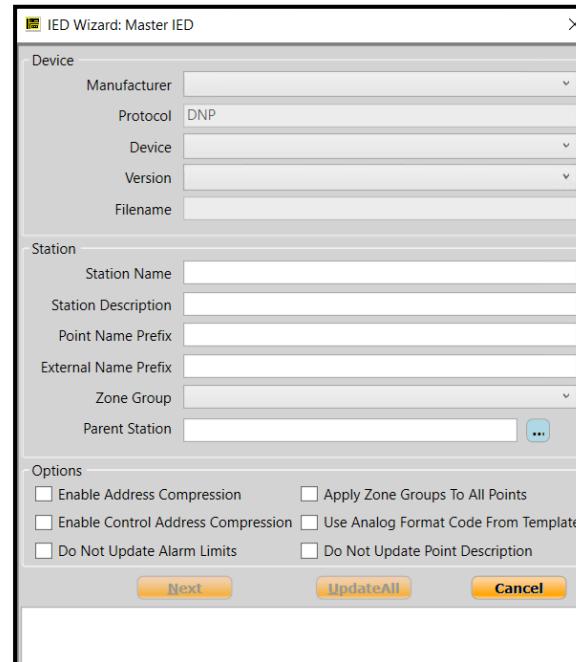
## Section H

Importing  
Control Panels

# Section A – IED Wizard

IED Wizard is a tool that handles the creation of database points, telemetry and configuration of an IED.

IED Wizard supports the creation of IED's from multiple different manufacturers using templates.



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# Section A – Features

Select the manufacturer, device and select a default or saved mapping from a drop-down list.

Telemetry for monitoring and control purposes are saved to the database.

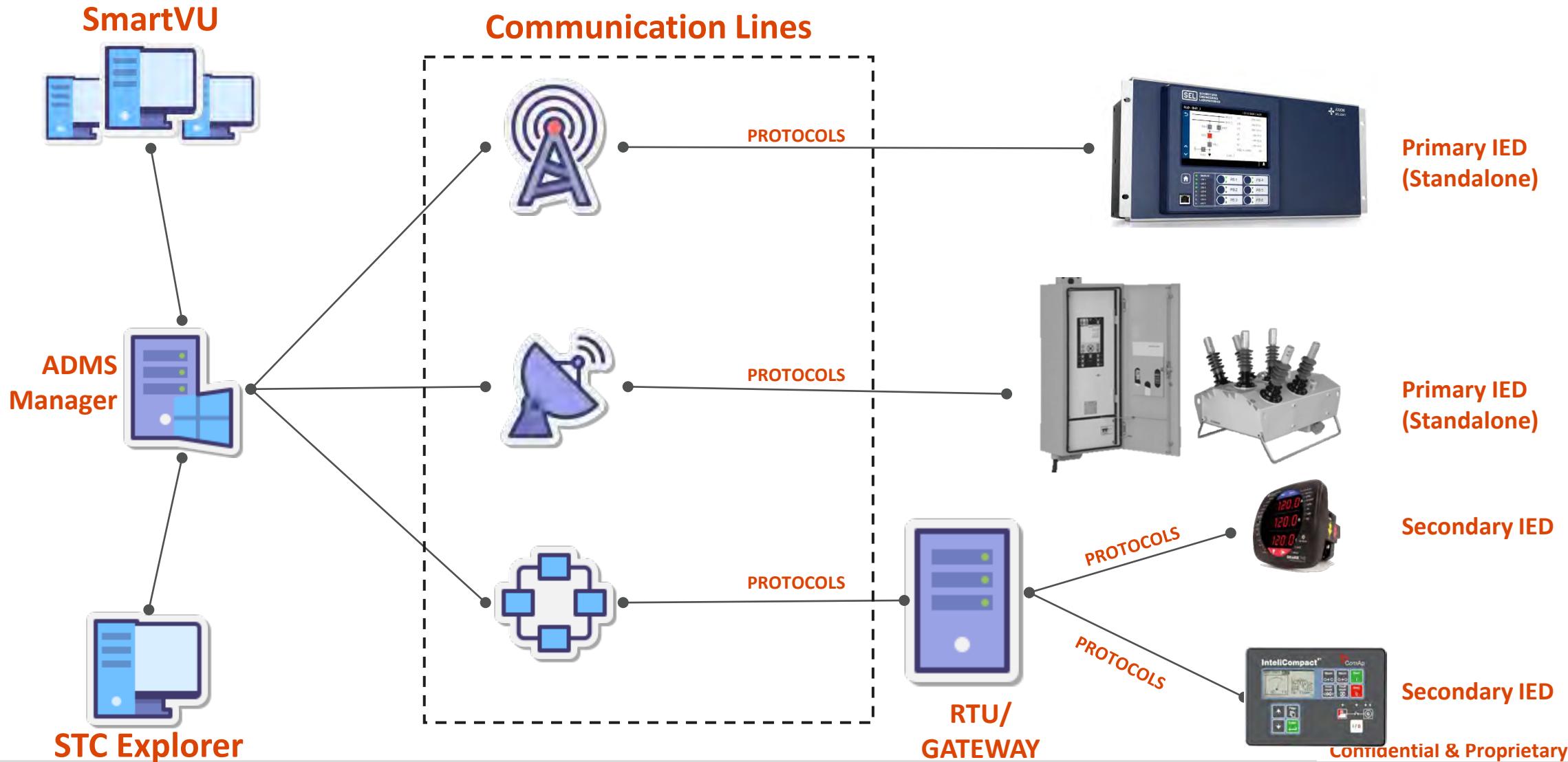
Modify individual mapped points before or after the IED is saved.

The IED can be visualized and used in Smart-VU by using control panel graphics.

Create your own configurable templates for unique IEDs, meters or devices.

IED's can be configured for direct communication to SCADA or through an RTU

# Section A – Visually Putting It All Together



# Section A – Reference Guides

Survalent.

**SurvalentONE**

IED-100

IED WIZARD

**USER GUIDE**

Version 1.3

ED. NOV 2019

Survalent.

**SurvalentONE**

IED-103

TEMPLATE MAKER

**USER GUIDE**

Version 1.1

ED. NOV 2019

Survalent.

**SurvalentONE**

IED-102

IED CONTROL PANEL

**USER GUIDE**

Version 2.1

ED. NOV 2019

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# Section A – IED Wizard Templates

- Available on the Survalent User Portal
- Includes a list of templates made by Survalent
- Various manufacturers and models of IEDs
- Looking for more? Contact Survalent Support

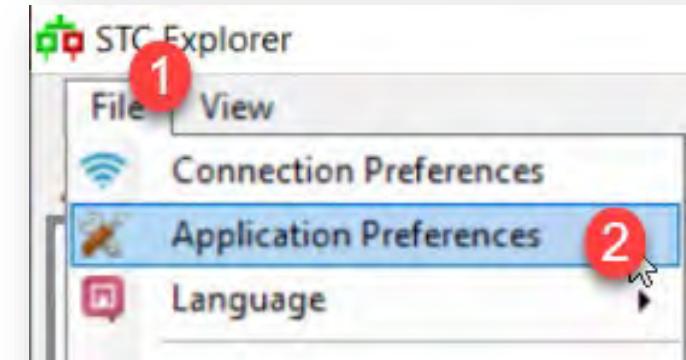
The screenshot shows a file library interface titled "Software IED Wizard Templates". The left sidebar has a "Libraries" tab selected, which is highlighted with a red border. Other tabs include "Owned by Me", "Shared with Me", "Recent", and "Following". The main area displays a table with the following data:

Title ↑	Last Modified Date
Satec	30/04/2020 12:51 p.m.
Schneider Electric	30/04/2020 12:51 p.m.
SEL-61850	30/04/2020 12:52 p.m.
SEL-DNP (all SEL IED DNP)	30/04/2020 12:52 p.m.
SEL-FM	30/04/2020 12:53 p.m.
SEL-Modbus	30/04/2020 12:53 p.m.
SEL-OPC	30/04/2020 12:53 p.m.

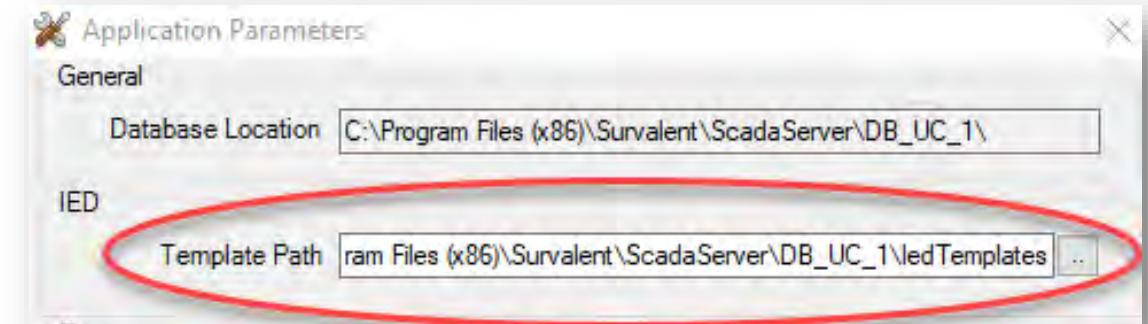
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# Section A – IED Wizard Local Folder

- By Default, the ledTemplates folder is located in the database folder under the Scada Server install.
  - We can ensure that STC Explorer is referencing this folder



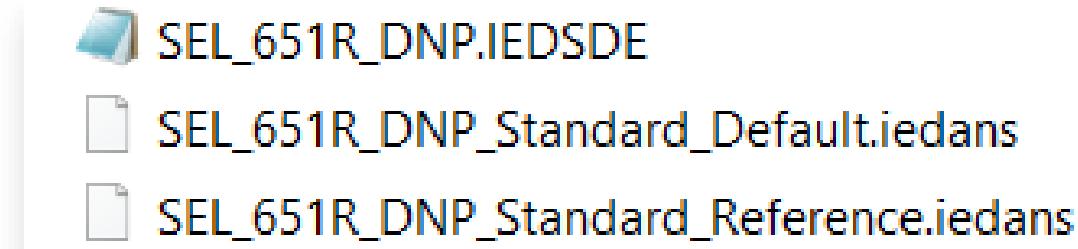
Name	Date modified	Type	Size
Siemens_3AD8_DNP.iedsde	2021-06-08 2:23 PM	IEDSDE File	192 KB
Siemens.zip	2021-06-08 2:21 PM	Compressed (zipp...)	56 KB
SEL-DNP (all SEL IED DNP).zip	2018-05-14 5:00 PM	Compressed (zipp...)	496 KB
SEL-61850.zip	2021-06-08 2:21 PM	Compressed (zipp...)	262 KB
SEL-421_DNP_Standard.iedans	2017-09-12 1:17 PM	IEDANS File	5 KB
SEL-421_DNP.IEDSDE	2017-09-12 1:17 PM	IEDSDE File	107 KB
SEL-351A_DNP_Standard.iedans	2017-09-12 1:17 PM	IEDANS File	21 KB
SEL-351A_DNP.IEDSDE	2017-09-12 1:17 PM	IEDSDE File	569 KB
SEL_DNP_ledReference.iedini	2017-09-12 1:17 PM	IEDINI File	1 KB
SEL_2523_DNP_Default.iedans	2017-09-12 1:17 PM	IEDANS File	7 KB



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# Section A – IED Wizard File Types

- Note that IEDTemplates are filetypes ending in .iedini, .iedsde, and .iedans



- IEDINI – contains the configuration (manufacture/model)
- IEDSDE – contains point definitions
- IEDANS – answer file (point enable/disable checkbox values)

# Section B – Creating a Primary IED

- Recall: This method means that it can directly communicate to the Scada server
- Communication line must support the same protocol as the device



Address Name

0	Recloser100
1	RTU_1
500	SEL_734
400	SEL-734
1	SUB1_F1_FORM6
2	SUB1_F2_FORM6
3	SUB1_F3_FORM6
4	SUB1_F4_FORM6
5	SUB1_F5_FORM6

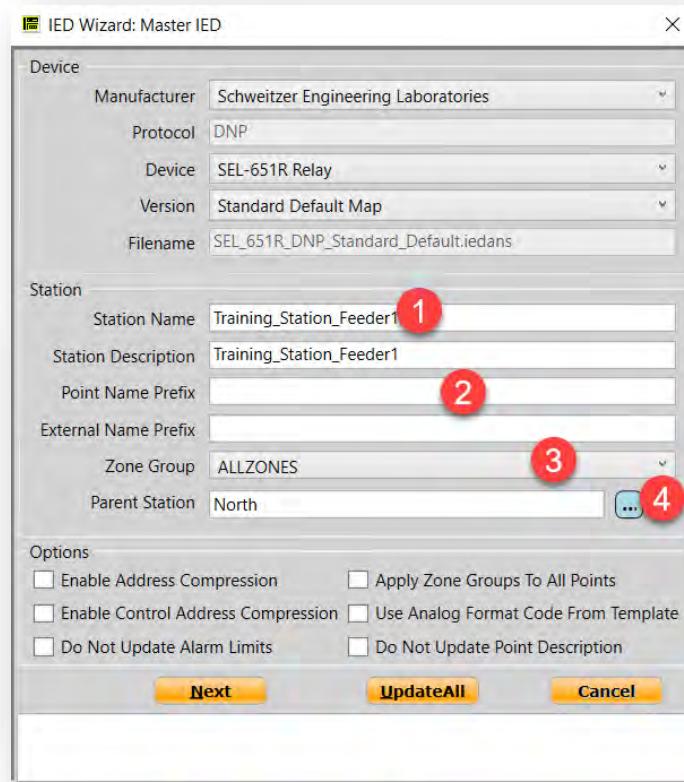
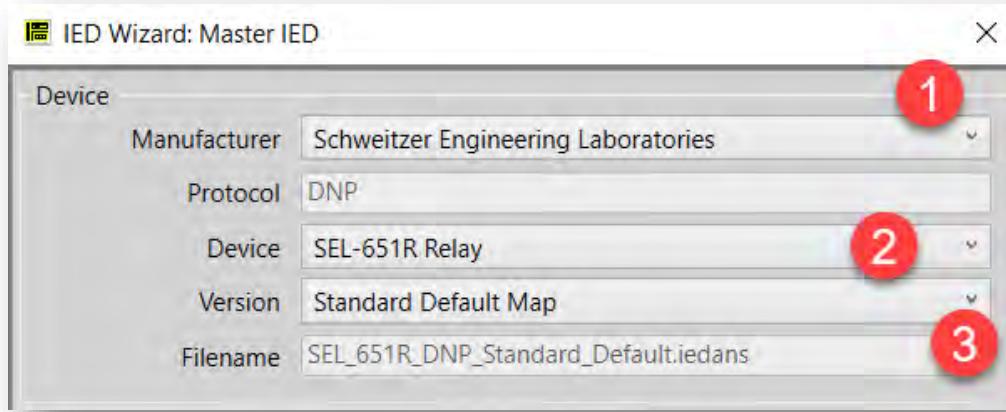
New IED

New Model Edit Delete References Find Print Refresh

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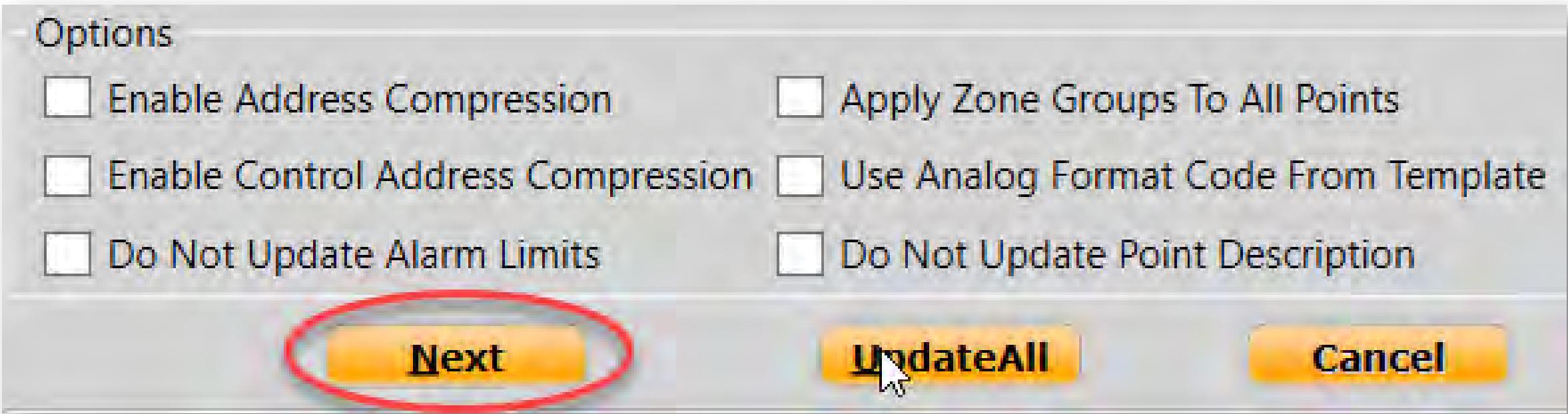
# Section B – Primary IED Overview

- 1. Select the manufacturer
- 2. Select the device
- 3. Select the version of mapping



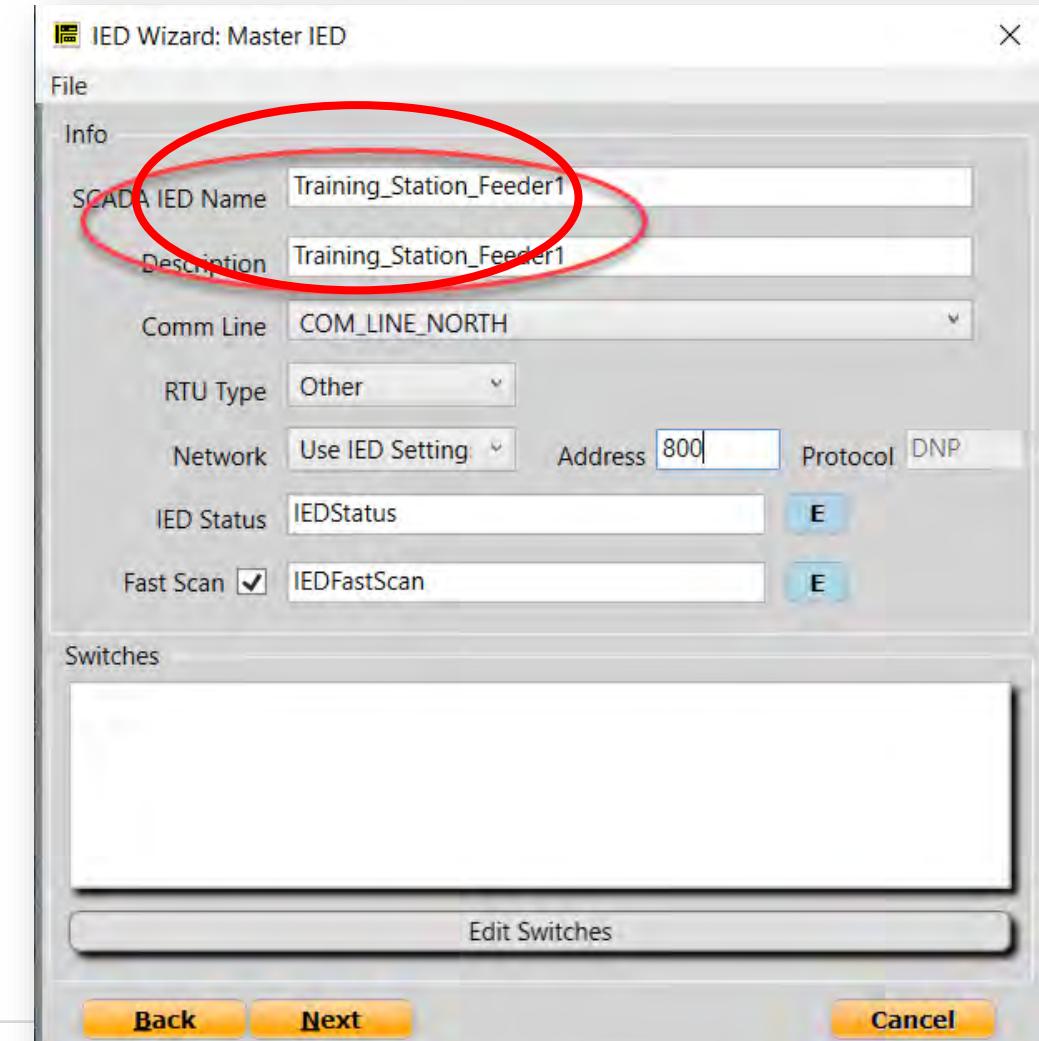
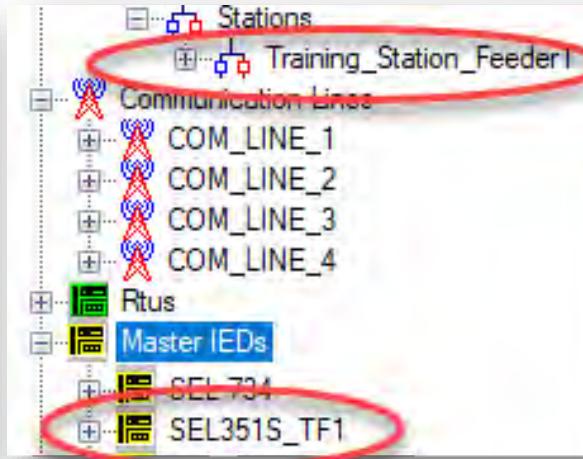
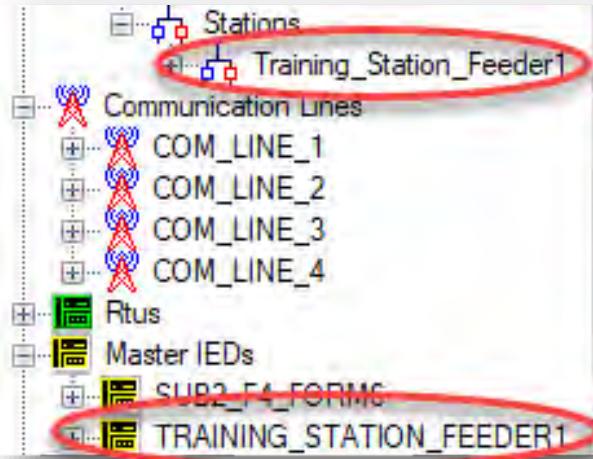
1. Station is a way to organize all the points in a device under one folder on the database.
2. A Prefix can be applied to all points in the mapping.
3. The zone group the device will belong to. This will effect which user has privileges to edit/ access this device depending on their user rights.
4. If the device branches from another station then the parent station can be defined.

# Section B – Primary IED Options



- Additional optional configurations are available to optimize the creation of the IED.
- Click Next to move on to the next window.

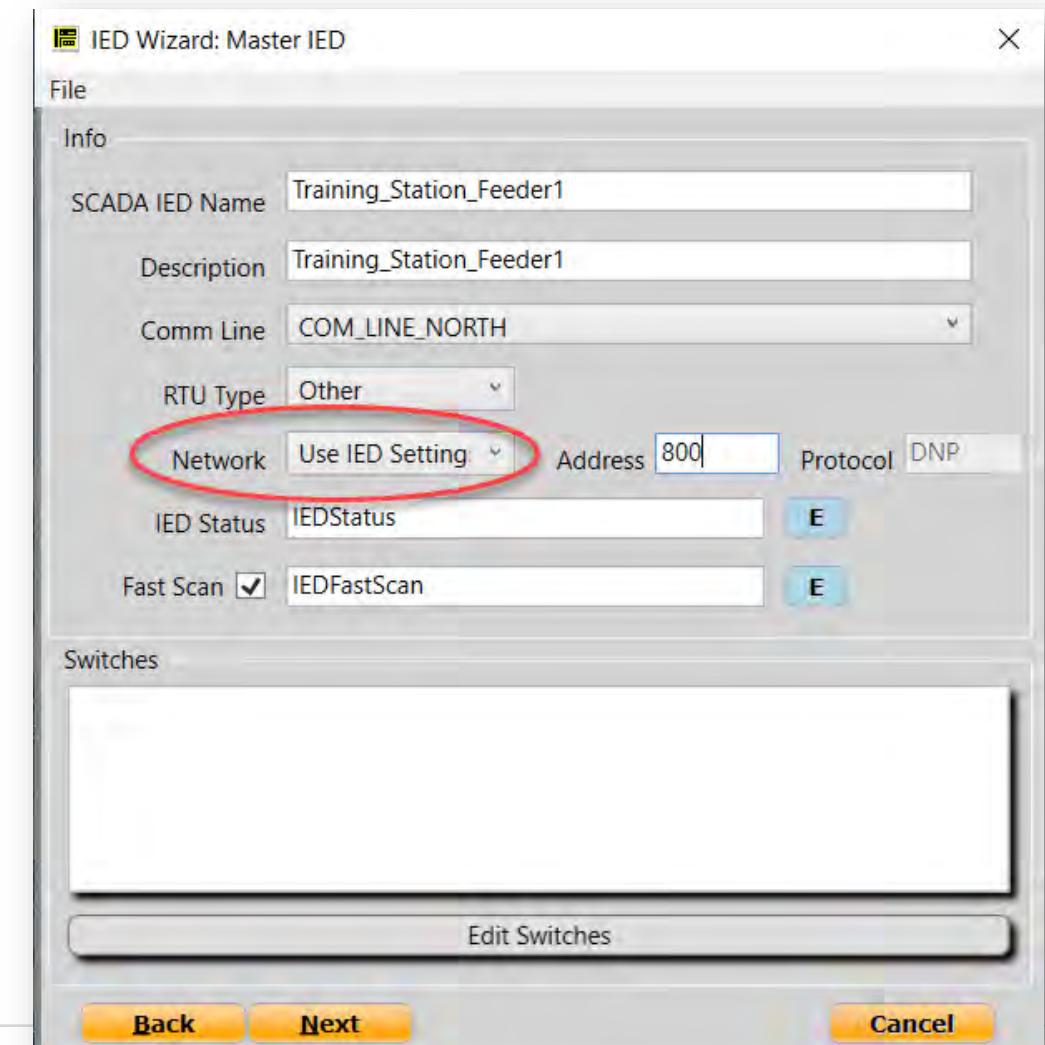
# Section B – Primary IED Naming



- The IED name can be the same or different from the station name. By default, it is the same.

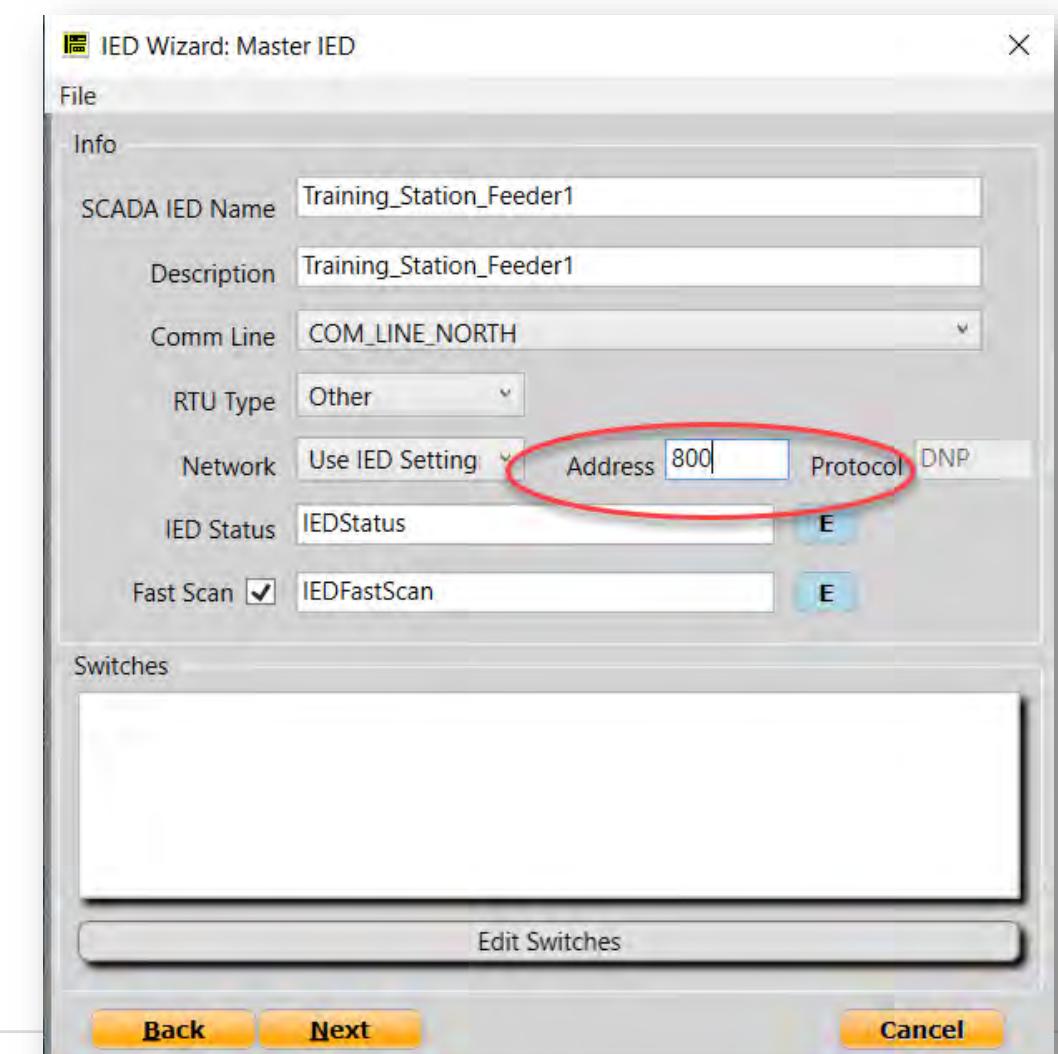
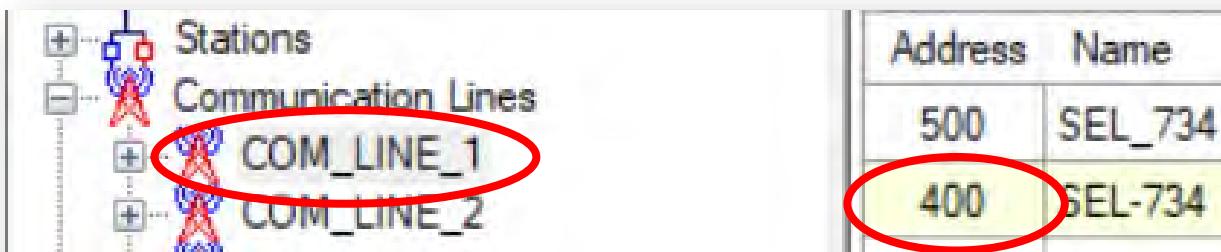
# Section B – Primary IED Network Options

- Either the defined IED protocol, IP, address and port can be used or the communication line.
- Usually, IED's with their own communication line can use comm line settings.



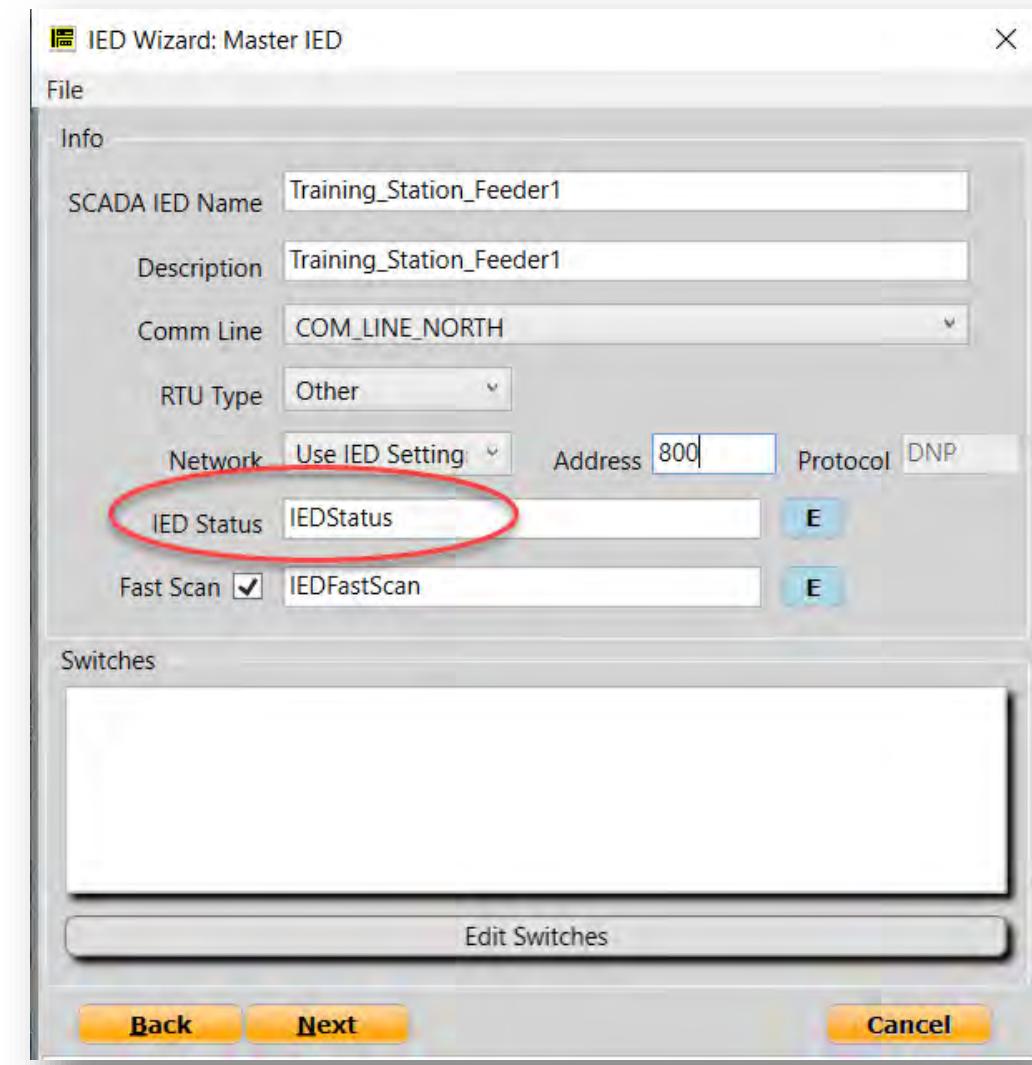
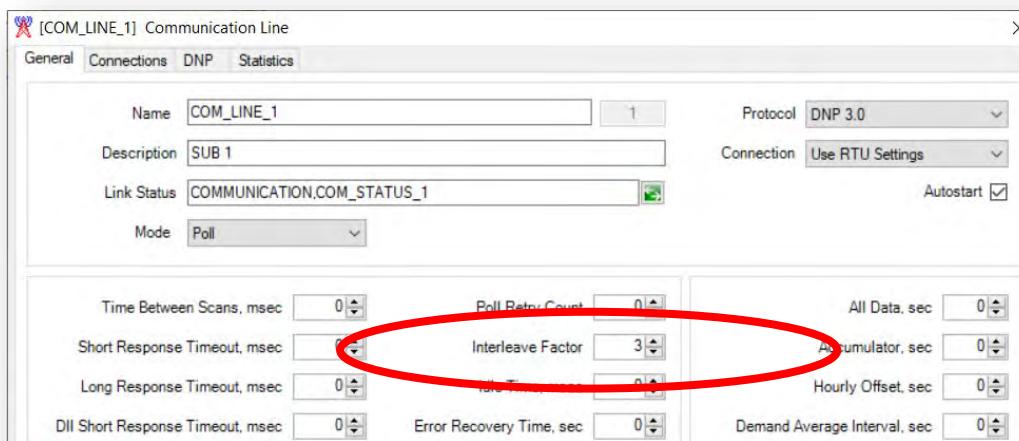
# Section B – Primary IED SCADA Address

- The Device DNP address number for the device
- The address defined here must match the address given to the device on field.



# Section B – Primary IED Health Points

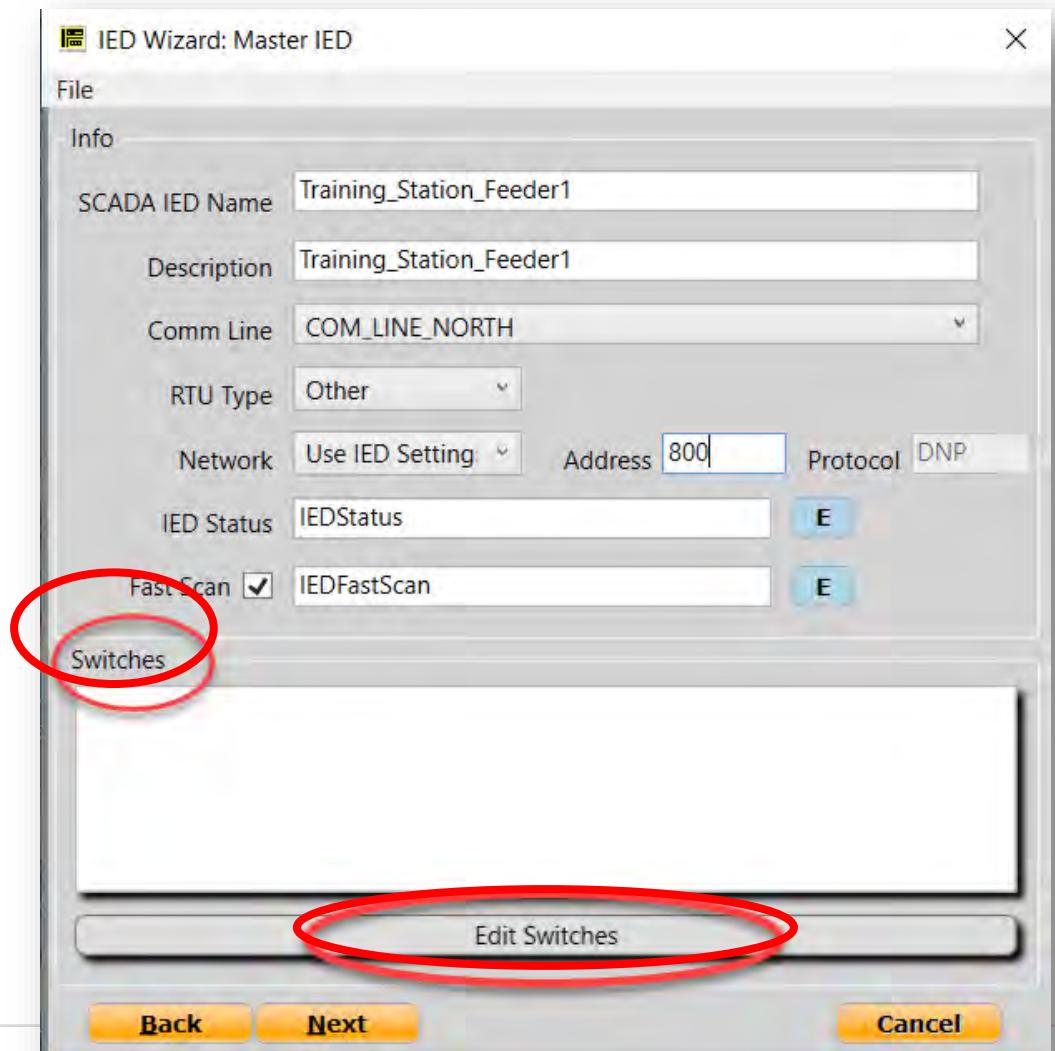
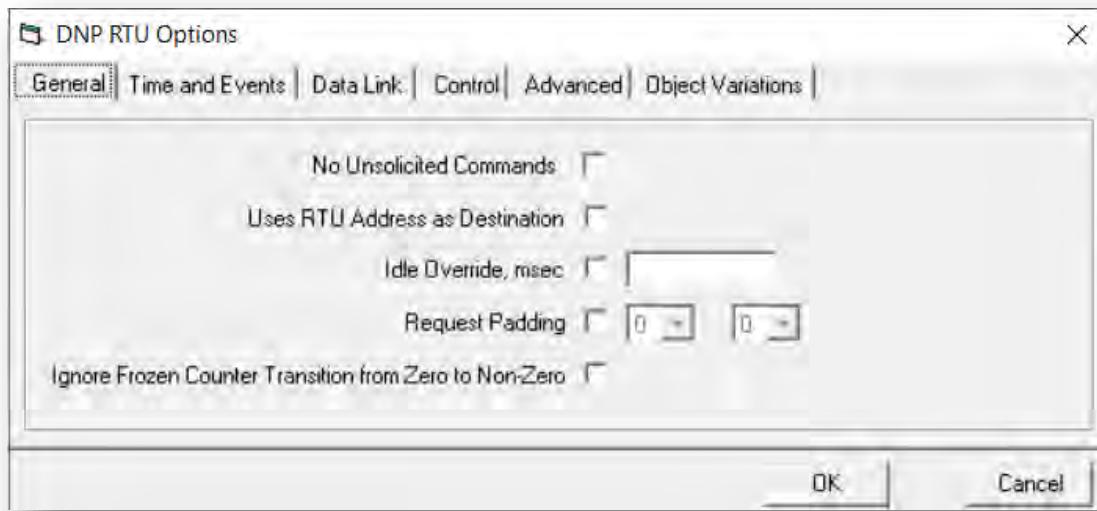
- The IED wizard creates a default IED health point to check for communication status. This point can be named differently as required.
- The Fast Scan point is a switchable parameter that allows you to use faster polling which is determined by the interleave factor on the communication line.



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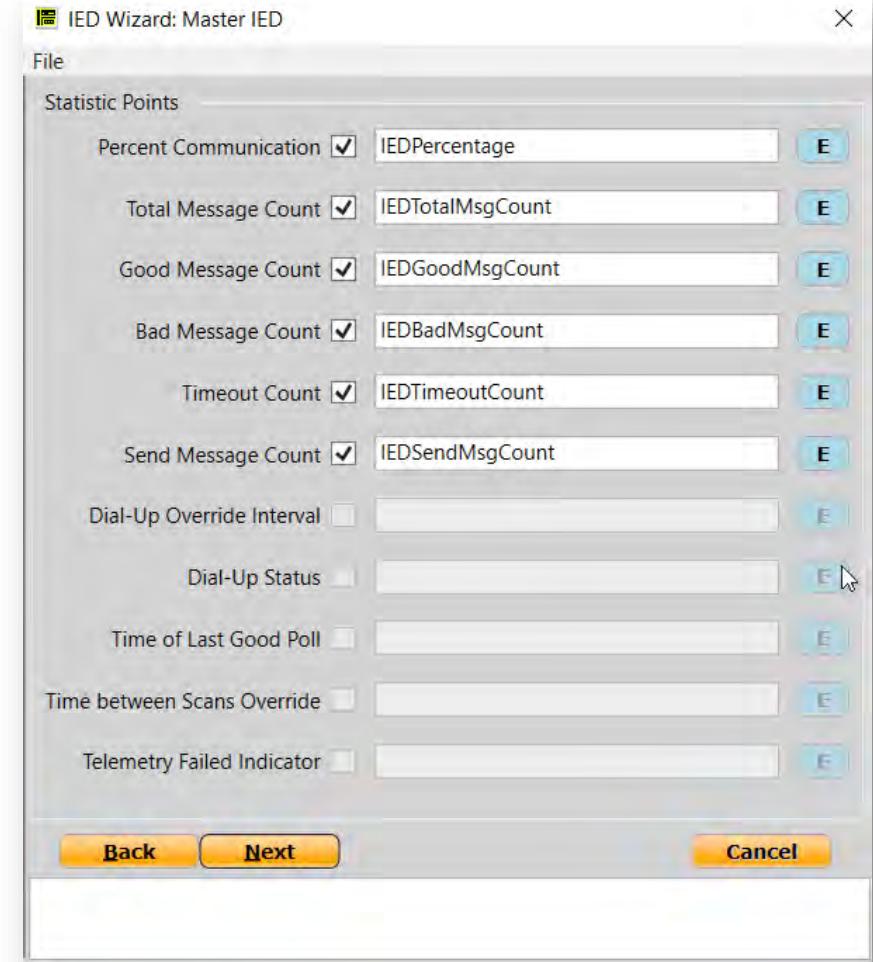
# Section B – Primary IED Advanced Settings

- Switches can be enabled through SQL commands or by selecting edit switches which allow you to configure the way logging, control, time and events and general parameters of the device work.
- We can go to the next window



# Section B – Primary IED Analog Pseudo Points

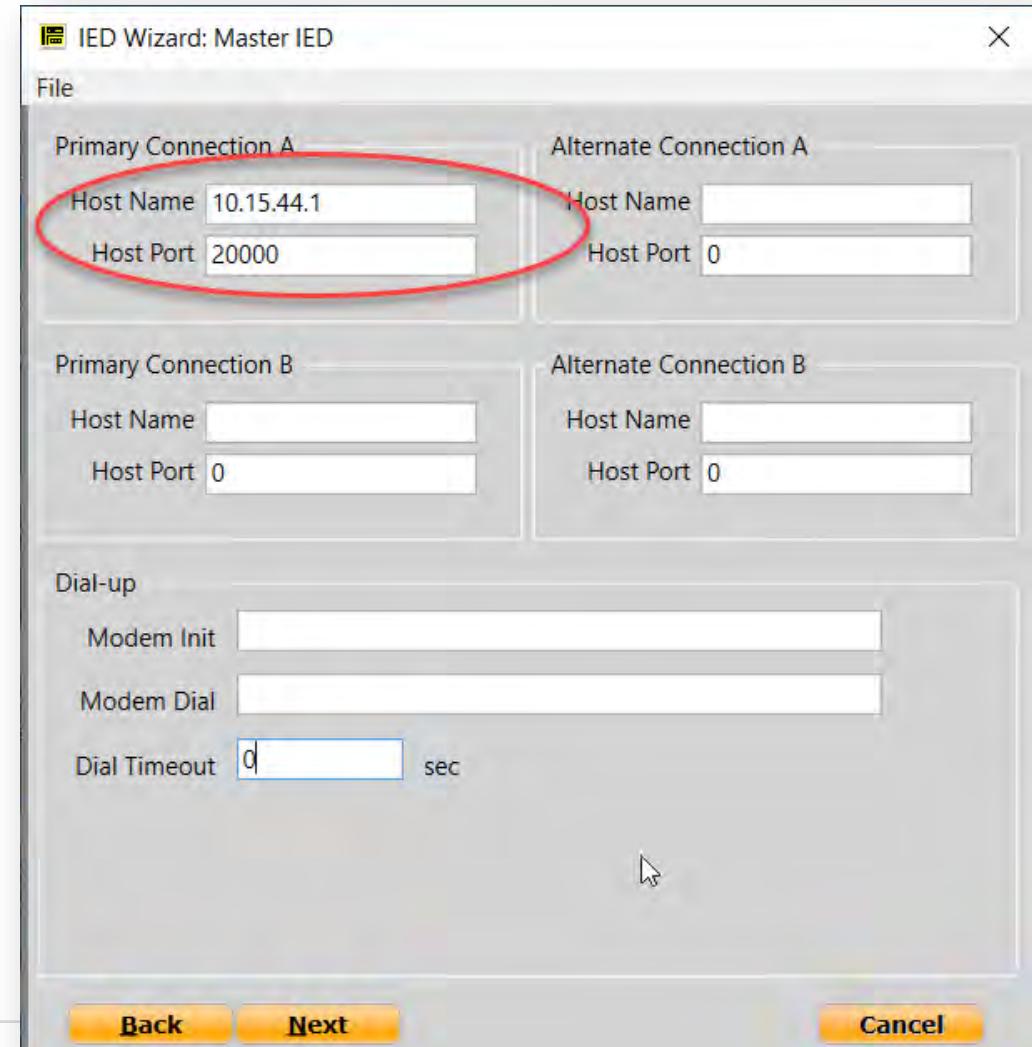
- The IED wizard also creates statistical points to track communication attributes of the device.
- the points can be unselected, named differently or changed to another point on the system as required.



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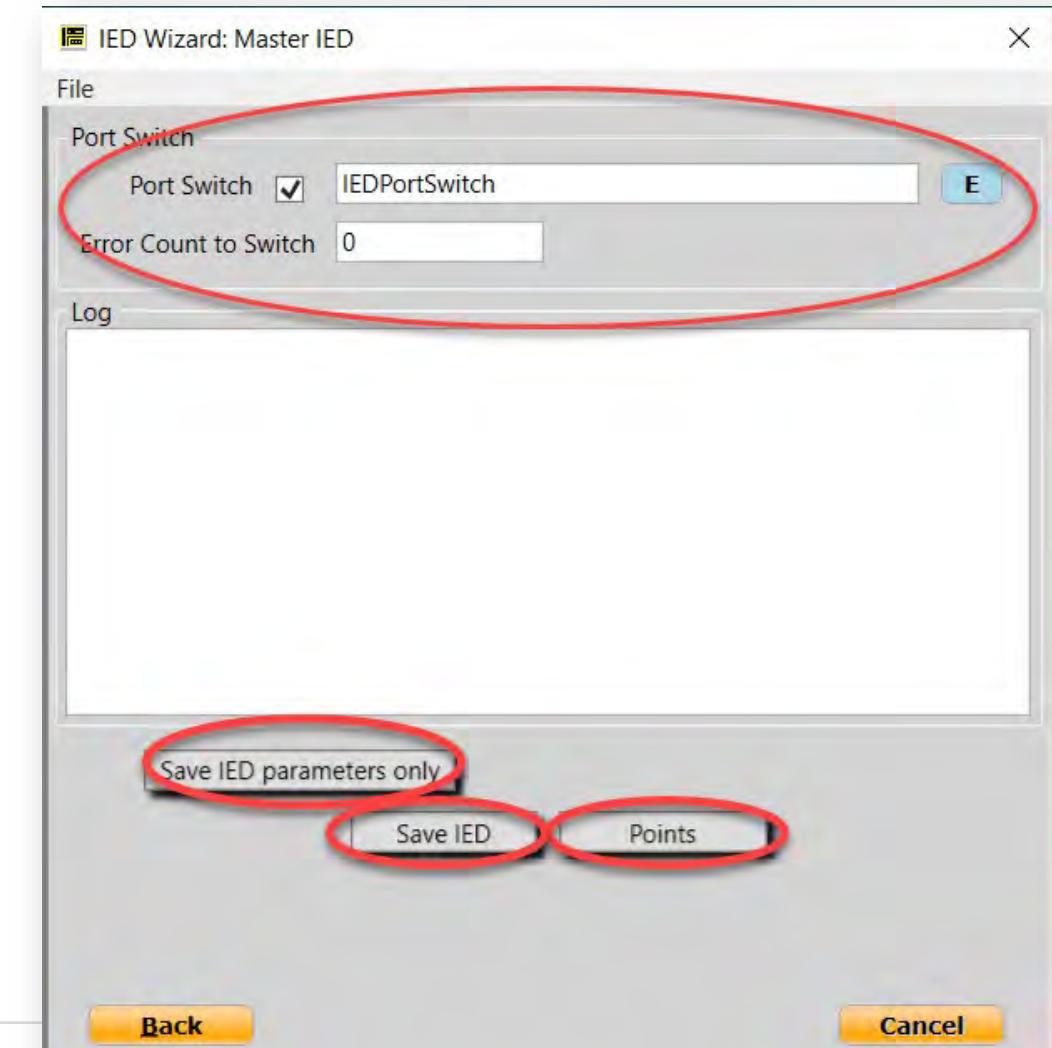
# Section B – Primary IED IP Configuration

- Earlier in the configuration we chose “Use IED Settings”, meaning that the SEL-651R has its own Ip address and port on the network
- This is where we input an IP address and port that the SCADA server will use to connect to this device.
- If the IED has alternate connections through a network switch that we can define those IP address and Port here.

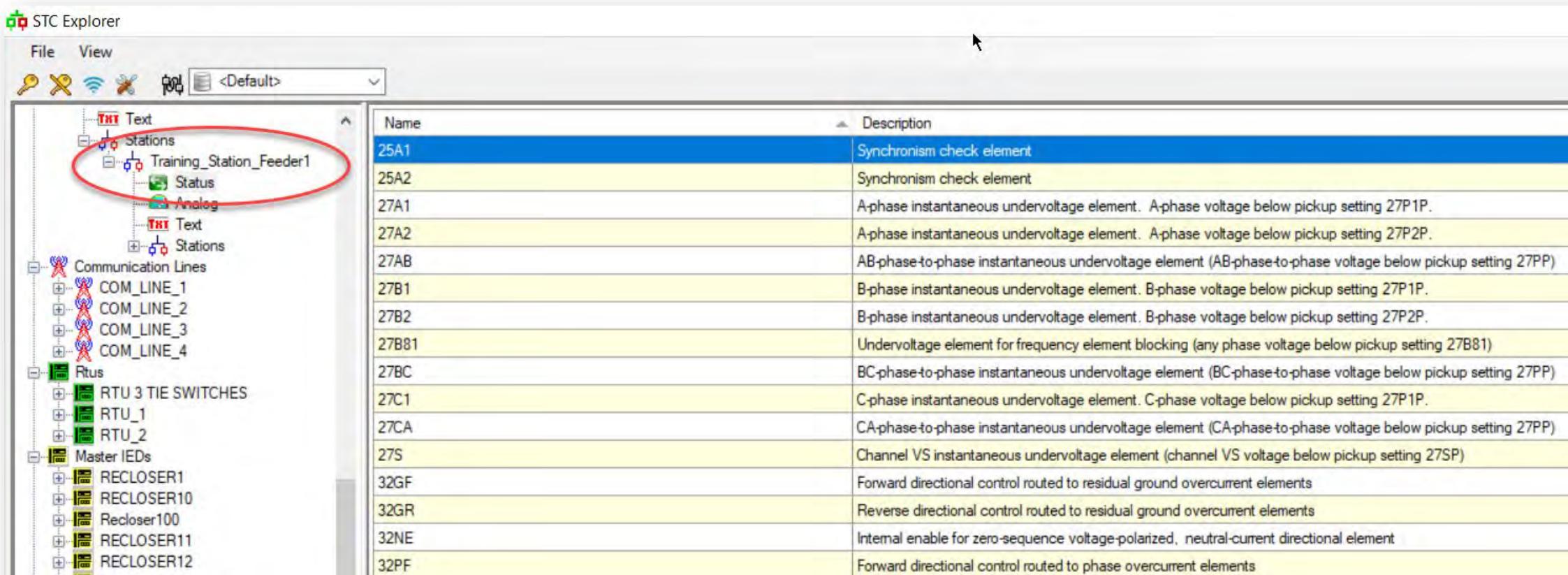


# Section B – Primary IED Final Options

- A port switch can be defined and toggled to switch between primary and alternate connection settings defined in the prior window.
- Switching can also be automated. The device will automatically switch to the alternate connection when the defined number next to “Error count to switch” is reached by the “bad message” statistical pseudo point.
- Selecting “Save IED” will begin the creation of the IED. The progress will be tracked in the log window. If there are any issues either the log or pop up window will prompt the failure to create the IED.
- “Save IED Parameters Only” creates the IED with only the default IED points defined in the prior windows.
- The Points button allows you to configure the individual points under the IED. This will be covered in detail later



# Section B – Primary IED Finished Result



- Once the IED has been successfully created, we can close the IED wizard window.
- Returning to STC explorer and refreshing the station list, we can now see the new device under the defined station with all the points and telemetry taken care of.

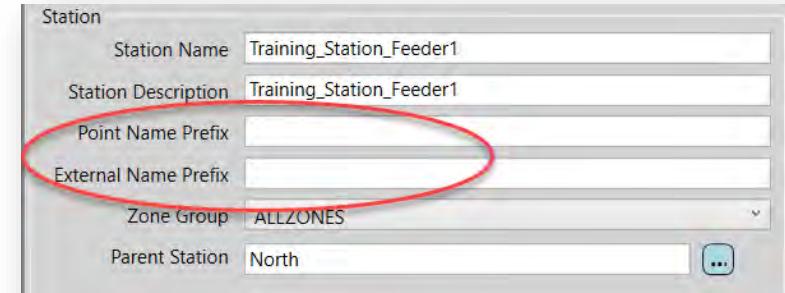
# Exercise

Install a few  
Primary IEDs

- Practice installing IEDs using the template “SEL\_651R\_DNP\_Standard”
- Create the new station
- The IED station and device name will be:
  - UCIED

# Section B – Primary IED External Name Prefix

- Point Name Prefix has an important function if our intention is to place multiple devices into the same station.
- Prefixes are often used to ensure there is no duplication in naming points or overwriting a created IED.
- **External Name Prefixes take a bit more explaining.**
  - External Name fields are used in protocols in which data values are accessed by variable names rather than numeric addresses.
  - Examples of these are OPC, SNMP and UAC2. Analog points have one external name per point. Status points can have up to three: one for input, and two for the open and close controls.
  - The purpose of inserting the external name prefix into the external variable names is to be able to support OPC (and other) servers that provide data from multiple devices or IEDs.



For example, if an external name field in a template is:

`Feeder.<prefix>Demand_IA`

and the external name prefix is "S0-352G1-TA1-ICU1-P8.", then the instantiated external name field becomes:

`Feeder.S0-352G1-TA1-ICU1-P8.Demand_IA`

If the external name prefix is left blank on the first page of the IED Wizard, then the wizard replaces the placeholder by nothing, as in:

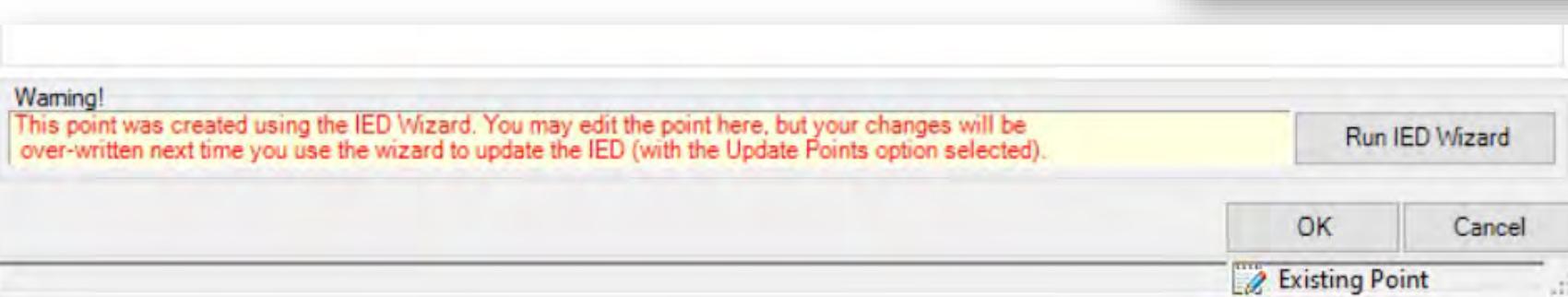
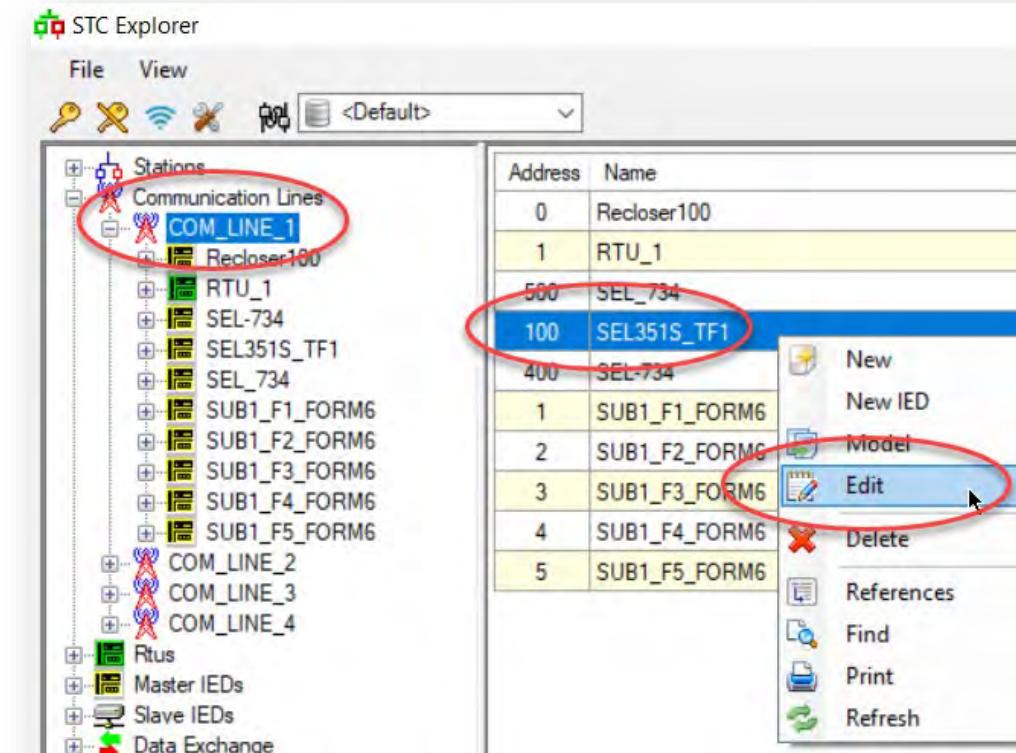
`Feeder.Demand_IA`

# Section C – Editing Points Using IED Wizard

IED wizard can be re-opened selecting the IED under the communication line, right clicking and selecting edit

Or

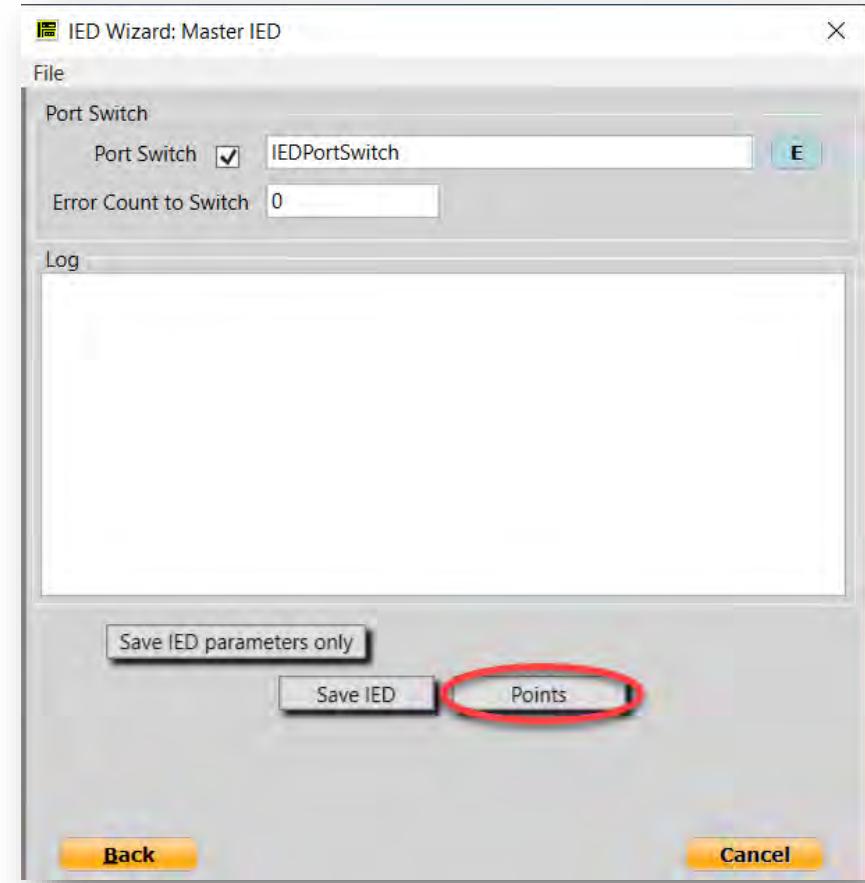
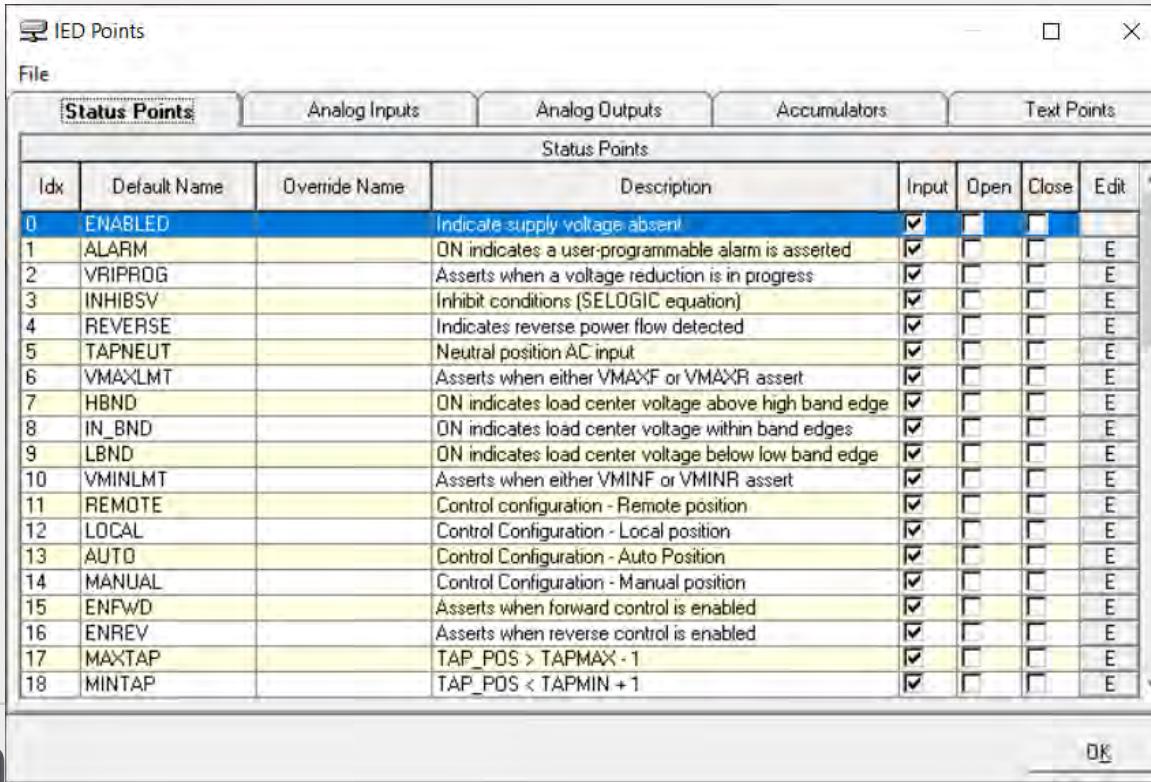
By selecting any point under the IED, right clicking and selecting edit.



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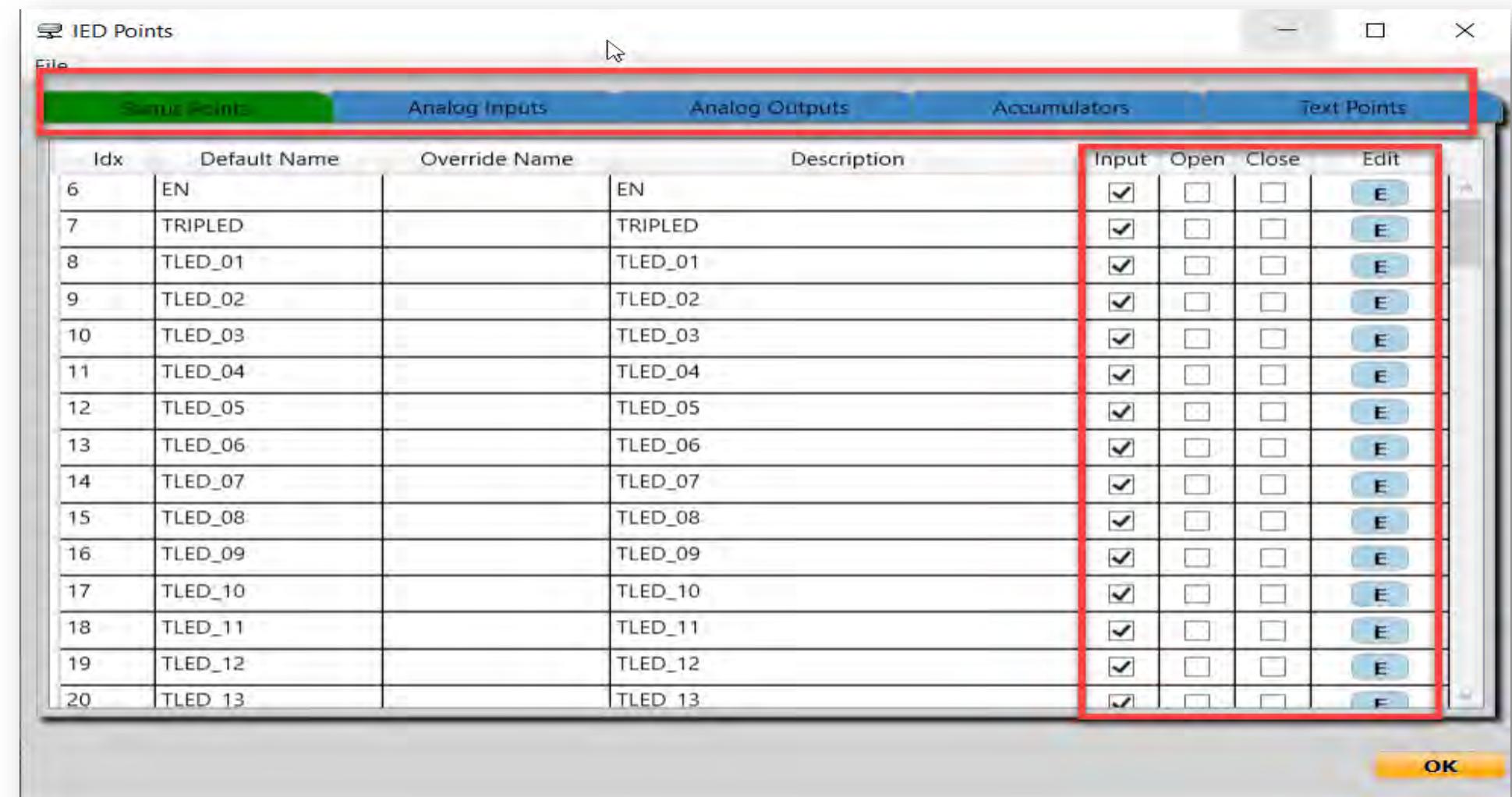
# Section C – Editing Points Using IED Wizard

- On the last window of the IED wizard we saw a points button
- This button allows you to view all the points that will be added using the mapping selected.
- Points can be selected to operate as input points (receiving data) or control points (output signal) or to not be added at all.



# Section C – Editing Points Using IED Wizard

- There are tabs for each type of point.
- We can choose to deselect data and control points by removing the checkmarks.
- Pressing the letter E allows us to open the point configuration and make changes as required.
- Note: that these changes will effect the mapping version being used by the IED wizard. Selecting **Update All** button in the first window will make the same changes to **every IED created using this template**.
- To avoid doing this by accident, it is recommended to save a new version of the template once changes have been made



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# Exercise

Remove some points in the IED Wizard

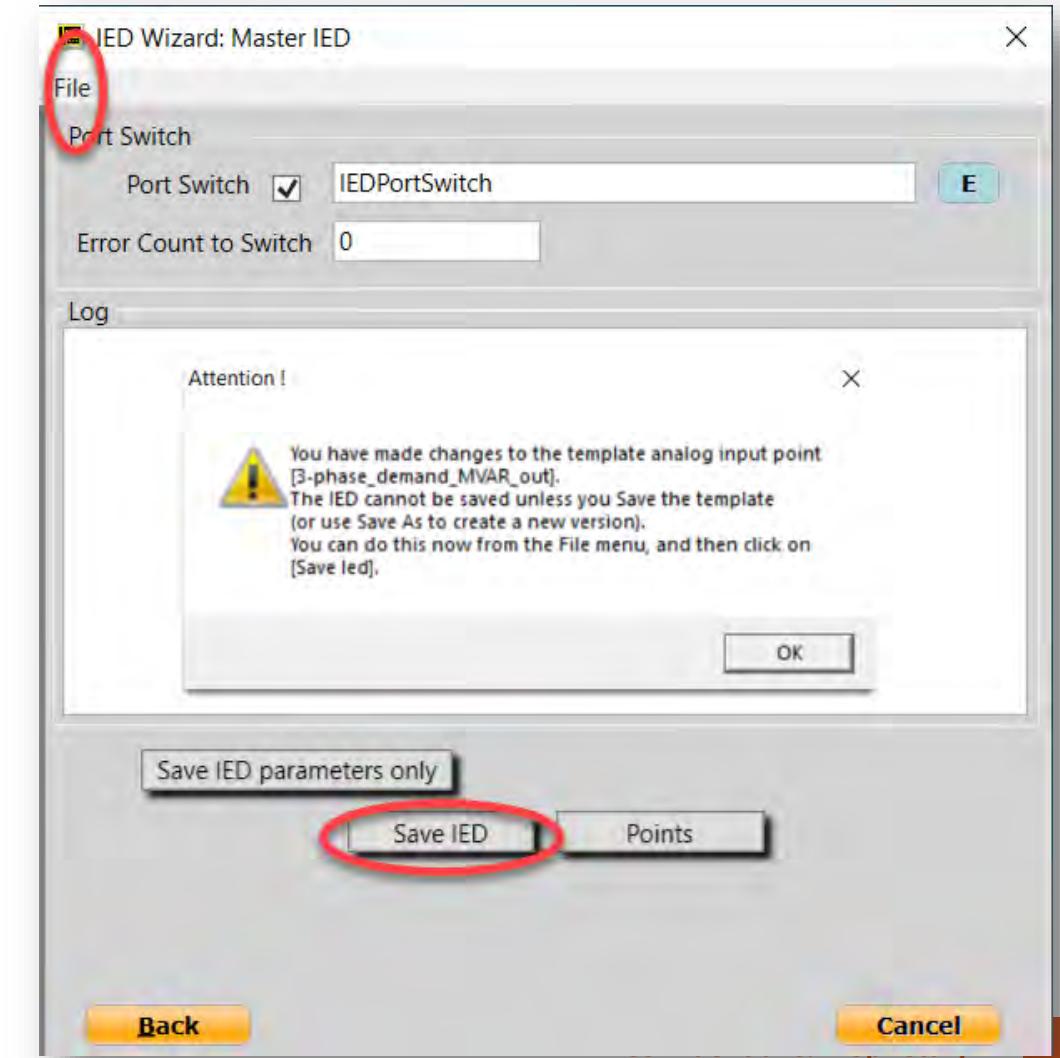


- Open the IED Wizard to edit Feeder 2
- Click on the Points button
- Uncheck or remove points 10 to 25 (referencing the Idx column)

Status Point		Analog Inputs		Analog Outputs		Accumulators		Text Points	
Idx	Default Name	Override Name	Description	Input	Open	Close		Edit	
6	EN		EN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
7	TRIPLED		TRIPLED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
8	TLED_01		TLED_01	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
9	TLED_02		TLED_02	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
10	TLED_03		TLED_03	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
11	TLED_04		TLED_04	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
12	TLED_05		TLED_05	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
13	TLED_06		TLED_06	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
14	TLED_07		TLED_07	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
15	TLED_08		TLED_08	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
16	TLED_09		TLED_09	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
17	TLED_10		TLED_10	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
18	TLED_11		TLED_11	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
19	TLED_12		TLED_12	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	
20	TLED_13		TLED_13	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="E"/>	

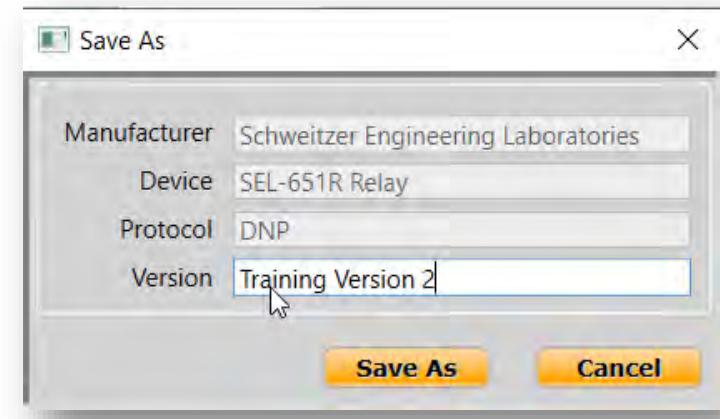
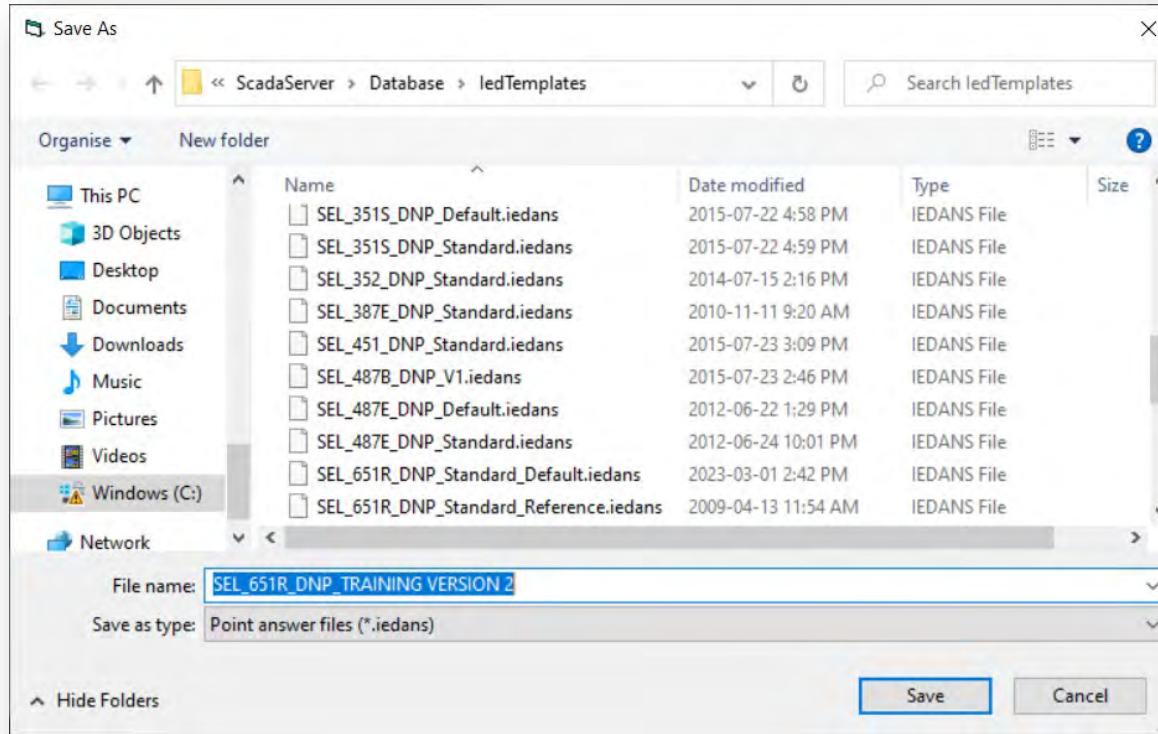
# Section C – Editing Points Using IED Wizard

- After making changes to the points list, a caution message appears when we try to press Save IED.
- Recall that – on the first page - there was an option to choose the version of mapping we were going to use. We chose Standard. This message is telling us that we have changed the version and we must save this point list as another version.
- After clicking the OK button from the message, we click FILE to save the new version of mapping.



# Section C – Editing Points Using IED Wizard

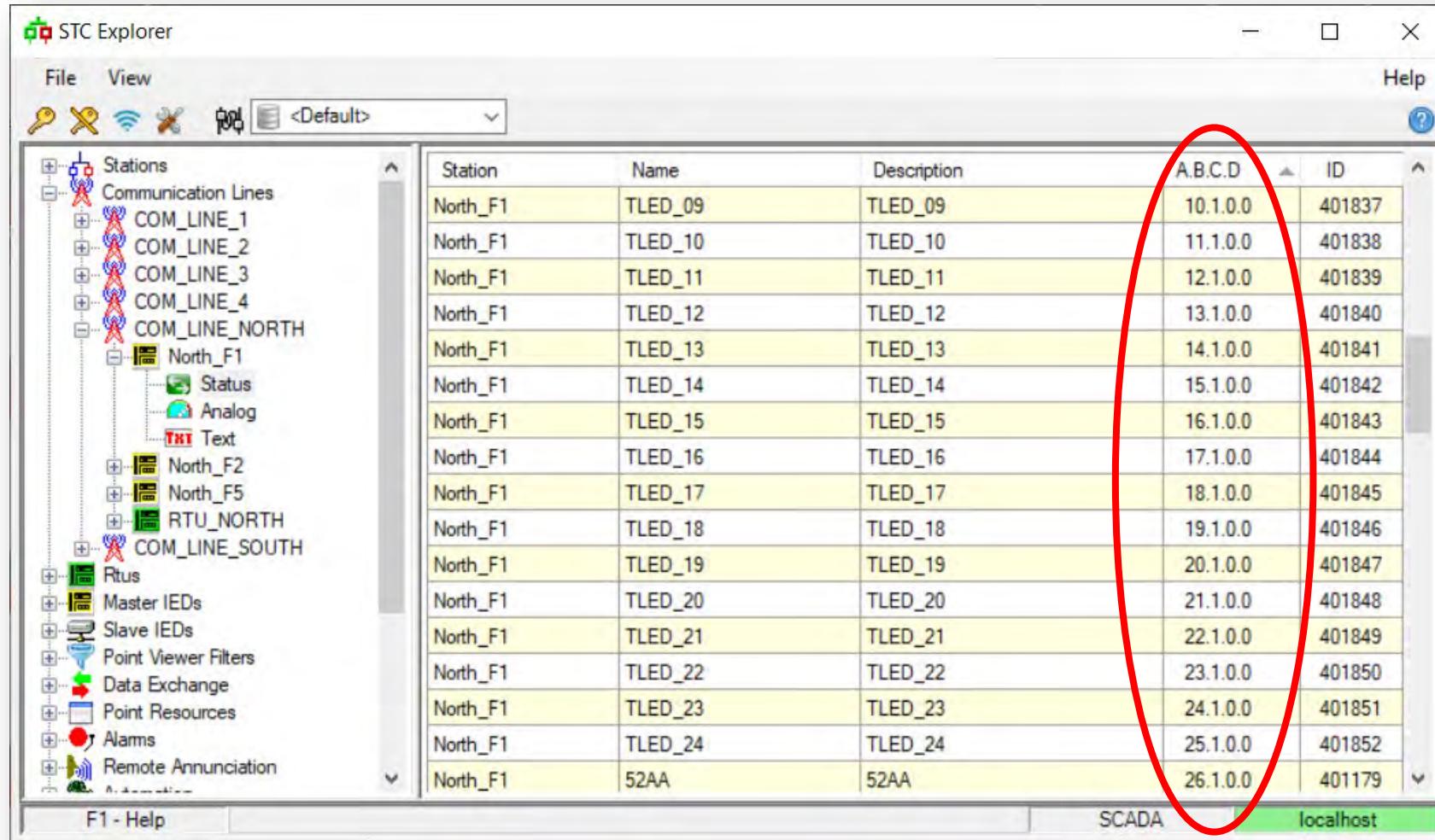
- We give the version a name to distinguish it from the Standard name.
- Click the Save button to continue



- This screen will allow us to save the changes into another template version
- Typically, users will include the device make and model along with the file name
- This folder should be part of your daily system back ups

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# Section C – Editing Points (Before)



The screenshot shows the STC Explorer application window. On the left is a tree view of project components, including Stations, Communication Lines, RTUs, and various IED types. The main area displays a table of points:

Station	Name	Description	A.B.C.D	ID
North_F1	TLED_09	TLED_09	10.1.0.0	401837
North_F1	TLED_10	TLED_10	11.1.0.0	401838
North_F1	TLED_11	TLED_11	12.1.0.0	401839
North_F1	TLED_12	TLED_12	13.1.0.0	401840
North_F1	TLED_13	TLED_13	14.1.0.0	401841
North_F1	TLED_14	TLED_14	15.1.0.0	401842
North_F1	TLED_15	TLED_15	16.1.0.0	401843
North_F1	TLED_16	TLED_16	17.1.0.0	401844
North_F1	TLED_17	TLED_17	18.1.0.0	401845
North_F1	TLED_18	TLED_18	19.1.0.0	401846
North_F1	TLED_19	TLED_19	20.1.0.0	401847
North_F1	TLED_20	TLED_20	21.1.0.0	401848
North_F1	TLED_21	TLED_21	22.1.0.0	401849
North_F1	TLED_22	TLED_22	23.1.0.0	401850
North_F1	TLED_23	TLED_23	24.1.0.0	401851
North_F1	TLED_24	TLED_24	25.1.0.0	401852
North_F1	52AA	52AA	26.1.0.0	401179

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# Section C – Editing Points (After)

The screenshot shows the STC Explorer interface. On the left is a tree view of the project structure, including Stations, Communication Lines, RTUs, Master IEDs, Slave IEDs, Point Viewer Filters, Data Exchange, Point Resources, Alarms, and Remote Annunciation. The main area displays a table of points:

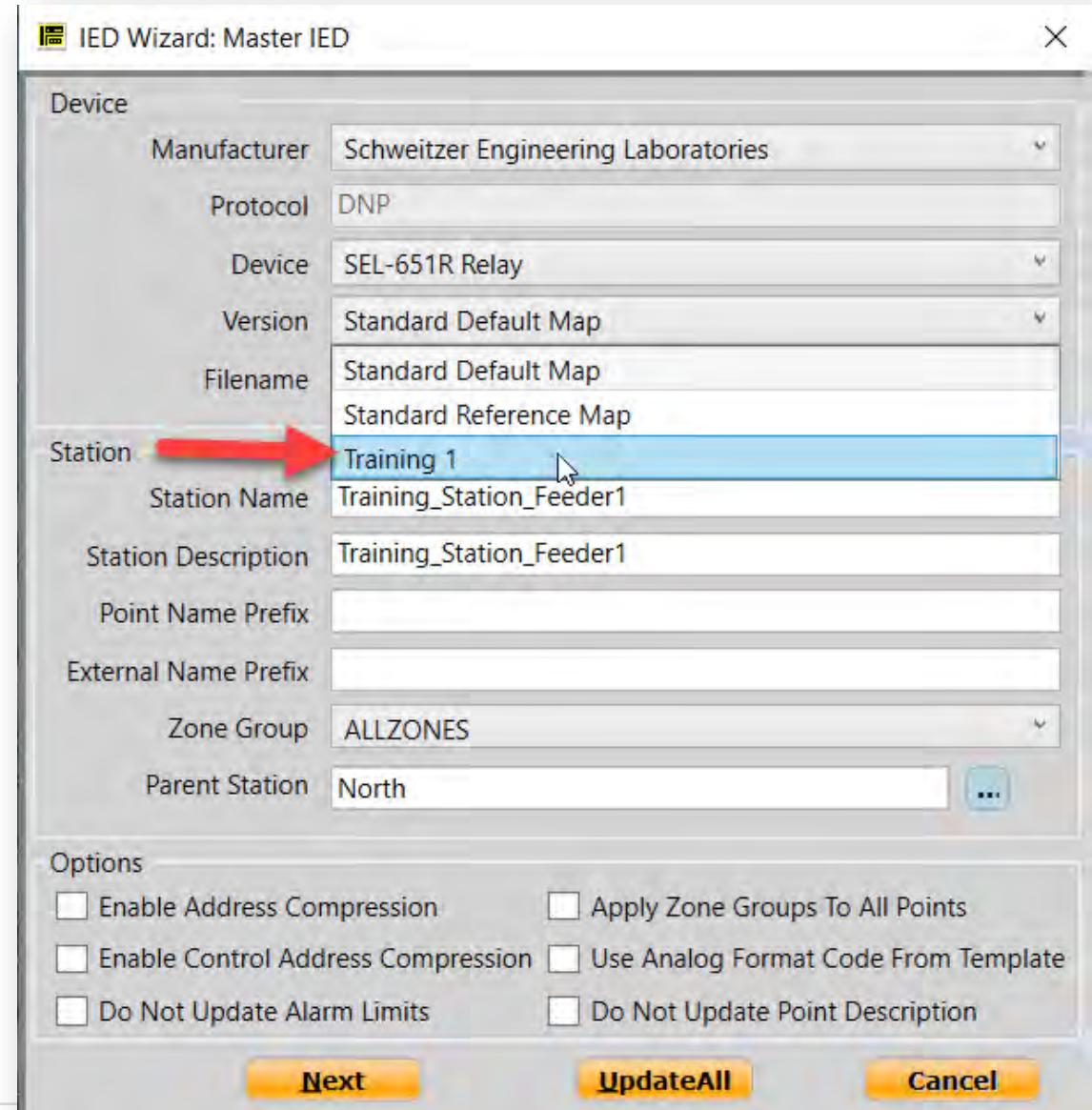
Station	Name	Description	A.B.C.D	ID
North_F1	TLED_05	TLED_05	6.1.0.0	401833
North_F1	TLED_06	TLED_06	7.1.0.0	401834
North_F1	TLED_07	TLED_07	8.1.0.0	401835
North_F1	TLED_08	TLED_08	9.1.0.0	401836
North_F1	52AA	52AA	26.1.0.0	401179
North_F1	52AB	52AB	27.1.0.0	401180
North_F1	52AC	52AC	28.1.0.0	401181
North_F1	52A3P	52A3P	29.1.0.0	401182
North_F1	PWR_SRC1	PWR_SRC1	30.1.0.0	401183
North_F1	BTFAIL	BTFAIL	31.1.0.0	401184
North_F1	CHRGG	CHRGG	32.1.0.0	401185
North_F1	DISCHG	DISCHG	33.1.0.0	401186
North_F1	TCCAP	TCCAP	34.1.0.0	401187
North_F1	PB01_LED	PB01_LED	35.1.0.0	401188
North_F1	PB02_LED	PB02_LED	36.1.0.0	401189
North_F1	PB03_LED	PB03_LED	37.1.0.0	401190
North_F1	PB04_LED	PB04_LED	38.1.0.0	401191

A red circle highlights the 'A.B.C.D' column header. The bottom of the window shows tabs for F1 - Help, SCADA, and localhost.

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# Section C – Editing Points (After)

- In subsequent installations, there will now be a “Training 1” in the version list along with the “Standard” and any other versions that have been created.



# Section D - Variations and Options for IEDs

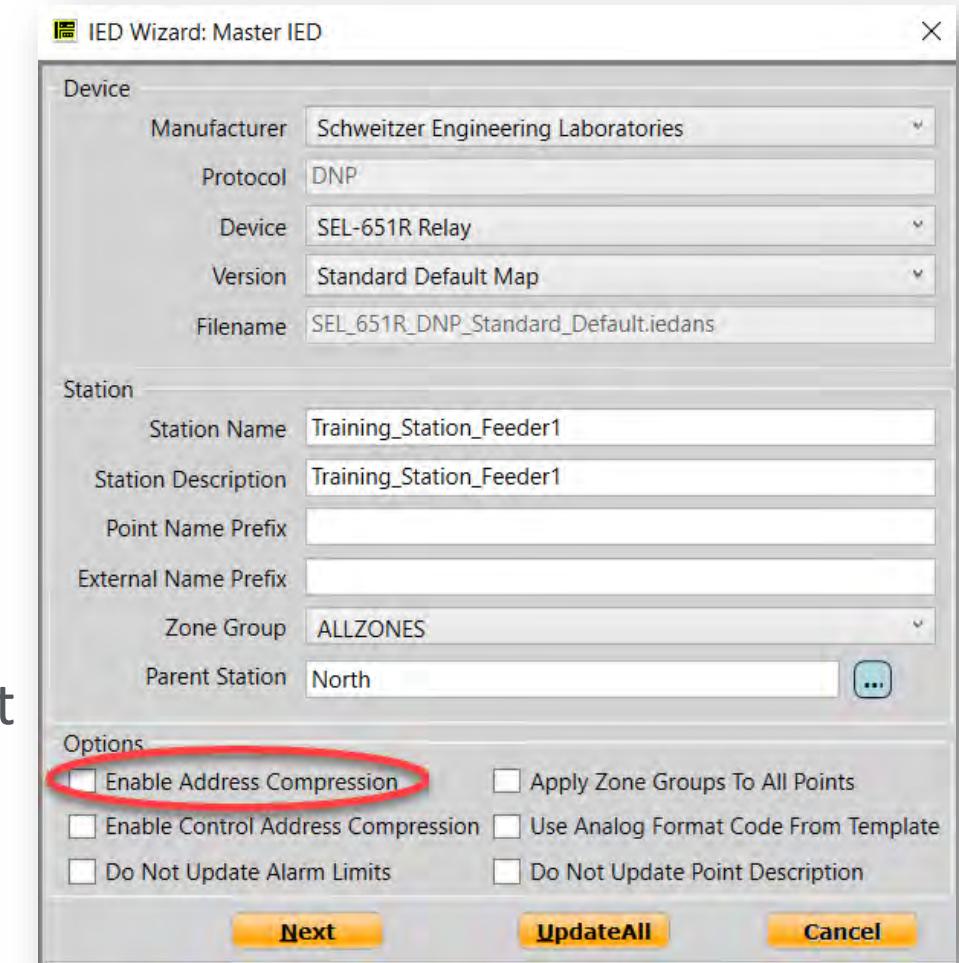
## Enable Address Compression

- Let's take a closer look at "Enable Address Compression"
- Using the default mapping, click Enable Address Compression and select "Save IED" in the last window

We get the same message as when we changed the point settings from the "Standard default map" version.

Address compression was not enabled in the default mapping

- Save a new version that has Address Compression enabled.



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# Exercise

## Enable Address Compression

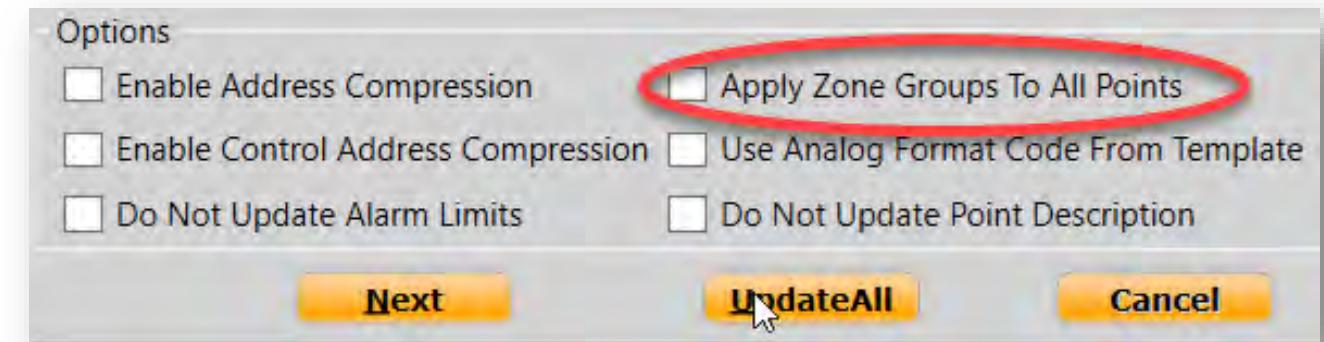
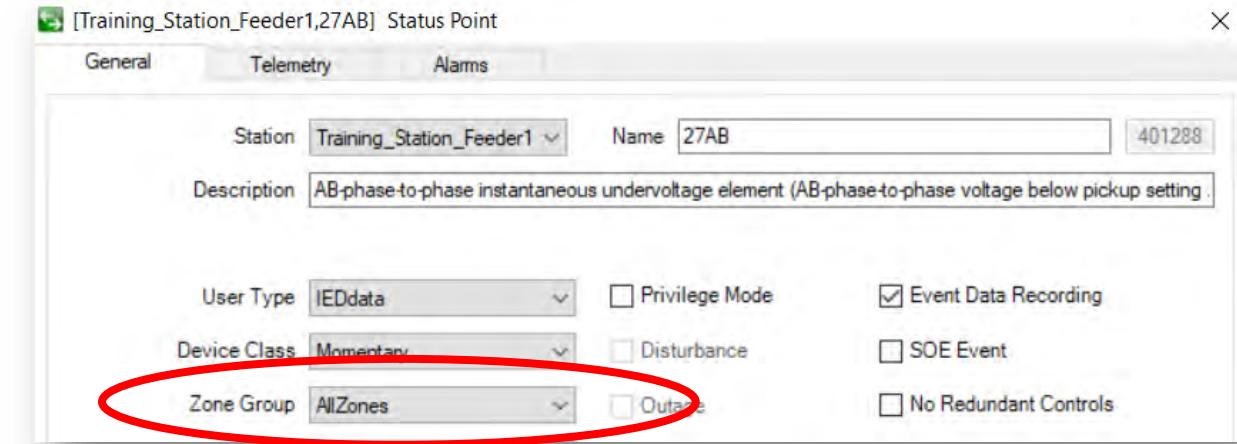


- Open up UCIED within the IED Wizard
- Enable Address Compression
- Save the template as UCIEDAC
- Then Save IED
- Compare the DNP addresses

# Section D - Variations and Options for IEDs

## Apply Zone Groups To All Points

- The “Apply Zone groups to all points” option allows users to apply the IED zone group to **all** underlying points.
- This is useful when the IED and points all belong to the jurisdiction of a specific restricted group.
- For instance, if the IED can be edited or accessed by certain individuals, then we can use this option to have a unanimous zone group on all points and the IED itself.

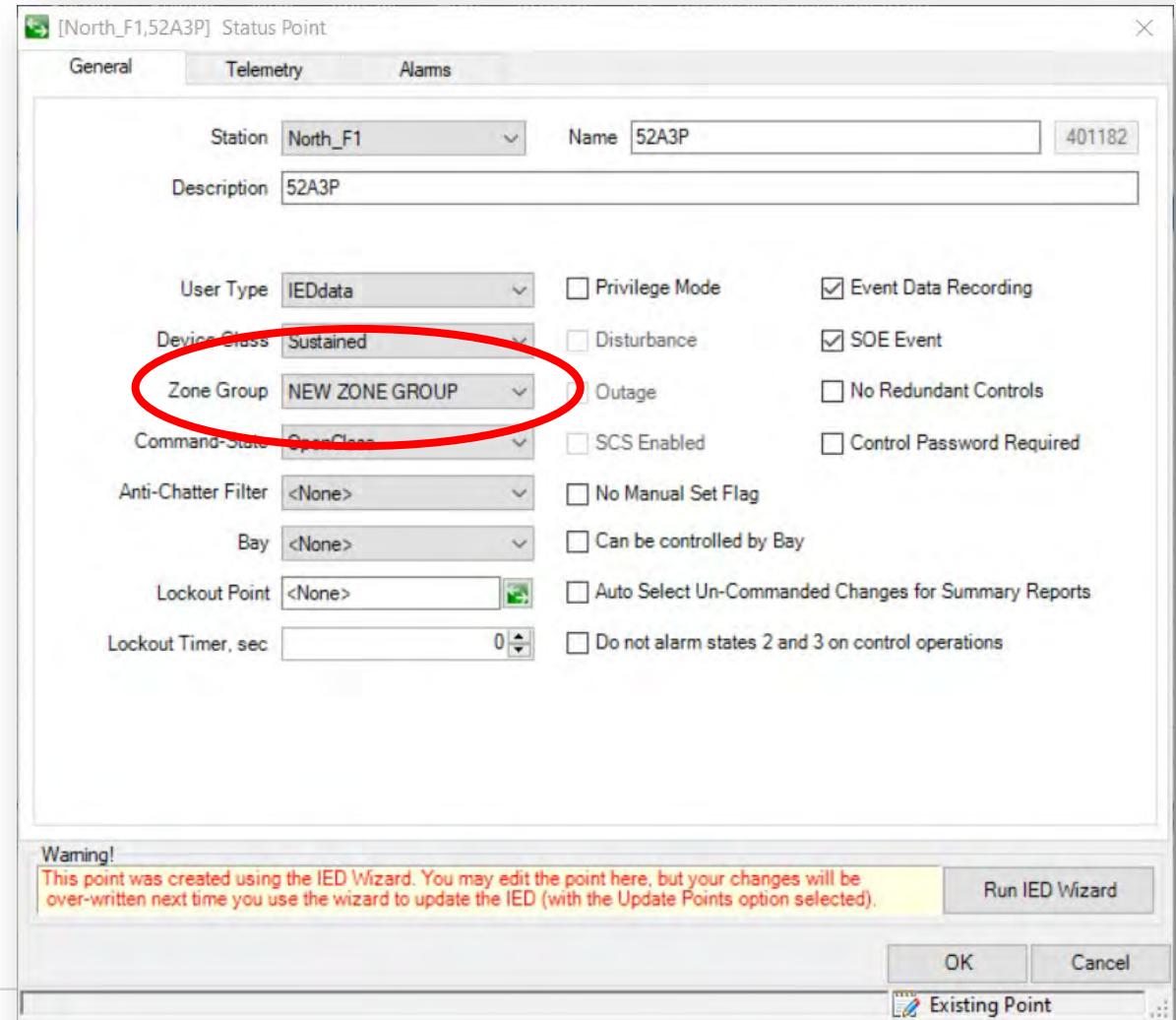


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# Section D - Variations and Options for IEDs

## Apply Zone Groups To All Points

- The result will be all the points under the IED will have the same zone group reflected in their point properties.



# Exercise

## Enable Apply Zone Groups to All Points

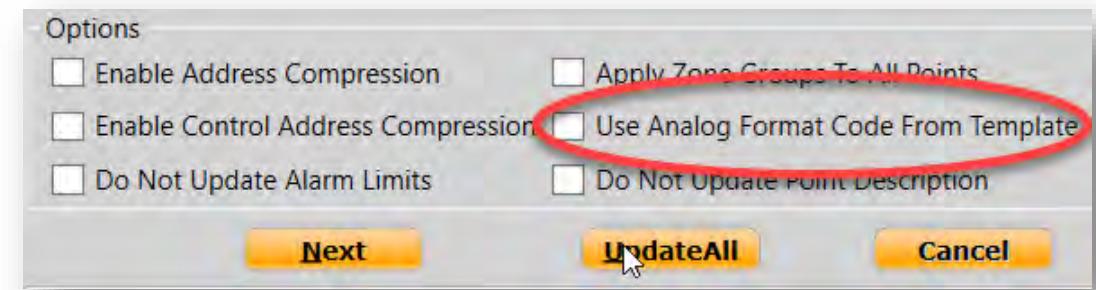


- Open the IED Wizard for UCIED
- Manually change the zone group
- Save IED
  - What happened?
- Go back to the IED Wizard
  - Enable Apple Zone Groups to all Points – observed the outcome

# Section D - Variations and Options for IEDs

## Use Analog Format Code From Template

- Use Analog Format Code changes how the IED wizard assigns the Format ID for how analog values are treated from the field.



	A	B	C	D	E	F	G	H	I	J	K	L
1	Name	Type	ZoneID	UserTypeID	AlarmSkillID	PrefSuffID	Description	RtId	FormatID	InputInUse	InputA	InputB
2	Dummy Station	Status	AllZones	IEDdata			Dummy device	<None>	1	0	0	
3	IEDStatus	Status	AllZones	IEDdata	Format01	FailNormal	IED Status Point	<None>	1	0	0	
4	IEDFastScan	Status	AllZones	IEDdata	Format01	OffOn	IED Fast Scan Point	<None>	1	0	0	
5	IEDPortSwitch	Status	AllZones	IEDdata	Format01	PriAlt	IED Port Switch Point	<None>	1	0	0	
6	IEDPercentage	Analog	AllZones	IEDdata			IED Percentage Point	<None>	1			
7	IEDTotalMsgCount	Analog	AllZones	IEDdata			IED Total Message Count Point	<None>	1			
8	IEDGoodMsgCount	Analog	AllZones	IEDdata			IED Good Message Count Point	<None>	1			
9	IEBadMsgCount	Analog	AllZones	IEDdata			IED Bad Message Count Point	<None>	1			
10	IEDTimeoutCount	Analog	AllZones	IEDdata			IED Timeout Count Point	<None>	1			
11	IEDErrorCount	Analog	AllZones	IEDdata			IED Error Count Point	<None>	1			
12	IEDSendMsgCount	Analog	AllZones	IEDdata			IED Send Message Count Point	<None>	1			
13	DIO1	Status	AllZones	IEDdata	Format01	OffOn	Status input 01	Dummy RTU	1	1	0	
14	AI01	Analog	AllZones	IEDdata			Analog input point 01	Dummy RTU	1			
15												
16												
17												
18												
19												
20												
21												
22												

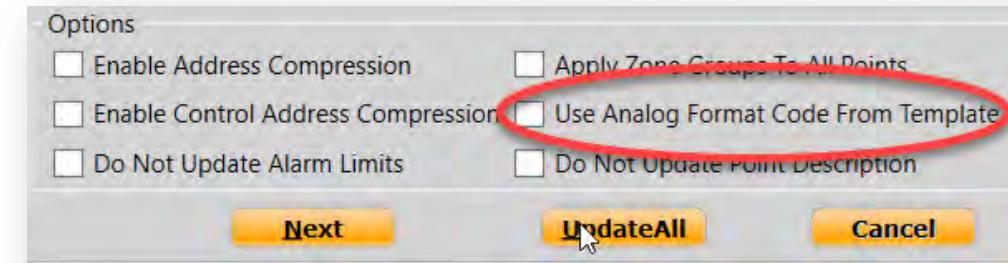
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# Section D - Variations and Options for IEDs

## Use Analog Format Code From Template

- The meaning of the format codes depends on the communication protocol of the RTU that transmits the point. A typical set of format codes is:

Code	Meaning
1	Scale, clamp to zero if value is within zero-clamp deadband and store in database.
2	Scale, clamp to zero if value is within zero-clamp deadband and add to database.
3	Calculate delta, scale and store in database.
4	Calculate delta, scale and add to database.
5	Scale, clamp to zero if value is negative or within zero-clamp deadband and store positive value in database.
6	Scale, clamp to zero if value is within zero-clamp deadband and store unsigned 16-bit value in database.
7	Scale, clamp to zero if value is within zero-clamp deadband and store unsigned 32-bit value in database.
8	Scale, clamp to zero if value is within zero-clamp deadband and store absolute value in database.
9	Scale, clamp to zero if value is within zero-clamp deadband and store (32-bit) floating point value in database.



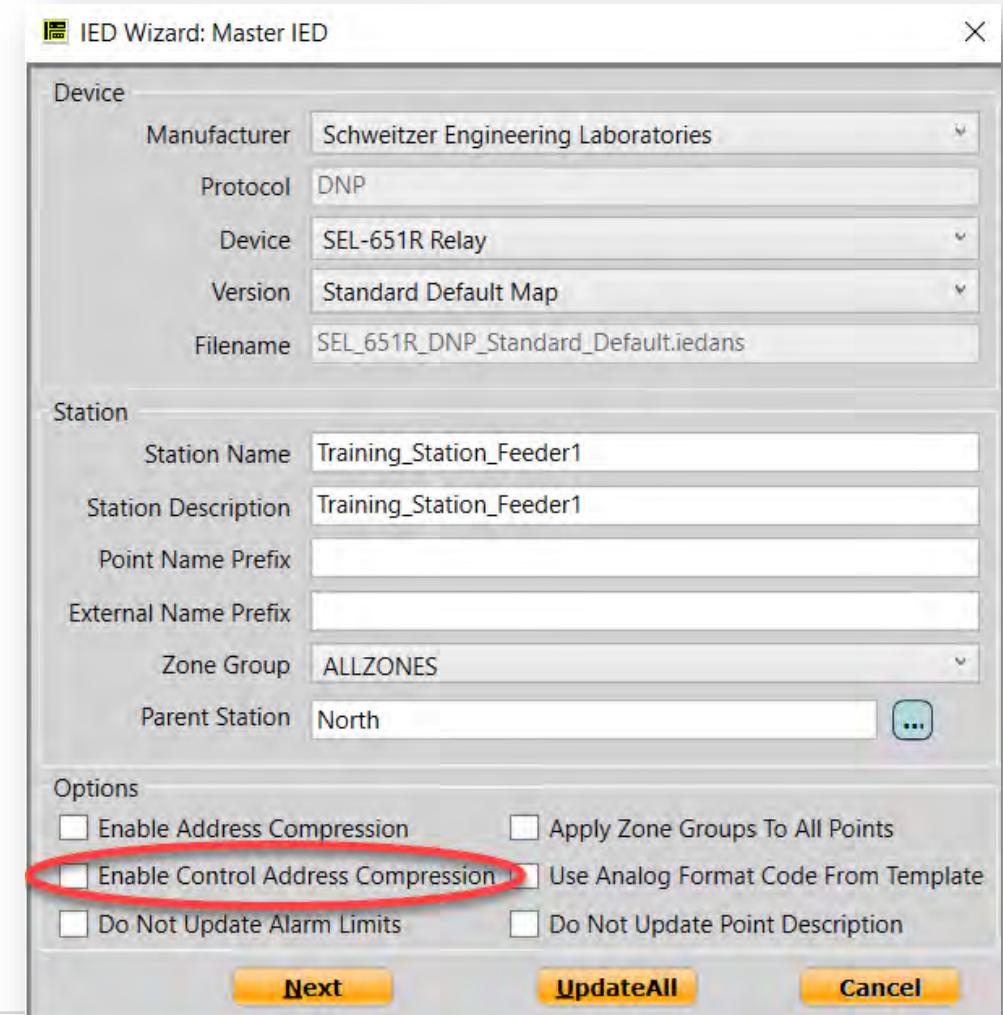
Check this checkbox if you want to use the analog format ID stored in the .iedans file instead of always setting the analog format ID to 1 for Slave IEDs.

- By default, it is always 1 for Secondary/Primary IED's

# Section D - Variations and Options for IEDs

## Control Address Compression

- “Enable Control Address Compression” works like “Enable Address Compression”.
- The purpose is to look for gaps in addressing for the control points that are assigned.



# Section D - Variations and Options for IEDs

## Control Address Compression

- Using the Status Point Viewer application, we see a gap between point IDs 15 and 32.
- Let's check "Enable control address compression" to see if it makes changes.

C0	C1
32.121.2	32.121.1
15.121.4	15.121.3
14.121.4	14.121.3
13.121.4	13.121.3
12.121.4	12.121.3
11.121.4	11.121.3
10.121.4	10.121.3
9.121.4	9.121.3
8.121.4	8.121.3
7.121.4	7.121.3
6.121.4	6.121.3
5.121.4	5.121.3
4.121.4	4.121.3
3.121.4	3.121.3
2.121.4	2.121.3
1.121.4	1.121.3
0.121.4	0.121.3

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# Section D - Variations and Options for IEDs

## Control Address Compression

- Enabling “Control address compression” eliminates gaps between the control points in an IED .

C0	C1
	39.12.1.1
	38.12.1.1
	37.12.1.1
	36.12.1.1
	35.12.1.1
	34.12.1.1
32.12.1.2	33.12.1.1
30.12.1.4	31.12.1.3
28.12.1.4	29.12.1.3
26.12.1.4	27.12.1.3
24.12.1.4	25.12.1.3
22.12.1.4	23.12.1.3
20.12.1.4	21.12.1.3
18.12.1.4	19.12.1.3
16.12.1.4	17.12.1.3
14.12.1.4	15.12.1.3
12.12.1.4	13.12.1.3
10.12.1.4	11.12.1.3
8.12.1.4	9.12.1.3
6.12.1.4	7.12.1.3
4.12.1.4	5.12.1.3
2.12.1.4	3.12.1.3
0.12.1.4	1.12.1.3

# Exercise

## Enable Control Address Compression

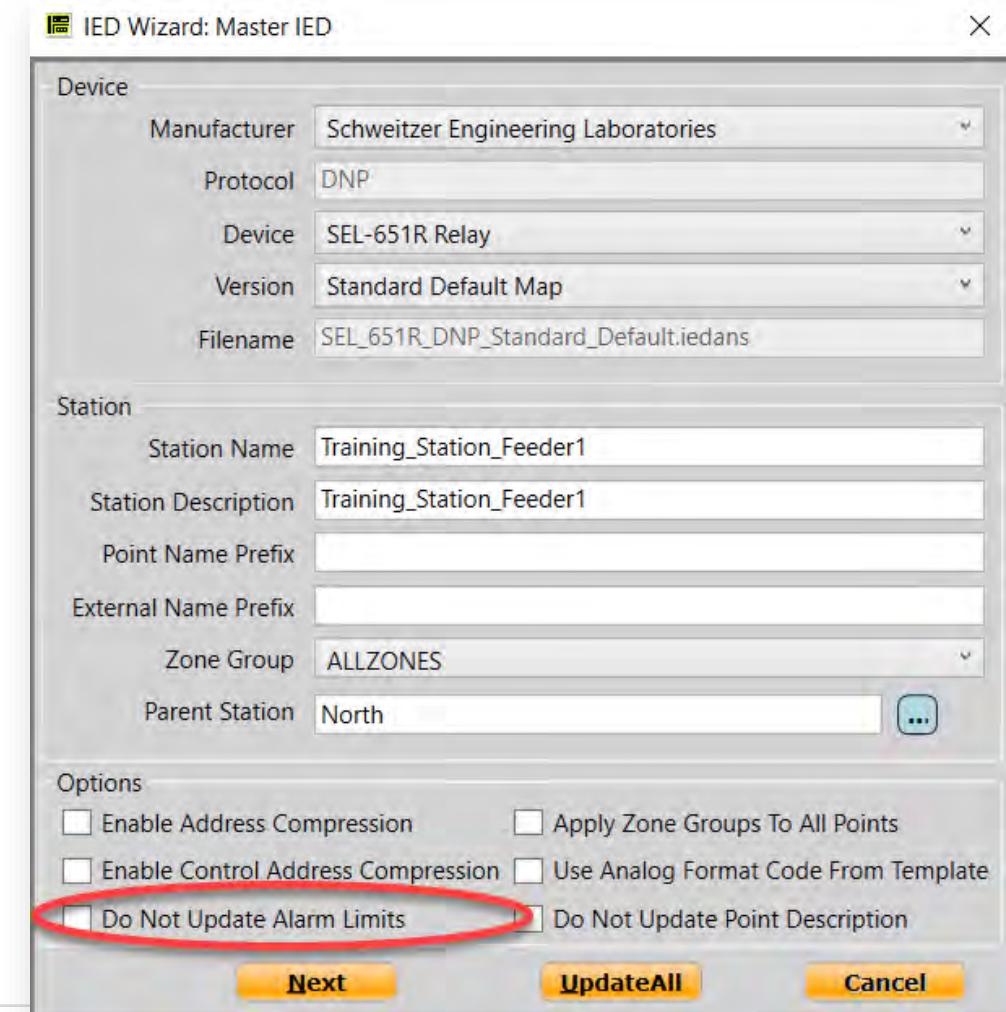


- Open up UCIED
- within the IED Wizard
- Enable Control Address Compression
- Save the template as UCIEDCAC
- Then Save IED
- Compare the addresses

# Section D - Variations and Options for IEDs

## Do Not Update Alarm Limits

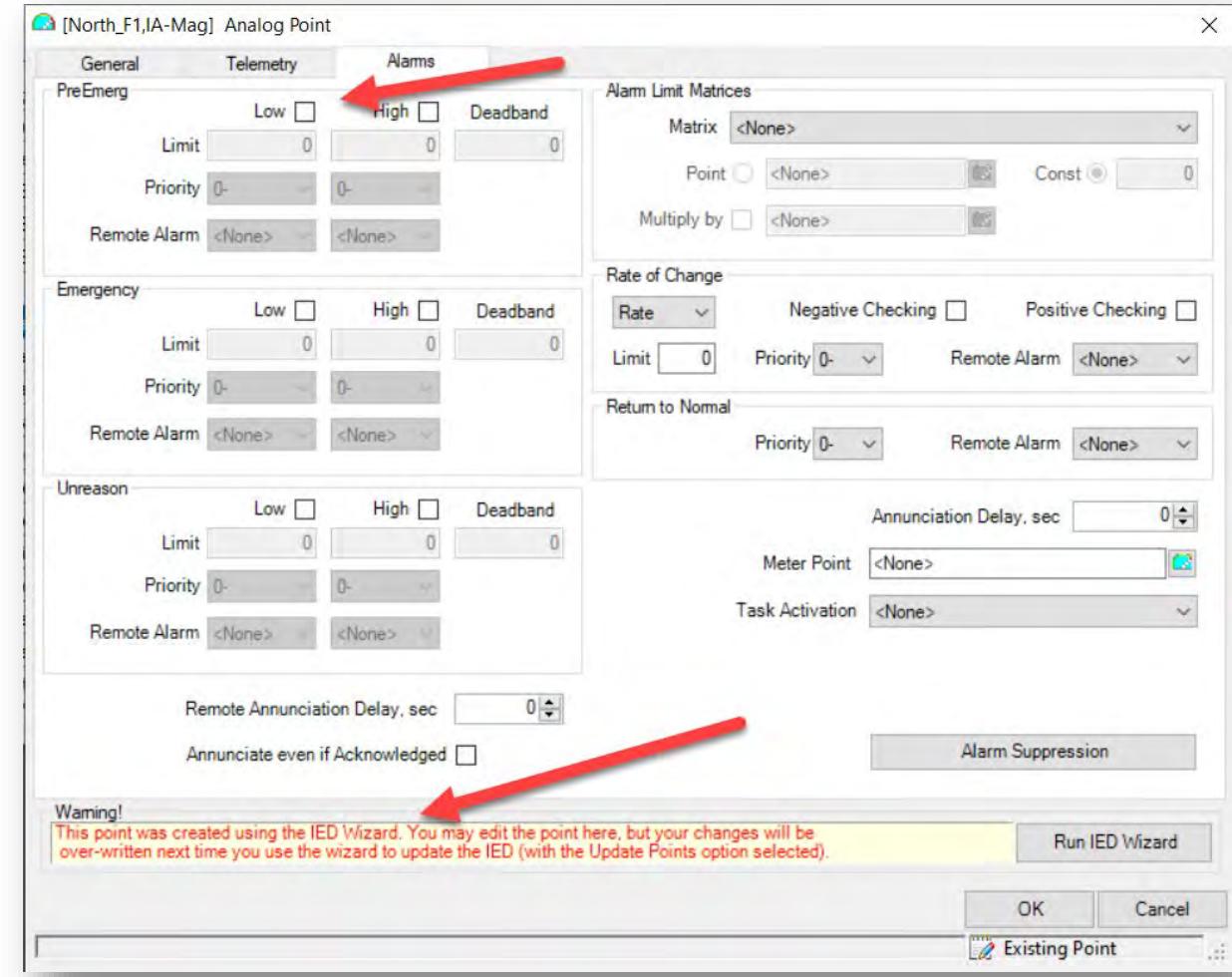
- “Do not Update Alarm Limits” allows us to manually make changes to Analog alarm limits created by the IED wizard.
- The unique limits applied by the user will not be changed or deleted the next time that we Save the IED.



# Section D - Variations and Options for IEDs

## Do Not Update Alarm Limits

- IA\_MAGNITUDE is a point that we created using our 651R via IED Wizard
- By default the wizard did not set any alarm limits
- Note: there is a warning at the bottom of the point properties that appears on all points created with the IED Wizard. The warning states that we can make manual changes, but they will be overwritten if the wizard is run for this device again using the same template or mapping.



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# Section D - Variations and Options for IEDs

## Do Not Update Alarm Limits

- Let's manually add some limits as shown.
- Normally, the settings would revert to all zeroes when the wizard is run.
- However, "Do not Update Alarm Limits" should stop the overwriting.
- Test by checking the box for "Do not update Alarm Limits" and then running the wizard for this IED.

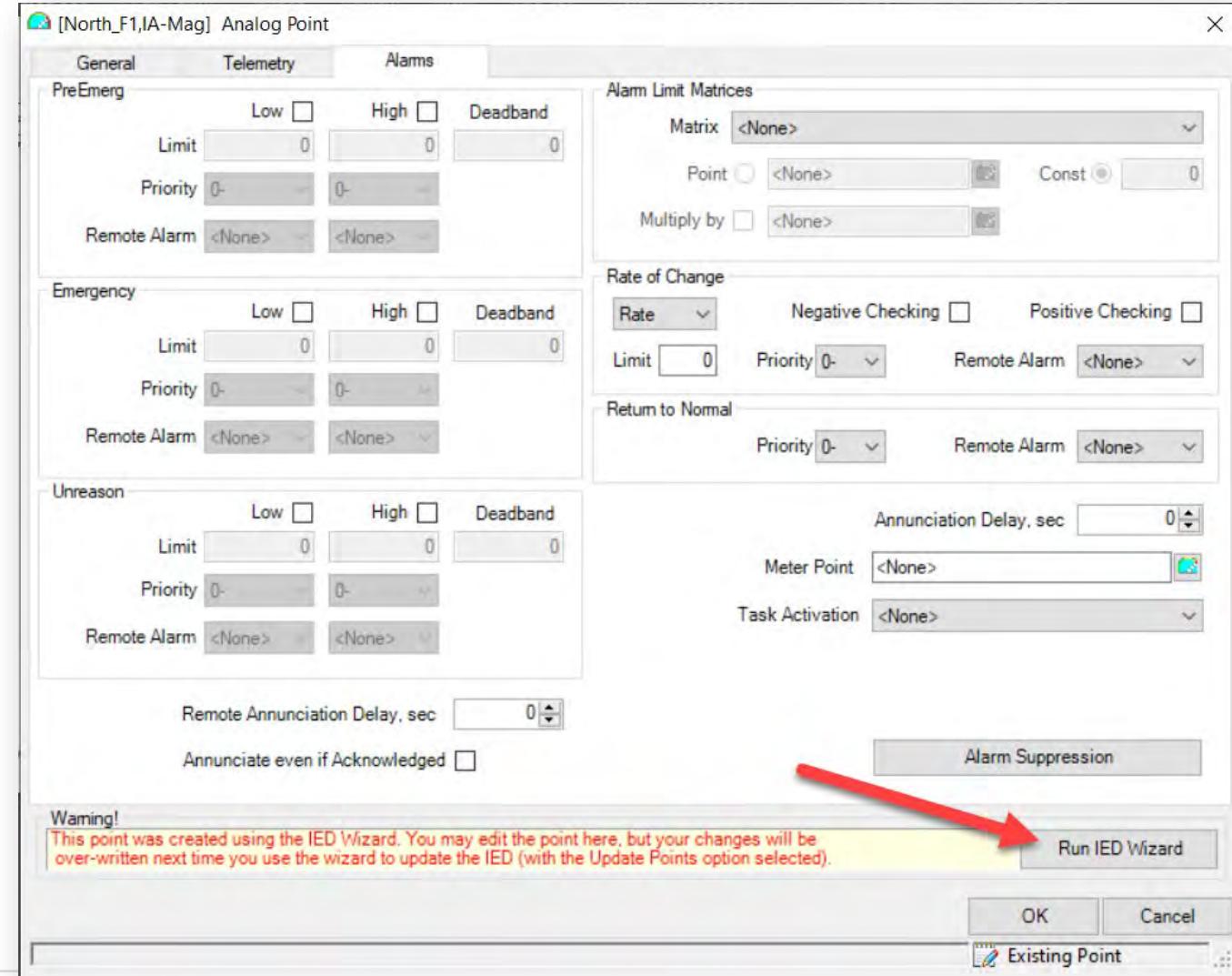
The screenshot shows a software interface for configuring alarm limits across three categories: PreEmerg, Emergency, and Unreason. Each category has two checkboxes for 'Low' and 'High' limits, and input fields for the limit values. Below each limit value are priority dropdowns and remote alarm dropdowns.

Category	Low Limit	High Limit
PreEmerg	100	400
Emergency	50	450
Unreason	25	475

# Section D - Variations and Options for IEDs

## Do Not Update Alarm Limits

- Note we can run the IED WIZARD right from the point by clicking the button on the bottom right.



# Section D - Variations and Options for IEDs

## Do Not Update Alarm Limits

- The settings remain intact after the wizard is run due to the DO NOT UPDATE ALARM LIMITS option.

PreEmerg	
<input checked="" type="checkbox"/> Low	<input checked="" type="checkbox"/> High
Limit <input type="text" value="100"/>	<input type="text" value="400"/>
Priority <input type="button" value="0-"/>	<input type="button" value="0-"/>
Remote Alarm <input type="button" value="None"/>	<input type="button" value="None"/>
Emergency	
<input checked="" type="checkbox"/> Low	<input checked="" type="checkbox"/> High
Limit <input type="text" value="50"/>	<input type="text" value="450"/>
Priority <input type="button" value="0-"/>	<input type="button" value="0-"/>
Remote Alarm <input type="button" value="None"/>	<input type="button" value="None"/>
Unreason	
<input checked="" type="checkbox"/> Low	<input checked="" type="checkbox"/> High
Limit <input type="text" value="25"/>	<input type="text" value="475"/>
Priority <input type="button" value="0-"/>	<input type="button" value="0-"/>
Remote Alarm <input type="button" value="None"/>	<input type="button" value="None"/>

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# Exercise

## Enable Do Not Update Alarm Limits

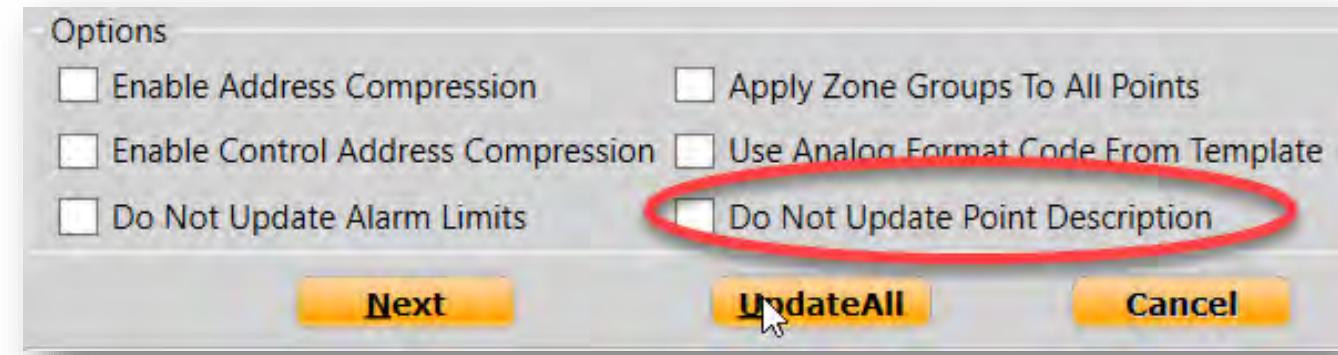


- Open up UCIED,IA-Mag point and set some limits
- Open the IED Wizard
- Enable Do Not Update Alarm Limits
- Save the template as UCIEDAL
- Then Save IED
- See if it changes or not

# Section D - Variations and Options for IEDs

## Do Not Update Point Description

- Works exactly like “Do not update Alarm Limits”
- The expectation is that our manually updated point description will not be updated by running the IED wizard.

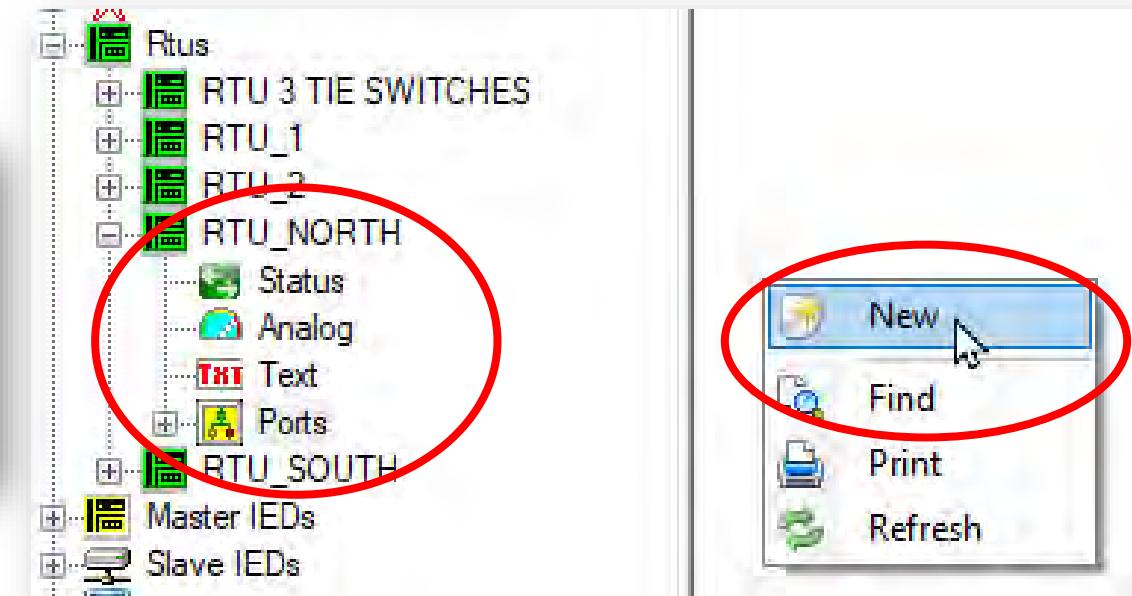
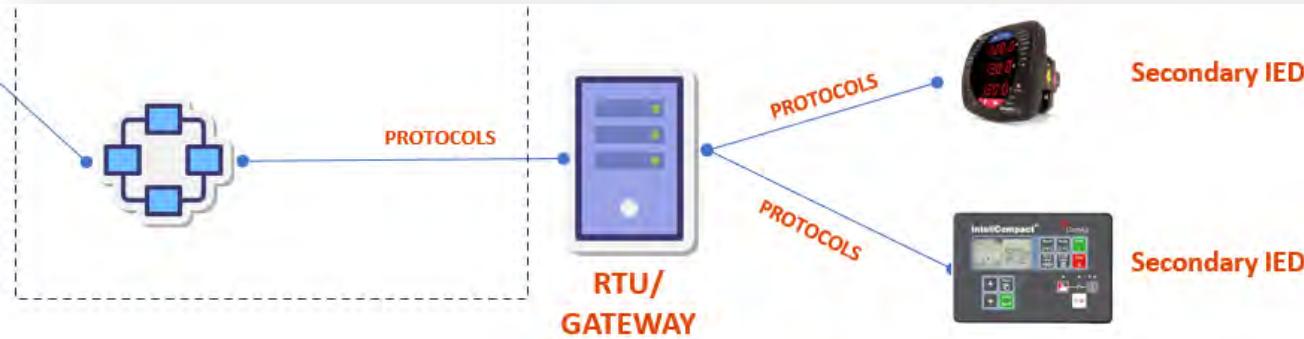


The image shows a software interface for defining a point. It includes fields for 'Station' (set to 'North\_F3'), 'Name' (set to 'IA-Mag'), and 'Description' (set to 'IA magnitude').

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# Section E - Secondary IED Creation

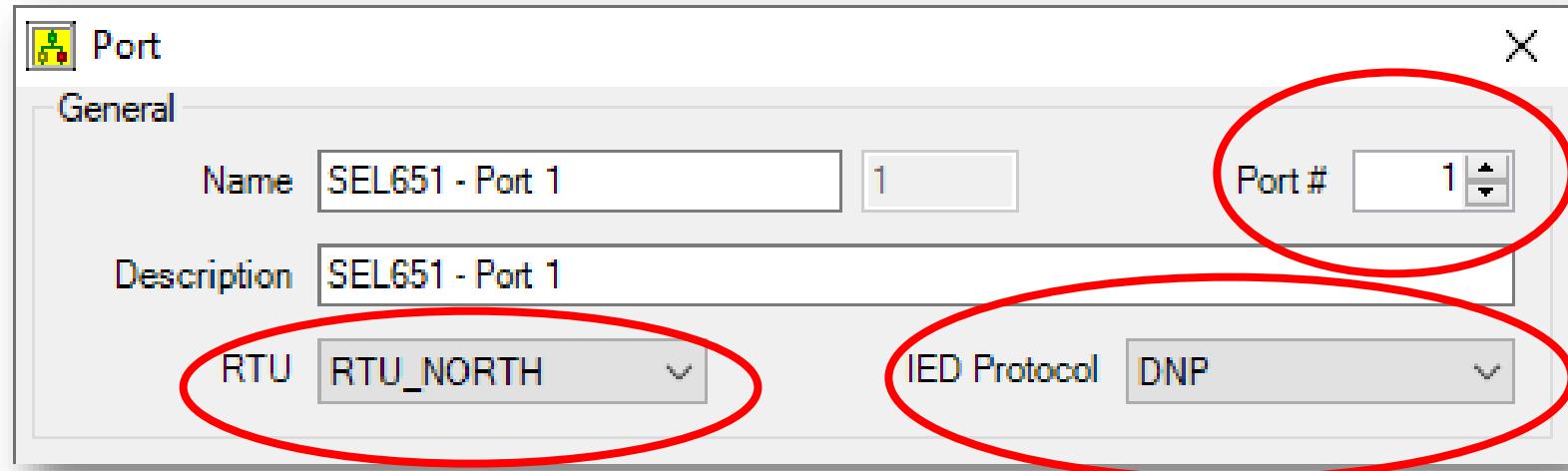
- Recall that Secondary IEDS are not directly connected into a Communication Line. They connect to an RTU/RTAC/Data Concentrator, etc...
- The first step is always defining a port on an RTU so we can attach the IED.



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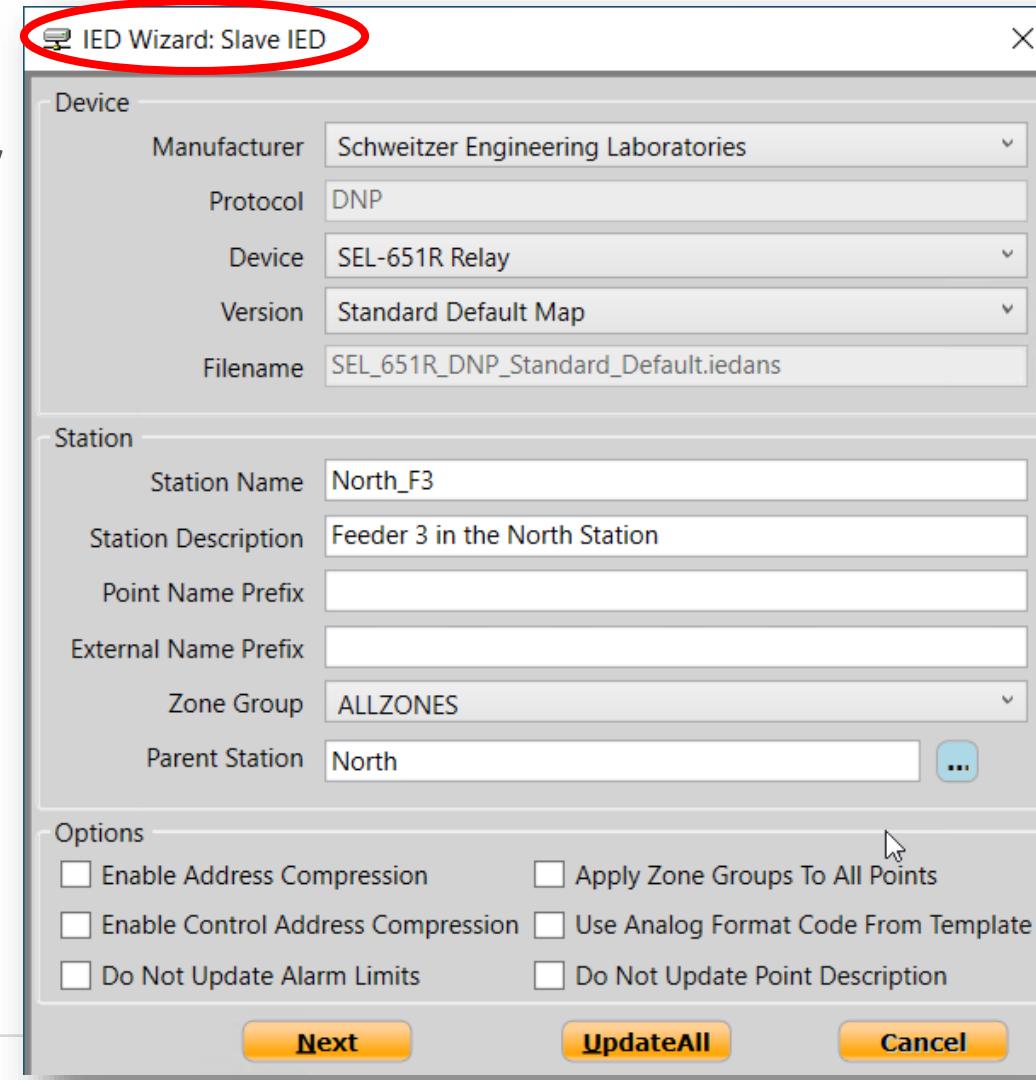
# Section E - Secondary IED Configuring the Port

- Below we have defined the port and are now able to attach our intended Secondary IED to the port similarly to how we attached the Primary IED to a Communication Line .



# Section E - Secondary IED Wizard Configuration

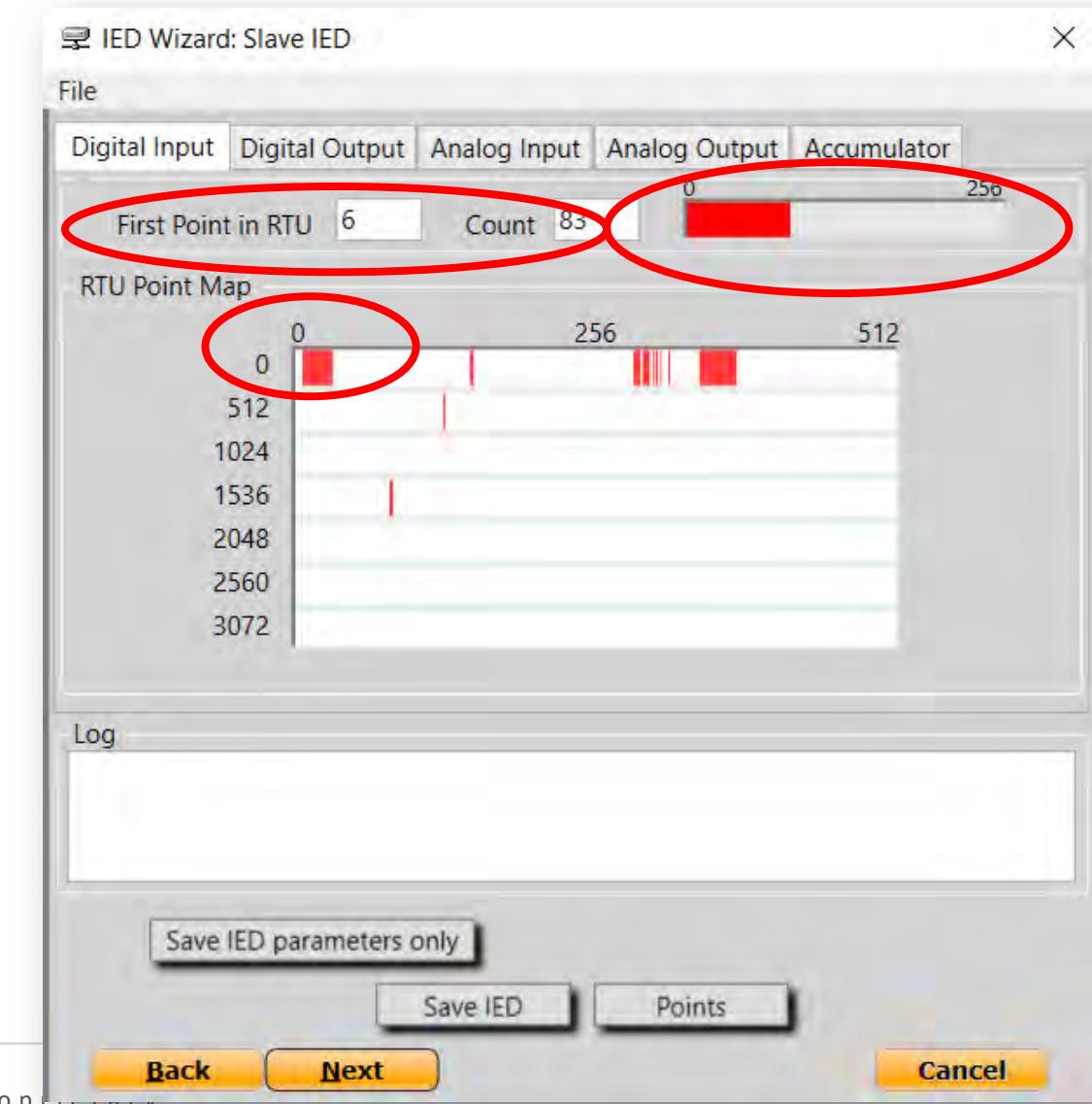
- There are many similarities between the configuration screen for a Primary IED and a Secondary IED.
- One key difference that will help you know if you're configuring the correct device is to check the top left menu to make sure it shows Secondary IED
- For this example, we will be using the same Template Version
- Station Name/Description can be filled in as if it was a Primary IED.



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# Section E - Secondary IED Point Mapping

- The final screen is notably different as it shows where the SEL-351S points will be placed (mapped) onto the RTU.
- The Count of 69 shown should match the default number of points in TRAINING VERSION 2 IED Wizard Template.
- The “First Point in RTU” is the first point that will handle the SEL-651 points. This can be modified by changing the number or dragging the circled red bar to the location on the map we wish to be the starting point.
- There is a small black bar at point 0. This bar shows any other points already mapped onto the RTU from other installations.



# Exercise

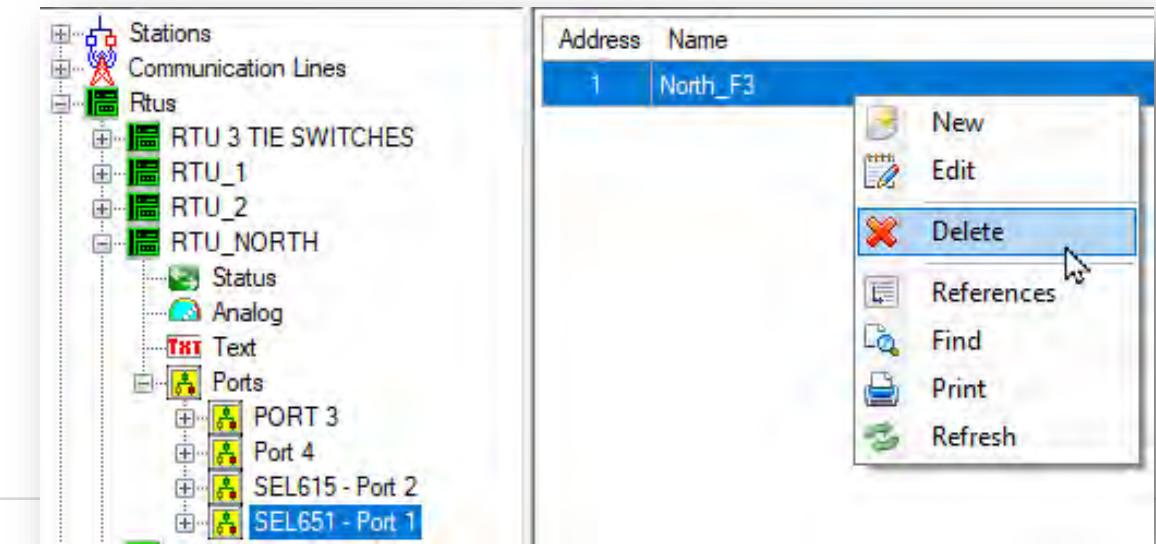
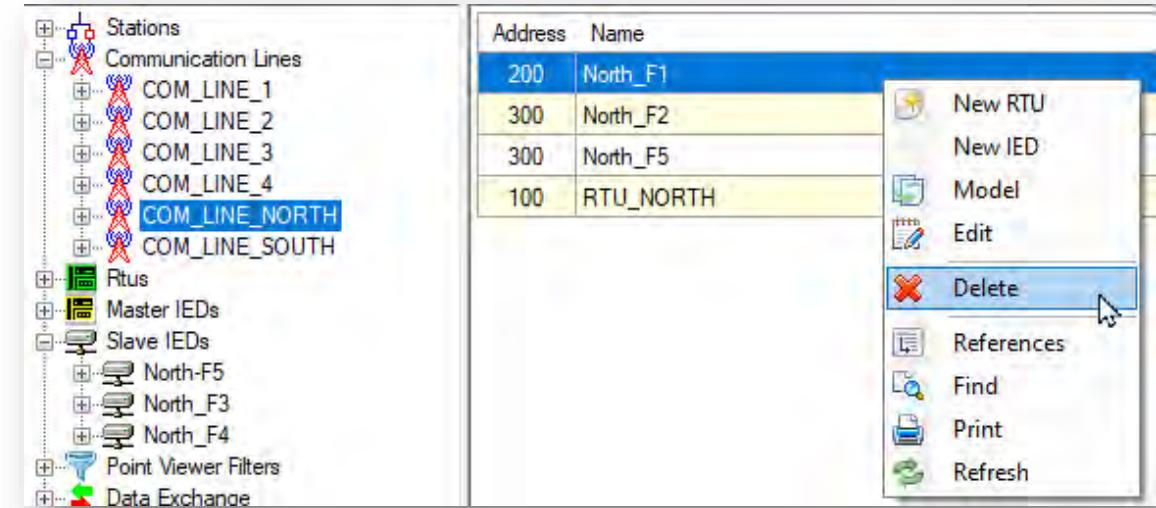
Install a few IED  
using the  
Secondary IED  
method



- Using the IED Wizard, create a new Port underneath an RTU
- Create a new IED called UCIED2

# Section F - Deleting Primary and Secondary IEDs

- The knowledge from the previous example is useful for deleting IEDs.
- Always perform a backup
- To start, locate our Primary IED from the Communication Line
- For our Secondary IED, it would be under our Port as shown to the right picture



# Exercise

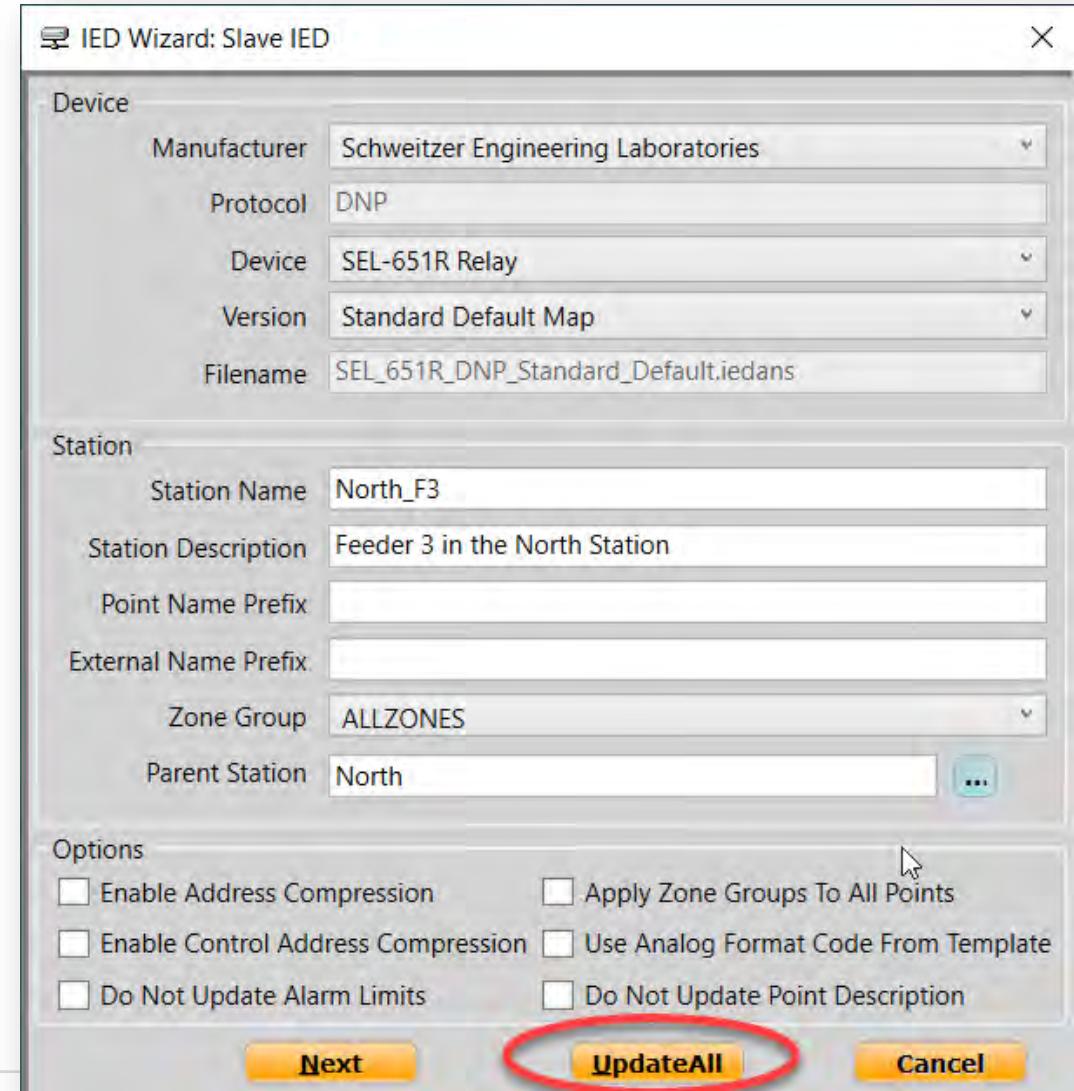
## Delete IEDs



- Practice deleting one of the Secondary IEDs

# Section F - Mass Point Updates In IED Wizard

- One of the great advantages in using the IED Wizard is that it's possible to make changes to all deployed IED devices at once.
- Of course, it's only an advantage if it's our intention to update all the devices.
- Below is the button that will do the mass updates. This button will work only on IEDs that have been installed with the same version (very important).



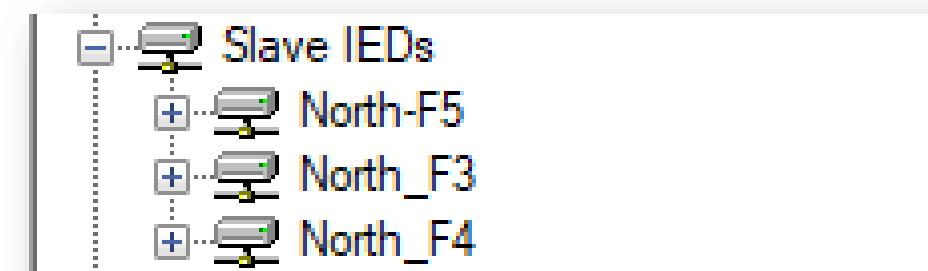
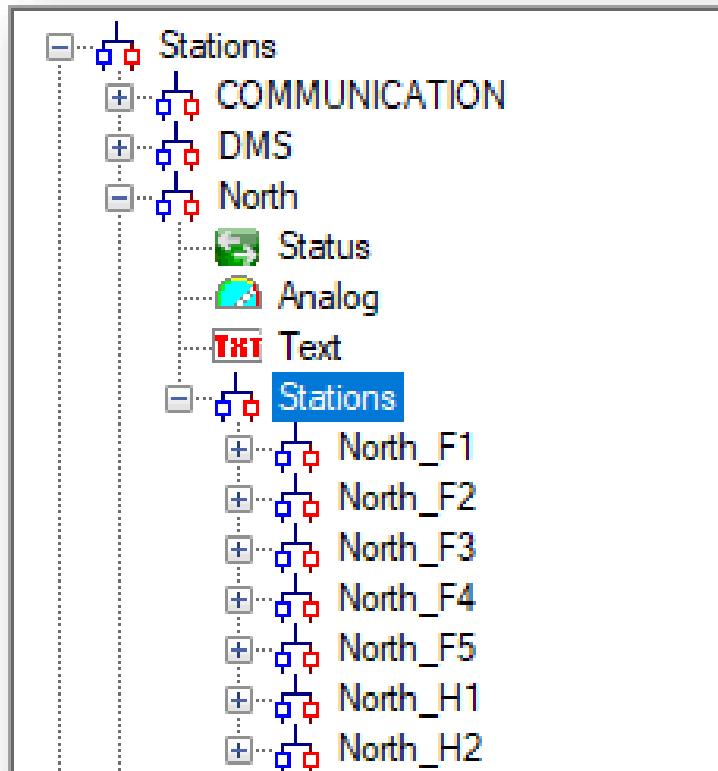
# Exercise

Update All  
Button

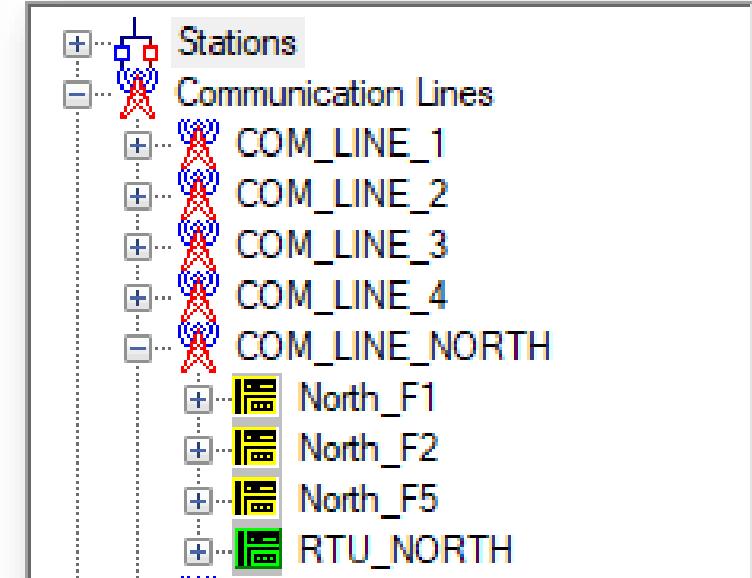
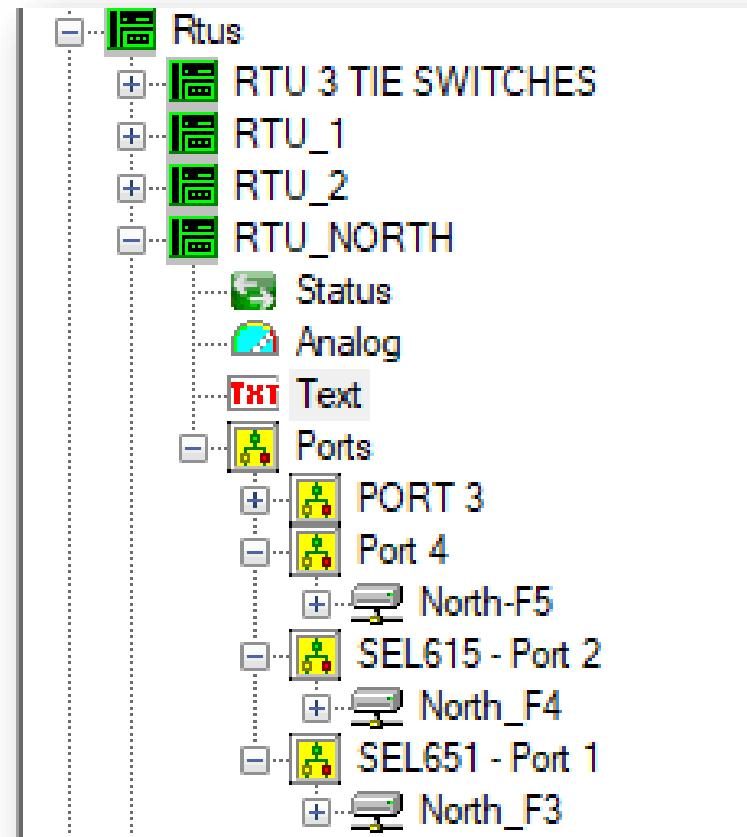
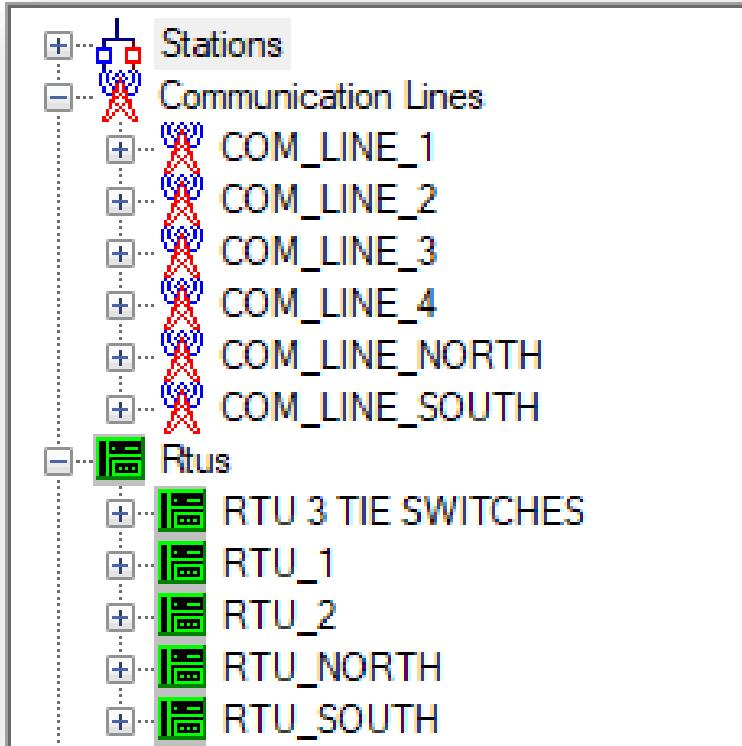


- Open up the IED Wizard from an existing point
- Change some points in a standard version and overwrite the iedans.
- Then click onto “Update All” button
- Observe what happens with other IED when it executes this process

# Section F - Finding ALL IEDs

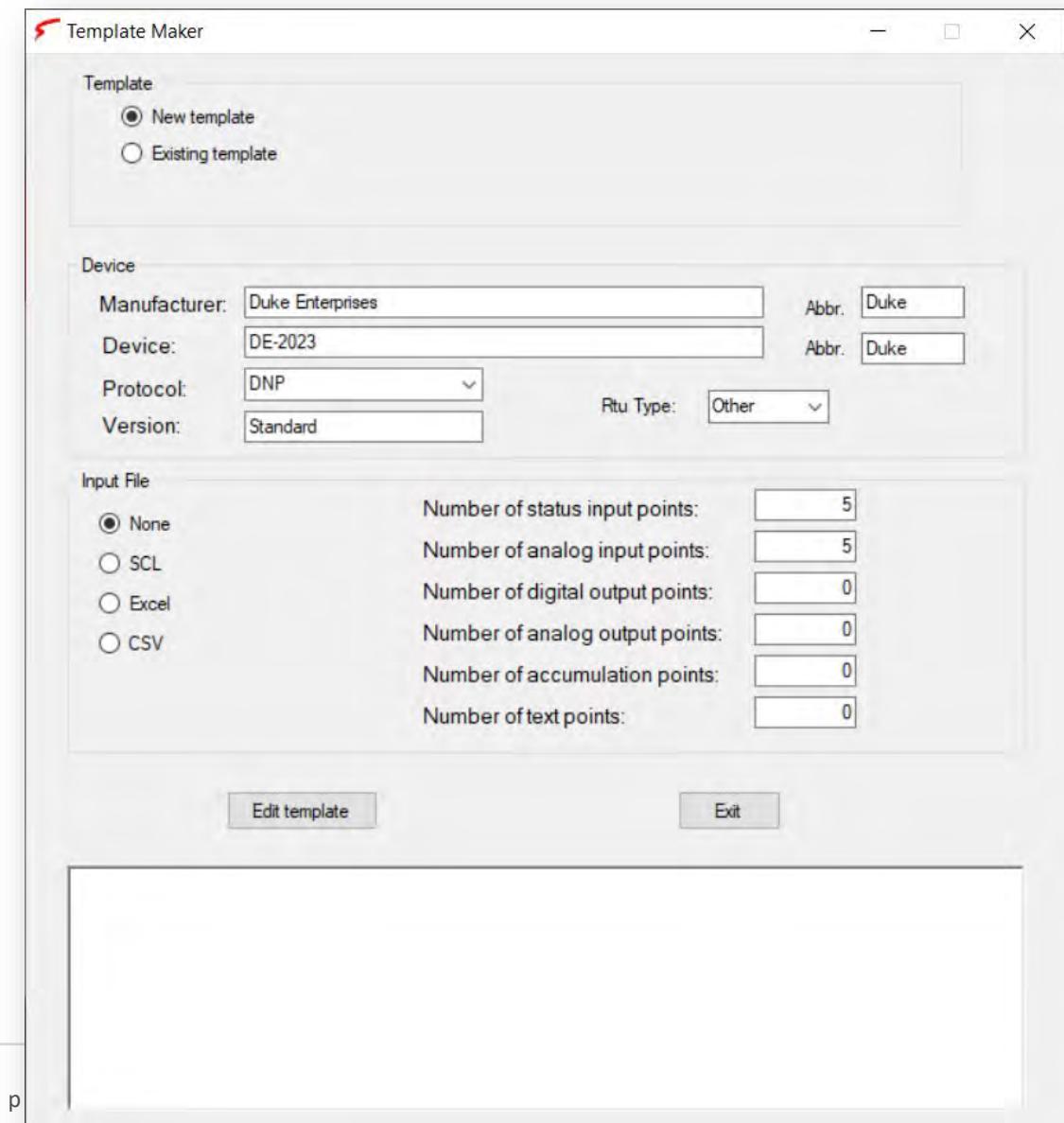


# Section F - Finding ALL IEDs



# Template Maker

- Located in the ScadaClient directory
- Must execute by “run as Administrator”
- Customize your own template for your device



# Template Maker



- Create a new template
- Or edit existing template

# Template Maker

Device

Manufacturer:	Duke Enterprises	Abbr.	Duke
Device:	DE-2023	Abbr.	Duke
Protocol:	DNP	Rtu Type:	Other
Version:	Standard		

- Manufacturer/Device and Abbr - customizable
- Protocol: DNP/Modbus/IEC61850 (supported)
- Version: Standard (template)
- RTU Type: Other (unless you have Survalent's devices)

# Template Maker

- Input file: None (unless you are making IEC61850 template)
- Number of Status/Analog points: specify the amount of database points
- Edit Template: will produce a template in excel – so that you can further customize/complete

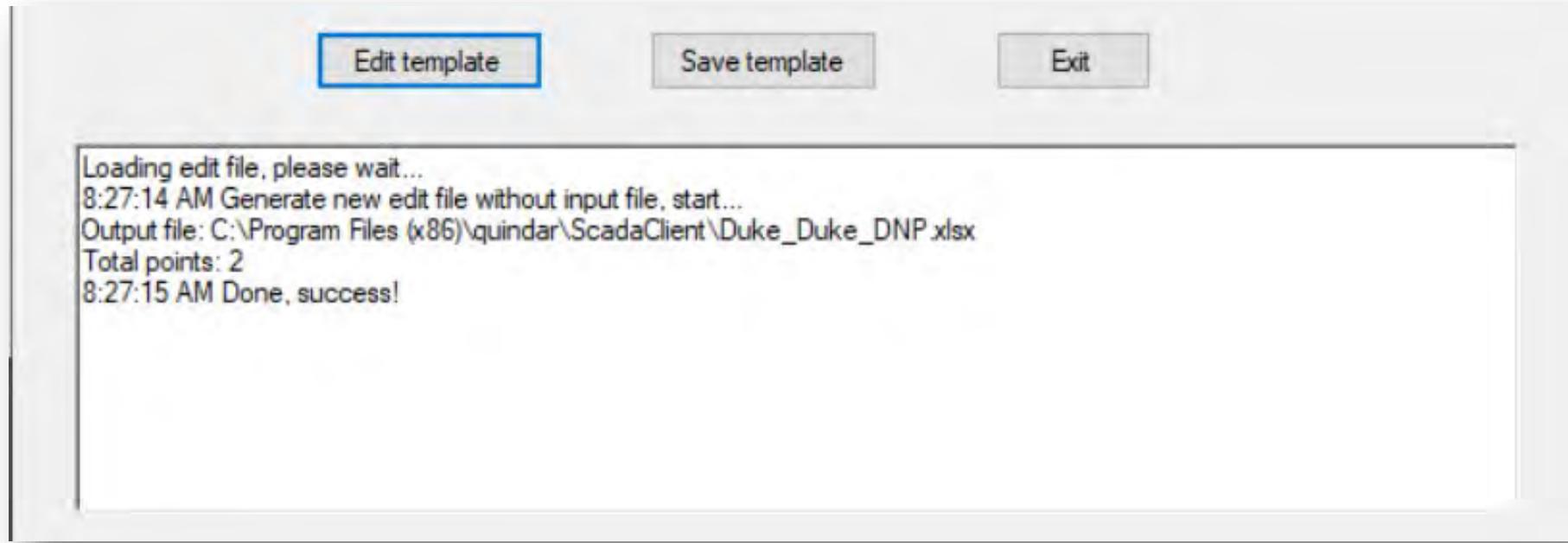
The screenshot shows a software window titled "Template Maker". On the left, there is a sidebar labeled "Input File" with four radio button options: "None" (selected), "SCL", "Excel", and "CSV". To the right of the sidebar, there are six input fields for specifying the number of different types of database points:

Point Type	Count
Number of status input points:	5
Number of analog input points:	5
Number of digital output points:	0
Number of analog output points:	0
Number of accumulation points:	0
Number of text points:	0

At the bottom of the window, there are two buttons: "Edit template" and "Exit".

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# Template Maker



- **Edit template button – will produce a log output, and then Microsoft Excel will automatically open up the spreadsheet (template)**

# Template Maker – Standard

- Usually, you will have an excel file from the person who configured the device in one of 3 different formats – SCL (for 61850 protocol), Excel or CSV.
- These files will have all the information you require to create a new template maker from scratch. You will need to just specify the amount of analog and status points you need to configure and then fill out the respective columns for each point of the device.

Index (30.0.X)	SCADA Name	SCADA Description	Raw Min	Raw Max	EU Scale	SCADA EU Min	SCADA EU Max	SCADA Low Low Limit	SCADA Low Low Priority	SCADA Low Limit	SCADA Low Priority	SCADA High Priority	SCADA High Limit	SCADA H-H Priority	Comments
1003	HS5B117PAV	HS 5B1-17 Phase A Volts 46 KV	0	28900	578	0	50	43.0	1	45.4	2	50.2	2	52.6	1
1004	HS5B117PBV	HS 5B1-17 Phase B Volts 46 KV	0	28900	578	0	50	43.0	1	45.4	2	50.2	2	52.6	1
1005	HS5B117PCV	HS 5B1-17 Phase C Volts 46 KV	0	28900	578	0	50	43.0	1	45.4	2	50.2	2	52.6	1
1006	HS5B117MW	HS 5B1-17 Megawatts	-10000	10000	100	-100	100								Status only. No alarm limits
1007	HS5B117MVAR	HS 5B1-17 MVAR	-20000	20000	1000	-20	20								Status only. No alarm limits
1008	HS5B217PA	HS 5B2-17 Phase A Amps	0	1600	1	0	1600					768	2	864	1
1009	HS5B217PB	HS 5B2-17 Phase B Amps	0	1600	1	0	1600					768	2	864	1
1010	HS5B217PC	HS 5B2-17 Phase C Amps	0	1600	1	0	1600					768	2	864	1
1011	HS5B217PAV	HS 5B2-17 Phase A Volts 46 KV	0	28900	578	0	50	43.0	1	45.4	2	50.2	2	52.6	1
1012	HS5B217PBV	HS 5B2-17 Phase B Volts 46 KV	0	28900	578	0	50	43.0	1	45.4	2	50.2	2	52.6	1
1013	HS5B217PCV	HS 5B2-17 Phase C Volts 46 KV	0	28900	578	0	50	43.0	1	45.4	2	50.2	2	52.6	1
1014	HS5B217MW	HS 5B2-17 Megawatts	-10000	10000	100	-100	100								Status only. No alarm limits
1015	HS5B217MVAR	HS 5B2-17 MVAR	-20000	20000	1000	-20	20								Status only. No alarm limits

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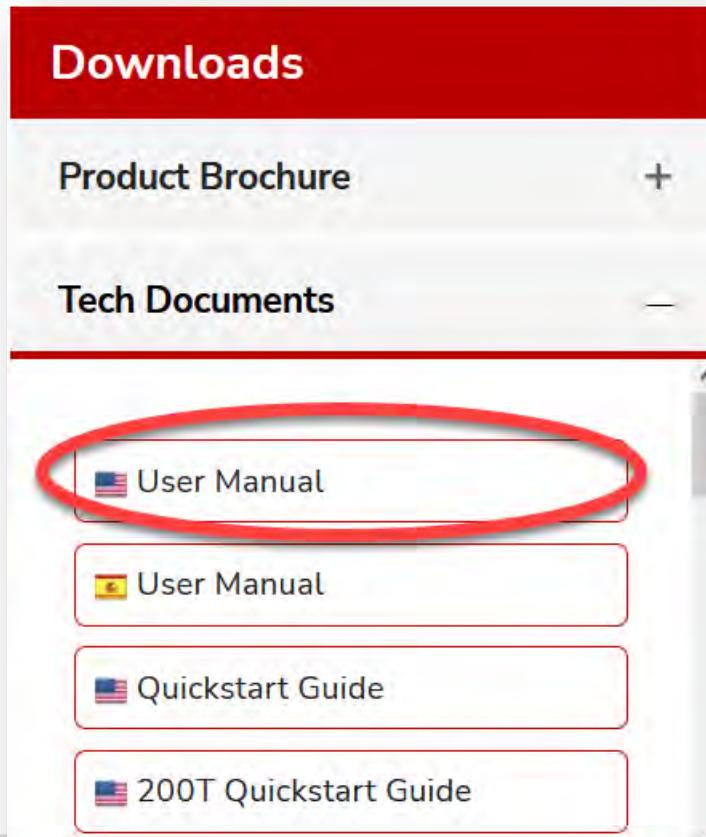
# Template Maker – Standard Process

- Once the input fields have been correctly populated, you can use the correct file type (Excel or CSV) to input and let the Template Maker turn it to the correct file type (iedans).

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# Template Maker – Useful Information

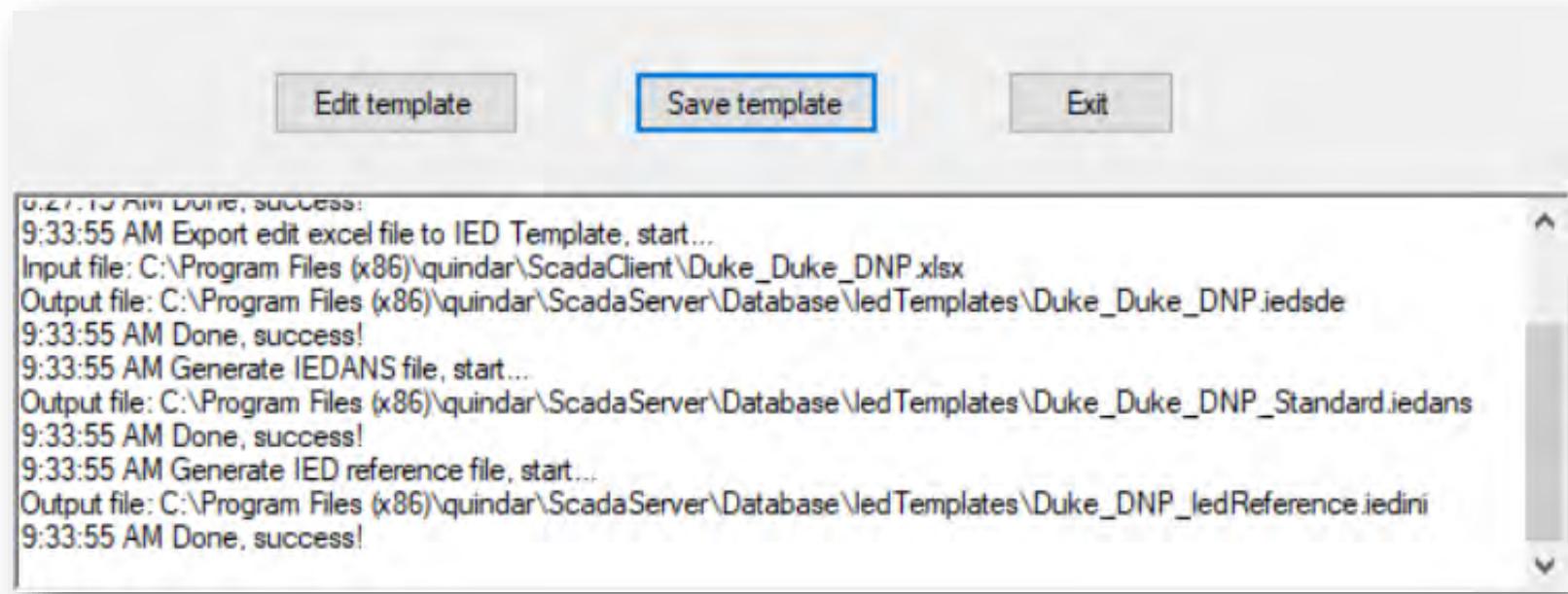
- Should you not have the required file in order to populate the excel spreadsheet, you can always consult the manufacturer for a user guide or input quick start document in order to get that information



Object 10 - Binary Output States								
Read with Object 10, Var 2, and Qualifiers 0, 1, 2 or 6. (Included in Class 0 responses.)								
Object	Point	Var	Description	Format	Range	Multiplier	Units	Comments
10	0	2	Reset Energy Counters	BYTE	Always 1	N/A	None	
10	1	2	Change to Modbus RTU Protocol	BYTE	Always 1	N/A	None	
10	2	2	Reset Demand Counters (Max / Min )	BYTE	Always 1	N/A	None	
10	3	2	Read Relay 1 State RO1S Relay 1 (expansion port 1)	BYTE	Bit Flags	N/A	None	Returns the Status and State of the Relay in the Flags.
10	4	2	Read Relay 2 State RO1S Relay 2 (expansion port 1)	BYTE	Bit Flags	N/A	None	Returns the Status and State of the Relay in the Flags.
10	5	2	Read Relay 3 State RO1S Relay 1 (expansion port 2)	BYTE	Bit Flags	N/A	None	Returns the Status and State of the Relay in the Flags.
10	6	2	Read Relay 4 State RO1S Relay 2 (expansion port 2)	BYTE	Bit Flags	N/A	None	Returns the Status and State of the Relay in the Flags.

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# Template Maker



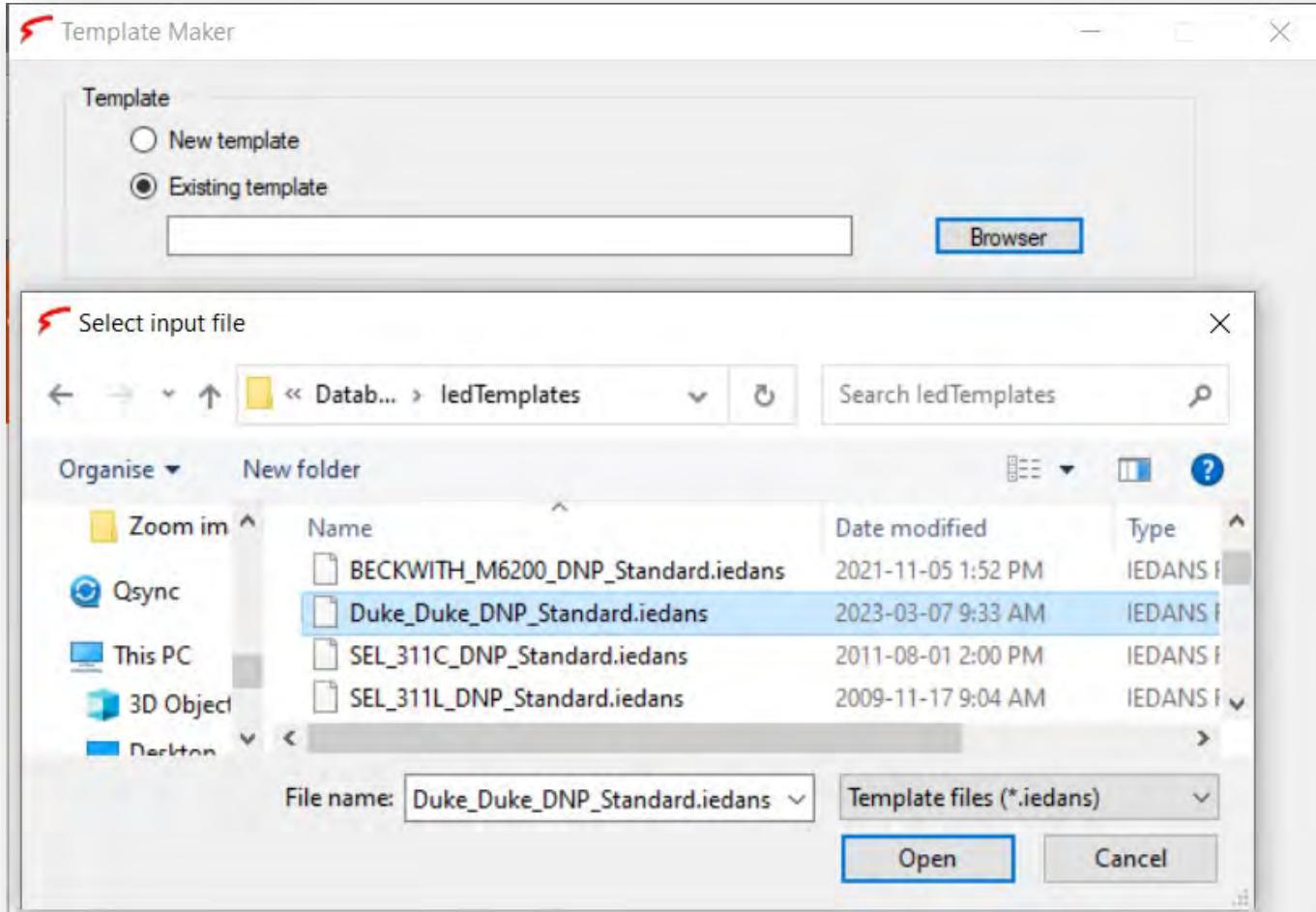
- Next, click the Save template button

As you can see above, there will be some files created for IED Wizard

- .Xlsx – spreadsheet
- .iedans | .iedsde | .iedini

# Template Maker

## Exercise



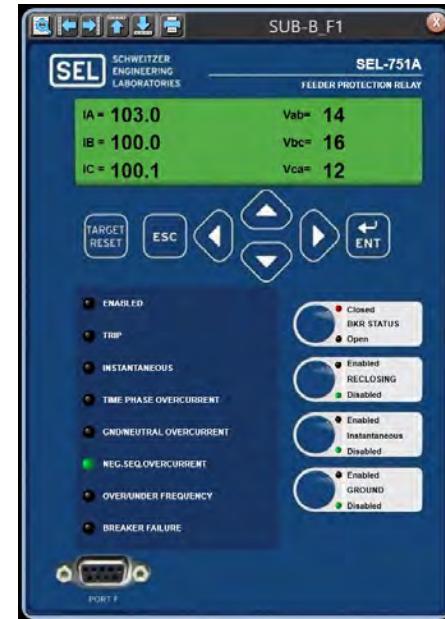
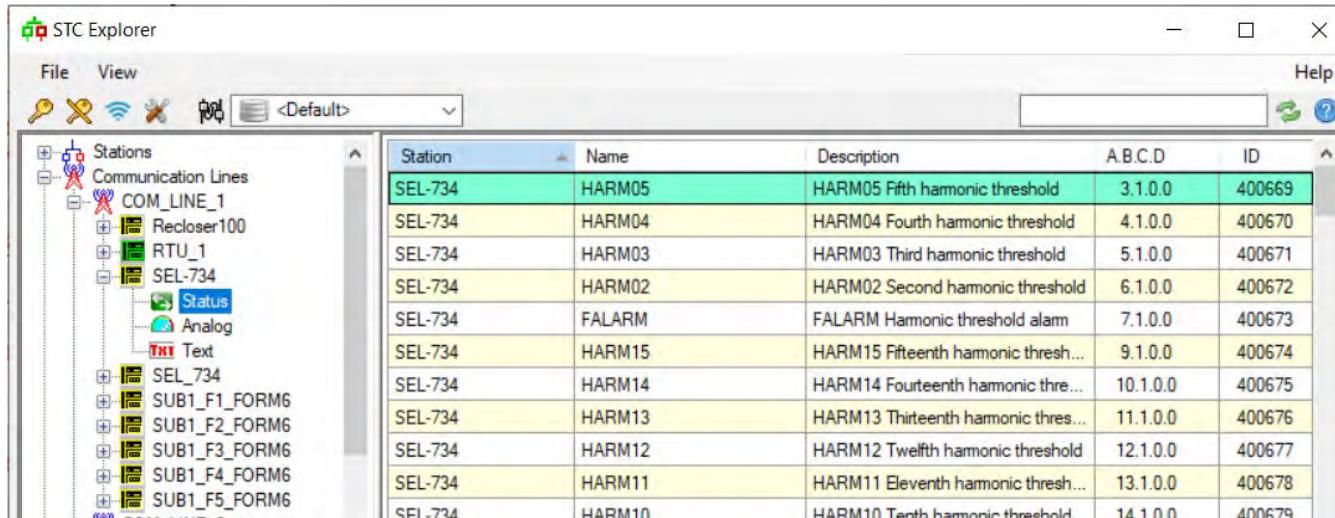
- Create a New template

# Section G – What are Control Panels?

## DEFINITION:

The IED Control Panel feature is a GUI development tool built into SmartVU.

It allows you to populate a substation drawing with buttons and numerical readings typically seen on an IED within the substation infrastructure.



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# Section G - Key Points

- Control panels are essentially small SmartVU popup windows that are invoked by their corresponding Pmacros
  - Station
  - Status
  - Pushbutton
- Control Panels need to be linked to the station name of the IED .
- From here the control panel will automatically use the point names to find the correct status or analog point with the same name.
- This is why an organized database with correct short names allows for effective database and graphics creation

# Section G - Key Components

## Control Panel Library

- Survalent designs and provides a list of common IEDs.
- Control panel graphics can be downloaded from the support portal. Once extracted and placed in the correct folder, the control panel can be linked to the created IED station

## Operation

- The control panels are called using station PMacros and these Station PMacros are placed on the map.
- License
  - Included with IED Wizard
  - IED Wizard/Control Panel – follow a standard naming convention for points using “shortnames”

# Section G – Control Panels Templates

- Available on the Survalent User Portal
- Includes a list of templates made by Survalent
- Various manufacturers and models of Control Panels
- Looking for more? Call Survalent Support

The image consists of two side-by-side screenshots of the Survalent User Portal interface.

**Screenshot 1: Downloads Section**

This screenshot shows the top navigation bar with links: Home, Topics & Articles, Feeds, Groups, Cases, Ideas, **Downloads** (which is highlighted with a red oval), and Security Bulletin. Below the navigation is a sidebar labeled "Files" and "Libraries". The sidebar includes buttons for "Owned by Me", "Shared with Me", "Recent", "Following", and "Libraries". The main content area displays a table with columns "Name" and "Owner". It lists three items: "ADMS Releases", "Software IED Wizard Templates", and "Software Control Panels". The "Software Control Panels" item is circled with a red oval.

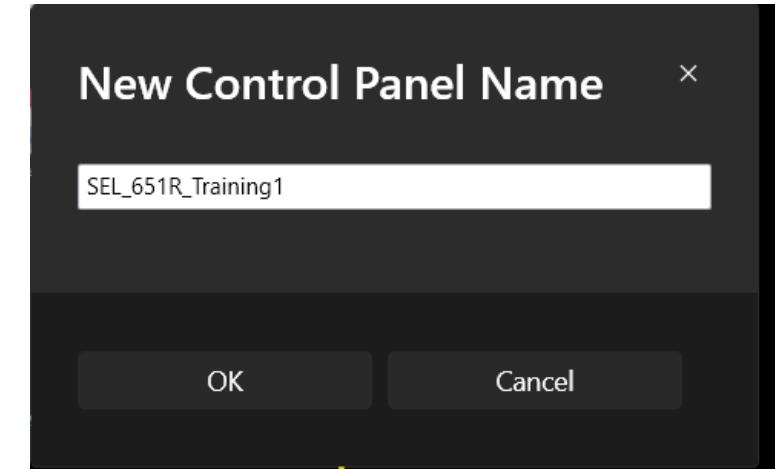
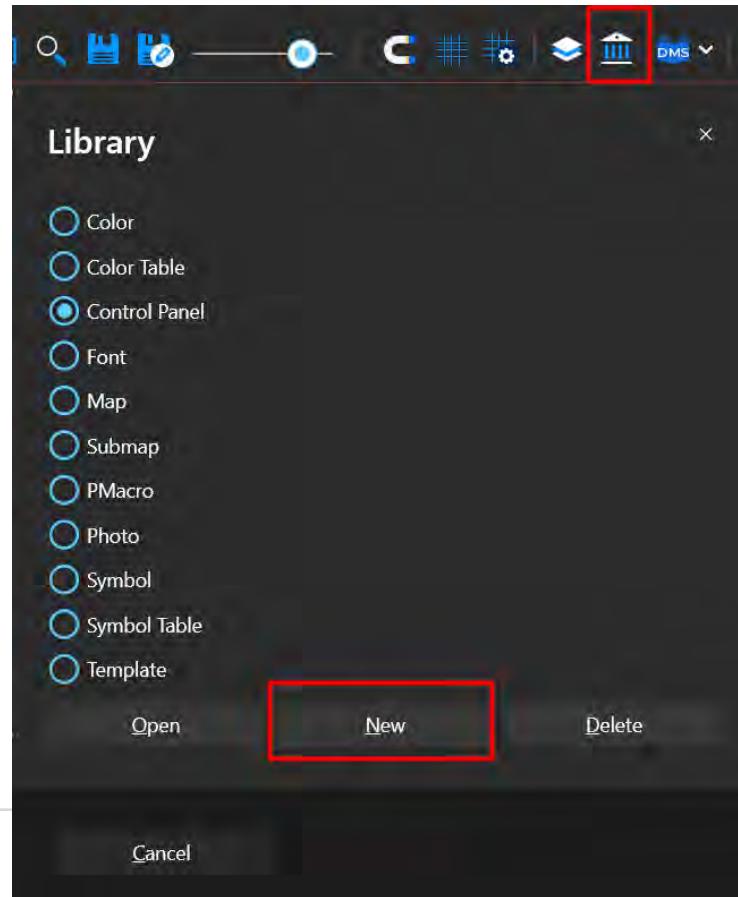
**Screenshot 2: Software Control Panels Library**

This screenshot shows a list titled "Software Control Panels" with a subtitle "125+ items". The list is sorted by "Title ↑". It shows several entries, each with a ZIP file icon and a file name: "SEL-351P", "SEL-351R Relay", "SEL-351RS", "SEL-351S Relay Feeders", and "SEL-351S Relay Main". The entire list is circled with a large red oval.

# Section H – Creating Control Panels

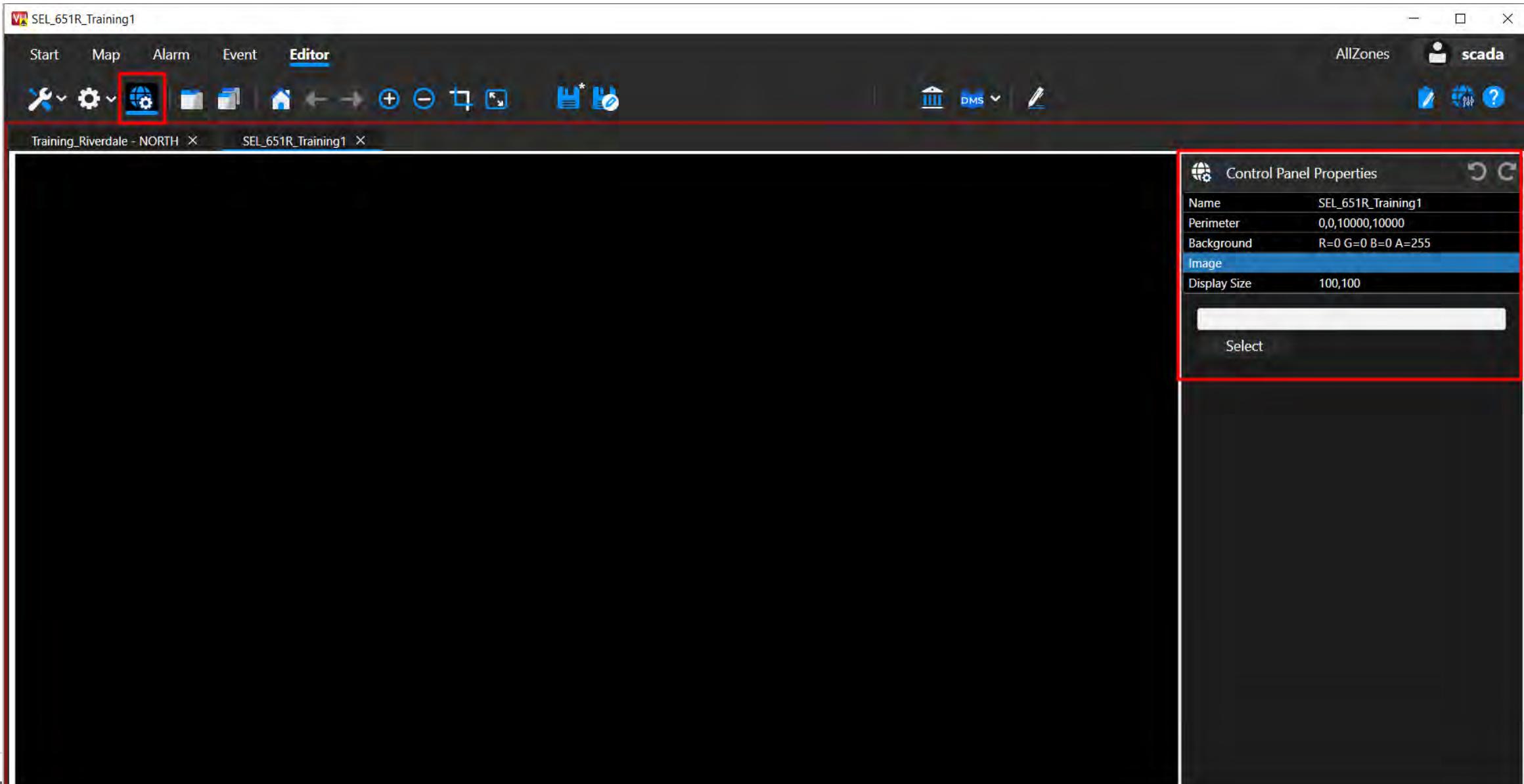
- Making new Control Panel

- SmartVU – Open Map “Training Riverdale” and go to substation
- Edit mode
- Library
- Control panel
- Click New



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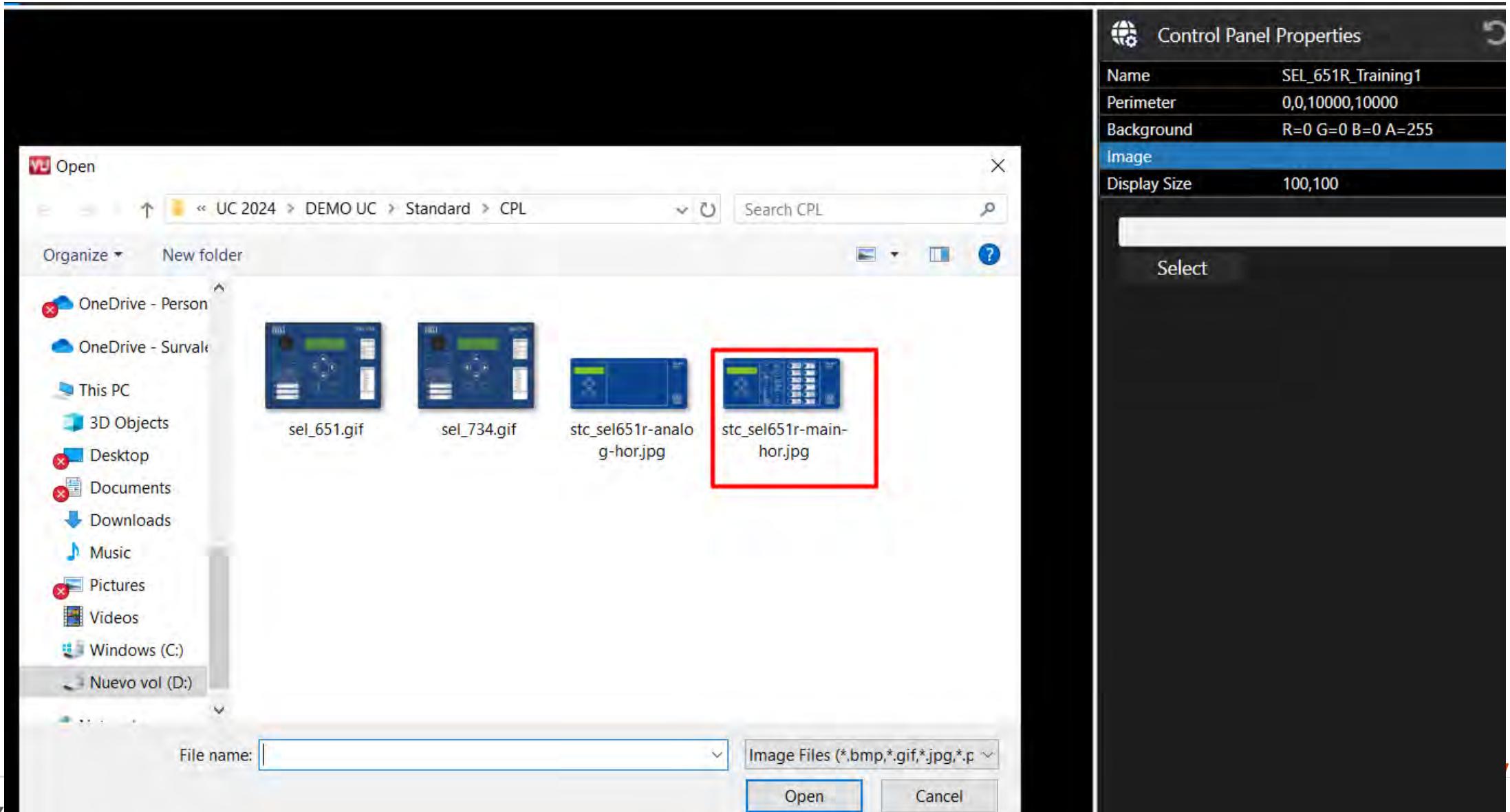
# Section H – Creating Control Panels



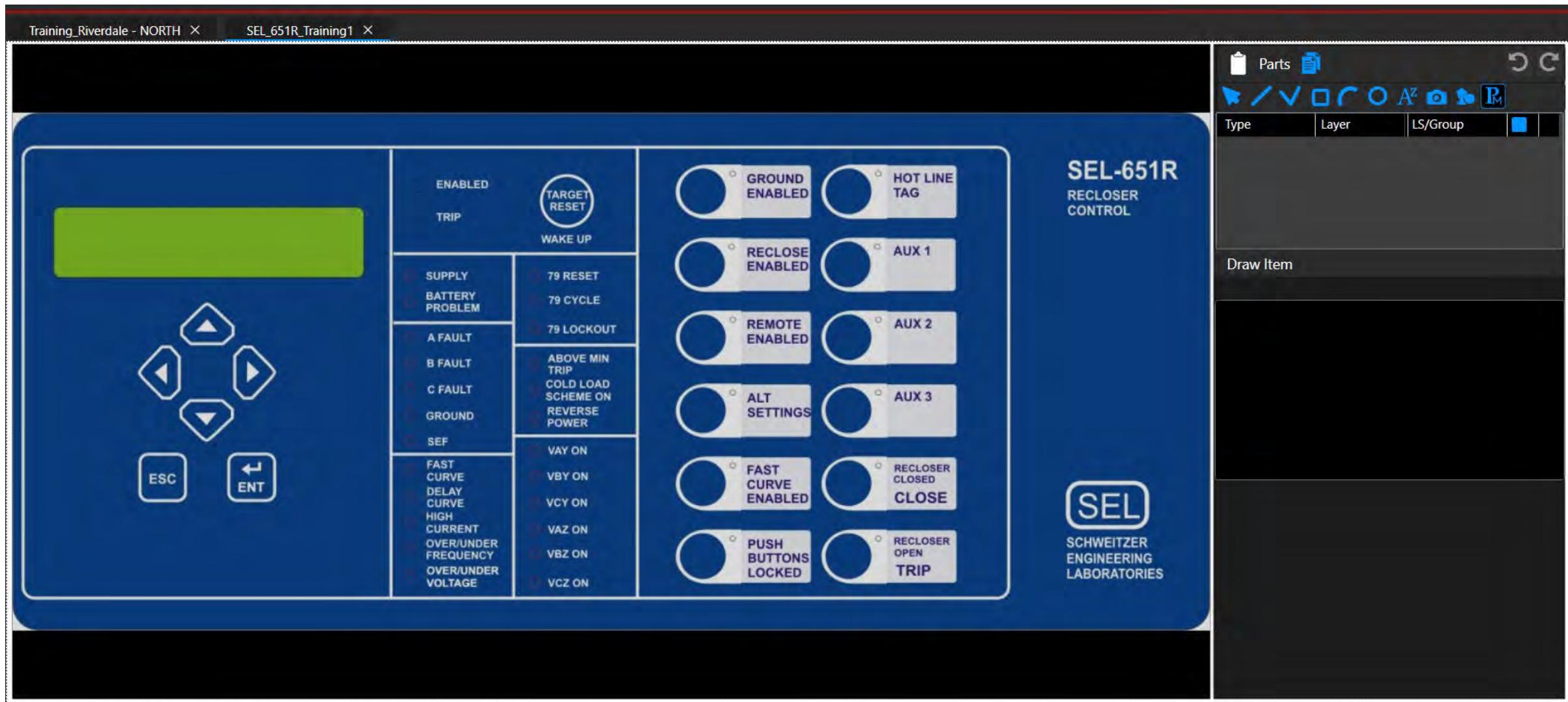
# Section H – Creating Control Panels

- Adjust size
  - Adjust size of Control Panel
- Background color
  - Choose background color
  - Save the Control Panel
  - Start drawing
- Using an image
  - Choose image (resize if necessary)
  - Save the Control Panel
  - Start Drawing

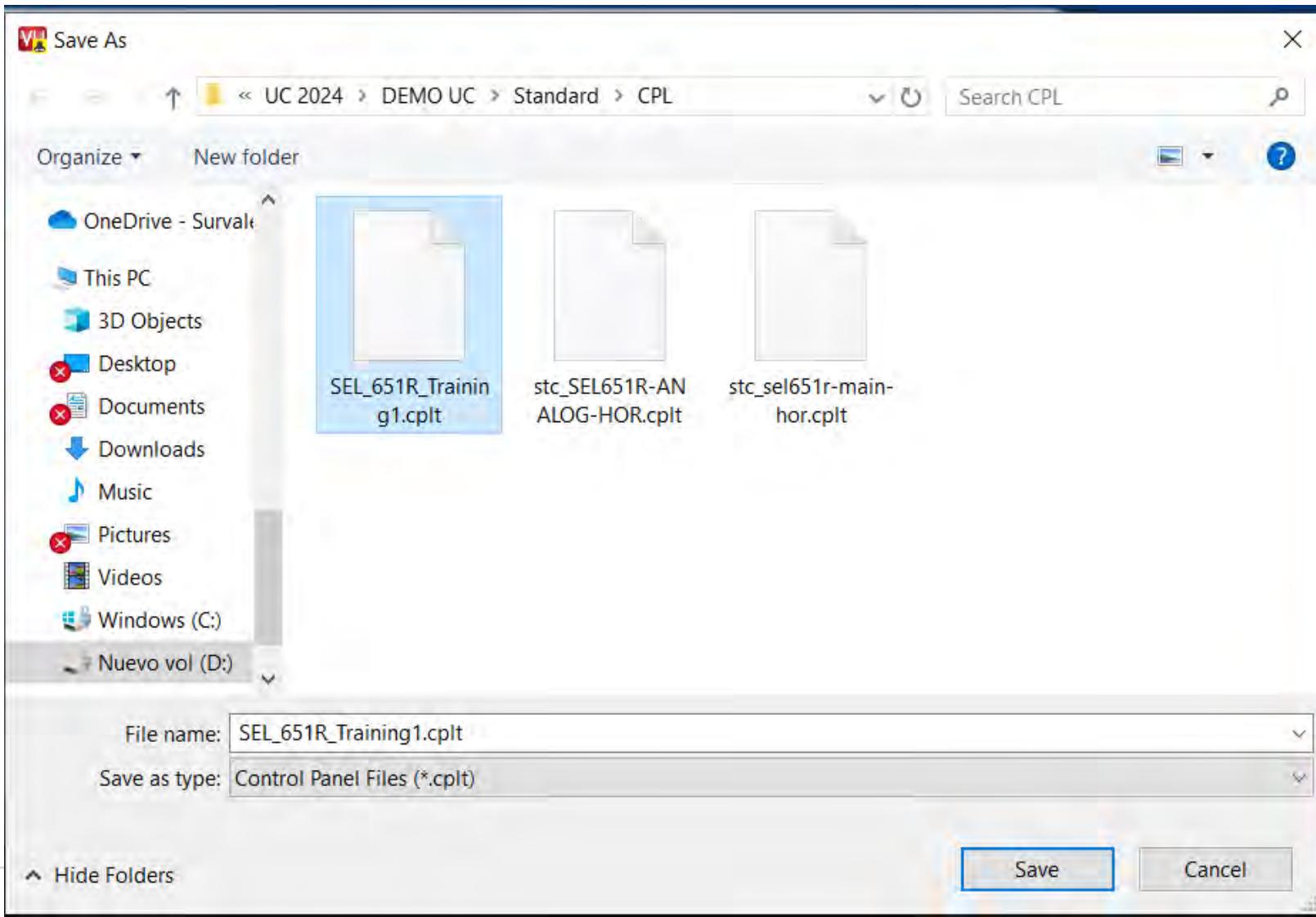
# Section H – Creating Control Panels



# Section H – Creating Control Panels



# Section H – Creating Control Panels

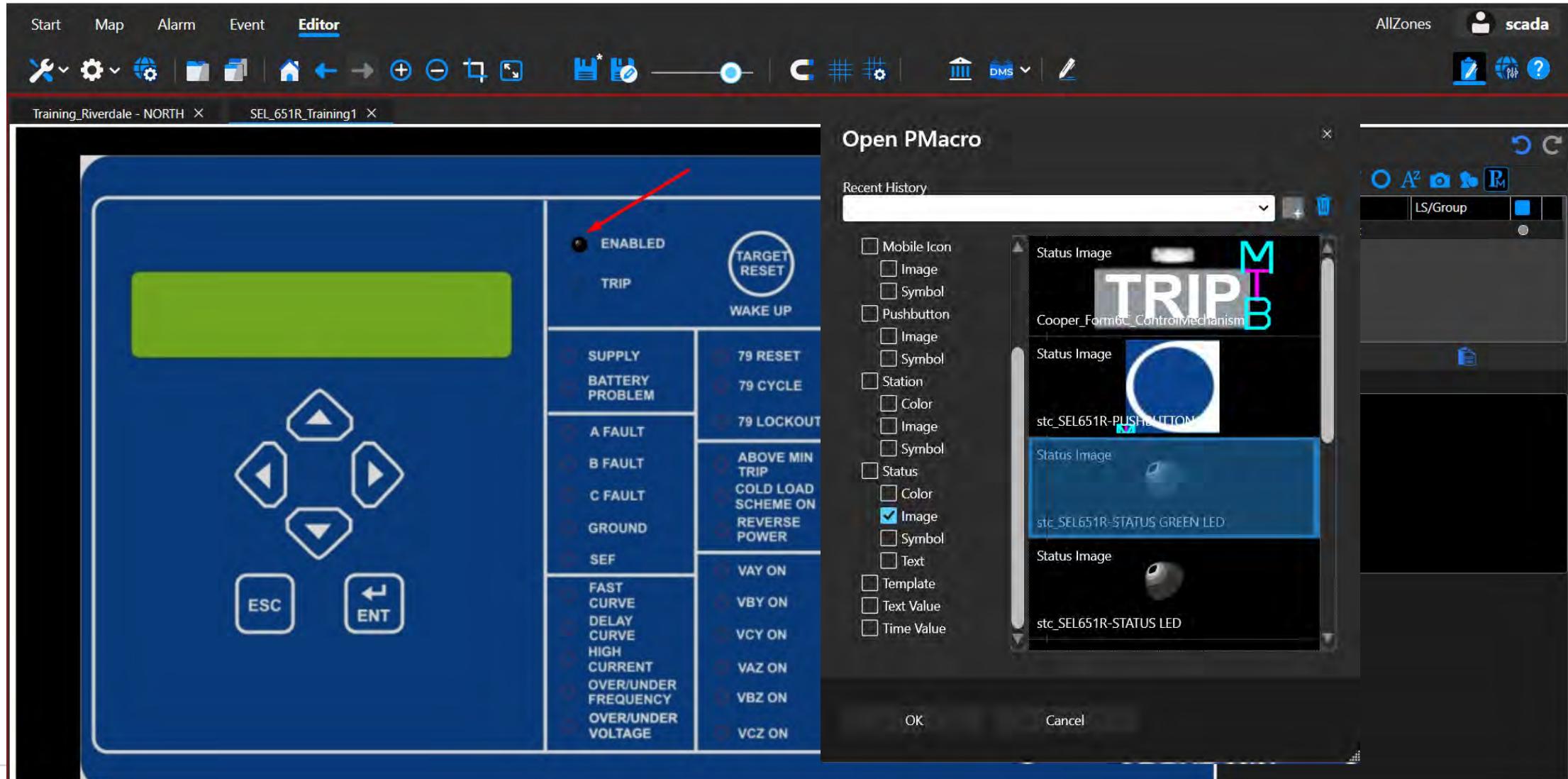


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# Section H – Creating Control Panels

- Steps:
  - Place one LED
  - Place text for the LED (if required)
  - Align the LED and the text
  - Copy the whole portion and do one row
  - Connect points

# Section H – Creating Control Panels



## Section H – Creating Control Panels

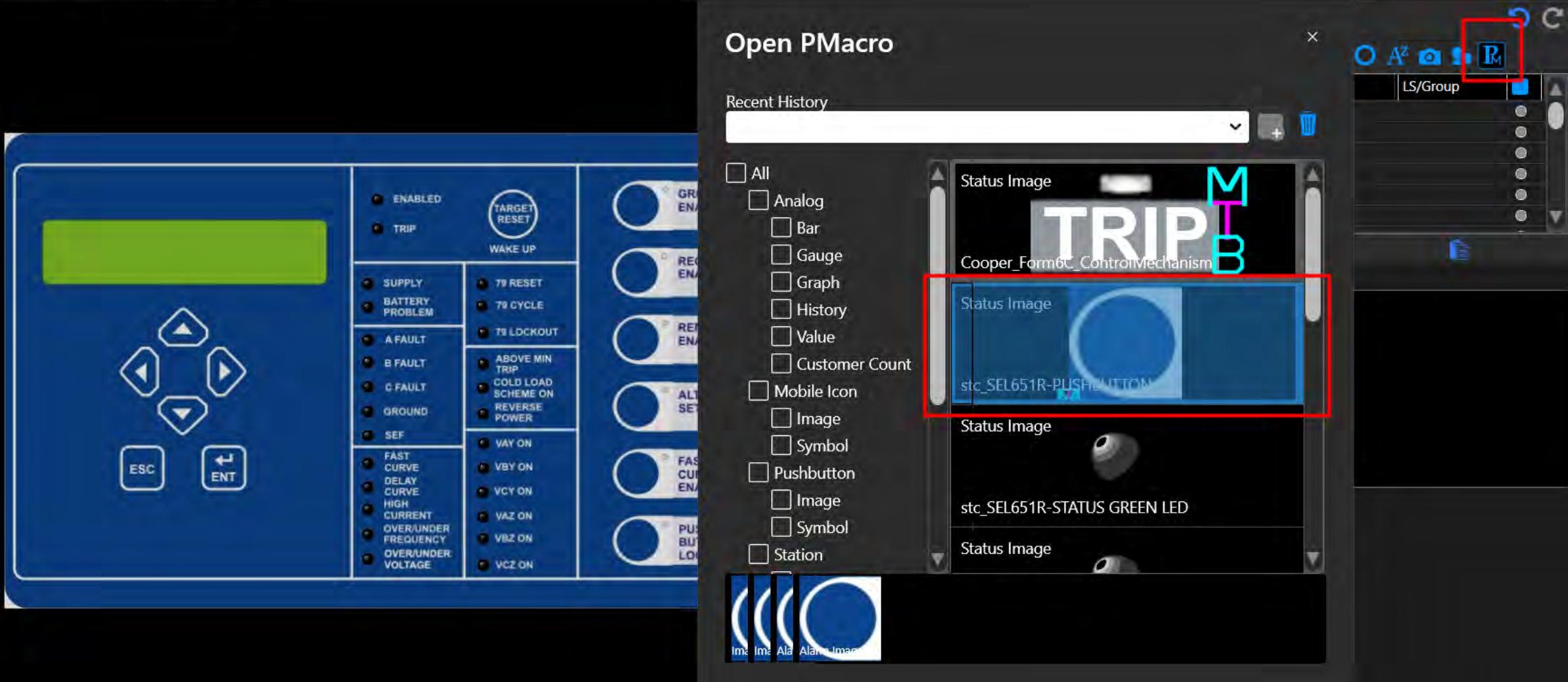
The screenshot shows a SCADA software interface with the following components:

- Top Bar:** Includes tabs for Start, Map, Alarm, Event, Editor (selected), AllZones, and a user icon labeled "scada".
- Toolbar:** Features various icons for file operations (New, Open, Save, Print, etc.), selection tools, and system settings.
- Control Panel Editor:** The main workspace displays a control panel with several sections:
  - A large green rectangular area on the left.
  - A vertical stack of fault indicators (TRIP, SUPPLY, BATTERY, PROBLEM) with associated status lights.
  - A vertical stack of fault indicators (A FAULT, B FAULT, C FAULT, GROUND, SEF) with associated status lights.
  - A vertical stack of fault indicators (FAST CURVE, DELAY CURVE, HIGH CURRENT, OVER/UNDER FREQUENCY, OVER/UNDER VOLTAGE) with associated status lights.
  - A vertical stack of trip indicators (WAKE UP, 79 RESET, 79 CYCLE, 79 LOCKOUT) with associated status lights.
  - A vertical stack of trip indicators (ABOVE MIN TRIP, COLD LOAD, SCHEME ON, REVERSE POWER) with associated status lights.
  - A vertical stack of trip indicators (VAY ON, VBV ON, VCY ON, VAZ ON, VBZ ON, VCZ ON) with associated status lights.
- Right Panel:** Shows a list of 12 items with columns for Type, Layer, LS/Group, and a checkbox column.

Type	Layer	LS/Group	
+ Status Image	default		
+ Status Image	default		
+ Status Image	default		
+ Status Image	default		
+ Status Image	default		
+ Status Image	default		
+ Status Image	default		
+ Status Image	default		
+ Status Image	default		
+ Status Image	default		
+ Status Image	default		
+ Status Image	default		
- Bottom Bar:** Includes buttons for Set Color, Set Layer, Set LS Group, Set Font, Align, Change Station, Front / Back, Extract, and Clear.

# Section H – Creating Control Panels

Training\_Riverdale - NORTH X SEL\_651R\_Training1 X



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## Section H – Creating Control Panels

The screenshot shows a SCADA software interface with the following components:

- Top Bar:** Includes tabs for Start, Map, Alarm, Event, Editor (selected), All Zones, and a user icon labeled "scada".
- Toolbar:** Features various icons for file operations (New, Open, Save, Print, Copy, Paste, Find, etc.), selection tools (Select, Zoom In, Zoom Out, Pan), and configuration (Properties, DMS).
- Control Panel:** A large blue rectangular panel representing a physical control unit. It includes:
  - A green rectangular area at the top left.
  - A 4-directional arrow navigation pad with ESC and ENT keys below it.
  - A vertical menu on the left side with options like ENABLED, TRIP, SUPPLY, BATTERY PROBLEM, A FAULT, B FAULT, C FAULT, GROUND, and SEF.
  - A list of trip conditions on the bottom left: FAST CURVE, DELAY CURVE, HIGH CURRENT, OVER/UNDER FREQUENCY, and OVER/UNDER VOLTAGE.
  - A central circular button labeled "TARGET RESET" with "WAKE UP" text below it.
  - A row of status indicators: GROUND ENABLED, HOT LINE TAG, RECLOSE ENABLED, AUX 1, REMOTE ENABLED, AUX 2, ALT SETTINGS, AUX 3, FAST CURVE ENABLE, RECLOSER CLOSED (with a "CLOSE" button), and PUSH BUTTONS LOCKED.
  - A "RECLOSER CONTROL" label and the SEL-651R logo.
  - The SCHWEITZER ENGINEERING LABORATORIES logo at the bottom right.
- Property Manager:** A floating window on the right side with tabs for X, Y, Width, Height, Factor, and Apply. It also includes a "Resize" button and a list of items under "Type: Status Image".
- Bottom Buttons:** A row of buttons for Set Color, Set Layer, Set LS Group, Set Font, Align, Change Station, Front / Back, Extract, and Clear.

# Section H – Creating Control Panels

Training\_Riverdale - NORTH X SEL\_651R\_Training1 X

SEL-651R RECLOSE CONTROL

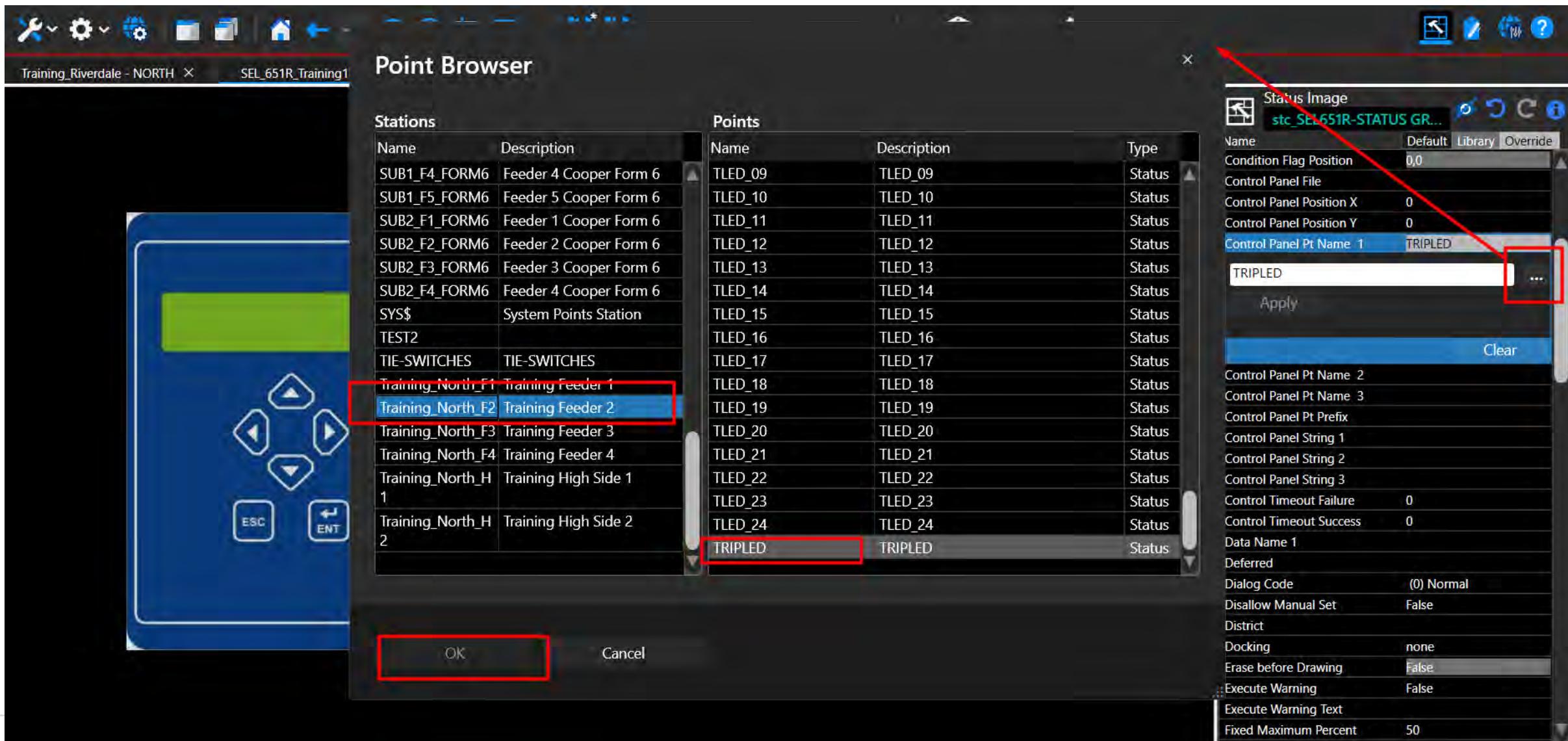
SEL SCHWEITZER ENGINEERING LABORATORIES

Status Image: stc\_SEL651R-STATUS GR...

Name	Default	Library	Override
Alarm Image 01	stc_SEL651GREEN LED.gif		
Alarm Image 02			
Alarm Image 03			
Blank If No Point or No Value	False		
Condition Flag	False		
Condition Flag Color Table	stc_FLAG_STATUS		
Condition Flag Position	0,0		
Control Panel File			
Control Panel Position X	0		
Control Panel Position Y	0		
Control Panel Pt Name 1	EN		
EN			
Apply			
Clear			
Control Panel Pt Name 2			
Control Panel Pt Name 3			
Control Panel Pt Prefix			
Control Panel String 1			
Control Panel String 2			
Control Panel String 3			
Control Timeout Failure	0		
Control Timeout Success	0		
Data Name 1			
Deferred			
Dialog Code	(0) Normal		
Disallow Manual Set	False		

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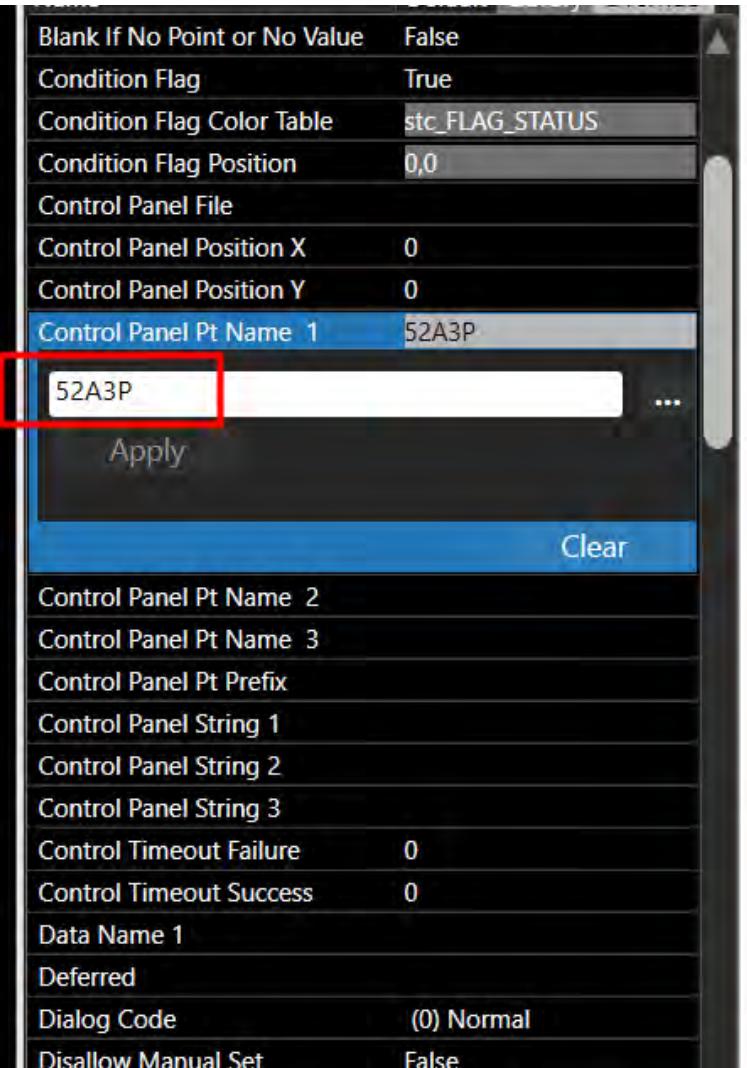
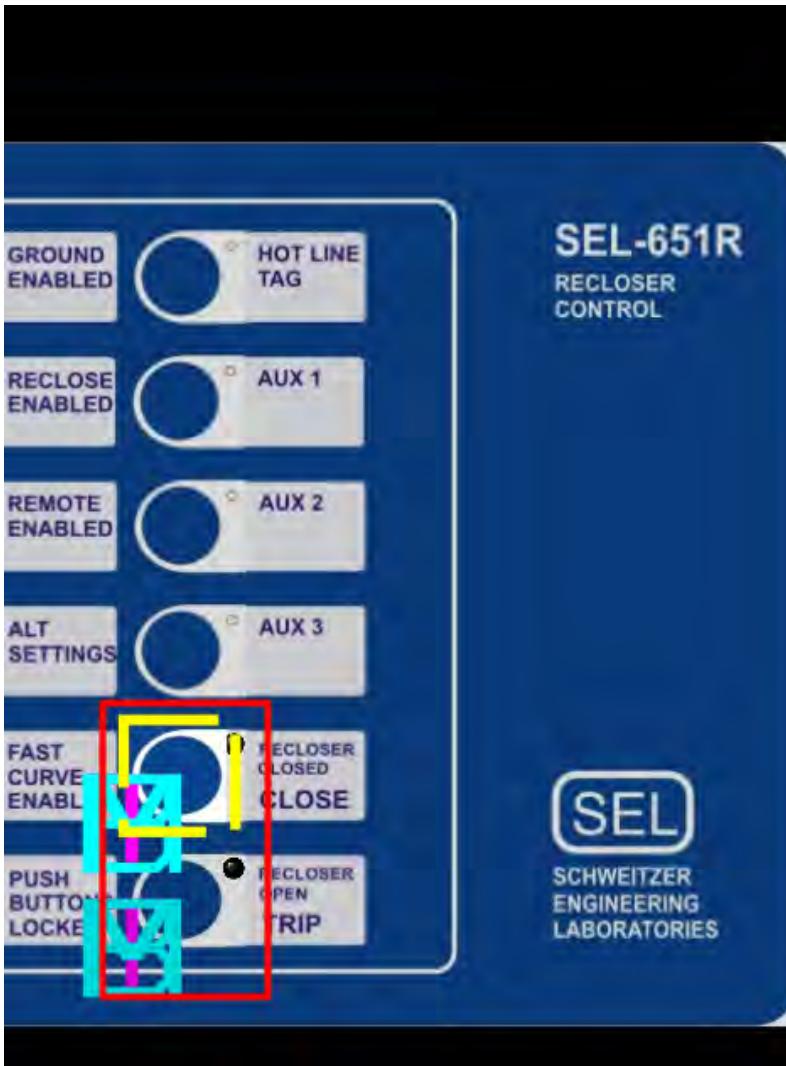
# Section H – Creating Control Panels



# Section H – Creating Control Panels

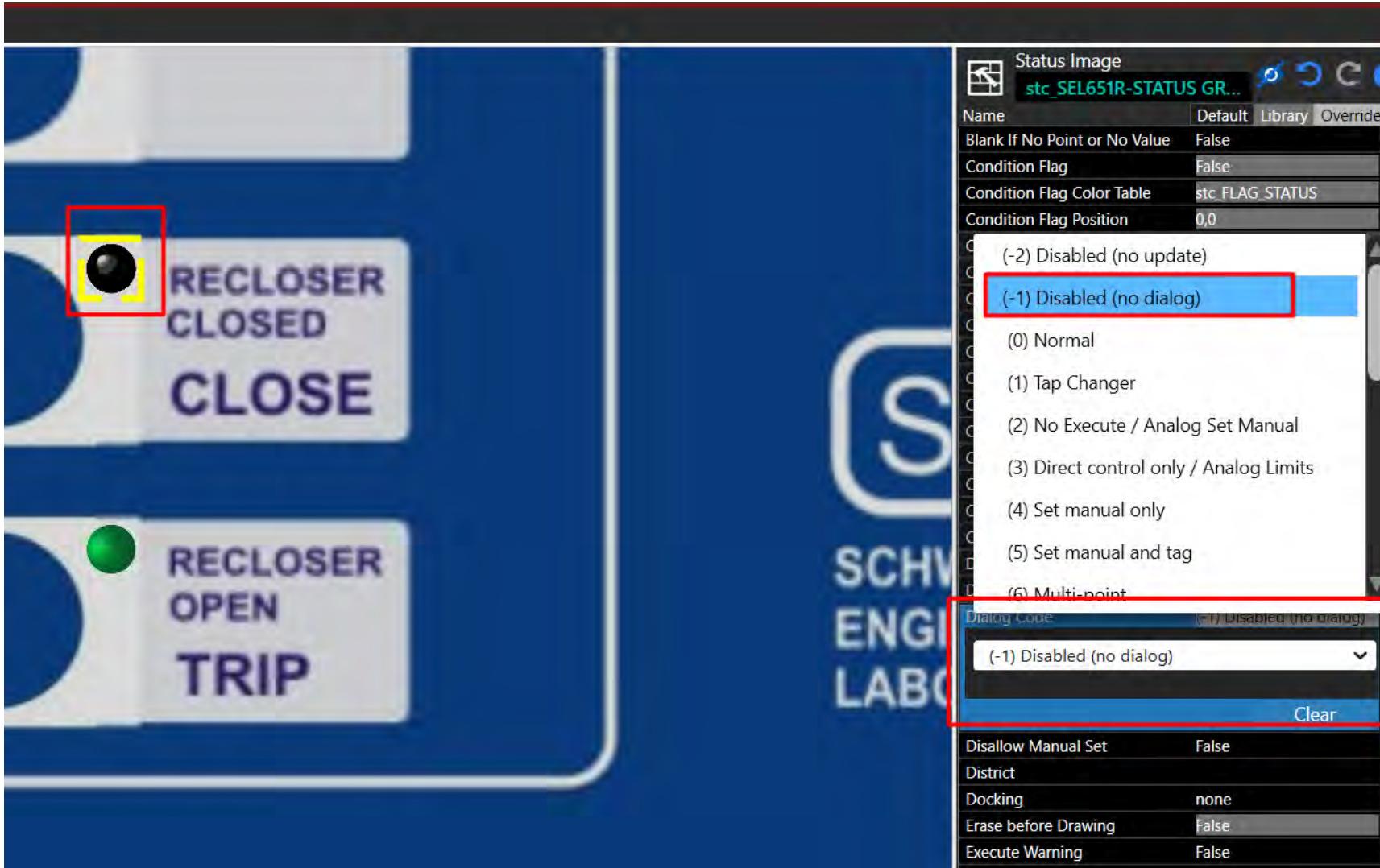
- Steps:
  - Place one LED
  - Place text for the LED (if required)
  - Align the LED and the text
  - Copy the whole portion and do one row
  - Connect points

# Section H – Creating Control Panels



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# Section H – Creating Control Panels

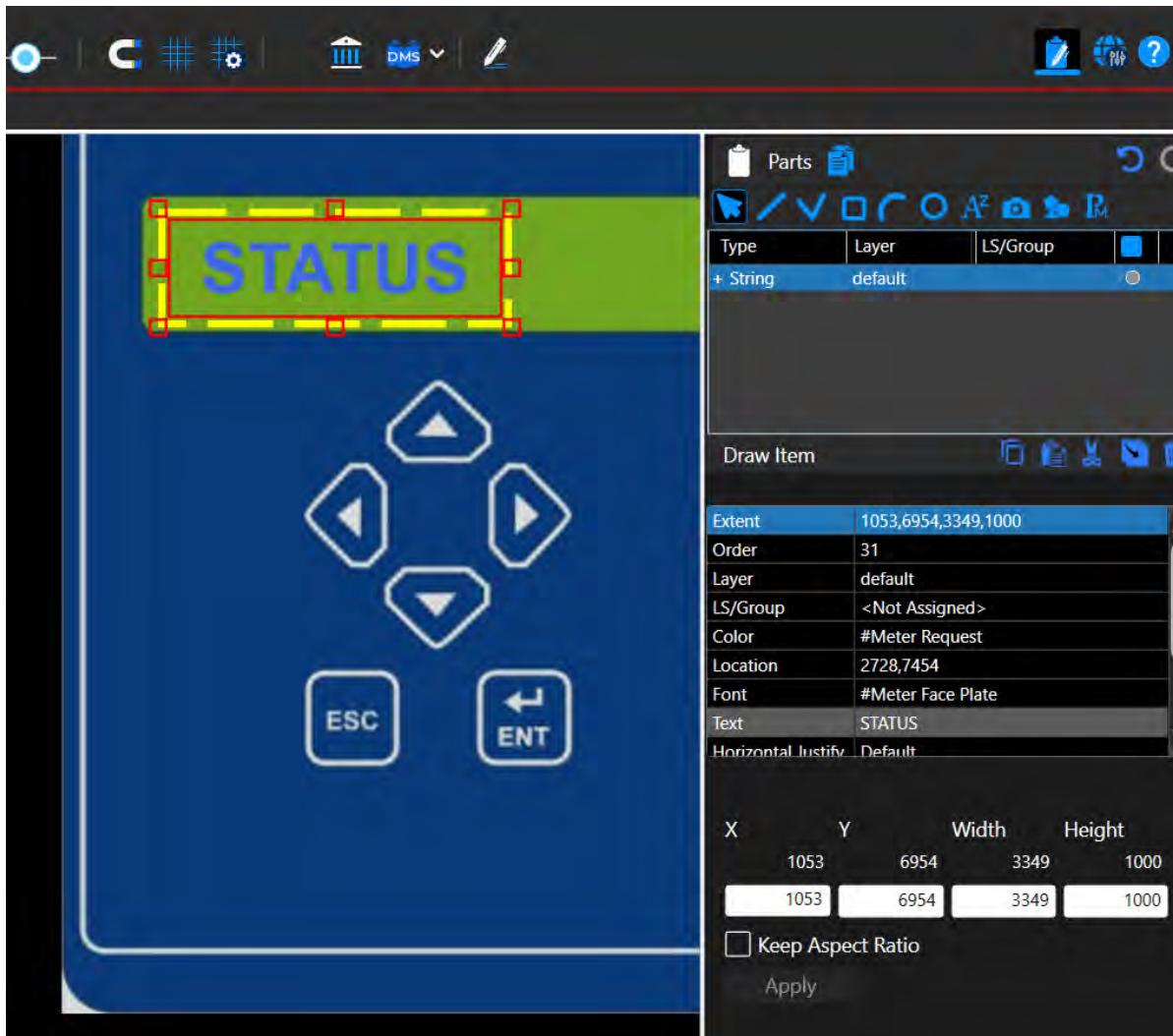


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# Section H – Creating Control Panels

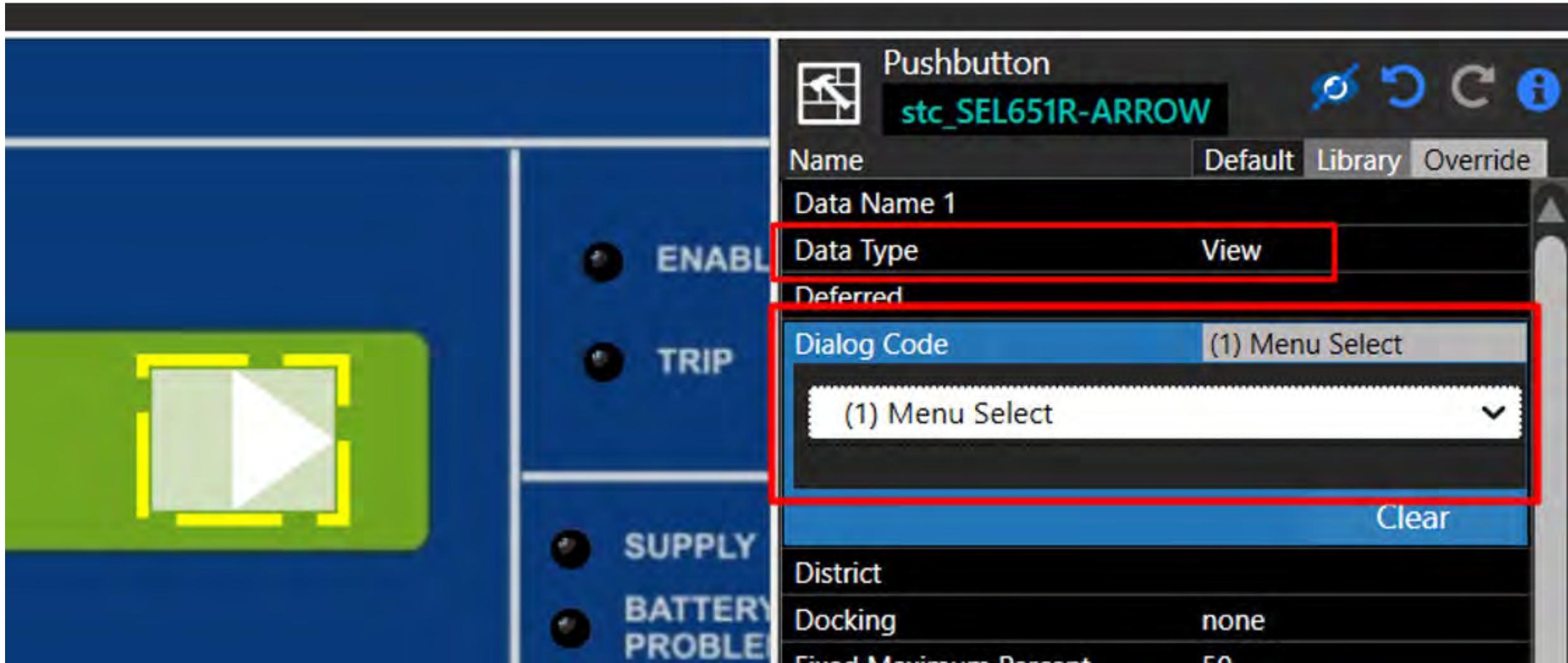
- Call a second Control Panel – Steps:
  - Add a text to identify your “Main” control panel (optional)
  - Add a Pushbutton
  - Associate the pushbutton to the second control panel - Conditions:
    - Data Type: View
    - Dialog Code: Menu select
    - Menu file: In Standard\CPL folder select the Control Panel
  - Save the control Panel

# Section H – Creating Control Panels



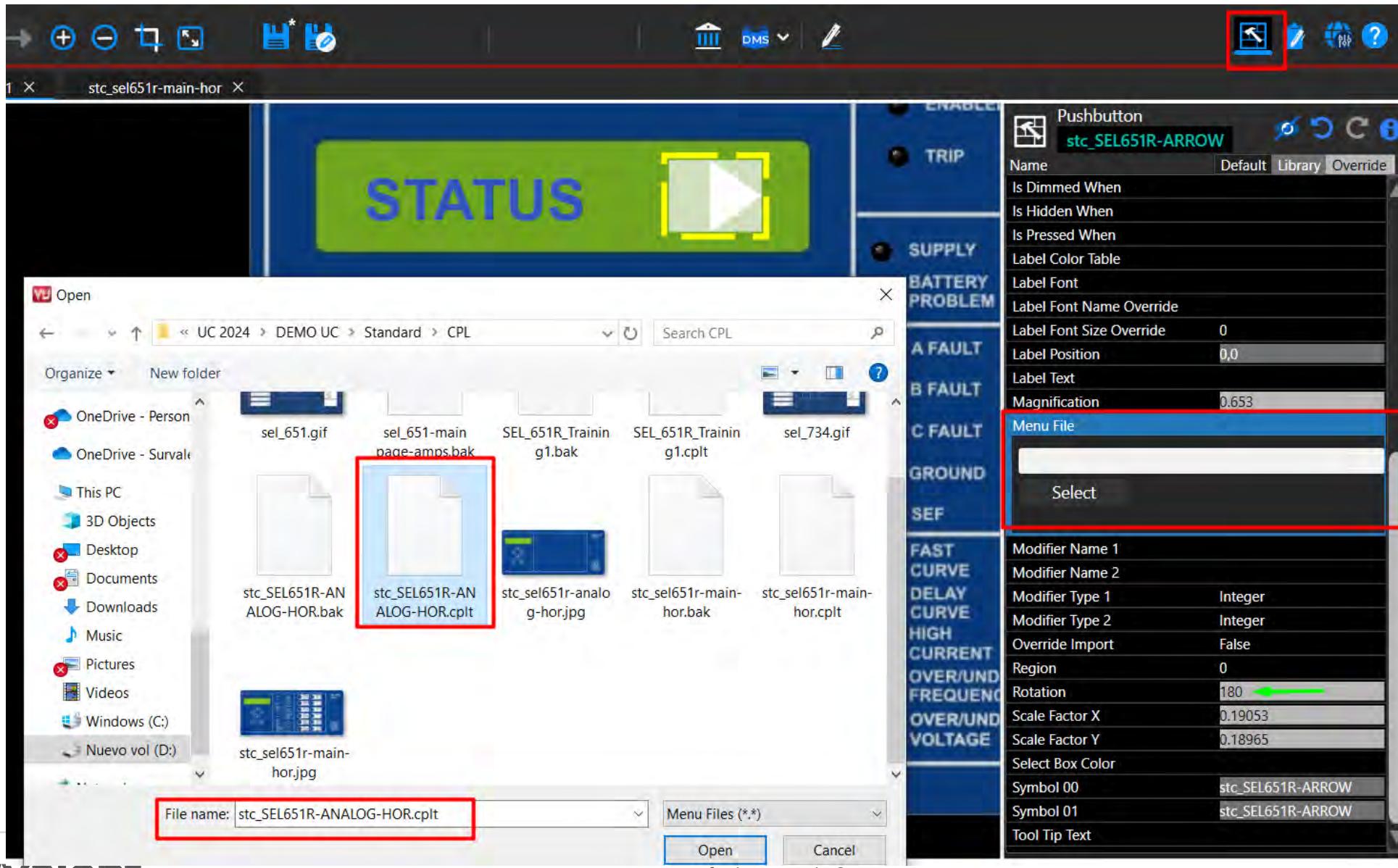
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# Section H – Creating Control Panels



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# Section H – Creating Control Panels



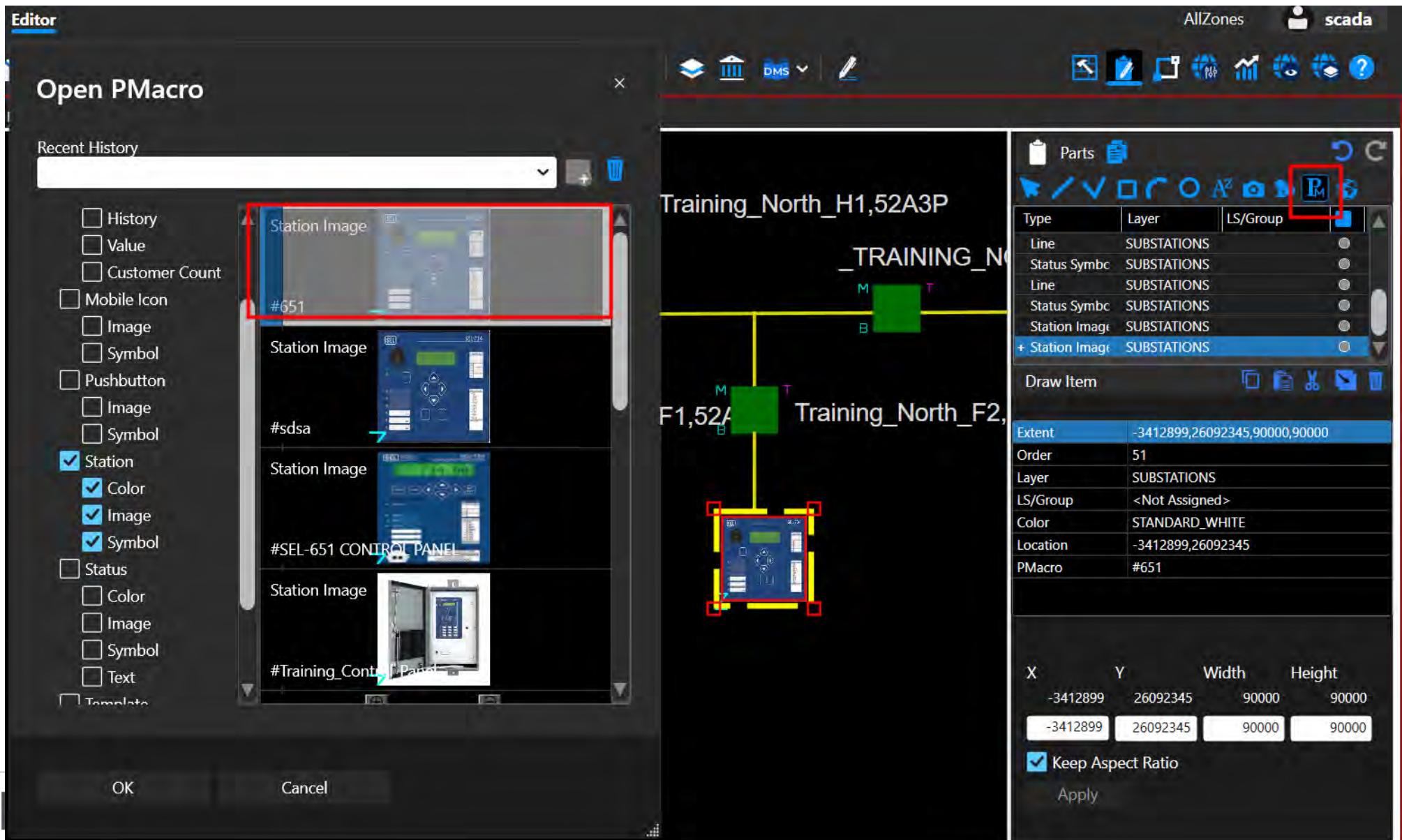
Confidential & Proprietary

# Section H – Creating Control Panels

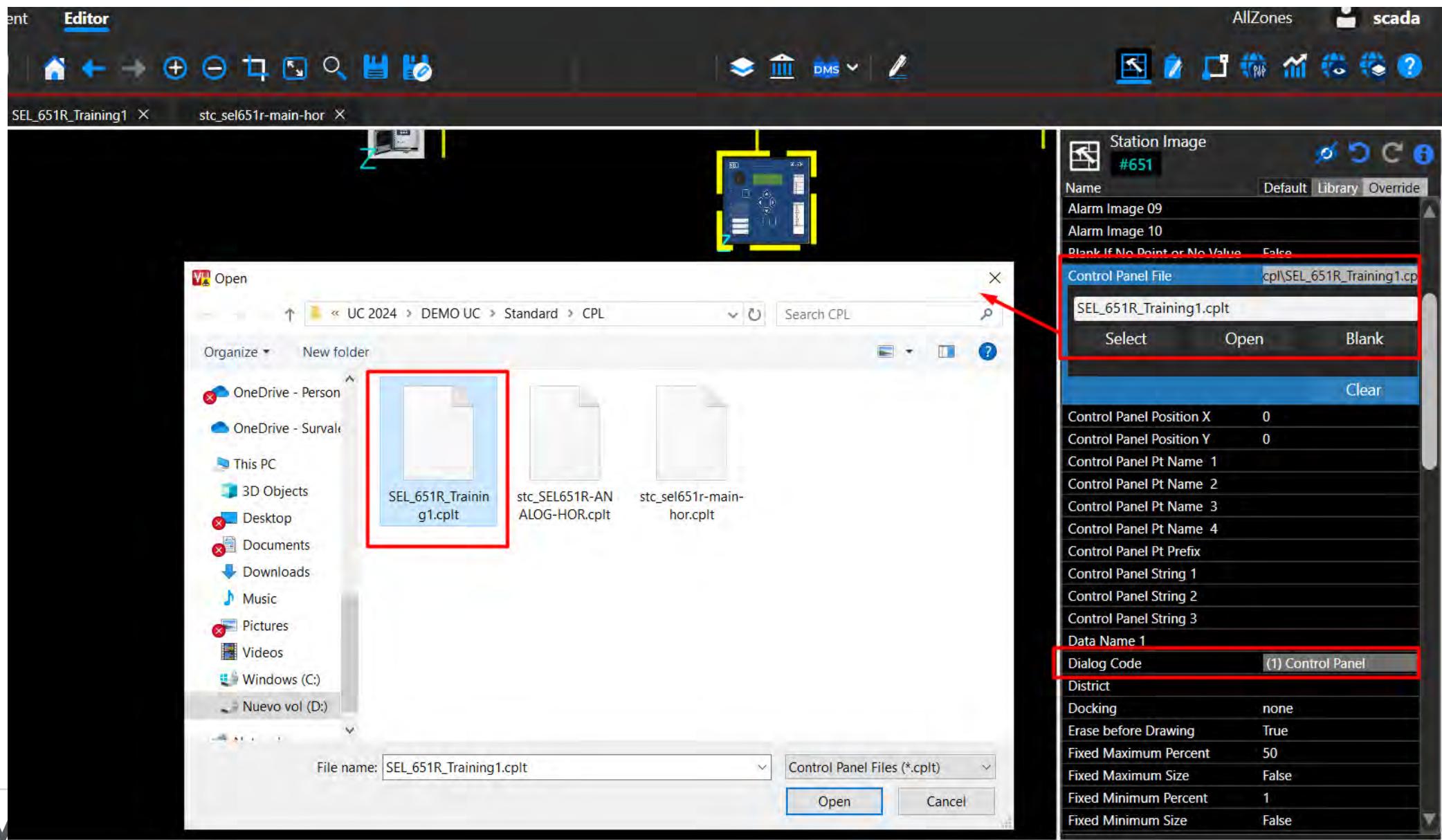
- Insert the control Panel in the Map
  - Add a STATION PMACRO into the MAP
    - Dialog Code: Control Panel
    - Control Panel File Name: In Standard\CPL folder select the Control Panel
    - PointId: Select the Station
  - Save the map

Note: Now you can use this same control panel for any other station that has the same IED.

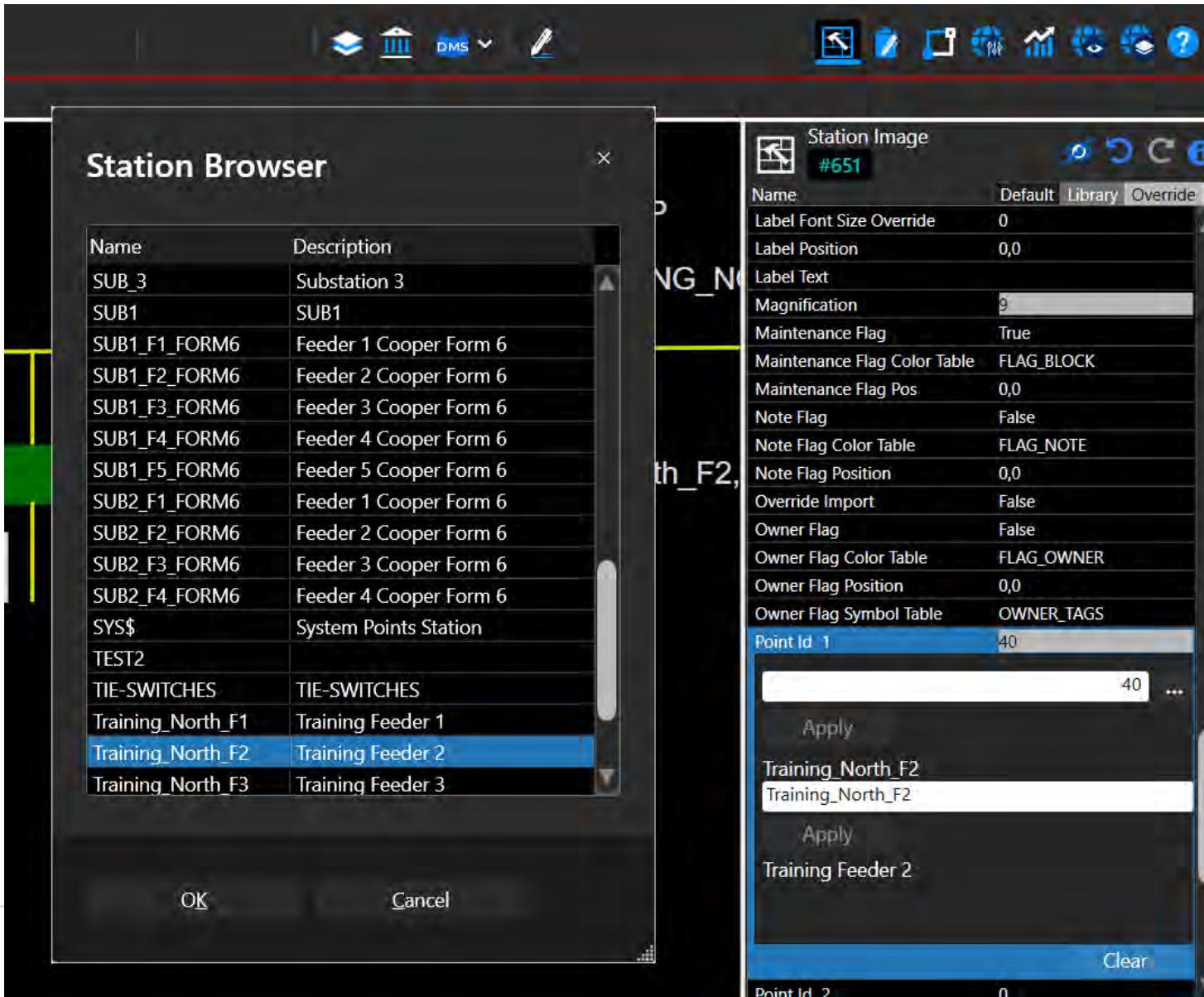
# Section H – Creating Control Panels



# Section H – Creating Control Panels

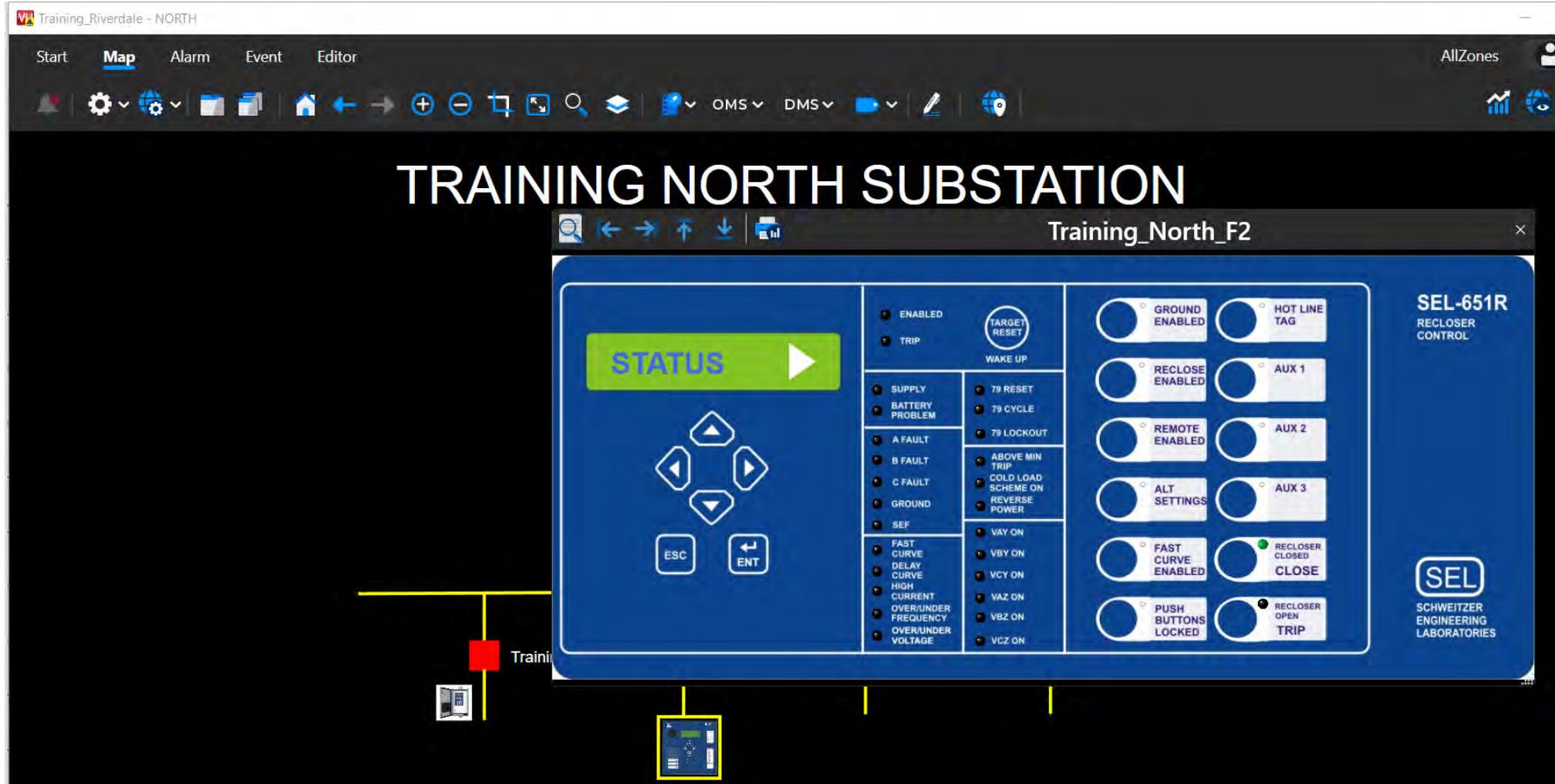


# Section H – Creating Control Panels



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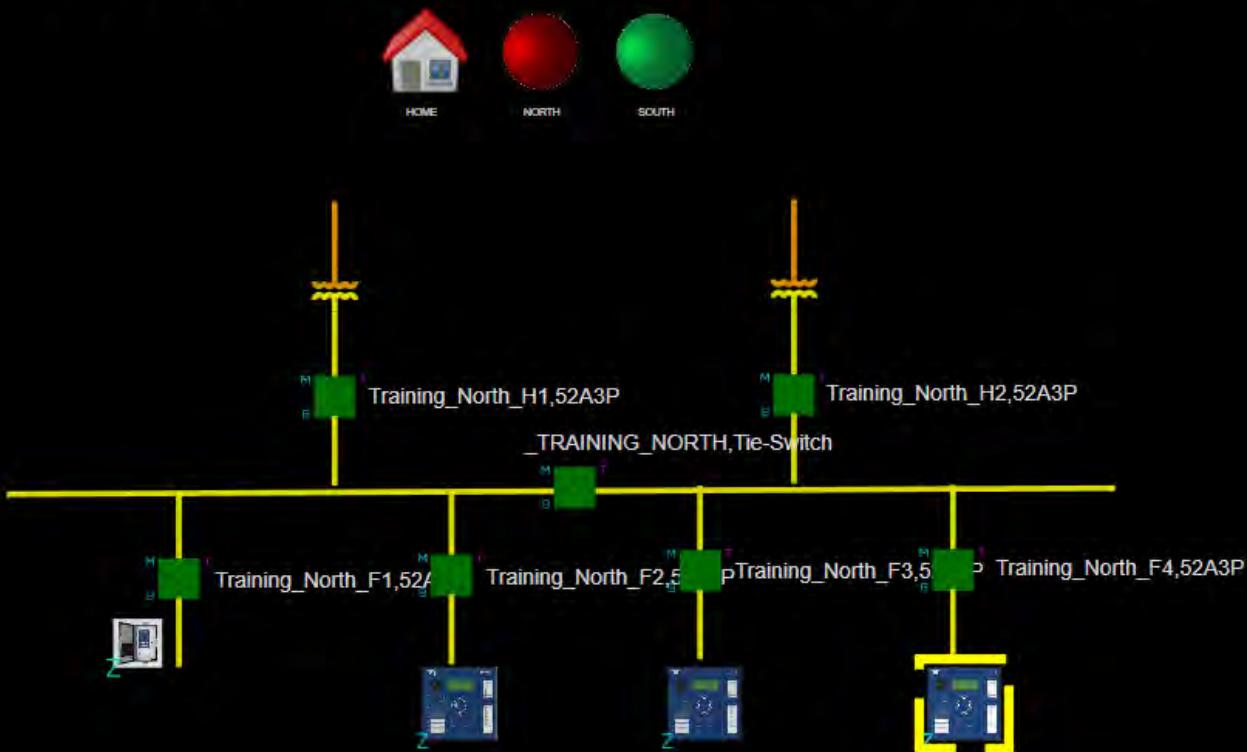
# Section H – Creating Control Panels



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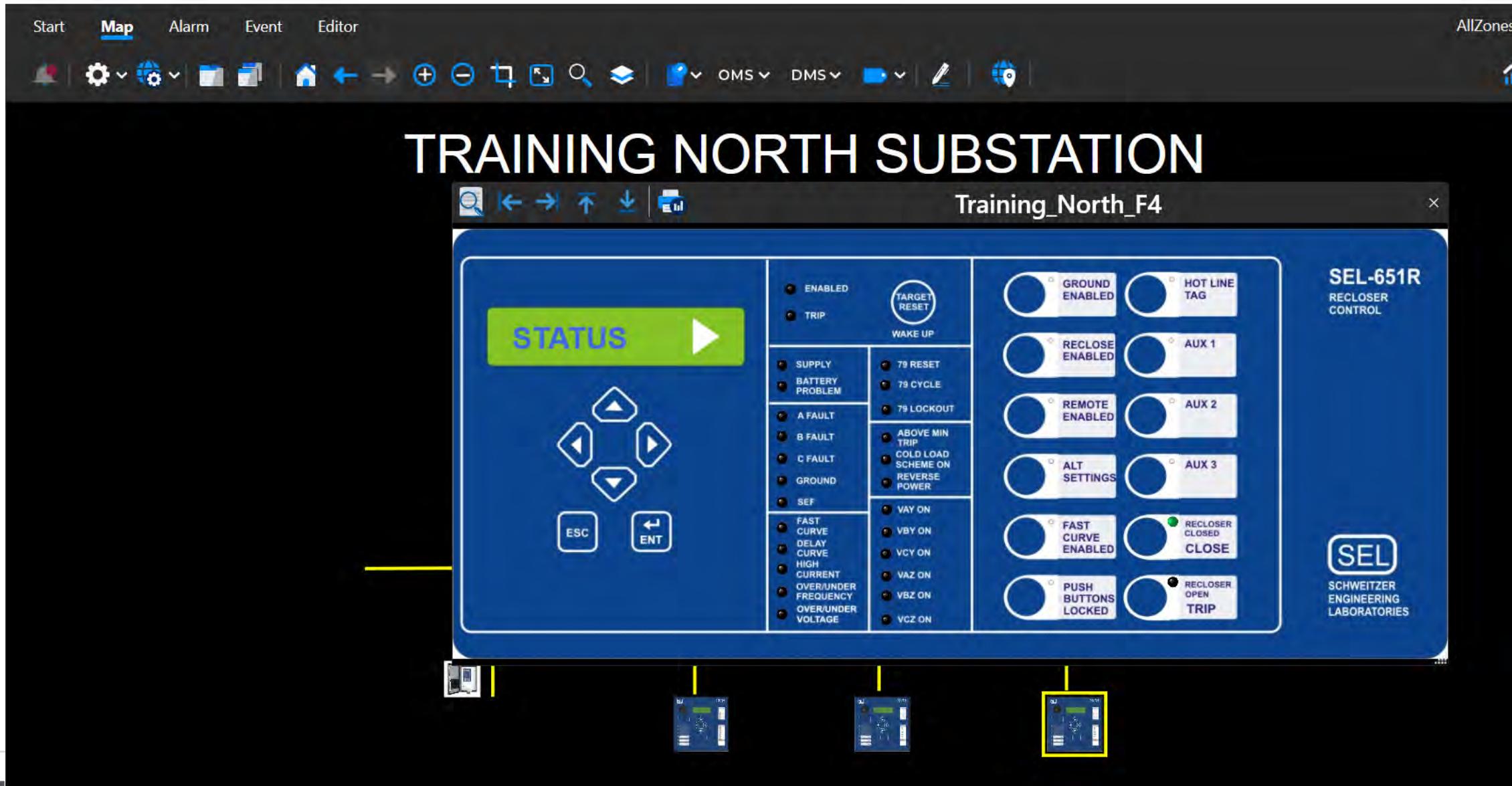
# Section H – Creating Control Panels

## TRAINING NORTH SUBSTATION

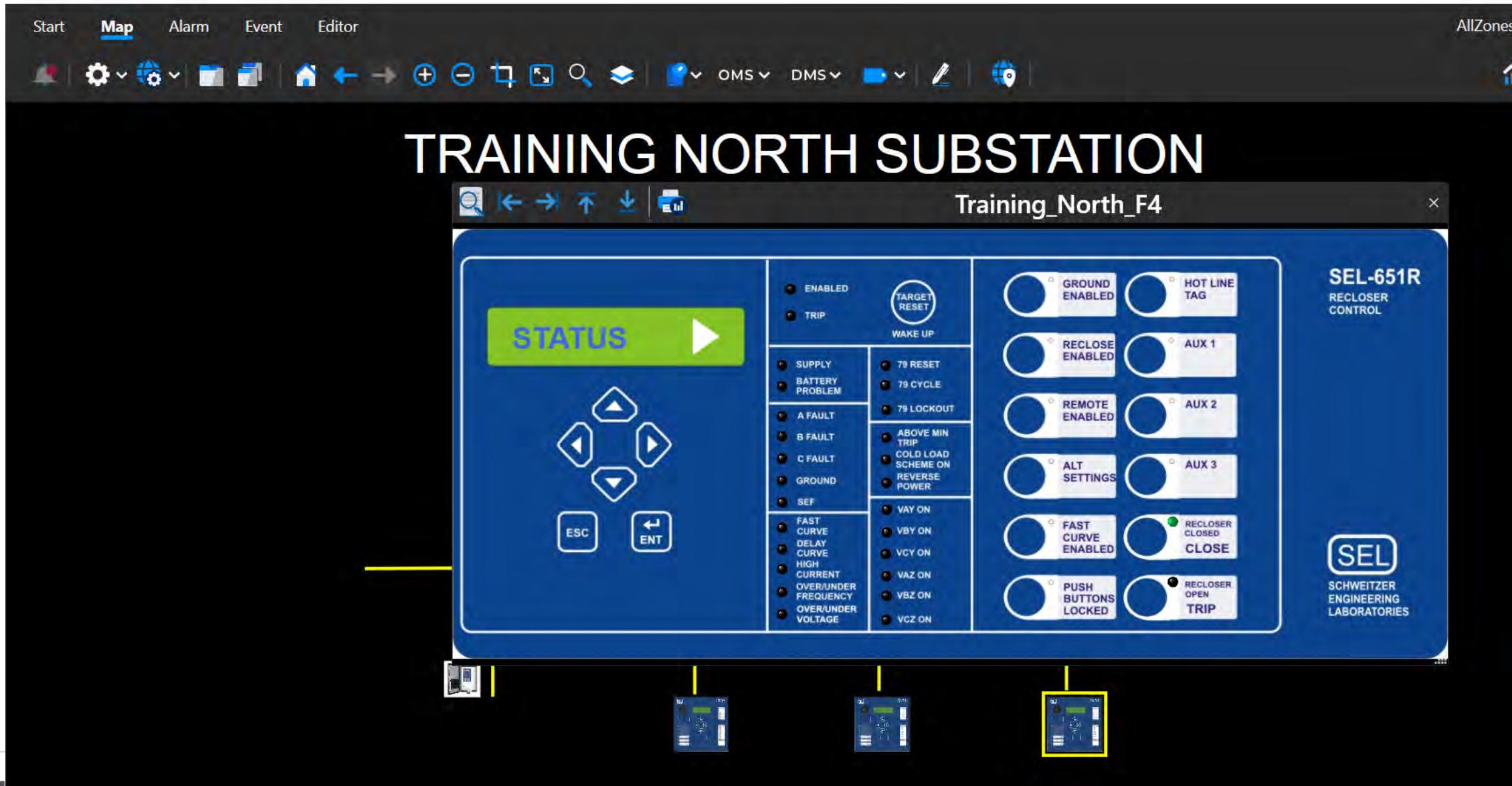


Station Image	
#651	
Name	Default Library Override
Maintenance Flag	True
Maintenance Flag Color Table	FLAG_BLOCK
Maintenance Flag Pos	0,0
Note Flag	False
Note Flag Color Table	FLAG_NOTE
Note Flag Position	0,0
Override Import	False
Owner Flag	False
Owner Flag Color Table	FLAG_OWNER
Owner Flag Position	0,0
Owner Flag Symbol Table	OWNER_TAGS
Point Id 1	42
<input type="text" value="42"/> ...	
Apply	
Training_North_F4	
Training_North_F4	
<input type="text" value="42"/> ...	
Apply	
Training Feeder 4	
<input type="text" value="42"/> ...	
Clear	
Point Id 2	0
Default Library	0

# Section H – Creating Control Panels

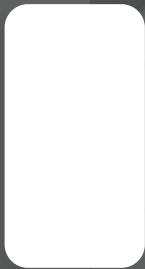


# Section H – Creating Control Panels





Questions?



# Thank You