Survalent.

Survalent Training Manual

SurvalentONE SCADA System Level 1

Module 5 – Efficiently Adding Points

Revision 01

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Module 5 – Efficiently Adding Points

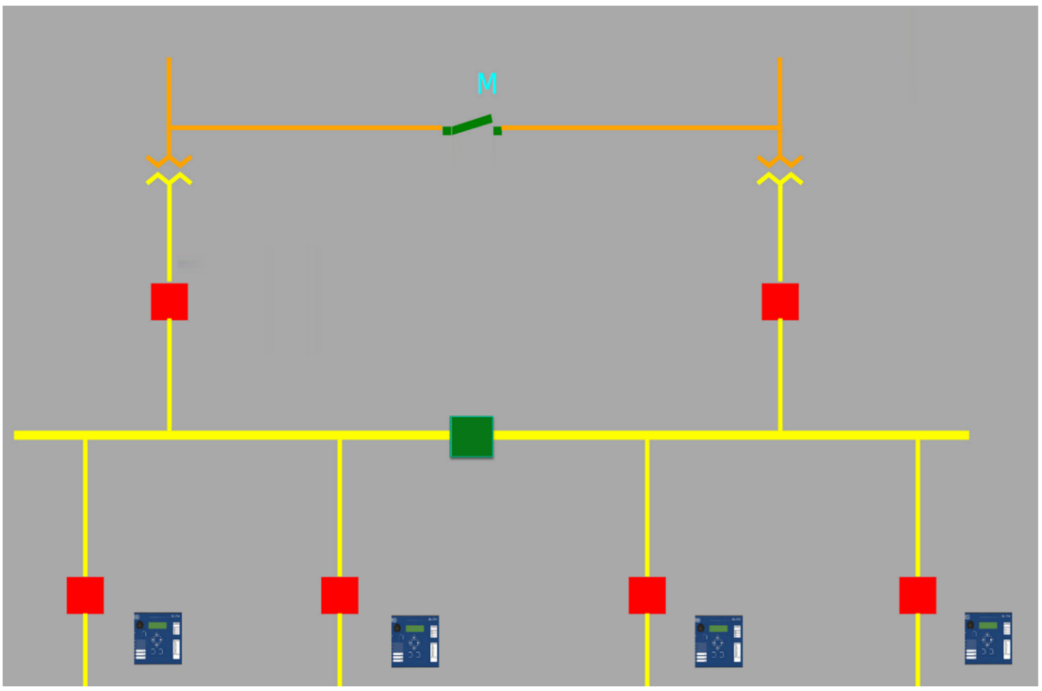
INTRODUCTION

In modules 3 and 4, we added points to the database and PMacros to the map. However, we have not put together an SLD (Single Line Diagram). After planning your SLD, the process would be to create the points and then draw the map.

In this module, we will continue adding points to the database; however, it will be with the goal of eventually drawing the North Station in an SLD. In addition, as you probably suspected, we should be using tools to do it much quicker than the manual additions we did in Module 3.

MODULE GOAL

By the end of this module, the goal is to have enough database points in the system for our North Substation, so that we can start planning out single line diagram as shown below. The 4 small replicas of IED devices each could contain hundreds of points so the way we have been creating points in the past is inefficient.



5.1 A Completed North Station

MODELLING

Up to now, we've been creating elements. We created a North Station and then we created a Communications Station. In both cases, we right clicked and selected New.

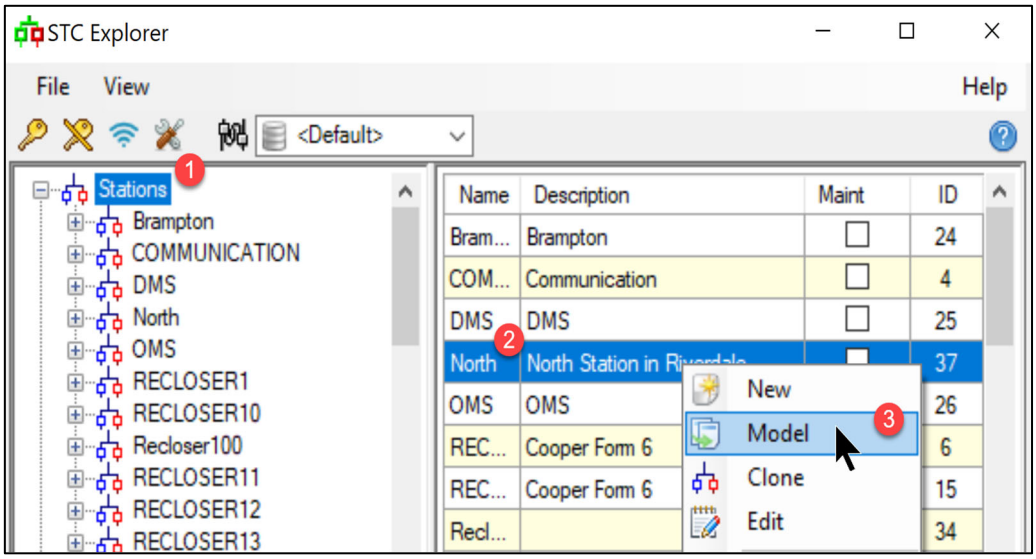
However, when in SmartVU, we found we could take some time by:

1. Opening a color such as Open.
2. Making some changes.
3. Using **Save As** to name the new modified color.

In STC Explorer, **modelling** is similar to **Save As**. Modelling provides all a quick way of copying the settings from a point into a new point.

Try this:

1. Click on Stations.
2. Click on the COMMUNICATION Station.
3. Right-click on Model.

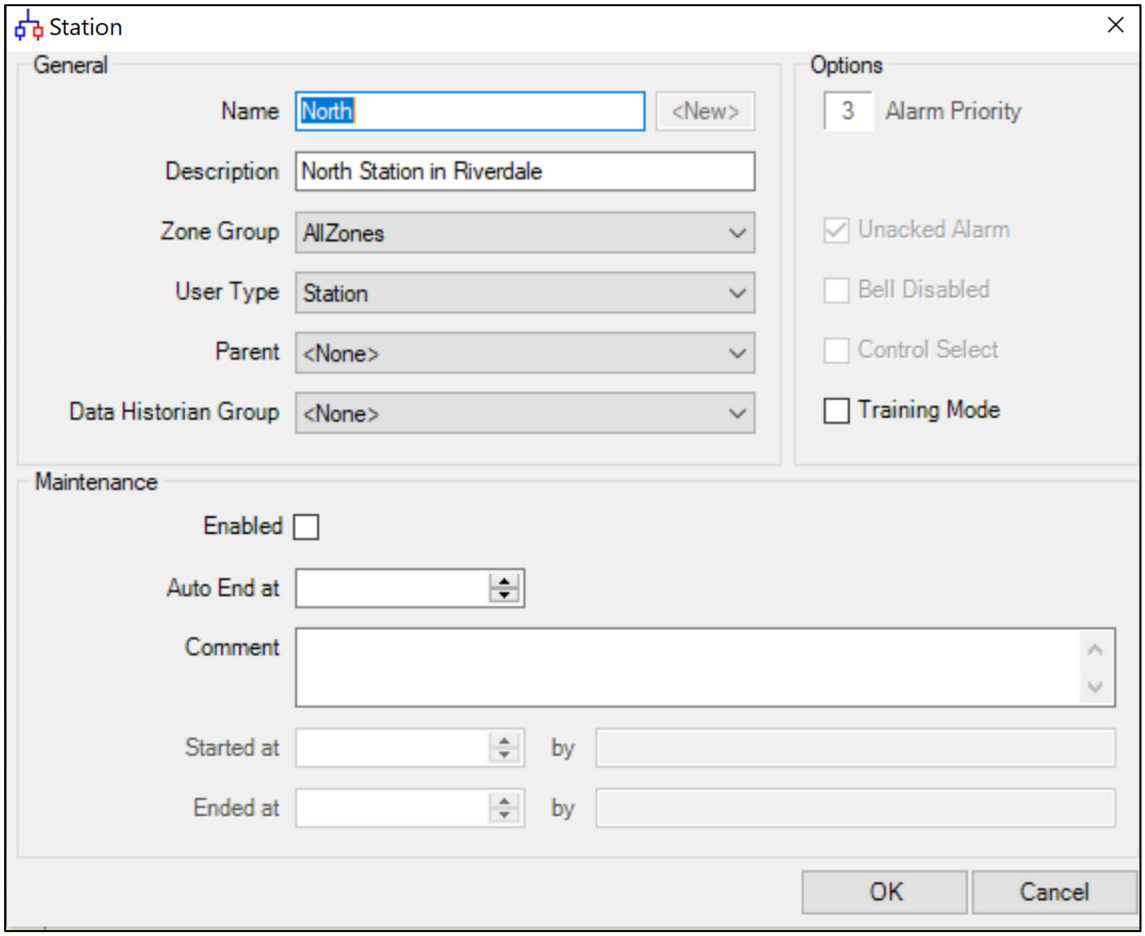


5.2 Finding the Model Option

An exact copy of the North Station will open. You change the name and whatever attributes you'd like to change and then click SAVE. You must change the name or you will get an error message when you try to SAVE.

CLONING STATIONS

If you were to model the North Station, you would end up with another station with the same settings as seen in Image 5.3.



5.3 Modelling a Station

Any Status, Analog, or Text points within the North Station are not part of the modelling process. All you get with modelling is a duplicate station with all the settings (e.g. All Zones, User Type) copied – no points.

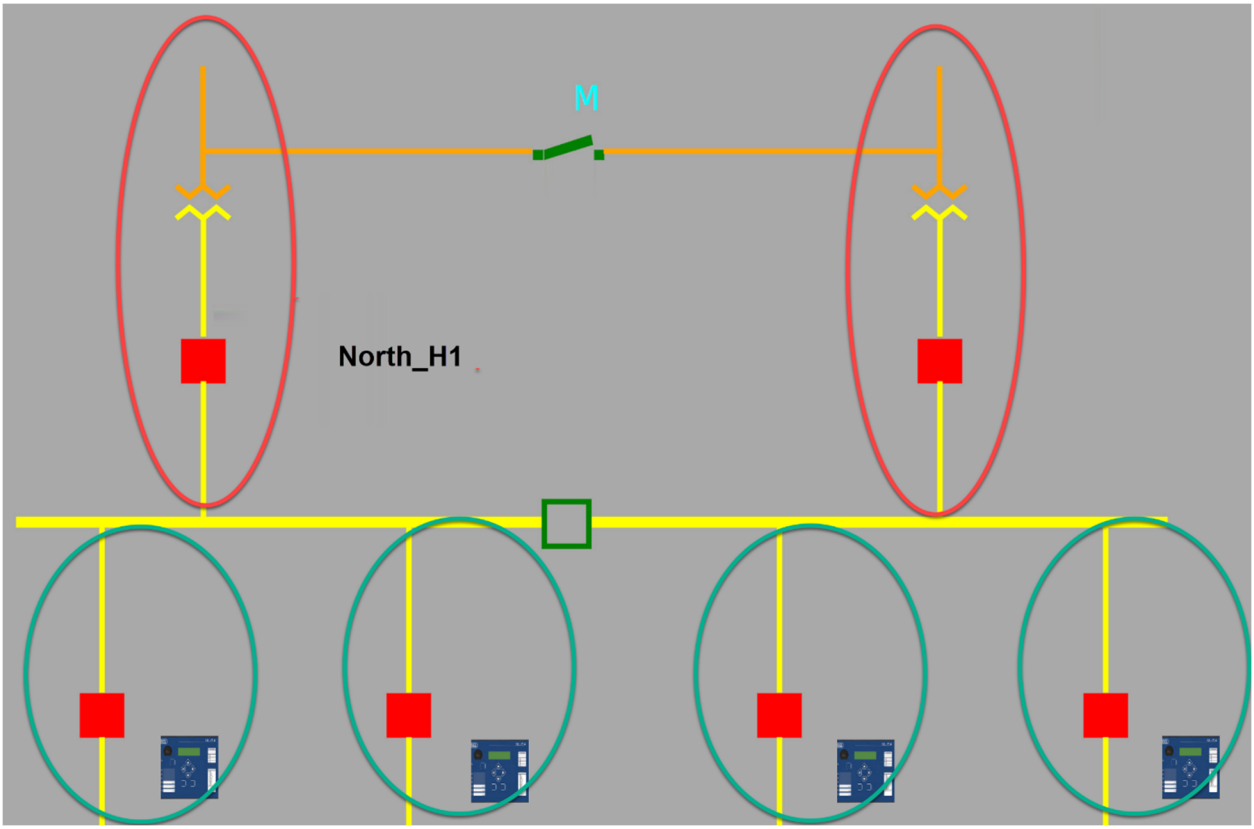
Cloning **does** copy all the underlying points. If you clone a station, you get the station's settings plus all the points associated with the station. Of course, there are some rules and we will get to them shortly.

Cloning is ideal if you are consistent with your names and structures.

For example, let's go back to image 5.1. We don't want to manually create points because it's a slow process. It looks like there are similarities between the sections circled in red and similarities between the points circled in green in image 5.4 (next page).

If we manually create points inside one of the red circles we could use them repeatedly through cloning as long as the structure and naming conventions are going to be constant.

Also, because of timing, we've only put 1 point in our system so far so our example will be based on 1 point. Cloning works by the same principle on hundreds of points.

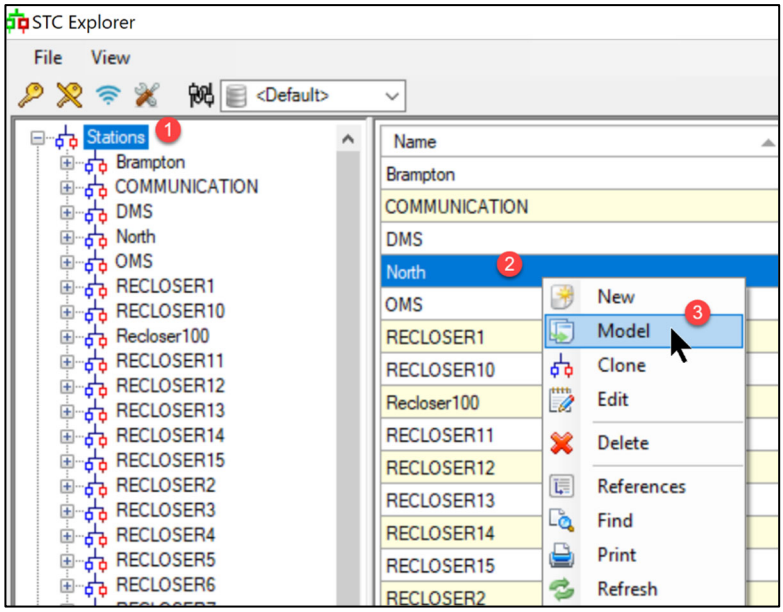


5.4 Similarities Throughout the North Station

To start, let's turn one of those red circles into a station. To the right of one of the circles, you'll see the name North_H1. Let's represent this in the database.

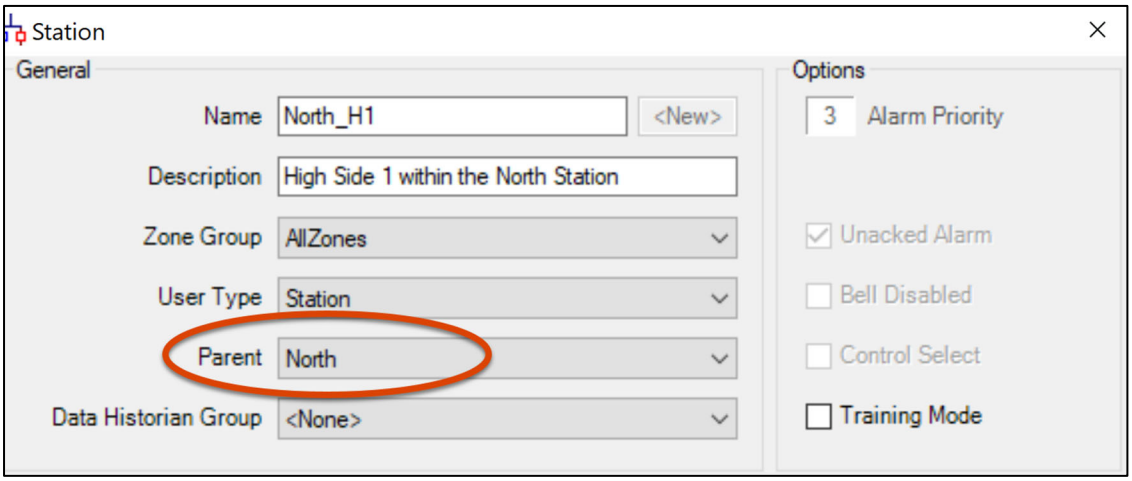
First, let's use Model to create our new station. Remember, this step just allows us to create a new station quickly. No points are being moved yet:

1. Click Stations.
2. Right-click on North.
3. Choose Model.



5.5. Modeling to Create a New Station (but no points)

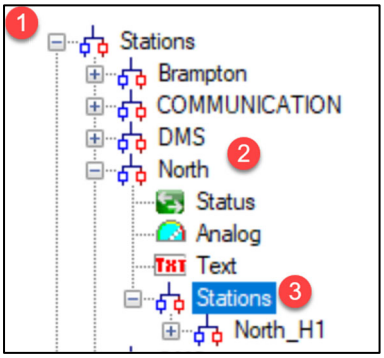
Let's name our new station and provide a description. All the other settings get moved over from cloning but **we do have to state that the North is the parent of this new station.**



5.6 Filling in the H1 Details

After you've made the addition, you will see this hierarchy on the left side of STC Explorer:

1. You may have to toggle the +/- sign to refresh.
2. Click on North.
3. Click on Stations and note the new North_H1 station.

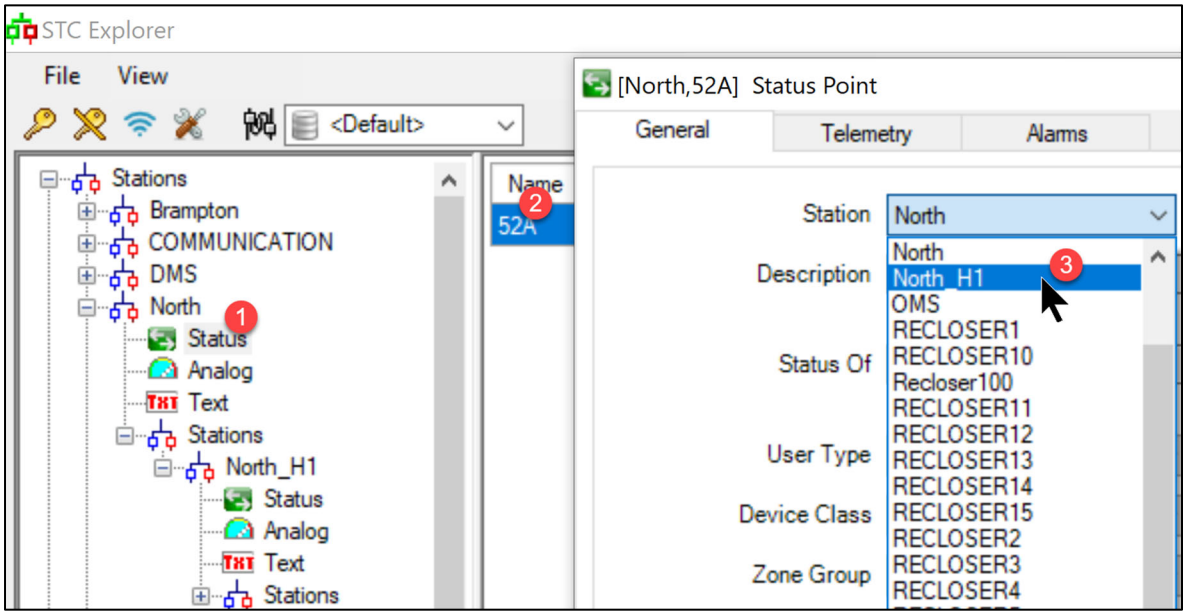


5.7 New Station Created

The North Station still has the status point we created (52A). In addition, it also has the analog point we named IA under the Analog section.

5.8 Status Point Under North

To move both points to North_H1, double-click on the point and reassign the point to North_H1 as shown in the images below.



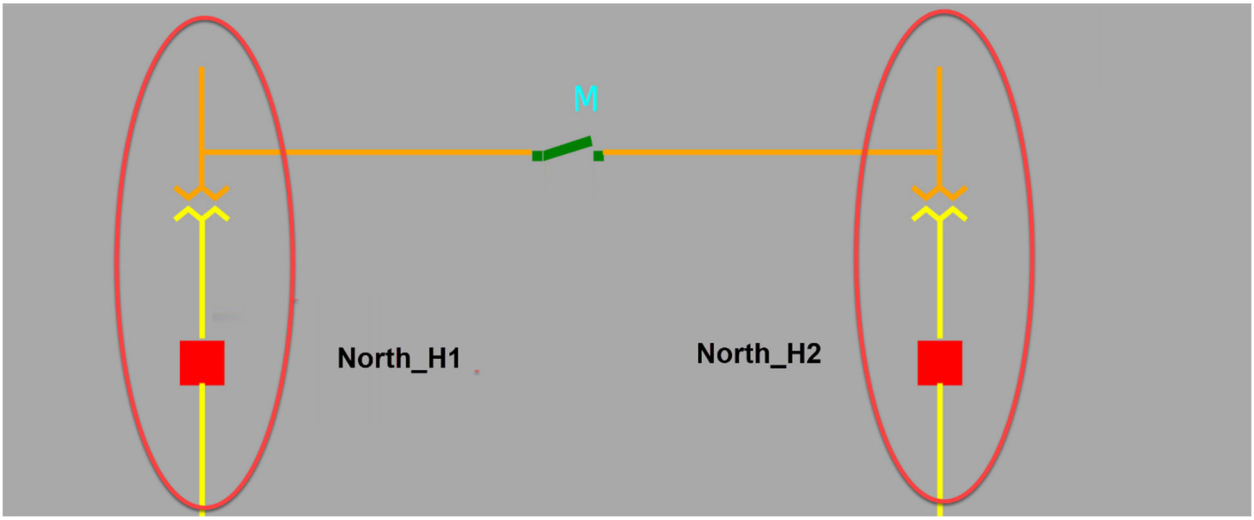
5.9 Moving 52A to North_H1

Exercise

In-class exercise: The process to move 52A to North_H1 is similar to the one we need to follow to move the analog point (IA) to North_H1.

Please move IA to North_H1 and confirm North_H1 now has both points.

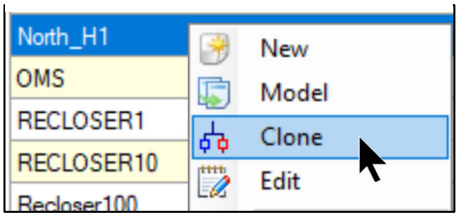
We are now in a situation where cloning is an attractive option. We have points set up as in Image 5.4 but we only have North and North_H1 set up in the database. We would like to create a North_H2 in the database without having to manually enter in all the points. North_H1 and North_H2 are exactly the same in structure and in nomenclature.



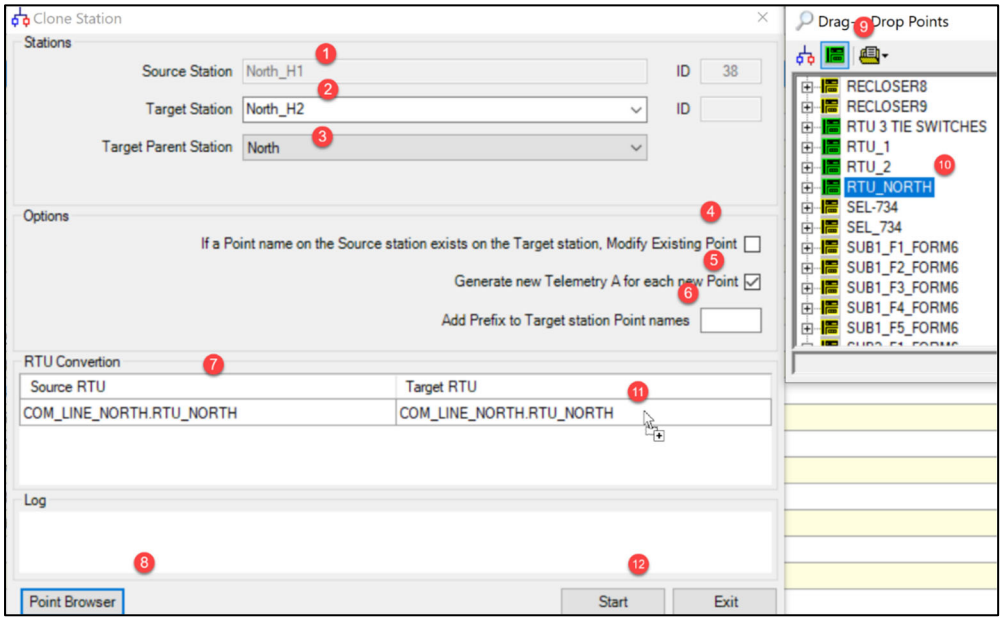
5.10 Preparing to Clone North_H1 into North_H2

5.11 Clone Function

The process starts by right-clicking North_H1 in the database and selecting Clone.



Please turn the page for an explanation of the steps in 5.12



5.12 Preparing to Clone

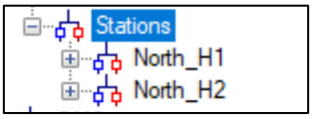
1. Choosing the source station. This was decided in Image 5.11 when you right-clicked on North_H1.
2. Choosing the target station. We typed in North_H2 because it's a new station. Note that dropdown menus would let you choose existing stations.
3. Here you select the parent station of the clone.
4. For option 2, if the target station was existing, do you want to modify points that have the same name as the station we are cloning?
5. Do you want to generate a new telemetry address? We chose yes, because if both stations share the RTU, there will be errors and alarms if they have the same point IDs. We will how this gets corrected in our example because both stations do have points that share an RTU.
6. Do you want to add a prefix to the cloned points? This is often not checked because of the advantages of stations sharing the same short names (e.g. 52A is better than North_52A).
7. The RTU of the same source station was entered when you made the decision to clone the station (Image 5.11).
8. To select the RTU of the target station, click Point Browser.
9. The green icon is for RTUs.
10. Select RTU_North.
11. Drag it to Target RTU. This is an important step for the system to understand which address to provide the point.
12. Click Start.

Upon completion, you will see a log of all the changes. Scroll to the top to see the beginning.

5.13 Log of Points Created

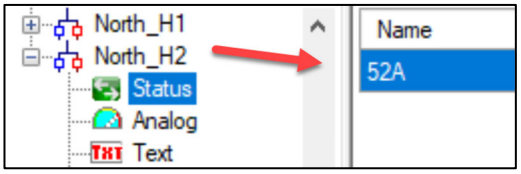
The logs explains that a station, a status point, and an analog point were all created. Let's look at this in STC Explorer:

1. New Station



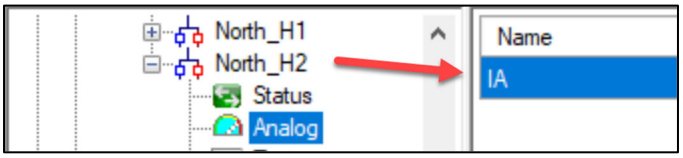
5.14 New Station

2. New Status Point



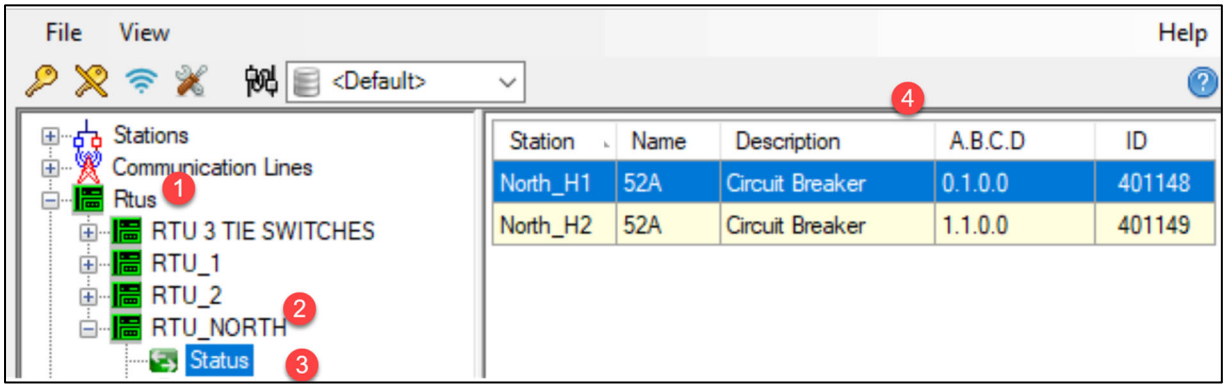
5.15 New Status Point

3. New Analog Point



5.16 New Analog Point

We set up the clone process to prevent any points from being duplicated. A good way to check quickly is to look at the addressing of the RTU.



5.17 Different Addresses

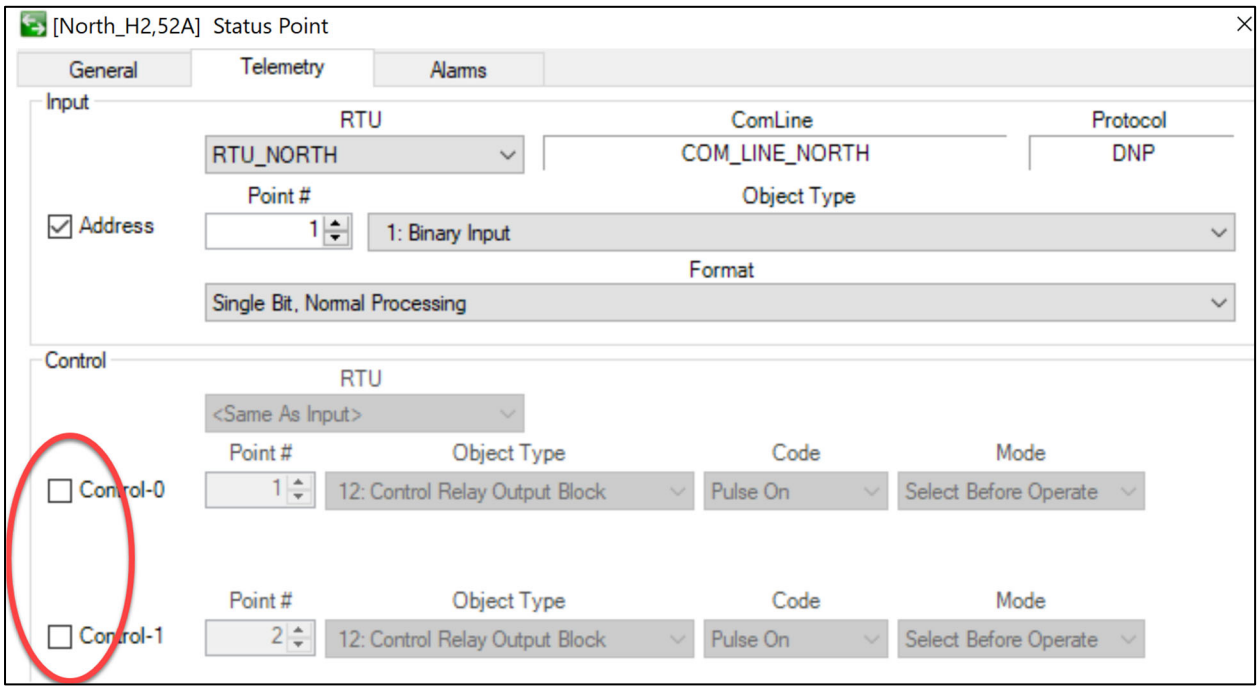
In the image above:

1. We selected RTUs.
2. Chose RTU_North.
3. Clicked Status.
4. Noted that the A (Point Address) under ABCD for North_H2 does not duplicate the address for North_H1.

Exercise

In-class exercise: Do the same steps for our analog point – IA. Under the RTU_NORTH, click on Analog and see the telemetry address.

Note that, when cloning a Status Point, the controls have to be clicked on again.



5.18 Controls Must Be Enabled on Cloned Point

Also, note that the description of the point is just a copy of the original with the word clone in brackets – see Image 5.19 below. This should be changed into a better description such as "High Side 2 within the North Station".

North_H1	High Side 1 within the North Station
North_H2	High Side 1 within the North Station (CLONE)

5.19 New Station Description Should be Edited

WHAT ARE IED WIZARD TEMPLATES AND WHERE CAN I FIND THEM?

Cloning was effective for the two "high side" paths. We built one manually and now we can clone it whenever we wish. However, if we go back and look at Image 5.4, we see it wouldn't be as efficient for the 4 feeders. For our example, let's say the 4 devices belonging to each feeder is an IED and the model is SEL 351AA. Furthermore, let's say we will be deploying dozens of 351AAs. Here are some issues with the cloning:

1. Building the first 351AA by manually adding points – even once – will take many hours.
2. If we change our mind in the future about the point settings, we will have to redo all the cloning which is also time consuming.

For these reasons, many clients use IED Wizard Templates to configure IEDs.

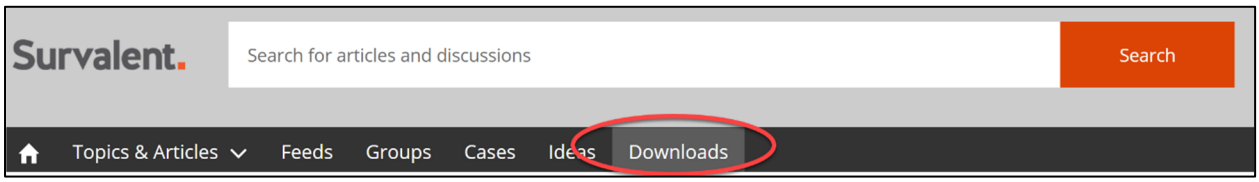
Survalent has many of these templates ready to go so you don't have to spend multiple hours manually making points for cloning. Later, if you decide to make changes, the push of one button can update dozens of devices.

Some notes:

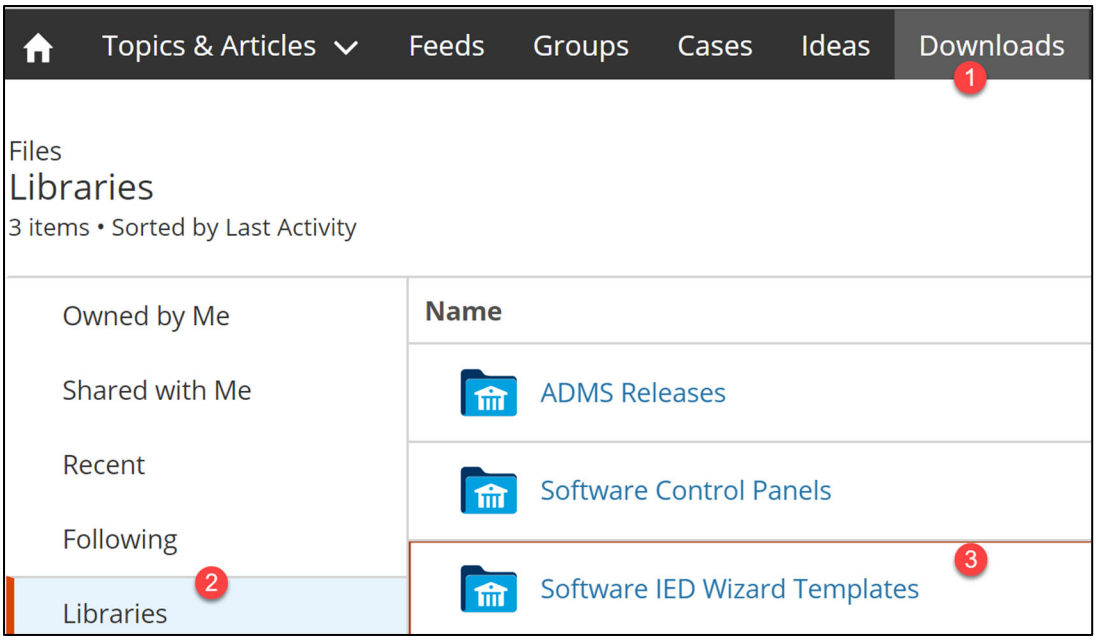
1. Survalent has accumulated these templates through installations and projects over the years.
2. As such, Survalent isn't proactively working with all the IED manufacturers. This means there may be devices without Templates.
3. In cases where there are no devices, you can:
    a. Create your own IED Templates
    b. Wait (with all the ongoing projects, all the most popular devices eventually end up with their own Survalent template).
    c. Or speak to Survalent support for customize template

This course covers the most likely scenario – an IED Wizard already exists for this device.

Recall in Module 1 that the Survalent customer portal had a section for downloading files:

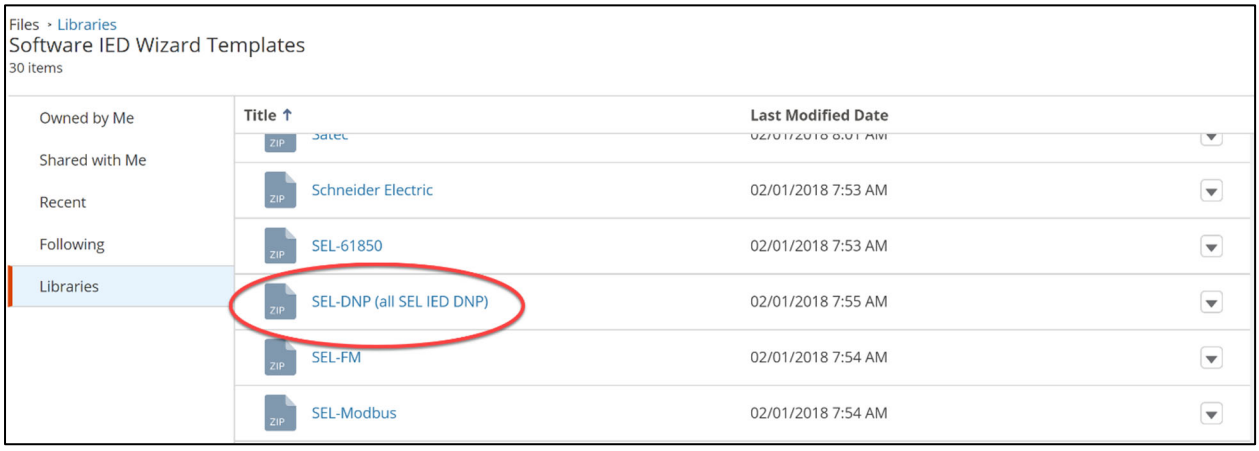


5.20 Downloading Files from Survalent Portal



5.21 Finding the Templates

Because an IED Wizard would not be a very large file (no media files), it's common to see many grouped together. Below, you can see our SEL 351AA has been bundled together with other SEL DNP IEDs. Download the file by double-clicking it.

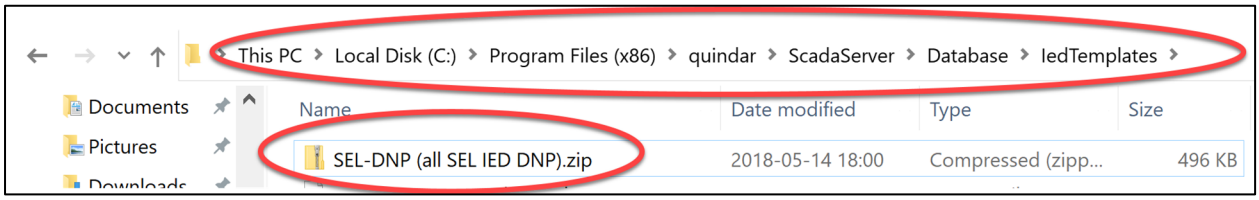


5.22 Finding Files for our Device

TEMPLATE FOLDER PLACEMENT

You can make the IED Templates work from anywhere if STC Explorer knows where they are located (we will cover pointing STC Explorer to the files in the next section).

One useful place to store them is in your database folder. There is a subdirectory called IedTemplates which would get backed up when you do back-ups on your database. Backing up the Templates is important because you may have made some changes unique to your company and these should be backed up so you don't have to make them again.



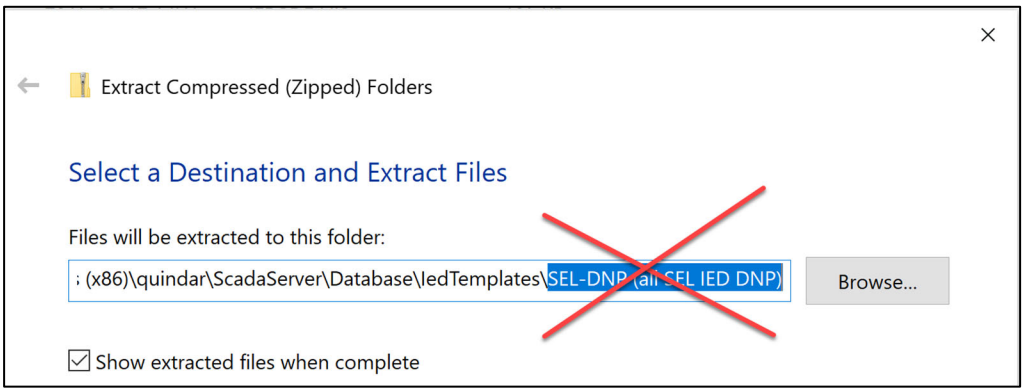
5.23 Placing Template Files in the Database Folder

Survalent software kit version 21.2 or higher, the fresh install path is:
c:\Program Files (x86)\Survalent\Scadaserver\Database\IedTemplates

By default, the extraction (unzip) process will default to putting the files in an SEL-DNP folder. It's not incorrect but many clients prefer to extract the files under IED Templates.

Putting them under IED Templates enables just having one location if you are using different manufacturers (e.g. Cooper). You can point STC Explorer to just the IedTemplate directory for all the

manufacturers.

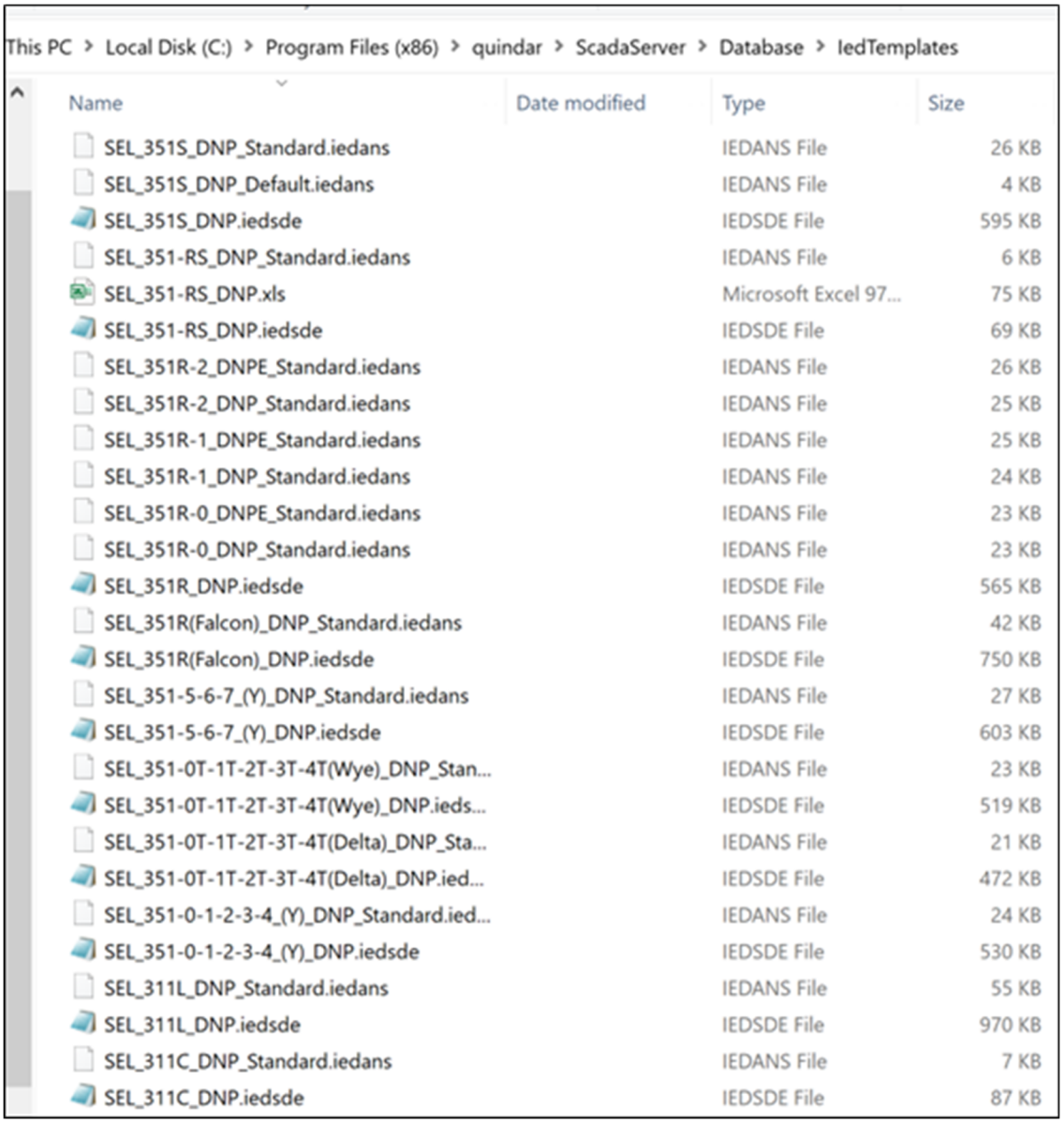


5.23 Extracting to IED Templates Folder and not a Specific SEL Folder

Upon extracting the files, you will see many different file names and file types. In the Level 2 course, we go into these files in more detail because they get created when you create a totally new IED Wizard device.

For now, the main thing to remember is that there are 3 critical files, one for the:

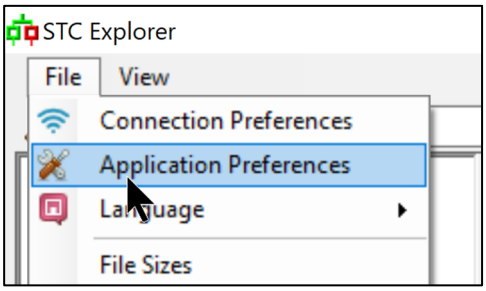
1. Manufacturer (e.g. SEL)
2. Model (e.g. SEL 351A)
3. Version (e.g. Standard version)



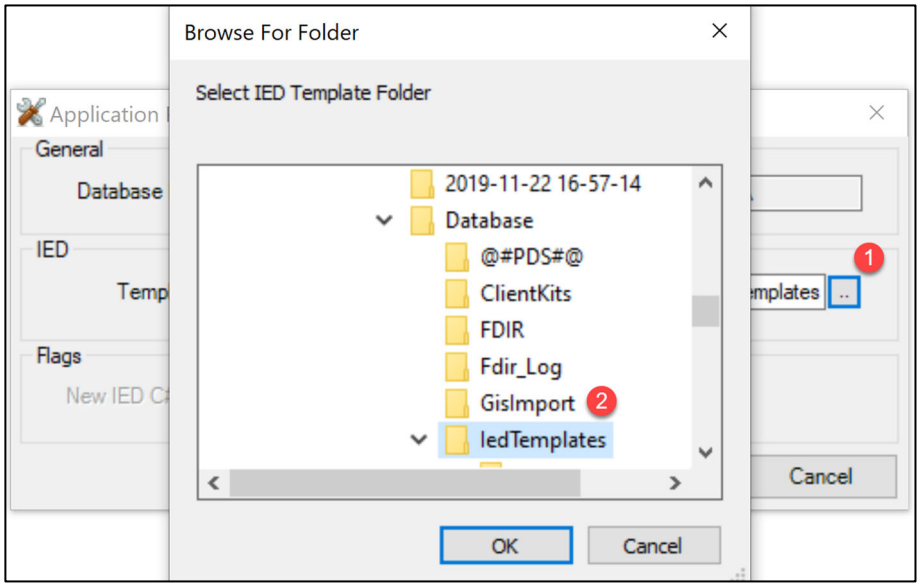
5.24 Many Different File Names and File Types

ENTERING LOCATION OF THE IED TEMPLATE FILES IN STC EXPLORER

The IED Wizard will be run from STC Explorer so now we must point STC Explorer to the files.
From the File menu in STC Explorer, select Application Preferences.



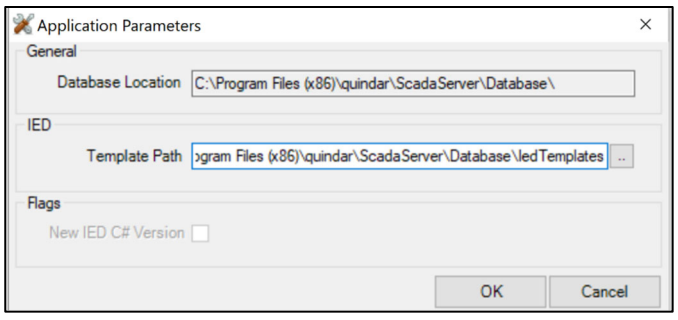
5.25 Application Preferences in STC Explorer



Using the folder selector (1), navigate to the folder that is holding the template files (2) and then click OK.

5.26 Finding the Folder with the Template Files

The path is set and we are ready to run the IED Wizard.



5.27 IED Wizard Ready to Go

INSTALL MASTER IEDs

IEDs can be connected directly into the Communications Line or they can be connected to an RTU which is connected to the Communications line. In the first instance, we refer to the IED as a Master IED. In this section we will install a Master IED.

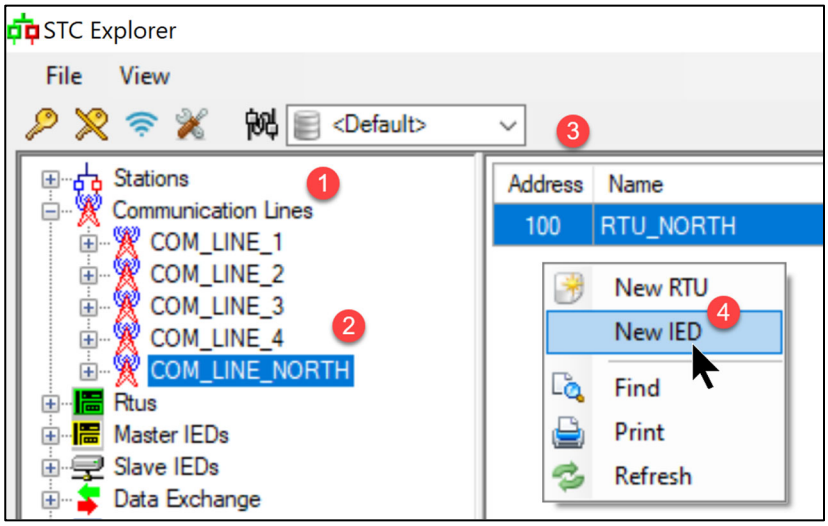
Refer to Image 5.4. This is when we started planning the North Station as being a series of stations within a station. We made a North_H1 station and then cloned it to create a North_H2 station. Now, we have 4 Feeders and each has its own IED. Let's name these feeders:

- North,F1
- North,F2
- North,F3
- North,F4

We will use the IED Template Wizard to create the stations and enter the point information into the database.

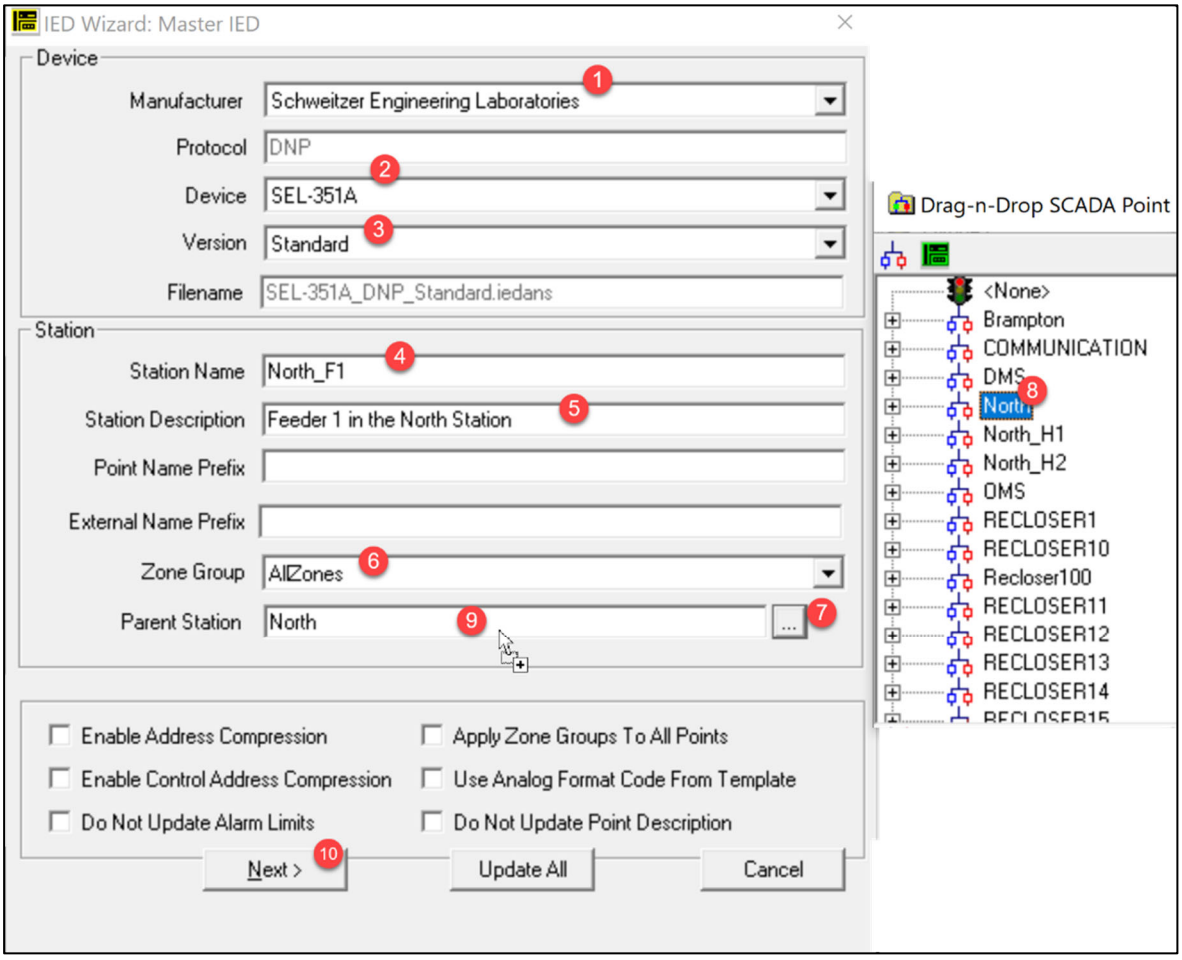
Start by going into STC Explorer and:

1. Select Communication Lines.
2. Choose the Communication Line that we will use for connecting our SEL 351AA.
3. Note the RTU we already installed in Module 3.
4. Right-click and choose to install a new IED into the database.



5.28 Creating a New IED

If the window below pops up, it means that STC Explorer is pointing to the files.



5.29 STC Explorer is Pointing to the Files

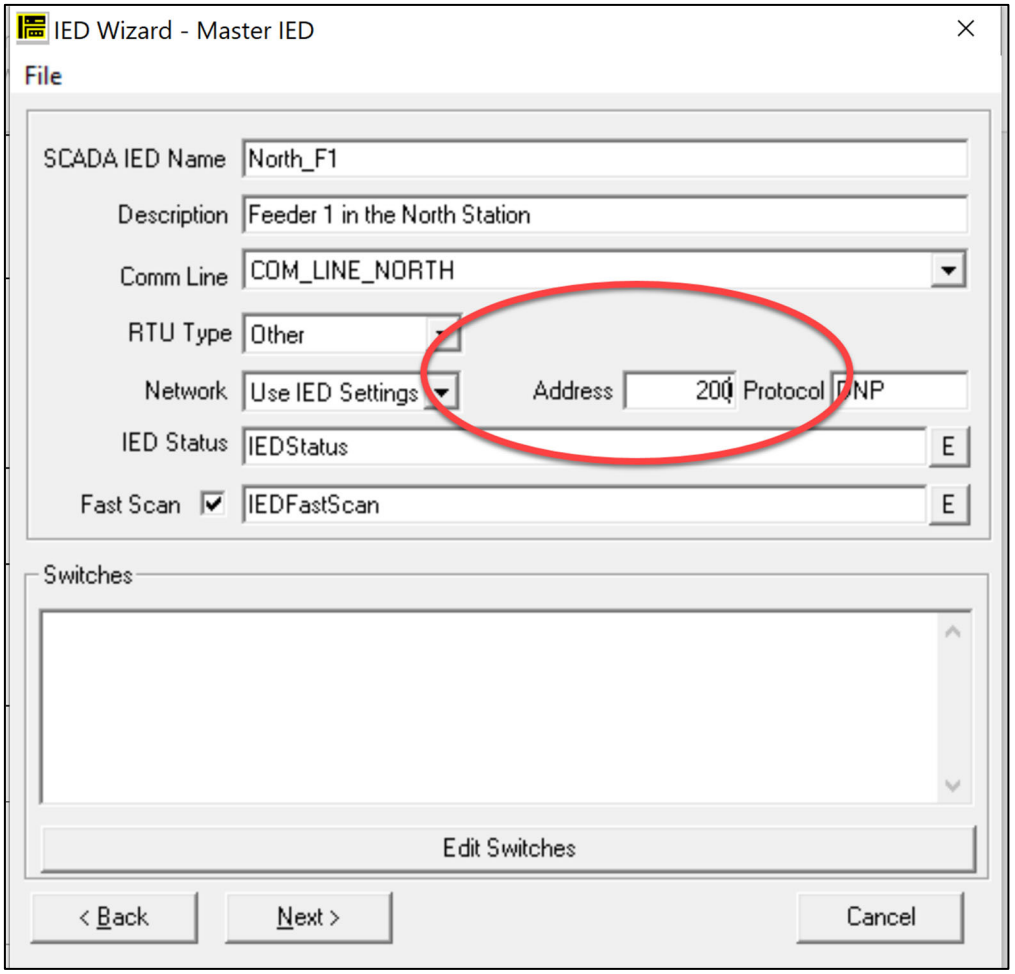
Please enter as shown above and find the explanations below.

1. STC Explorer has found the manufacturer files.	2. STC Explorer has found the model files.
3. STC Explorer has found all the versions for this device.	4. We enter the name of the station that we will be creating with these points (no spaces etc.).
5. Enter the description.	6. Choose Zones.
7. Click Selector Button.	8. Choose North (make sure green RTU button not selected).
9. Drag into place.	10. Click Next.

The main item on the next box is the Address.

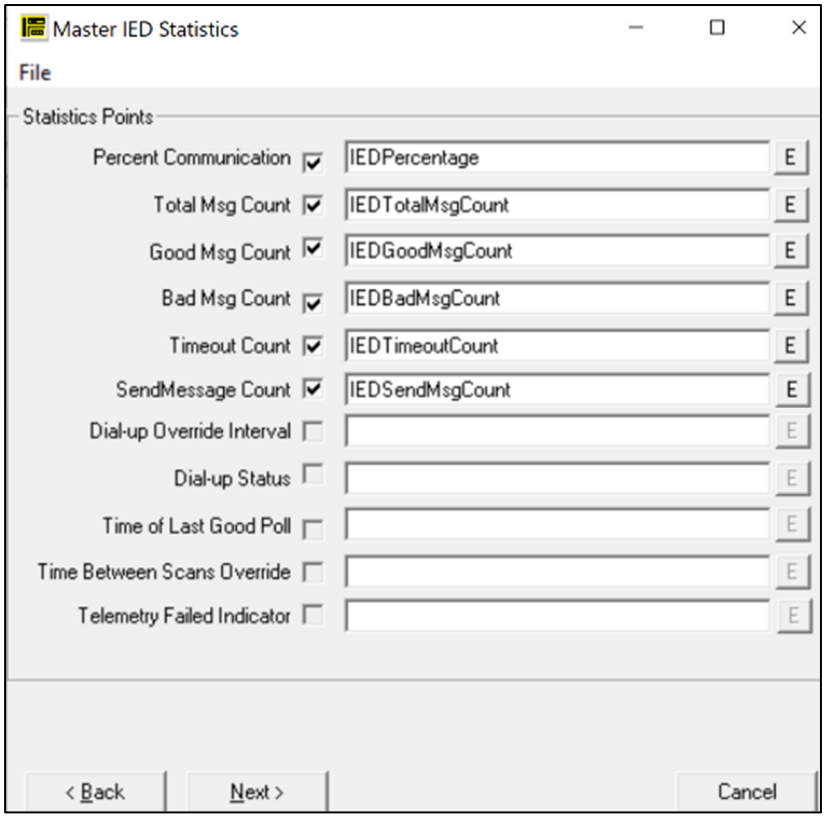
If you look back to Image 5.28, you will see that we gave the RTU and address of 100. We just have to avoid giving our IED device the same address.

Click Next.



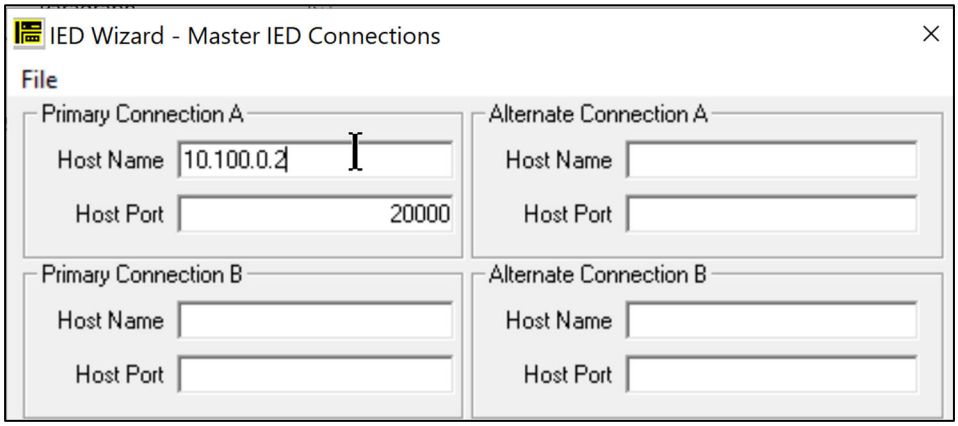
5.30 Setting the Address

We won't have to create health or Pseudo points because the system does that for us. We can click Next.



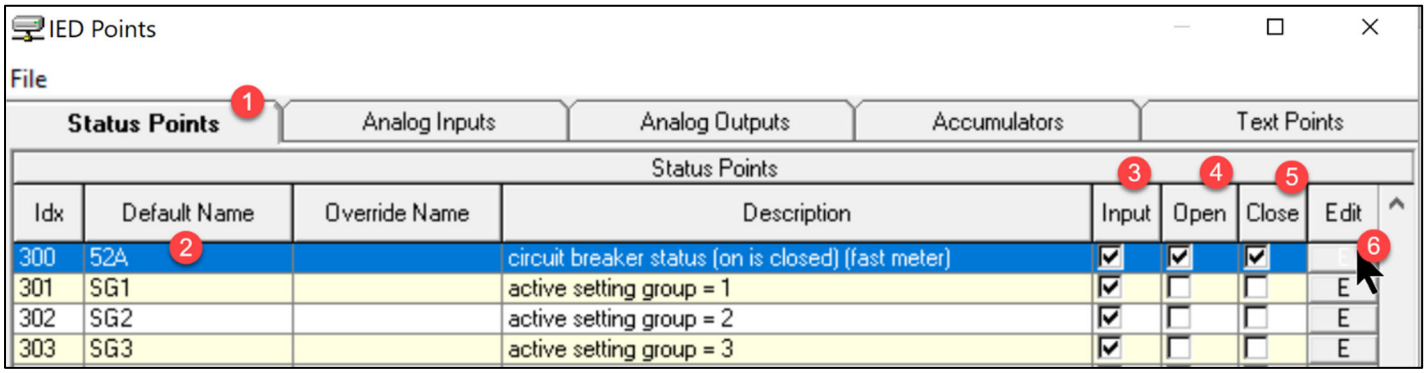
5.31 Pseudo Points Defined

Here, we enter the IP address of the device and the default Host Port for the Protocol (DNP general address is 20000).



5.32 Enter IP Address of IED

Below, we see the final window. If you were **(but please don't do it yet)** to hit the button labelled SAVE IED, hundreds of default point settings would be entered into the database. To see the default settings, please click **Points**.

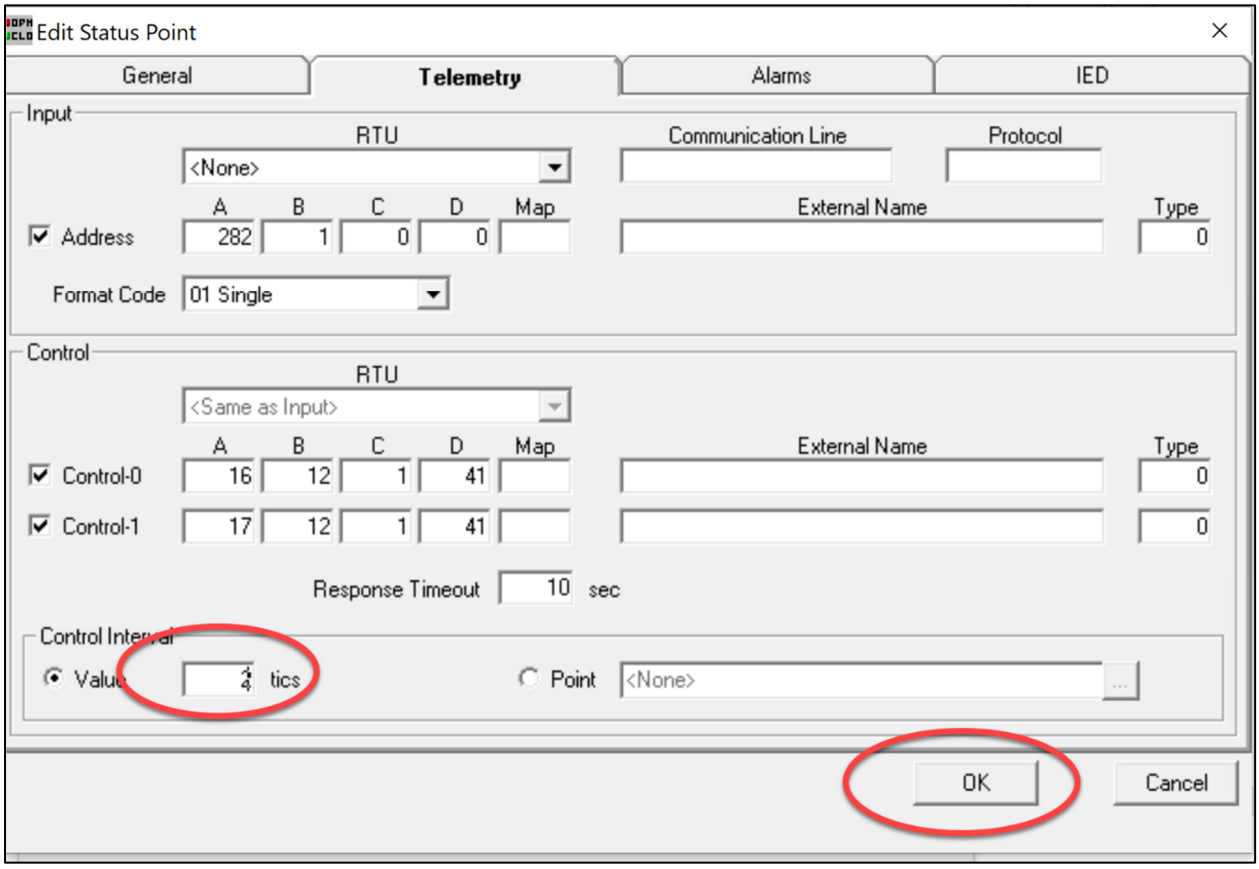


5.33 Some Point Attributes

1. Let's check status points.
2. Find 52A (Index 300).
3. We will be able to query this device and get information.
4. The open command is set.
5. The closed command is set.
6. Click the Edit button for more options.

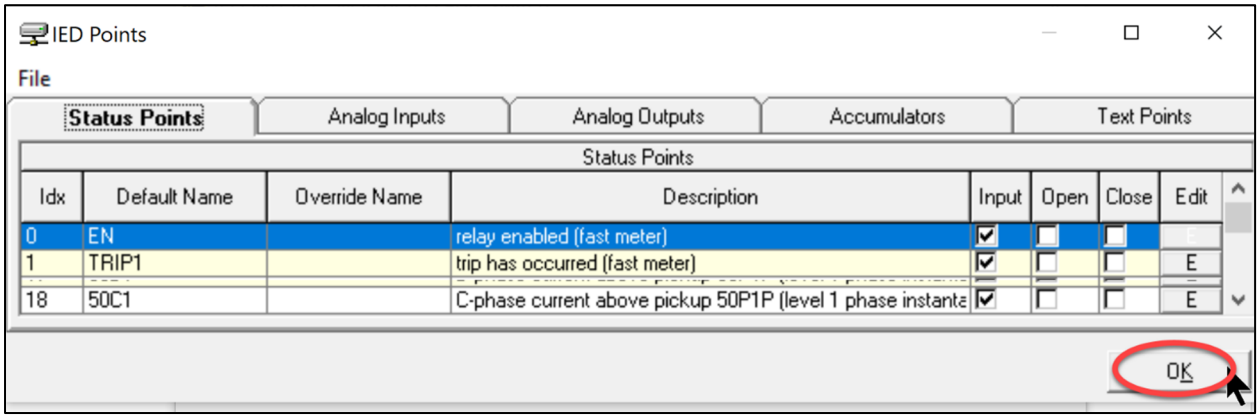
Going through the tabs, you will see the same options was when we set up points manually in STC Explorer.

Let's make a change. Enter 2 for Control Interval and then click OK.



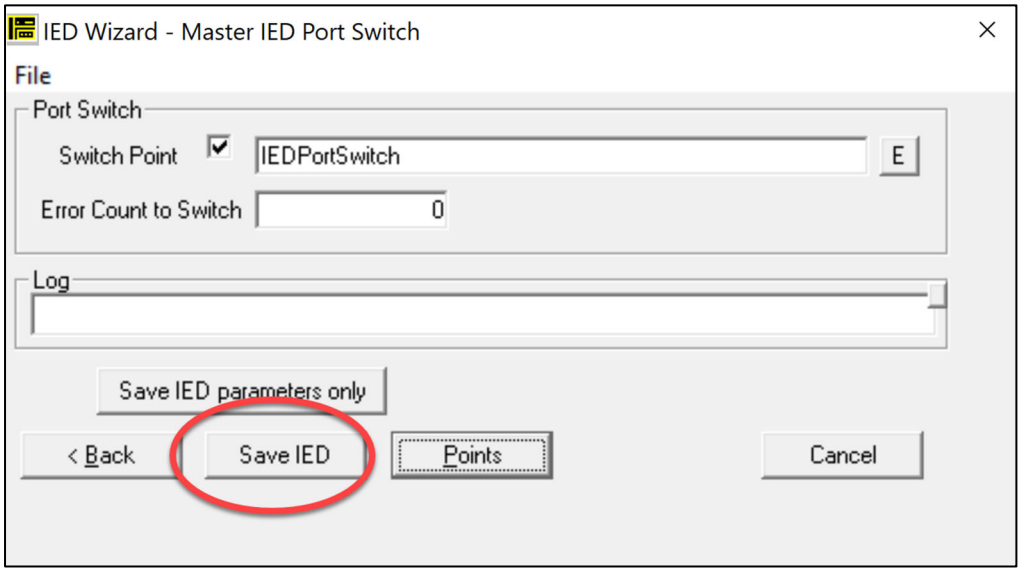
5.34 Changing a Default Value

See below, you'll have to click OK once more to get back to the template window.



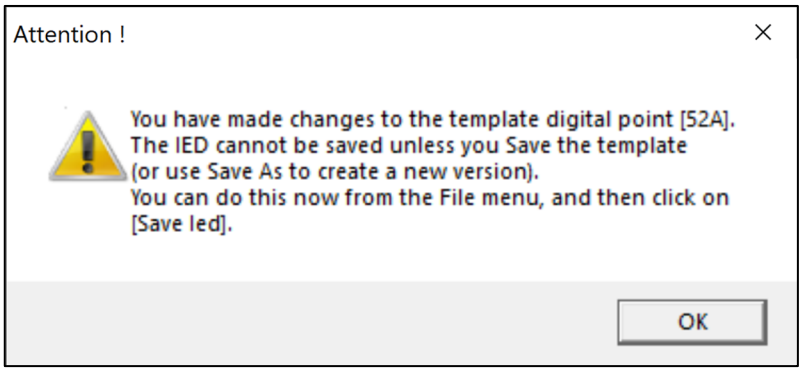
5.35 Getting Back to the Main Wizard Page

Let's try to enter the points now using Save IED.



5.36 SAVE IED Enters the Points into the Database

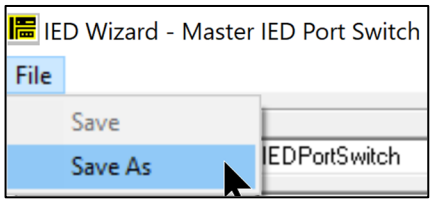
However, when we try to Save IED, we get this error message.



5.37 Unable to Save

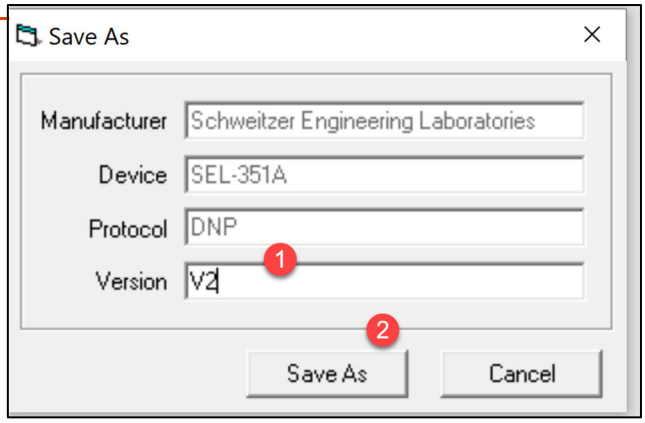
The reason for this message is logical. In Image 5.29 we said we were saving the Standard version of the template. However, in image 5.34, we made some changes. The message is simply stating that this collection of point settings is no longer standard. We are going to have to give this collection a different name such as Version 2 or V2.

To get started on this click File and then Save As.

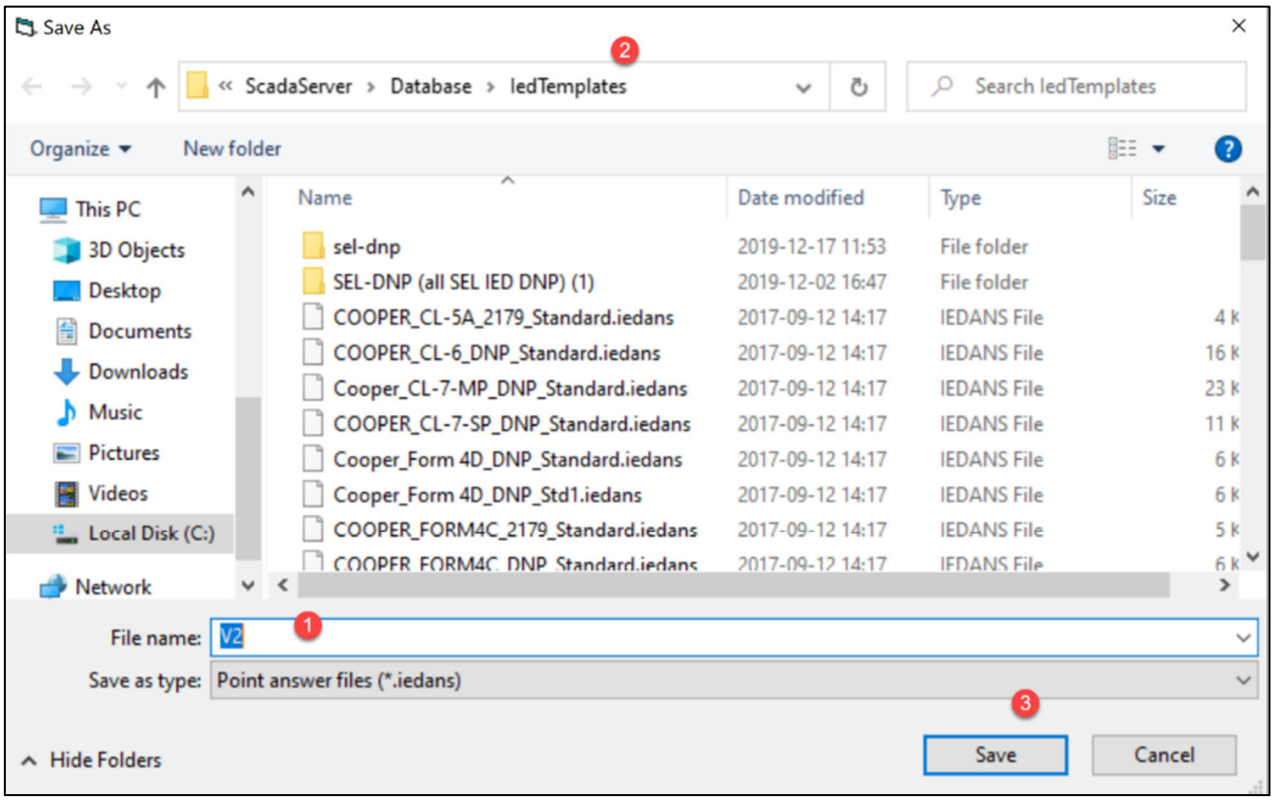


5.38 Saving a New Version

We will call our new version V2. Next, click Save As.



5.39 Naming the New Version



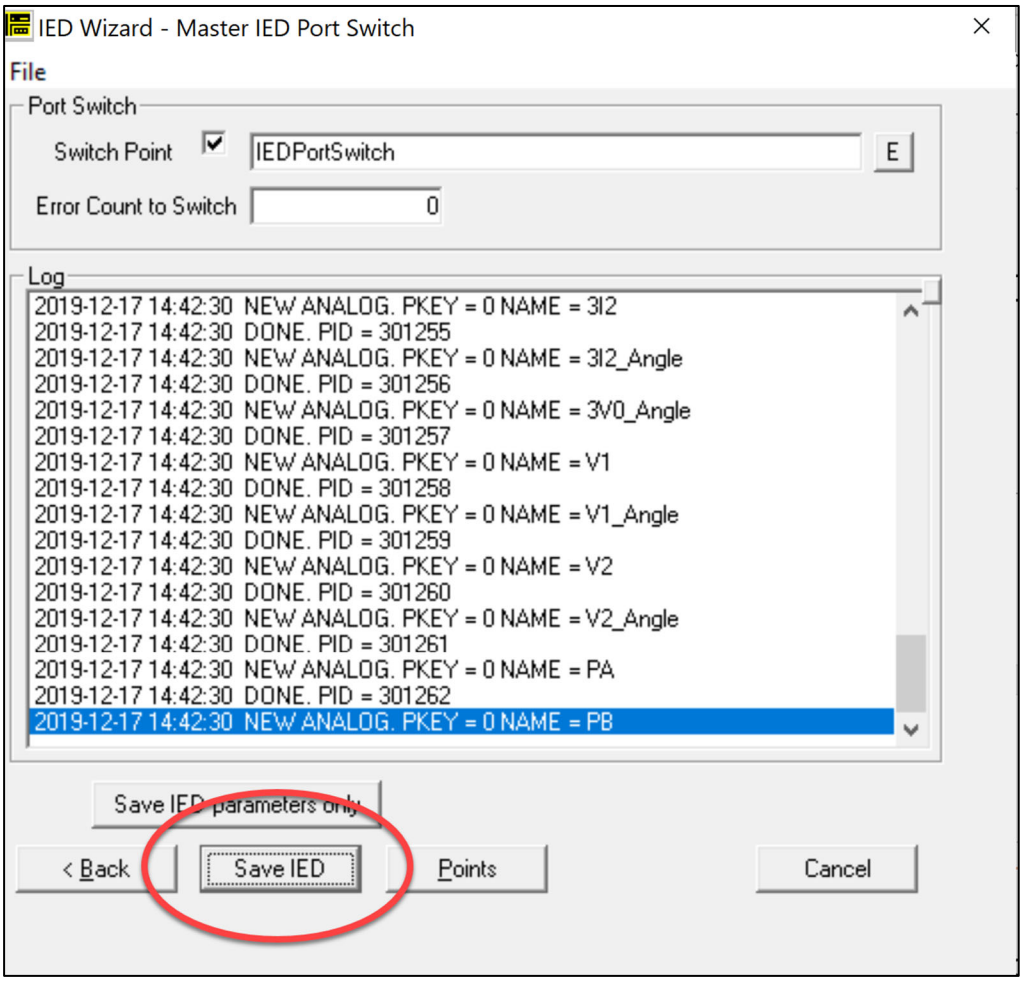
5.40 Saving the New Version

Enter our new name again at the bottom where is says File Name (1).

Understanding these file types will be more important in Level 2 training but, for now, just note that each new version requires a new file. These files should all be located in the choice we made earlier – IedTemplates in the Database folder (2).

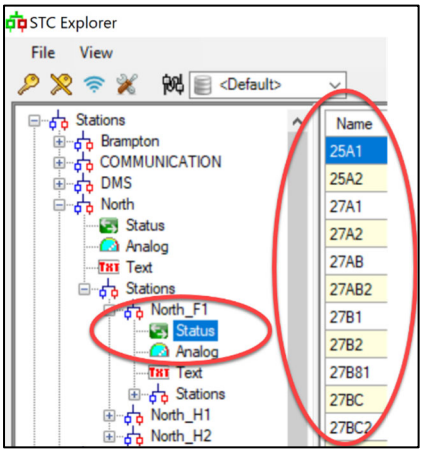
Click Save to save the new filename (3).

Upon returning to the main screen, we should see plenty of activity when clicking SAVE IED now.



5.40 Multiple Points Quickly Added

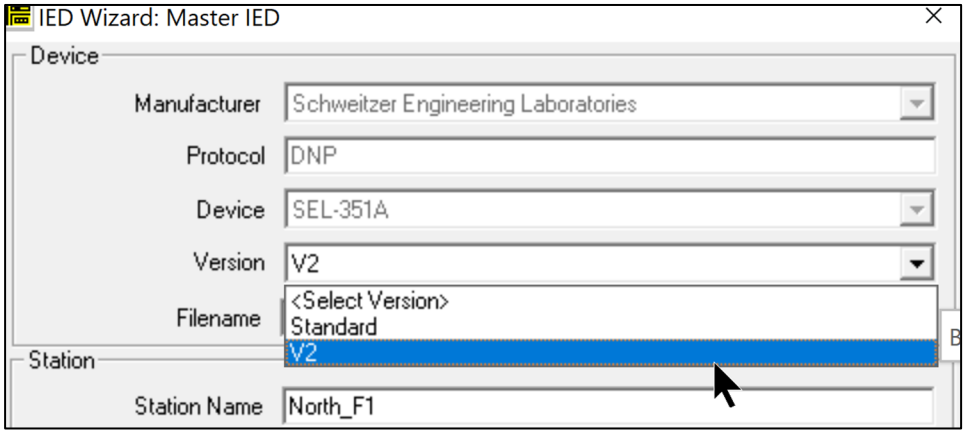
If we look at the stations now, we see that we now have a new station called North_F1 with multiple Status and Analog points.



5.41 Our New North_F1 Station

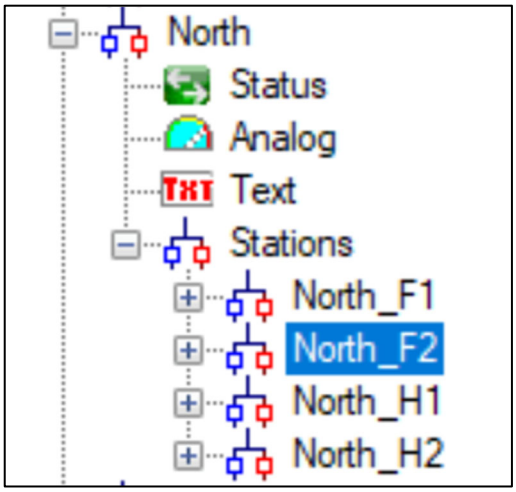
Exercise

Create Station North_F2 which also has an SEL 351A device. Use the IED Wizard but make sure we are installing our own V2 version.



5.42 V2 Option

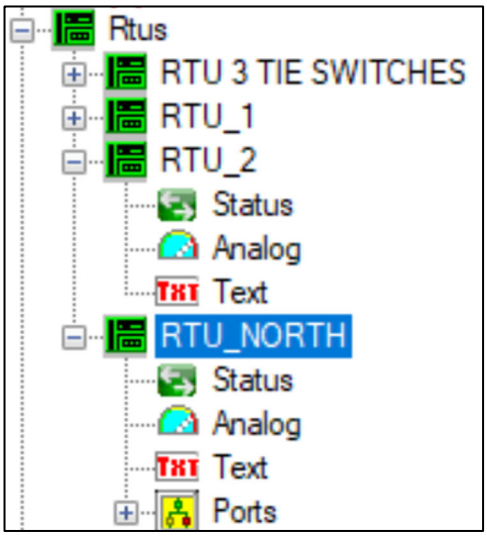
Check to make sure North_F2 is installed.



5.43 North_F2 in Database

INSTALL SLAVE IEDs

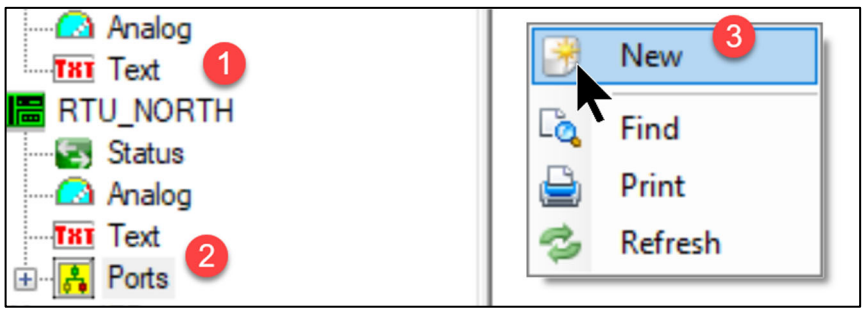
Many of the procedures in installing Slave IEDs are the same as for Master. The differences lie mostly at the beginning because a Slave IED starts off by being linked to an RTU.



5.44 Ports on an RTU that uses DNP3

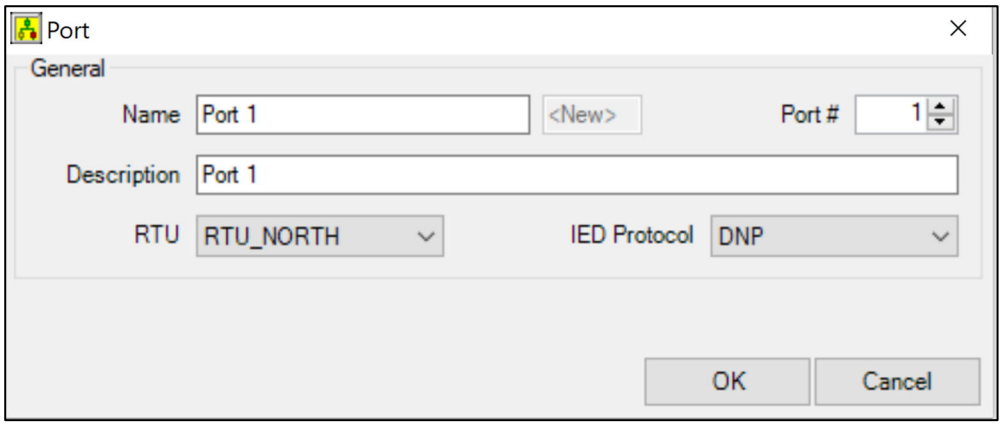
Comparing the RTU we installed to an RTU installed prior to the session, we see a difference. Our RTU_North has a section called Ports. The reason for the difference is that the protocol linked to RTU_North (DNP3) supports connecting IEDs to RTUs.

To take advantage of the port functionality,
(1) Click RTU_North
(2) Click Ports and
(3) Right-click on the right side of the window and select New.



5.45 Creating a New Port

Let's give the port the name Port 1.

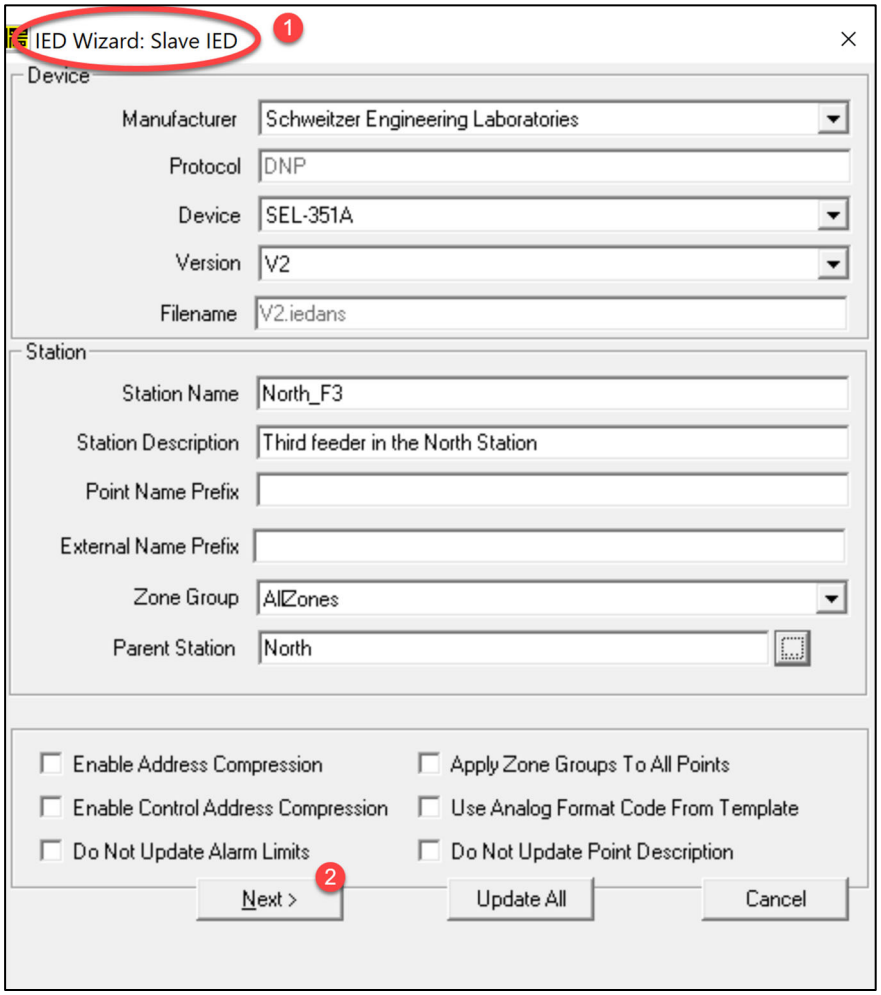


5.46 Creating a Port 1

After creating Port 1, you may have to toggle the +/- sign (1) before it shows as in label (2). Once you do see it, you can right-click on the right side as we have done previously when we want to attach something to database element (3).

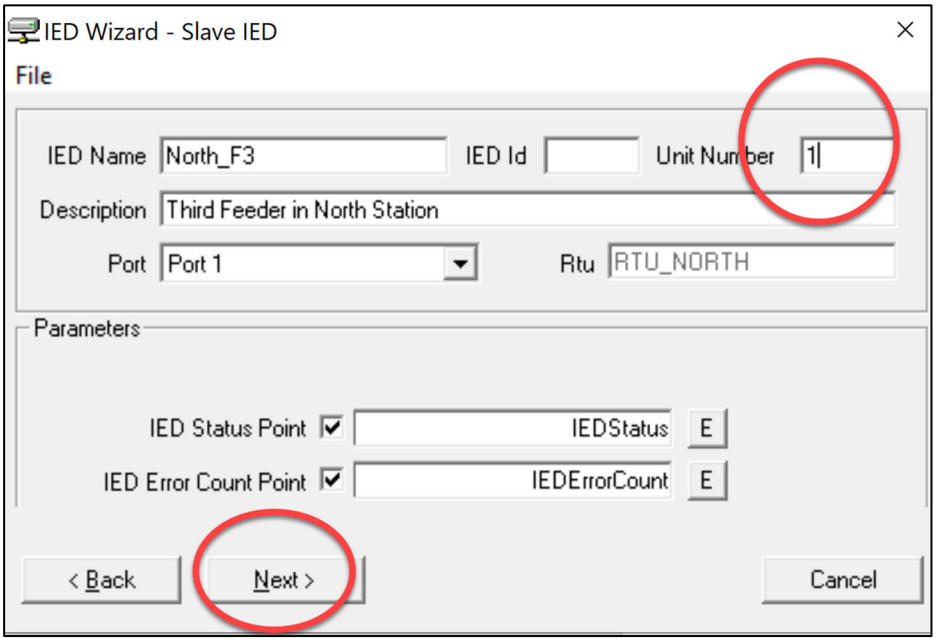
5.47 Preparing to Attach Something to the Port

Mostly it's similar to the other IEDs we created. One major difference is that it's labelled as a Slave IED. Click Next to continue.



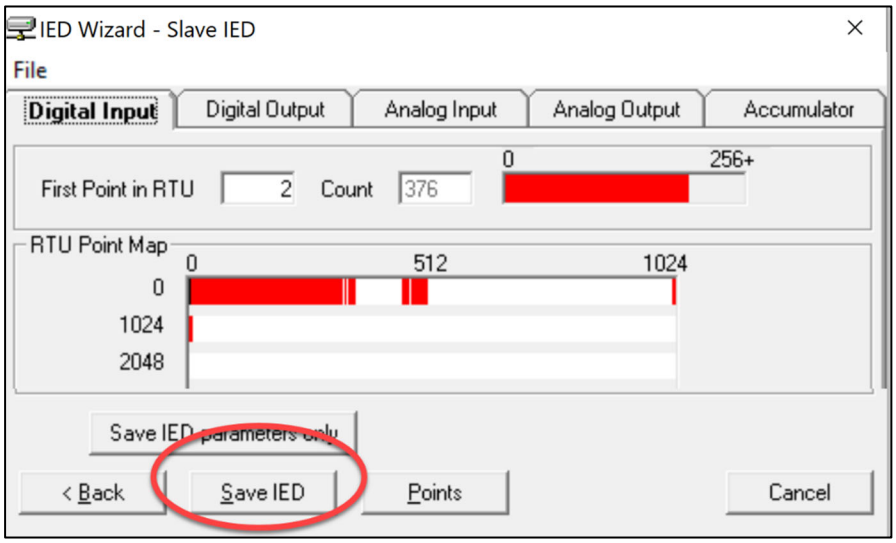
5.48 Label Indicates this IED will be a Slave

Just as we entered an address for RTUs and Master IEDs on a Comm Line (Image 5.30), so too do we enter a unique addresses for Slave IEDs connected to an RTU Port. Click Next after entering the address.



5.48 Label Indicates this IED will be at Address 1 on the RTU Port

Since the IED is slave to the RTU, its points must also correspond to available points in the RTU. This image shows which RTU ports will be used by this device and what is still available. Click Save IED to install the points.



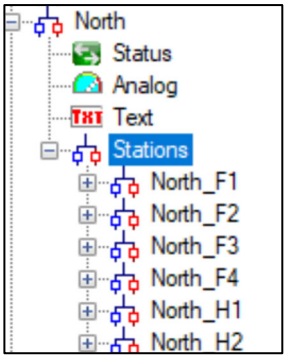
5.49 Saving Slave IED

Exercise

In-class exercise: Install another SEL 351A. This one will form Feeder 4. The IED should be attached to another port in the RTU (Slave IED).

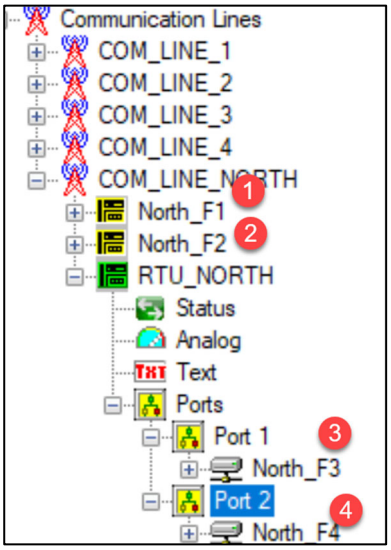
Now that we've installed points for 4 IEDs, let's note all the places where they can be seen in STC Explorer.

1. Under Stations (F1-F4).



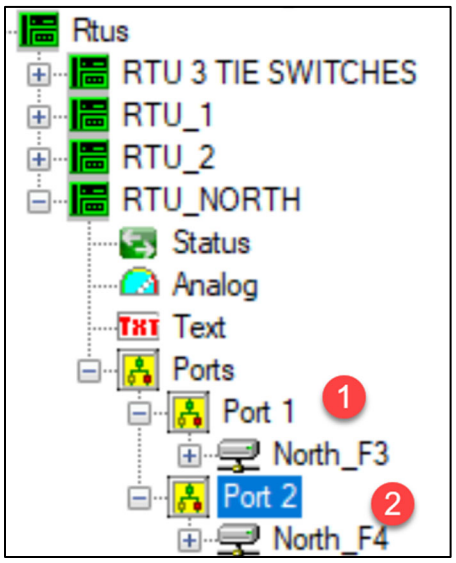
5.50 IED Points Under Stations

2. Under Communication Lines (2 direct and 2 through RTUs connected to a Communication Line).



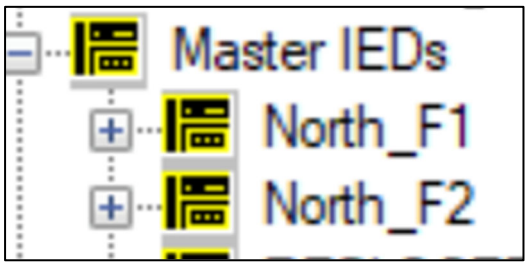
5.51 IED Points Under Communication Lines

3. Two can be found under RTUs.



5.52 Two IEDs under RTUs

4. Two can be found under Master IEDs.



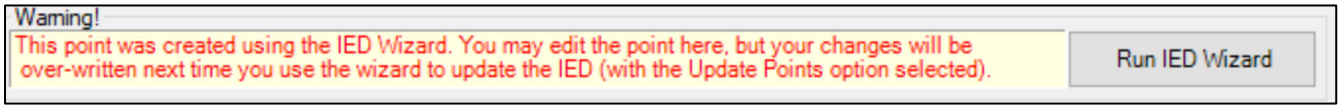
5.53 Two IEDs under Master IEDs

5. Two can be found under Slave IEDs.

5.54 Two IEDs under Slave IEDs

FURTHER CHANGES

Points created by the IED Wizard look different from points that are created manually. They all have the same warning at the bottom.



5.55 IED Point Warning 1

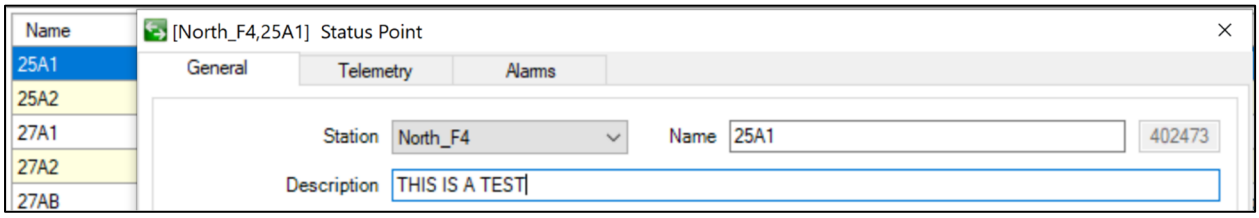
That is, you can edit the point manually; however, if the IED Wizard runs again for that collection of points, all your changes will be overwritten.

The warning becomes more significant when you can update all your IEDS with the push of a button.

The main point is that, whenever practical, it's best to update and edit IED points using the IED Wizard.

Let's do an example.

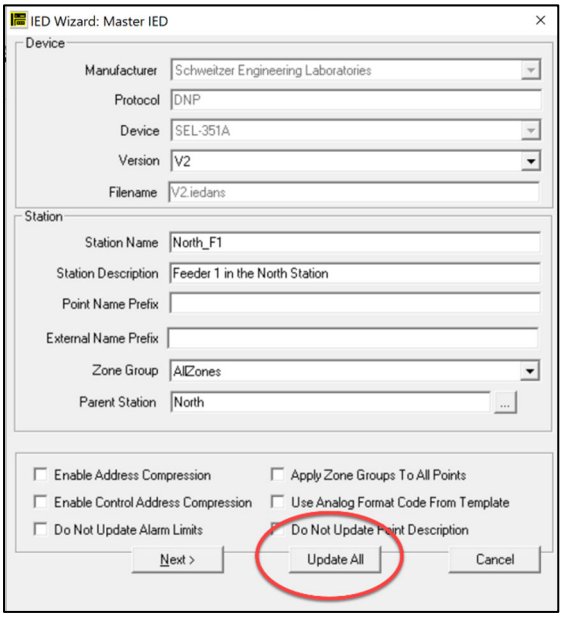
1. In North_F4 find point 25A1. Write something different in the description.



5.56 Making a Manual Change

2. Now, choose any point in North_F1 created by the IED Wizard and then click the button Run IED Wizard (see Image 5.55).

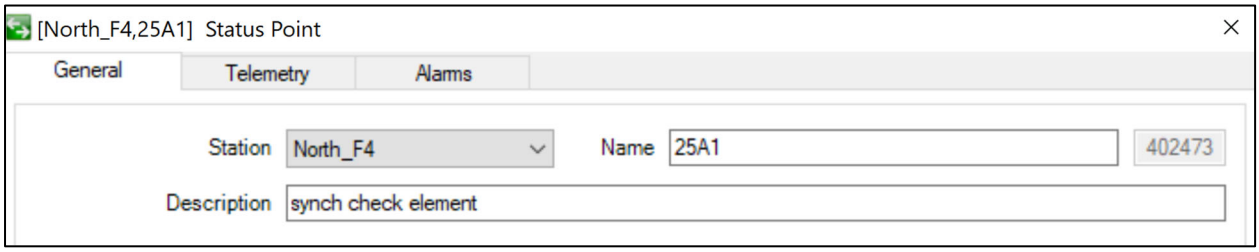
3. When the Wizard launches, click the Update All button.



5.57 Update All Button

When you select the Update All button, it doesn't matter which station you have up on the screen. All IEDs with the same Manufacturer, Device, and Version number get updated. You may have noticed that the wizard ran through all the applicable stations when you hit Update All.

The point we manually changed in F4 has been overwritten and it's now back to default.



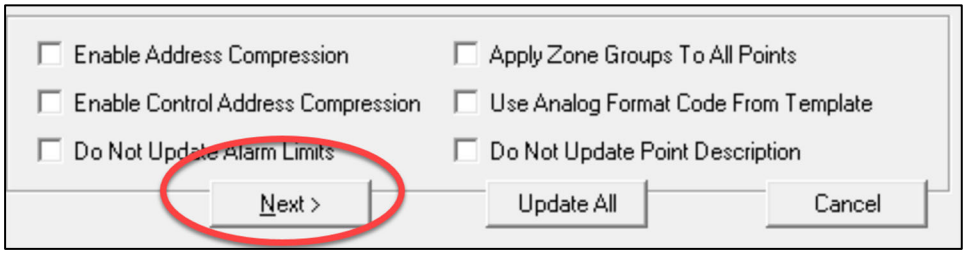
5.58 Changes Are Now Overwritten

Note: If we would have manually created a new point in North_F4, it would **NOT** have been overwritten. The IED Wizard overwrites points and, if the point does not exist in the IED Wizard, there is nothing to overwrite.

Even though the overwriting of manual points seems dangerous, it actually is an attractive aspect of the IED Wizard. If you have dozens of these devices, you will only have to make one change in the template and then use the Update All button to make hundreds or thousands of changes with one button push.

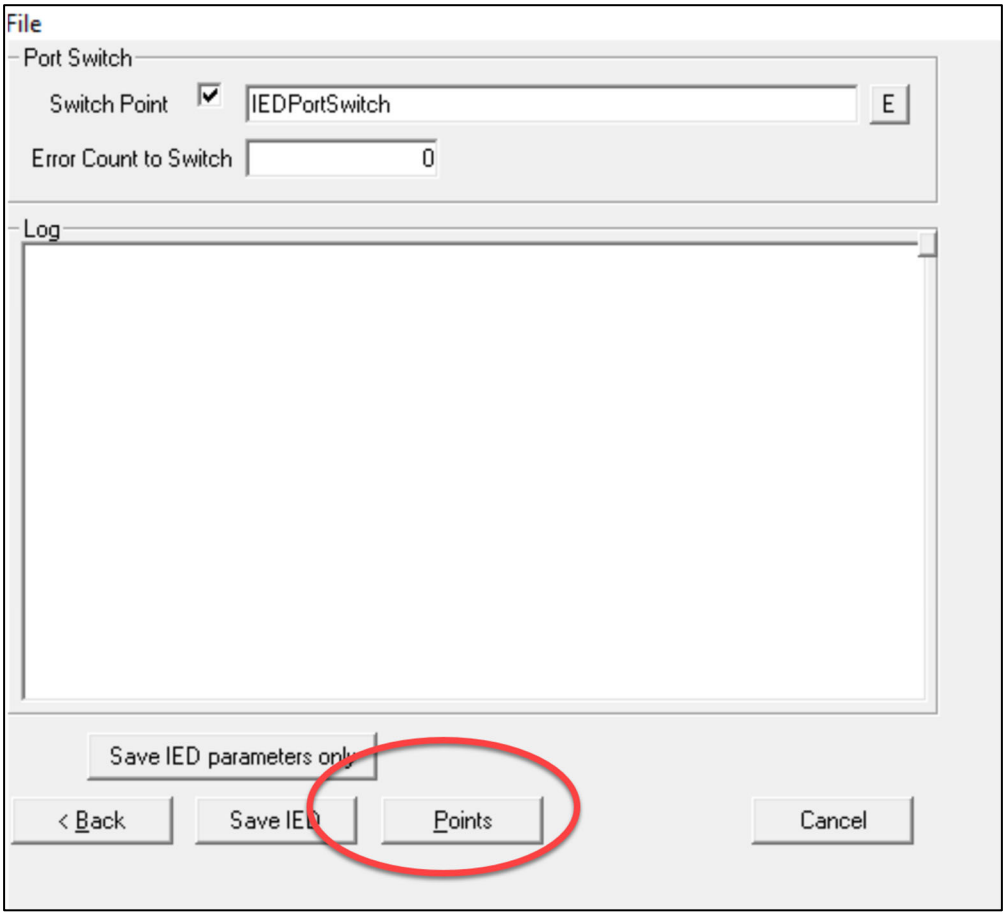
Once again, find any point created by the IED Wizard and click the Run IED Button (Image 5.55).

This time keep clicking Next until you get to the last page with the Points button.



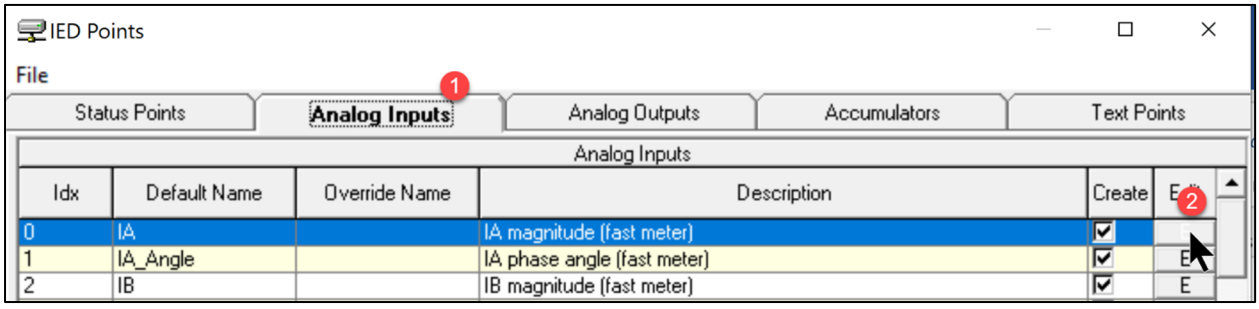
5.59 Click Next Until You Get to Last Page

Click Points.



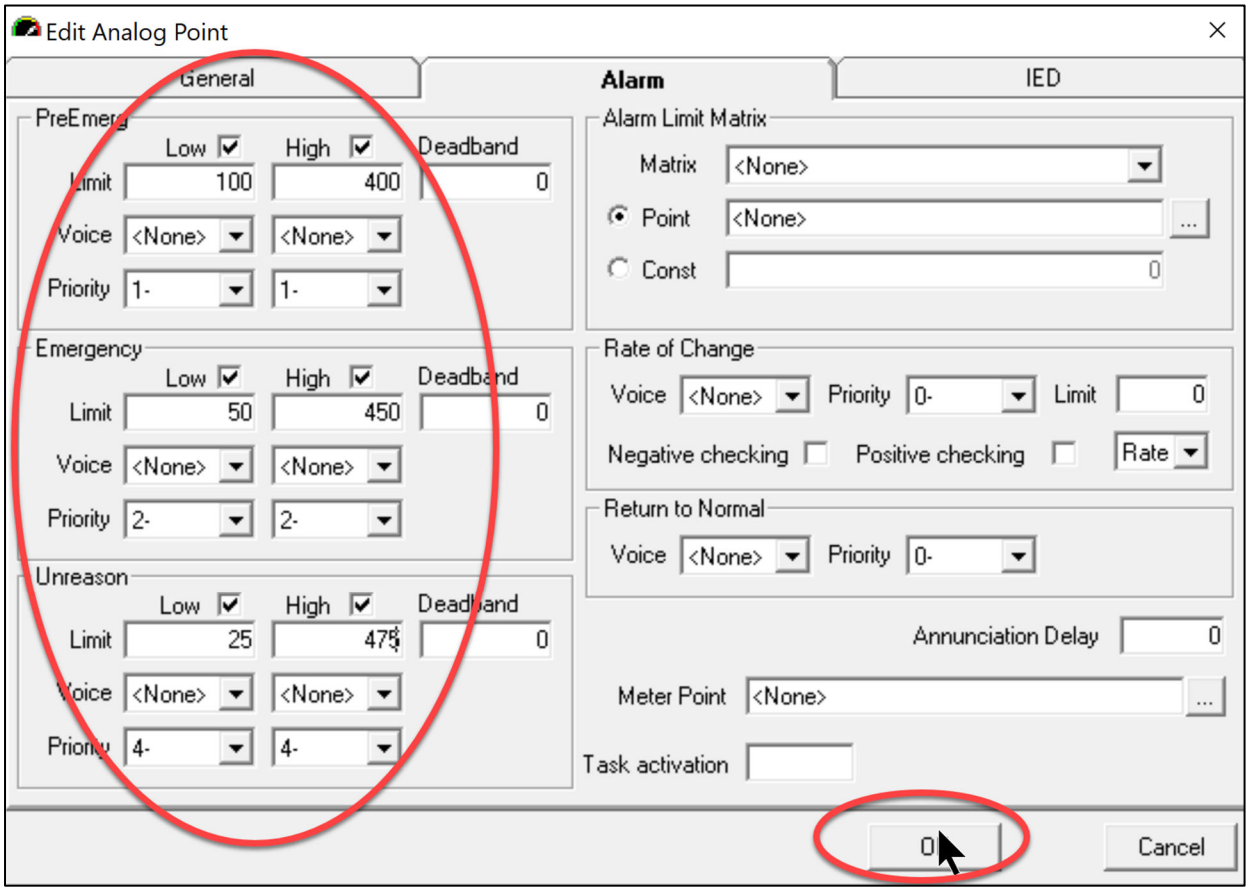
5.60 Edit Points

In Analog Points, click the edit button for point IA.



5.61 Editing IA

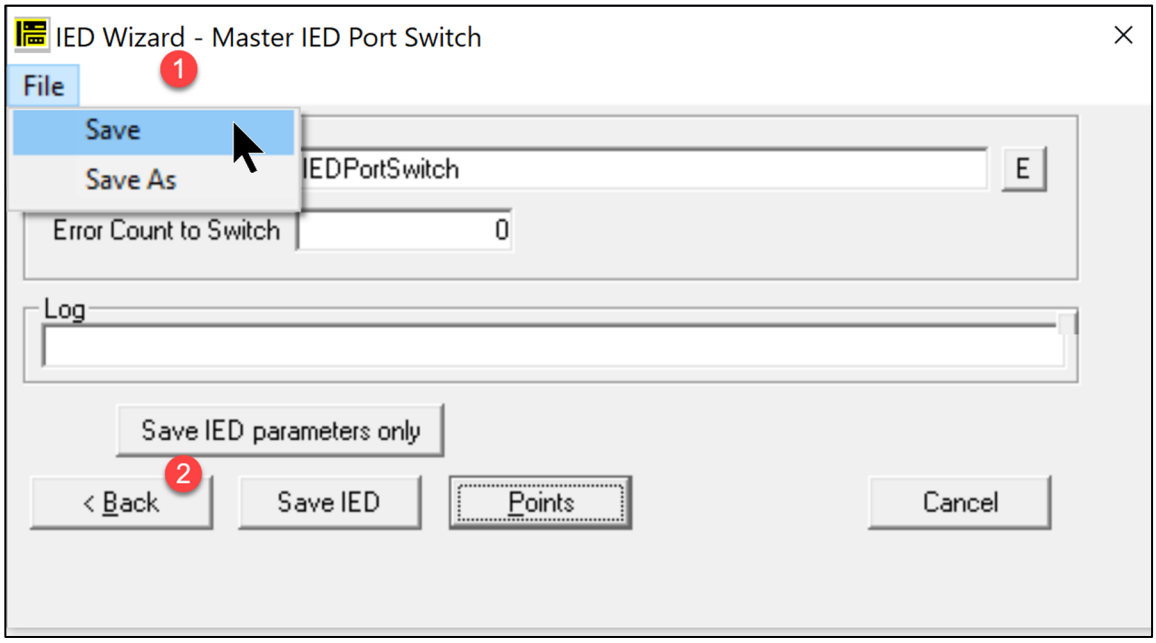
Add some alarm settings as seen below and click OK. Make your way back to the Points button (i.e. keep clicking OK).



5.62 Adding Alarm Settings

Earlier in this section we made a small change in the Control interval (Image 5.34). We then were forced to do a Save As because we were impacting the standard version (Image 5.38).

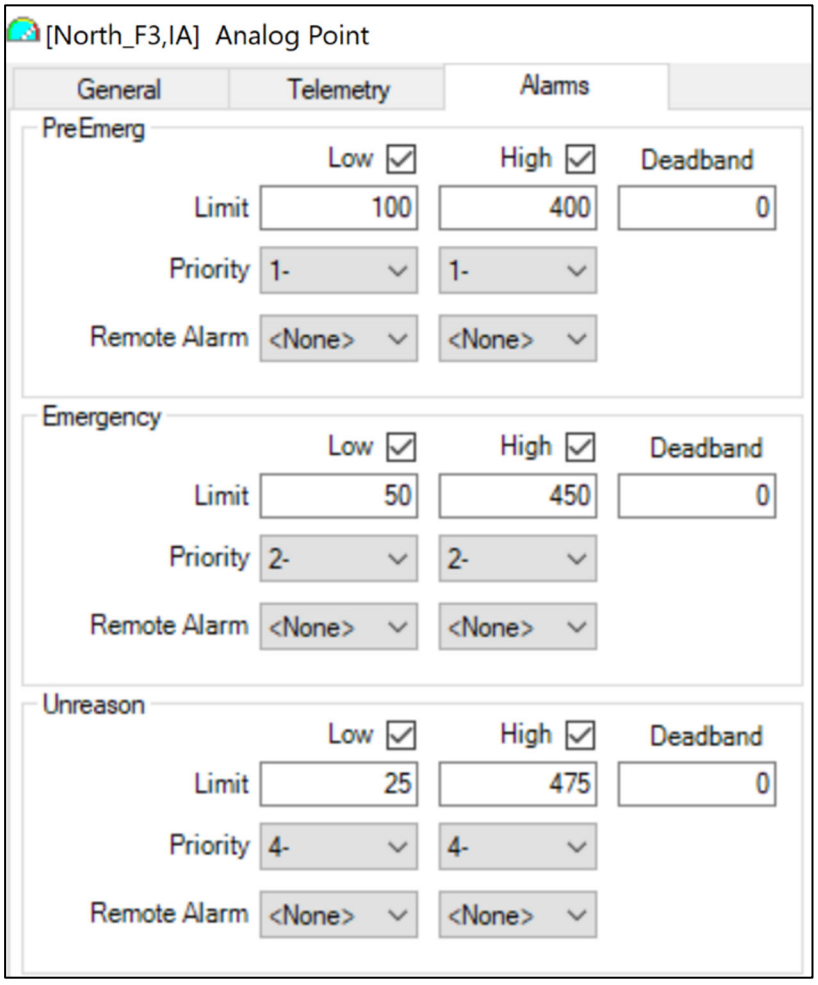
This time the scenario is slightly different. We are now impacting our V2 version so we are not forced to Save As. A simple Save (1) will just rewrite our V2 version. Please see image 5.63 on the following page.



5.63 Saving our Change

Next, let's go back all the way to the first page (2) where we can hit Update All again (Image 5.57).

Every single Analog point named IA using V2 of the SEL 351A template should now have alarms. The example below is from Feeder 3.

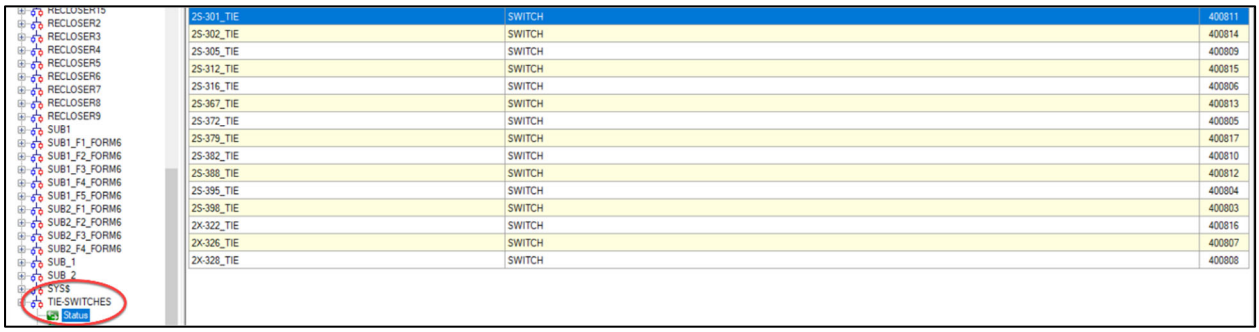


5.64 All IA Points Updated

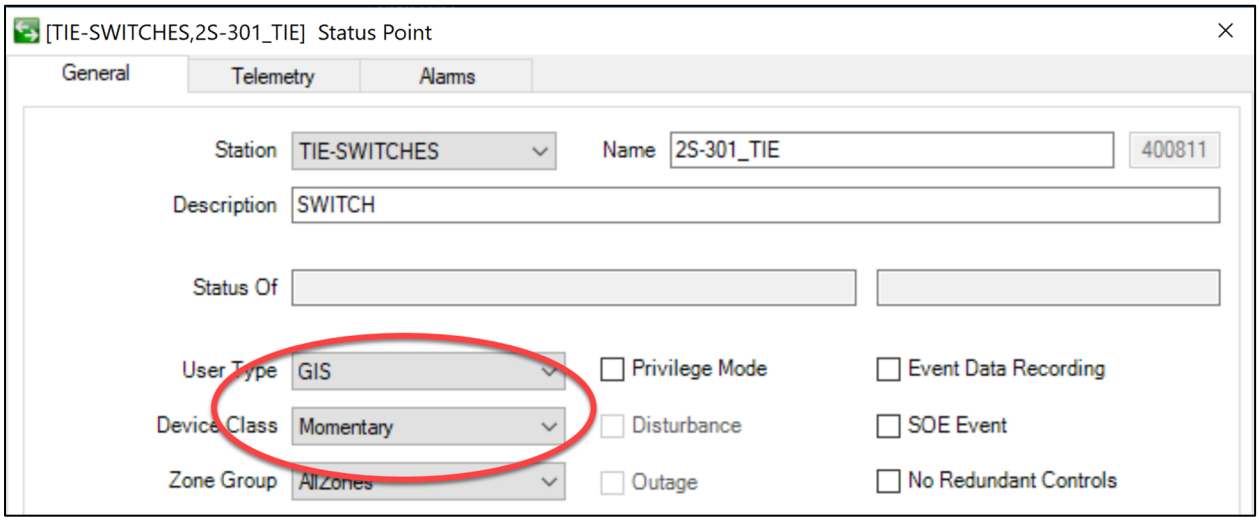
DUMP, EDIT, CONVERT, LOAD EXISTING POINTS

Even if you are not using IEDs, there are still other ways to manipulate and change multiple points at once. In this section, we will use tools that work with Excel for quick point manipulation.

To start, let's look at a group of points in a Station called Tie-Switches. Tie-Switches has many status points all set for Momentary Alarms.



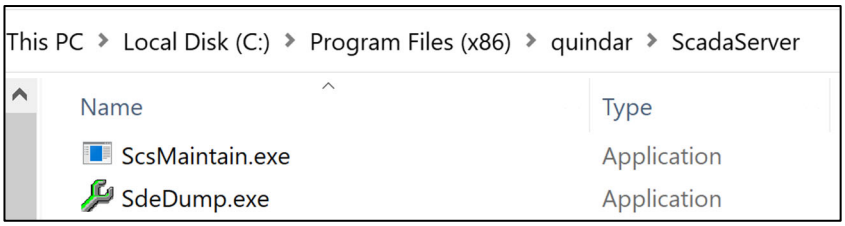
5.65 Tie-Switches Station



5.66 Momentary Settings

For our scenario, let's imagine there are hundreds of those TIE points and we would like to change the alarm to Sustained. Changing them manually would take a long time. The better way would be to Dump and Load.

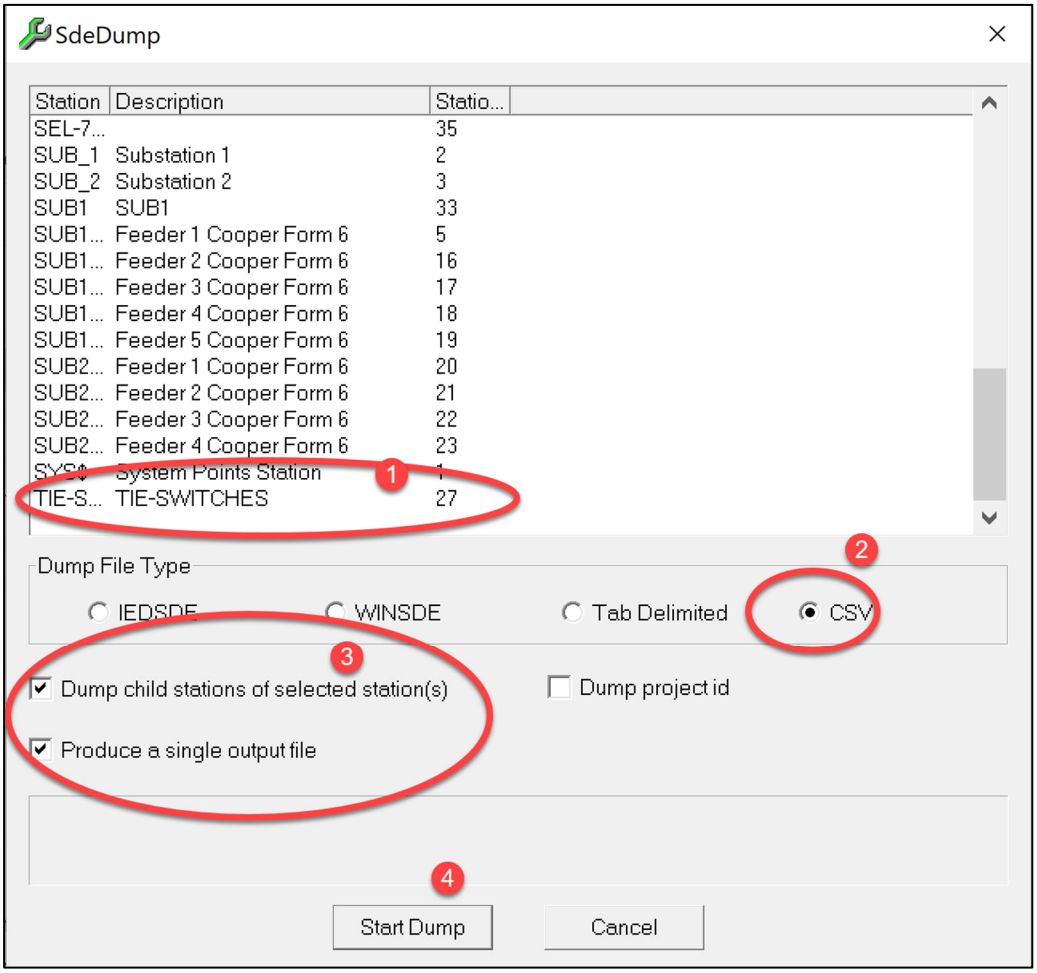
We start by launching the application SdeDump found in the ScadaServer folder.



5.67 SdeDump

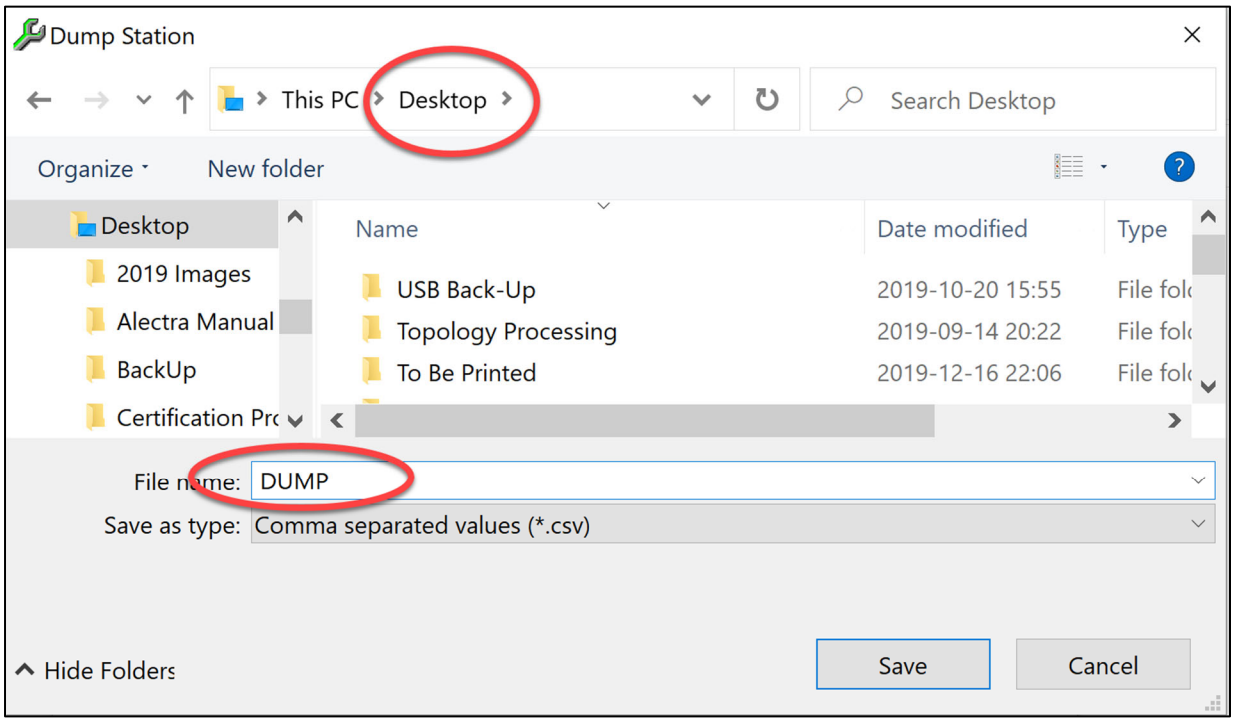
The options we will choose for our exercise are selecting:

1. The Station.
2. CSV Output.
3. If Tie-Switches has child stations, we will download those as well; however, we want to work with just one big file.
4. Start Dump.



5.68 Dump Options

Next, you will be asked to name the dump file and where you would like the file to be dumped. When you click Save the file will be downloaded.



5.69 Settings for the File to Be Dumped

When you open the file that was dumped, there will be many headings listed in the top row. These all correspond to point attributes. Some will be intuitive (e.g. Name) and some will be very hard to decipher (e.g. alarmskild).

Over the next 9 pages, you will find a helpful transition table with the fields listed in alphabetical order. We will continue with our scenario after you have a quick skim of the information.

Spreadsheet Point Field **Descriptions** – If not specified, assume 0 for entry.

Name	Comment
addrinuse	**Analog point. Enter "1" if point is telemetered. Else 0.**
addra	**Analog point. First entry in A,B,C,D format. For DNP, this is the point #.**
addrb	**Analog point. Second entry in A,B,C,D format.** **For DNP, this is the Object Type (For details refer to DNP scan task manual, pg.6-3)** **E.g. 20 is Binary Counter.** **30 is Analog Input, Do Not Download Deadband.** **There are numerous less used options too.**
addrc	**Analog point. Third entry in A,B,C,D format. Enter 0 for DNP.**
addrd	**Analog point. Fourth entry in A,B,C,D format. Enter 0 for DNP.**
alarmsev0	**Status point. Alarm priority if unacknowledged status point is in state 0.**
alarmsev1	**Status point. Alarm priority if unacknowledged status point is in state 1.**
alarmsev2	**Status point. Alarm priority if unacknowledged status point is in state 2.**
alarmsev3	**Status point. Alarm priority if unacknowledged status point is in state 3.**
alarmtask	**If you want to call a command sequence if the point goes into alarm status, this would be the number of the command sequence. E.g. #1 or #2 or #3 etc.**
alarmsklid	**Alarm format for status points. E.g. Format01.**

Name	Comment
annundelay	**Delay in seconds before an alarm is displayed.**
bayid	**Status point. If using a bay, enter the name here. It must already exist in the system.**
baycanctrl	**Status point. Enter a "1" if the point can be controlled at a bay.**
chknegpro	**Analog point. Enter "1" if checking negative ROC.**
chkposroc	**Analog point. Enter "0" if checking positive ROC.**
ctrintpid	**If you are using a point to set a control interval, enter the point here.**
ctrintval	**If you are using a value to set a control interval, enter the value here.**
ctrinttype	**A "0" means you are using a value to set a control interval and a "1" means you are using a point value.**
ctrl0a	**Status Point. If Control 0 is being used, this is the point # for opening a device.**
ctrl0b	**Status Point. If Control 0 is being used, this is the Object Type – e.g. 12 is Control Relay Output Block. See dropdown for others.**
ctrl0c	**Status Point. If Control 0 is being used, enter 1. A 0 would be consider null.**

Name	Comment
ctrl0d	**Status Point. If Control 0 is being used, the following Control Codes are available:** **1 = Pulse On, Select Before Operate** **101 = Pulse On, Direct Operate** **201 = Pulse On, Direct Operate, No Ack** **2 = Pulse Off, Select Before Operate** **102 = Pulse Off, Direct Operate** **202 = Pulse Off, Direct Operate, No Ack** **3 = Latch On, Select Before Operate** **103 = Latch On, Direct Operate** **203 = Latch On, Direct Operate, No Ack** **4 = Latch Off, Select Before Operate** **104 = Latch Off, Direct Operate** **204 = Latch Off, Direct Operate, No Ack** **21 = Pulse on Trip, Select Before Operate** **121 = Pulse on Trip, Direct Operate** **221 = Pulse on Trip, Direct Operate, No Ack** **41 = Pulse on Close, Select Before Operate** **141 = Pulse on Close, Direct Operate** **241 = Pulse on Close, Direct Operate, No Ack** Optionally, you may add one or more of the following to the control code if your device requires it: • Add 16 to force the control operation to the end of the device's queue once it is complete. • Add 32 to cancel any existing operation and delete any queued operations before performing the new control. • Add 64 to strip out the Trip or Close field from the message sent to the device. Otherwise, all Off (control-0) commands received by the RTU will send a Trip, and all On (control-1) commands will send a Close to the IED (in addition to the control code you selected from the above table).
ctrl1a	**Status Point. If Control 1 is being used, this is the point # for opening a device.**
ctrl1b	**Status Point. If Control 1 is being used, this is the Object Type – e.g. 12 is Control Relay Output Block. See dropdown for others.**

Name	Comment
ctrl1c	**Status Point. If Control 0 is being used, enter 1. A 0 would be consider null.**
ctrl1d	**Status Point. If Control 0 is being used, then the following Control Codes are available:** **1 = Pulse On, Select Before Operate** **101 = Pulse On, Direct Operate** **201 = Pulse On, Direct Operate, No Ack** **2 = Pulse Off, Select Before Operate** **102 = Pulse Off, Direct Operate** **202 = Pulse Off, Direct Operate, No Ack** **3 = Latch On, Select Before Operate** **103 = Latch On, Direct Operate** **203 = Latch On, Direct Operate, No Ack** **4 = Latch Off, Select Before Operate** **104 = Latch Off, Direct Operate** **204 = Latch Off, Direct Operate, No Ack** **21 = Pulse on Trip, Select Before Operate** **121 = Pulse on Trip, Direct Operate** **221 = Pulse on Trip, Direct Operate, No Ack** **41 = Pulse on Close, Select Before Operate** **141 = Pulse on Close, Direct Operate** **241 = Pulse on Close, Direct Operate, No Ack** Optionally, you may add one or more of the following to the control code if your device requires it: • Add 16 to force the control operation to the end of the device's queue once it is complete. • Add 32 to cancel any existing operation and delete any queued operations before performing the new control. • Add 64 to strip out the Trip or Close field from the message sent to the device. Otherwise, all Off (control-0) commands received by the RTU will send a Trip, and all On (control-1) commands will send a Close to the IED (in addition to the control code you selected from the above table).
ctrl0inuse	**Status Points – Must be "1" if you are using telemetry to open this point. Else the value is "0".**

Name	Comment
ctrl1inuse	**Status Points – Must be "1" if you are using telemetry to close this point. Else the value is "0".**
ctrluid	**Usually this is 0. Set it to 1 if Control Points are going through a separate RTU.**
description	**Point Description – Free Form**
devclassid	**Type of alarm processing for the point.** **Available device classes for status points:** **1-Momentary** **2-Sustained** **3-Non-alarm** **4-Four-state moment** **5-Special breaker** **6-Trip alarm** **(Consult manual DB-401 pg.6-4 for details on each device class type).** **Available device classes for analogs:** **1-Analog point** **2-Parameter** **3-Setpoint** **4-Lead-Lag**
distcapt	**Enter "1" if activating Disturbance Flag.**
edrdisable	**Should Event Data Recording be disabled? "0" is no and "1" is yes.**
emghiuse	**Analog. Enter "1" if using emergency high alarms on this point. Else 0.**
emglouse	**Analog. Enter "1" if using emergency low alarms on this point. Else 0.**
emghi	**Analog. Enter the emergency high value.**
emglo	**Analog. Enter the emergency low value.**

Name	Comment
emgdb	**Enter deadband value if applicable for emergency high values.**
emgsevhi	**Alarm priority for emergency high alarms.**
emgsevlo	**Alarm priority for emergency low alarms.**
engunits	**Freeform engineering units get entered here for analog points. E.g. AMPS, kV.**
enum	**If using enumeration, enter the ID# of the enumerated value you are using. E.g. 1**
formatid	**This field specifies how the scan task should process the status input data from the RTU.** **For status points:** **1-single bit** **2-single bit inverted** **3-dual bit, first bit on=open** **4-Dual bit, second bit on=open** **5-dual bit,inverted,first bit off=open** **6-dual bit inverted, second bit off=open** **7-dual bit, pass through** **8-dual bit, pass through inverted** **(refer to DNP scan task manual for details, pg. 5-5)** **For the analog points refer to DNP scan task manual, pg. 6-4.** **For analog points, the values are from 1 to 4 (check format dropdown in Telemetry tab for more information).**
hstrnsnd	**Enter "1" if sending to a historian.**
input a	**Status Point – first value in A,B,C.D format. For DNP, this is the point number.**
input b	**Status Point – second value in A,B,C,D format. For DNP, this is the Object Type and is typically 1 (binary input) or 3 (dual bit binary input).**
input c	**Status Point – third value in A,B,C,D format. For DNP, this is 0.**
input d	**Status Point – fourth value in A,B,C,D format. For DNP, this is 0.**

Name	Comment
inputinuse	**Status Points - Must be "1" if you are using telemetry to track the status of the point. Else the value is "0".**
jog	**Analog point. If using a jog value, enter it here.**
limmrxid	**Analog point. If an Alarm Matrix is active, enter in the id #. E.g. 1.**
limmrxtype	**Analog point. If an Alarm Matrix is active, enter a "1" if you are using a point value or "2" if you are using a numerical value.**
limmrxpid	**Analog point. If using a point for an alarm matrix, enter the full name of the point here. E.g. station,name.**
limmrxcnst	**Analog point. If using a numerical value for an alarm matrix, enter the number in here.**
lmmrxmult	**Analog point. If using a multiplier for an alarm matrix, enter "1". Else "0".**
limmrxmpid	**Analog point. If using a multiplier for an alarm matrix, enter the full name of the point here. E.g. station,name.**
lockoutpid	**Used if a status point gets locked out – the lockoutpid is the place in the database that will store the status as locked or unlocked.**
lockouttmr	**Time in seconds that decides if a point gets locket out.**
meterpid	**Value of an associated meter when a specific analog point enters alarm status.**
name	**Point Name – No Spaces or Special Characters.**
normstate	**Which state is the normal state for this point – "0" or "1"**

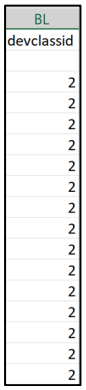
Name	Comment
normsev	**Analog. If using ROC and you are setting a priority when the point returns to normal, enter the value in this box.**
offset	**Analog point. Enter freeform offset value if used.**
parentsid	**This is for the station entry, if it is to go under a parent station, type the name of the parent station here exactly as it is entered in the system.**
premghiuse	**Analog. Enter "1" if using pre emergency high alarms on this point. Else 0.**
premglouse	**Analog. Enter "1" if using pre emergency low alarms on this point. Else 0.**
premghi	**Analog. Enter the pre emergency high value.**
premglo	**Analog. Enter the pre emergency low value.**
premgdb	**Enter deadband value if applicable for pre emergency high values.**
premgsevhi	**Alarm priority for pre emergency high alarms.**
premgsevlo	**Alarm priority for pre emergency low alarms.**
presuffid	**For status points, what are the states? These must already exist. E.g. OpenClose.**
prvlgmode	**Enter a "1" if only "privileged" users are allowed to issue controls.**
roclimit	**Analog points. Freeform. Enter the ROC limit if using ROC.**
rocmode	**Analog point. If using ROC alarms, enter "0" for rate or "1" for step.**

Name	Comment
rocsev	**Analog. Freeform. If using ROC, what alarm priority to you want to set when the ROC exceeds your limit.**
rollover	**Analog point. Enter freeform rollover if used.**
rtuid	**For analog and status points, the connected RTU must appear here exactly as it is entered in the system.**
scalefact	**Analog point. Enter freeform scale factor.**
soeevntdis	**Should SOE be disabled? "0" is no and "1" is yes.**
stationpid	**For analog and status points, their station name must appear here extactly as it is entered in the system.**
timeout	**Response timeout in seconds.**
type	**Has to be "Station" or "Status" or "Analog"**
unrshiuse	**Analog. Enter "1" if using unreasonable high alarms on this point. Else 0.**
unrslouse	**Analog. Enter "1" if using unreasonable low alarms on this point. Else 0.**
unrshi	**Analog. Enter the unreasonable high value.**
unrslo	**Analog. Enter the unreasonable low value.**
unrsdb	**Enter deadband value if applicable for unreasonable high values.**
unrssevhi	**Alarm priority for unreasonable high alarms.**

Name	Comment
unrssevlo	**Alarm priority for unreasonable low alarms.**
useretypeid	**The are the User Point Types under Point Resources. It has to already exist in the system. You can't make one up here.**
zeroclamp	**Analog. Freeform clamp value.**
zoneid	**This is the Zone Group. It has to already exist in the system. You can't make on up here.**

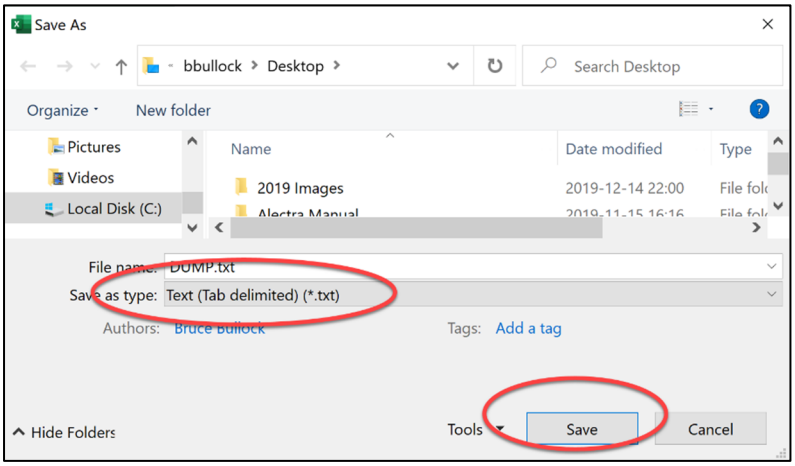
For our scenario, we want to change the Alarm Format. The second last item on page 44 says that we need to find the field devclassid and change the values to 2.

Let's make the necessary changes.



5.70 Changing to Sustained

Now that we've made the changes, the process to get the changes into the database begins with saving the changes as Tab Delimited text files.

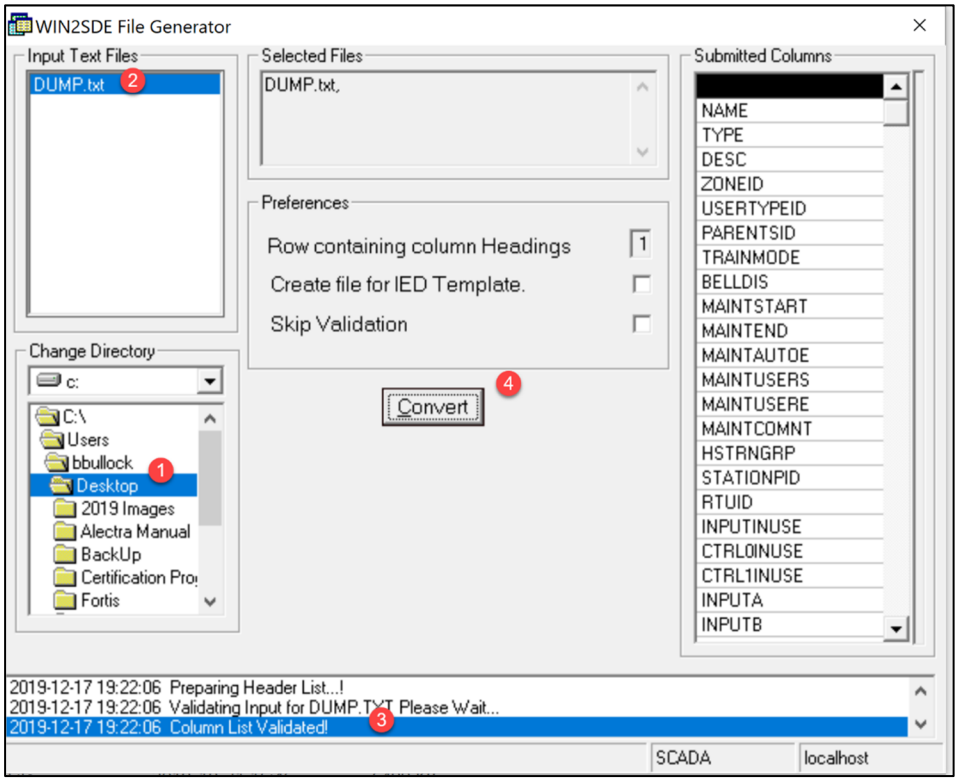


5.71 Saving as Text Files

Now that the files are in text format, we can begin the conversion. In Image 5.67 we found the SdeDump tool. In the same ScadaServer folder is a tool called Win2Sde. As the name suggests, its role is to take files formatted for Windows and change them into files formatted for Survalent Data.

Launch Win2Sde. As soon as you locate your text file (labels 1 and 2), a validation is carried out to make sure all the column headers are valid (3).

We now can click Convert (4).



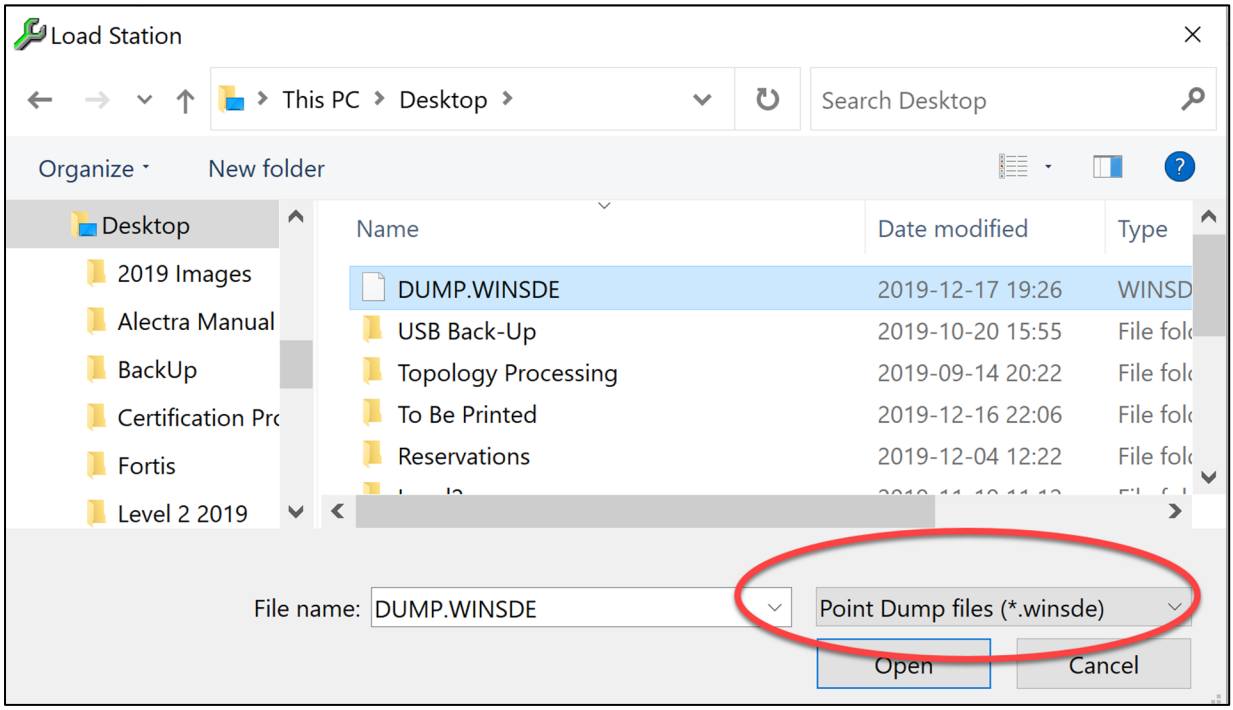
5.72 Conversion Process

You now will have an SDE file in the same location where you placed your earlier csv and txt files.

5.73 SDE File

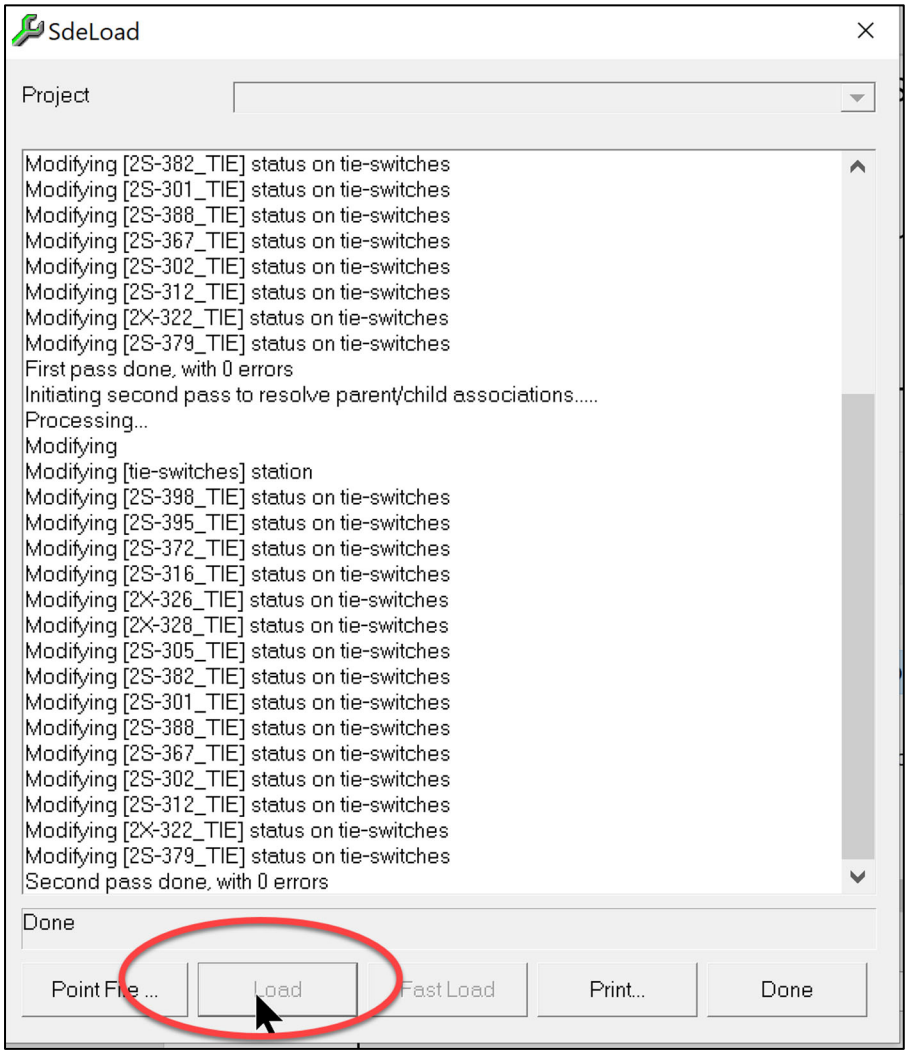
This SDE file now gets loaded into the database using a tool called SdeLoad. You will find this tool in the same ScadaServer folder you used for the SdeDump and Win2Sde. Double-click SdeLoad.

Don't worry if the tool can't find your file at first. The default is to look for IED files (covered in Level 2). Change the default to WINSDE and you will see your file.



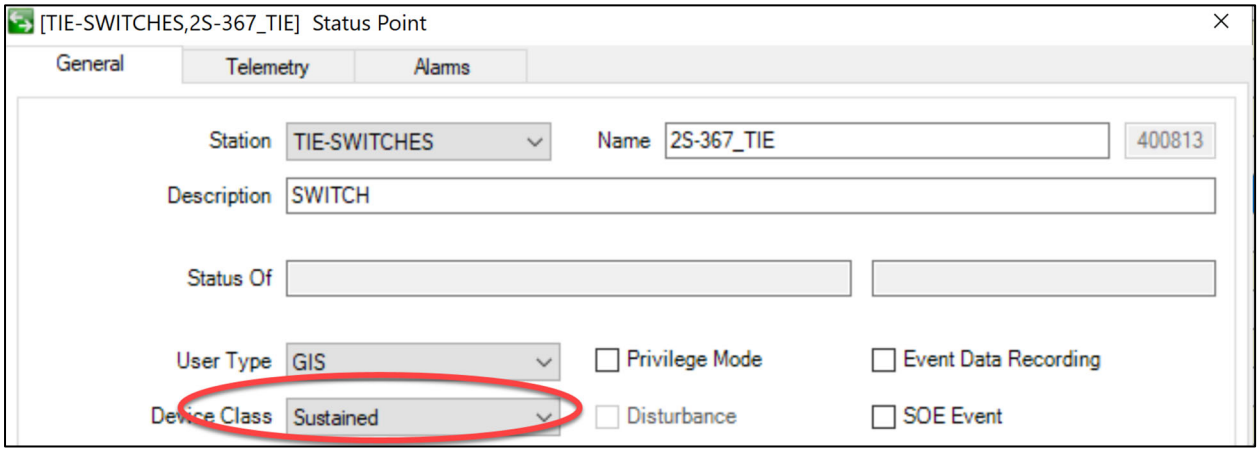
5.74 Locating your SDE File

When the tool opens with your folder, the final step is to click the LOAD button (see Image 5.75 on the next page).



5.75 Loading the Changes

Every point in our station should now be changed to Sustained.



5.76 Changes Showing in STC Explorer

BATCH RENAME POINTS

If you try to change the name of a point using the SDE Dump and Load method, you will not be successful. Changing the name means that the original point name will not be overwritten.

That is, if you want to change North_52A to just 52A, the new 52A will load but the old North_52A will still exist too.

To change the name of points (or to delete points), you would use a tool called BatchRenamePoints.

In our Tie-Switch station, let's say we want to change the name of all the points beginning with "2S" to "2X". Instead of manually changes, we could do the following.

Name
2S-301_TIE
2S-302_TIE
2S-305_TIE
2S-312_TIE
2S-316_TIE
2S-367_TIE
2S-372_TIE
2S-379_TIE
2S-382_TIE
2S-388_TIE
2S-395_TIE
2S-398_TIE
2X-322_TIE
2X-326_TIE
2X-328_TIE

5.77 Tie Switch Names

Start by creating a CSV file with these 5 headings. You can name it whatever you want – let's call it RENAME.

	A	B	C	D	E
1	Action	Old Station	Old Name	New Station	New Name

5.78 5 Headings for Batch Rename Points

For our scenario, the sheet would get filled out as shown below. It was helpful to copy and paste from the DUMP file used in the last section.

	A	B	C	D	E
1	Action	Old Station	Old Name	New Station	New Name
2	RENAME	TIE-SWITCHES	2S-398_TIE	TIE-SWITCHES	2X-398_TIE
3	RENAME	TIE-SWITCHES	2S-395_TIE	TIE-SWITCHES	2X-395_TIE
4	RENAME	TIE-SWITCHES	2S-372_TIE	TIE-SWITCHES	2X-372_TIE
5	RENAME	TIE-SWITCHES	2S-316_TIE	TIE-SWITCHES	2X-316_TIE
6	RENAME	TIE-SWITCHES	2S-305_TIE	TIE-SWITCHES	2X-305_TIE
7	RENAME	TIE-SWITCHES	2S-382_TIE	TIE-SWITCHES	2X-382_TIE
8	RENAME	TIE-SWITCHES	2S-301_TIE	TIE-SWITCHES	2X-301_TIE
9	RENAME	TIE-SWITCHES	2S-388_TIE	TIE-SWITCHES	2X-388_TIE
10	RENAME	TIE-SWITCHES	2S-367_TIE	TIE-SWITCHES	2X-367_TIE
11	RENAME	TIE-SWITCHES	2S-302_TIE	TIE-SWITCHES	2X-302_TIE
12	RENAME	TIE-SWITCHES	2S-312_TIE	TIE-SWITCHES	2X-312_TIE
13	RENAME	TIE-SWITCHES	2S-379_TIE	TIE-SWITCHES	2X-379_TIE

5.79 Completed CSV File

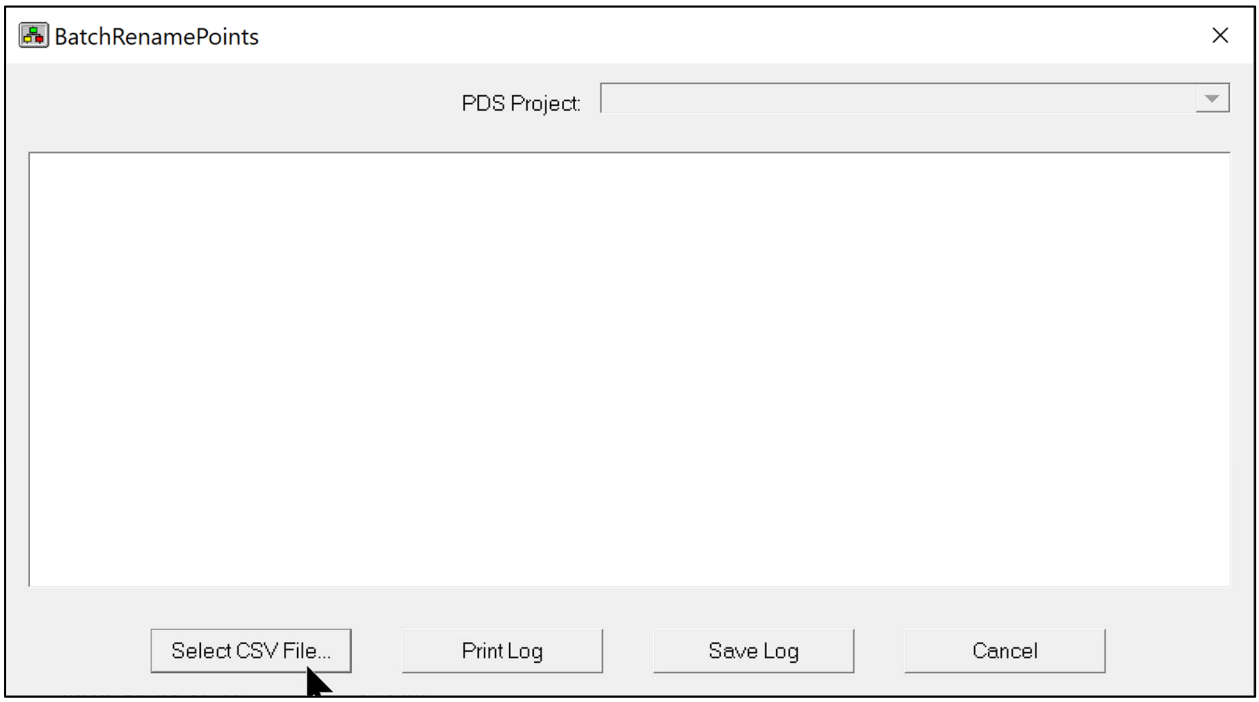
1. For Action, you have a choice of RENAME or DELETE.
2. Enter in the name of the station containing the point we want to rename.

3. Enter in the name of the point.
   YOU CAN STOP HERE IF YOUR TASK IS TO DELETE THE POINTS
4. It's possible to move the points to a totally different station (that already exists) but our scenario is to keep the points in the same station. We just want to rename them.
5. Enter in the name of the new points (i.e. we want to change all the ones with "2S" to "2X").

You can now save your CSV file.

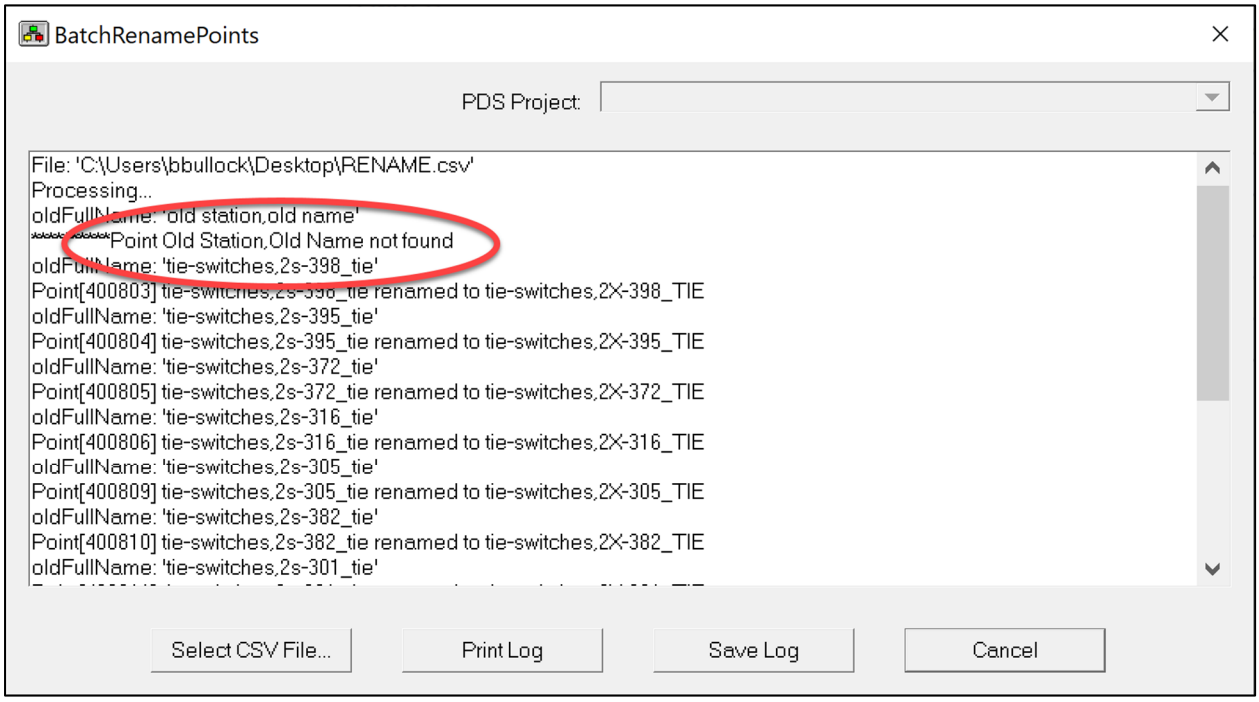
The BatchRenamePoints application is located in the same ScadaServer folder as the dump, load, and convert tools from the last section. Launch the tool.

Click Select CSV File.



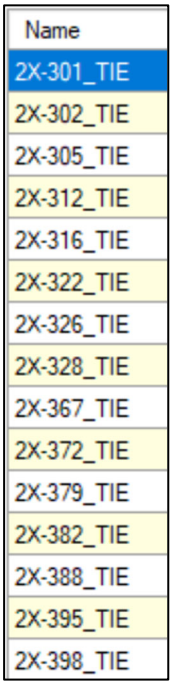
5.80 Loading our File Into the Tool

Don't worry if you see messages like Old Station, Old Name not found. Most likely this means the tool is in the process of removing the old name.



5.81 Work in Process

Refresh STC Explorer by toggling the stations open and closed. Note that our points have all been renamed.



5.82 Names Changed

Exercise

Use the BatchRenamePoints tool to delete 10 of the points from Image 5.82.

CREATING STATIONS AND POINTS FROM A SPREADSHEET

Earlier in this module we dumped out some points, changed them, and reloaded them. It's also possible to create a station and points starting from a spreadsheet.

We saw that there were many columns of information in the Spreadsheet columns but very few of them have to be filled in for an upload to work. On the next page is a list of the minimum fields needed for Stations, Status Points, and Analog Points.

Mandatory Columns for a Station Point:

Column Name	Description
Name	Station name
Type	Point type (= Station)
ZoneId	Zone group name
UserTypeId	User type

Mandatory Columns for a Status Point:

Column Name	Description
Name	Point name
Type	Point type (= Status)
ZoneId	Zone group name
UserTypeId	User type
AlarmSklID	Alarm format name
PrefSuffID	Command-state strings set name

Mandatory Columns for an Analog Point:

Column Name	Description
Name	Point name
Type	Point type (= Analog)
ZoneId	Zone group name
UserTypeId	User type

5.83 Mandatory Columns

Of course, the more information the better.

Another restriction is that we can't make up values for items that first have to be defined. In other words, we can't say the point is a Circuit Breaker if Circuit Breaker hasn't been defined in Point Resources. Here are more examples:

- RTUs referred to in the spreadsheet have to exist (spreadsheet will not create).
- Alarm Formats (we can't enter Format 15 if there is no Format 15 defined)
- State Strings (we can't say In/Out if these states aren't in the database)
- Zones and Zone Groups also have to exist and cannot be added by loading.

Exercise

1. Do an SDE Dump (any station) to get a CSV file with all the proper headings.
2. Delete everything except the headings.
3. Copy the information from the following screen captures below to create a spreadsheet that will eventually create a station called WEST with a status point call Mechanism3ph and an analog point called IIPhaseA.

	A	B	C	D	E	F	G	H	I	J
1	name	type	desc	zoneid	usertypeid	parentsid	trainmode	belldis	maintstart	maintend
2	WEST	station	West of Main	AllZones	Station	<None>	0	0	0	0
3	Mechanism3ph	status	Recloser	AllZones	Circuit Breaker					
4	IIPhaseA	analog	Instantaneous cur	AllZones	Amps					

	A	K	L	M	N	O	P	Q	R	S	T
1	name	maintautoe	maintusers	maintusere	maintcom	hstrngrp	stationpid	rtuid	inputinuse	ctrl0inuse	ctrl1inuse
2	WEST	0	0	0		0					
3	Mechanism3ph						WEST	RTU_2	1	1	1
4	IIPhaseA						WEST	RTU_2			

	A	U	V	W	X	Y	Z	AA	AB	AC	AD
1	name	inputa	inputb	inputc	inputd	inputm	ctrlrtuid	ctrl0a	ctrl0b	ctrl0c	ctrl0d
2	WEST										
3	Mechanism3ph	0	1	0	0	0	0	1	12	1	1
4	IIPhaseA										

	A	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1	name	ctrl0m	ctrl1a	ctrl1b	ctrl1c	ctrl1d	ctrl1m	timeout	voiceid0	voiceid1	voiceid2
2	WEST										
3	Mechanism3ph	0	0	12	1	1	0	10	<None>	<None>	<None>
4	IIPhaseA										

	A	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW
1	name	voiceid2	voiceid3	meterpid	lockoutpid	lockouttm	alarmsev0	alarmsev1	alarmsev2	alarmsev3	alarmsklid
2	WEST										
3	Mechanism3ph	<None>	<None>		DMS,RECL	6000	3	3	3	3	Format01
4	IIPhaseA										

	A	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF
1	name	alarmsklid	annundela	transtime0	transtime1	transtime2	transtime3	ctrintpid	ctrintval	ctrinttype	prvlgmode
2	WEST										
3	Mechanism3ph	Format01	0	0	0	0	0		1000	0	0
4	IIPhaseA		0								0

	A	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP
1	name	normstate	prefsuffid	formatid	alarmtask	phase	devclassid	soeevntdis	outageena	edrdisable	flags
2	WEST										
3	Mechanism3ph	1	OpenClose	1		0	1	1	0	0	0
4	IIPhaseA			1			1	1			0

	A	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ
1	name	nomanflag	commande	nms	ignorete	achatterid	iedinpinus	engunits	emghiuse	emglouse	emghi
2	WEST										
3	Mechanism3ph	0	1	0	0	0	0				
4	IIPhaseA			0				Amps	0	0	0

	A	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ
1	name	emglo	emgdb	premghius	premglous	premghi	premglo	premgdb	unrshiuse	unrslouse	unrshi
2	WEST										
3	Mechanism3ph										
4	IIPhaseA	0	0	0	0	0	0	0	0	0	0

	A	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT
1	name	unrslo	unrsdb	emgsevhi	emgsevlo	premgsevh	premgsevl	unrssevhi	unrssevlo	emgvchi	emgvclo
2	WEST										
3	Mechanism3ph										
4	IIPhaseA	0	0	0	0	0	0	0	0	0	0

	A	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD
1	name	premgvchi	premgvclo	unrsvchi	unrsvclo	rocvoice	normsev	normvc	rocsev	addrinuse	addra
2	WEST										
3	Mechanism3ph										
4	IIPhaseA	0	0	0	0	0	0	0	0	1	0

	A	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX
1	name	enum	zeroclamp	scalefact	offset	rollover	roclimit	excpwindo	limmrxid	limmrxtype	limmrxpid
2	WEST										
3	Mechanism3ph										
4	IIPhaseA	0	0	0.1	0	0	0	0	0	0	

4. Convert the CSV to Text like we did in the Dump and Load section.
5. Convert Win2SDE like we did in the Dump and Load section.
6. Load the new Station and Points.

DELETING POINTS

To delete a point, right-click it and select delete. If the system won't delete the point it could be because you don't have EDIT privileges in User Rights or the point could be part of a calculation (i.e. other points depend upon it).

Deleting IEDs is done from the Communication Line but again there are user rights and dependencies issues that may prevent the deletion.

REVISITING OUR GOAL

At the beginning of this module, we wanted to create enough points for all the devices shown in Image 5.1. We now have the points and will next represent them on our map.