Ira A. Fulton Schools of Engineering
Arizona State University

RTAC Steup at the Machine Learning for Power System Lab

Arizona State University

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1. Objective

The objective of this system is to learn real time operating system based deterministic and uninterrupted automation for all critical applications.

2. Introduction

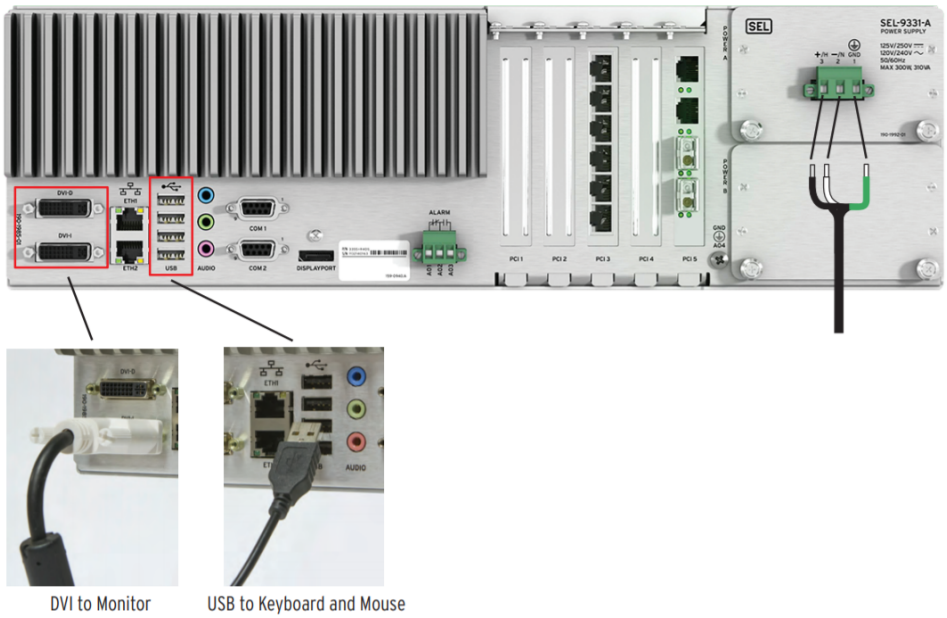
The RTAC features secure communication, advanced data concentration, high-speed logic processing, flexible engineering access, and protocol conversion capabilities between multiple built-in client/server protocols.

3. Software Required

SEL Acselerator Quickset, SEL Acselerator RTAC

4. Installation

- The first steps in applying the SEL-3555 Real-Time Automation Controller (RTAC) are installing and connecting the device.



DVI to Monitor

USB to Keyboard and Mouse

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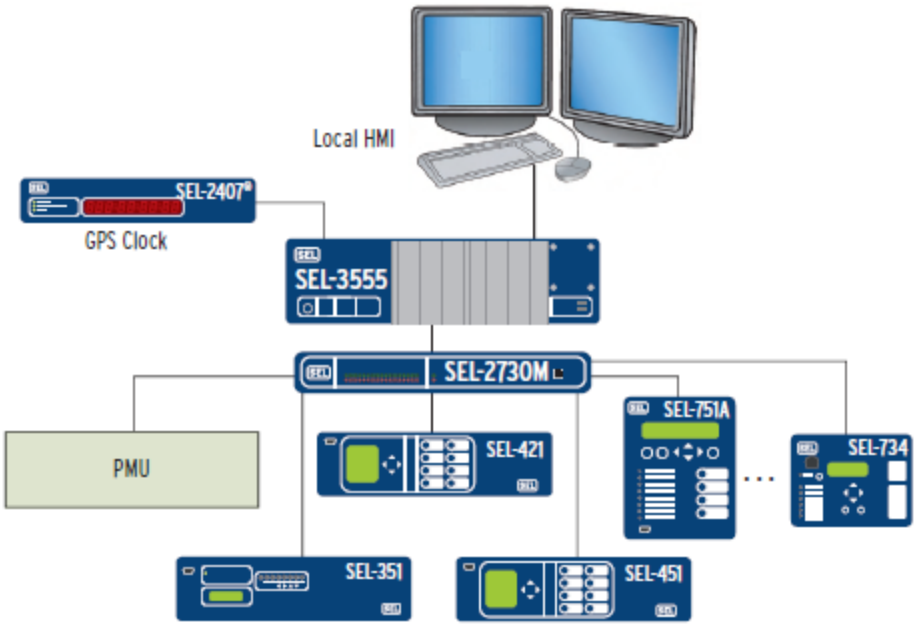
- Install the SEL Acselerator RTAC software.

- Establish ethernet connections



5. Ethernet Port Configuration

Use the Ethernet port on the SEL-3555 to connect to the RTAC web interface and to send project configurations to the unit by using ACSELERATOR RTAC software. Web configuration settings are covered in the SEL-5033 ACSELERATOR RTAC Instruction Manual.

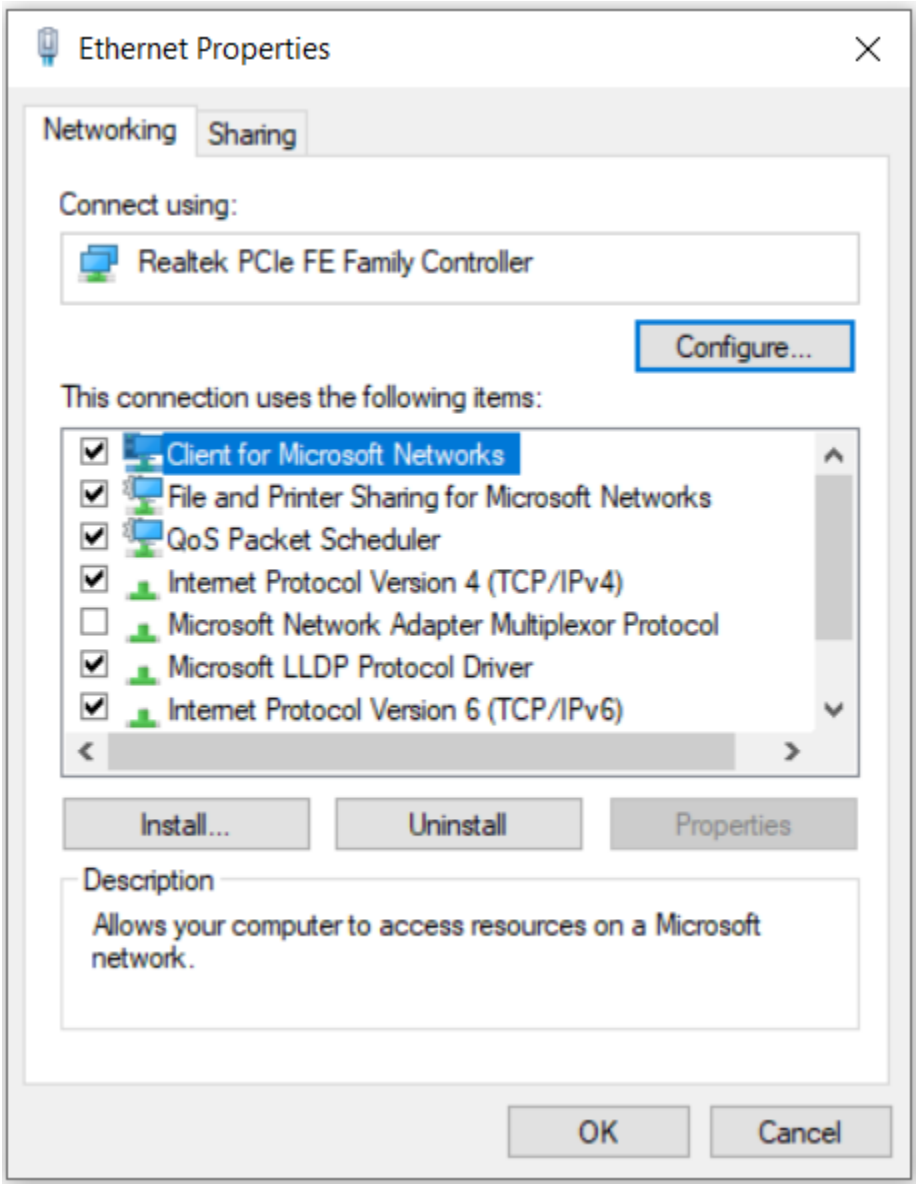
https://selinc.com/products/3555/

All Ethernet ports may be used at the same time and have unique SEL-programmed MAC addresses

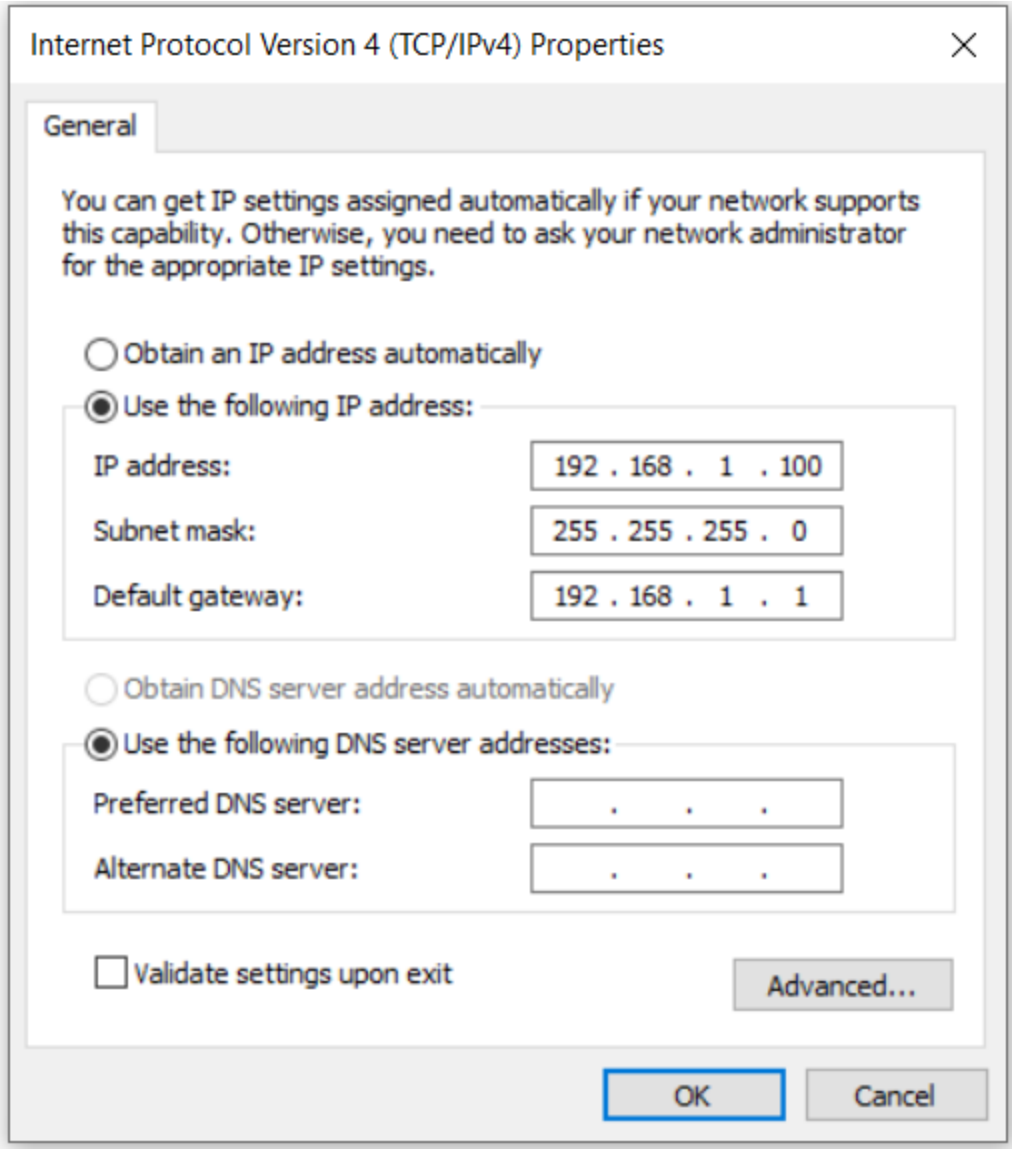
➤ ETH 1: 192.168.1.2

➤ ETH 2: 192.168.2.2

In order to configure the RTAC's ethernet settings the following changes need to be done to the user's laptop/desktop. Go to Control Panel > Network and Sharing > Change Adapter Settings > Ethernet Properties.

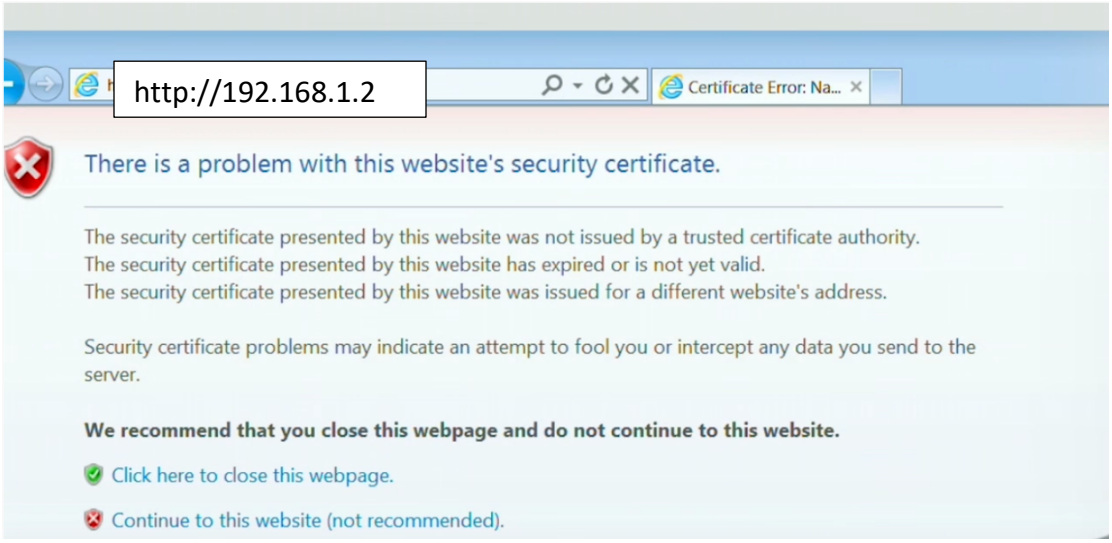


Then double click on Internet Protocol Version 4 (TCP/IPv4)

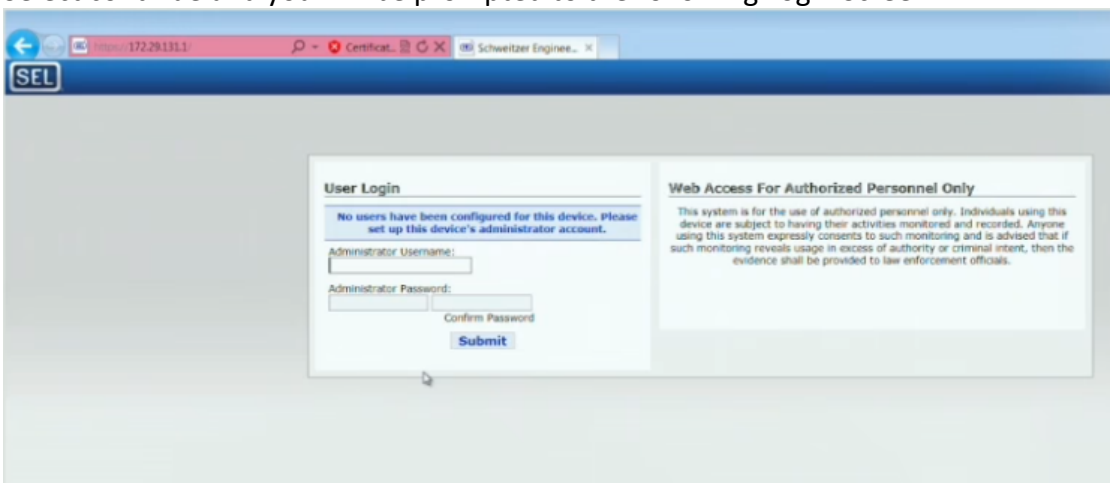


Make sure that the IP address, Subnet mask and Default gateway are set to the values shown above.

6. Web Interface



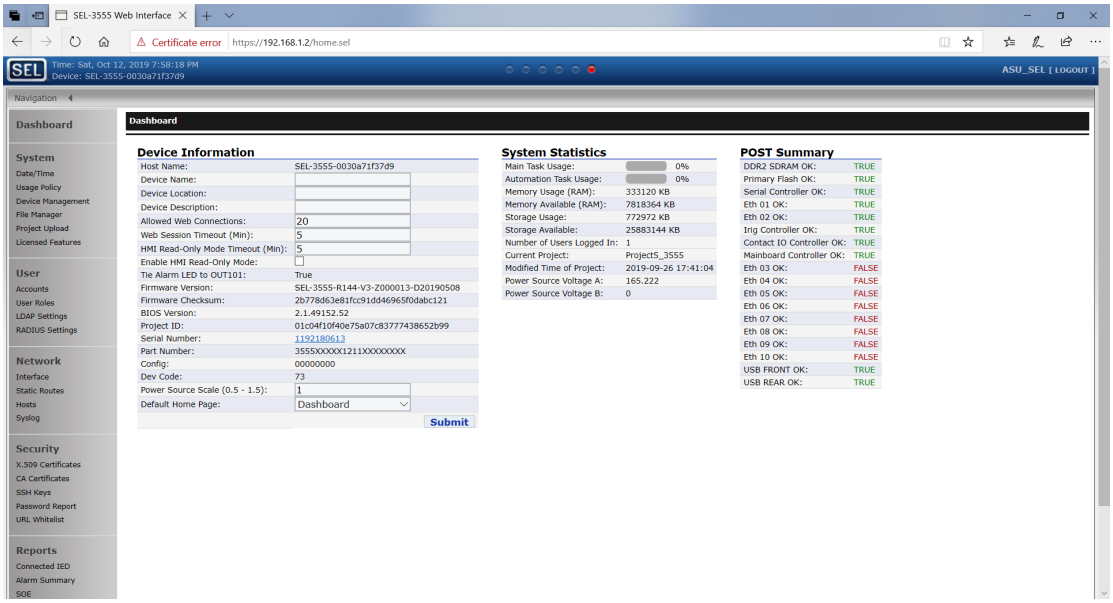
Select continue and you will be prompted to the following Login Screen.



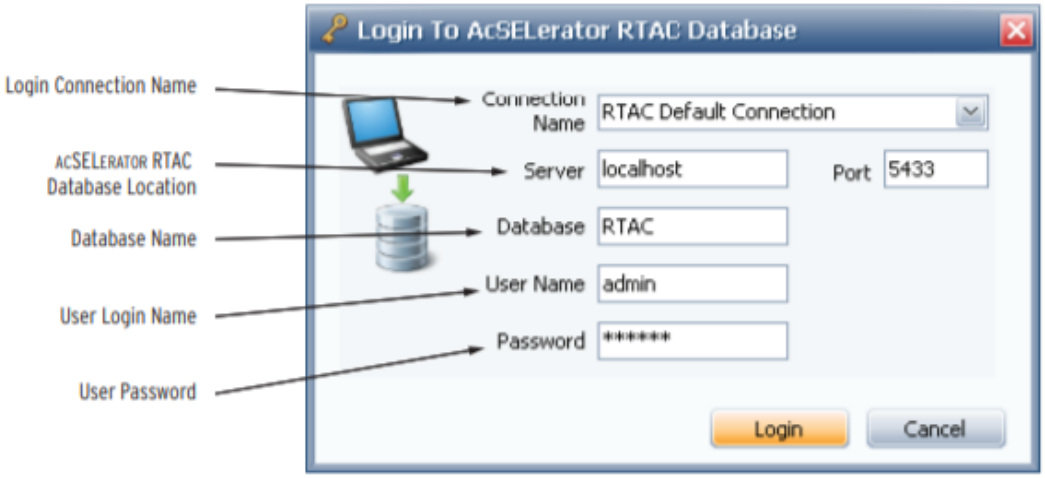
Username: ASU_SEL

Password: Asu12345@

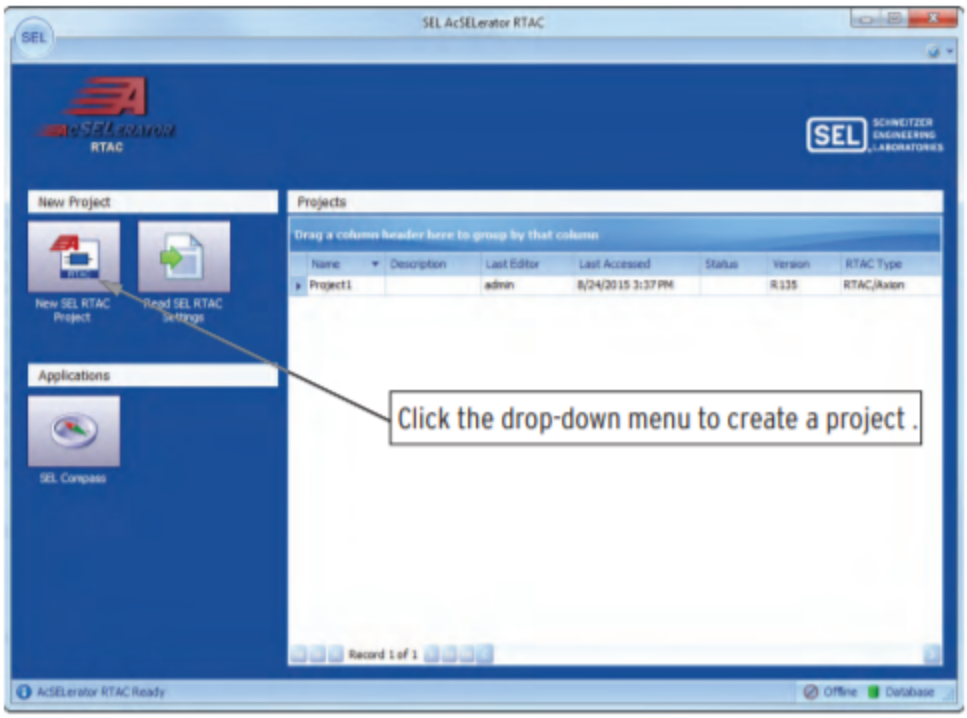
RTAC's web interface is where you configure usernames and passwords, you can configure the Ethernet addresses and a lot of other information



7. SEL Acselerator RTAC
   - Open the SEL Acselerator RTAC software. Initially, two user accounts exist for the default database. One user account has a username of admin and a password of TAIL. The second user account has a username of engineer and a password of OTTER.



Use the start page that appears after you log in to the Acselerator RTAC database to view existing projects or create new ones.



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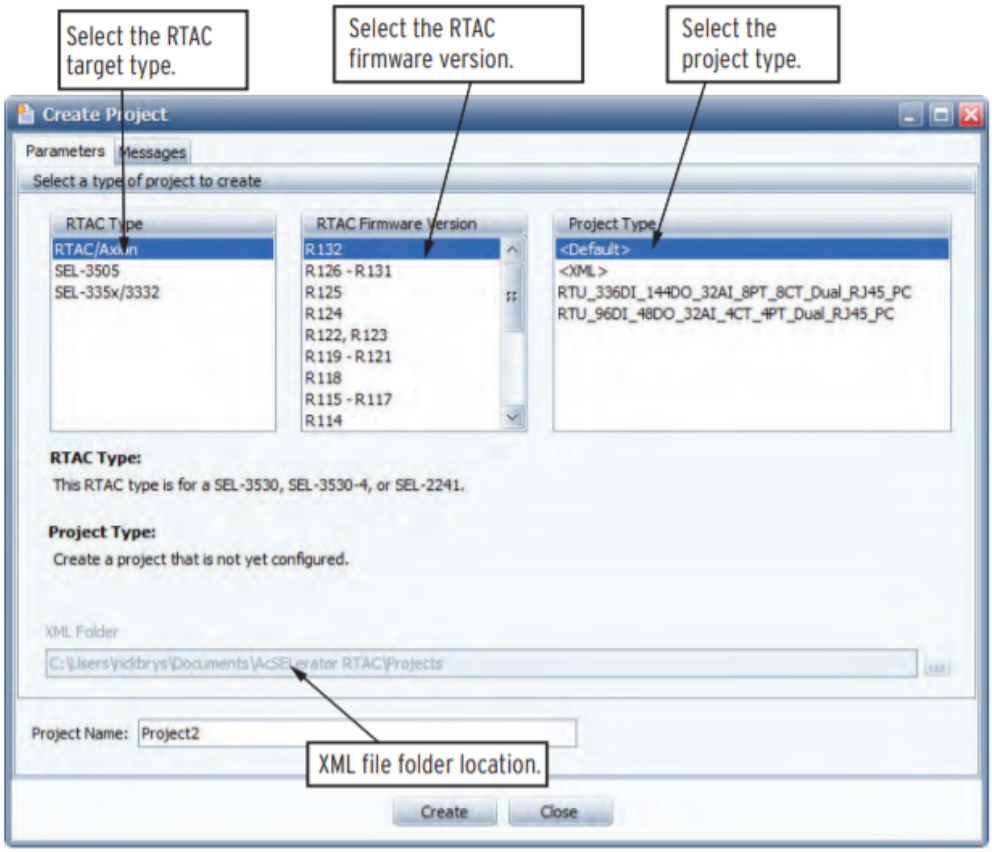
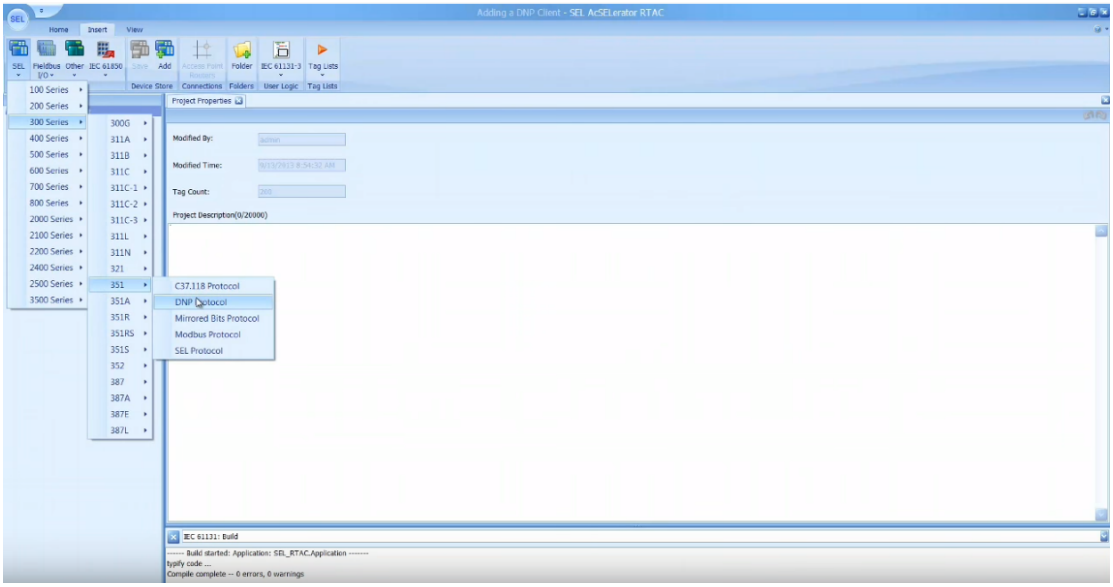
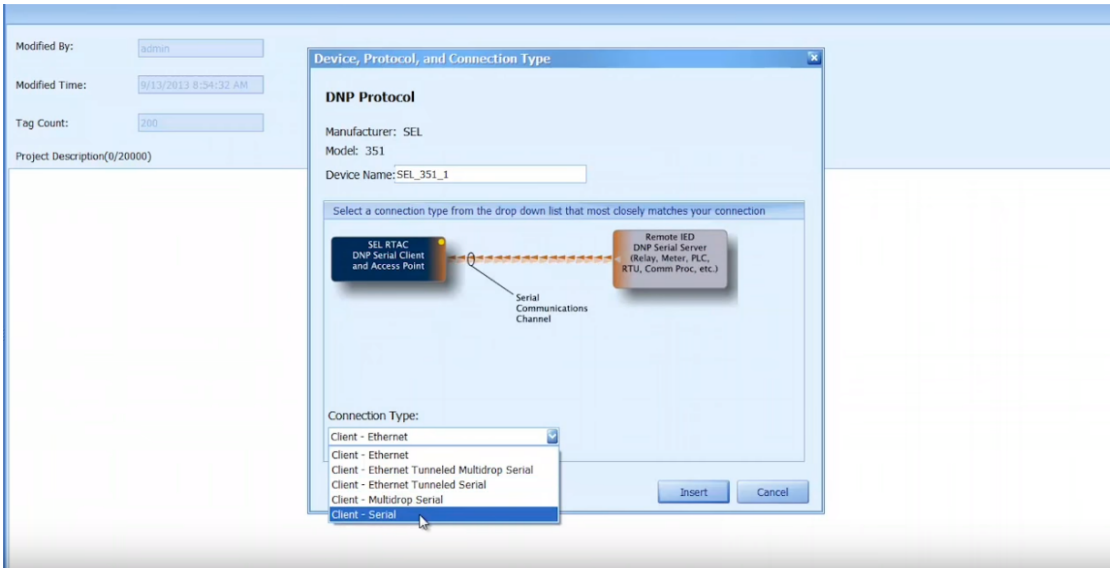


In our experiment the RTAC is SEL 3555. Choose the latest firmware version and let the project type be default.

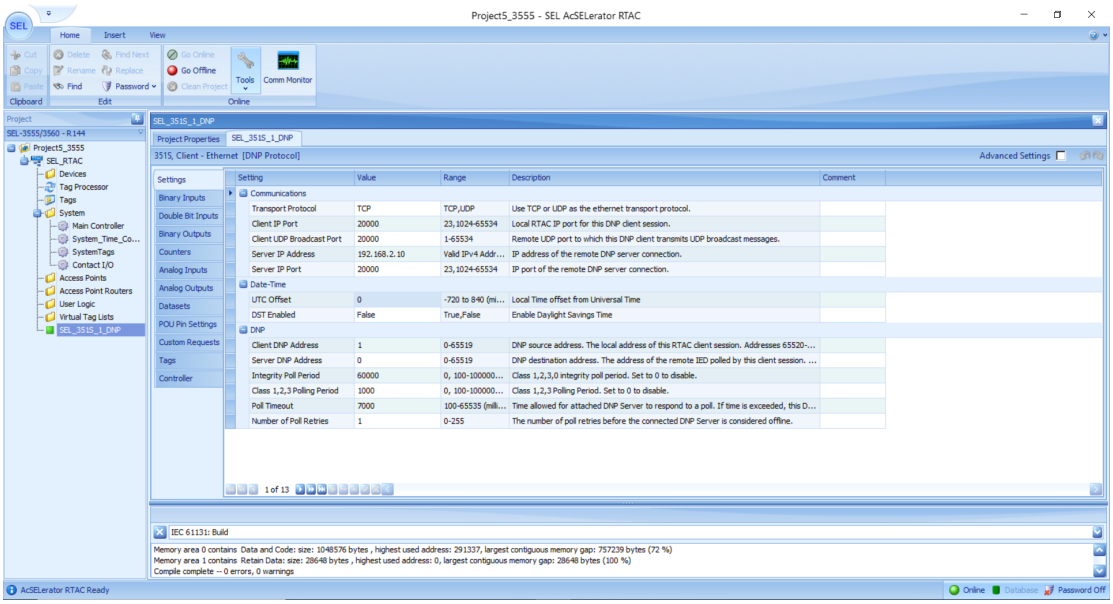
The first thing you do in the project is add SEL 351/ 351S relay under the SEL devices tab as shown below. There are a number of protocols available. We select the DNP protocol.



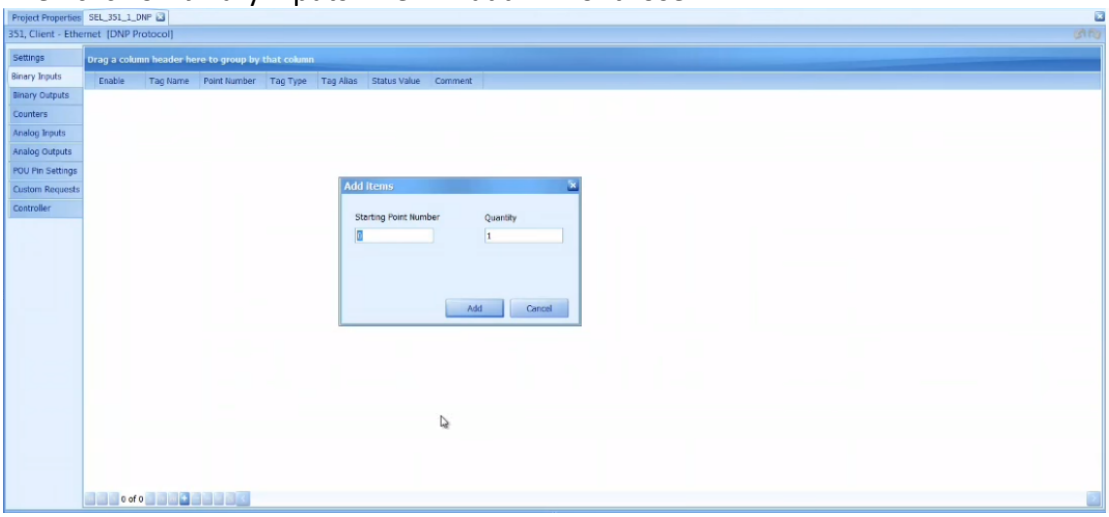
Select the client-server mode of connection as we have a connection via RS232 cable as shown below



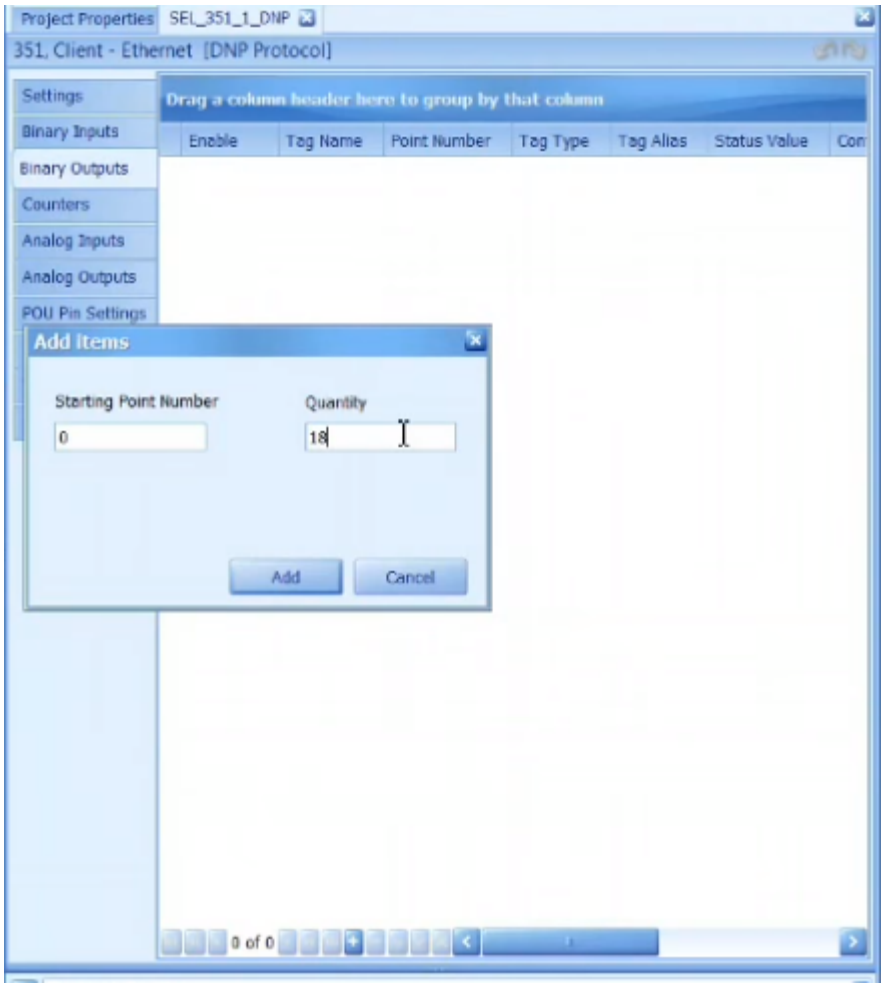
Once the 351S is added double click on the same and configure the IP address, transport method and poling period. Set the parameters to the values shown below.



Then click on binary inputs. We will add 24v of those.

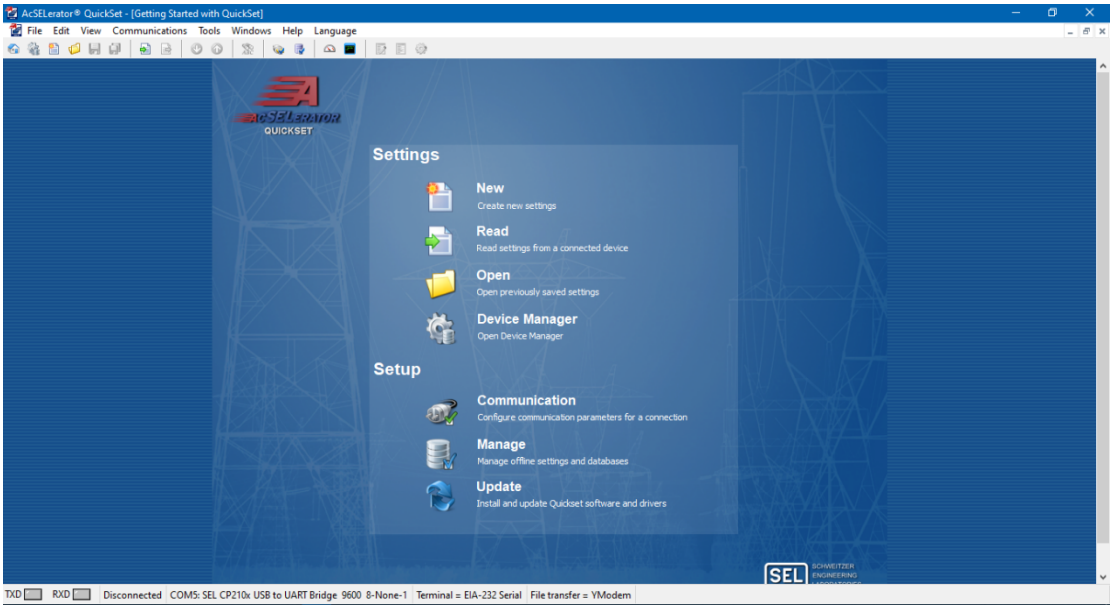


Similarly, we add 18 binary outputs.

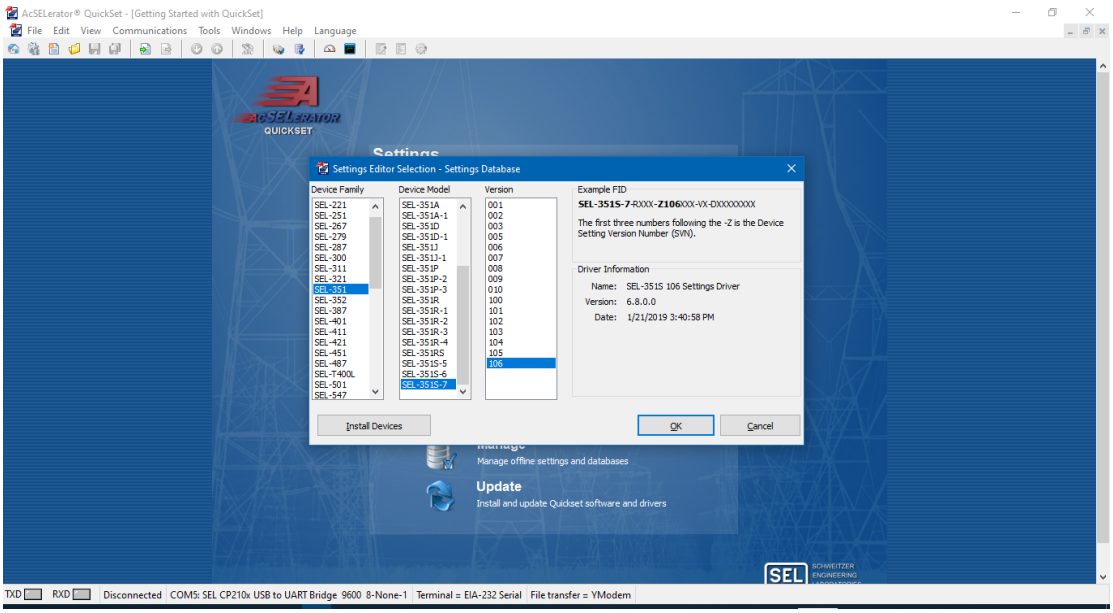


Likewise, add 40 analog inputs. This marks the end of configuration process for RTAC.

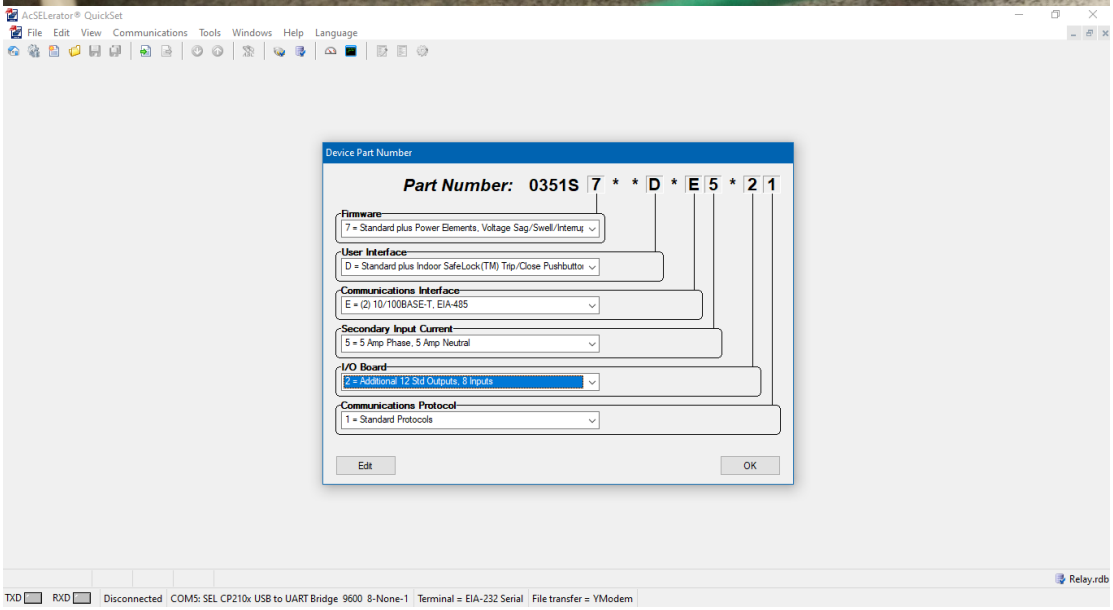
8. Configuration of 351S using Acselerator Quickset
    1. Install and Open SEL AcSElerator QuickSet.



2. Creat new Project and Select Device family, model, and version from devise Part No (P/N).

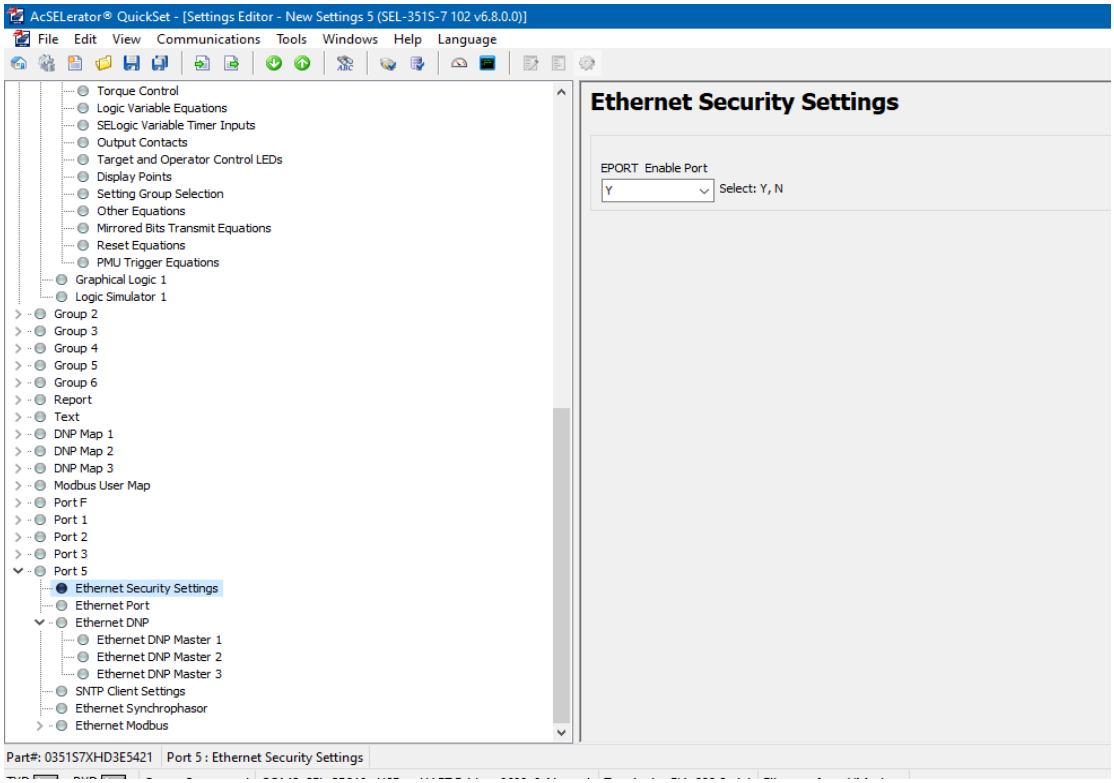


3. Enter Device Part No. as per given Part no. (P/N)

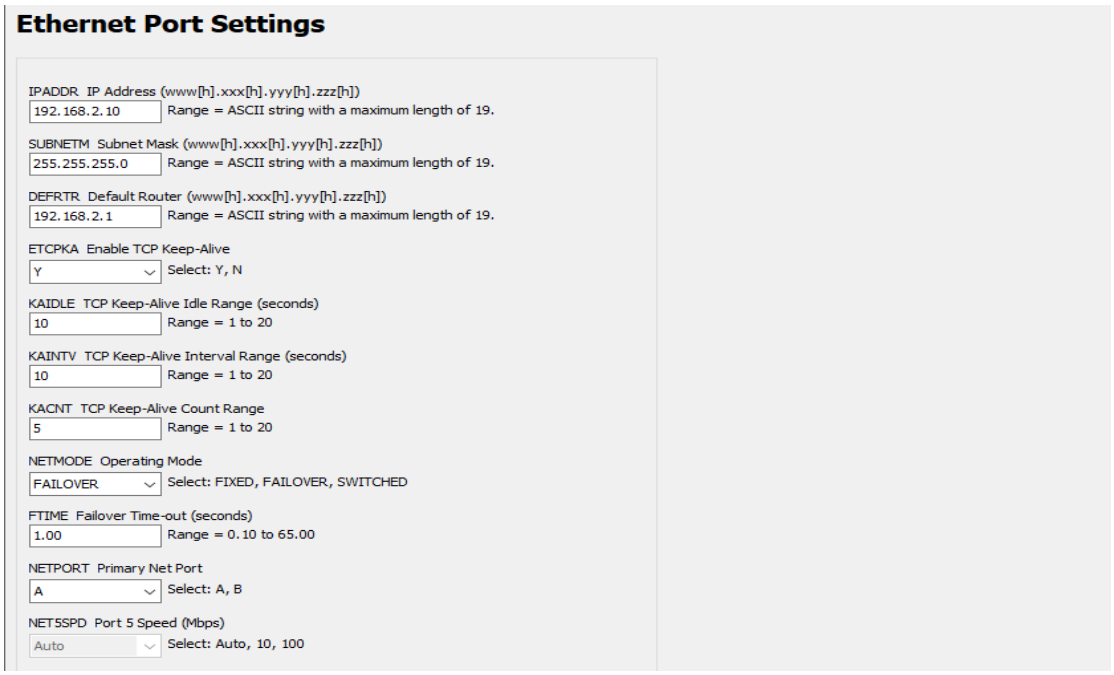


4. Define varoius settings under Port 5 as per following.

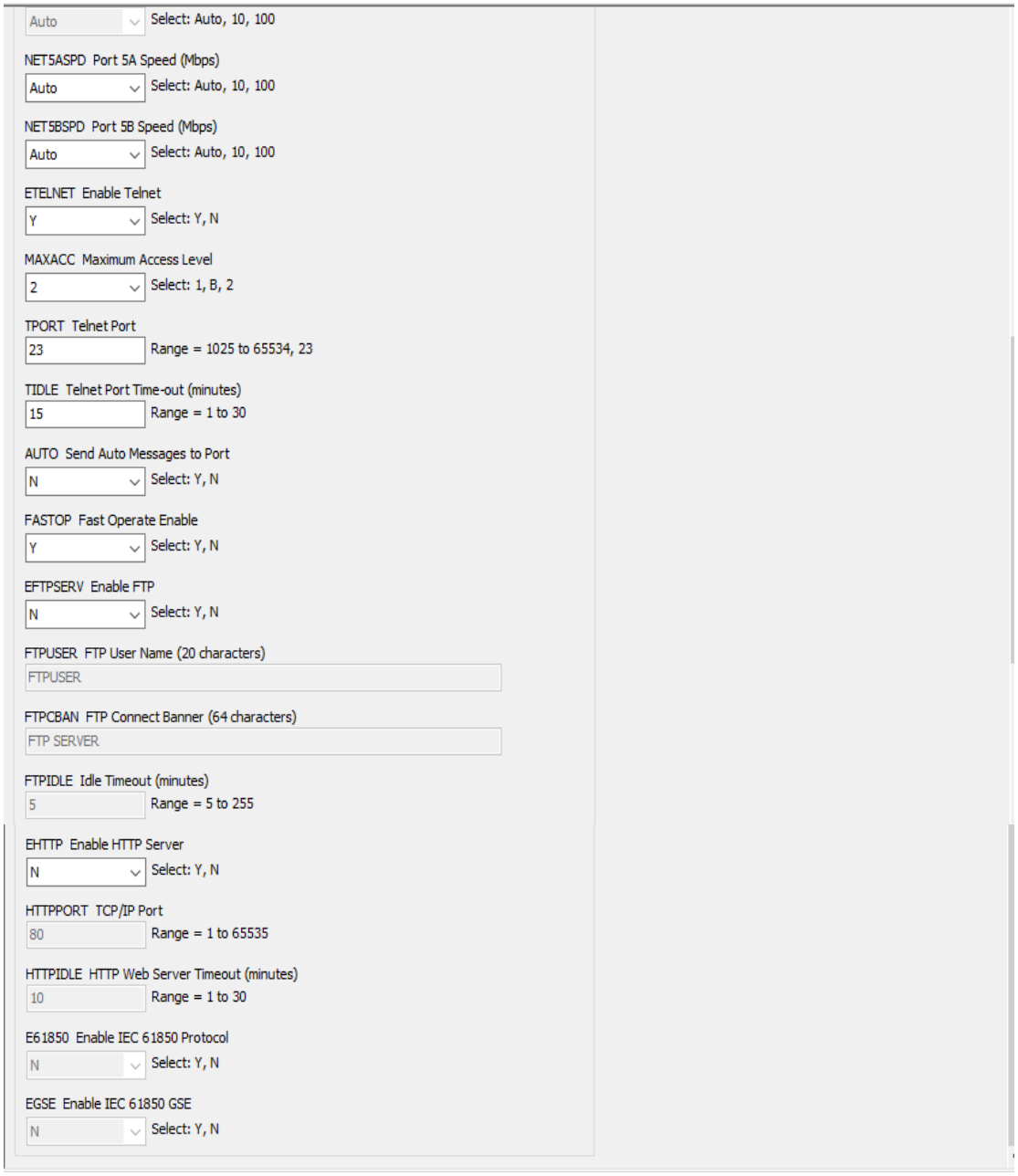
    - Ethernet Security Setting



- Ethernet Port Settings



- Ethernet Port Settings



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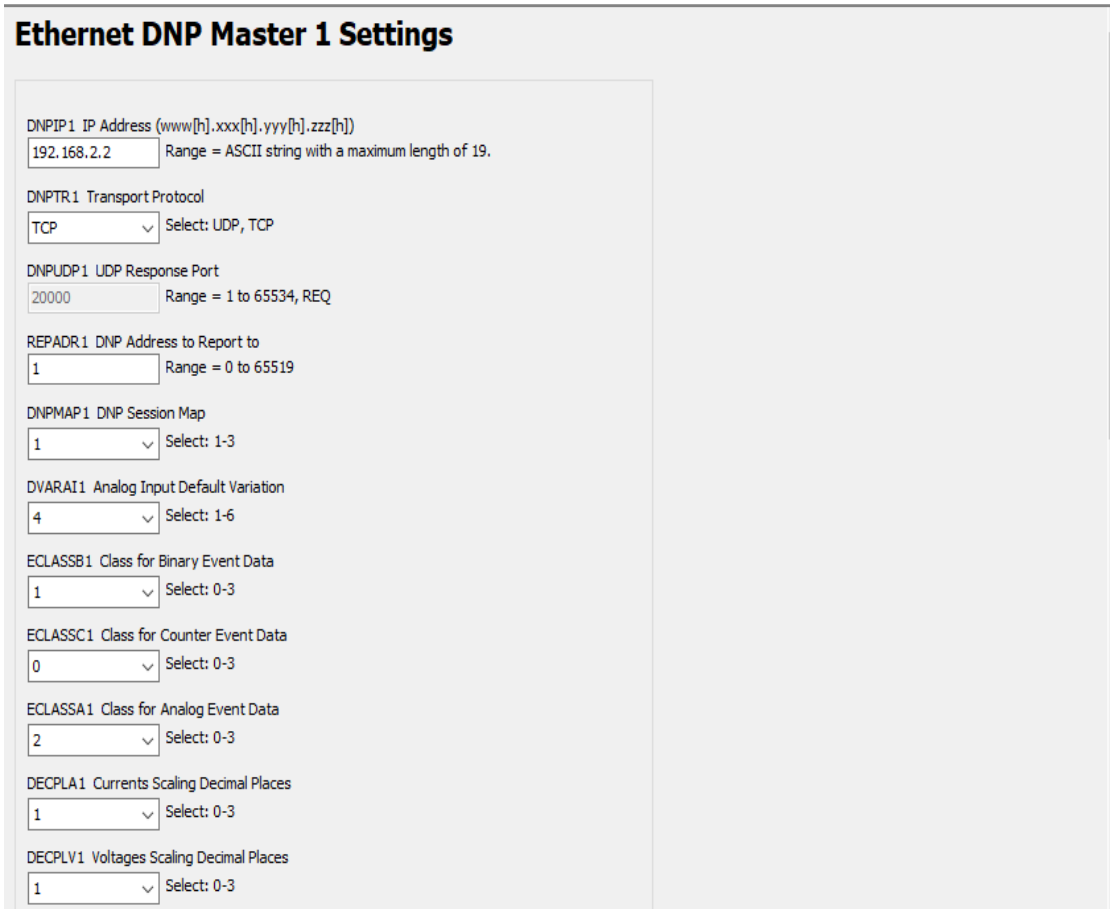
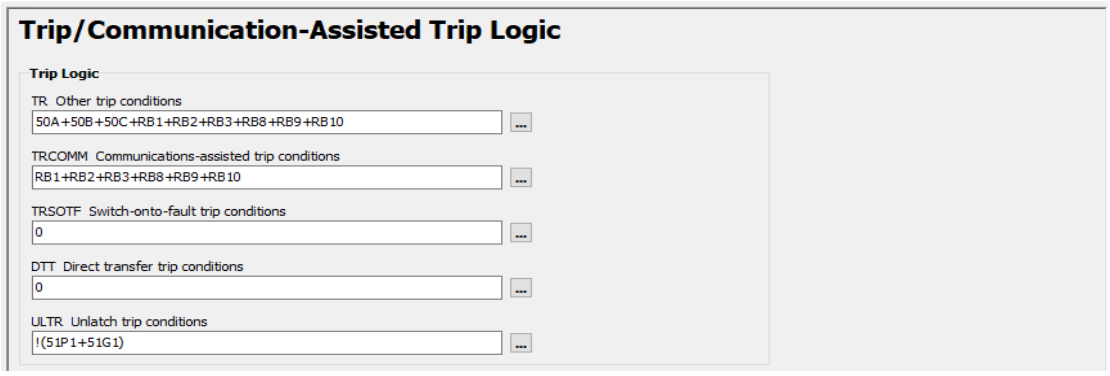
- Ethernet DNP Settings

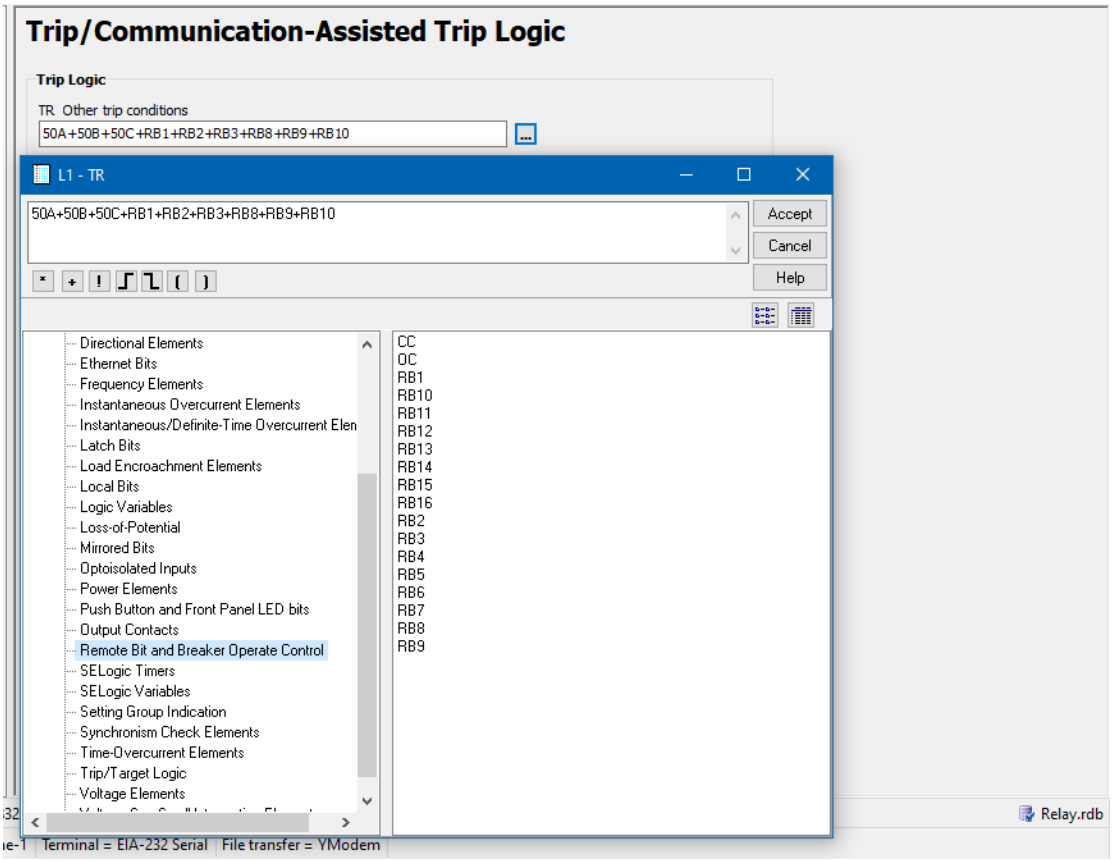
- Ethernet DNP Master 1



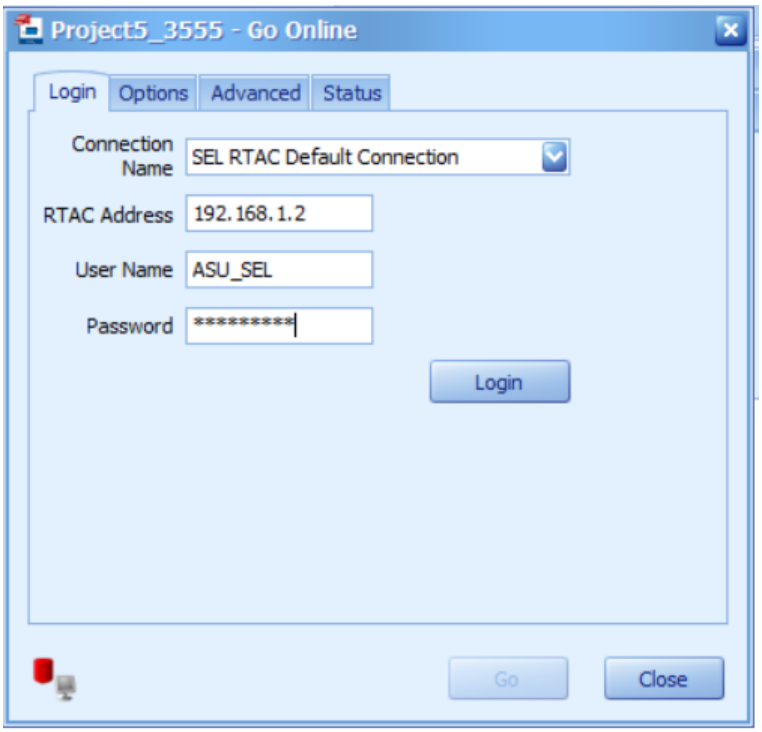
5. Set Trip/Comminication-Assisted Trip logic. (Remote Bit from RTAC)

   Grpup 1 > Logic 1> Trip/Communication-Assisted Trip Logic





9. Open the Acselerator RTAC
    1. Click the Go-online button and enter the ID and password



After this hit the Go button.

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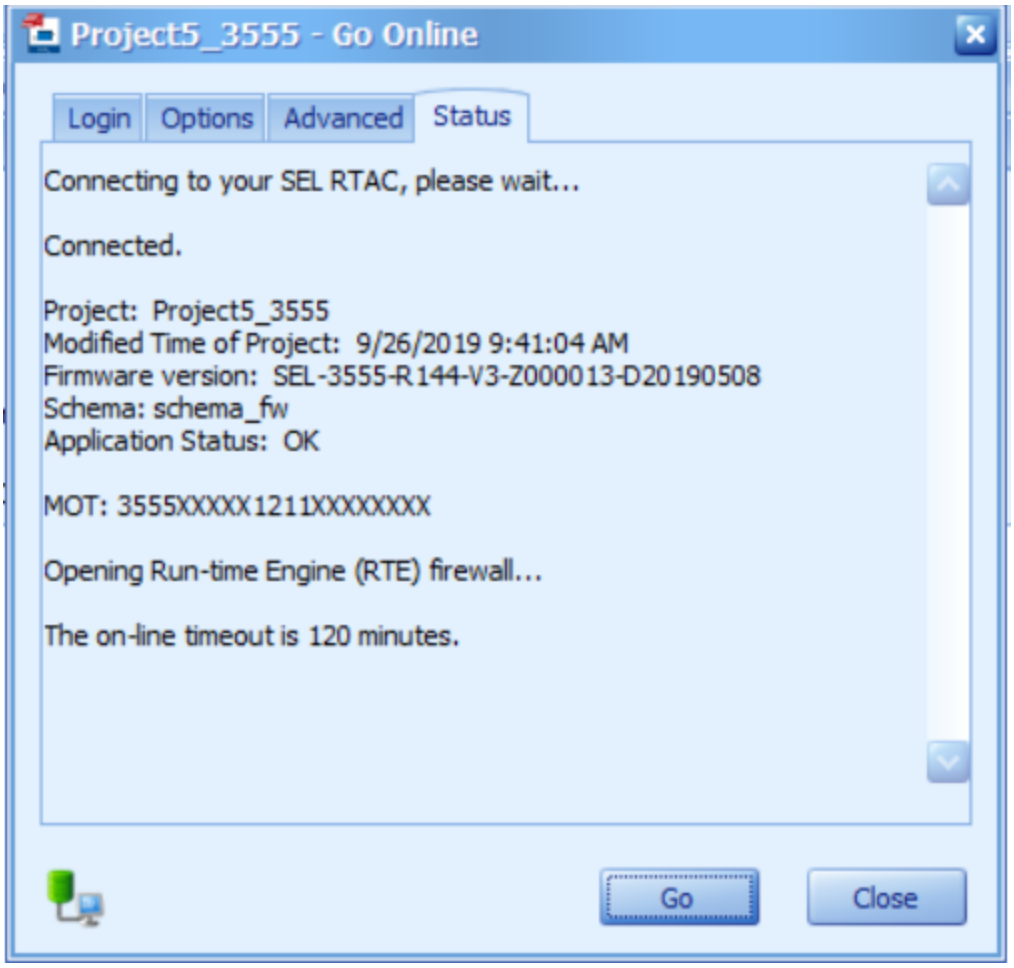
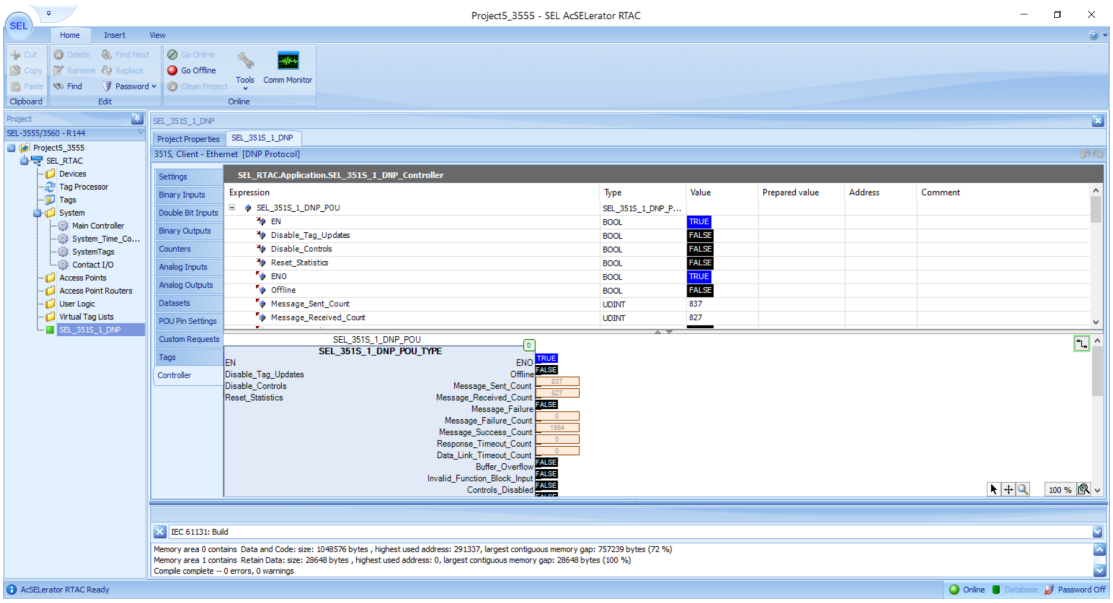
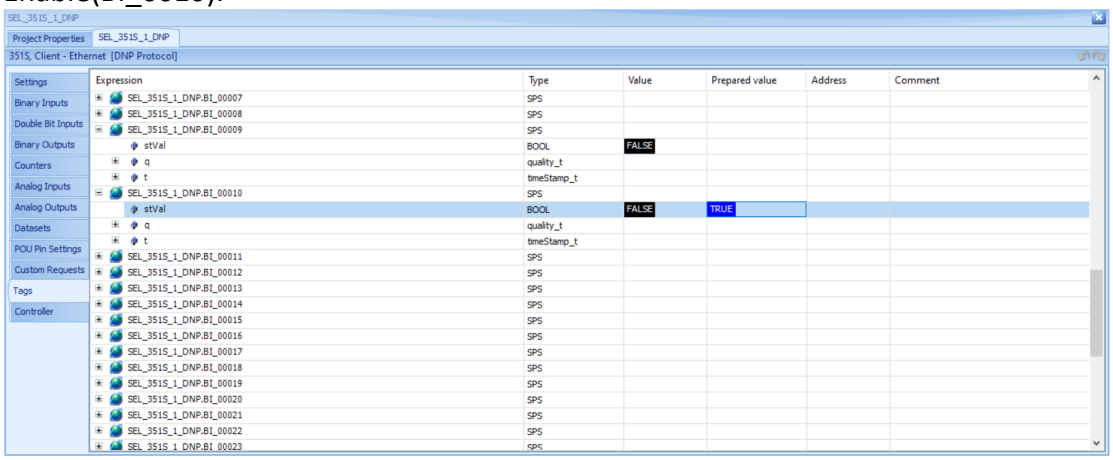


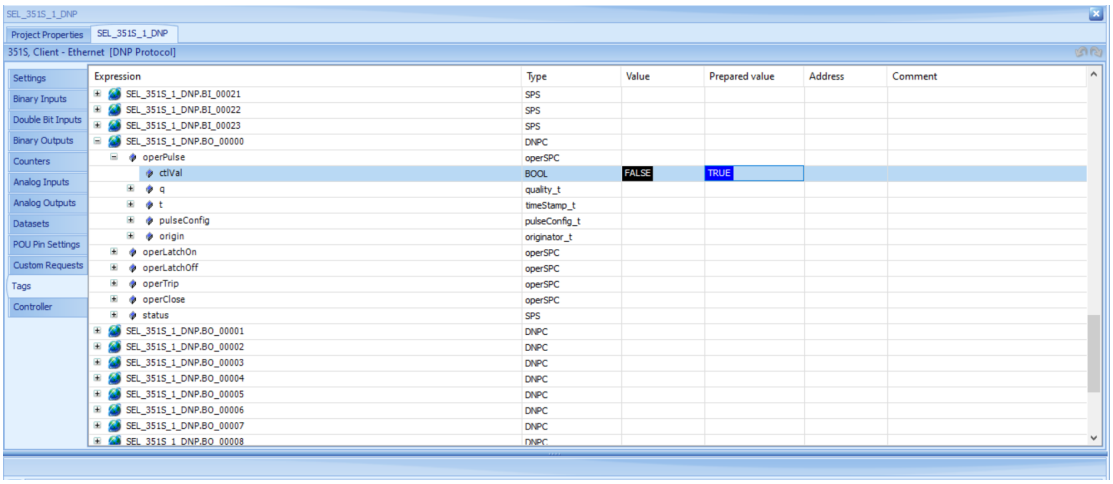
Click on the controller tab and expand the SEL_351S_1_DNP_POU. Make sure to verify that the offline button is 'FALSE' which implies that the RTAC is successfully communicating with SEL 351S as shown below



In order to issue a trip signal to the relay from the RTAC click on the Tags tab on the left. Ensure that the trip LED (BI_009) is false. The relay must be enabled to perform this action. So put the prepared value 'TRUE' by clicking on the prepared value column and pressing F6 in Enable(BI_0010).



We are going to send a trip signal. So, we need to put the prepared value True on the BO_000_RB1 as shown in the figure below.



After doing this the TRIP LED on the front panel of 351S should light up.