+ Purchases Addition sophisticated 6M

Sel Trinity@12345

Eduardo 10603

SEL service password Pass#123

[12:44 PM] Rhett Smith

again so sorry it is a weird time to start a new job, please know we are very excited to have you here and both Eduardo and I are happy to help get you going so keep asking questions and contacting us when you need us.  Eduardo will be providing tasks for you in June so please look to him for direction.  Then in July you'll get a full project in critical infrastructure networking (smile)

[9:39 AM] Rhett Smith

The controller is in .NET Core

​

[9:39 AM] Rhett Smith

so we can port it to Linux easy

​

[9:39 AM] Rhett Smith

right now it is only tested and supported on Windows but we will have a project soon to support it on a Linux distribution

​

[9:40 AM] Munja Dnyanoba Solanke

okay great to know.

​

[9:40 AM] Rhett Smith

We are thinking to have a containerized Linux distribution so we make it easy for any customer to spin it up on any version

----------------------------------------------6/2/2020-----------------------------------------------------------------------------

**Introduction to SEL Relays**

**SELogic Control Equations**

The equations are combinations of relay word bits and logical operators.

* Relay word bits(1/0)–outputs of protection & control element logic – can see instruction manual
* Logic operators -
* Timers and latches- timers allows to delay the output & latches used to retain O/P even after I/O has dropped out.
* Convert logic diagram to SELogic control equations
* Program SELogic control equation

**Data Capture and Event Reports**

* Event reporting feature in SEL relays
* Retrieve event reports using Quickset
* View event reports using synchroWAVe event software – allows to open, visualize, and analyze data from relay event reports

**Relay Testing Basics**

* Identify test types and test tools –
* - **Types** -static tests / Multistate / end-to-end / system fault / fault playbacks
* - **Tools** – relay word bits / sequential event recorder SER reports / event reports
* Utilize SEL-4000 relay test system
* Create pickup and timing test
* Design multistate test
* Retrieve relay word bits via front panel / Terminal window through QuickSet – sec 5.2 / HMI
* Pickup test –
* Timing test -Sec 5.6

------------------------------------------------6/3/2020------------------------------------------------------------------------------

**SEL-5230**

**acSELerator Database API**

The acSELerator Database API is a representational state transfer (RESTful) web service that provides access to device data collected by acSELerator Team SEL-5045 Software. Once acSELerator Team archives data in the acSELerator Database, third-party software tools can use the acSELerator Database API to send standard HTTP GET requests as well as “strongly typed” request objects.

In University project, I created ASP.NET Web API service that returns data from a SQL Server database.

Videos need to watch on youtube

* <https://synchrocenter.ad.selinc.com/sites/RD/RD_Techinars/Recently%20Recorded%20Techinars/20180302_AcSELerator%20Database%20API%20Training?d=wba88f35a7a0b4ad58458d365af190141>
* <https://selinc.com/events/on-demand-webinar/126686/>
* ACSELERATOR TEAM® Global Options Overview
* ACSELERATOR QuickSet® Device Manager Overview
* How to Set the SEL Secure Communications System, Part 1: Overview & part 2,3,4,5,6
* SEL RTAC — Basic Software (1 of 9)

**webinar on Introduction to SEL RELAYS**

SEL-751 Feeder Protection Relay

* How reclosing works?
* Enhanced SELogic control equations and operators
* SER variables
* Relay generates event reports
* Programmable default display
* Local control switches – operate via front panel display
* Remote control switches – operates via serial port
* Computer connections -eg windows hyper terminal
* Front panel HMI menus
* PC communications required equipment
* **AcSELerator QuickSet features**
* Targets
* New relay settings
* Z number – version number followed by Z(3 digits) and found in relay FID
* Setting tree + sign to expand tree
* Use powerful analysis tools – impedence plots, al[ha plane
* Database manager – copy and move settings from database A to B

------------------------------------------------6/4/2020------------------------------------------------------------------------------

* <https://confluence.metro.ad.selinc.com/display/SDNRC>
* Nice, this is where we put all our project planning details. all the specs, builds and tests are in other linked tools, but this is the starting point
* Under this heading, <https://confluence.metro.ad.selinc.com/display/SDNRC/Research>, I'd like you to start a new page and record any fun details you learn as you spin up on the SEL products.
* Feel free to think of it as your "notes" and this way we all benefit from your research
* write them for yourself and don't feel like you need to polish them, just a good way to make sure we capture all your good work. and a good way for you to centrally manage your own notes for yourself 🙂
* yes, document in Confluence rather than outside tool, this keeps all the info together for the team (SDNRC = Software Defined Network Responsibility Center)  The SDNRC is the full team of all R&D engineers working on SDN
* DDC- Device Data Collection
* SEL-3355: This is rugged computer in which we are hosting the software AcSELerator TEAM and AcSELerator quickset.
* **AcSELerator TEAM** is going to be an integral tool to the system providing us real time acquisition of our asila graphic event reports. **AcSELerator quick** **set** is providing us the configuration tool for the rest of the system.
* SEL-3620 is a security gateway providing us the proxy services user management and password management in order to comply with standards. It also allows VPN dead-ending.
* **SEL RTAC – Real Time Automation** Controller. This device is used for configuration baselining as well as data collection and logic processing.
* **Protective relays SEL- 351S and SEL-451**: these are used as protective relay connection that our technicians
* **I** added SEL-3620 security gateway device in AcSELerator QuickSet tool. There if I go to Device Tab under SEL-3620, and click on the Global Device ID, it gives popup text about the Global Device ID and warning message. I suggest we can give small description for each variable in QuickSet tool.

------------------------------Week-2------------------6/8/2020-------------------------------------------------------------------

**AcSELerator Database API (SEL-5230) Integration Training**

**Getting Started with the ACSELERATOR Database API**

5230-001 Single Database with single client connection

5230-002 Multiple database connection with multiple clients

Database PING 10.42.96.254

uniqueDeviceId is the dbHost and deviceId.

------------------------------Week-2------------------6/10/2020------------------------------------------------------------------

|  |  |
| --- | --- |
| **File name** | **ORM function** |
| appsettings.json | Connection string |
| EF\_Models.cs | Entity definitions |
| ApplicationDbContext.cs | Entity framework context |
| DatabaseExampleController.cs | Business application |
| Startup.cs | Database connection |

**API Workflow**

**Read data from SEL database file (SEL Database server-Read only)**

**Display data on Web Browser**

**Add search and filter logic on web pages (like filter data by device type SEL-351)**

**Can deploy the data on SEL database server/ Microsoft Azure cloud database**

**Can save the data to local database file**

**How to show the web browser data to customers/third party?**

**Make an Executable file to run on third part or any PC**

**Add-Migration InitialCreate**

**Update-Database**

Categories for the website (How many = List all in the website)

Inventory Query:

1. How many IEDs (intelligent electronic devices) are in the Database?
2. How many RTACs are in the Database? (these are of Device Type SEL-3530/3530-4/3555/3505/3505-3/3630)
3. How many Security Gateways are in the Database? (these are of Device Type SEL-3620/3622)
4. How many SEL-2730M Managed Ethernet Switch are in the Database?
5. How many Substations are there?
6. How many Regions are there?
7. How many IEDs of Device Type “xyz” are there in “xyz” Region?
8. How many IEDs of Device Type “xyz” have Firmware Version “xyz”?
9. How many IEDs are IN Service?

Protection Query: (<https://selinc.com/products/comparisons/product-features/> )

1. How many IEDs are Transformer Protection? (this query compares the DeviceType string versus the list of devices that fall under this category, for example the SEL-487E is of category Transformer Protection and cannot be associated with any other category like Motor Protection)
2. How many IEDs are Motor Protection?
3. How many IEDs are Feeder Protection?
4. How many IEDs are Generator Protection?
5. How many IEDs are Breaker Failure and Capacitor Bank Protection?
6. How many IEDs are Bus Bar Protection?
7. How many IEDs are Transmission Line Protection?
8. Etc

Communications/Connection Query:

1. How many relays are connected via Serial Port?
2. How many relays use “xyz” baud rate on their Serial Ports?
3. How many relays are connected via Ethernet Port?
4. How many relays are connected with a SEL-RTAC as its Master?
5. How many relays are connected with a SEL-3620 as its Security Gateway?
6. How many Host IP addresses are duplicates?

IED Settings Query:

1. How many IEDs have been created by “admin”?
2. How many Users are authorized to login to the Database to access these IEDs?
3. How many settings have been created during “start date” to “end date”?
4. Who was the last user to change any settings in the Database?

TEAM settings Query:

1. How many IEDs have the “in service” check box marked?
2. How many IEDs have automatically Event Report Collection?

The SEL setup

1. **Powerup** all the devices connected in setup.
2. Connect **serial cables** from each relay/ any other devices to RTAC for each rack. Remember the serial port numbers connected to RTAC that is required when you add new SEL devices to AcSELerator RTAC (asks for com port connection)
3. Connect **Ethernet cables** from each relay/any other devices to RTAC through Ethernet switch for each rack
4. Make **Network connection loop** of all the devices and RTACs from each rack by connecting through Ethernet cables.
5. Connect the **IRIG-B cable for time synchronization**.