

SMP16 migration with D20 to SG-4260 with SMP IO-2330

The benefits of using the Embedded Configuration Tool to simplify SMP IO 2330 integration.

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Agenda

Norwood Station 495 Upgrade Project

Eaton RTU Upgrade Solution

SMPIO 2330 and SG 4260 Features

Integration using Embedded Configuration Tool

Norwood Municipal Light Departement (NMLD)



Utility company located in Norwood town in Massachusetts



Provides electric service to over 15,000 business and residential customers



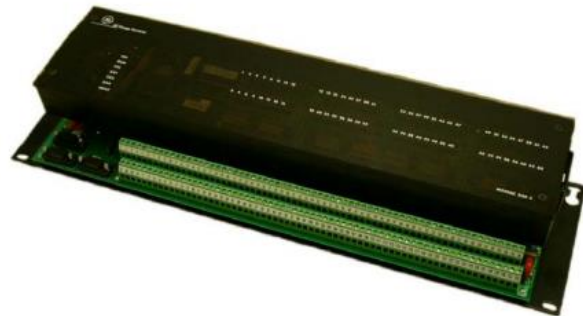
Using SMP Gateway and Visual & TD products

Station 495 Details (Hardware)

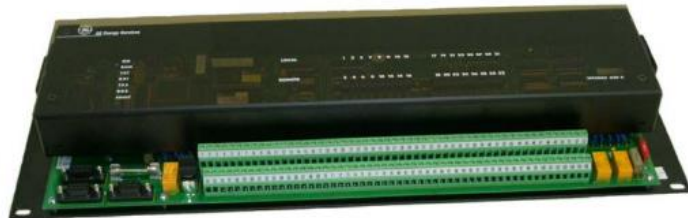
1 SMP 16 CP/PM



3 GE D20S:64 Digital Input Module



2 GE D20K : 32 Control Relay Module



Station 495 Details (Hardware)

SMP 16 CP/PM + GE D20 I/O Units



SMP 16 CP Back Panel



Station 495 Details (Software)

SMP Tool version: 7.1R2

SMP Manager: 8.3R2

SMP 16 CP Configuration

❖ **DNP3 Master Protocol**

✓ 64 Masters instances (SEL 351, XFMR ..)

❖ **Master GE D20 (I/O Module) Protocol**

✓ 5 Master instances (3 D20S , 2 D20K)

❖ **DNP3 Slave Protocol**

✓ 2 Slave instances (Yukon ,SCADA)

Station 495 Diagram

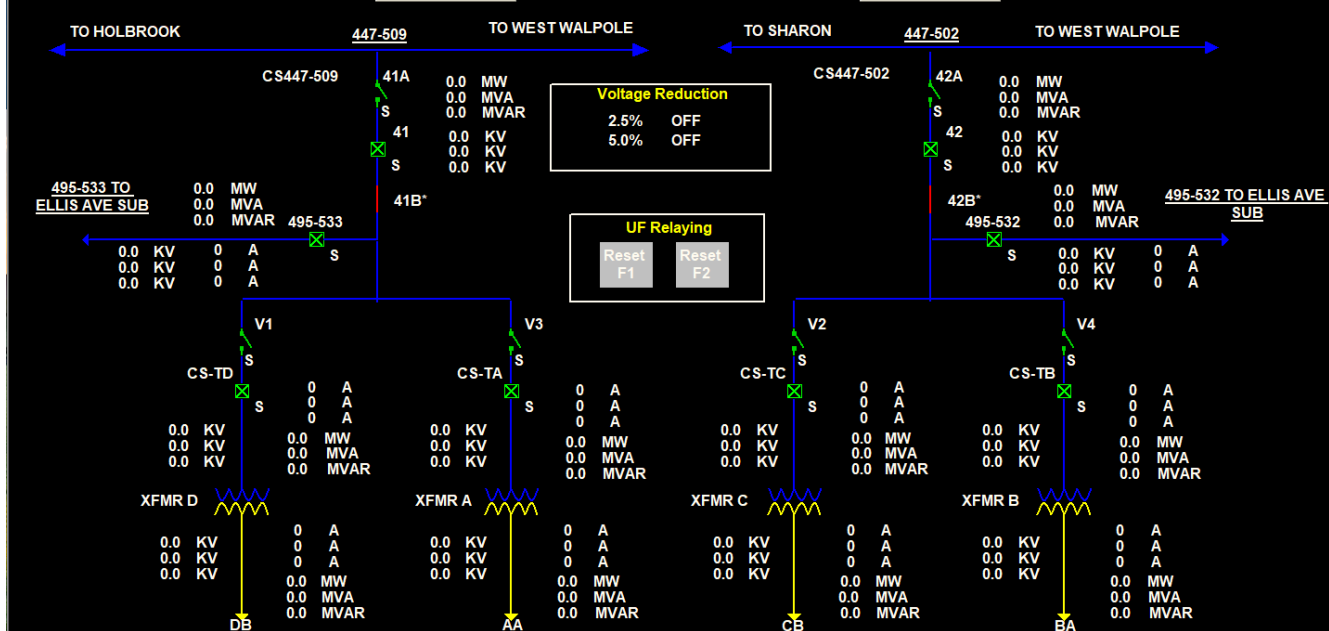


DEAN STREET #495 SUBSTATION 115 KV ONE LINE

Substation List

[GO TO 13.8 KV ONE LINE](#)

Substation Data



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Existing System Limitation

❖ 1 SMP 16 CP / PM

- Limited Hardware Capabilities

16 Ports , 1.4 GHz Processor

End of hardware support(EoHS) Jul 2017

- Software version Limitation

Version 8.0 Max

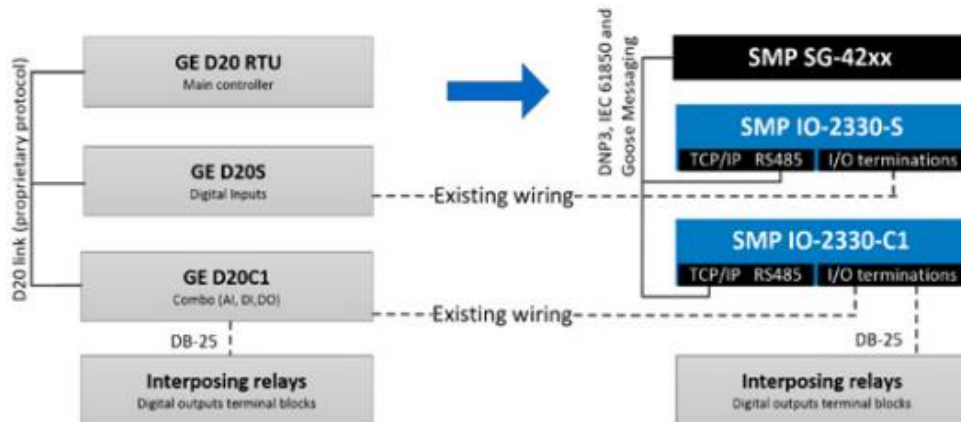
End of software support (EoSS) Apr 2023

❖ 5 GE D20 I/O Boards

- Limited Hardware capabilities
- Limited Automation possibilities
- Obsolete hardware technology with aging software
- Lack of support from GE

EATON RTU Upgrade Solution

- The solution is a combination of the SMP SG-4260 and SMP IO-2330 platforms.
- The SMP 16 CP/ PM unit is replaced by an SMP SG-4260
- Legacy GE D20 I/O boards are replaced by SMPIO-2330 logic panels



Benefits of the Eaton RTU Upgrade Solution

- Eaton's RTU upgrade solution preserves wiring of the legacy I/O cabling.
- Enables the system to be replaced with minimal impact to engineering and operations while delivering best-in-class security, communications and data management.
- The SMP IO-2330 system offers the complete legacy RTU upgrade as well as open frame options, keeping the legacy GE terminations panel in place and replacing only the logic panel, reducing even more upgrade impacts.
- Embedded configuration of the SMP IO-2330 into the configuration of the SG4260 platform (single configuration file for all devices)
- Minimum substation outage time required for the replacement
- This solution enables utilities to implement smarter and more secure substations with advanced technology and minimized service interruptions.

Station 495 Upgrade Scope

Replace

- 1 SMP 16 CP/PM with 1 SG4260 Platform

Replace

- 5 GE D20 /IO units with 5 SMPIO-2330 units

Convert

- Convert SMP 16 Config to match SG 4260 Platform

Configure

- Configure SG4260 to interrogate SMP IO 2330 units

Customer Order

- 1 SMP SG4260 Platform
- 5 SMP IO 2330 Platforms
- ✓ 3 SMP IO 2330 S : Status and Alarm Input Module
- ✓ 2 SMP IO 2330 K : Control Output Module
- 40H Bank of engineering services (Configuration and Integration)
- 2 days site visit and installation

SMP IO 2330 K :Control Output Module



- Rack- and wall-mountable, 3U, depth: 2.8 in
- Open frame options: logic and terminations panels
- 2 x Form C auxiliary relays, available for system applications or alarms
- The SMP IO-2330-K (KR) system is hardware configurable and can be setup for the following configurations:
 - 32 Trip/Close pairs
 - 24 Trip/Close pairs and 4 Raise/Lower pairs
 - 16 Trip/Close pairs and 8 Raise/Lower pairs
 - 8 Trip/Close pairs and 16 Raise/Lower pairs
 - 16 Raise/Lower pairs
- 32 isolated Form C control outputs
- Master Close / Master Trip relays and logic
- Test Breaker Close / Test Breaker Trip relay and logic
- Universal Binary input for alarm or status (software configurable)
- Disconnect terminations (K) and DB25 connectors (KR) for connection to GE KI interposing relays
- All connections located at the front of the system

SMP IO 2330 S :Status and Alarm Input Module



- Rack- and wall-mountable, 3U, depth: 2.8 in
- Open frame options: logic and terminations panels
- 2 x Form C auxiliary relays, available for system applications or alarms
- 64 binary inputs, hardware configurable using a configuration module on the terminations panel to individually select voltage range (+/- 24, +/- 48, +/- 125 Vdc)
- Disconnect terminations
- All connections located at the front of the system

SMP SG 4260 Gateway Platform



- Dual hot-swappable power supplies option
- Satellite-synchronized (GNSS) clock option using GPS and/or GLONASS constellations
- Up to 32 serial ports.
- Up to 10 Ethernet ports, fiber or metallic, with VLAN tagging and multihoming
- Supports all standard and proprietary protocols – DNP3, IEC, SEL, Cooper, ABB, GE, L&G...
- Advanced Ethernet optional module with standard Ethernet and PRP/HSR protocols for network redundancy
- Built-in automation functions and the IEC 61131-5 compliant SoftPLC engine
- Local and remote HMI with single-line and alarm management capabilities

SG4260 + SMPIO 2330



Configuration Challenges

- Master GE D20 (I/O Module) Protocol is not supported on SG4260
- Manually configure DNP3 instances to poll SMP IO 2330 Devices

Solution

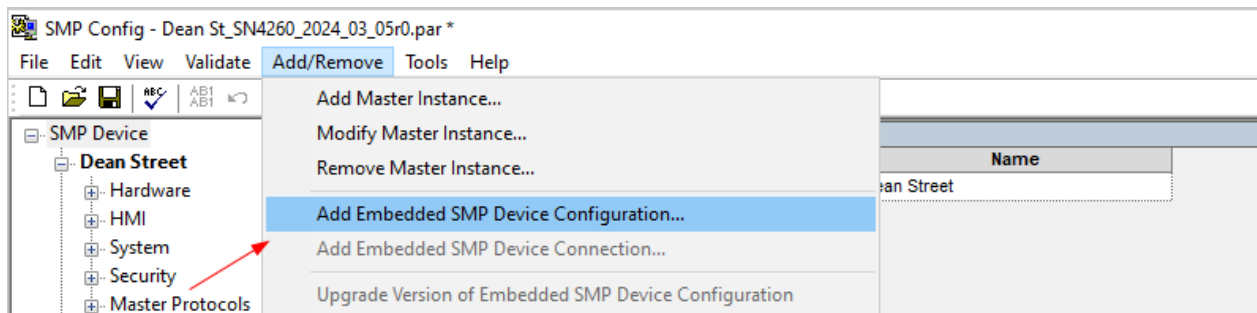
- ✓ Use SMP 16 Device to review configuration before importing to SG 4260
- ✓ Configure SMP IO Devices using Add Embedded SMP Device Function

Embedded Configuration Tool

- Embedded configurations allows using a single configuration file to configure and manage all devices involved.
- Import all the device points automatically
- Embedded SMPIO 2330 settings are managed by the SG4260

Configuration Step 1

- Select **Add/Remove** from SMP Config Menu



Configuration Step 2

- Specify the device name
- Select the SMPIO-2000 Series version
- Specify the IP of the device

New Embedded SMP Device Configuration

Embedded Configuration

Name

☒ New SMP IO-2000 Series
Version

☐ Import SMP IO-2000 Series Configuration from File

Configuration Version

SMP Device Connection Settings

IP Address

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Configuration Step 3

- Select the IO Model and Hardware configuration

New Embedded SMP Device Configuration

Select the SMP IO-2XXX Type:

SMP IO-23XX

Select the SMP IO-23XX Model:

Select...
Select...
Model A
Model C1
Model K
Model S

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Configuration Step 4

- If DNP3 selected, you can update the Names and Devices prefixes

New Embedded SMP Device Configuration

Select a communication protocol for linking the Master instance of the SMP Gateway with the Server instance of the embedded SMP Device

☒ DNP3
☐ None

Master instance identification

Name: SMPIOK1.dnp3
Device Prefix: SMPIOK1.dnp3_

Embedded Server instance identification

Name: SMPIOK1.dnp3
Device Prefix: SMPIOK1.dnp3_

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Configuration Step 5

- The standard DNP3 master import points dialog is presented
- You can edit point list if you wish

Note:
GEN and REQ are used to indicate that the DNP3 master general and request setting have been updated to match DNP3 server setting

Update Data Points

Select the data points to be updated in the site configuration:

Points to add: Points to remove: Points to modify:

☒ Al: _smp__avgCpuLoad
☒ Al: _smp__clockDay
☒ Al: _smp__clockHour
☒ Al: _smp__clockMinute
☒ Al: _smp__clockMonth
☒ Al: _smp__clockSecond
☒ Al: _smp__clockYear
☒ Al: _smp__cpuLoad
☒ Al: _smp__memoryLoad
☒ Al: _smp__memorySize
☒ Al: _smp__numPwrUp
☒ Al: _smp__phyHealth

☒ GEN: General Parameters
☒ REQ: Time Synchronization

Attribute	Value

☐ The points to be added that are not selected will be added, but will be disabled.

Configuration Step 6

- Save and send the config file to SG 4260

SMP Config - Dean St_

File Edit View Validate Add/Remove Tools Help

AB1 AB1

SMP Device

- Dean Street
 - Hardware
 - HMI
 - System
 - Security
 - Master Protocols
 - Slave Protocols
 - Hydro-Québec (Annonciateur)
 - Connections
 - Connection Usage
 - Passthrough
- D20K1
- D20K2
- D20S1
- D20S2
- D20S3

SMP Device

	Name
1	Dean Street

Embedded SMP Device

	Name	Version
1	D20K1	2.0R2
2	D20K2	2.0R2
3	D20S1	2.0R2
4	D20S2	2.0R2
5	D20S3	2.0R2

D20K1

- Hardware
- IO Configuration
- HMI
- System
- Monitoring
- Security
- Servers
- GOOSE
- Connections
- Connection Usage

D20K2

D20S1

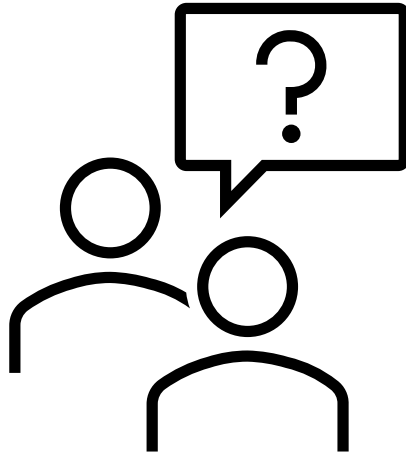
D20S2

D20S3

Integration Process

- The configuration of all SMP IO 2330s using the embedded configuration tool is very fast (around 70% less than manual configuration).
- 1-2 Hours max to replace the D20s with SMP IO 2330 units
- 1 Day site visit instead of 2 Days

Questions?





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