

SMP DA-3050 new product and roadmap discussions

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Product Manager



Powering Business Worldwide

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SMP Gateway Family

SMP SG-4260



SMP 4/DP



SMP DA-3050



SMP SG-4260

- Integrated HMI
- PTP/PRP/HSR
- GPS Master Clock
- IRIG-B Time Sync
- Codesys SoftPLC
- 128 Client / 20,000 Tags

SMP DA-3050

- Linux Operating System
- Embedded I/O
- DNP/Modbus Client
- DNP Server
- SNTP Time Synchronisation
- 8 Clients / 5,000 Tags

SMP IO Family

SMP IO-2230



SMP IO-2230

- Linux Operating System
- 64 I/O fully configurable
- DI/DO/AI
- Web HMI Commissioning tool
- Firewall
- DNP / 61850 Server

SMP IO-2330



SMP IO-2330

- Linux Operating System
- Direct GE D20 I/O replacement
- ETERM / EDAC can be installed separately
- A/S/K/C1 model available
- DNP / 61850 Server

SMP DA-3050 automation platform

Compact, powerful, rugged and reliable
automation platform for secure data
acquisition and management



- Feeds ADMS/SCADA applications with quality data to increase grid edge situational awareness
- Facilitates DER integration with local automation at the edge
- Vendor agnostic—interoperable platform for easy IED integration
- Robust platform for harsh environments, from substations to distribution pole-top cabinets
- Cybersecure platform for improved grid resiliency



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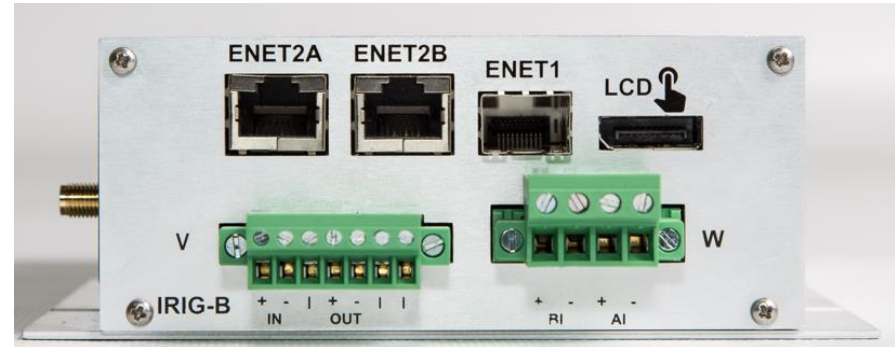
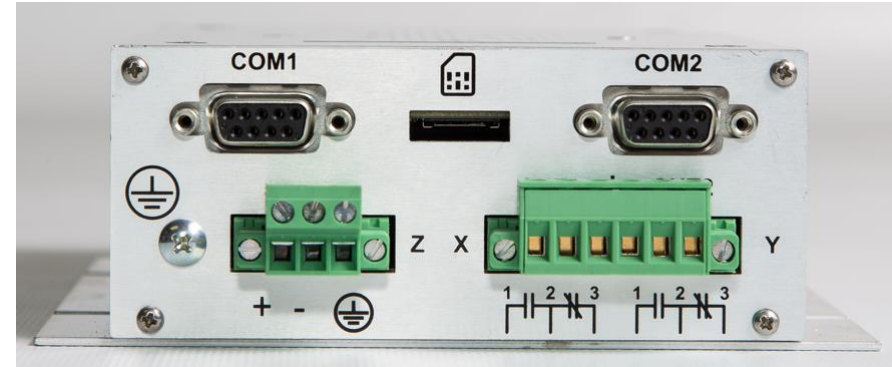
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Use cases

- **Grid Edge Automation**
 - Increase situational awareness on grid edge devices
 - Implement wide-area protection scheme (Direct Transfer Trip)
 - Improve reliability and power quality
- **Distributed Energy Resources (DERs) Integration**
 - Increase DER visibility (monitoring)
 - Control/Dispatch DER
 - Optimize DER utilization at the edge (decentralized decision-making)
 - Meet regulatory compliance requirements
- **Modernization of legacy equipment**
 - Motorized Switch/Disconnect (MOD/MOS) modernization
 - Generation Dam monitoring and Control
 - Replace legacy RTU/PLC (Schneider ScadaPack/ GE iBox)
 - Security Gateway for Distribution IED
 - Create IEC61850 interface for legacy equipment
- **Asset Monitoring**
 - Asset Monitoring (e.g., transformer) / Condition-based maintenance

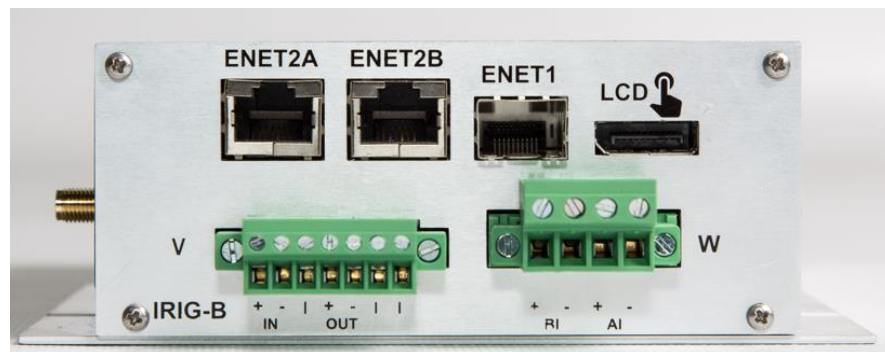
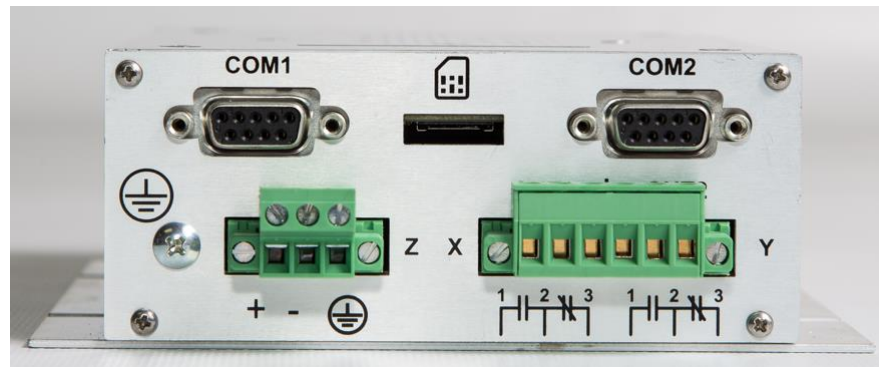
HW Features SMP DA-3050

- SMP 4/DP replacement
- 1 SFP for network connectivity + 2 fix Ethernet (RJ45)
- Built-in BI/BO/AI
- Video port for HMI display(v2)
- Integrated Cell Modem (v2)



HW Features SMP DA-3050 (Sides)

- 2x Serial ports (RS-232/RS-485)
- Sim cards (Cell modem) (*)
- Power supply (24-48 VDC)
- BO (125 VDC / 8A)
- 2x Switch Ethernet Ports (100Mbits)
- SFP (100/1000 Mbits)
- HMI (*)
- IRIG-B IN/OUT (*)
- BI/AI (48 VDC)



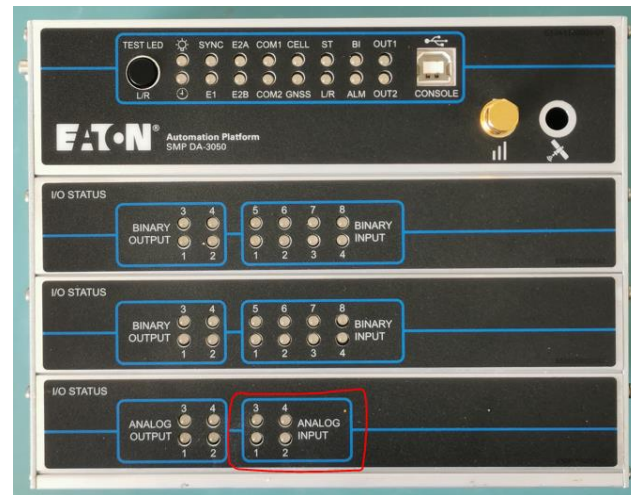
* Not supported in version 1.0

HW Features – Secure boot

- This process makes sure the unit only boots code that has been signed
- Internal e-fuse burned to secure the device in production:
 - The process is irreversible
 - Debug interface disabled in application
 - I,MX8 JTAG interface changes to “Secure JTAG mode”

HW Features – Expansion AI (30x2 variant)

- Software-configurable mode
 - $\pm 10\text{V} \rightarrow \pm 12\text{V}$
 - $\pm 1\text{mA}$ (Burden resistor $10\text{k}\Omega$ 0.01%)
 - $\pm 2\text{mA}$ (Burden resistor $5\text{k}\Omega$ 0.01%)
 - $\pm 20\text{mA}$ (Burden resistor 500Ω 0.01%)
 - All mode are 120% overrange capable
- Input impedance $12\text{M}\Omega$
- Scan rate 5Hz (200ms)
 - Designed for slow-variation DC signal
- No need for external resistors in current mode

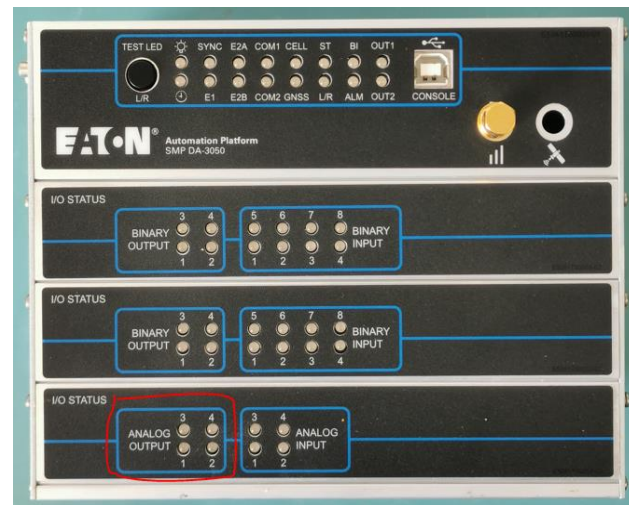


Use-case:

- Digitize slow-variation DC signals from sensors in closed-loop process controls

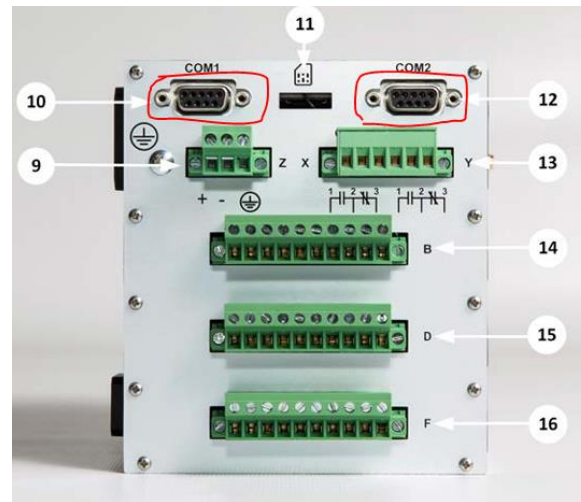
HW Features – Expansion AO (30x2 variant)

- Software-configurable mode:
 - $\pm 10\text{V}$ – 115% overrange capable
 - Capacitive load $\leq 100\text{nF}$
 - Resistive load $> 2\text{k}\Omega$
 - $\pm 20\text{mA}$ – 105% overrange capable
 - Burden resistance $\leq 750\Omega$
 - High-Z mode for redundancy applications (fail-safe)
- 12 bits resolution, $\pm 0.2\%$ accuracy
- Self-powered output – no need for external loop supply
- $\leq 500\mu\text{s}$ typical step response
- Use-case:
 - Drive solenoids, valves and other analog actuators in closed-loop process controls



HW Features – Serial ports (232 – 485 - IRIG-B OUT)

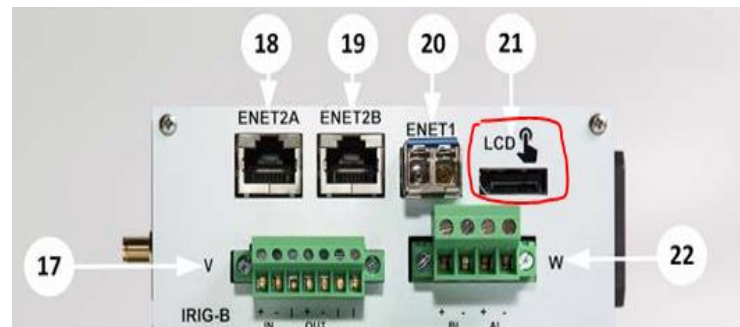
- Dual serial port (COM1 – COM2) supports 3x software-configurable operating modes:
 - RS-232, 115200bps
 - RS-485, 115200bps
 - IRIG-B Output distribution
- RS-232
 - Full modem handshake
- RS-485*
 - Includes fail-safe idle biasing
 - Drives up to 320 unit loads
- IRIG-B Output*
- * : Not supported in 1.1R1 yet.



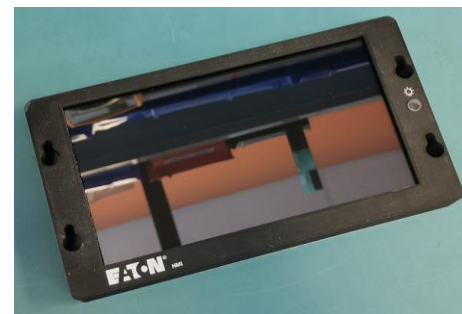
- Use-case:
 - Connect legacy modem / equipment through RS-232
 - Distribute IRIG-B time to other devices in the substation / cabinet

HW Features – HMI (Unreleased yet)

- DisplayPort connector (single cable)
 - Not compatible with COTS DisplayPort screen/ devices
 - Non-destructive and fail-safe for both the SMP as well as the 3rd party device
- 7" 1024x600 high brightness LCD
 - Up to 10x simultaneous touch points
 - Projected capacitive touch technology
 - Industrial-grade touch panel, works with thin gloves (medical latex for example)
- Software-controlled backlight
- Display cable up to 3m
- Power-good LED



Prototype




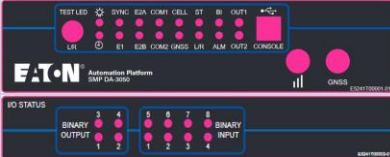
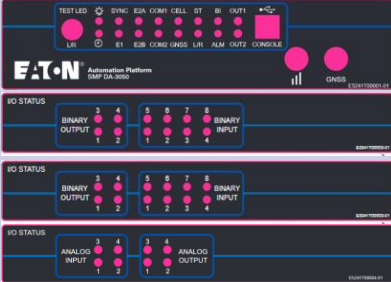
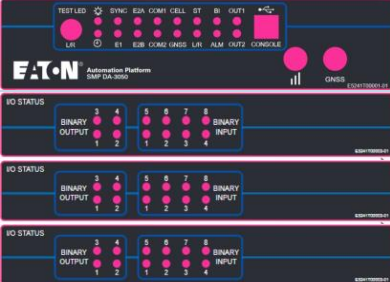
Production sample

HW Features – Cellular modem (Unreleased yet)

- Telit ME910G1-WW
 - Worldwide coverage
- LTE CAT-M1 / NB IoT bands
 - For low-bandwidth, low-power, low throughput applications
- SIM card accessible from device enclosure, field exchangeable
 - 3FF size
- LED indicator
 - The behavior of this LED in operation is to be defined
- Firmware update OTA



Hardware Options DA-3050

Standalone unit SMP DA-3050	DA Cabinet SMP DA-3051	Full I/O SMP DA-3052	DA Cabinet – Ex SMP DA-3053
			
<ul style="list-style-type: none"> • 1 BI / 2 BO / 1 AI 	<ul style="list-style-type: none"> • 1 BI / 2 BO / 1 AI • +8 BI / 4 BO 	<ul style="list-style-type: none"> • 1 BI / 2 BO / 1 AI • +8 BI / 4 BO • +8 BI / 4 BO • +4 AI / 4 AO 	<ul style="list-style-type: none"> • 1 BI / 2 BO / 1 AI • +8 BI / 4 BO • +8 BI / 4 BO • +8 BI / 4 BO

Main differences with SMP 4/DP

	SMP 4/DP	SMP DA-3050 v1.1
Power Supply	10-36 Vdc 19-75 Vdc 85-264 Vac/110-370 Vdc	24-48 Vdc
Serial Ports	COM1 RS-232/RS-485 COM2-4 RS-232	COM1-2 RS-232/RS-485
OS	Windows CE 6	Linux
Max Capacity	10,000 points 32 Clients	20,000 points 64 Clients
Protocols	Multiple protocols support	Client : DNP/Modbus/GOOSE Server : DNP/IEC-104/GOOSE
Time Sync	SNTP, IRIG-B In, Protocol	SNTP Client, Protocol

DA-3050 - Platform

- Linux YOCTO Build
- Containerized application
- Open platform with programmable interface to customize application (C#,C++, Python,..)



What is a container application ?

- Lightweight application that package all necessary library and files to execute the application
- It does not contain the OS which make it very small and easy to deploy
- Python is probably the best language and more open to use with this new way of creating app in SMP Platform
- REST API on SMP Platform is getting richer and we continue to develop it

Application example for SMP DA-3050

- Email Notification
- SNMP Client
- New Web Server UI
- Load management system
- Automatic Transfer Switch
- Ideas.. ?

Container app : what's the process ?

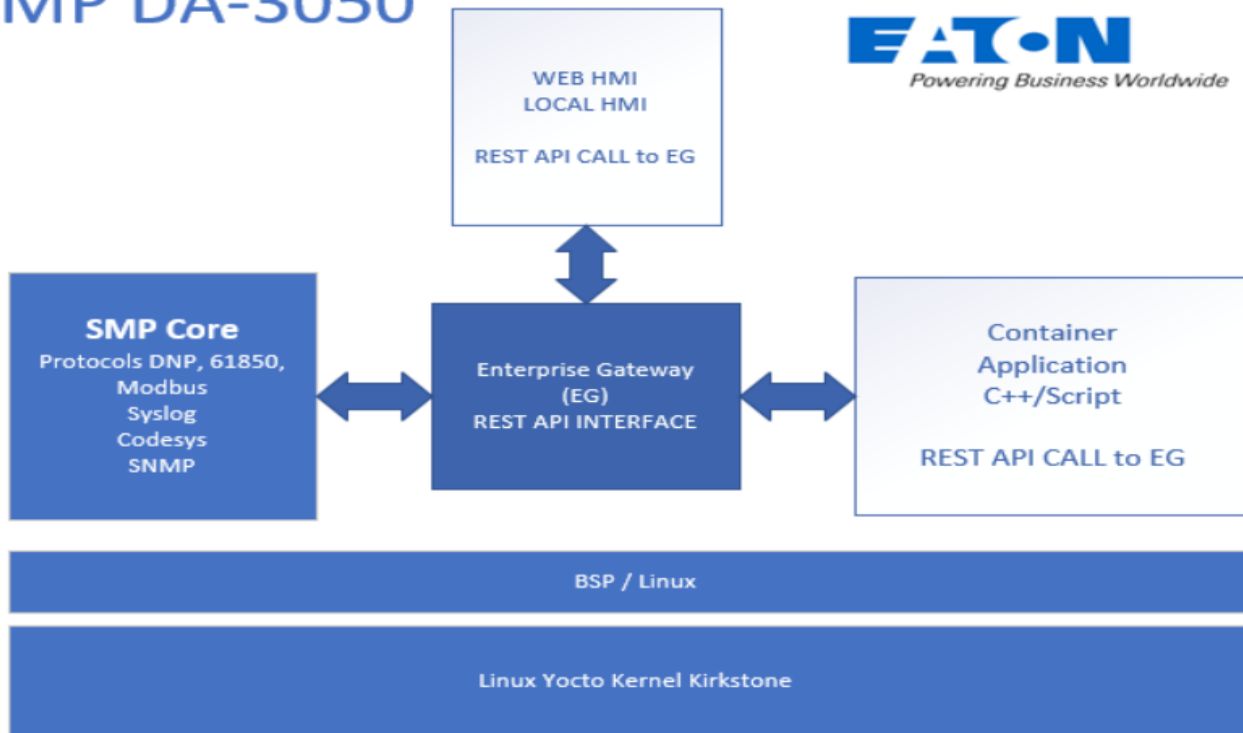
- Eaton will publish a container sample with examples using python and interacting with the DA-3050 REST API
- First release only Eaton employee will be able to develop app and sign application
- Second release we plan to provide a way to our customer to develop and sign their application.

Deployment process :

- Eaton/Customer do the development based on sample
- Eaton/Customer test and package the final app container
- Eaton to provide an interface to deploy the app on the device
 - SMP Config, Web Server, SMP Manager
- Container will have interface to publish to Logs/Stats/Trace for debugging
- All information about container (version, errors, stats) will be available in the SMP Tools

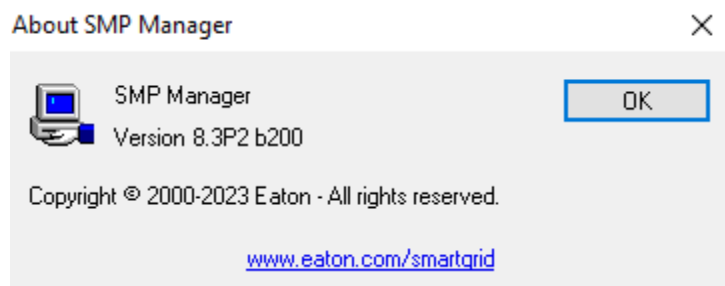
Architecture

SMP DA-3050



SMP Manager

- Requires SMP Manager version 8.3P2 to work with SMP DA-3050 1.XR1



SMP Logs

- Alarm
- Application
- Certificates
- Communication
- Control
- File
- Firewall
- Protocol
- Reset
- Security
- Startup
- System
- Time

SMP Log - 10.106.184.230 (TLS 1.2, ECDHE-P256, RSA-2048, AES-256 GCM, SHA-384)

System View Diagnostics Help

	Time	Time Zone	Code	Subcode	Description
10.106.184.230					
Alarm	2024/01/05 10:30:44.683	-05:00	System	Informational	Configuring "Watchdog"...
Application	2024/01/05 10:30:44.683	-05:00	System	Informational	Configuring "Thread Factory"...
Certificates	2024/01/05 10:30:44.683	-05:00	System	Informational	Configuring "File Manager"...
Communication	2024/01/05 10:30:44.683	-05:00	System	Informational	Configuring "File Manager"...
Control	2024/01/05 10:30:44.683	-05:00	System	Informational	Configuring "Configuration Manager"...
File	2024/01/05 10:30:44.684	-05:00	System	Informational	Configuring "RTDX Server"...
Firewall	2024/01/05 10:30:44.718	-05:00	System	Informational	Configuring "Acquisition Manager"...
Protocol	2024/01/05 10:30:44.768	-05:00	System	Notice	Initialization completed successfully.
Reset	2024/01/05 10:30:44.772	-05:00	System/Configuration Manager	Notice	SAFE MODE
Security	2024/01/05 10:43:46.220	-05:00	smp-parameters	Informational	Parsing license ...
Startup	2024/01/05 10:43:46.224	-05:00	smp-parameters	Informational	Validating license ...
System	2024/01/05 10:43:46.224	-05:00	smp-parameters	Informational	Setup configuration file directory ...
Time	2024/01/05 10:43:46.225	-05:00	smp-parameters	Informational	Parsing configuration file ...
	2024/01/05 10:43:46.230	-05:00	smp-parameters	Informational	Loading "DA3000_CS_for_doc.par" ...
	2024/01/05 10:43:46.295	-05:00	smp-parameters	Informational	Copying configuration file ...
	2024/01/05 10:43:46.295	-05:00	smp-parameters	Informational	Patching configuration ...
	2024/01/05 10:43:46.328	-05:00	smp-parameters	Informational	Validating license options ...
	2024/01/05 10:43:46.329	-05:00	smp-parameters	Error	License allows only 0 data points (91 configured)
	2024/01/05 10:43:46.329	-05:00	smp-parameters	Error	ConfigData.cpp (357): Invalid Configuration (License)
	2024/01/05 10:43:46.329	-05:00	smp-parameters	Informational	License option "DNP3 master protocol" is allowed (2 configured)
	2024/01/05 10:43:46.329	-05:00	smp-parameters	Informational	License option "Modicon MODBUS master protocol" is allowed (1 configured)
	2024/01/05 10:43:46.330	-05:00	smp-parameters	Informational	License option "DNP3 slave protocol" is allowed (2 configured)
	2024/01/05 10:43:46.330	-05:00	smp-parameters	Informational	License option "IEC 60870-5-104 slave protocol" is allowed (1 configured)
	2024/01/05 10:43:46.330	-05:00	smp-parameters	Informational	License allows 128 clients (3 configured)
	2024/01/05 10:43:46.330	-05:00	smp-parameters	Informational	License allows any number of class 1 client protocols (2 configured)
	2024/01/05 10:43:46.330	-05:00	smp-parameters	Informational	License allows 64 servers (3 configured)
	2024/01/05 10:43:46.330	-05:00	smp-parameters	Informational	License allows any number of class 1 server protocols (2 configured)
	2024/01/05 10:43:46.330	-05:00	smp-parameters	Error	==== ERROR: Processing parameters
	2024/01/05 10:43:46.330	-05:00	smp-parameters	Informational	Clearing configuration ...
	2024/01/05 11:20:17.523	-05:00	smp-parameters	Informational	Parsing license ...
	2024/01/05 11:20:17.527	-05:00	smp-parameters	Informational	Validating license ...
	2024/01/05 11:20:17.528	-05:00	smp-parameters	Informational	Setup configuration file directory ...
	2024/01/05 11:20:17.528	-05:00	smp-parameters	Informational	Parsing configuration file ...
	2024/01/05 11:20:17.533	-05:00	smp-parameters	Informational	Loading "DA3000_CS_for_doc.par" ...
	2024/01/05 11:20:17.584	-05:00	smp-parameters	Informational	Copying configuration file ...
	2024/01/05 11:20:17.584	-05:00	smp-parameters	Informational	Patching configuration ...
	2024/01/05 11:20:17.606	-05:00	smp-parameters	Informational	Validating license options ...
	2024/01/05 11:20:17.607	-05:00	smp-parameters	Error	License allows only 0 data points (91 configured)
	2024/01/05 11:20:17.607	-05:00	smp-parameters	Error	ConfigData.cpp (357): Invalid Configuration (License)
	2024/01/05 11:20:17.607	-05:00	smp-parameters	Informational	License option "DNP3 master protocol" is allowed (2 configured)
	2024/01/05 11:20:17.607	-05:00	smp-parameters	Informational	License option "Modicon MODBUS master protocol" is allowed (1 configured)
	2024/01/05 11:20:17.607	-05:00	smp-parameters	Informational	License option "DNP3 slave protocol" is allowed (2 configured)
	2024/01/05 11:20:17.608	-05:00	smp-parameters	Informational	License option "IEC 60870-5-104 slave protocol" is allowed (1 configured)
	2024/01/05 11:20:17.608	-05:00	smp-parameters	Informational	License option "Operational HMI lite" is allowed (1 configured)
	2024/01/05 11:20:17.608	-05:00	smp-parameters	Informational	License allows 128 clients (3 configured)
	2024/01/05 11:20:17.608	-05:00	smp-parameters	Informational	License allows any number of class 1 client protocols (2 configured)
	2024/01/05 11:20:17.608	-05:00	smp-parameters	Informational	License allows 64 servers (3 configured)
	2024/01/05 11:20:17.608	-05:00	smp-parameters	Informational	License allows any number of class 1 server protocols (2 configured)
	2024/01/05 11:20:17.608	-05:00	smp-parameters	Error	==== ERROR: Processing parameters
	2024/01/05 11:20:17.608	-05:00	smp-parameters	Informational	Clearing configuration ...

SMP Trace

Traces are different from what we had in 4260/4DP, the tree structure on the left is different.

- Clients are under Services
- Server are under Protocols
- Connections are duplicated: under connections(top) at the top and under each instance.

IO Configuration : Good way to see all hardware I/O update and time

IO Configuration	15:13:50,263	-05:00	AI>	[Name: "IO_AI_E2"]	[Int: "0"]	[Float: "-0.000679"]	[Quality: "OK"]	[Time: "2024/01/10 21:05:0.112 UTC"]	[Time Quality: "IED"]	<AI (Live)
	15:13:50,468	-05:00	AI>	[Name: "IO_AI_W1"]	[Int: "0"]	[Float: "-0.000548"]	[Quality: "OK"]	[Time: "2024/01/10 20:13:50.310 UTC"]	[Time Quality: "IED"]	<AI (Live)
Data Exchange	15:13:50,472	-05:00	AI>	[Name: "IO_AI_E1"]	[Int: "0"]	[Float: "-0.000152"]	[Quality: "OK"]	[Time: "2024/01/10 20:13:50.311 UTC"]	[Time Quality: "IED"]	<AI (Live)
	15:13:50,472	-05:00	AI>	[Name: "IO_AI_E2"]	[Int: "0"]	[Float: "0.001537"]	[Quality: "OK"]	[Time: "2024/01/10 20:13:50.312 UTC"]	[Time Quality: "IED"]	<AI (Live)
Management	15:13:50,473	-05:00	AI>	[Name: "IO_AI_E4"]	[Int: "0"]	[Float: "0.000060"]	[Quality: "OK"]	[Time: "2024/01/10 20:13:50.314 UTC"]	[Time Quality: "IED"]	<AI (Live)
Protocol	15:13:50,662	-05:00	AI>	[Name: "IO_AI_W1"]	[Int: "0"]	[Float: "0.000398"]	[Quality: "OK"]	[Time: "2024/01/10 20:13:50.310 UTC"]	[Time Quality: "IED"]	<AI (Live)

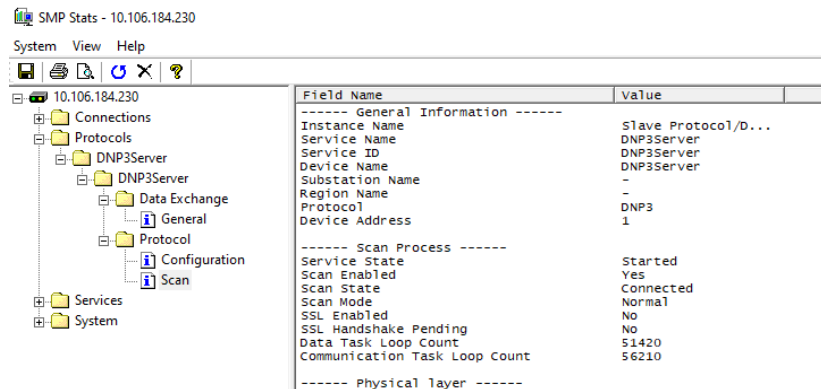
The screenshot displays the SMP Trace application window for the instance 10.106.184.230. The left pane shows a hierarchical tree structure with categories: Connections, Protocols, Services, DNP3Client, DNP3Server, IO Configuration, and System. The right pane shows a detailed log of messages and events, including timestamps, time zones, and descriptive text. Key events include 'DEBUG: Asking next call in 2057 ms', 'Processing communication work (cycle) returning 2057', and 'End updates'. The log also shows data frames and application headers.

SMP Stats

Stats are different from what we had in 4260/4DP, the tree structure on the left is different.

- Clients are under Services
- Server are under Protocols

Interesting information for Client and Server are under sub folder Protocol (Configuration and Scan)



The screenshot shows the 'SMP Stats - 10.106.184.230' application window. On the left is a tree structure with the following nodes: 10.106.184.230, Connections, Protocols, DNP3Server, DNP3Server (sub-folder), Data Exchange, General, Protocol, Configuration, Scan, Services, and System. On the right is a table with 'Field Name' and 'Value' columns. The table contains three sections: General Information, Scan Process, and Physical layer.

Field Name	Value
----- General Information -----	
Instance Name	Slave Protocol/D...
Service Name	DNP3Server
Service ID	DNP3Server
Device Name	DNP3Server
Substation Name	-
Region Name	-
Protocol	DNP3
Device Address	1
----- Scan Process -----	
Service State	Started
Scan Enabled	Yes
Scan State	Connected
Scan Mode	Normal
SSL Enabled	No
SSL Handshake Pending	No
Data Task Loop Count	51420
Communication Task Loop Count	56210
----- Physical layer -----	

SMP Console

commands are pre-defined and pre-configured

Help command will display all available commands

```
Welcome to SMP Console
\> help
Available commands

ai-cal          print AI calibration data
ai-cal-update   to calibrate, ground AI port(s)
ao-cal          print AO calibration data
arp             print the system ARP cache
arping          send ARP REQUEST to a neighbour host
coredump        list/clear the pending coredump files
date            get/set the current date
df              print disk space usage
free            print memory usage
hw              print hardware configuration
ifconfig        print network interfaces
iptables        print packet filtering rules
netstat         print network statistics
newfiles        list/clear the pending update files (new files)
ping            ping a network host
platform-infos  print platform info
ps              print current processes
restart         update or restart the device
rm-hmibanner    remove HMI Banner file
route           print network routes
time            get/set the current time
uptime          print uptime and cpu usage
verinfo         print the applications version
viewlog         view system logs
```

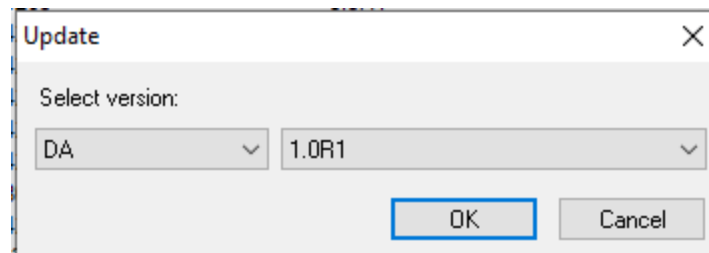
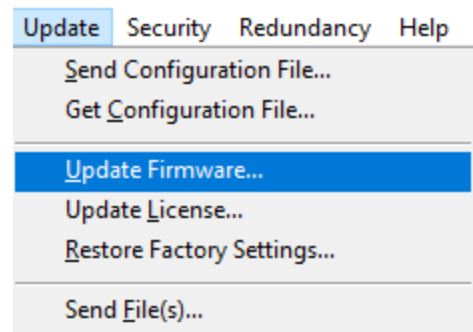
Firmware Update

Firmware update is made through the Update Menu

Only 1 file to send on device (.smp)

SMP DA-3050 will automatically update or try to convert the .par file to work with the new firmware.

No need to upgrade .par file during firmware update.



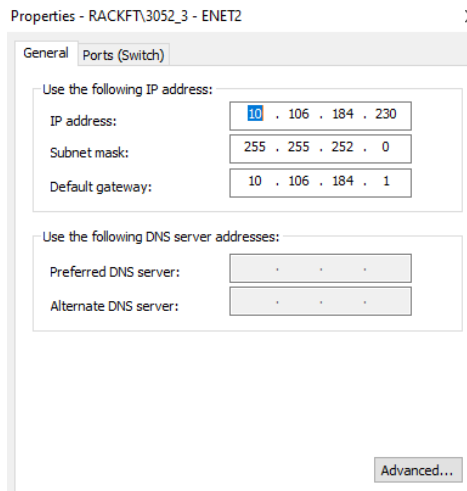
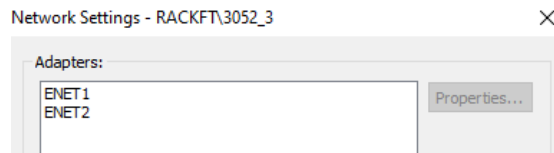
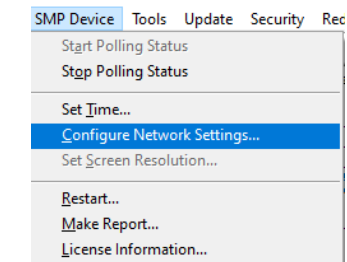
Factory Reset

- Factory reset mechanism is the same as all SMP device
- Requires a USB connection
- Will delete all information (.par) and Ethernet address

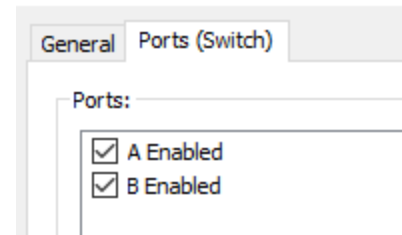
Licenses

- Default License
 - 5000 points (up to 20,000 points)
 - 8 IEDs (up to 64 IEDs)
 - 1 Server (up to 16 Servers)
- All Class 1 protocol are now included (1.1R1)
 - DNP C/S
 - Modbus C
 - IEC-104 S
 - GOOSE
- User pay for additional Devices and Points and Options (HMI, CODESYS, etc)

Set IP Address



Properties - RACKFT\3052_3 - ENET2



For more information :
See user manual in section
7.3. Network adapter configuration

Automation Functions 1.1R1

- All functions from the previous implementation are all present in version 1.1R1.



Time Synchronization options

- Protocol synchronization
 - Client can set time on device through DNP
 - Server DNP/104 can receive time synchronization from SCADA
- SNTP Client
 - DA-3050 can receive synchronization from SNTP Server

Alarm History

★

☰

Active Alarms

Type search keywords

🔍

☑

Features Status

⚙

Application Settings

ℹ

About SMP HMI

Ack New Alarms

Acknowledge

Clear

Ack/Clear All

Block

	Description	Date	Time
A	IO_AI_E3 High	Jan 10, 2024	16:42:47.683 IED

- SMP Device
 - Training 1.0R1
 - Hardware
 - IO Configuration
 - General
 - Analog Inputs
 - Physical Inputs
 - Logical Inputs
 - Binary Inputs
 - Analog Outputs
 - Binary Outputs
 - HMI
 - System
 - Automation Functions
 - Alarms
 - General
 - Analog Inputs
 - Binary Inputs
 - Categories

	Name	Alarm Level	Low Threshold	High Threshold	Deadband	Disabled	Low Threshold Description	High Threshold Description	Category
1	IO_AI_E1	Major	-10	10	0	<input type="checkbox"/>	IO_AI_E1 Low	IO_AI_E1 High	Default
2	IO_AI_E2	Major	-10	10	0	<input type="checkbox"/>	IO_AI_E2 Low	IO_AI_E2 High	Default
3	IO_AI_E3	Major	-10	10	0	<input type="checkbox"/>	IO_AI_E3 Low	IO_AI_E3 High	Default
4	IO_AI_E4	Major	-10	10	0	<input type="checkbox"/>	IO_AI_E4 Low	IO_AI_E4 High	Default
5	IO_AI_W1	Major	-10	10	0	<input type="checkbox"/>	IO_AI_W1 Low	IO_AI_W1 High	Default
*						<input type="checkbox"/>			

SOE (Sequence of Events)

- Sequence of Events
 - General
 - Event Entries Format**
 - Event Binary Inputs
 - Event Analog Outputs
 - Event Binary Outputs

Event Entries Format		
	Point Type	Format
1	Event Binary Inputs	[LABEL] Event: [POINTNAME] updated to [STATE] ([QUALITY])
2	Event Analog Outputs	[LABEL] [CONTROL]: Set [POINTNAME] to [CONTROLVALUE], Result: [CONTROLRESULT]
3	Event Binary Outputs	[LABEL] [CONTROL]: [CONTROLTYPE] on [POINTNAME], Result: [CONTROLRESULT]

Allowed Keywords		
	Keyword	Description
1	[LABEL]	Label of the point that triggered the event
2	[POINTDESC]	Description of the point that triggered the event
3	[POINTNAME]	Name of the point that triggered the event
4	[QUALITY]	Quality of the point that triggered the event
5	[STATE]	State of the point that triggered the event

- Sample-mqtt
- Security
- Sequence of Events**
- Startup
- System
- Time

2024/03/20 13:47:12,533	-04:00	Protocols/Sequence of Event... Notice	2024-03-20 17:47:12.531 +0000 : Quality Event: IO_BI_A4 updated to 0 Off (Suspect)
2024/03/20 13:47:18,267	-04:00	Protocols/Sequence of Event... Notice	SYSTEM STARTED at 2024/03/20 17:47:18.267 UTC (Please refer to Reset log for details)
2024/03/20 13:47:18,277	-04:00	Protocols/Sequence of Event... Notice	2024-03-20 17:47:18.271 +0000* IED : Quality Event: IO_BI_A4 updated to 0 Off (Good)
2024/03/20 14:32:10,541	-04:00	Protocols/Sequence of Event... Notice	SYSTEM STARTED at 2024/03/20 18:32:10.541 UTC (Please refer to Reset log for details)
2024/03/20 14:32:10,551	-04:00	Protocols/Sequence of Event... Notice	2024-03-20 18:32:10.544 +0000* IED : Quality Event: IO_BI_A4 updated to 0 Off (Good)
2024/03/20 16:17:10,376	-04:00	Protocols/Sequence of Event... Notice	SYSTEM STARTED at 2024/03/20 20:17:10.376 UTC (Please refer to Reset log for details)
2024/03/20 16:17:10,386	-04:00	Protocols/Sequence of Event... Notice	2024-03-20 20:17:10.379 +0000* IED : Quality Event: IO_BI_A4 updated to 0 Off (Good)
2024/03/20 16:41:20,892	-04:00	Protocols/Sequence of Event... Notice	SYSTEM STARTED at 2024/03/20 20:41:20.892 UTC (Please refer to Reset log for details)
2024/03/20 16:41:20,902	-04:00	Protocols/Sequence of Event... Notice	2024-03-20 20:41:20.894 +0000* IED : Quality Event: IO_BI_A4 updated to 0 Off (Good)
2024/03/20 17:03:33,402	-04:00	Protocols/Sequence of Event... Notice	SYSTEM STARTED at 2024/03/20 21:03:33.402 UTC (Please refer to Reset log for details)
2024/03/20 17:03:33,412	-04:00	Protocols/Sequence of Event... Notice	2024-03-20 21:03:33.405 +0000* IED : Quality Event: IO_BI_A4 updated to 0 Off (Good)
2024/04/02 16:51:47,489	-04:00	Protocols/Sequence of Event... Notice	SYSTEM STARTED at 2024/04/02 20:51:47.489 UTC (Please refer to Reset log for details)
2024/04/02 16:51:47,499	-04:00	Protocols/Sequence of Event... Notice	2024-04-02 20:51:47.491 +0000* IED : Quality Event: IO_BI_A4 updated to 0 Off (Good)

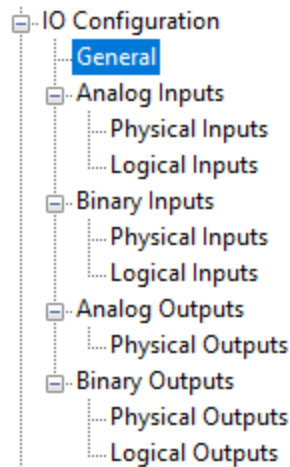
IO Configuration

This section is used to configure physical I/O parameter: like voltage input and control type. Setting and understanding those parameters is necessary to obtain the right value from an external hardwired connection.

For more information :

See user manual in section

8.3 Application - Inputs/Outputs configuration



Physical Inputs										
	Name	Disabled	Transducer Type	Resistor Value	Low Input Value	Engineering Value at Low	High Input Value	Engineering Value at High	Units	
1	AI_W1	<input type="checkbox"/>	48V Onboard	0	-48	-48	48	48	Volt	0
2	AI_E1	<input type="checkbox"/>	10V	0	-10	-10	10	10	Volt	0
3	AI_E2	<input type="checkbox"/>	10V	0	-10	-10	10	10	Volt	0
4	AI_E3	<input type="checkbox"/>	10V	0	-10	-10	10	10	Volt	0
5	AI_E4	<input type="checkbox"/>	10V	0	-10	-10	10	10	Volt	0

Physical Inputs							
	Name	Disabled	Voltage Level	Voltage Type	Tolerance Filter	Intolerance Filter	Filter Time Tagging
1	BI_W1	<input type="checkbox"/>	Low Voltage Input	DC	4	4	Start of Tolerance
2	BI_A1	<input type="checkbox"/>	High Voltage Input	DC	4	4	Start of Tolerance
3	BI_A2	<input type="checkbox"/>	High Voltage Input	DC	4	4	Start of Tolerance
4	BI_A3	<input type="checkbox"/>	High Voltage Input	DC	4	4	Start of Tolerance

Physical Outputs						
	Name	Disabled	Transducer Type	Output Control	Engineering Value at Low	Engineering Value at High
1	AO_F1	<input type="checkbox"/>	Off	Raw	-10	10
2	AO_F2	<input type="checkbox"/>	Off	Raw	-10	10
3	AO_F3	<input type="checkbox"/>	Off	Raw	-10	10
4	AO_F4	<input type="checkbox"/>	Off	Raw	-10	10

Physical Outputs					
	Name	Disabled	Control Type	Protocol Duration Allowed	Duration Time
1	BO_OUT1	<input type="checkbox"/>	Local/Remote	<input checked="" type="checkbox"/>	500
2	BO_OUT2	<input type="checkbox"/>	Local/Remote	<input checked="" type="checkbox"/>	500
3	BO_B1	<input type="checkbox"/>	Trip/Close pair (Trip)	<input checked="" type="checkbox"/>	500
4	BO_B2	<input type="checkbox"/>	Trip/Close pair (Close)	<input checked="" type="checkbox"/>	500
5	BO_B3	<input type="checkbox"/>	Trip/Close pair (Trip)	<input checked="" type="checkbox"/>	500
6	BO_B4	<input type="checkbox"/>	Trip/Close pair (Close)	<input checked="" type="checkbox"/>	500
7	BO_D1	<input type="checkbox"/>	Trip/Close pair (Trip)	<input checked="" type="checkbox"/>	500
8	BO_D2	<input type="checkbox"/>	Trip/Close pair (Close)	<input checked="" type="checkbox"/>	500
9	BO_D3	<input type="checkbox"/>	Trip/Close pair (Trip)	<input checked="" type="checkbox"/>	500
10	BO_D4	<input type="checkbox"/>	Trip/Close pair (Close)	<input checked="" type="checkbox"/>	500

REST API

REST API Addition with Recent development

- Alarm History (4260 and 3050)
- Security Certificates (4260)
- System Factory Reset (3050)
- System Time (3050)


Documentation

- Documentation Online
- Product Landing page
 - [Distribution controller | I/O | edge | HMI | Eaton](#)
- Catalog (Datasheet)
 - [SMP DA-3050 automation platform catalog \(eaton.com\)](#)
- Brochure
 - [A scalable compact grid edge automation platform \(eaton.com\)](#)

Software Roadmap Schedule

Phase	Target	Protocols	Options
1.0RX 1.1RX	March 2024	Client: DNP/Modbus/104/GOOSE Server: DNP/104/Interconnect/GOOSE	<ul style="list-style-type: none">• Automation Function• Web Server/Commissioning Tool• Syslog• SNTP Client• SOE/Alarms
1.XRX 2.XRX	2024-2025	<ul style="list-style-type: none">• 61850 Client(1) / 103(7) / OPC UA / SEL Events• Client Multidrop support• Server : DNP Secure / OPC UA / 61850 Server(12) / MODBUS(8)	<ul style="list-style-type: none">• Passthrough (2)• SNMP• Containers support(11)• Cell Modem support(4)• IRIG-B Support(6)• SoftPLC Codesys (9)• Web HMI Support (3)• Local HMI Support(5)• .par file upgrade (10)

Hardware Roadmap Schedule

Phase	Target	Power Supply	Expansion
1.XRX	2025	<ul style="list-style-type: none">12 VDC option125 VDC option	<ul style="list-style-type: none">2-4 additional RS-232/RS-485 port+5V on Pin 1 for Serial converter  <p>The image shows the Eaton Automation Platform SMP DA 3050 and a Serial Expansion Module. The main unit has a front panel with various ports and indicators, including a console port, RS-232/RS-485 ports, and a power input. The Serial Expansion Module is shown below it, with a COM1 port. Below these are two detailed views of the expansion module's internal components, showing the COM1, COM2, COM3, and COM4 ports, and the ENET2A, ENET2B, ENET1, and LGS ports.</p>

SMP SG-4260 and 4/DP 8.2R5

- 8.2R5 Maintenance (June 2024) **Highlights**
 - Support of new Ethernet Controller
 - WebHMI new certificates requirement from Chromium (Edge and Chrome)
 - Fix a problem in 8.2R4 when generating Gateway Report, sometimes empty or error
 - Subscribe to more than once to the same point in SoftPLC
 - Fix “again” the Screensaver issue with LocalHMI



SMP SG-4260 Maintenance

- SMP SG-4260 Congatec CPU A4 with specific serial number (< 9000650)
 - Risk of failure due to intel malfunction, need upgrade.
- Compact Flash with version < 8.2R1
 - Risk of failure due to excessive writing
 - SMP Gateway flash memory writing, a guide to good practiceMN912197EN-v4.pdf
- Web HMI access with Microsoft Edge and Google Chrome
 - HMI access with Edge and Chrome applications-MN912215EN-v6.pdf

Technical Note MN912215EN, version 6

Problem with HMI access when using Edge or Chrome

Recently, when trying to access the SMP Device's HMI, you get the following error using Microsoft Edge or Chrome: ERROR: SSL_CERT_ERROR: CERTIFICATE_EXPIRED. This indicates a failure of the SMP Device's HMI. It will be provided on upcoming firmware releases for Linux-based SMP products and in the version 8.2R1 and later for the Windows-based SMP automation platforms (SMP SG-4260 and SMP KCP automation platforms). Meanwhile, workarounds are available for the affected web browsers; they are described in the first section of the document.

Another connection problem with the SMP Device's HMI arose in April 2024 when using Microsoft Edge or Chrome, only for Windows-based SMP automation platforms (SMP SG-4260 and SMP KCP automation platforms). The connection for this site is not secure (SSL address not an invalid response (SSL_PROTOCOL_ERROR)). A fix will be available for version 8.2R1 and later. Meanwhile, a workaround is available for the affected web browsers; it is described in the second section of the document.

This technical note provides detailed procedures on how to bypass these situations to be able to access the SMP Device's HMI.

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SMP Gateway Lifecycle

SMP Gateway - Life Cycle and compatibilities											Last Update: June 2023	
Versions	Release Date (SR)	End of Support (EoS)	End of Cyber-Security Watch	Last Revision	Windows Server Operating System Supported	Windows Client Operating System Supported	MS SQL Version Supported	Web Browser Supported	JAVA Runtime Required	SMP Gateway supported by SMP Manager	SMP Gateway supported models	SMP I/O Supported
Version 8												
8.2	Jul 2021	Jul 2024	Jul 2029	8.2R4	2019 2016	11 10 x64 b1909	2019 Express LocalDB 2014 Express LocalDB (others)	Chrome Edge	None	Any model: Version 5.2 to 8.2	SG-4260 SG-4250 SMP 4/DP	2.0 & 3.0
8.1	Jul 2020	Jul 2023	Jul 2028	8.1R5	2019 2016 2012 R2	10 8.1	2014 Express LocalDB (others) 2008 R2 Express (2003)	Chrome Edge	None	Any model: Version 5.2 to 8.1	SG-4260 SG-4250 SMP 4/DP	2.0 & 3.0
8.0	Apr 2018	Apr 2023	Apr 2028	8.0R9	2016 2012 R2 2008 R2	10 8.1 7	2014 Express LocalDB (others) 2008 R2 Express (2003)	IE 11 IE 10 IE 9 Chrome	None	Any model: Version 5.0 to 8.0	SG-4260 SG-4250 SMP 4/DP SMP 16/XX-CM SMP 16/XX-PM	2.0 & 3.0
Version 7												
7.2	Apr 2017	Apr 2020	Apr 2025	7.2R6	2012 R2 2008 R2	10 8.1 7	2014 Express LocalDB (others) 2008 R2 Express (2003)	IE 11 IE 10 IE 9 Chrome	None	Any model: Version 5.0 to 7.2	SG-4250 SMP 4/DP SMP 16/XX-CM SMP 16/XX-PM	2.0 & 3.0
7.1	Aug 2015	Aug 2018	Aug 2023	7.1R5	2012 R2 2008 R2 2003 R2	10 8.1 7	2014 Express LocalDB (others) 2008 R2 Express (2003)	IE 11 IE 10 IE 9 Chrome	None	Any model: Version 5.0 to 7.1	SG-4250 SMP 4/DP SMP 16/XX-CM SMP 16/XX-PM	2.0 & 3.0
7.0	Jun 2014	Jun 2017	Jun 2022	7.0R7	2012 R2 (>= 7.0R5) 2008 R2 2003 R2	8.1 (>= 7.0R5) 7	2008 R2 Express (others) 2000 MSDE (2003)	IE 11 IE 10 IE 9	8 (>= 7.0R5) 6 (< 7.0R5)	Any model: Version 5.0 to 7.0	SG-4250 SMP 4/DP SMP 16/XX-CM SMP 16/XX-PM	2.0 & 3.0

SMP Gateway Lifecycle

<i>Last Update: December 2023</i>
Hardware Release Date (HR)
Not recommended for new design (NRND)
Last time buy announcement (LTBA)
Last time buy (LTB)
End of delivery (EoD)
End of hardware support (EoHS)
Last supported software version
End of new software features development
End of software support (EoSS)
End of cyber-security watch (EoCSW)

SMP SG-4200 Product family	
SMP SG-4260 Intel® Atom E3845 Quad Core 1.91 GHz	SMP SG-4250 Atom D525 1.8 GHz
Oct 2017	Jun 2014
Dec 2026	Dec 2017
Mar 2027	Sep 2019
Mar 2028	Mar 2020
2038-12-31 ²	2027-12-31 ²
To Be Determined ¹	To Be Determined ¹
Dec 2027	Dec 2027
Dec 2032	Dec 2032
Dec 2037	Dec 2037

SMP 16 Product family		
SMP 16/CP-PM SMP 16/SG-PM Pentium 1.4 GHz	SMP 16/CP-CM SMP 16/SG-CM Celeron 600 MHz	SMP 16/CP SMP 16/SG Geode 266 MHz
Mar 2007	Feb 2013	May 2005
Jun 2015	Jun 2015	Aug 2010
Mar 2017	Mar 2017	Mar 2011
Jul 2017	Jul 2017	Jul 2011
2025-06-30 ²	2025-06-30 ²	Mar 2020
8.0	8.0	6.3
Apr 2018	Apr 2018	Mar 2013
Apr 2023	Apr 2023	Mar 2018
Apr 2028	Apr 2028	Mar 2023

SMP 4 Product family	
SMP 4/DP OMAP35x 600 MHz	SMP 4 Geode 266 MHz
Mar 2011	May 2005
Jun 2023	Aug 2010
Dec 2024	Oct 2010
Jun 2025	Dec 2010
2030-06-30 ²	Dec 2020
To Be Determined ¹	6.3
Dec 2023	Mar 2013
Dec 2028	Mar 2018
Dec 2033	Mar 2023

Note 1: To Be Determined means that the life-cycle of this model is not near the end.

Note 2: Or with compatible hardware if not available

Virtual SMP (vSMP) – What is it ?

What ?

Software Only solution with SMP core functionalities

- TCP IP Protocols
 - 61850 MMS, DNP, Modbus, IEC-104, SEL Events, SEL FM, OPC UA, ICCP
- PTP/SNTP Time Synchro
- SoftPLC CODESYS
- WebHMI (Single Line, Alarms)
- Sequence of Events
- Syslog
- SNMP Client/Server
- FTPS
- RESTAPI

How ?

- Configured with the same suite of SMP Tools using SMP Manager and SMP Config, Trace, Stats
- Can be deployed to :
 - Linux Virtual Machine (.ovf format)
 - Linux(ARM) Containerized application (Docker)
- Software license



Virtual SMP (vSMP)

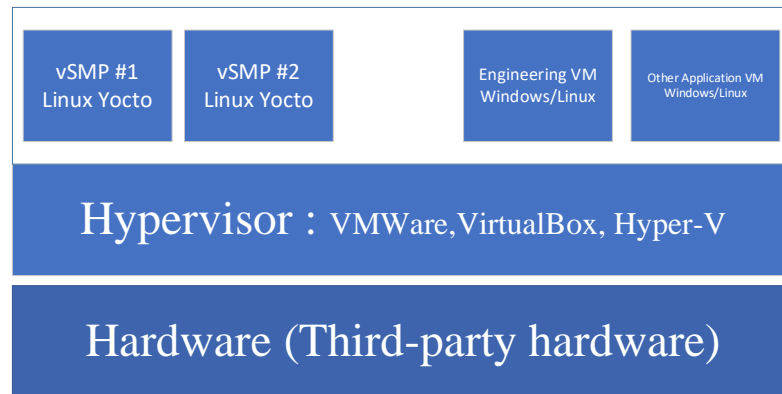
Why

- Detach Hardware/software
- Future proof scalability
- Easily deploy new RTU
- Leverage IT Solutions (Hypervisor)
- Dynamic Reconfiguration (not lose the whole system on reboot)

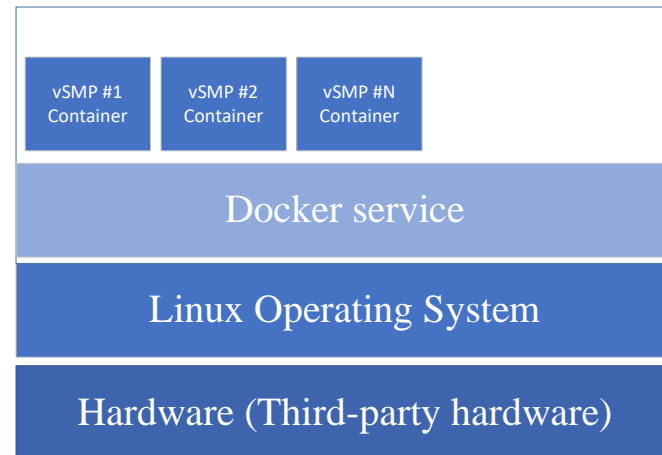
Use case

- Digitalized substation
- Centralized data acquisition
- Data center integration

Option #1



Option #2



SMP SG-5000 (Substation Gateway)

Two options

Evolution of SG-4260 hardware (new CPU)
Linux firmware/application (embedded
appliance)

Virtualization with VMWare (vSMP)
Runs on 3rd party hardware platform

Hardware





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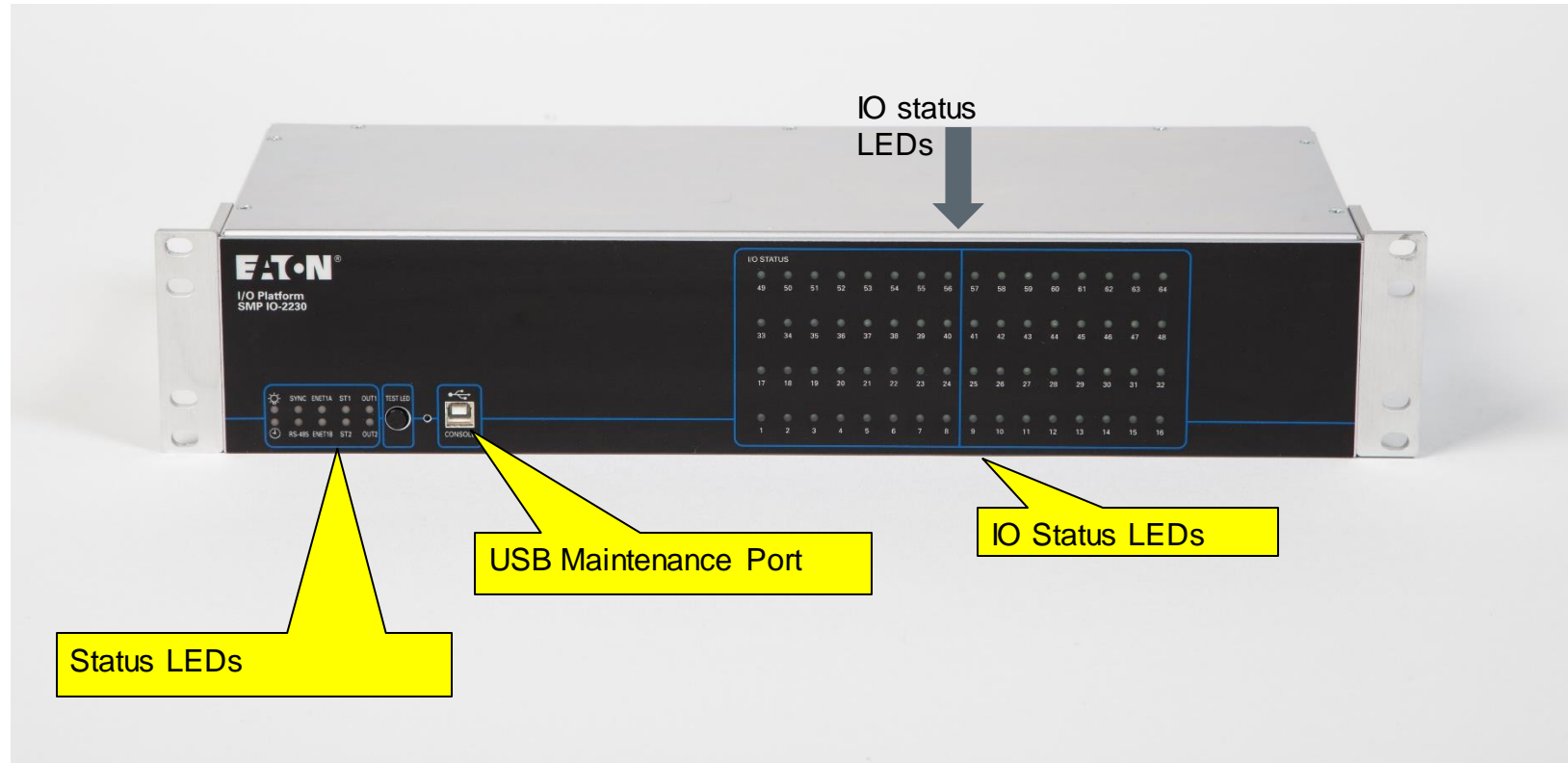
Eaton.com/WhatMatters

SMP IO-2230

- 64 input/output (DI, DO, AI)
- DNP3, IEC 61850
- Ethernet, RS-485
- IRIG-B
- SMP Tools



Front Panel Main Features

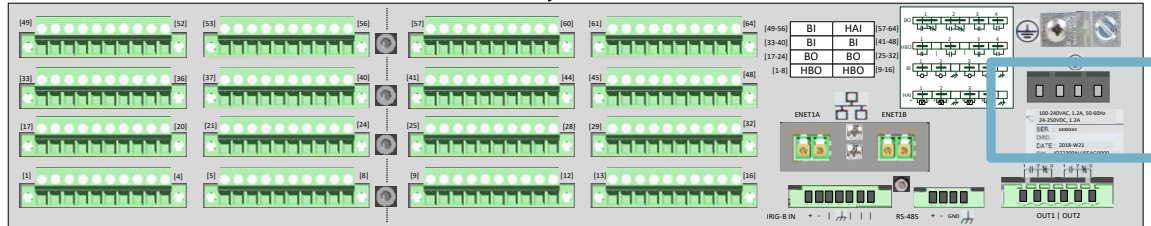


Back Panel

Universal Power supply and wide range binary input voltage

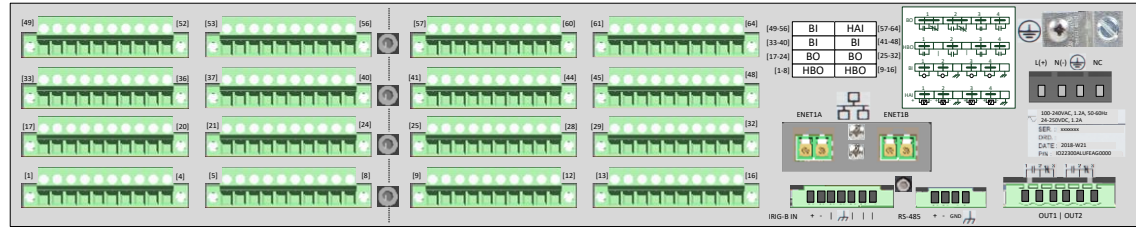
- Easy ordering with one universal part
- Simplify maintenance / stocking / spares

24-250 Vdc ,100-240 Vac



Back Panel

- 2 Ethernet ports (fiber or RJ-45) for daisy chain.
- IRIG-B time sync
- RS-485 port



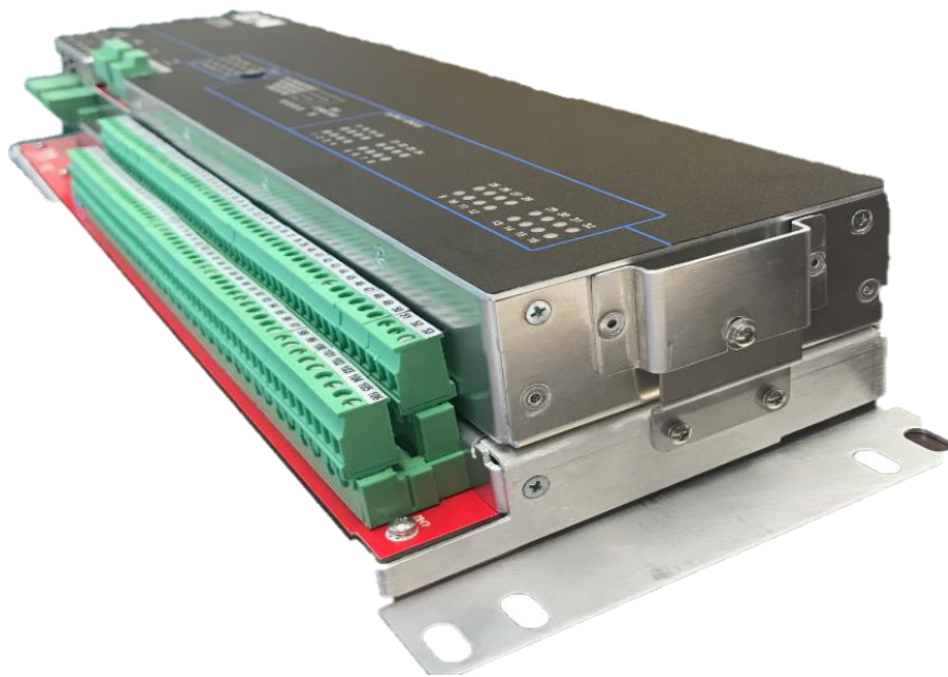
Card Configuration – The Basics

4 card type configurations :

- Binary Inputs (16)
- Binary Output (16)
- High Current Binary Output (16)
- Analog Input (8) / Binary Input (8)

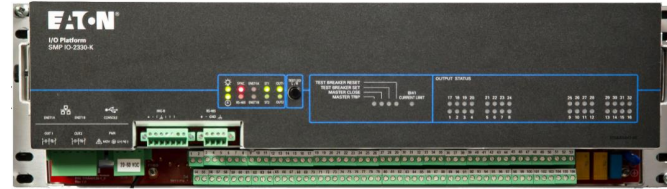
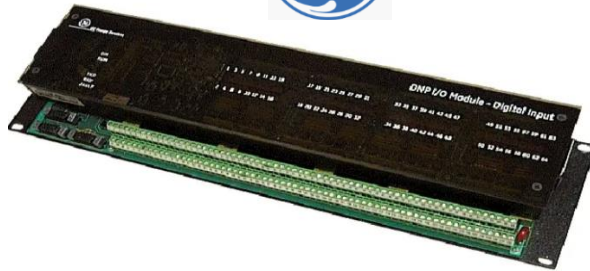
IO-2330 Solution

D20 Wall Mount Replacement solution With the SMP IO-2330



IO-2330 D20 Wall Mount

Introducing new SMP IO-2330 with exact same
GE D20 form factor



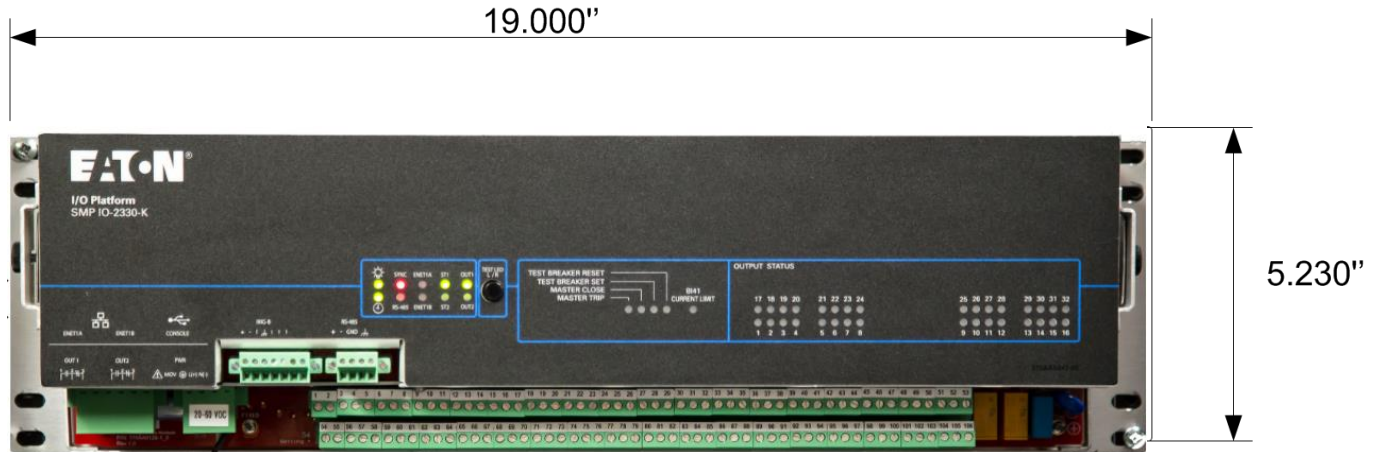
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IO-2330 Wall Mount Design – Front View

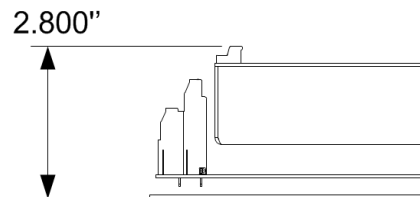


IO-2330 Wall Mount Design

Bottom View



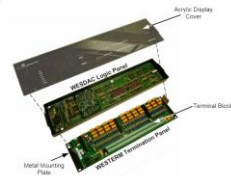
Side View



Modular and easily replaceable

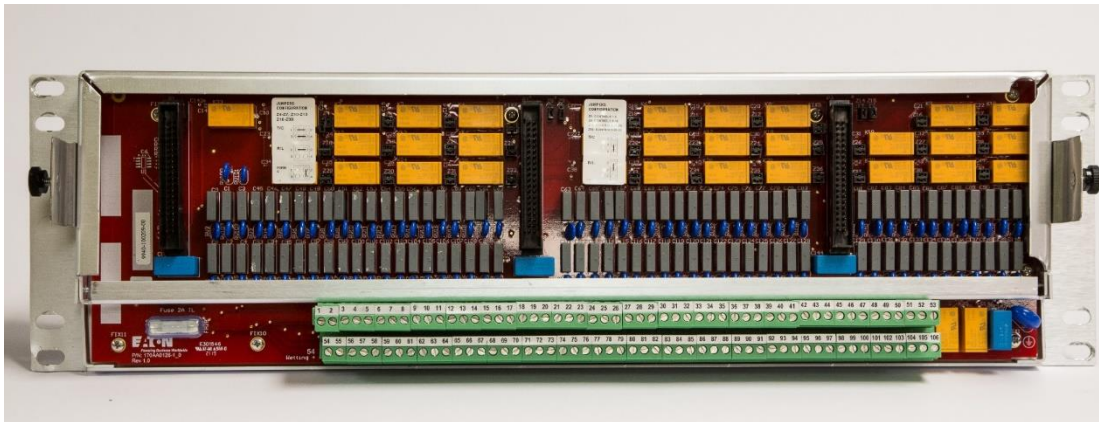
E-DAC
(WESDAC)

E-TERM
(WESTERM)



E-TERM

Eaton design – not compatible with GE WESDAC



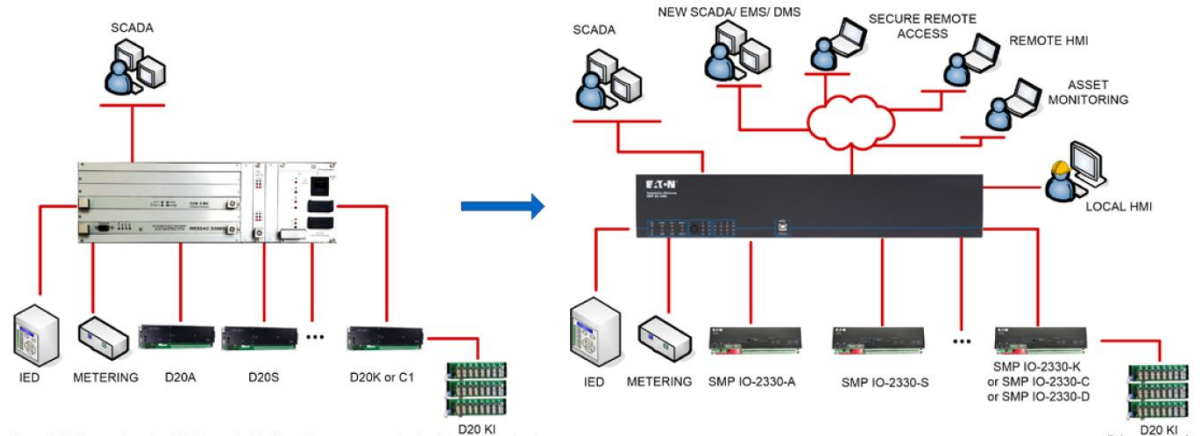
E-DAC

Eaton design – FULLY Compatible with GE WESDAC
Need the specific E-DAC to match E-TERM or WESTERM



Connectivity : **Fiber LC or Copper @ 100 Mbit / RS-485**
Time Synchronisation : **IRIG-B / NTP**
Power : **20-60 VDC External Power Supply**

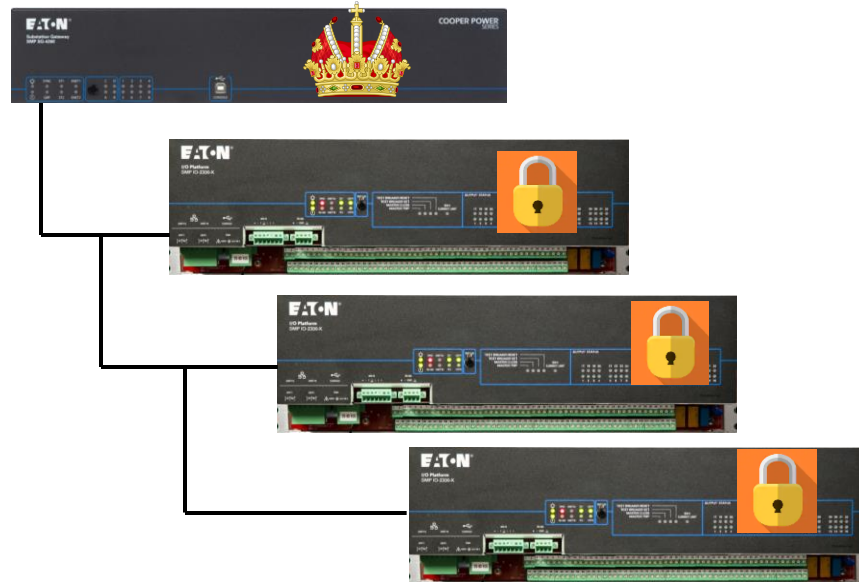
GE to Eaton solution transition



Capabilities gained with Eaton's RTU replacement solution

Software

- Using the SMP Gateway you can control all IO-2330 modules with one configuration file
- Securely communicate with all IO-2330 modules using DNP, 61850 or GOOSE
- Using Linux Operating System
- Firewall , Local Security , Web HMI and more



Full D20 Wall Mount replacement solution with IO-2330-K/A/S/D

Model	GE D20 Type	Available Connectors	Description
IO-2330-K	D20K	Compression TB and DB25	32 DO
IO-2330-S	D20S	Compression TB and DB25	64 DI
IO-2330-A	D20A	Compression TB and DB25	32 AI
IO-2330-C	D20-C/C1	Compression TB and DB25	16 DI / 8 DO / 16 AI



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