1. **Scope**

This specification describes the features and specifications of the SMP DA-3050 automation platform, as part of Eaton’s substation automation solution; it includes four (4) models. The SMP DA-3050 platform is designed to work as a standalone product or with a complementary product like Visual T&D.

1. **Applicable Standards**

The vendor shall have implemented an ISO 9001 certified Quality Management System.

1. **Hardware Features**
   1. **Form factor**
      1. The product shall be available with different installation kits to fit the application. The following installation kits are available: DIN rail-mount, 19’’ rack-mount, wall or panel-mount (smaller footprint).
   2. **Power supply**
      1. The product shall support low voltage (DC) power supply.
   3. **Communication interfaces**
      1. The product shall have at least two independent Ethernet ports for all models.
      2. The product shall have at least one (1) SFP-based connector at 1Gbit/s.
      3. The product shall have option for metallic and optical Ethernet (LC).
      4. The product shall have option for up to two (2) serial ports (RS-232/RS-485).
      5. The product shall have an USB port on the front panel for maintenance purposes.
   4. **Storage**
      1. The product shall have at least 8 GB of non-volatile memory.
   5. **Physical inputs/outputs** (on controller module)
      1. The product shall have at least two (2) built-in Form C output relays (on controller module).
      2. The product shall have one (1) built-in binary input 24 Vdc (on controller module).
      3. The product shall have one (1) built-in analog input that is not software-configurable and can be used in voltage mode only (on controller module).
      4. The product shall have an ordering option with 8 binary inputs and 4 binary outputs (on digital I/O module).
      5. The product shall have an ordering option with 16 binary inputs, 8 binary outputs, 4 analog inputs and 4 analog outputs (on digital and analog I/O modules).
      6. The product shall have an ordering option with 24 binary inputs and 12 binary outputs (on digital I/O module).
   6. **Type tests and certifications**
      1. The product shall be compliant to IEC 61850-3 (minimum) for climatic environmental conditions.
      2. The product shall have an operating temperature of -40 to 75 Celsius (-40 à +167 Fahrenheit).
      3. The product shall be compliant to IEC 61850-3 (minimum) for mechanical environmental conditions.
      4. The product shall be compliant to IEEE Std 1613™-2009 standard class 2 for LC optical port (minimum).
      5. The product shall have a cTUVus certification.
      6. The product shall be RoHS compliant.
      7. The product shall be WEEE compliant.
      8. The product shall have CE marking to meet European market requirements.
2. **Software features**
   1. **Protocols and data concentration**
      1. The product shall support most industry standard protocols for gathering data from IEDs:

* DNP3 (IEEE Std 1815™-2012 standard)
* IEC 61850 GOOSE
* MODBUS
  + 1. The product shall support most industry standard protocols for sending data to control centers or enterprise applications:
* DNP3 (IEEE Std 1815™-2012 standard)
* IEC 60870-5-104
  1. **Security**
     1. The product shall implement cybersecurity regarding access, operation, configuration, firmware revision and data retrieval as defined by IEEE Std 1686™-2007 standard:
* Electronic access control:
  + Major functions have associated access level or permissions.
  + Management of users and groups with associated permissions.
  + System access management includes system lockup upon failed access attempts.
  + Strong passwords enforcement.
* Audit trail:
  + At least 2048 entries for security-specific logs.
  + Other types of log entries shall not interfere with security logs.
* Supervisory monitoring and control:
  + Alarms sent to SCADA when authentication failure are detected.
* Configuration software:
  + Distinct permissions allow to:
    - View device settings
    - Change device settings
    - Manage username/passwords
* Communication port access
  + All communication ports shall be configurable. It shall be possible to disable all communication ports, on a port-by-port basis.
    1. Firmware quality assurance
    2. All product components shall be digitally signed by the manufacturer.
    3. The product shall implement secure communication networks as defined by IEC 62351-3. This shall apply to all remote communications links and including maintenance tools.
    4. The product shall support TLS 1.2 with AES 256 bits encryption.
    5. The product shall support X.509 certificates for authentication and encryption key management for protocols.
    6. System logs shall be retrieved using a standard system such as Syslog.
    7. The product shall have a built-in firewall.
    8. Digital signature shall be validated before using the system.
  1. **Redundancy**
     1. The product shall support IED redundancy. Both devices should be polled and a “best of” algorithm should apply on a point per point basis.
  2. **Configuration tools**
     1. The configuration tool shall allow offline configuration of the product.
     2. The configuration tool shall be template driven.
     3. The configuration tool shall have import/export capabilities in Microsoft ExcelTM compatible format.
     4. The configuration tool shall support copy/paste from/to Microsoft ExcelTM spreadsheet.
     5. The configuration tool shall have import/export capabilities for IEEE Std 1815™-2012 standard (DNP3) client and server protocols (XML format).
     6. The configuration toolset shall support versioning.
     7. The configuration toolset shall be backward compatible – it shall allow the configuration of older firmware versions and conversion to newer versions.
     8. The configuration tool shall include a configuration parameter validation mechanism.
  3. **Visualization, commissioning and debugging tools**
     1. The product shall have an embedded web server to allow for remote data visualization.
     2. The product shall have a commissioning tool that allows the user to force points and issue control commands.
     3. The product software toolset shall include a protocol analyzer to facilitate commissioning activities.
     4. The product software toolset shall include a system log viewer for audit trails.
     5. The product software toolset shall include a system statistic viewer for health monitoring.
     6. The product software toolset shall include an IED communication dashboard and System dashboard to allow the user to easily monitor the substation network status.
  4. **Alarm and event management**
     1. The product shall include an alarm management system with acknowledgement/clear mechanism.
     2. The alarm management system shall be accessible remotely (via web browser).
     3. Any point (digital or analog) of the system shall be configurable as an alarm.
     4. The alarm management system shall keep the alarm history in non-volatile memory.
     5. The alarm management system shall allow the user to block/unblock alarms during normal operation.
     6. The product shall include a Sequence of Event (SOE) system that allows recording any transitions into non-volatile memory.
  5. **Logic capabilities**
     1. The product shall include an embedded logic module allowing to create logical points and to perform the following operations:
        + - Analog control from analog input value
          - Binary control from binary input state
          - Best of function (on analog and binary inputs)
          - Binary debouncing
          - Force point value from control operation (on analog and binary inputs)
          - Grouped control
          - Inhibition management from control operation
          - Input latch and reset
          - Logical (AND, OR, NOT, etc.)
          - Arithmetic (add, subtract, multiply, etc.)
          - Relational (less than, greater than, etc.)
          - Conditions (if Then Else, etc.)
          - Math (Abs, Exp, Log, Sin, Cos, Min, Max, etc.)
          - Statistics (average)
     2. The trigger for the evaluation of each equation shall be user configurable:
        + - On a periodic basis
          - By exception on any value change
          - By exception on a selectable value change
  6. **Time synchronization**
     1. The product shall have an RTC (real time clock) that maintains a good accuracy in free-running mode (when disconnected from the time source) or when the unit is powered off.
     2. The product’s RTC shall be synchronize using one or many of the following sources:
        + - SNTP
* SCADA protocols that support “set time” command, such as DNP3 and IEC 60870-5-104
  + - * + Manual operation
    1. The product shall be able to synchronize IEDs using one or many of the following method:
       - * Protocols that support “set time” command, such as DNP3.
    2. When multiple time sources are available, the product shall automatically select the best time source available based on time quality of each source.
    3. The product shall support multiple time zones across client and server protocol instances.
    4. All time events (updates, source change, etc.) shall be logged.
  1. **Robustness**
     1. The product shall pass the NESSUS vulnerability scan and results shall be available.
  2. **Certifications and compliance**

1. **Licensing and upgrades**
   1. The licensing model shall be flexible and scalable.
   2. The product shall be remotely upgradable.
   3. Product upgrades shall be made available free of charge.
   4. New software options/modules shall also be made available for installed products, when feasible. Additional fees may apply.
2. **Operating system**
   1. The product shall be based on an embedded operating system.