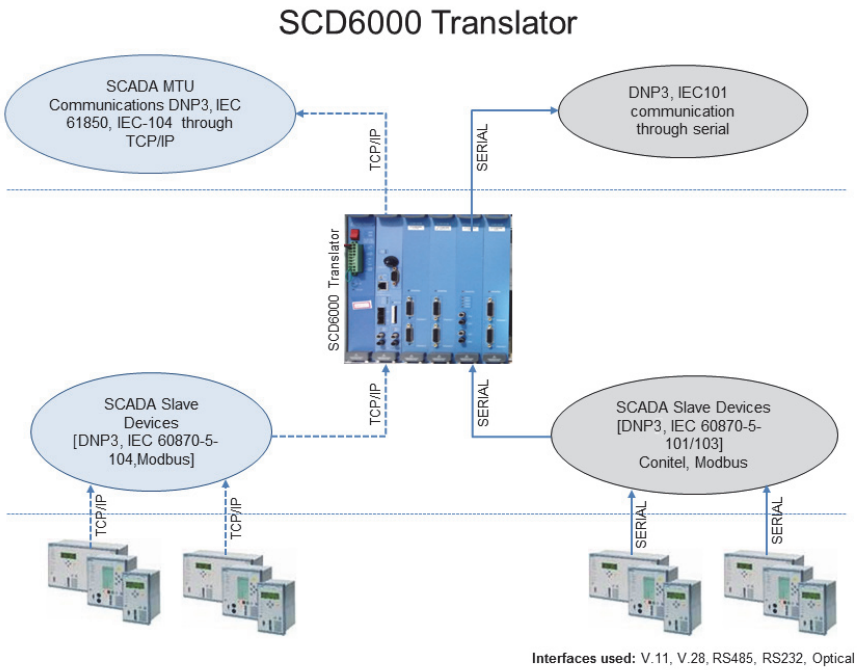
Foxboro Process Automation System

Product Specifications

Foxboro by Schneider Electric

PSS 31S-2M16

Foxboro SCD6000 Translator



OVERVIEW

The SCD6000 is an embedded computing and networking platform that serves as a distributed Station Computing Device (SCD).

The Foxboro SCD6000 Translator is a configuration of the SCD6000 product. It enables the translation of multiple low level communications protocols and physical media types to one or more high level protocols, for example, to an IEC61850 Edition 1 object schema for integration with IEC61850 control schemes.

Any SCD6000 node can be an IEC 61850 Client or an IEC 61850 Server, or both simultaneously.

The SCD6000 supports both half and full duplex Ethernet communications.

DualSFP ports support either 100Base-FX or 10/100Base-T and provide a cost-effective and versatile optical and wired Ethernet interface.

Each SCD6000 rack mounted card file can support Power, CPU, and Communications. The SCD6000 is an embedded computing and networking platform, which serves as a distributed Station Computing Device (SCD).

The SCD6000 translator module inherits the functionality of the compact Foxboro SCD5200 module and provides more dynamic RAM for a higher concentration of IEC 61850 IEDs. The SCD6000 Main Processor module can be used as plug-in replacement for existing SCD5200 installed base.

DNP3 SAv2 and SAv5 protocol were added to the SCD6000 translator with firmware version D or later. This feature needs a change in firmware of the DCB modules and this feature cannot be retrofitted to the SCD6000 without the replacement of the associated DCB modules. For more information, see the “Dual Communication Board (DCB)” on page 4.

The SCD6000 can be password protected on any TCP/IP or serial port to restrict end user access. Passwords can be assigned for individual users and common roles such as Maintainer, Browser, and Superuser.

The SCD6000 translator has the ability to update online parameters for communication protocols, which avoids restart of the RTU if certain parameters such as trusted hosts, delays and timeouts are changed.

Control Points store the last 5 control events with Request time, Operate Time, Value, and CE Flag.

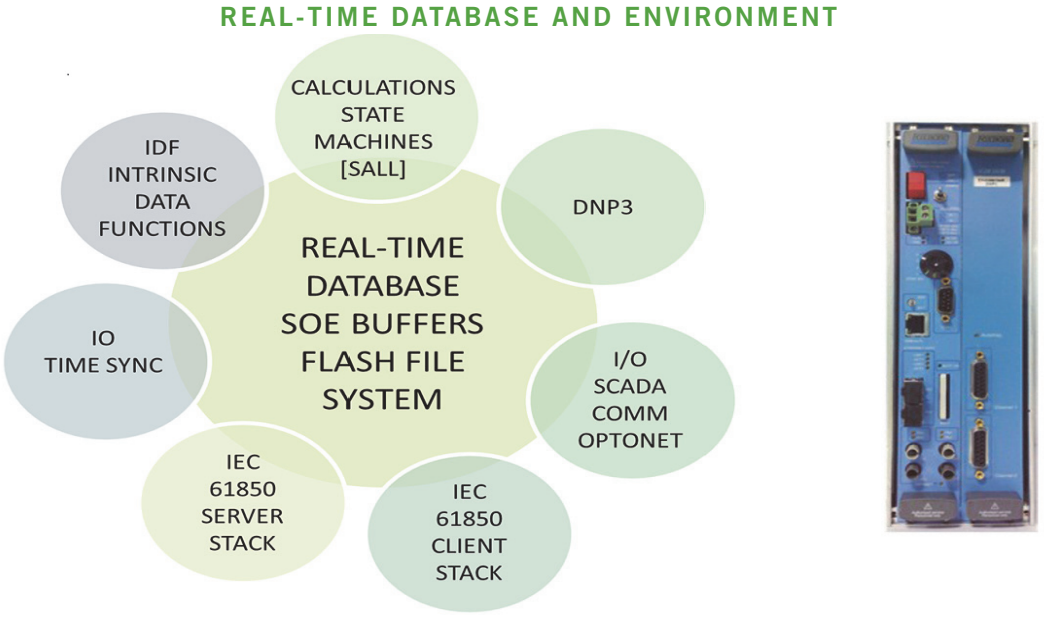


Figure 1. Real-Time Database and Environment

Figure 1 shows the SCD6000 translator environment, which consists of a central real-time database that is kept up-to-date by a variety of independent processes. These processes are supported by the embedded operating system executive.

- Intrinsic Data Functions (IDF) – Event driven preconfigured functionality is fast and often used for implicit conversions of IO information.
- Calculations – Up to 3 calculation tasks can be programmed. Each task is written as a State Machine or a Procedural Logic using the dedicated State And Logic Language [SALL].
- IEC 61850 Client – A separate stack process is maintained to allow the IEC 61850 Client services to operate.
- IEC 61850 Server Stack – A separate stack process is maintained to allow the IEC 61850 Server services to operate.

- IO Time Sync – A real time clock is used to synchronize the IO time syncing using electrobus interface.

The real-time database accepts incoming data and records changes in any of the change-driven protocol stacks with a time-based comparison. The real-time database is supported by a flash-based file system.

A whole set of diagnostic interfaces is provided to allow both remote and local diagnostic tools to establish a connection with the unit at any time. The on-board flash file workspace allows multiple files to be downloaded and used as current, past, or future running configurations. The diagnostic interface allows the SCD6000 to be reset remotely and re-started with a new or test configuration.

FILE FORMATS

Multi-Slot Cardfile Formats

The SCD6000 is provided with a passive parallel backplane that makes it possible to provide many formats with a varying number of DCB slots.

Higher communications densities can be accommodated using the 5-slot cardfile. In this case, a COPE [variant of the CPU module] supplies backplane power that avoids the need for a separate wide range power supply. This 5-slot file can be located in smaller spaces where a 19 inch rack solution might not be feasible.

FILE POWER SUPPLY

In smaller file formats (up to 5 communication modules), the COPE's integral 40 W wide input voltage supply powers the system.

Optional Power Supply (SY-0399131/SY-0399131R)

If the communication modules are more than 5 in number, a standalone power supply is necessary to power them. These power supplies operate from 19.2 to 148 VDC.

CPU OPTONET AND ETHERNET MAIN PROCESSOR MODULE

The SCD6000 module provides access to its battery from the front panel. Therefore, the battery can be replaced without removing the SCD6000 module from the cabinet. The LED indicator on the front panel provides the status of the battery.

The SCD6000 COPE board has an industrial processor with an Electrobus interface and includes:

- 1 serial port (configurable RS232/RS485)
- 256 KB of non-volatile static RAM
- 256 MB DDR3 SDRAM
- 64 MB flash
- Dual 100Mbps fixed SFP ports to support either 100Base-FX or 10/100Base
- On-board real-time clock
- 40 W regulated wide input VDC power supply
- Single OptoNet node (2 optical ports)

The SCD6000 CPU module supports:

- Rotary Switch hardware available on the front panel labelled as Zone Sel has four selectable zone positions.The four zone positions are available to the RTU interfaces like SALL, IDF and other protocols linked to the zone positions.
- Dedicated RJ45 Ethernet diagnostic port for the Foxboro Remote Terminal Viewer (RTV)
- COM2 port RS-232/RS-485 supported protocols
    - DNP3 Master (SAv2 and SAv5)
    - DNP3 Slave (SAv2 and SAv5)

- DNP3 Slave Dialup (SAv2 and SAv5)
- Modbus Master
- Modbus Slave
- IEC 60870-5-101 Master
- User Configurable Serial Interface

- Ethernet supported protocols and features:
  - DNP3 Master on TCP/IP (SAv2 and SAv5)
  - DNP3 Slave on TCP/IP (SAv2 and SAv5)
  - DNP3 Master on UDP (SAv2 and SAv5)
  - DNP3 Slave on UDP (SAv2 and SAv5)
  - IEC 60870-5-104 Slave
  - DNV GL certified IEC 61850 Edition 1 Server and Client
  - iEC 60870-5-101 Master
  - DNV GL certified IEC 61850 GOOSE Publisher and Subscriber
  - Modbus/TCP Master
  - Diagnostic Utility over TCP/IP

Dual Communication Board (DCB)

DCB provides communication interface between SCD6000 and Master station. For the technical specifications of the SCD6000 Dual Communication Modules, see the latest revision of PSS 31H-8K4. For the technical specifications of the SCD6000 RoHS Dual Communication Modules, see the latest revision of PSS 31H-8K4R.

State and Logic Language (SALL)

SALL provides the means to implement individual control and data processing logic for execution on the SCD6000.

Intrinsic Database Functions (IDF)

IDF uses the predefined functions for control and data processing logic for execution on the SCD6000.

Foxboro Remote Terminal Viewer (RTV)

- Password-based authentication for diagnostic utility RTV to avert unauthorized access to the RTU.
- Three-level access privilege for RTV with a log of access and diagnostic activities.

CPU

Part Number	Description
SY-60399001R	SCD6000 CPU OptoNet Power Supply Ethernet (COPE) Module (RoHS)
SY-60399002R	SCD6000 CPU OptoNet Ethernet (COE) Module (RoHS)

POWER SUPPLY

Part Number	Description
SY-0399131	Wide Input Range Power Supply Module (for 2003098)
SY-0399131R	Wide Input Range Power Supply Module (for 2003098) (RoHS)

I/O FILES

Part Number	Description
SY-2003092	2x5 I/O slot file (RoHS)
SY-2003098	Ten I/O slot card file (RoHS)
SY-2003100	Five I/O slot card file (RoHS)
SY-2003102	Three I/O slot card file (RoHS)
SY-2003104	One I/O slot card file (RoHS)
SY-2003107	3x3 I/O slot file (RoHS)

ASSOCIATED PRODUCT SPECIFICATION SHEETS

Part Number	Description
PSS 31H-8K2	SCD6000 CPU OptoNet Power Supply Ethernet (COPE) Module / SCD6000 CPU OptoNet Ethernet (COE) Module
PSS 31H-8K3	SCD6000 Wide Range Input Power Supply Module
PSS 31H-8K3R	SCD6000 Wide Range Input Power Supply Module (RoHS)
PSS 31H-8K4	SCD6000 Dual Communications Modules
PSS 31H-8K4R	SCD6000 Dual Communications Modules (RoHS)
PSS 31H-8K5	SCD6000 8 Channel Serial Module
PSS 31H-8K5R	SCD6000 8 Channel Serial Module (RoHS)
PSS 31S-2M12	RTU Connect Secure
PSS 31S-2M15	SCD6000 State And Logic Language (SALL)

COMMUNICATIONS BOARDS

Part Number	Description
SY-0399132	8 CH Serial Module RS-485/RS-232
SY-0399132R	8 CH Serial Module RS-485/RS-232 (RoHS)

DUAL COMMUNICATIONS MODULES

Part Number	Description
SY-0399122[a]	DCB DNP Glass Optical supporting DNP3 Master/Slave
SY-0399122R[a]	DCB DNP Glass Optical supporting DNP3 Master/Slave (RoHS)
SY-0399127	DCB IEC 60870-5-103 Glass Optical supporting IEC 60870-5-103 Master
SY-0399127R	DCB IEC 60870-5-103 Glass Optical supporting IEC 60870-5-103 Master (RoHS)
SY-0399163[a]	DCB DNP V.11 supporting DNP3 Master/Slave
SY-0399163R[a]	DCB DNP V.11 supporting DNP3 Master/Slave (RoHS)
SY-0399192	Communications Module V.28 Conitel C2020/C2025 Master/Slave
SY-0399192R	Communications Module V.28 Conitel C2020/C2025 Master/Slave (RoHS)
SY-0399194[a]	Communications Module V.28 DNP3 Master/Slave
SY-0399194R[a]	Communications Module V.28 DNP3 Master/Slave (RoHS)
SY-0399196	Communications Module V.28 IEC 60870-5-101 Slave
SY-0399196R	Communications Module V.28 IEC 60870-5-101 Slave (RoHS)
SY-0399224[a]	Communications Module V.11 DNP3 Master/Slave (Ignore DCD)
SY-0399224R[a]	Communications Module V.11 DNP3 Master/Slave (Ignore DCD) (RoHS)
SY-0399225R[b]	SCD6000 Communications Module V.11 DNP3 Master/Slave Type 2 (RoHS)
SY-0399226R[b]	SCD6000 Communications Module V.28 DNP3 Master/Slave Type 2 (RoHS)
SY-0399227R[b]	SCD6000 Communications Module Glass Optical DNP3 Master/Slave Type 2 (RoHS)
SY-60399004R	Electrobus Upper I/O Expansion Module
SY-60399005R	Electrobus Lower I/O Expansion Module

(a) These modules support SCD6000 firmware version SY-1101207-A up to SY-1101207-C
(b) These modules support SCD6000 firmware version SY-1101207-D or later

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