

COOPER Power Systems

Cybectec SMP Products

Turn Substation Data into Valuable Enterprise Information



SUBSTATION SOLUTIONS

 **cybectec**

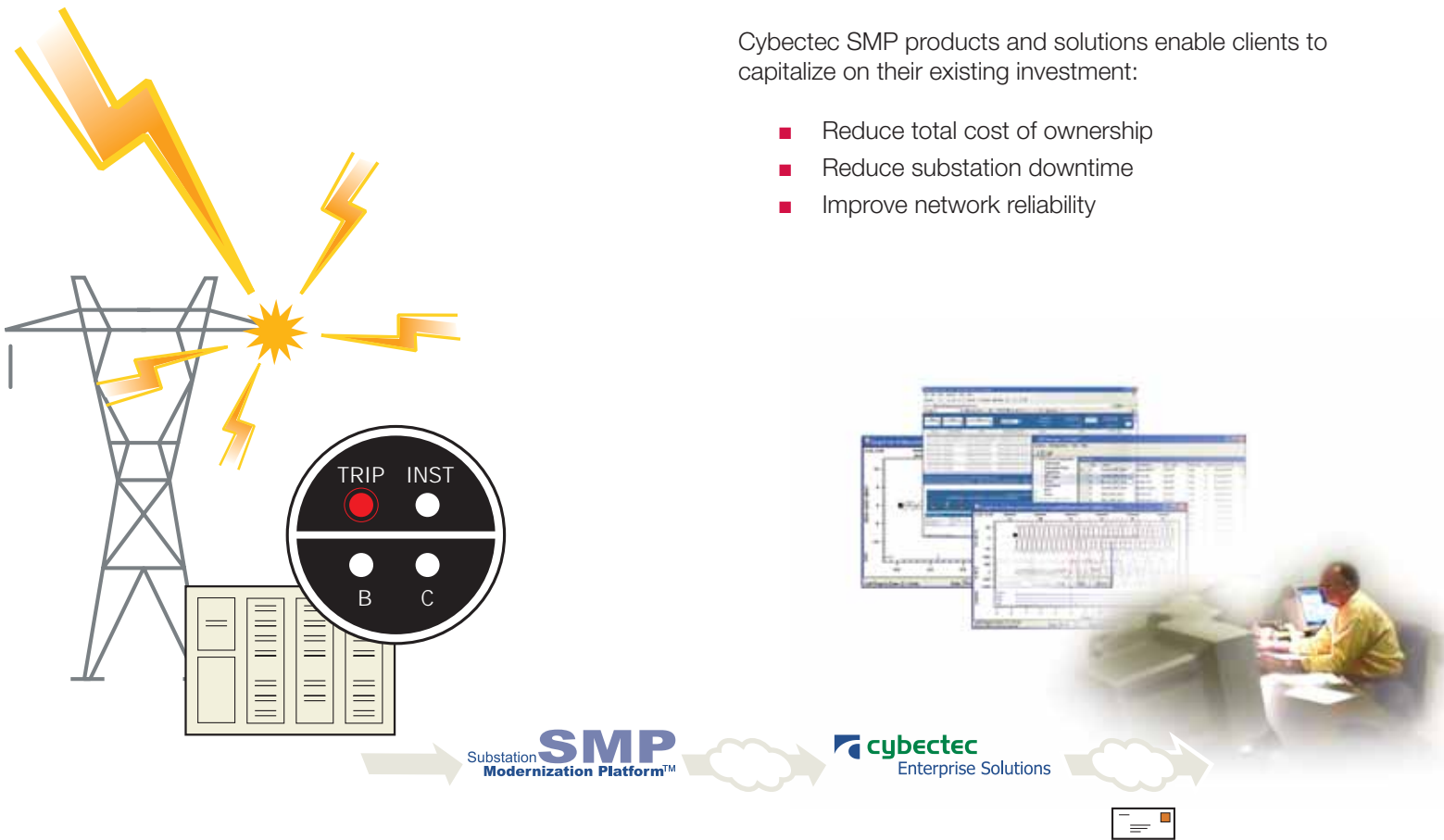
THE SMARTER GATEWAY

Cybetec SMP products are designed to simplify substation integration and automation while giving clients vendor independence:

- Communication gateway
- Protocol translation
- Data concentration
- System-wide device automation and integration
- Remote control and passthrough
- Substation-hardened computing

Cybetec SMP products and solutions enable clients to capitalize on their existing investment:

- Reduce total cost of ownership
- Reduce substation downtime
- Improve network reliability





Upgrade Your Substation and Keep Your Legacy Devices

- Automates data processing and device control.
- Permits secure passthrough to any device.
- Extracts and concentrates data for SCADA, planning, maintenance, engineering, and fault analysis.
- Universal ports permit connecting **any serial device to any serial port**.
- Can be installed in cascading configuration to multiply the number of connected devices.
- **Extends the capabilities of legacy devices** with high-level functions such as grouped controls.

Add Intelligence to Substation Equipment

- Automatic load shedding
- Feeder management
- Automatic breaker control

NERC CIP Compliant

- Provides a single point of access to substation data.
- Protects data flows with the built-in firewall and VPN server.
- Creates a NERC-compliant electronic perimeter.

Take Control of Your Automation Project

Cybetec's SMP streamlines your automation project by giving you complete control.

- Processes data locally.
- Seamlessly integrates legacy and new SCADAs, PLCs, RTUs, IEDs, **regardless of protocol**.
- Reduces overall network bandwidth.
- Gives local and remote clients access to all substation data **regardless of the application used**.
- Simplifies native format data access.
- Supports local or remote HMIs.
- Open and flexible architecture.

A System to Depend on

- Extensive redundancy options.
- Meets all IEEE and IEC requirements for substation-grade equipment.
- Rugged, reliable and tailored to users' needs.
- Thousands of installed systems worldwide.
- User-friendly configuration tools for simple substation upgrades.

The Result?

- Modern communications architecture
- Improved performance
- True device integration
- Proven robustness
- Increased flexibility

SMP GATEWAY

PRODUCT LINE

SMP 4 Entry-Level

Typically installed directly in relay protection enclosures, the SMP 4 Gateway is perfect for space-sensitive applications, where every inch counts!

- Compact enclosure
- Data concentration and protocol translation
- Extended operating temperature range
- Cost-effective
- Optional internal modem

SMP 16/CP Standard

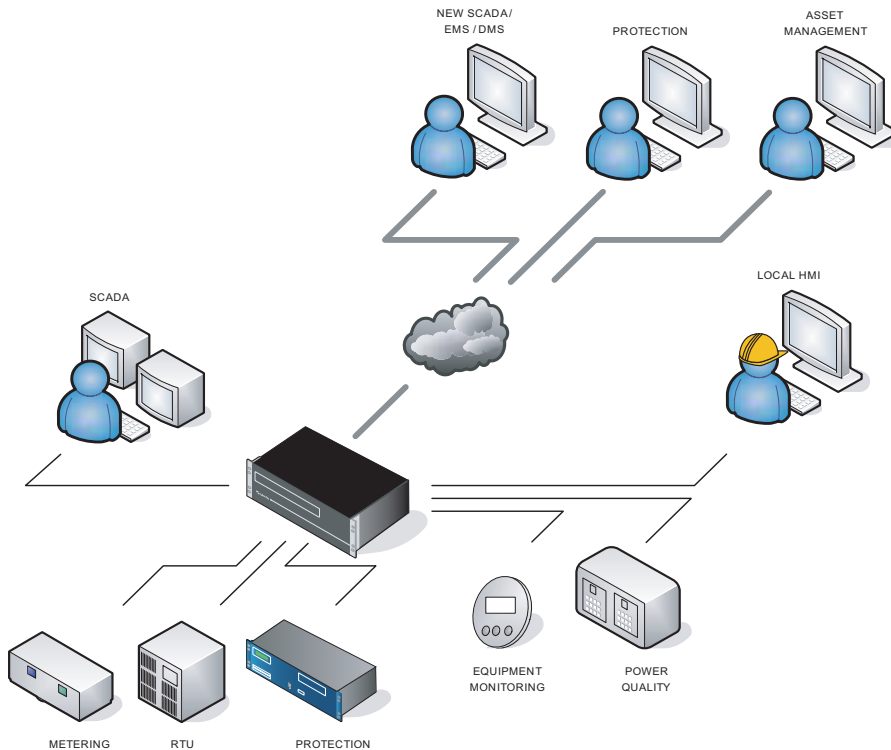
The SMP 16/CP Gateway is the ideal first step in a substation automation project. As our entry-level solution, it supports redundancy, features advanced automation functions and delivers strong security features—all in the same box.

- Up to 128 devices, 64 control centers and 10,000 data points per system
- Optional GPS clock
- Optional annunciator/HMI

SMP 16/SG Maximum Expandability

The most advanced and flexible solution in the SMP Gateway family, the SMP 16/SG includes all of the SMP 16/CP's features, with added expandability—still all in the same box.

- Up to 128 devices, 64 control centers and 10,000 data points per system
- Up to 48 serial ports, via expansion cards
- Optional 16-port Ethernet switch card
- Optional GPS clock
- Optional annunciator



OPTIONS

Processors



The SMP 16/CP and SMP 16/SG can be ordered with the optional 1.4 GHz Pentium processor, increasing the SMP's processing capability **tenfold**. The faster processor option is ideal for high-capacity applications, where a high number of devices are connected or many automation scripts are used.

GPS Clock



The SMP Gateway GPS clock installs directly on Cybectec's SMP 16/CP and SMP 16/SG gateway models to provide a highly accurate internal time source. This factory-installed option provides a cost-effective solution to maintain substation devices in accurate synchronization, as recommended by NERC.

- Synchronizes the internal SMP 16 Gateway clock.
- Distributes IRIG-B to all connected devices.
- Alerts SCADA via a binary data point in case of signal loss.
- Maintains accurate time, even with GPS signal loss.
- Reduces total system complexity –no box to install in the rack.

Automation Functions

All Cybectec SMP Gateway models come with a built-in logic processor. The optional Soft PLC is also available for advanced automation.

- Introduces sophisticated control functions.
- Creates new logical data points from computations.
- Processes data in real-time.

The built-in Logic Processor lets you create logical data points from mathematical expressions. It can be used for simple tasks such as combining alarms signals, or more complex tasks such as calculating phase imbalance from existing voltage and current data points.

The Soft PLC module permits creating sophisticated automation scripts, such as circuit breaker control and load balancing. It is used with the CoDeSys development platform, which supports the IEC 61131 programming languages:

- Instruction List (IL)
- Structured Text (ST)
- Function Block Diagram (FBD)
- Continuous Function Chart (CFC)
- Ladder Diagram (LD)
- Sequential Function Chart (SFC)

Annunciator/HMI

This software option provides immediate access to all substation data. Simply connect a standard touch screen display to the built-in video connector.

No Additional Hardware is Required

- No need for laptop or substation computer

Immediate Access to Substation Real-Time Data and Alarms

- Visual and audio alarms
- Real-time data point values and statuses
- Real-time statistics
- Alarm and event history

User-Configurable Alarms

- Alarms can be set on binary state changes or analog levels.
- Alarms can be blocked/unblocked.
- Configurable alarm acknowledgement sequence.

User-Friendly Interface

- **No configuration:** all data points are automatically extracted from the SMP Gateway.
- Custom Readings Pages are easily configured with SMP Gateway configuration tool.

SMP 16/SG OPTIONS

Ethernet Switch Card

Cybetec's built-in substation-grade Ethernet switch installs directly in the SMP 16 to provide high-speed, error-free connection to Ethernet-ready devices.

- Meets the most exacting IEEE and IEC substation environmental requirements.
- Complies with IEEE 802.3 and IEEE 802.3u Ethernet standards.
- 16 10/100BASE-TX twisted pair Ethernet, RJ45 connectors.
- High-performance non-blocking architecture.
- Automatic speed detection.
- Automatic full or half-duplex negotiation.
- Automatic support for MDI/DIX crossover.
- No box to install in the rack.

16-Port Serial Card

- Up to 2 expansion cards can be installed in the SMP 16/SG for up to 48 serial devices.
- Each serial expansion card adds 16 universal serial ports, which support RS-232/422/485.
- Serial port extension cards have the same characteristics as the standard serial ports.



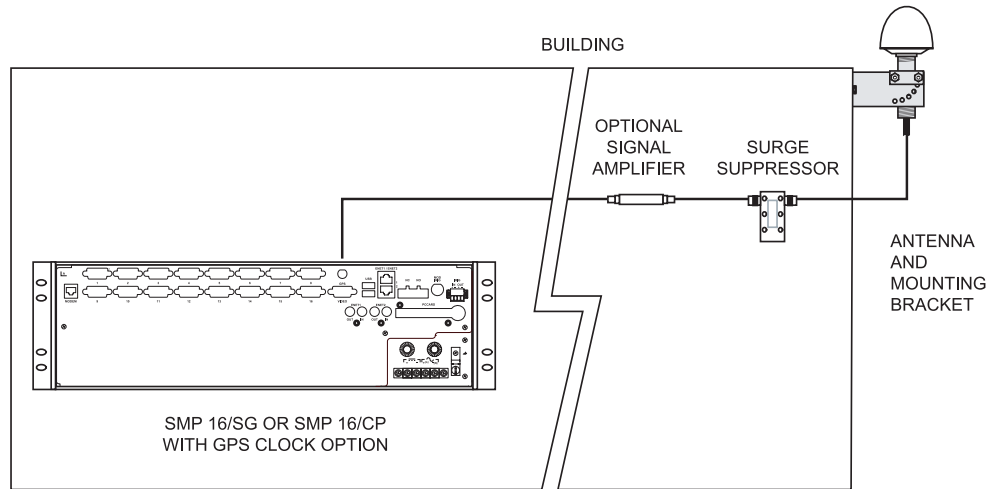
TECHNICAL SPECIFICATIONS - SMP GATEWAYS

	SMP 4	SMP 16/CP	SMP 16/SG
Ideal for:	Space-sensitive applications: relay enclosures, pole-top installations	First step in your substation automation project	Advanced, high-capacity, expandable automation projects
General Features			
Data concentration	√	√	√
Protocol translation	√	√	√
NERC CIP-compliant security	√	√	√
Built-in Web server	√	√	√
Automation functions	√	√	√
Built-in optional annunciator	-	√	√
Passthrough connections	√	√	√
Hardware redundancy	-	√	√
Flexible licensing	√	√	√
Dialup connections	√	√	√
IEC-61131 compatible Soft-PLC	√	√	√
Windows-based configuration and maintenance tools	√	√	√
Built-in self-diagnostics	√	√	√
Windows CE operating system	√	√	√
Real-time clock with battery backup	√	√	√
Built-in watchdog timer, power supply monitoring	√	√	√
Processor			
Standard	266 MHz AMD Geode™ SC 2200	266 MHz AMD Geode™ SC 2200	
Optional	-	1.4 GHz Pentium™ M	
Security Features			
Built-in firewall and VPN	√	√	√
Modem connection management	√	√	√
Passthrough management	√	√	√
Account management: Strong passwords User accounts User groups Detailed group permissions	√	√	√
Access management	√	√	√
Access attempts logs	√	√	√
Account lock upon failed access attempts	√	√	√
Retrievable access logs for auditing	√	√	√
All system components signed	√	√	√
Continuous file monitoring for system integrity	√	√	√
Communications			
Ethernet	1 10/100BASE-TX	2 10/100BASE-TX, 100BASE-FX optional	
Serial ports	1 RS-232/422/485 3 RS-232 1 RS-232 console	16 RS-232/422/485 1 RS-232 console	Up to 48 RS-232/422/485 1 RS-232 console
Modem	Optional built-in 33.6 Kbps V.34 modem (replaces 1 RS-232 serial port)	Standard built-in 56 Kbps V.90 modem	
I/O	-	1 NC system health contact 1 NO software-controlled relay contact	

TECHNICAL SPECIFICATIONS - GPS CLOCK OPTION

The GPS clock is a factory-installed option available on the SMP 16/CP and SMP 16/SG Gateways, and the SMP 16/SP Substation Processor.

General Features
Synchronizes internal SMP clock
Distributes IRIG-B to connected devices
Logical data point signals SCADA in case of signal loss
Maintains accurate time, even with GPS signal loss
Input
Female TNC RF connector for GPS antenna
Output
Modulated IRIG-B Through BNC connector
Demodulated IRIG-B Through terminal block
Short-circuit protected On 16, 32 or 48 serial ports 0.4 A at 4 VDC 0.4 A at 8 VDC
Accuracy
Demodulated IRIG-B ± 400 ns, worst case
Modulated IRIG-B ± 200 μ s, worst case
Free-Running Accuracy
Demodulated IRIG-B ± 0.4 ms/hour
Output Format IRIG-BXX0 IEEE 1344 IRIG-BXX2 (without year) IRIG-BXX6 (with year)
Electrical
Powered by SMP Gateway
Mechanical
Requires 1 SMP 16/SG, SMP 16/CP or SMP16/SP



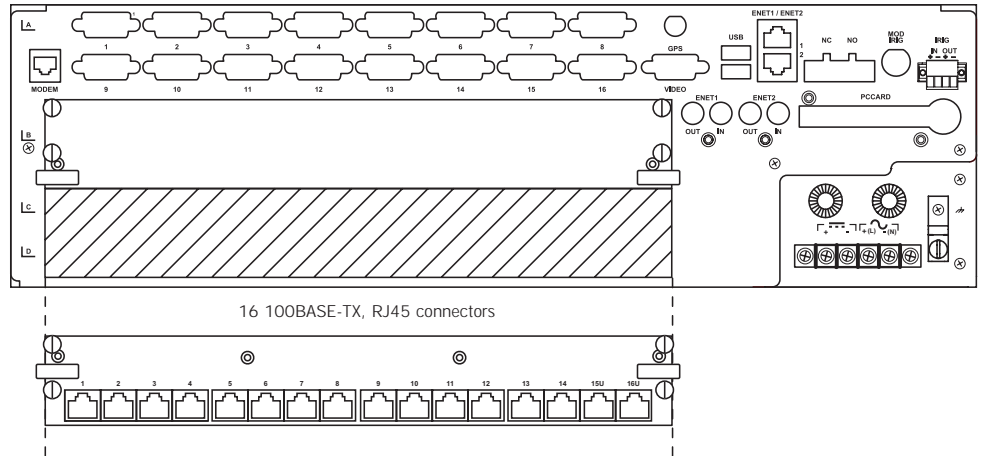
Typical GPS clock installation.

For a complete list of specifications, refer to the SMP 16/CP or SMP 16/SG specifications.

TECHNICAL SPECIFICATIONS - ETHERNET SWITCH OPTION

The Ethernet Switch is a factory-installed option available on the SMP 16/SG.

General Features
8K MAC addresses with automatic learning and aging
Front-panel LED display of activity and speed
16 10/100BASE-TX twisted pair Ethernet, RJ45 connectors
Ethernet Ports
High performance ethernet switching
IEEE 802.3 10BASE-T Ethernet
IEEE 802.3u 100BASE-TX Fast Ethernet
IEEE 802.3x flow control
IEEE 802.3u auto-negotiation
Mechanical
Requires 1 SMP 16/SG expansion slot



TECHNICAL SPECIFICATIONS - ANNUNCIATOR/HMI OPTION

The SMP Gateway Annunciator is a software option available on the SMP 16/CP and SMP 16/SG.

Hardware Requirements
SMP 16/CP or SMP 16/SG
ELO-touch driver-compatible touch screen, USB or serial
Software Requirements
SMP firmware version 4.0 and up
SMP software version 4.0 and up
Configuration
In SMP Config application
Capacity
Up to 5000 alarms
Up to 1000 history events kept in log
Up to 16 user-defined Readings Pages

Alarm count: 7 Blocked: 3

Date	Time	T	Description
2006-12-19	16:12:04.289	A	RTU_020_B05_VB Phase B voltage
2006-12-19	16:12:09.964	A	RTU_020_B05_VB Phase A voltage
2006-12-19	16:12:09.883	A	RTU_020_B05_VB Phase B voltage
2006-12-19	16:12:09.883	A	RTU_020_B05_VB Phase A voltage
2006-12-19	16:12:09.883	A	RTU_020_B05_VC Phase C voltage
2006-12-19	16:12:07.781	A	RTU_020_B05_VB Phase B voltage
2006-12-19	16:12:04.209	A	RTU_020_B05_VB Phase B voltage
2006-12-19	16:12:14.881	A	RTU_020_B05_VB Phase B voltage
2006-12-19	16:12:08.140	A	RTU_020_B05_VB Phase A voltage
2006-12-19	16:12:08.016	A	RTU_020_B05_VC Phase C voltage
2006-12-19	16:12:08.849	A	RTU_020_B05_VB Phase A voltage
2006-12-19	16:12:08.794	D	Sound released
2006-12-19	16:12:04.781	A	RTU_020_B05_VB Phase B voltage
2006-12-19	16:12:04.689	A	RTU_020_L1_ALARM Type 1 alarm active
2006-12-19	16:12:09.609	A	RTU_020_F4_ALARM Type 2 alarm active
2006-12-19	16:12:04.780	A	RTU_020_F4_ALARM Type 1 alarm active
2006-12-19	16:12:00.210	A	RTU_020_L1_ALARM Type 2 alarm active
2006-12-19	16:12:00.806	A	RTU_020_B05_VB Phase B voltage
2006-12-19	16:12:07.889	A	RTU_020_B05_VB Phase B voltage
2006-12-19	16:12:07.889	A	RTU_020_B05_VC Phase C voltage
2006-12-19	16:12:08.121	A	Alarm blocked: RTU_020_B05_VB Phase B voltage

Alarm count: 0 Blocked: 0

Name	Floating Point Value	Integer Value	Low Threshold	High Threshold	Deadband
RTU_020_B05_VB	25.76	2576			
RTU_020_B05_VC	25.62	2562			
RTU_020_F1_IA	209.40	2094			
RTU_020_F1_IB	211.80	2118			
RTU_020_F1_IC	210.60	2106			
RTU_020_F1_PFP	15.90	1590			
RTU_020_F1_PA	5.25	525			
RTU_020_F1_PB	5.33	533			
RTU_020_F1_PC	5.25	525			
RTU_020_F1_Q3P	0.32	319			
RTU_020_F1_QA	0.11	106			
RTU_020_F1_QB	0.11	107			
RTU_020_F1_QC	0.11	106			
RTU_020_F2_IA	251.90	2519			
RTU_020_F2_IB	255.40	2554			
RTU_020_F2_IC	249.00	2490			
RTU_020_F2_PFP	19.21	1920			
RTU_020_F2_PA	6.35	635			
RTU_020_F2_PB	6.47	646			
RTU_020_F2_PC	6.38	637			
RTU_020_F2_Q3P	0.35	386			
RTU_020_F2_QA	0.13	126			
RTU_020_F2_QB	0.13	127			
RTU_020_F2_QC					
RTU_020_F3_IA					
RTU_020_F3_IB					
RTU_020_F3_IC					

Substation Overview

Legend: Open (Red), Close (Green), Alarm (Orange)

Reading Pages: 1/1

Buttons: Alarm, Readings, Blocked, History, System State

Footer: 2007-05-02 15:52:04 MS

SMP SUBSTATION PROCESSOR

SUBSTATION-GRADE COMPUTING

SMP 16/SP

Add Computing Power to the Substation

Add local control and real-time status display to your substation equipment with Visual Substation running on the SMP 16/SP Substation Processor. With Visual Substation, Cooper Power's powerful HMI, local users get a comprehensive overview of equipment status, in a tough, substation-hardened computer:

- No fans
- No moving parts
- Substation-grade
- Runs Windows XP applications

The SMP 16/SP is available with Visual Substation preinstalled and can be used to implement custom substation applications.

Built to Meet the Highest Rugged Standards

16 universal serial ports and 2 Ethernet ports connect to local equipment or LAN/WAN

- Meets all the IEEE and IEC requirements for vibration, electrical surges, fast transients, and extreme temperature ranges.
- Supports both twisted pair and optical Ethernet connections.
- Uses industry-standard ST fiber optic connectors.
- No hard drive required, all data is stored in sturdy Flash memory.

Flexible Configuration

- 8 GB Flash memory, or
- 4 GB Flash memory and 30 GB industrial-grade hard disk

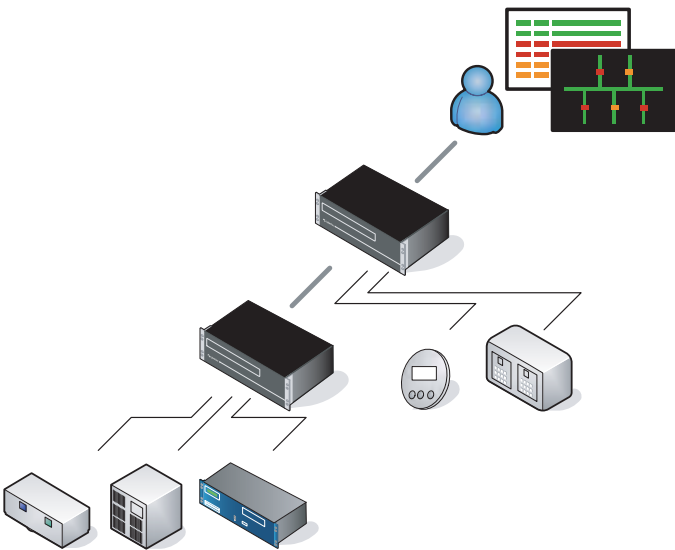
Hardware Options

- Built-in GPS clock
- Optical Ethernet ports

Visual Substation Bundle

Visual Substation gives instant access to all data points, in real time, without having to connect to them individually.

- Statistics
- Real-time data trending
- Single-line diagrams with control capabilities
- Sophisticated alarm features
- Email and pager alarm notification



TECHNICAL SPECIFICATIONS - SMP 16/SP

General Components
1.4 Ghz Pentium-M processor
512 MB RAM
8 GB Flash, industrial grade, or 4 GB Flash, industrial grade and 30 GB hard disk, industrial grade
512 KB NVRAM
4 USB 2.0 ports
Cable retainers on USB ports
Built-in watchdog timer
Hardware diagnostics
Optional Hardware
RAM upgrade to 1 GB
30 GB hard-disk industrial grade for non-critical data logging
Supplemental 4 GB memory on CardBus
Dual-screen compatible video card
Audio output capability
Visual Substation
Take advantage of supplemental Visual Substation capabilities when installed on the SMP 16/SP No hardware protection key Power status monitoring and alarming Temperature monitoring and alarming

Standards Compliance
Protective Relay Standards IEEE C37.90 IEC 60255
EMI Immunity Type Tests & Specifications IEC-61850-3 IEEE-1613
Telephone Terminal Equipment TIA-968-A CS-03
CE Marking for Low Voltage Electrical Equipment
Unit test list available upon request
Environmental
Temperature
Operating: -40°C to +65°C -40°F to +149°F
Storage: -40°C to +85°C -40°F to +185°F
Hard-disk industrial grade: -30°C to +65°C -22°F to +149°F
Humidity: 5 to 95%, non-condensing
Mechanical
3U
5.22 in. H x 19 in. W x 11.02 in. L
132.6 mm H x 482.6 mm W x 280 mm L
9 kg / 20 lbs.

Time Synchronization
Optional built-in GPS clock
IRIG-B time-code synchronization for connected devices
Communications
Serial
16 universal (RS-232/422/485) with IRIG-B distribution
Modem
Built-In 56 Kbps V.90 modem
Ethernet
2 10/100BASE-TX or
2 100BASE-FX optional Multimode Fiber ST Connector 1300 nm Up to 2 km
I/O
1 NC system health contact
1 NO software-controlled relay contact
Electrical
Power supply options 21-29 VDC 42-56 VDC 85-264 VAC / 105-370 VDC Terminal block connector
50 W consumption
Life-time built-in battery
Warranty
5-year limited

Harness the True Value of Your Data

The Cybectec SMP family of products was designed especially to provide utilities with the information they need to improve the efficiency of their operations. Cybectec SMPs provide the innovative and reliable solutions for substation modernization, integration, and automation projects.

The team behind Cybectec SMP products has longstanding expertise in custom and consulting services, and an outstanding reputation for customer support, making Cooper Power's Energy Automation Solutions a leader in the field of enterprise automation solutions for the power industry.

For more information about Cybectec products and how the SMP product line can benefit substation integration, security and communications, contact sales@cybectec.com and request a demonstration with a representative and an application specialist.

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