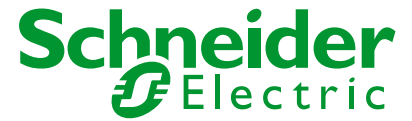


SAGE 4400



Substation Gateway, Communications, and I/O

The SAGE 4400 combines the best features of the SAGE 3030M and the SAGE 2400. The 4400 is a rack mounted RTU with all the communications capabilities of the 3030M and the I/O flexibility of the SAGE 2400. The 4400 uses the same I/O cards as the other SAGE products for maximum retrofit



capability and is designed for applications that require a significant capability for discrete I/O along with processor power for integration of many IED's as well as "intelligent" embedded applications and logic functions. The SAGE 4400 is mounted in 19" rack mounting relay style aluminum enclosure with serial and Ethernet communications ports built-in but also provides the capability to have many analog, status, accumulator and control outputs from hard-wired discrete I/O field connections.

Features in SAGE 4400

- 16 Serial Ports + IRIG-B In / Out
- 2 Independent Ethernet Ports (separate NICs)
- Optional 4 Port switch for LAN Connections
- Large Physical I/O Capacity
 - 224 Digital Input (Status- 5ms /Accum)
 - 128 SBO T/C Control Output Points
 - 256 Analog Input points
 - 256 1msSOE Digital Input points
 - 256 DO points
 - 2 On Board Alarm Contacts
- 12/24 VDC Input Power Supply
- Input Power Fusing and Power switch
- 19" x 7" Rack Mounting Enclosure
- Three Year Standard Warranty

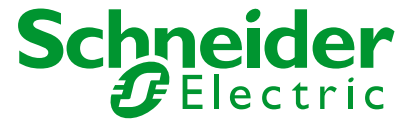
Same Firmware Features as all SAGE RTUs

- Enhanced Cybersecurity
- Extensive Logging Capabilities
- Force Point Data Function
- Browser Compatibility Enhancements
- Custom Built-in Applications
- Math and Logic Applications
- Optional IsaGRAF (IEC 61131) Logic Interface
- Annunciator HMI Screens without Logging In
- Enhanced Logging via Syslog Client
- Persistent Network Routing
- PCAP Ethernet Captures
- SEL IED Config Management
- New Linx GPS Card
- Detailed Diagnostic Comm Counters

The SAGE 4400 uses the same Browser based config@WEB User InterFace as the all SAGE RTU's, so there is no special or proprietary software to buy or install. SAGE is compatible with Microsoft Internet Explorer® and Chrome® browsers and ships with the full MTU/ IED protocol library which consists of the following protocols:

- | | | | | |
|-----------------------|------------------|-------------------|------------------------|--------------------|
| - DNP 3.0 (R) | - L&N C300 (R) | - Harris 5000 (R) | - Series 5 (R) | - Incom (M) |
| - DNP 3.0 (R) over IP | - L&N C2020 (R) | - Harris 5000 (M) | - Series 5 (M) | - Electran (M) |
| - DNP 3.0 (M) | - L&N C2100H (R) | - Harris 5500 (R) | - Series III (R) | - JEM2 ASCII (M) |
| - DNP 3.0 (M) over IP | - L&N C2100H (M) | - Harris 5500 (M) | - Series 5 NCEMC (R) | - Symax (M) |
| - SEL Fast Meter (M) | - L&N C3000 (R) | - Cooper 2179 (M) | - Series 5 Ga. Pwr (R) | - Tunnel (M) |
| - Modbus (R) | - C2100H (R) | - Harris 6000 (R) | - M9000 (R) | - IDLC (R) |
| - Modbus (R) over IP | - C2100H (M) | - Harris 6000 (M) | - Redac 80 (R) | - ETI (M) |
| - Modbus (M) | - CDC Type 1 (R) | - VanComm (R) | - PG&E (R) | - CDT (R) |
| - Modbus (M) over IP | - CDC Type 2 (R) | - SES 92 (R) | - Quantum Meter (M) | - Tickle (M) |
| - SEL Terminal tunnel | - L&G 8979 (R) | - PMS 80 (R) | - Transdata Meter (M) | - Arbitr Clock (M) |
| - FMS/FMS over IP | | | | |

SAGE 4400



Substation Gateway, Communications, and I/O

Specification

CPU/Memory

Processor / Speed AMD LX-800, 500 MHz
DRAM 256 MB
BB RAM 2 MB
Compact Flash 1 GB
Bios Flash 1 MB
Real Time Clock ± 10 sec per day (115ppm)
Battery 3.0V Rechargeable Lithium Model BR2330A (Standby power for 10+ years)

Size

Enclosure 19"W x 10.5"D x 7.0"H aluminum box –
Fits standard 19"rack/relay panel

User Interface

Web Browser Internet Explorer® or Chrome®
Ethernet 10/100BASE-T (RJ45)
PPP 38.4kbps (RS232)

Communications

Ethernet Two 10/100Base-T (RJ45)
Serial Sixteen RS232 (DB-9)
Console RS232 (DB-9)
Dial-up (PPP) RS232 (DB-9)
Serial Speeds 300-115,000 bps
Protocols Synchronous and asynchronous
3 Port Ethernet Switch – Option (Req. optional internal C3463 module)

Logic Capabilities

Built in Math and Logic Applications
IEC 61131 compliant PLC runtime engine

Power Requirements

Input Voltage 24 VDC (10-33 VDC)
Input Power 35 Watts maximum
Input/Output Isolation 500 VDC

IRIG-B Input

Modulated/Demodulated signal through BNC format connector Output
Demodulated Available on all 16 RS232 Communications Ports
Format Pins 4&6 on RS232C (DB-9)
Demodulated Available on BNC connector

Power for external devices on RS232

5VDC Configurable on all 16 Comm ports
Formats Pin 1 on RS232C (DB-9)
Power Available 5W Max Total

Visual Indications

Comms: 5 LEDs per RS232 port (DCD/+5V, RX, RTS, TX, CTS)
Ethernet Link
Other LED Indications: Power, Run, Reset, Local/Remote, Time
Source Failed, IED Failed, Alarm 1, Alarm 2, User Logged In, Config
Changed, RLL Running

Environmental

Operating Temperature -40° to +85° C
Relative Humidity 5 percent to 95 percent, non-condensing
Transient Protection All user field connections designed to pass: IEEE
C37.90.1:2012-09, IEEE C37.90.2:2004-12, IEEE C37.90.3:2001-10

Alarm Outputs (Configurable Source)

Two Form C - Contact Ratings 30 VDC @ 2A

Digital Inputs Req optional external termination (C3432 module)

Used as Status Inputs: Accuracy 5ms
Isolation Optically isolated, 1500VDC
Configuration 2 terminals per point (common ground)
Max Input Points 224

Used as 1ms SOE Inputs: Accuracy 1ms

Isolation Optically isolated, 1500VDC
Configuration 2 terminals per point (common ground)
Max Input Points 256

Used as Accumulator Inputs

Accum. Formats FA, FC (One or two counts/cycle)

Accum. Input Rate 20 pps max.

Max Input Points 112

Power 129/48/24VDC (wetting from ext. PS)

XT Dimensions 32pts / 5x8 inch card

SBO Control Outputs Req. optional external termination

(C3233 module)

Duration Software programmable in 5 msec increments

Momentary KUP type 1FC/2FA 10A @ 240VAC or 10A @ 28VDC.

KUEP type 1FC 3A @ 150VDC, 2FA 5A @ 150VDC, 1FX 10A @ 150
VDC.

Latching KUL type 1FC/2FA 10A @ 240VAC or 10A @28VDC.

Max Output Points 128 T/C Pairs (256 coils)

XT Dimensions 4pts/6.4x8 inch card & 8pts/8.75x19 inch card

Analog Inputs (Req. optional external termination (C3430

module)

Input Type Differential

Input Ranges ± 5 VDC, 0-5VDC, 1-5VDC, ± 1 mA, 0-1mA, 4-20mA, 10-
50mA

Resolution 12 Bits (11 plus sign)

Accuracy $\pm 0.25\%$ FS between -40 to +85 C

Max Input Points 256

XT Dimensions 16pts/5x8 inch card

Digital Outputs (Requires optional external termination (C3231

or C3243 module)

Duration Software programmable in 5 msec increments

KUP type 1FC/2FA 10A @ 240VAC or 10A @ 28VDC. KUEP type 1FC

3A @ 150VDC, 2FA 5A @ 150VDC, 1FX 10A @ 150 VDC, RT Type

10A @ 250VAC/24VDC

Max Output Points 256 Relays

XT Dimensions 16pts/6.4x8 inch card & 16pts/8.75x19 inch card