SYNC 2000 Series
Substation Protocol Gateway

OVERVIEW

SYNC 2000 protocol gateway series of products are substation rugged communication devices with real-time embedded linux operating system, and supports for a host of automation protocols including, DNP 3.0 IEC 60870-5-101/103/104, DLMS/COSEM, Modbus as well as proprietary protocols like SPABus, Courier and various others. Devices come with an option to add an internal plugable cellular modem, and support secure VPN connections over dynamic IP.

FEATURES

Software Features

- Support more than 40 protocols including IEC 60870-5-101/103/104, IEC 61850, DNP3.0, Modbus RTU/TCP, and DLMS/COSEM
- Automatic startup, initialization with restart notification following the power restoration
- Multi master communication capability
- Up to 10000 data point support#
- File upload/download support, remote configuration
- Time sync based on NTP/SNTP/NMEA/Protocol specific synchronization (IEC 104/DNP3.0 etc.)
- Transparent/tunneling support for remote configuration and disturbance collection
- Remote Device Management from Kalki.io
- SNMP Agent/ Manager for NMS Integration
- Can be configured to be used as a terminal server

Reliability

- IEC 61850-3 compliant hardware#
- KEMA certified IEC 61850 server

Security

- IEC62351-3 transport layer security
- IEC62351-5/DNP3 secure authentication

- SSL based VPN with AES, DES or 3DES encryption over WAN/LAN
- Compliant to NERC-CIP security standard (refer to implementation document for details)

Enhance Capability

- Internal and external pluggable cellular modem (GPRS EDGE/CDMA/HSPA/EVDO)
- External pluggable RF/PSTN modem
- Fibre Optic Ethernet#
- Wide range of AC and DC power supply**
- Customization of existing protocol as well as addition of new protocol possible
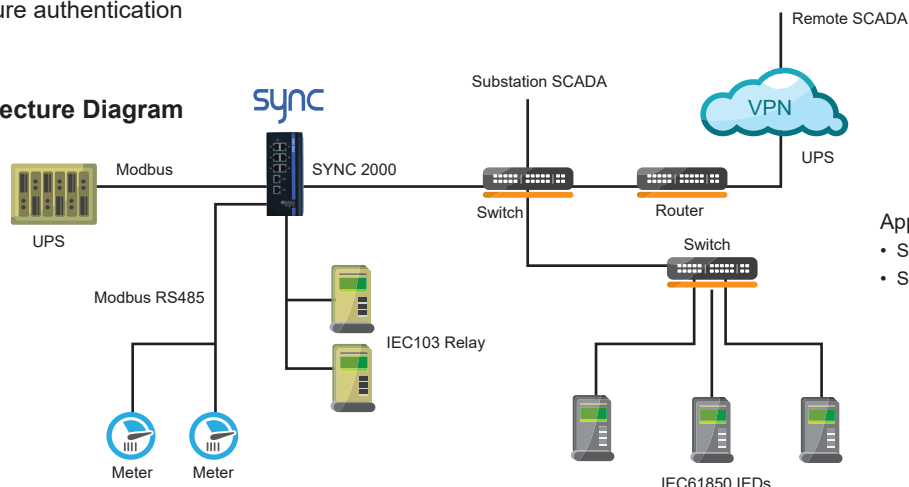
MODELS

- SYNC 2000 - M1: 2 Serial, 1 Ethernet (Copper)
- SYNC 2000 - M2: 6 Serial, 1 Ethernet (Copper)
- SYNC 2000 - M3: 4 Serial, 2 Ethernet (Copper)
- SYNC 2000 - M4: 6 Serial, 1 Ethernet (Fiber Optic)

RELATED PRODUCTS

- Kalki.io: Energy IoT Platform
- SYNC 4000: Control Center Gateway

Sample Architecture Diagram

Applications
- Substation Protocol Gateway
- SMS Gateway

Specification Sheet			SYNC 2000 - M1 (S2R1)	SYNC 2000 - M2/M4 (S6R1/S6F1)	SYNC 2000 - M3 (S4R2)
General		Management	EasyConnect configuration utility/web server/SNMP & SSH Interface over secure network		
		Maintenance	Direct over debug port or console port		
		System Protocols	TCP/IP, UDP/IP, SMTP, POP, HTTP, FTP, SNMP, ICMP, DHCP, BOOTP, Telnet, DNS,ARP, PPPoE, DDNS		
		Device Security	NERC/CIP compliant (refer to implementation document for details), SSHv2		
		Communication Security	IEC62351-3 and -5 (DNP3 secure authentication), SSL based VPN tunnel using Blowfish/AES/3DES		
		Logic Programming	AND/OR/NOT/Bit SHIFT/Split/Index support for digital and analog data delay operations		
		Redundancy	Downstream/upstream communication		
		SMS Based Alarm	Available*	Available*	Not available
		Certifications	IEC61850-10 KEMA, IEC61850-3, CE		
Communication Capability		Standard Protocols	IEC 60870-5-101/103/104, DNP3 serial/TCP, Modbus RTU/ASCII/TCP, IEC62056-DLMS, IEC61850**, SFTP, SNMP, SNTP		
		Proprietary Protocols	ABB - RP570, 571, SPA bus SEL - SEL451, 421, 311, 300G Schneider - SEPAM Modbus**	Areva - Courier RTK**, EXCOM**, CMC Master**, SPORT** Triguard peer to peer**	
		Additional Protocol	Refer to the full list of protocols at https://www.kalkitech.com/knowledge-center/protocols/		
		Multi-master Protocol	No, one-to-one conversion	Yes, many-to-many conversion	
		Devices Supported			
		SPA	20	20	25
		DNP3, IEC60870, Modbus and other Proprietary Protocols	50	50	64
		Datapoints Supported			
		SPA	800	800	1600
		DNP3, IEC60870, Modbus and other Proprietary Protocols	5000	5000	10000
		Serial			
		Connector	2 RS232/485 - RJ45	4 RS232/485 - RJ45 2 RS232 - RJ45	4 RS232/485/422 - RJ45
		Data Rate	110bps - 38.4kbps		
		Ethernet			
		Connector	1 RJ45	1 RJ45/ST FO**	2 RJ45
		Physical Layer	10/100 Mbps		
		Isolation	1500VAC min per IEEE802.3/ANSI X3.263		
		Fiber Optic Option**	NA	1 multi mode fiber with ST connector	NA
		FO Range	NA	1200 meter	NA
IO Interfaces		Analog	Via R485 expansion module		
		Digital	Via R485 expansion module		
Power Requirements		Power Supply	Option 1 (SYNC 2000 PS-DC1): 19 - 58VDC Option 2 (SYNC 2000 PS-ACDC1) 85 - 264VAC 50 - 60Hz, 100 - 370VDC		12-48VDC
		Consumption			
		Main Card	10W		
		Internal Plug-in Modem	8W peak		NA
Plug-in Modem Options		Internal	NA	GPRS/EDGE/CDMA/HSPA/EVDO	NA
		External	NA	RF modem, PSTN modem	NA
Physical		Dimensions (H x W x D)	164mm x 71mm x 140mm	164mm x 71mm x 140mm	60mm x 137mm x 100mm
		Weight (In grams)	1000 (excluding modem)	1000 (excluding modem)	530
		LED Indications	Power, LAN link/status, serial port RX/TX		
		Mounting	DIN Rail		
Environmental		Cold Temperature test	As per IEC60870-2-2 tested at -40 oC		-10 oC 5 to 95% RH
		Hot Temperature test	As per IEC60870-2-2 tested at 70 oC		60 oC, 5 to 95% RH
		Humidity test	As per IEC60870-2-2 95% RH 55oC and 55oC		5 to 95% RH
		Barometric Pressure test	IEC 60870-2-2 Ed 1.0 Test range 0 (101.3 kPa) to 3000m (70.0 kPa)		NA
		Vibration and Shock test	As per IECC60870-2-2, Class Am, 5Hz to 500Hz on X,Y, Z axis, 10g in X,Y, Z axis		1 g @ IEC-68-2-6, sine wave (resonance search), 5-500 Hz, 1 Oct/min, 1 cycle, 13 mins 17 sec/axis
Emission		Conducted Emission	EN 55022:2006+A 1: 2007 Class A		EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024
		Radiated Emission	EN 55022:2006+A 1: 2007 Class A		EN55022 Class A, EN61000-3-2 Class A, EN61000-3-3, EN55024
Immunity		Radiated Susceptibility	IEC 61000-4-3: 2006 -80 - 1000 MHz : 10V/m 80% AM, 1 kHz sine wave		NA
		Electrical Fast Transient	IEC 61000-4-4:2004 - ±4 kV serial ports, Ethernet port, DC Power Ports		NA
		Electrostatic Discharge	IEC 61000-4-2:2001 - +/- 6 kV Contact Discharge, +/- 8 kV Air Discharge		IEC 61000-4-2:2001 - +/- 8 kV Contact Discharge, +/- 15 kV Air Discharge
		Surge Protection	IEC 61000-4-5:- 2011 Serial port ± 4kV, 1.2/50 µs for common mode, Ethernet port ± 2kV, 1.2/50 µs for common mode DC Power port ± 2kV, 1.2/50 µs for common mode, ± 1kV, 1.2/50 µs for differential mode AC Power port ± 4kV, 1.2/50 µs for common mode, ± 4kV, 1.2/50 µs for differential mode		NA
		Induced (Conducted) RFI	IEC 61000-4-6: 2004 - 0.15 - 80 MHz: 10 Vrms 1 kHz, 80%AM for DC power, serial and Ethernet port		NA
		Power Frequency Magnetic Field immunity	IEC 61000-4-8: 2001 -30 A/m continuous & 1000 A/m for 1 sec		NA
		Damped Oscillatory Magnetic fields immunity test	IEC 61000-4-10 T rise: 75 ±- 20% Oscillation frequency 1MHz : ±- 10% Repetition rate: 400 /s for 1 MHz ± 10%, Burst duration: Not less than 2s Continuous magnetic field strength: 30 A/m		NA
		Damped Oscillatory Wave immunity	IEC 61000-4-12 Damped Oscillatory Frequency: 1 MHz Common Mode: up to ± 2.5 kV Differential Mode: up to ±1.0 kV for DC power port 1 MHz Common Mode: up to ± 2.5 kV for serial port and Ethernet port		
		Impulse voltage Immunity	IEC60255-5 2000-12, Ed2.0 ±5kV for power port and earth		NA
		Conducted Common mode disturbances Immunity	IEC 61000-4-16 Ed 1.1 30/300V at 50Hz, 3V/30V at 15 to 150kHz		NA
Power supply		DC Voltage Dips & Interrupts	IEC 61000-4-29: 2000 - 0% short interruption for 0.03 sec, 40% and 70% dips for 0.3 sec, 80% & 120% variation for 3 sec		NA
		Ripple on DC power line immunity test	IEC 61000-4-17 10% of the Nominal DC voltage AC line frequency 50Hz on DC power port		
		AC Voltage Dips & Interruption	IEC 61000-4-11 - AC Power port 0% short Interruption for 250 cycles, 0% of AC mains voltage for 0.5 cycles and 1 cycles, 40% dips for 10 cycles, 70% dips for 25 cycles, 80% dips for 250 cycles		NA
		AC Voltage Range and Tolerance test	IEC 60870-2-1 Ed 2.0 176 Vac (-20 %) to 253 Vac (+15%)		

* Available when packet data is not used; ** Need to be ordered seperately; # Model dependent