

# SYNC 2000 Protocol Gateway

## OVERVIEW

SYNC 2000 Protocol Gateways support more than 40+ protocols and is used across utility applications. It features substation rugged hardware with a real time embedded Linux operating system. DNP3.0, IEC 60870-5 101/103/104, DLMS-COSEM, Modbus are some of the standard protocols supported in the product in addition to common proprietary protocols like SPABus, Courer, SEL used by legacy utility grid devices.

## FEATURES

### Software Features

- Supports more than 40 utility protocols
- Automatic startup, initialization with restart notification following power restoration
- Multi-master communication capability
- Up to 10000 data points supported<sup>#</sup>
- Time sync based on NTP/SNTP/NMEA/protocol specific synchronization (IEC 104/DNP3.0 etc.)
- Transparent/tunneling support for remote configuration and disturbance record collection
- Remote device management from Kalki.io
- SNMP Agent/ Manager for NMS integration
- Can be used as terminal server

### Reliability

- IEC 61850-3 compliant hardware<sup>#</sup>
- KEMA certified IEC 61850 server



### Security

- IEC 62351-3 transport layer security
- IEC 62351-5/DNP3 secure authentication
- SSL based VPN with AES, DES or 3DES encryption over WAN/LAN

### Enhanced Capability

- Internal and external pluggable cellular modem (GPRS EDGE/CDMA/HSPA/EVDO)<sup>^</sup>
- External pluggable RF/PSTN modem
- Fiber Optic Ethernet<sup>#</sup>
- Wide range of AC and DC power supplies

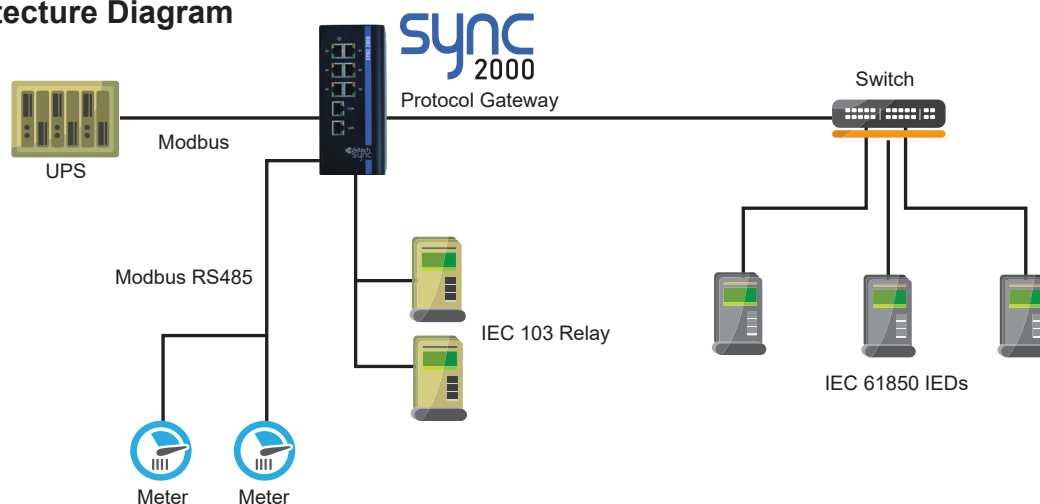
## MODELS

- SYNC 2000 - M1: 2 Serial, 1 Ethernet (Copper)
- SYNC 2000 - M2: 6 Serial, 1 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



Specifications		SYNC 2000 - M1 (S2R1)	SYNC 2000 - M2 (S6R1)	SYNC 2000 - M4 (S6F1)
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	IEC 62351-3 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*		
Communication Capability	Certifications	IEC 61850-10 KEMA, IEC61850-3, CE		
	Standard Protocols^	IEC 60870-5-101/103/104, DNP3 serial/TCP, Modbus RTU/ASCII/TCP, IEC 62056-DLMS, IEC 61850^, 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 <a href="https://www.kalkitech.com/knowledge-center/protocols/">https://www.kalkitech.com/knowledge-center/protocols/</a>		
	Multi-master Protocol	No, one-to-one conversion	Yes, many-to-many conversion	
	<b>Devices Supported</b>			
	SPA, IEC 61850	20		
	DNP3, IEC60870, Modbus and other Proprietary Protocols	50		
	<b>Datapoints Supported</b>			
	SPA, IEC 61850	800		
	DNP3, IEC 60870, Modbus and other Proprietary Protocols	5000		
	<b>Serial</b>			
	Connector	2 RS232/485 - RJ45	4 RS232/485 - RJ45 2 RS232 - RJ45	
	Data Rate	110bps - 38.4kbps		
	<b>Ethernet</b>			
	Connector	1 RJ45	1 RJ45	1 x ST Fiber
Physical Layer	10/100 Mbps			
Isolation	1500VAC min per IEEE802.3/ANSI X3.263			
Fiber Optic Option^	NA	NA	Multi Mode Fiber	
FO Range	NA	NA	1200 meter	
I/O 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		
	<b>Consumption</b>			
	Main Card	10W		
	Internal Plug-in Modem	8W peak		
Plug-in Modem Options	Internal	NA	GPRS/EDGE/CDMA/HSPA/EVDO^	
	External	NA	RF modem, PSTN modem (not a production option/accessory)	
Physical	Dimensions (H x W x D)	164mm x 71mm x 140mm		
	Weight (In grams)	1000 (excluding modem)		
	LED Indications	Power, LAN link/status, serial port RX/TX		
	Mounting	DIN Rail		
Environmental	Cold Temperature test	As per IEC 60870-2-2 tested at -40°C		
	Hot Temperature test	As per IE C60870-2-2 tested at 70°C		
	Humidity test	As per IEC 60870-2-2 95% RH 25°C and 55°C for 4 days		
	Barometric Pressure test	IEC 60870-2-2 Ed 1.0 Test range 0 (91.6 kPa) to 3000m (70.0 kPa)		
	Vibration test	As per IEC 60870-2-2, Class Bm, 5-500 Hz- displacement 3mm 5-9Hz+A1, acceleration 1g for 9Hz-200Hz, 1.5g for 200Hz-500Hz		
Emission	Shock test	As per IEC 60870-2-2 10g in X,Y, Z axis		
	Conducted Emission	EN 55022: 2006+A 1: 2007 Class A		
	Radiated Emission	EN 55022: 2006+A 1: 2007 Class A		
Immunity	Radiated Susceptibility	IEC 61000-4-3: 2006 80-100MHz: 10V/m 80% AM, 1 kHz sine wave		
	Electrical Fast Transient	IEC 61000-4-4: 2004 ±4 kV serial ports, Ethernet port, DC Power Ports		
	Electrostatic Discharge	IEC 61000-4-2: 2001 ±6 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, ±1 kV, 1.2/50 µs for differential mode AC Power port ±4kV, 1.2/50 µs for common mode, ±2 kV, 1.2/50 µs for differential mode		
	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		
	Power Frequency Magnetic Field immunity	IEC 61000-4-8: 2001 30 A/m continuous & 1000 A/m for 1 sec		
	Damped Oscillatory Magnetic fields immunity test	IEC 61000-4-10 Magnetic field strength 30 A/m @ Oscillation frequency 1MHz		
	Damped Oscillatory Wave immunity	IEC 61000-4-18 Damped Oscillatory Frequency: 1 MHz Common Mode: up to ±2.5 kV Differential Mode: up to ±1.0 kV for power port 1 MHz Common Mode: up to ±2.5 kV for serial port and Ethernet port		
	Impulse voltage Immunity	IEC 60255-5 2000-12, Ed2.0 ±5kV for power port and earth		
	Conducted Common mode disturbances Immunity	IEC 61000-4-16 Ed 1.1 30/300V at 50Hz, 3V/30V at 15 to 150kHz		
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		
	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		
	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; ^ Required to be ordered separately; # Model dependent



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