Kalkitech
Enabling the Smart Grid

SYNC 200

SYNC 200 Series
IED Upgrade Card

OVERVIEW

Embedded Product IED upgrade card also known as OEM modules, provides various options to the customers to enable their devices with standard communication protocols, computation functions and other automation capabilities without any change in the end products.

SYNC 200 enables device manufacturers the capability to have the latest protocols like IEC 61850 and DLMS/COSEM and other standard communication protocols in the end product at minimal development cost and time to market. SYNC 200 has been embedded in various devices like Protection Relays, Energy Meters, Mini RTUs, Transformer Monitoring Systems, PLCs, Switchgears and Alarm Annunciators.

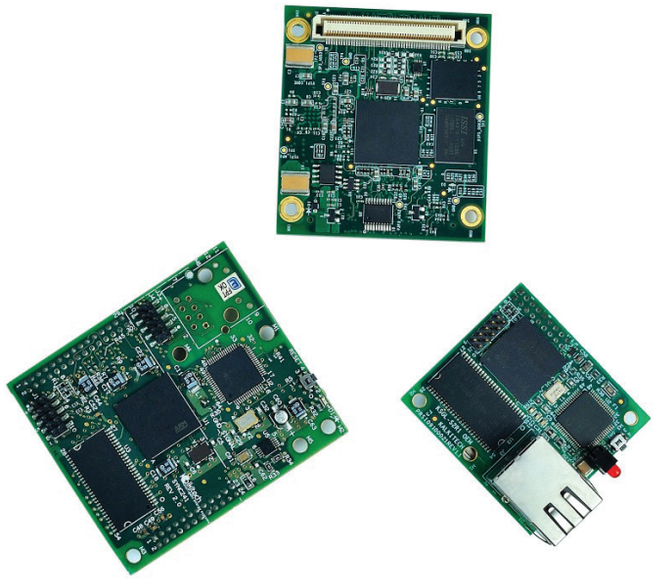
SYNC 200 modules are specifically designed for power industry applications, with its superior processing capabilities as well as numerous interfacing options. SYNC 200 modules are tested to stringent temperature and environmental levels, and have proven experience in a variety of industry segments. Numerous products with SYNC 200 upgrade cards have been approved by most of the test and certification labs by various customers.

SYNC 200 provides not just one-to-one protocol conversion, but also supports the full set of protocols (main protocols listed on the right), which makes the end device capable of multiple standard protocols. Moreover, the small form factor and the various interfacing mechanisms like TTL, I2C, SPI and GPIO makes it ideal for a large variety of products and applications.

APPLICATIONS

SYNC 200 modules have been deployed in numerous IEDs across the world. Some of the common equipments where SYNC 200 modules have been used are:

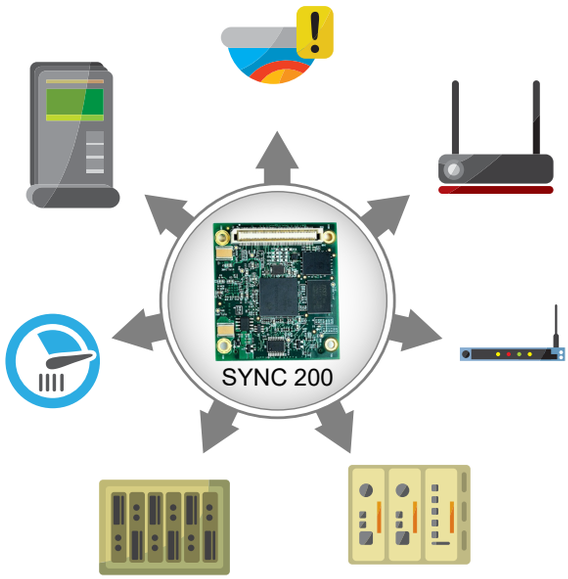
- Alarm Annunciators
- Capacitor Banks
- Circuit Breakers
- Data Loggers
- Industrial Ethernet Switches
- Intelligent Electronic Devices (IEDs)
- Programmable Logic Controllers (PLCs)
- Protection Relays
- Remote Terminal Units (RTUs)
- Switchgears
- Transformer Monitoring Systems



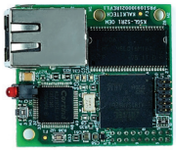
IEC 61850	DNP 3.0 Serial & TCP	DLMS/COSEM
IEC 60870-5-101/104	IEC 60870-5-103	MODBUS ASCII/RTU

* Additional protocol on request

SYNC 200 modules are also suited for high performance IEC 61850 requirements, and can be used for high speed messaging mechanism like GOOSE using hardwired GPIOs.



SYNC 200 Platforms



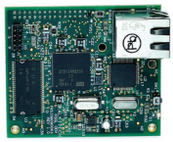
SYNC 221

Dimensions :
45mm x 40mm x 21.6mm

SYNC 221 is best suited for space critical applications for conversion between most standard protocols, and is almost half the size of the other models. With onboard Ethernet port, SYNC 221 is ideal for applications which require less data points support using a small form factor communication card.

Model:

- SYNC 221-M1 with on board Copper Ethernet



SYNC 241

Dimensions :
63mm x 55mm x 18mm*

SYNC 241 provides up to 48 GPIOs and plug-in ethernet jack with support for copper or fiber ethernet port plug making it possible to use this module as the building block for smart grid ready IEDs like relays, switchgears and many more.

Models:

- SYNC 241-M1: with Copper Ethernet addon
- SYNC 241-M2: with ST Fiber Ethernet addon
- SYNC 241-M4: with LC Fiber Ethernet addon
- SYNC 241-M3: with onboard Copper Ethernet port

* Base board only

SYNC 261

Dimensions :
55mm x 50mm x 9mm*

SYNC 261 powered with high-end processor, wich is ideal for modern automation systems. The dual redundant communication link and can be used for various applications apart from protocol conversion, 61131 based logic engine, web-based monitoring systems.

Models:

- SYNC 261-M1: base board
- SYNC 261-M2: Base Board with: Dual Copper Ethernet addon

* Base board only

KEY FEATURES

- Supports many-to-many protocol conversion. More than 30 protocols can be enabled
- APIs for adding custom protocol & applications (selected model)
- Extensive support provided for integration and testing: Starter Kit available for all SYNC 200 series Models, along with free remote support
- Maximum of 2 TTL ports, 48 GPIOs, I2C, SPI, USB, CAN available*
- Meets high processing capabilities required for IEC 61850 GOOSE
- Supports up to 128MB RAM and 256MB Flash*
- Supports temperature range from -40°C to +85°C
- Supports TCP/IP, UDP, SMTP, POP, FTP, HTTP, SNMP
- File Upload/Download, Remote configuration through customizable configuration tool - EasyConnect
- SSL VPN with AES, DES or 3DES encryption over WAN
- Transparent Channel/Tunneling support
- Custom development services to integrate your proprietary interface

* Model dependent

INTERFACING DETAILS

SYNC 200 can be internally plugged to the device using TTL/ GPIO interfaces (+I2/SPI/USB/CAN additional) and can be connected to the external world using RS485 (to be expanded from TTL)/Ethernet Port.

When SYNC 200 IED Upgrade card is used for native protocols to IEC 61850 conversion, UART communication is too slow to meet the timing requirements needed for GOOSE. To enable fast message transfer from actual I/O points to the network, these cards are equipped with a provision of Fast-Message-GOOSE-Bus. SYNC 241 has a maximum of 48 GPIOs which can be configured as Inputs/outputs (3.3V DC) and connect to direct input and output terminals on the vendor device (can be also attached with level shifters to convert the same to 24V or 48V which can be input/outputs on the I/O terminals of vendor devices). These GPIOs can be attached directly to the GOOSE Publishers (Inputs) and GOOSE-Subscribers (outputs) which can be configured as IEC 61850 GoCB (GOOSE Control Blocks). By this method, an event change can be sent over the network within a worst case scenario of 10msec. This will work in parallel with sending less critical signals using UART communication and can send over 61850 RCBs. This featureis also available in SYNC 261 variant too.

SPECIFICATION SHEET		SYNC 221 (M1)	SYNC 241 (M1/M2/M3/M4)	SYNC 261 (M1/M2)
General	Management	EasyConnect Configuration Utility/Web Server/SNMP and SSH Interface over secure network. Device also accessed using 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, SSHv2		
	Communication Security	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, IEC 61131-3 based logic engine on request		
	Network Management	SNMP Agent		
	Approvals	IEC 61850-10 Kema*		
Communication	Interfaces	TTL/GPIO/ETHERNET/I2C/SPI/CAN/USB		
	Capability	IEC 60870-5-101/103/104, DNP3 serial/TCP, Modbus RTU/ASCII/TCP, IEC 62056-DLMS, IEC 61850, IEC 61400		
	Protocol support for internal communication	IEC 60870-5-101/103, DNP3 serial, Modbus, IEC 62056-DLMS		
Supported Data Point	IEC 61850, SPA	800	800	3000
	DNP3, IEC 60870, Modbus and other protocols	3000	3000	6000
Communication Interfaces	Serial	2 TTL Interface	2 TTL Interface	
	GPIO	4-11 IO**	16 to 48 IO**	
	I2C	I2C Master		
	Ethernet	1 10/100 BASE-TX	Plug-in Ethernet (Refer to Addon section)	
Power Requirements	Power Supply	3.3 VDC		
	Consumption	2W	2W	
Physical	Dimensions (H x W x D)	21.6mm x 40mm x 45mm	63mm x 55mm x 18mm	55mm x 50mm x 9mm
	Weight (in grams)	20	20	
Environmental	Operating Temperature	-40ºC to 85ºC		
	Rel. Humidity	5%-95% RH non-condensing		

Ethernet Ports	SYNC 221 Copper onboard	SYNC 241 Copper onboard	SYNC 241 with Copper addon card	SYNC 241 with Fiber ST addon card	SYNC 241 with Fiber LC addon card	SYNC 261 with Copper addon card
						
Part Number	SYNC 221-M1	SYNC 241-M3	SYNC 241-M1	SYNC 241-M2	SYNC 241-M4	SYNC 261-M2
Number of ports	1	1	1	1	1	2
Connector Type	RJ45	RJ45	RJ45	Fiber ST	Fiber LC	RJ45
Speed	10/100Mbps	10/100Mbps	10/100Mbps	100Mbps	100Mbps	10/100/1000Mbps
Isolation	1500VAC min per IEEE 802.3/ANSI X3.263					
Fiber Mode	NA	NA	NA	Multi mode	Multi mode	
Wavelength	NA	NA	NA	1300nm	1300nm	NA
Dimension	Onboard	Onboard	54mm x 40mm x 18mm	54mm x 29mm x 14mm	NA	80mm x 55mm x 20mm
LED Indications	LAN Link/Status					

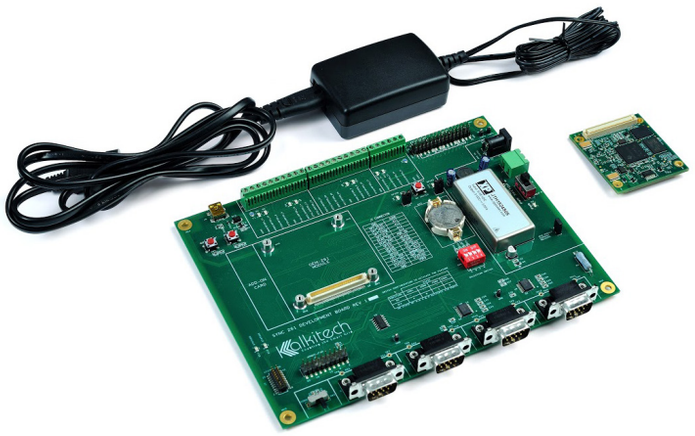
* Certified for end products using 200 series
** Range Depends upon IO used for full modem TTL/I2C/Debug port is multiplexed with GPIO
*** Applicable only for fiber ethernet port

SYNC 205/206
Developer Kit

OVERVIEW

Developer Kits enable users to test and integrate SYNC 200 modules to end devices quickly and easily with minimal capital costs.

SYNC 200 Development board provides a development platform for the OEM products, by projecting all the features of a SYNC 200 module to external world as standard interfaces like RS232/ RS485/IO Terminals etc., for testing and integration. The developer can use the board for customized developments on the OEM products and explore the possibilities of integrating the device in to the end product. This development platform gives all options to implement and test the solutions thereby verifying proper and intended operation.



KEY FEATURES OF DEVELOPMENT BOARD

- Four serial RS232 ports with Full Modem on COM 1 and Console port
- RS485 support
- On-Board RTC
- Wide power input range
- GPIO expansion with LED indication
- Sockets for various SYNC 200 series modules

MODELS

- SYNC205-M2: Development Kit for SYNC221 Module
- SYNC205-M3: Development Kit for SYNC241 Module and Copper add-on (fiber add-on available on request)
- SYNC206-M1: Development Kit for SYNC261 Module

DEVELOPER KIT INCLUDES:

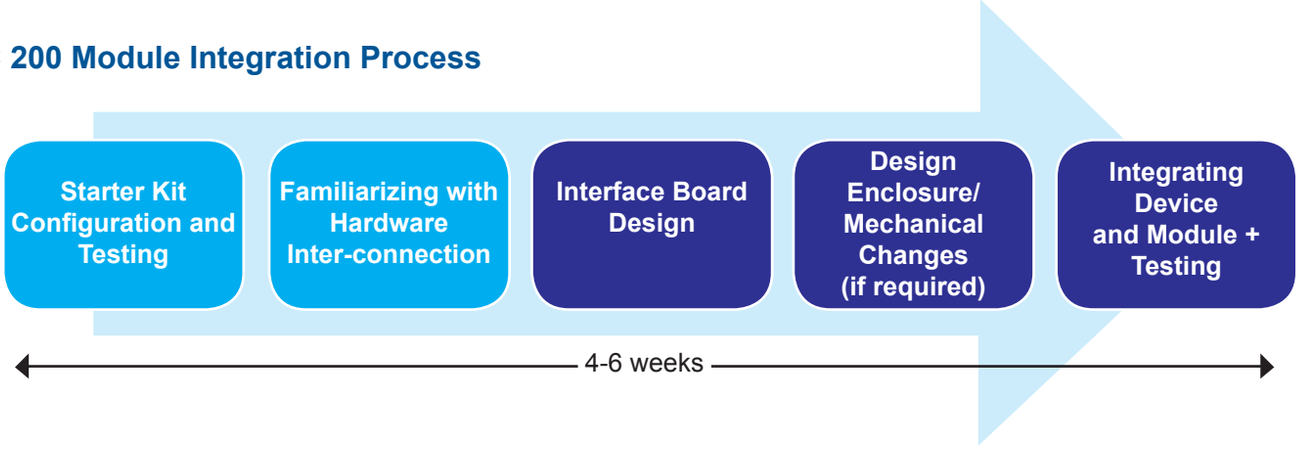
- SYNC 205/206 Development Board
- Modules of SYNC 221/241/261, depending on the requirement (2 nos.)
- EasyConnect Configuration Tool (CD)
- User manuals for Development kit and SYNC 200 series Module (CD)
- Ethernet Cross Cable -1 no.
- Power Adapter 12V

CUSTOMIZATION SERVICES

Integration Support and Consultancy Services provided are:

- Product design consultancy/support
- Hardware Customization
- Software Customization
- Certification Services
- Training - Protocols
- Training - Domain

SYNC 200 Module Integration Process



Kalkitech
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