

saTECH SynchroStar GPS 200 Series



KEY BENEFITS

Designed with high quality oscillator OCXO the device is characterized by superior frequency stability and improved holdover performance that allows maintaining high accuracy internal clock even when the GPS is disconnected or when satellite signal is not available over extended periods of time.

This unit unifies both IRIG-B and SNTP communications in the same equipment, allowing to share the most precise GPS networks with the most modern ST telecommunications like IEC-61850.

High Connectivity Level, providing BNC, Fiber Optic, console, as well as RJ-45 ports and NTP/SNTP Server.

Cascaded time distribution topology with the following components:

- saTECH SynchroStar GPS: connects to GPS antenna or to NTP server, then it generates the substation clock signal.
- saTECH SynchroStar TX: optional component, it receives the signal from the saTECH SynchroStar GPS (main chassis) and distributes it via its outputs to up to 8 saTECH SynchroStar RX receivers.
- saTECH SynchroStar RX: optional component, it is typically installed in the protection and control panel, it receives the clock signal from remote saTECH SynchroStar TX and delivers it to IEDs and other legacy devices

CASCADED TIME SYNCHRONIZATION IN LEGACY INSTALLATIONS



APPLICATIONS

- > Time synchronization of legacy devices with clock signal outputs available through multiple coding standards and physical interfaces. Flexible design allows various topologies including daisy chain or star arrangements.
- IRIG-B signal distributed directly from the main chassis outputs or via a cascaded star topology composed of optional saTECH SynchroStar TX and saTECH SynchroStar RX devices. Cascaded topology is especially useful when it is desired to synchronize legacy end devices in a star arrangement that helps minimizing substation wiring



KEY FEATURES

- > Small form factor: standard 1U rack mounting.
- Multiple power supply options including 24Vdc, 48Vdc, 125Vdc or universal power supply (85 to 265Vac with 47-63Hz / 120 to 370 Vdc.
- > High accuracy GPS input module with built-in isolation against electrical interferences.
- > Oven Controlled Crystal Oscillator (OCXO) maintains time accuracy during extended periods of external GPS signal losses, frequency stability of +/-140 ppb, and a holdover stability of +/- 320 ppb.
- > Maximum time drift 1 millisecond per day.
- Support for IEEE1344 to implement configuration settings for local time offset and automatic Daylight-Savings-Time (DST).

- Remote access, configuration and firmware upgrade through FTP.
- > High-reliability and superior resolution OLED display (256x100) allows quick visualization of device status as well as basic configuration of the unit.
- > Full numeric keypad with 19 buttons and front LEDs provide enhanced user experience, facilitate configuration and monitoring.
- > Front mini-USB console port allows direct access for maintenance and diagnostics.
- Designed for harsh environment: Reliable performance also under EMC and EMI stress conditions, works without errors or data losses in extreme conditions, extended operating temperature range of -40°C to +80°C
- > 3 Independent Ethernet port. It's for making until 3 independent networks with one device.



- 1- RF Antenna Input
- 2- TTL Output (BNC)
- 3- AM Output (BNC)
- 4- ASCII Protocol (DB9-Rs232)
- 5- IRIG-B extension:
- I Option: BNC Connector (7 IRIGB output)
- **J** Option: Fiber (7 IRIGB output)
- **K** Option: Terminal (9 IRIGB output)

- 6- Alarm Relay (NC,NO,C)
- 7- TTL Output (Terminal-Rs485)
- 8- ASCII Protocol (Terminal-Rs485)
- 9- TTL Output (Fiber)
- 10- ASCII Protocol (Fiber)
- 11- Ethernet ports (3 up top ip addresses)
- 12- Power supply:
 - A Option DC: 125 Vdc (43 to 160 Vdc)
 - B Option DC: 24 Vdc (18 to 75 Vdc)
 - **C Option DC:** 48 Vdc (18 to 75 Vdc)
 - D Option AC/DC: 85 to 265 Vac with 47-63Hz / 120 to 370 Vdc



HARDWARE FEATURES

Hardware Features	
	3 Ethernet ports, 100BaseTX with RJ45 Ethernet
	5x BNC outputs: > PPS (Pulse per second) > 1KHz signal > PP (Programmable pulse signal) > Unmodulated IRIG-B 003, 004 (100mA / 5Vdc) > Amplitude Modulated IRIG-B123/124 (100mA / 5Vdc)
Communications and Interfaces	4x Fiber outputs (ST connectors) : PPS (Pulse per second) PP (Programmable pulse signal) Unmodulated IRIG-B B003, B004 ASCII protocol
	2x Terminal- RS485 outputs > Unmodulated IRIG-B B003, B004 > ASCII protocol 2x DB9-RS232 outputs > ASCII protocol > ASCII protocol
	1 mini USB front console port for maintenance, optically isolated 1 USB front port maintenance, optically isolated. ⁽¹⁾
Optional Accessories	IRIG-B outputs extension board (unmodulated IRIG-B 003/004): > I Option: Seven fiber outputs, ST connectors. > J Option: Seven BNC outputs. > K Option: Nine terminal outputs. External GPS antenna
	30 or 50 meter antenna cable
	A Option: 125 Vac (43 to 160 Vac)
Power Supply	B Option: 24 Vdc (18 to 75 Vdc)
	C Option: 48 Vac (18 to 75 Vac)
	D Option: 85 to 265 vac $(47-63\pi^2)$ / 120 to 370 vac (Oniversal power supply)
Environmental Characteristics	Storage temperature range: -40 °C to +80 °C
	High: 1U (44.45 mm)
Dimensions	Width: 430mm
	Length: 246mm
	Front LED Display 256x100
Visual Indicators	3 LED for status indication
	Faceplate with 19 buttons for management and configuration of equipment
Accuracy	+ /-100 nanoseconds

⁽¹⁾ Only available in 3 model, (Model selection table)
 ⁽²⁾ Power supply option D: Operating temperature range -20 to 70°C



STANDARDS COMPLIANCE

Standards Com	plian	ce		
TEST			STANDARD DOCUMENT	LEVEL OF SECURITY REQUIRED
	1	Temperature	IEC 60068-2-1	-40 ºC 16 h
Environmental	2	Temperature	IEC 60068-2-2	+80 ° C 16 h
Environmentai	3	Temperature and Humidity	IEC 60068-2-30	25 °C to + 55 °C With 95 % RH
	4	Electrostatic Discharge	IEC 61000-4-2	Level 3 ± 6KV contact ± 15 KV air
Electromagnetic Compatibility	5	Immunity to radiated electromagnetic fields	IEC 61000-4-3	10 V/m at 1 kHz ;(80 to 1000) MHz
	6	Fast Transient	IEC 61000-4-4	Level 3 ± 2 KV 5/50 S.
	7	Surges in common mode and differential	IEC 61000-4-5	Level 2 to 1kV for line by line Level 3 to 2 kV for line to earth
	8	Immunity to Conducted Disturbances	IEC 61000-4-6	10 Vrms of 0.15 to 80 MHz
	9	Damped Oscillatory Wave	IEC 61000-4-12	Level 3 to 1kV for line by line Level 3 to 2 kV for line to earth 100 MHz
	10	Immunity to damped Oscillatory Waves	EN 60255-22-1	1KV for line by line 2 KV for line to earth
Emissions	11	Electromagnetic Emissions	EN 60255-25:2000	30 MHz - 230 MHz limit 50 dbµV/m > 230 MHz - 1000MHz limit 57 dBµV/m
	12	Insulation	IEC 60255-5	500 Vdc at 5 s with limit 100 $M\Omega$
Security	13	Dielectric Strength	IEC 60255-5	500Vac ± 4.3 % Voltage maintained by 60s with threshold current of 10mA
	14	Impulse Voltage	IEC 60255-5	0.875Kv ± 5.3 %. 3 Pulses per polarity Pulses of 50 μs ± 20% with 1.2μs ± 30%



FRONT AND REAR VIEWS

saTECH Synchrostar GPS



saTECH Synchrostar TX

0				INPUT						OUTPUT			saTECH Syr	chroStar TX	
	arteche	POWER	FO	TTL O	R5232	R5485	FOI	FO2	FO3	FO4	FO5	FO6	FO7	FO8	
0															0
\bigcirc															0

FO	TTL1 RS232	CONF	RS485 FO1	FO2	FO3	FO4	FO5	FO6	F07	FO8	S/N	POWER 45-160	
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saTECH Synchrostar RX

0				IN	IPUT					OUTPUT			saTECH SynchroStar RX					
	arteche	POWER	FO1	FO2	FOOUT	R\$485	R5232-1	RS232-2	TTLI O	TTL2	TTL3	TTL4	UTLS	MODI	MOD2			
0																		
0																0		

FO1 FO2 FO OUT RS485 CONF	ото 1 тт.1 в тро 2 в RS232		TL4 TTL5 MOD1 MOD	S/N POWER 45-160
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MODEL SELECTION TABLE

saTECH Synchrostar	Model		Power Supply		IRIG-B ext.		Acce	sories
Model Selection						-		
Model								
IRIG-B + 1 SNTP/NTP	1							
IRIG-B + 1 SNTP/NTP + Display & Keypad	2							
IRIG-B + 3 SNTP/NTP + Display & keypad + USB (2 Aditional Ethernet)	3							
TX Regenerator Transmitter IRIG-B signal	т							
RX Regenerator Receiver IRIG-B signal	R							
Extension								
125 Vdc (43Vdc to 160 Vdc)		_	Α					
24 Vdc (18 to 75 Vdc)		_	В					
48 Vdc (18 to 75 Vdc)		_	С					
85 to 265 Vac (47-67Hz) / 120 to 370 Vdc (Universal Range) [-20 to 70°C]			D					
IRIG-B extension								
Without IRIG-B extension				_	Х			
With IRIG-B extension Optical Fiber					I *			
With IRIG-B extenxion BNC					J*			
With IRIG-B extenxion Terminal					K*			
Accesories								
Without Antenna						_	Х	
Antenna GPS						_	J*	
Without wire						_		Х
30 meter low-loss antenna wire						_		3*
50 m low-loss antenna wire								5*

Other Accesories

saTECH Synchrostar Wire-Protection saTECH Synchrostar External Display

(*) Use to only with model 1, 2 or 3.