Kronos Series 3R
19" Rackmount – Grandmaster Satellite Clock

Description

The Kronos Series 3R Satellite Clock, meticulously engineered for power systems applications, is an indispensable asset for ensuring synchronized operations within the power grid. Designed with a keen focus on precision and adaptability, this utility-grade timekeeping solution by NovaTech Automation delivers unmatched reliability to meet the stringent demands of electric utilities with a growing need for digital applications. With its robust design and advanced features, including IEEE1588-2008v.2 grandmaster functionality, the Kronos Series 3R sets the standard for accuracy and performance in critical time synchronization tasks.

Key Features

Ethernet Integration
- Supports browser-based configuration and SNMP
- Simultaneous support for multiple PTP profiles
- Synchronizes any Ethernet device over PTPv2 and/or NTP/SNTP in a simple or HSR/PRP network
- Syslog

Output Flexibility
- IEEE1588-2008v.2 (PTPv2)
- NTP and SNTP (with NTS)
- IRIG-B (unmodulated and modulated)
- Ethernet, twisted pair, coax, fiber
- PPS or PPM signals

Multi-Constellation Support
- Locks onto GNSS constellations: GPS, GLONASS, BeiDou, Galileo
- Assures fast lock and minimal time in holdover

High Precision
- Available with standard TCXO or optional OCXO
- Antenna cable-delay compensation for enhanced accuracy
- Accuracy 20ns (99%, clear sky)

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Technical Data

General Data	
Unit Dimensions	19"W x 1.73"H x 7.7"D (483 x 44 x 155mm)
Mounting / Front Panel Height	19" Rack / 1 RU
Housing Material	Aluminum
Degree of Protection	IP40-rated enclosure protection
Weight	5.5 lb (2.5 kg)

Power Supply	
Supply Voltage Range	**LV**: 24-48V dc +/-20% **HV**: 80-300V dc / 90-240V ac (50/60 Hz) +/-20%
Max Power Consumption	52VA
Redundant Power Supply	Optional

Indicators	
LED	Locked (Green) Holdover (Yellow) Alarm (Red)
Display	Red Dot Matrix Display (5.0"x0.7"/127x18mm)

Environmental	
Operating Temperature	-40°C to +70°C (-40°F to +158°F)
Storage Temperature	-40°C to +70°C (-40°F to +158°F)
Humidity	5% to 95%, non-condensing
Altitude	2000m

Unmodulated IRIG-B	
Supported IRIG-B Protocols	B000/B002/B004/B006
Connector Type / Quantity	Pluggable compression screw terminal (twisted pair): up to 6 BNC female (coax): up to 12 ST (fiber): up to 6
Physical Performance (twisted pair, coax)	200 mA drive capability at 5V level Up to 160 ft. (50 m) cable 15 Ω output impedance Fully-isolated
Optical Performance (fiber)	820nm wavelength Optical power: -15.8 dBm into 50/125 μm fiber (-12 dBm into 62.5/125 μm fiber)

Modulated IRIG-B	
Supported IRIG-B Protocols	B120/B122/B124/B126
Connector Type / Quantity	BNC female (coax): up to 6
Electrical Performance (twisted pair, coax)	5V pp (no load) / 3.2V pp (50 Ω load) output voltage 25 Ω output impedance

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Technical Data

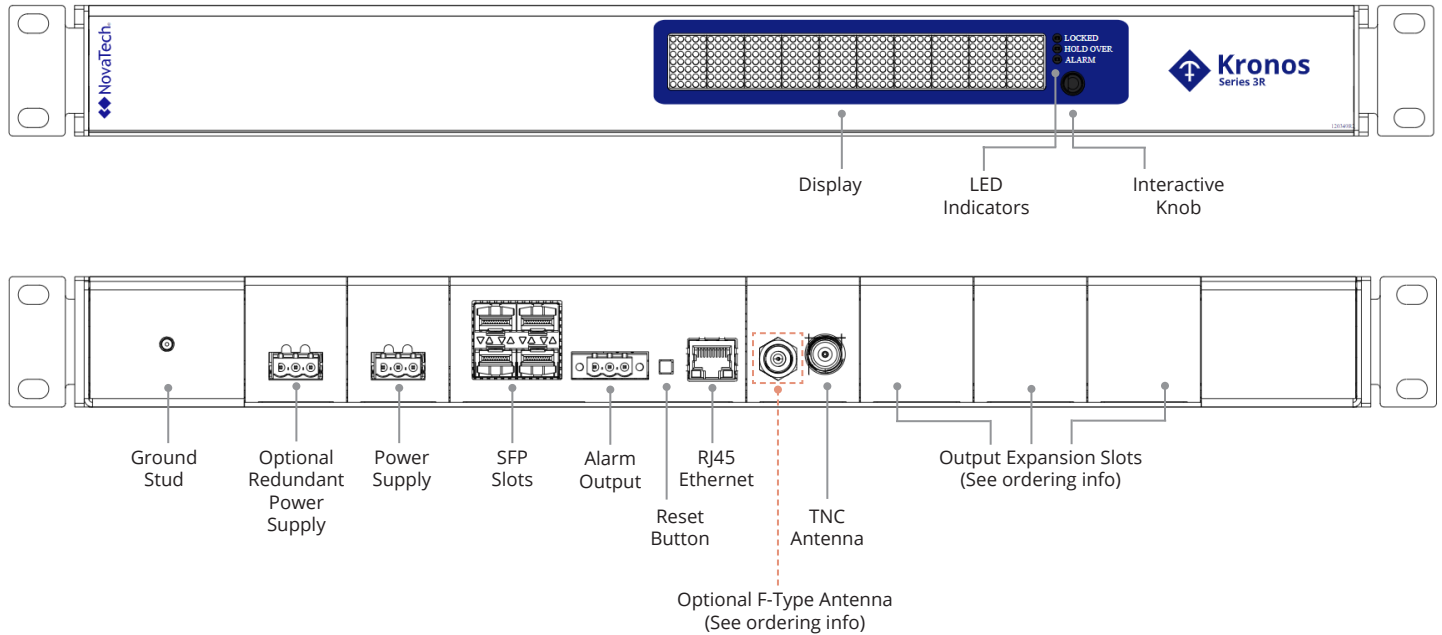| Ethernet	
Connector Type	1 RJ45 10/100/1000BaseT Ethernet Port 4 SFP slots (SFP transceivers optional)
Protocols	VLAN IEEE 802.1Q IEEE1588-2008V.2 (PTPv2) NTP/SNTP (with NTS) SNMP HSR/PRP (IEC 62439-3) MQTT HTTPS

GNSS Interface	
GNSS Receiver Multi-constellation 72-channel	L1-C/A (1575.42 MHz) GPS signal E1-B/C (1575.42 MHz) Galileo L1OF (1602 MHz) GLONASS B1 (1561.098 MHz) BeiDou Note: TCXO supports GPS, Galileo, and GLONASS or BeiDou simultaneously OCXO supports GPS, and GLONASS or BeiDou simultaneously
Antenna Connector Type	TNC (female), 50 Ω / Optional F-type (female), 75 Ω
Antenna Type	Active
Holdover Oscillator	TCXO (standard): 0.1 ppm (approx. 8.64ms/24hrs) typical drift OCXO (optional): 1 ppb (approx. 8.64us/24hrs) typical drift
Tracking Sensitivity	-166dBm

Functional	
PTP Profiles	UDP 802.3 IEEE C37.238-2011 (Power Profile) IEEE C37.238-2017 (Power Profile) IEC 61850-9-3 (Utility Profile) Telecom G.8265.1 Telecom G.8275.1 Telecom G.8275.2 Custom
Alarm Dry Contact	Type C / Breaking Capacity: 300mA @ 300V dc (resistive load)
Additional Features	Built-in SNMP agent, with trap generation User-configurable rules for daylight saving time (DST) Antenna cable open and short-circuit detection PPS/PPM signal Syslog

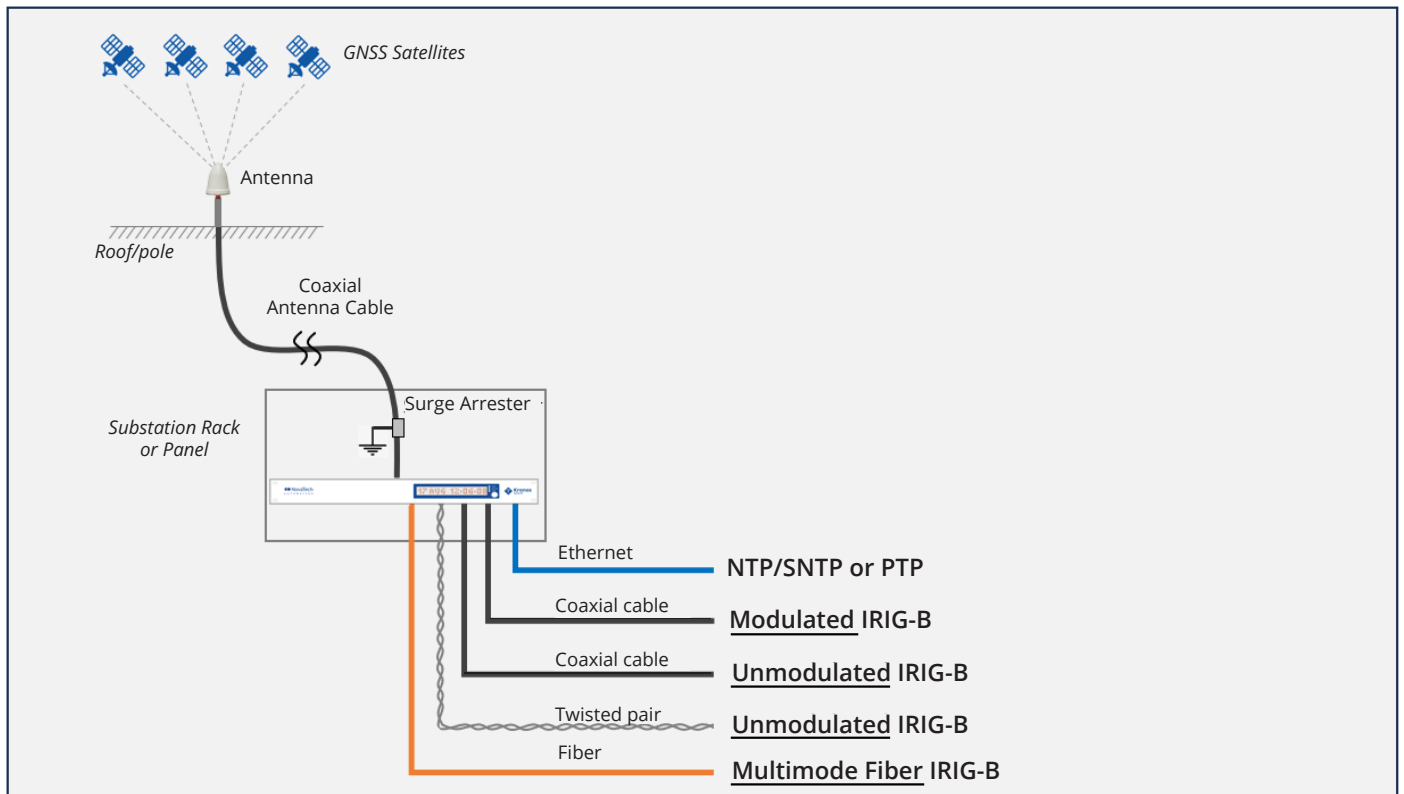| Export Information	
Country of Origin	USA
HS Code	8517.62

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Product Diagram

Display

LED Indicators

Interactive Knob

Ground Stud

Optional Redundant Power Supply

Power Supply

SFP Slots

Alarm Output

Reset Button

RJ45 Ethernet

TNC Antenna

Output Expansion Slots (See ordering info)

Optional F-Type Antenna (See ordering info)

Application Diagram

GNSS Satellites

Antenna

Roof/pole

Coaxial Antenna Cable

Substation Rack or Panel

Surge Arrester

Ethernet — **NTP/SNTP or PTP**

Coaxial cable — **Modulated** IRIG-B

Coaxial cable — **Unmodulated** IRIG-B

Twisted pair — **Unmodulated** IRIG-B
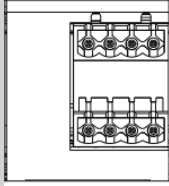
Fiber — **Multimode Fiber** IRIG-B
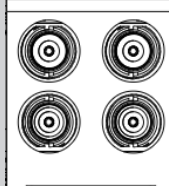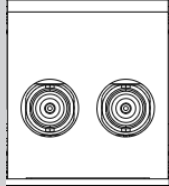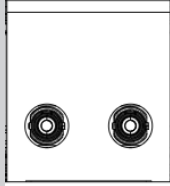
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Ordering Information

Output Expansion Cards

Card P/N	-1	-2	-4	-F	-A
Type	Unmodulated	Unmodulated	Unmodulated	Modulated	Multimode Fiber
Connectors	1 BNC + Compression screw terminal	Compression screw terminal	4 BNC	2 BNC	2 ST
IRIG Formats	B000/2/4/6	B000/2/4/6	B000/2/4/6	B120/2/4/6	B000/2/4/6
Output Power	1 x 200mA	2 x 200mA	4 x 200mA	2 x 200mA	-15.8dBm in 50/125µm fiber
Diagram					

Model Builder (Excluding Accessories)

Model	Power Supply 1	Power Supply 2	Oscillator	Antenna Connector	Expansion Card 1	Expansion Card 2	Expansion Card 3	Description
Kronos 3R				[ ]				Rack mount satellite clock, includes 1 RJ45, 4 SFP Slots, 10' coax cable and surge arrestor
	HV	HV						80-300V dc/85-264V ac Power Supply
	LV	LV						18-60V dc Power Supply
		XX						No Redundant Power Supply
			TCXO					Standard Temperature Compensated Oscillator
			OCXO					Optional Oven-Controlled Oscillator
				[ ]				Standard TNC connector [no digits added to Model #]
				[F75]				Dual antenna connectors (TNC and F-type, available to use either)
					A	A	A	Dual Modulated Output Card
					1	1	1	Single Unmodulated Output Card
					2	2	2	Dual Unmodulated Output Card
					4	4	4	Quad Unmodulated Output Card
					F	F	F	Dual Fiber Output Card
					X	X	X	Empty Expansion Slot (note: Must fill in order)

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Ordering Information

Accessories (Append to Model #)

Optional SFP Transceivers up to 4 total — X represents quantity for each type [bracketed items only inserted if at least 1 is selected]				Antenna	Antenna Cable	Antenna Mount	Description
[ ] -	[ ] -	[ ] -	[ ] -	-		-	
[MM1X] -	-	-	-	-	-	-	SFP-MM01, Multimode, LC, 550m, 850nm, 1Gbps
	[SM1X] -	-	-	-	-	-	SFP-SM01, Single Mode, LC, 10km, 1310nm, 1Gbps
		[SM4X] -	-	-	-	-	SFP-SM04, Single Mode, LC, 40km, 1310nm, 1Gbps
			[RJ1X] -	-	-	-	SFP-RJ01, RJ45, 100m, 1Gbps
				AU -	-	-	Universal Antenna
				XX -	-	-	No Antenna
					C015 -	-	Antenna Cable 15' (4.5m) – RG58
					C030 -	-	Antenna Cable 30' (9m) – RG58
					C050 -	-	Antenna Cable 50' (15m) – RG58
					C080 -	-	Antenna Cable 80' (25m) – RG58
					C200 -	-	Antenna Cable 200' (60m) – LMR400
					XXXX -	-	No Antenna Cable
						MT	Antenna Mount for Universal Antenna (AU)
						XX	No Antenna Mount

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