Kronos Series 3 Satellite Clock

Introducing the Kronos Series 3 Satellite Clock, specifically designed for applications in power systems. Key features include high precision, multi-constellation support, output flexibility, and Ethernet integration. Kronos clocks are backed by the same NovaTech Automation sales and support policies as Orion and Bitronics products.

Kronos Series 3R Rack Mount

High Precision
The Master Clock supports IEEE1588-2008v.2 grandmaster functionality, and is available with standard temperature controlled crystal oscillator (TCXO) or optional oven controlled crystal oscillator (OCXO). It achieves 60 ns (99%) maximum time deviation. Antenna cable-delay compensation further enhances accuracy.

Multi-Constellation Support
Kronos is more than just a GPS clock; it can lock onto any of the GNSS constellations: GPS, GLONASS, BeiDou, or Galileo. This means more assurance of a fast lock and less time in holdover.

Output Flexibility
- Unmodulated IRIG-B over twisted pair, coax, or fiber
- Modulated IRIG-B over coax
- PPS or PPM signals
- NTP/SNTP
- IEEE1588-2008V.2 (PTPv2)

Ethernet Integration
Kronos supports browser-based configuration and SNMP. Can synchronize any ethernet device over PTPv2 and/or NTP/SNTP in a simple or PRP/HSR network. Port bonding is available.

	Kronos Series 3R
Mounting	19” rack
Front panel height	1 RU
Isolated unmodulated outputs	Up to 8
Amplitude modulated outputs	Up to 8
Optical fiber outputs	Up to 8
Ethernet ports	4 SFP slots (copper or fiber) + 1 Gigabit RJ45 port for configuration and monitoring
NTP/SNTP support	Yes
PTP/IEEE1588-2008v.2 support	Yes (optional)
PRP/HSR (IEC 62439-3) support	Yes
Holdover oscillator	TCXO (standard) or OCXO (optional)
IRIG-B with C37.118 extensions	B000/B002/B004/B006, B120/B122/B124/B126
PPS signal	Yes
PPM signal	Yes
Alarm dry contact	Yes
Redundant power supply	Optional
Operating voltages	18-72V dc or 80-300V dc / 86-264V ac (50/60 Hz)
Max power consumption	15 VA
Unit dimensions	19”W x 1.73”H x 6”D (483 x 44 x 152mm)
Unit weight	5.5 lb (2.5kg)

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Specifications

GNSS Receiver

Multi-constellation 72-channel GPS, GLONASS, BeiDou, Galileo receiver

- L1-C/A (1575.42 MHz) GPS signal
- E1-B/C (1575.42 MHz) Galileo
- L1OF (1602 MHz) GLONASS
- B1 (1561.098 MHz) BeiDou
- Antenna cable delay compensation
- -166dBm tracking sensitivity
- Single-satellite operation supported
- Antenna cable open and short-circuit detection
- Time pulse accuracy (99%)
  - PPS 60ns
  - NTP 100µs
  - PTP 100ns

Holdover Oscillator

- Typical drift
  - TCXO: 0.1 ppm
  - OCXO: 1 ppb
- User-defined out-of-bounds alarm

Dot Matrix Display

- 5.0" x 0.7" (127 x 18mm) "hyper red" (630nm) LED
- User-configurable content: date, time and/or time zone / offset
- Clear text alarm messages

Daylight Savings Time

- Pre-defined DST rules for North America, Brazil, Europe
- Custom rules

Alarm Dry Contact

- Normally closed, Type B
- Breaking capacity: 300 mA @ 300 V dc (resistive load)

Power Supply

- Operating voltages: 18–72V dc or 80–300V dc /85–264V ac (50/60 Hz)
- 15VA power consumption

Environmental

- -40°C to +85°C (-40°F to +185°F)
- 5% to 95%, non-condensing
- IP40-rated enclosure protection

Outputs

Isolated unmodulated

- 200 mA drive capability at 5V level
- Up to 160 ft. (50 m) cable
- 15 Ω output impedance
- Fully-isolated

Fiber optic

- 820nm wavelength
- Optical power: -15.8 dBm into 50/125 µm fiber (-12 dBm into 62.5/125 µm fiber)
- ST connectors

Amplitude modulated

- IRIG-B124 enconding
- 5V pp (no load) / 3.2V pp (50 Ω load) output voltage
- 25 Ω output impedance
- BNC connectors

Ethernet

- 1 RJ45 10/100/1000 Ethernet port
- 4 SFP slots
- DHCP client support
- VLAN IEEE 802.1Q support
- Embedded NTP/SNTP server
- SNMP v1, v2c, v3 agent support
- PRP/HSR support

Bonding Link Aggregation

- Round-robin: alternate network packets over both interfaces
- Active-backup
- Broadcast: all packets are sent over both interfaces

Antenna

- L1 antenna for GPS, Galileo, GLONASS, and Beidou
- High gain, low noise, high out-of-band rejection, robust anti-jamming design
- Built-in lightning protection meeting/exceeding IEC 61000-4
- Ruggedized IP67 enclosure
- Operating temperature -40°C to +90°C (-40°F to +194°F)

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