

New Cesium-Less ePRTC360+ Solution

Resilient GNSS and GEO Holdover Clock System for Secure Critical Infrastructure



NEW CESIUM-LESS ePRTC360+ SOLUTION

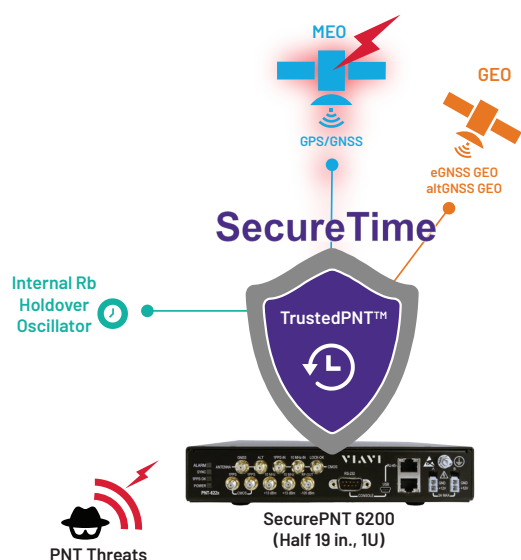
Defense | 5G Comms | Transportation | Data Center | Energy | Financial

The Need for an Alternative Cesium-Less ePRTC Solution Compliant with ITU-T G.8272.1 Standard

Traditional Cesium based ePRTC systems, combining a Cesium clock with a GNSS Grandmaster, deliver $<\pm 100$ ns holdover accuracy for up to 14 days during GNSS disruptions—meeting the ITU T G.8272.1 standard—and up to 100 days for some enhanced models. However, Cesium clocks are expensive, limiting their use mainly to core networks. They are also sensitive to shock, require export licenses, long GNSS learning periods (up to 40+ days), strict handling and storage procedures, tube replacement every 7 years, and special disposal due to their hazardous material content.

Resilient ePRTC360+ Clock Solution Deployable Across Affordably Core/Midhaul/Edge Networks

Successfully tested in real-world defense and commercial GNSS jamming and spoofing environments, the patent-pending ePRTC360+™ solution delivers $<\pm 100$ ns holdover accuracy for over 360 days—with no limit thereafter. It provides a resilient, affordable, and easy to deploy alternative across sync networks, from core to midhaul to edge. The ePRTC360+ eliminates traditional Cesium clock constraints while enhancing holdover reliability and sync robustness through distributed deployment, where each remote ePRTC360+ clock can back up others via PTP feeds during local interference threats.



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Features

- < ±100 ns holdover accuracy for 360+ days, with no limit thereafter
- Compliant with the ePRTC holdover mask according to the ITU-T G.8272.1 standard (±30 ns initially, ±100 ns after 14 days)
- Resilient GEO timing signals: GNSS-independent and UTC traceable
- SecureTime altGNSS GEO-L helical antenna, using highly directional signal reception with up to 40 db filtering attenuation for anti-jamming capability
- Enhanced GNSS antenna, receiving exclusive eGNSS GEO service for GPS/GNSS NMA authentication capability to detect/mitigate spoofing threats

Benefits


- Affordable, patent-pending Cesium-less ePRTC360+ clock solution
- Resilient GEO holdover signals, successfully tested in real-world jamming and spoofing environments
- Distributed ePRTC360+ clocks across core/midhaul/edge networks, boosting sync network robustness and holdover reliability via meshed PTP backup feeds between clocks
- Rapid, easy deployment, eliminating Cesium clock constraints
- Seamless replacement of an end-of-life Cesium clock at the core with multiple distributed ePRTC360+ clocks across the network—all at the same cost of a single Cesium clock



Typical Specifications

Alternative Cesium-Less ePRTC360+™ (enhanced Primary Reference Time Clock) Solution

A Simple Combination of Three Resilient Products

1	SecurePNT™ 6260L Clock	
<p>1 PPS output Stability with GNSS and Resilient SecureTimeSM altGNSS GEO-L Service</p>		<±5 ns p2p ¹ RMS GPS/GNSS locked
		< ±50 ns p2p ¹ altGNSS GEO-L locked to Fugro AtomiChron service on Inmarst
		< ±2.5 ns p2p ¹ RMS eGNSS GEO-L locked to Fugro AtomiChron service on Inmarsat
<p>Patent-pending ePRTC360+™ Holdover Technology</p>		<p>SecureTime altGNSS GEO holdover service² when GPS/GNSS is lost or jammed and/or spoofed. Holdover performance:</p> <ul style="list-style-type: none"> Initially: < ±30 ns¹ when entering into holdover After 14 days: < ±100 ns¹ for 360+ days, with no limit thereafter
		<p>Smart GPS/GNSS and SecureTime altGNSS GEO-L disciplining and switching technology with an internal Rb oscillator, exceeding the ITU-T G.8272.1 ePRTC standard</p>
<p>Patented μPNTranscoder™ (multisource-to-GPS transcoder)</p>		<p>GPS L1 C/A RF output signal to retrofit legacy GPS/GNSS grandmaster clocks</p>
<p>NMEA Messages</p>		<p>USB and RS-232 connectors, GGA, RMC, ZDA, GSV, PASHR, GSA</p>
GPS/GNSS Receiver		
<p>Multifrequency</p>		<p>L1, L2, L3, L5</p>
<p>Constellations</p>		<p>GPS/Galileo (SBAS)/GLONASS/BeiDou/QZSS/NAVIC</p>
Tracking Performance (C/N0 Threshold)		
<p>Acquisition</p>		<p>33 dB-Hz</p>
<p>Tracking</p>		<p>20 dB-Hz</p>
TTF		
<p>Cold Start</p>		<p><45 sec</p>
<p>Warm Start</p>		<p><20 sec</p>
<p>Reacquisition</p>		<p>1 sec</p>
GEO-L LEO Receiver		A VIAVI leading-edge design
<p>Sensitivity</p>		<p>-100 dBm tracking</p>
<p>TrustedPNT™ Technology</p>		<p>Smooth, seamless multi-orbit switchover between GNSS (4 frequencies) and GEO timing reference after authenticating, verifying, and qualifying multi-orbit sources based on a zero-trust architecture that adheres to the “never trust, always verify” principle.</p>

¹Traceable to UTC/NIST

²With GEO-L receiver

A Simple Combination of Three Resilient Products

Outputs

10 MHz	2x +13 dBm 10 MHz sine wave, low phase noise option
Accuracy	<1xE-13 after 30 minutes with GNSS augmented by eGNSS GEO service
1 PPS	2 x 1 PPS Outputs via SMA (Coax)(>1K Load), 3.3 V 1 x 1 PPS Input, SMA, >1 K Load
Frequency	10 MHz
Stability Over Temperature (holdover mode)	-10° to +75°C: ±5E-011 Rb option
Spurs	<-110 dBc/Hz

Power and Consumption

Supply Voltage (Vdd)	
Power Consumption	Single or Dual redundant +12 V DC inputs <10 W (DOCX0 variant)

Environmental

Operating Temperature Range	-25°C to +75°C, forced air environment
Storage Temperature Range	-45°C to +85°C

Mechanical



Size	Half 19 in. width, 1.64 in. x 8.53 in x 8 in., (H x W x D)
Weight	1.5 lbs

Connections

RF Antenna (One for STL, One for GNSS)	SMA (antenna power enable controls on both ports)
10 MHz In/Out, 1 PPS In/Out, TTL Status	SMA
In Situ Firmware Updates	Fully field-upgradeable through USB or RS-232 serial ports

Typical Specifications

Alternative Cesium-Less ePRTC360+™ (enhanced Primary Reference Time Clock) Solution

A Simple Combination of Three Resilient Products	
<p>2 SecureTime™ altGNSS GEO-L Helical Antenna</p>	
<p>VIAVI's Leading-Edge Antenna Design</p>	<p>SecureTime altGNSS GEO-L helical antenna, using highly directional signal reception with up to 40db attenuation for anti-jamming capability. Detailed data sheet available on VIAVI website.</p>
<p>3 Enhanced GNSS Antenna with SecureTime™ eGNSS GEO-L Service Reception</p>	
<p>Augmented Antenna Design</p>	<p>Triple-band GNSS antenna with enhanced eGNSS GEO-L service reception for GPS/GNSS NMA authentication capability to detect and mitigate spoofing threats. Detailed data sheet available upon request.</p>



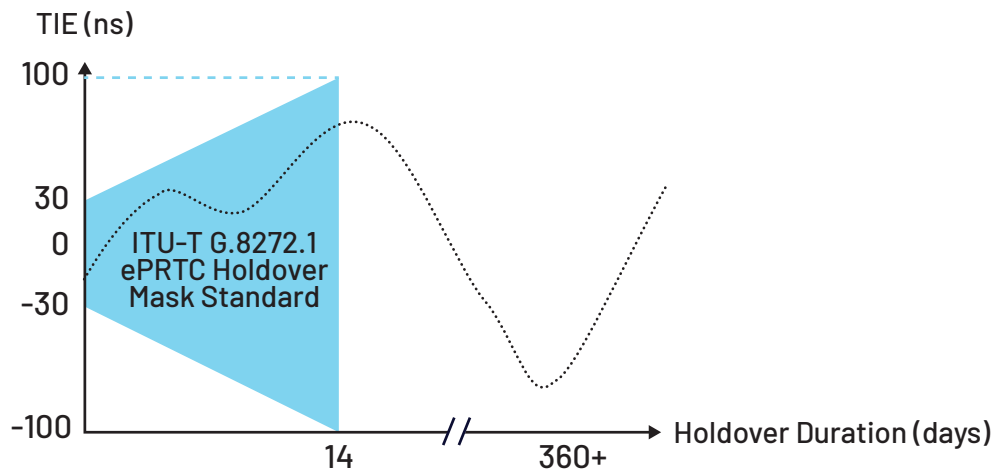
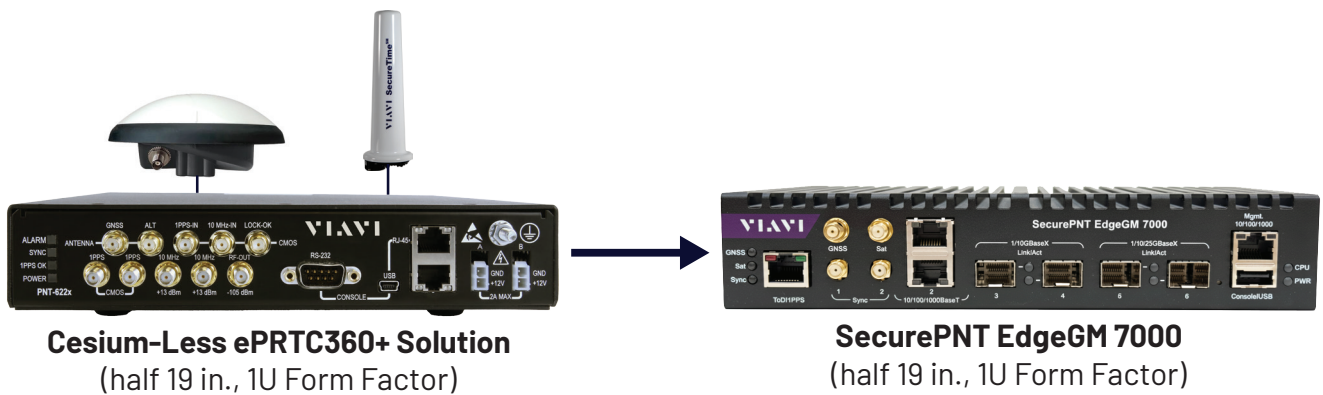
SecurePNT 6200 Series Compliance List

Compliance Mark	Other
CB: Scheme International Safety	NEBS GR 1089-CORE
CE: EU Safety and EMC	EN 61000-3-2 harmonic emission
FCC: USA EMC	EN 61000-3-3 voltage fluctuations and flicker emissions
RCM: Australia/New Zealand EMC	EN 61000-4-11 voltage dips and interruptions
Emissions	Safety
FCC Part 15 (Class A)	IEC 62368-1
ICES 003 (Class A)	EN 62368-1
ETSI EN 300 386	Directives
Immunity	Safety Directive 2014/35/EU
ETSI EN 300 386	EMC Directive 2014/30/EU
ETSI EN 301 489-1	Radio Equipment Directive (RED) 2014/53/EU
ETSI EN 301 489-19	RoHS Directive 2011/65/EU and the (EU) 2015/863 amendment
EN 61000-4-2 ESD	
EN 61000-4-3 radiated immunity	
EN 61000-4-4 EFT	
EN 61000-4-5 surge	
EN 61000-4-6 low-frequency common immunity	
CISPR 32	
EN 55032	
ETSI EN 303 413	
ETSI EN 301 489-1	
ETSI EN 301 489-19	

TYPICAL USE CASES

Case 1

Combining a VIAVI Cesium-less ePRTC360+™ solution with a VIAVI Grandmaster (GM) clock delivers exceptional holdover and multi-orbit switchover performance during GPS/GNSS jamming and spoofing. These capabilities have been successfully validated through real-world sky tests in defense and commercial environments.



Simplified Cesium-Less ePRTC360+ Performance

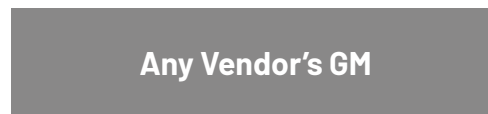


Case 2

Same as Case 1 but combining a VIAVI alternative Cesium-less ePRTC360+™ solution with any vendor's grandmaster (GM) clock.



Cesium-Less ePRTC360+ Solution
(half 19 in., 1U Form Factor)

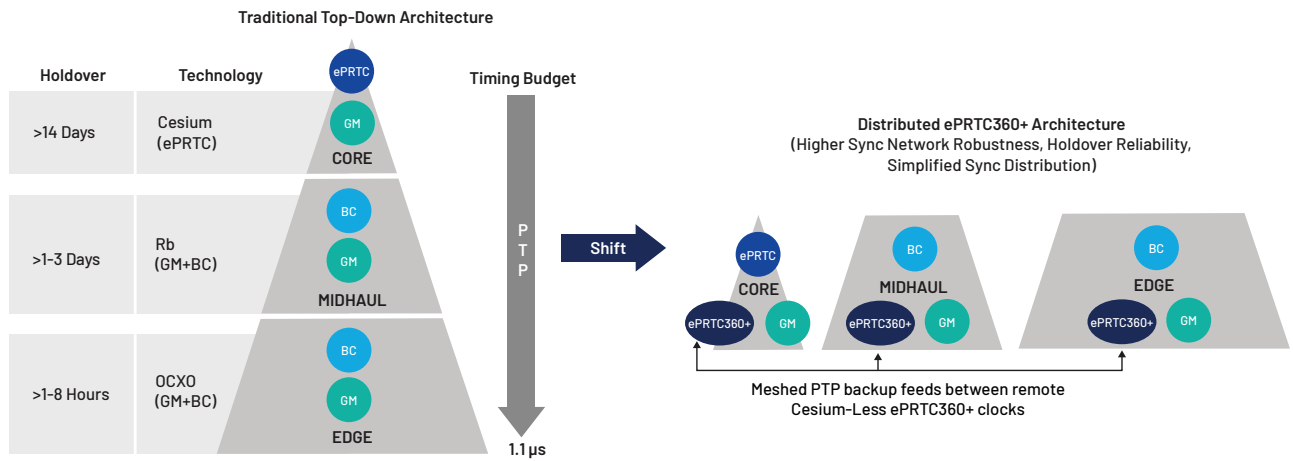


(Various Form Factors)


Case 3

The need for VIAVI Cesium-less ePRTC360+™ clocks to protect critical infrastructure from escalating GPS/GNSS jamming and spoofing threats.

The Benefits of Shifting from Traditional Centralized Cesium ePRTC at the Core to Distributed Cesium-Less ePRTC360+ across Your Network



2254-900-0226



Request your Alternative Cesium-Less eRPTC360+™ demo unit today to start your successful proof of concept for safeguarding your critical infrastructure from increasing jamming and spoofing threats.





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