Brochure

New Cesium-Less ePRTC360+ Solution

Resilient GNSS and GEO Holdover Clock System for Secure Critical Infrastructure

NEW CESIUM-LESS ePRTC360+ SOLUTION

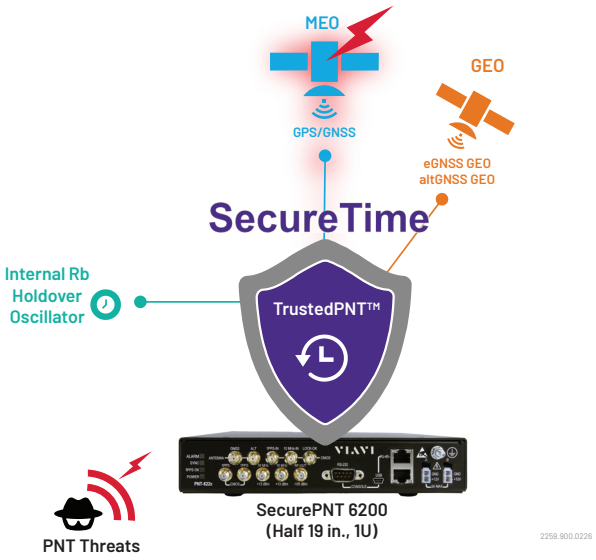
Defense | 5G Comms | Transportation | Data Center | Energy | Financial

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 <±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 <±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.



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**	
1 PPS output Stability with GNSS and Resilient SecureTime℠ altGNSS GEO-L Service	<5 ns[1] RMS GPS/GNSS locked
	<70 ns[1] p2p altGNSS GEO-L locked to Fugro AtomiChron service on Inmarst
	<2.5 ns[1] RMS eGNSS GEO-L locked to Fugro AtomiChron service on Inmarsat
Patent-pending ePRTC360+™ Holdover Technology	SecureTime altGNSS GEO holdover service[2] when GPS/GNSS is lost or jammed and/or spoofed. Holdover performance: • Initially: <+30 ns[1] when entering into holdover • After 14 days: <+100 ns[1] for 360+ days, with no limit thereafter
	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
Patented µPNTranscoder™ (multisource-to-GPS transcoder)	GPS L1 C/A RF output signal to retrofit legacy GPS/GNSS grandmaster clocks
NMEA Messages	USB and RS-232 connectors, GGA, RMC, ZDA, GSV, PASHR, GSA
GPS/GNSS Receiver	
Multifrequency	L1, L2, L3, L5
Constellations	GPS/Galileo (SBAS)/GLONASS/BeiDou/QZSS/NAVIC
Tracking Performance (C/NO Threshold)	
Acquisition	33 dB-Hz
Tracking	20 dB-Hz
TTF	
Cold Start	<45 sec
Warm Start	<20 sec
Reacquisition	1 sec
GEO-L LEO Receiver	A VIAVI leading-edge design
Sensitivity	-100 dBm tracking
TrustedPNT™ Technology	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.

[1]Traceable to UTC/NIST

[2]With 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	<±0.2E-010 after 20 min with GNSS
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 (DOCXO 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	
2 **SecureTime™ altGNSS GEO-L Helical Antenna**	
VIAVI's Leading-Edge Antenna Design	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.
3 **Enhanced GNSS Antenna with SecureTime℠ eGNSS GEO-L Service Reception**	
Augmented Antenna Design	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.

SecurePNT 6200 Series Compliance List

Compliance Mark
CB: Scheme International Safety
CE: EU Safety and EMC
FCC: USA EMC
RCM: Australia/New Zealand EMC
Emissions
FCC Part 15 (Class A)
ICES 003 (Class A)
ETSI EN 300 386
Immunity
ETSI EN 300 386
ETSI EN 301 489-1
ETSI EN 301 489-19
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

Other
NEBS GR 1089-CORE
EN 61000-3-2 harmonic emission
EN 61000-3-3 voltage fluctuations and flicker emissions
EN 61000-4-11 voltage dips and interruptions
Safety
IEC 62368-1
EN 62368-1
Directives
Safety Directive 2014/35/EU
EMC Directive 2014/30/EU
Radio Equipment Directive (RED) 2014/53/EU
RoHS Directive 2011/65/EU and the (EU) 2015/863 amendment

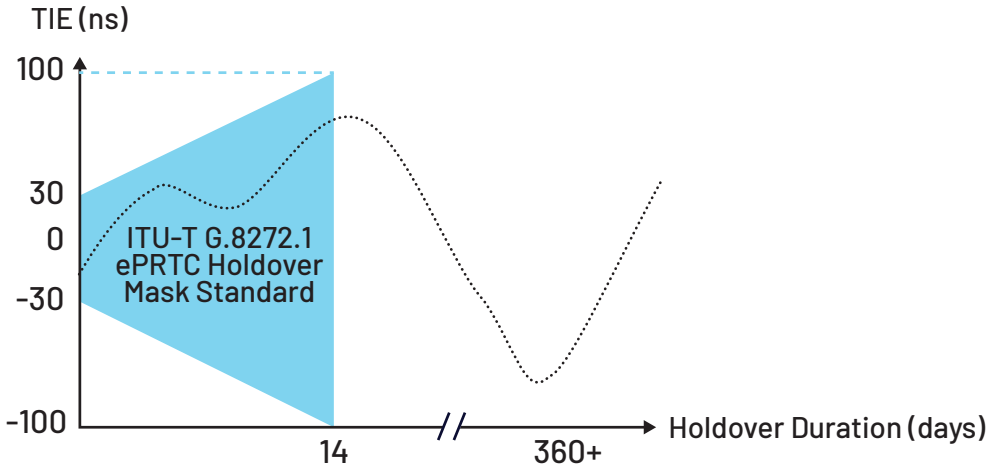
TYPICAL USE CASES

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.

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

SecurePNT EdgeGM 7000
(half 19 in., 1U Form Factor)



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.

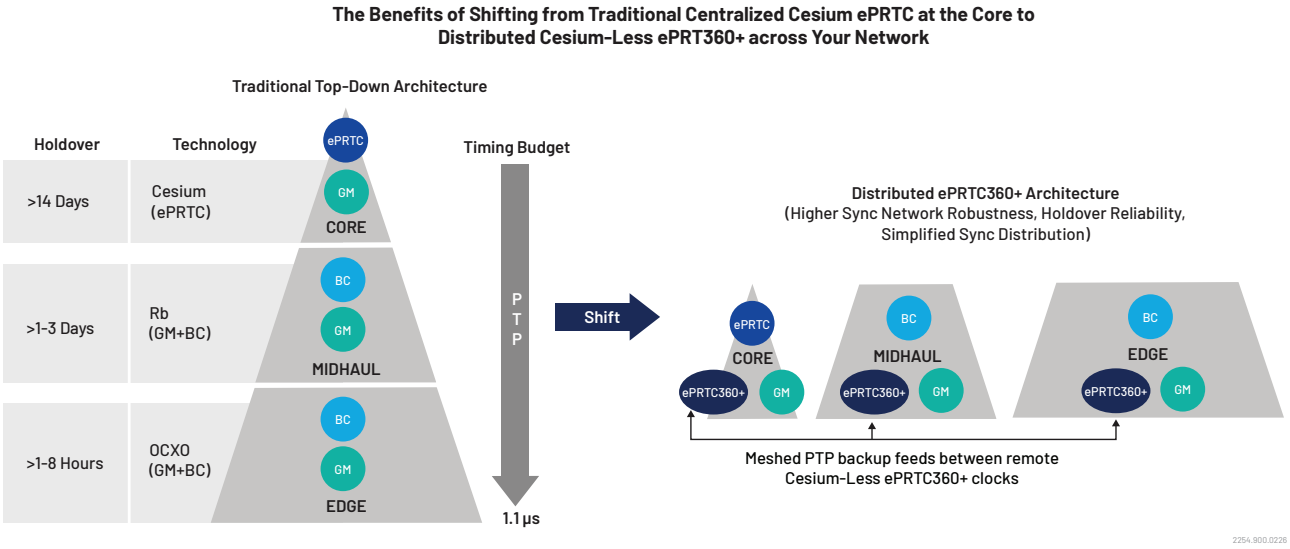
Cesium-Less ePRTC360+ Solution
(half 19 in., 1U Form Factor)

Any Vendor's GM

(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.



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.

viavisolutions.com

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