SAVITRI
TELECOM SERVICES

Cesium Primary Reference Source
TimeCesium 4500

The TimeCesium® 4500 is an autonomous Primary Reference Source based on the latest Cesium III technology from Microchip. It is designed for telecom network operators to generate superior and highly reliable Stratum I synchronization signals for advanced network services.

Plug and Play in Less Than 45 Minutes

The TimeCesium 4500's architecture uses the latest digital technology to provide superior performance and maintenance-free operation. The TimeCesium 4500 is easy to install and is fully operational in less than 45 minutes. Its plug and play architecture provides highly reliable operation over the lifetime of the system.

Network Applications

The TimeCesium 4500 is used to equip core network offices with Stratum 1 synchronization.

The deployment of TimeCesium 4500 sources across the network provides the following benefits:

- Flattens the sync distribution hierarchy
- Lowers the overall OAMP costs
- Reduces the number of network recovery clocks (TSG/SSU) operating in tandem
- Minimizes pointer adjustments caused by frequency errors in the SONET/SDH payload
- Prevents up-stream network clock errors to propagate across the network
- Enhances overall network perfor-mance
- Provides total control of your network synchronization source

KEY FEATURES

- State-of-the-art Cesium III beam tube technology
- Autonomous Stratum 1 primary reference source
- No antenna installation required
- Rear access ANSI shelf
- DS1, E1, 2048 kHz G.703/13, 10 MHz, 5 MHz, 1.544 MHz and composite clock outputs

KEY BENEFITS

- Maintenance-free (8-year warranty on Cesium tube)
- Plug and play; less than 45 minutes of installation
- Flattens the sync distribution hierarchy
- Lowers the overall Operation Administration Maintenance and Provisioning (OAMP) costs
- Enhances network performance and provides total control of your network synchronization source
- Prevents upstream clock errors from propagating across the network

Standards Compliance

The TimeCesium 4500 meets or complies with the following industry standards:

Electromagnetic Compatibility (EMC)
- ETSI EN 300 386 V1.6.1 (2012-09)
- EMC Directive 2014/30/EU

Safety Certifications
- IEC 62368-1 (Second Edition)
- Low Voltage Directive 2014/35/EU

Environmental Compliance
- EU Directive 2015/863 Reduction of Hazardous Substances (RoHS)
- ETSI EN 300 019
- 2-1 Storage, Class T1.2
- 2-2 Transportation, Class T2.3
- 2-3 Operational, Class T3.2

Telecom
- ITU-T K.20 7.2 (shielded cable to Earth)
- ITU-T G.811.1 ePRC Standard
- ITU-T G.8272.1 compliance when used with Microchip TP4100 with ePRTC license
- 1 sigma holdover compliance - PRS4500
- 2 sigma holdover compliance - PRS-4500-EP

Specifications

Performance
- Accuracy (over environment): $\leq \pm 1 \times 10^{-12}$

Stability

Average Time

Part Number		
	PRS-4500	**PRS-4500-EP**
1 s	$1.2E^{-11}$	$1.2E^{-11}$
10 s	$8.5E^{-12}$	$4.4E^{-12}$
100 s	$2.7E^{-12}$	$1.4E^{-12}$
1000 s	$8.5E^{-13}$	$4.4E^{-13}$
10000 s	$2.7E^{-13}$	$1.4E^{-13}$
100000 s	$8.5E^{-14}$	$4.4E^{-14}$

- Warm-up time (typical): 30 minutes

Ordering Information

Part Number	RoHS 3 Status
PRS-4500	Noncompliant
PRS-4500-EP	Noncompliant

Outputs

- Telecom signals: Two framed or unframed
- Framed (AMI)
  - 1544 kbps: ANSI T1.102 DS1 selectable framing: SF(D4) or ESF, with Stratum 1 Sync Status Message (SSM)
  - Format: Framed all ones, B8ZS
  - 2048 kbps: ITU-T Rec.G.703/9 (E1) with G.704 framing and with Stratum 1 Sync Status Message (SSM)
  - Format: Framed all ones, HDB3
- Unframed
  - 1544 kHz G.703/13
  - 2048 kHz G.703/13
  - Composite clock G.703/4
- Connectors
  - DE9 for balanced signal
  - CC, 133Ω
  - T1, 100Ω
  - E1, 120Ω
  - BNC for unbalanced signals, 75Ω
- Sinusoidal signals
  - 1 at 5 MHz, 10 MHz
  - 1 VRMS/50Ω, BNC

General

- Power requirements: Dual redundant DC inputs
- Operating voltage: –48 Vdc nominal (–36 Vdc to –62 Vdc)
- Power
  - Operating: 40W
  - Warm-up: 55W
- Interface connections
  - External DC inputs, A and B: #6 screw terminal block
  - RS232: 9-pin male D-connector
  - Chassis ground, A and B: #6 screw terminal block
  - Alarm (critical and minor): #6 screw terminal block
- Fuses: External DC input 2A, 250V, slow acting
- Dimensions
  - Width: 18.2" (46.2 cm)
  - Depth: 10.2" (25.7 cm)
  - Height: 10.5" (26.67 cm)
  - Weight: 36.5 lb (16.6 kg)
  - Mounting: Mounting ears provided for 19" (48 cm) or 23" (58 cm) racks

Environment

- Temperature
  - Operating: –5°C to +50°C
  - Non-operating: –40°C to +70°C
- Humidity: 95%, non-condensing