TCA6000 and TCA6500 Timing Client

PTP and NTP Client for the Network Edge

Product Overview

TCA6000 and TCA6500 Timing Clients break ground as Precision Time Protocol (IEEE1588-2008, or PTP) timing clients. These products allow mobile service operators to provide the timing and synchronization required at the radio access network edge to enable carrier-class IP backhaul. With the TCA6000 line of timing clients, the operator can be assured that call handoffs are seamless in and among 2G/3G/4G base stations and across the IP/Ethernet backhaul network. The TCA6000 line provides a seamless migration path for operators looking to capitalize on the efficiencies of IP/Ethernet as bandwidth demands explode, while seamlessly supporting legacy T1/E1 backhaul environments.

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Product Description

Juniper Networks® TCA6000 and TCA6500 Timing Clients are carrier-class, compact, network timing clients that deliver multiple synchronous outputs in a cost-efficient and flexible platform. Designed as a network edge timing device, the TCA6000 line accurately recovers ITU Stratum timing over IP networks when used in conjunction with Juniper Networks TCA8000 or TCA8500 Timing Servers, Four output signals are available in the following formats—2x T1/E1, PPS/PPM/PP2S, and 10/5/1 MHz. In addition to delivering accurate synchronization at the network edge, the TCA6000 line supports Key Performance Indicators (KPIs) that include one-way and round-trip jitter and latency measurements with a resolution of ± 1-3 microseconds. The TCA6500 Timing Client is also equipped with a GPS receiver to provide higher accuracy (<± 1 microsecond) measurements, while also acting as a backup source for synchronization.

The TCA6000 line can be mounted in either a 19 or 23 in rack, requiring 1 RU for 2 units mounted side-by-side.

Features and Benefits

Features

- Compact and flexible form factor
- Multiple system outputs, including T1/E1, PPS, PPM, PP2S, and 10/5/1 MHz
- System status via LEDs
- Integrated Web server
- Telnet, SNMP, and MIB support
- 10/100BASE-T Ethernet interfaces

Benefits

- Cost-effective distributed timing option
- Service-level agreement (SLA) assurance and KPI monitoring
- Ease of management
- Reduced installation costs

TCA6000

TCA6500

Specifications

General

- GR-1244
- ITU G.823
- ANSI T1.101

Internal Oscillator

- OCXO

Communications

- RS-232 (RJ-45)
- Ethernet (RJ-45), 10/100BASE-T, IEEE 802.3

Receiver Options (TCA6500 only)

- GPS receiver (L1)
- 12 channel, parallel tracking
- L1 (1575.42 MHz) frequency

System Inputs

- IEEE1588-2008 (PTP version 2)
- GPS RF cable (TCA6500 only)
  - LNA power: 3.3/5 VDC software selectable (only with GPS option)

System Outputs

- Number of system outputs: 4

T1/E1

- Number of T1/E1 outputs: 2

T1 port format

- Transmit Bit Rate: 1.544 Mbps (G.704)
- Line Coding: B8ZS, or 1.544MHz
- Framing: Extended Super Frame (ESF) or Super Frame (SF) with or without SSM
- Connector: RJ-48C, 100 ohm

Note: If you select 1.544MHz Coding, framing and SSM configuration will be ignored

E1 Port Format

- Transmit Bit Rate: 2.048 Mbps (G.704)
- Line Coding: HDB3, or 2.048MHz
- Framing: CRC4, or No-CRC4 with or without SSM
- Connector: RJ-48C, 120 ohm

Note: If you select 2.048MHz Coding, framing and SSM configuration will be ignored

Frequency Output

- Number of 10/5/1 MHz outputs: 1 (software selectable)
- Connector BNC, 50 ohm

PPx Output

- Number of PPx outputs: 1
- Format: PPS, PP2S, PPM, PPH
- Signal type: TTL, Pulse
- Connector: BNC, 50 ohm

Frequency/Timing Accuracy

- Locked to GPS (TCA6500 only)
  - Frequency: 1×10^{-12} per month
  - Timing: ±100 ns to UTC
- Locked to PTP timing server
  - Frequency: 1.5 ppb
  - Timing: <±1.5 µsec to UTC
- Holdover Accuracy
  - 7.0×10^{-10}: 24 hour stability

Physical

- Dimensions (W x H x D):
  - 8.5 x 1.75 x 10.5 in (21.59 x 4.45 x 26.7 cm)
- Rack mountable
- Power: 48 VDC nominal (18 to 60 VDC); dual feeds (redundant); AC option via adapter
- Operating temperature: -40º to +144º F (-40º to +65º C)
- Operating altitude—15,000 feet (4,500 meters) maximum
- Humidity: 0% to 85% noncondensing
- EMC: FCC Part 15, Class A, CE
- Safety: TÜV, North America and Europe
- RoHS: Level 6

Management

- Alarms: Critical, major, minor (LED)
- Local or remote
- Embedded Web server GUI
- Telnet/SSH/Craft command-line interface (CLI)
- Network management that can be performed through the Ethernet port
- SNMP v1/v2/v3

Protocols and Standards

- ANSI T1.101
- DiffServ/DiffServ code point (RFC 2474)
- GR-1244
- HTTP/HTTPS (RFC 2616)
- IPv4
- ITU G.812, G.813, G.823, G.824, G.703, G.704
- IEEE1588-2008 (PTP version 2)
- SMTP forwarding
- SNMP v1 (RFC 1157), v2 (RFC 1448), v3 (RFC 2271), MIB II (RFC 1213)
- SSH (RFC 4250-4254)
- SSL v1, v2, v3
- Telnet (RFC 854)
- TFTP (RFC 1350)
- 802.3

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Ordering Information

For more information about TCA6000 and TCA6500 Timing Clients, please visit or contact your Juniper Networks sales rep.

About Juniper Networks

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