Ts2 Clock
Multi-Sync Gateway

FEATURES

- Multiple holdover options
- Full IEEE 1588-2008 (PTP) Grand Master
- Telecom BC functionality
- Supports G.8262 Synchronous Ethernet
- ITU-T G.8265.1 Frequency, ITU-T G.
  - 8275.1 & G.8275.2 Time & Phase Profiles
- ITU-T G.8272 and G.8273.2 (T-BC)
- IEEE PC37.238 Power profile
- Supports 1-step & 2-step clock
- -48V DC power
- Remote provisioning & management
- (CLI, HTTP(S) and SNMP)
- 4 TDM Outputs Port Selectable T1/E1/2.048MHz SQ (with SSM)

APPLICATIONS

Precision sync platform designed for:

- 5G, ORAN, small cell clusters, C-RAN & neutral host deployments
- Smart grid transmission & distribution substations
- Mobile edge computing & enterprise
- Industrial IoT & factory automation applications
- Datacenters & financial applications

BENEFITS

- Small form-factor, designed for indoor deployments
- Highly scalable slave capacity
- Low power consumption
- High performance PTP clock
- Easy to deploy, user friendly management
- Configurable to operate in multiple modes:
  - PTP Grand Master
  - Boundary
  - Slave clock
- Position and location information to aid SAS and other locationbased services

Mobile operators are deploying small cells to build out their LTE and 5G networks. This is occurring in a variety of locations such as in urban canyons and indoors, where GNSS signals are weak or intermittent. TesCom's Ts2, a multi-sync gateway addresses the challenges of providing reliable and precise synchronization everywhere through IEEE 1588-2008 (PTP) and leveraging multiple sync references.

Ts2 is designed for deployment in distributed clustered architectures. In such deployments, timing resources are deployed close to the edge of the network in order to meet the phase and frequency precision requirements at the small cell or remote distributed or radio units (DU / RU). Deploying a centralized Grand Master with full onpath support to deliver high precision sync imposes significantly higher cost. Next generation networks require a more decentralized approach. The Assisted Partial Timing Support (APTS) architecture is designed for these networks to deliver precise phase and frequency to small cells in a scalable and cost-effective manner. Ts2 is highly field-scalable and designed for such edge oriented distributed architectures.

Ts2 provides IEEE 1588-2008 (PTP) Grand Master and Boundary Clock functionality at low total cost of ownership. It leverages TesCom's unique industry-leading PTP algorithms to deliver stringent timing for LTE-A, LTE-TDD, CBRS (USA), SxGP (Japan), private LTE and 5G architectures (both operator and private) and supports ITU-T G. 8265 and G.8275 frequency and phase profiles. The product features multiple oscillator options to deliver a range of holdover performance.

Ts2 utilizes GNSS (GPS, Beidou, GLONASS, QZSS and Galileo), PTP and Synchronous Ethernet as input references and generates PTP, SyncE and timing signals (frequency, 1PPS and ToD) as outputs. The Multi-Sync Gateway features dual 1 GbE ports for both copper RJ45 and optical connections. It provides all the relevant timing interfaces such as GNSS, 1 Pulse Per Second (1PPS), Time of Day (ToD) (input / output) and frequency (programmable output).

The true innovation in this product lies in its simplicity, high performance, scalability and cost effectiveness. The Ts2 has some unique features designed to make it easily manageable and provide resilient performance when reference sources are lost.

Technical Specifications

Synchronization Interfaces

- 1x GNSS L1 Antenna (SMA); 50 Ω impedance, 5V
- 1x 1PPS out (BNC)
- 1x Syntonized programmable frequency out (BNC)
  – 1.544 MHz, 2.048 MHz, 10 MHz
- 1x Time of Day (ToD) + 1PPS in/out (RJ45/RS442)
  ToD Format – configurable (ASCII (YYYY-MM-DD HH:MM:SS), NMEA, or China Mobile Binary format
- 2x IEEE 1588-2008 (PTP) 100Base-TX, 1000Base-T & 1000Base-X with Synchronous Ethernet (electrical RJ45 & optical SFP)
- 4 TDM Outputs Port Selectable T1/E1/2.048MHz SQ (with SSM)

IEEE 1588-2008 (PTP) Profiles

- PTP: L2: Ethernet; L3: UDP IPv4 / IPv6
- Default profile
- ITU-T G.8265.1 frequency delivery profile
- ITU-T G.8275.1 & G.8275.2 time/phase delivery profile
- Power profiles: IEEE PC37.238 & IEEE 61850
- TSN (802.1AS)*
- Enterprise profile*
- SMPTE*

GNSS

- GPS-only or GPS + [Beidou / GLONASS / Galileo / QZSS1]
- Phase accuracy (under ±100nsec from UTC) as per G.8272

Holdover Performance

- Phase holdover during GNSS outage achieved using a combination of
  PTP (in BC mode), syncE or local oscillator (details below):

Grade	Oscillator type	1.5 µs	5 µs	Frequency 16 ppb
Standard	OCXO	4 hrs	10 hrs	1 week
Superior	Super OCXO	8 hrs	15+hrs	1 month

Note: *These are approximate values assuming constant temperature and assuming equipment is in normal operation mode for considerable time.*

Scalability

- 450 [license/SKU options] slaves @ 128 packets per sec in unicast mode

Software Features

- DHCP client
- SSH server
- Serial terminal (console/craft)
- Remote firmware upgrade

Management

- 1x Management (10/100 Mbps, RJ45)
- CLI, HTTP(S), SNMP
- Remote login via SSH/Ethernet
- 1x mini USB console for local CLI access (craft interface)

Synchronous Ethernet (SyncE)

- Ethernet Synchronization Message Channel (ESMC)
- Support on both Ethernet interfaces (electrical and optical)

LEDs

- Power status, GNSS acquisition & sync status

Power Supply

- Supply: 28 - 40 VAC or 36 - 60 VDC
- Power consumption: depends on holdover grade), typically 9W - 22W

Operating Specifications

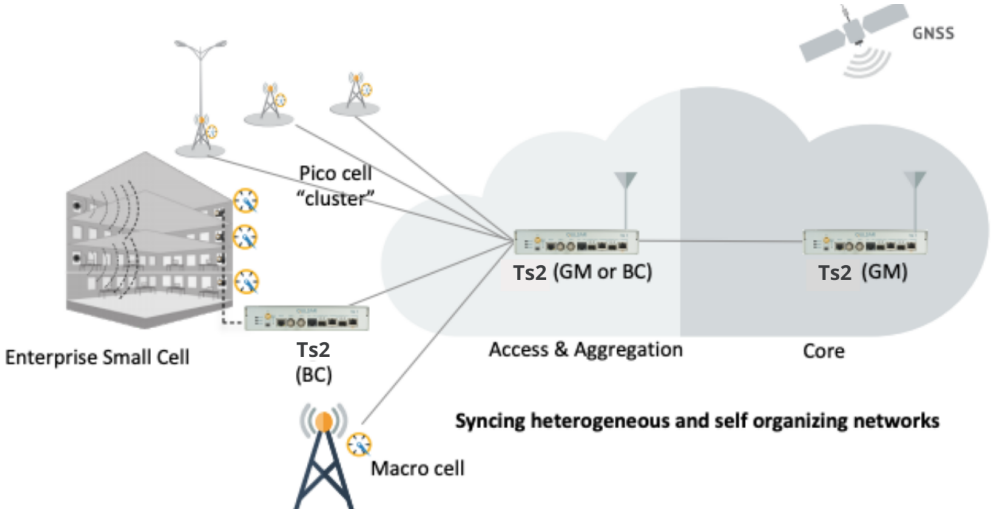
- Operating temperature: 0oC to 50oC
- Storage temperature: -40oC to 70oC
- 6/6 RoHS and WEEE compliant
- Size: 218 mm (W) X 159 mm (D) X 44 mm (H)

Certifications

- FCC Part 15B (Class A) / CISPR 22 / EN 55022 (Class A)
- EN-61000-4-2 ESD
- EN 60960-1 Safety
- EN 300 386 Telecommunications Network Equipment (EMC)

Ordering Information

https://tescomusa.com/collections



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