

Brochure

VIAVI

Qg 2

Multi-Sync Gateway and PTP Grandmaster

Mobile operators are deploying small cells to build out their Data Center, Lab, Small-Cell LTE/5G, and other Critical Networks. This is occurring in a variety of locations such as urban canyons and indoor environments, where GNSS signals are weak or intermittent. The Qg 2, a multi-sync gateway, addresses the challenges of providing reliable and precise synchronization everywhere through IEEE 1588-2008 (PTP) and leveraging multiple sync references.

As 5G evolves from non standalone (NSA) supporting 4G today, to standalone (SA) architecture with 5G radio, the support for massive MIMO radios, network slicing, low latency and tight synchronization are critical considerations. In order to meet phase and frequency requirements for applications in the 5G service-based architecture, deploying more GMs (PRTC) in RAN and at the Edge is the only optimal solution that helps in future proofing the deployment and associated investment. The low cost, small footprint Qg 2 is the natural choice for all networks – carrier, cloud provider and private networks.

With virtualization and decomposition of 4G/5G base stations, the newly designed data-centers and CORDs (Central Office re-architected as Data Centers) require a very high capacity, easily scalable PTP master (T-GM, T-BC) in providing synchronization to hundreds of PTP slave devices. Qg 2 with its rich set of features easily meets this challenge.

Features

- Multiple holdover options
- Full IEEE 1588–2008 (PTP) Grandmaster
- Telecom BC functionality
- Supports G.8262 Synchronous Ethernet
- ITU-T G.8265.1 Frequency, ITU-T G.8275.1 and G.8275.2 Time and Phase Profiles
- ITU-T G.8272 and G.8273.2 (T-BC)
- IEEE PC37.238 Power profile
- SMPTE ST 2059:2015 Broadcast industry profile
- Supports 1-step and 2-step clock
- -48V DC power
- SNTP (NTP Stratum 1) Server
- Remote provisioning and management (CLI, HTTP(S) and SNMP)
- Receives and displays both time and location information from GNSS

Applications

- Precision sync platform designed for:
 - 5G, Open RAN, small cell clusters, C-RAN and neutral host deployments
 - Suited to any S-plane LLS C1 – C4 5G ORAN configurations and different functional splits of RU/DU/CU in the RAN and edge evolution
 - Smart grid transmission and distribution substations
 - Mobile edge computing and enterprise
 - Industrial IoT and factory automation applications
 - Data centers and financial applications



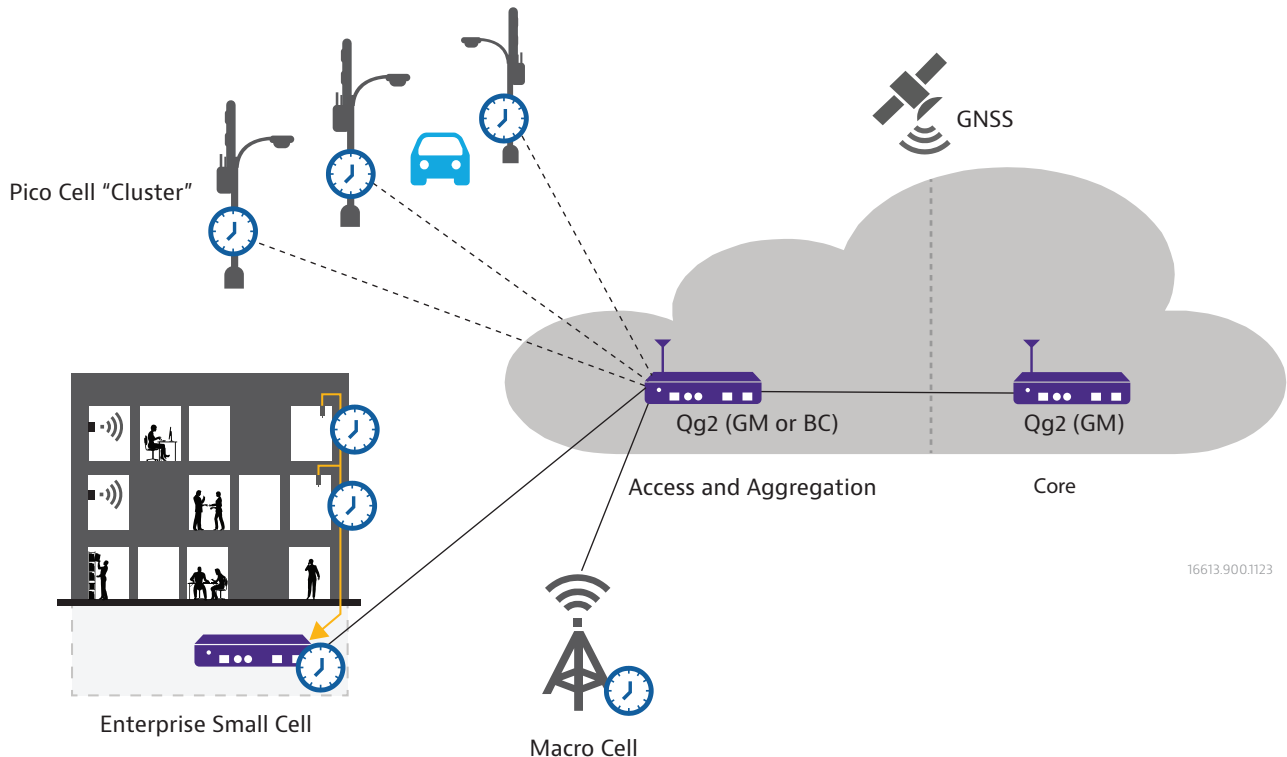
Qg 2 provides IEEE 1588-2008 (PTP) Grandmaster and Boundary Clock functionality at low total cost of ownership. It leverages VIAVI's unique industry-leading PTP algorithms to deliver stringent timing for LTE-A, LTE-TDD, CBRS (USA), SxGP (Japan), private LTE and 5G architectures (both operator and private) 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.

Qg 2 utilizes GNSS (GPS, Beidou, GLONASS, QZSS and Galileo) to receive and display both timing and location information. Qg 2 also utilizes PTP and Synchronous Ethernet as input references and generates PTP, SyncE and timing signals (frequency, 1 PPS 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 (1 PPS), 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 Qg 2 has some unique features designed to make it easily manageable and provide resilient performance when reference sources are lost.

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 Grandmaster, boundary, and slave clock
- Position and location information to aid SAS and other location-based services



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Synchronizing heterogeneous networks

Specifications

Synchronization Interfaces

1x GNSS L1 Antenna (SMA); 50 Ω impedance, 5 V

1x 1 PPS out (BNC)

1x Synchronized programmable frequency out (BNC) – 1.544 MHz, 2.048 MHz, 10 MHz

1x Time of Day (ToD) + 1 PPS in/out (RS422 ITU-T G.703) ToD Format – configurable (ASCII (YYYY-MM-DD HH:MM:SS), NMEA, or China Mobile Binary format)

2x IEEE 1588-2008 (PTP) 100 Base-TX, 1000 Base-T and 1000 Base-X with Synchronous Ethernet (electrical RJ45 and optical SFP)

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 and G.8275.2 time/phase delivery profile

Power profiles: IEEE PC37.238 and IEEE 61850

SMPTE

TSN (802.1AS)*

Enterprise profile*

SNTP (NTP Stratum-1) Server, when in GM mode

Synchronous Ethernet (SyncE)

Ethernet Synchronization Message Channel (ESMC)

Support on both Ethernet interfaces (electrical and optical)

GNSS

GPS-only or GPS + [QZSS/Beidou/GLONASS/Galileo]

Phase accuracy (under ± 100 ns 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	1.5 μ s	5 μ s	Freq 16 ppb
Standard	OCXO	4 hours	10 hours	1 week
Superior	Super OCXO	8 hours	15+ hours	1 month

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

* Available in future with SW upgrade

Specifications continued

Scalability

450 [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)

LEDs

Power status, GNSS acquisition and sync status

Power Supply

Supply: 28 - 40 VAC or 36 - 60 VDC

Power consumption: Typically 9 W - 22 W depending on holdover grade

Operating Specifications

Operating temperature: 0°C to 50°C

Storage temperature: -40°C to 70°C

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 62368-1 Safety

EN 300 386 Telecommunications Network Equipment (EMC)



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