

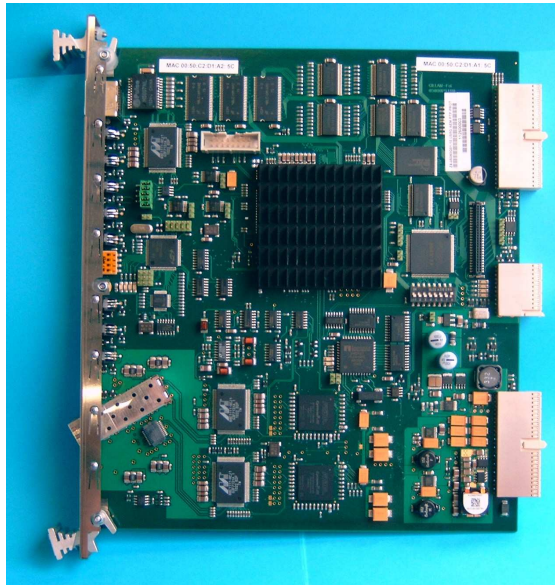


US5G-US5Ge PTP Card

PTP (IEEE1588-2008) Grandmaster clock for US5G and US5Ge products

Card Overview:

The US5G PTP redundant card is designed to be a very stable Grandmaster clock. It can synchronize with the IEEE-1588 (1588-2008 also known as PTPv2) protocol the real-time clocks in the nodes of a distributed system that communicates using a network.



The US5G PTP redundant card is fully integrated in the US5G(e) system. One or several cards can be plugged into the US5G main shelf. Each card occupies one POUT slot (Protected Outputs) of a shelf. Two cards can be installed in a POUT slots pair to perform as a protected pair. In this case, if the active card fails, its sister card takes the PTP interface control in a transparent way to the network. One or several pairs of cards can also be plugged into a US5G expansion shelf.

The card is based on a powerful CPU with dedicated Gigabit Ethernet LAN controller and large FPGA device for on the fly PTP packets timestamping at Gigabit speed. PTP timestamps clock is derived from the high stability US5G-US5Ge local clocks (Rubidium or OCXO quartz). UTC time and PPS synchronization are routed either from IOP1 and/or IOP2 through the backplane if the US5G(e) is equipped with a GPS receiver or from the card's TOD interface which can be directly connected to a UNI-SYNC TOD port.

The PTP interface utilizes Small Form-factor Pluggable (SFP) modules to support Gigabit optical interface on the front face. PTP card(s) provisioning and monitoring are under control of the US5G-US5Ge COM management card and thus separated from the PTP dedicated Ethernet interface.

A set of front face LED's allow to quickly monitor the activity.

Card Features:

- Support of IEEE 1588 protocol in version 2 (1588-2008 also known as PTPv2) on Ethernet (UDP/IP)
- One Gigabit Ethernet optical interface : SFP module (MSA compliant) selected by user accessible from the front face of the card
- Integrated hardware PTP messages detectors and timestamps unit (PTP hardware assistance)
- Behaves as one IEEE 1588 Grandmaster clock on its Gigabit Ethernet optical network interface
- One-step clock configuration
- Unicast or multicast IEEE 1588 support
- IPv4 support (IPv6 in a future release)
- Unicast sessions negotiation
- Two cards in a pair of protected slots act as redundant PTP ports with automatic switch over from one to the other in case of failure
- PTP timescale distribution (TAI time)
- Auto-provisioning of the card during installation and initialisation
- TL1 remote management of the card via the COM card
- TOD interface for UTC reference in absence of integrated GPS receiver (US5GA, expansion shelves)



Card Specifications:

Protocols:

- IEEE1588-2008
- IPv4, IPv6 (future release)

PTP server performance:

- Timestamps accuracy: 8ns typ.
- 15000 PTP transactions per second
- 250 unicast slave sessions at 16 Sync/sec, 16 Delay Req/sec and 16 Delay Rsp/sec
- 125 unicast slave sessions at 32 Sync/sec, 32 Delay Req/sec and 32 Delay Rsp/sec
- Switch over in less than 10 seconds

Interfaces:

- PTP interface : SFP Ethernet (front face)
- TOD input : RJ45 (NTP clock driver type 4 with PPS signalling format)
- TOD output for TOD daisy chaining : RJ45 (NTP clock driver type 4 with PPS signalling format)
- Management Ethernet port : 10/100 BASE-T RJ45 for software upgrades

Management:

- TL1

Protection:

- Full 1:1 hardware redundancy

