OCP-TAP Time Card with on-board Miniature Atomic Clock

Available from Vespertec for the data centre market, the OCP-TAP Time Card manufactured by Timebeat provides timing accuracy to a host computer to transform it into a high-end time server — all via a vacant PCIe slot.

Developed by the Open Compute Project's (OCP) Time Appliances Project (TAP), the OCP-TAP Time Card features a Miniature Atomic Clock (MAC) on an industry standard PCIe card.

At the heart of the OCP-TAP Time Card lies not just one source of timing information, but two: a GNSS receiver and a Miniature Atomic Clock (MAC), to support network synchronisation protocols including NTP, PTP and SyncE as well as PPS-based sync alignment.

The holdover provided by the on-board MAC means trading/operations can continue even when an external source of timing synchronisation is not available. The MAC also provides resilience to spoofing and jamming risks that may come from the GNSS receiver.

As such, the OCP-TAP Time Card allows market participants to confidently meet regulatory requirements and provide highly accurate time data.

Best Fit Use Cases

When time is being measured in nanoseconds, precise timing synchronised to UTC (Coordinated Universal Time) is critical. The cost-effective, flexible and easy to maintain OCP-TAP Time Card will greatly benefit industries that require highly accurate, reliable and synchronous time, and operate in regulated environments.

Example use case industries:
• Financial trading
• Telecom and mobile
• Power
• Broadcast/professional audio and video

Vespertec and Timebeat
Your precise advantage

Vespertec's expertise in the data centre and the special characteristics of the OCP-TAP Time Card from Timebeat provide client organisations with a unique advantage.

Vespertec expertise:
As specialists in x86 server platforms, and as an OCP solution provider too, Vespertec can source, configure, test and deliver servers featuring OCP-TAP Time Cards. Vespertec also specialises in global deployment, so is able to handle delivery into locations all over the world, including those with complex tax jurisdictions.

Form factor:
The OCP-TAP Time Card is mounted on an ordinary PCIe card and can be fitted or retrofitted into any vacant PCIe slot in most industry standard servers. This makes it cost effective to buy and maintain.

Open source:
The OCP-TAP Time Card is open source, from the Open Compute Project. Open-source firmware is available (including Timebeat's own software). Organisations also have the freedom to develop their own software specific to their use case.

Open modular design:
The open modular design of the OCP-TAP Time Card means there is a choice of MAC. Alternatively, the MAC can be swapped for an oven-controlled crystal oscillator (OCXO) or a temperature compensated crystal oscillator (TCXO) for a budget-conscious solution.

Accuracy maintained via holdover

A time master is a critical part of a PTP enabled network. It provides accurate time via GNSS while maintaining accuracy in case of GNSS failure via a high stability (and holdover) oscillator such as an atomic clock.

Existing products in the market are often closed sourced and are far from having sufficient features for the most precise time synchronisation.

x86 servers
Transformed in no time

The Time Card and Vespertec's expertise allows any x86 machine with a NIC capable of hardware time-stamping to be turned into a best-in-class Grandmaster time system. This system is agnostic to whether it runs for NTP, PTP, SyncE, or any other time synchronisation protocol since the accuracy and stability provided by the Time Card is sufficient for almost any system.

The Time Card operates with open sync stacks as well as pairing perfectly with Timebeat's Enterprise sync software.

OCP-TAP Time Card Specification

GNSS Module		u-blox RCB-F9T GNSS time module
Oscillator Options		
Atomic	SA5X	www.microsemi.com/document-portal/doc_view/1244700-mac-sa5x-data-sheet
	mRO-50	www.orolia.com/document/spectratime-mro-50-datasheet
	SA.45s	www.microsemi.com/document-portal/doc_view/1243238-space-csac-datasheet
OCXO	SiT5711	www.sitime.com/products/stratum-3e-ocxos/sit5711
TCXO	SiT5356	www.sitime.com/products/super-tcxo/sit5356
Form Factor	FHHL (Full Height, Half Length)	Approximate dimensions: Length: 18cm, Width:10cm, Depth: 2cm
Operating System		CentOS as well as other Linux distributions
Outputs		10Mhz PHC MAC GNSS1 GNSS2 IRIG DCF GEN1 GEN2 GEN3 GEN4 GND VCC
Inputs		10Mhz PPS1 PPS2 TS1 TS2 IRIG DCF TS3 TS4 FREQ1 FREQ2 FREQ3 FREQ4 None
Optional Supporting Software	Timebeat	Timebeat Enterprise software - PTP, PPS, phc and system clock sync/distribution
	Open Source	LinuxPTP, phc2sys, testptp, chronyd, ptp4u, ts2phc

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