



MODULAR • SCALABLE • RESILIENT PNT

OPEN TIMECARD

PCI-E TIME SYNCHRONISATION CARD



KEY FEATURES

- Modular design — full height and half height PCIe slot profiles
- Flexible protocol selection: NTP, PTP, PPS, SyncE & Frequency distribution direct from the card
- 1GbE built-in network port
- OCXO and Rubidium oscillator options
- Full multi-band GNSS receiver, full constellation support
- Frequency Output: 1Hz – 1GHz • Frequency Input
- Linux Operating System
- Anti-jam & Anti-spoof technology

QUICK SPECIFICATIONS

- Ethernet switch: IEEE1588 TC, SFP, SyncE client/server
- PTM: 2× Intel i226 with PTM on card, SDPs connected to clock gen, multiple 1588 hardware timestamping registers, nanosecond accurate system clock sync
- Clock generator: Programmable outputs incl. differential LVDS, low phase noise, 8 inputs for timestamping external events
- Raspberry Pi CM4: PTP & NTP onboard
- GNSS module: Ublox LEA-F9T (2.5ns accuracy to UTC)
- LFFO oscillator: SA53/55 Rb (200ns/24hr holdover) or Rakon ROD2522S2 OCXO (1.5µs/24hr holdover)

BENEFITS

- Simple and effective sync solution — hardware and software fully supported
- Compliance / performance data can be hosted in cloud or on-prem
- Modular-by-design: use your own chassis, servers, OS or monitoring system
- Up to 3 units per 1RU of rack space
- Clock Ensemble: UTC verification and clock ensemble techniques for secure, resilient PNT

PTP

NTP

PPS

SyncE

Rubidium

OCXO

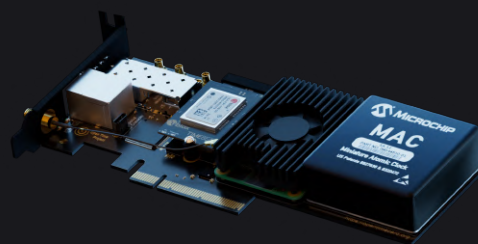




PRODUCT SPECIFICATIONS

RUBIDIUM
OSCILLATOR OPTIONS

BLACK & BLACK+ COMPARISON



● ETHERNET SWITCH

Transparent Clock	IEEE1588 TC
SFP Port	SFP
SyncE	Client / Server

● PTM

Intel i226	2× with PTM on card
SDPs	Connected to clock gen
Timestamping	Multiple 1588 HW registers
System Clock	Nanosecond accurate sync

● ONBOARD COMPUTE

Raspberry Pi CM4	PTP & NTP onboard
GNSS Module	Ublox LEA-F9T

● RUBIDIUM BLACK VS RUBIDIUM BLACK+

SPECIFICATION	RUBIDIUM BLACK	RUBIDIUM BLACK+
Frequency	10 MHz	10 MHz
Short-Term Stability	$\leq 5 \times 10^{-11}$ at 1s	$\leq 3 \times 10^{-11}$ at 1s
Allan Deviation ($\tau=1000s$)	$\leq 1.5 \times 10^{-12}$	$\leq 1 \times 10^{-12}$
Aging (Daily)	$\leq 3 \times 10^{-10}$	$\leq 1 \times 10^{-10}$
Aging (Monthly)	$\leq 9 \times 10^{-10}$	$\leq 3 \times 10^{-10}$
Aging (Yearly)	$\leq 1.1 \times 10^{-8}$	$\leq 4 \times 10^{-9}$
Frequency Stability (1 Day)	$\leq 5 \times 10^{-11}$	$\leq 2 \times 10^{-11}$
Frequency Stability (1 Week)	$\leq 1.5 \times 10^{-10}$	$\leq 7 \times 10^{-11}$
Frequency Stability (1 Month)	$\leq 6 \times 10^{-10}$	$\leq 2 \times 10^{-10}$
Holdover (Drift) 1 Day	~0.5 μs (500 ns)	~0.2 μs (200 ns)
Holdover (Drift) 1 Month	~10 μs (10,000 ns)	~5 μs (5,000 ns)
Holdover (Drift) 3 Months	~30 μs (30,000 ns)	~15 μs (15,000 ns)
Holdover (Drift) 1 Year	~120 μs (120,000 ns)	~60 μs (60,000 ns)
Power Consumption	120 mW (typical), up to 240 mW	500 mW (typical)
Warm-Up Time	2 minutes (typical)	2 minutes (typical)

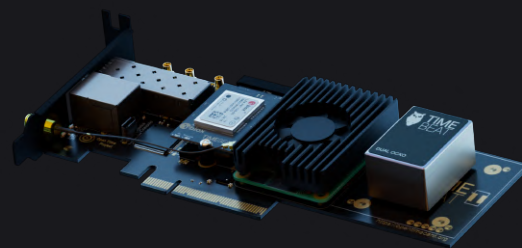




PRODUCT SPECIFICATIONS

RAKON OCXO ROD2522S2

OVEN-CONTROLLED CRYSTAL OSCILLATOR



● RAKON OCXO ROD2522S2

Frequency Stability	±0.5 ppb over temperature range
Aging (Daily)	±0.2 ppb
Aging (Monthly)	±10 ppb
Aging (Yearly)	±50 ppb
Frequency Stability (1 Day)	$\leq 5 \times 10^{-11}$
Frequency Stability (1 Week)	$\leq 1.5 \times 10^{-10}$
Frequency Stability (1 Month)	$\leq 6 \times 10^{-10}$
Holdover (Drift) 1 Day	±1.5 µs (1,500 ns)
Power Consumption	1.5 to 3.5 W

APPLICATIONS

Telecom / 5G

Critical 5G and IoT applications with time-sensitive requirements demand precise and reliable synchronisation.

Finance

Precise, dependable synchronisation for competitive edge and regulatory compliance.

Defence

Robust PNT solutions essential for national defense against GPS/GNSS threats.

Broadcast

Reliable time synchronisation for time-series data and cloud-based media delivery.

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