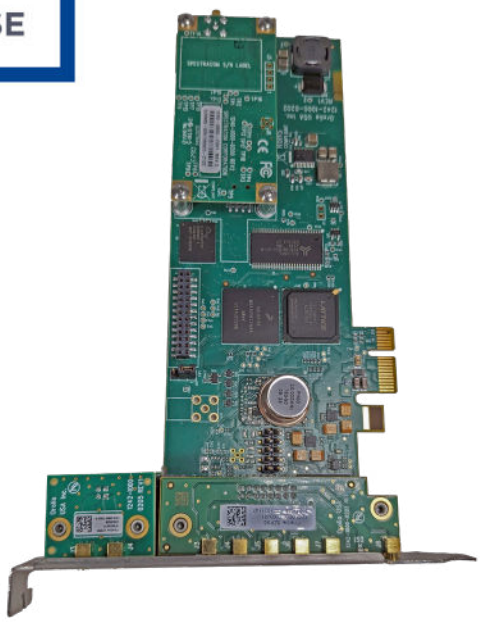
ELECTRONICS & DEFENSE

CDM-7

Clock Distribution & Timing Reference Module



Safran's CDM-7 clock distribution and timing reference module is a PCIe card that provides 10MHz and 1PPS signals for up to seven devices that need precise synchronization.

The CDM-7 is ideal for PCIe-based Software-Defined Radios (SDR) installed in rack- mounted or desktop PCs, and can also be used for any other application that requires a precise timing reference.

Superior Timekeeping

Available in two configurations (full height/ half-height), each card has an OCXO (oven crystalized oscillator) that can phase-lock to a wide variety of external timing references and provides 1 ns resolution to the timekeeping hardware.

Thanks to the addition of a GNSS receiver, the CDM-7 allows users to calibrate the clock. This feature is a significant advantage over other clock distribution modules.

Integrate it in your own design

CDM-7 can be integrated into a custom assembly simply by removing the bracket plate and powering the board through its 12V DC power pins. The operating mode can then be toggled using the onboard switch.

Key Features

- Timing and frequency source with 5-way (half-height) or 7-way (full-height) distribution of 10MHz and 1PPS signals.
- PCIe form factor for rack-mount or desktop PC.
- Three operating modes: internal clock, synchronous external, and asynchronous external.
- Supports standalone operation with 12V DC power supply.

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Three Operating Modes

Mode	Description
Internal	This mode uses the internal OCXO of the CDM-7. No additional input required. The CDM-7 will distribute the internal 10 MHz and PPS signals.
Synchronous External	This mode requires a 10 MHz and PPS input from an external device. The CDM-7 will distribute the external 10 MHz and PPS signals.
Asynchronous External	This mode requires only a 10 MHz input from an external device. The CDM-7 will derive its own PPS signal from this external 10 MHz signal. The CDM-7 will distribute the external 10 MHz signal and the derived PPS signal.

Technical Specifications

Form Factors

- PCIe
- Half-height/Full-height
- Rugged design

Available References

- GNSS synchronization (multi-constellation)
- 1PPS
- Internal clock

Timing Function

- 1PPS
- 10 MHz output

Internal Timekeeping

- Disciplined On-board clock
- Frequency: 200 MHz
- Resolution: 5 ns
- Sync Sources: GNSS, 1 PPS inputs

Input Specifications

Reference Inputs	1PPS
Connector type	MMXC
Input range	2.5...5 V
Amplitude	0 V to +5.5 V, +0.8 V VIL, +2.0 V VIH
Pulse	1Hz rising edge or
Minimum pulse width	100 ns
Input Impedence	<150 pF capacitive

Reference Inputs	10 MHz
Connector type	MMXC
Input range	0.5...5 V

Internal GNSS Receiver

- SMA jack (+5 V at 30 mA max supplied to power antenna pre-amp)
- Antenna sold separately
- SMA to Type N adapter cable included
- Frequency: GPS L1 (1575.42 MHz), GLONASS L1 (1602 MHz); contact the factory for compatibility with QZSS (1572.42 MHz), BeiDou (1561.1 MHz) and Galileo (1575.42 MHz)

Output Specifications

Output	1PPS
Connector Type	MMXC
Output range	5 V
Output waveform	Logic-level pulse
Duty cycle	1%
Time offset between any two 1PPS outputs	< 50 ps
Signal level	TTL compatible, 4.3 V minimum, base-to-peak into 50 (TTL compatible, 2.2 V minimum, base-to-peak into high impedance)
Pulse width	Configurable Pulse width (200 ms by default)
Rise time	< 10 ns
Timing Output	
Accuracy to UTC (locked to GPS @ 1 sigma)	325 ns
Holdover (constant temp after 2 weeks GPS lock)	
After 4 hours	1 Qs
After 24 hours	25 Qs
Signal Waveform & Levels	TTL (5 V_{P-P}), into 50 ohm, BNC

Output	10 MHz
Connector Type	MMXC
Output range	2.5 V
Output waveform	Square wave
Duty cycle	50%
Frequency Accuracy	< 100ppb
Recommended Warm-up time	30 min
Minimum operational warm-up time	5 min
Phase Noise	-113dBc@10Hz -120dBc@100Hz -140dBc@1kHz
Harmonics	< -40 dBc
Spurious	< -70 dBc

Hardware Specifications

Power Supply	
DC input (PCIe slot or external connector)	12 V
Current consumption	< 1 A
Physical	
Dimensions	PCIe Standard 6.60” long
Temperature range	-40° C to +80° C non-condensing @ 12,000 m
Humidity	Operating & storage: 95% RH at 60°C for 5 cycles of 48 hours/ cycl
Weight	PCIe: 4.3 oz/122 g
PCIe	• Full-height mounting bracket provided • Bus interface: Low-profile PCIe x1, Rev 1.1
Safety & EMI	Certifications: RoHS, CE, FCC Class A
Firmware	
Drivers	Linux* 64/32 bit *Contact sales for specific kernel versions

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January 22, 2024