Echo 4RP™

Portable and flexible high bit depth and fidelity Multi-frequency GNSS record and playback system
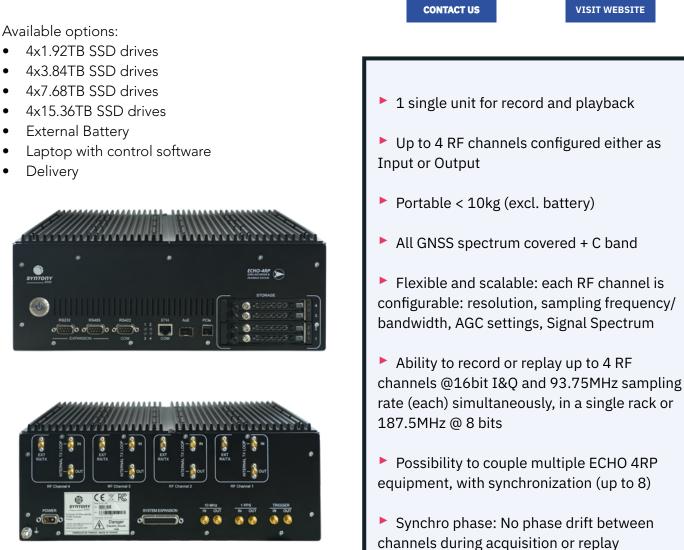
SYNTONY *GNSS*

Putting the «real» into Real World Tests

Whether developing new components, improving algorithms, working on the integration of an entire receiver system, or analyzing any kind of phenomenon in the real life, ECHO 4RP GNSS Recorder & Player is the perfect fit for your testbed environment.

Based on specific features below, Echo is customizable, scalable and evolutive to support your current and future GNSS Record and Playback requirements.

Embedded in a vehicle or in an aircraft, it can then precisely analyze the different phenomenon encountered: electromagnetic environment disruptions (from natural sources or generated by the human activity), reflections & masking, reflectometry or any other specific application.

Don't hesitate to contact us for more information about the ECHO 4RP.

CONTACT US   **VISIT WEBSITE**

Available options:
- 4x1.92TB SSD drives
- 4x3.84TB SSD drives
- 4x7.68TB SSD drives
- 4x15.36TB SSD drives
- External Battery
- Laptop with control software
- Delivery

▶ 1 single unit for record and playback

▶ Up to 4 RF channels configured either as Input or Output

▶ Portable < 10kg (excl. battery)

▶ All GNSS spectrum covered + C band

▶ Flexible and scalable: each RF channel is configurable: resolution, sampling frequency/bandwidth, AGC settings, Signal Spectrum

▶ Ability to record or replay up to 4 RF channels @16bit I&Q and 93.75MHz sampling rate (each) simultaneously, in a single rack or 187.5MHz @ 8 bits

▶ Possibility to couple multiple ECHO 4RP equipment, with synchronization (up to 8)

▶ Synchro phase: No phase drift between channels during acquisition or replay

Supported by **cnes**

Echo 4RP™

Specifications

ECHO-4RP
GNSS RECORDER & PLAYBACK SYSTEM

General

Flexible product struture	Depending on configuration : number of concurrent bands, bit depth, sampling frequency, bandwidth, storage size (8 TB, 16TB, 32 TB), customization for external sensors…
Multiple constellations	GPS, GLONASS, Galileo, BeiDo, IRNSS, QZSS
Multiple frequencies	L1, L2, L5, S band, C band
Multiple bands	Up to 4 bands in a same rack
Frequency bands	GNSS 1100MHz to 2550MHz, C Band (LEO PNT) from 5010 to 5030 MHz
Center frequency for RF channels	Selectable (ex L1, L2, L5, S, C), for each individual band or all, possible to configure a center frequency only shifted of a few hundreds of kilohertz from the targeted one.
Number of RF channels	Up to 4 simultaneously. Each channel can be configured as Input for recording or as output for playback
Recording & Playback power level	-130dBm to 0dBm
Output power control during playback	Better than 1dB resolution

Storage

Standard	4 x 3.8 TB SATA removable SSDs
Options	4 x 7.6 TB | 4 x 15.3 TB
Max Write and Read Speed	Up to 368 MB/s per channel

Interfaces

RF Channels	SMA
Internal / external 10MHz	BNC Female
High speed interface	Ethernet 10Gb/s PCIe Gen2x4 over cable
Trig & Interfaces	1 PPS Trigger
Serial	RS422, RS485, RS232
Other	Ethernet 1 Gb/s for equipment control

RF & Digital Quality

Bit depth (quantization)	16 bits for I 16 bits for Q Possible decimation to 8, 4, 2 or 1 bit
Bandwidth of each RF band	Up to 150MHz effective bandwidth with 187.5MHz sampling (I/Q) on 8 bits IQ. 75MHz effective bandwidth with a 93.75MHz sampling (I/Q) on 16 bits IQ.
ADC sampling frequency	187.5 MHz
ADC - ENOB	16 bits ADC (11,95 bits)
Maximum voltage gain	80dB (typ.)
Maximum Dynamic	100dB
AGC – Harmonic Spurious (Record)	< -60dB
AGC – RMS jitter	< 150 fs
AGC – Group Delay Variation	< 15 ns
Level resolution	+/- 0,1 dB
Level precision	+/- 0,5 dB
Synthesis Step	1,5 Hz
Harmonic Spurious (Replay)	< -65dBc min
Non-Harmonic Spurious (Replay)	< -55 dBc (SF dependent)
RMS Jitter	104 fs
Group Delay Variation	< 15 ns @ BW = 55 MHz
Group Delay Stability	< 10 ps/°C @ BW = 55 MHz

Control

Built-in real-time IQ display and spectrum analyzer	SMA
In-built GNSS receiver acquisition —to verify performance	A L1C/A real time software receiver is provided to see the presence of satellite signals on L1C/A in real-time.
LEDs, control buttons and simple display	Front panel
Graphical user interface available through the connection of a remote laptop	Laptop and GUI for configuration and signal quality analysis before recording

Physical & Environmental

Size (approx.)	350 mm x 300 mm x 125 mm (max)
Weight	<10 kg excl battery
Power Supply	20 to 36V DC (an AC adapter is delivered)
Power consumption	60W + 3W per SSD disk
Operating/Storage Temp. Range	+0 to +70°C / -20 to +85°C
Attachable Battery in option	2 hours autonomy minimum

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