Echo R&P™

GNSS Recorder & Playback

Choose the best recorder & playback solution for GNSS signals

For DESIGN, VALIDATION and PRODUCTION

Whether developing new components, improving algorithms or working on the integration of an entire receiver system, Echo™ GNSS Recorder is the perfect fit for your testbed environment.

Space agencies & industry leaders already benefit from our GNSS Record & Playback system.

Echo™ singularity lies in the alliance of SDR (Software-Defined Radio) and a state-of-the-art RF Analog front-end. Top-end processing performance and superior RF quality are now met into a COTS appliance with utmost flexibility in recording control.

Constellations & Bands

- Galileo E1, E5a/b, E6
- GPS L1 C/A, L2, L5, L6, P(Y), M-Code
- GLONASS G1, G2, G3,
- QZSS L1 C/A, L1C, L1S, L1-SAIF, L2C, L5, LEX
- IRNSS NavIC L5, S-Band
- BeiDou B1, B2, B3
- SBAS EGNOS, WAAS, GAGAN, MSAS

Highest-Fidelity

- 16-bit I&Q
- 200 MHz Sampling Rate
- 1.6 GB/s write/read speed
- Ability to record 3 RF channels at 16-bit I&Q and 200 MHz sampling rate simultaneously

Flexible & scalable

- 2 independent units: 1 to record & 1 to playback
- Starting with GNSS L1, 50 MHz, 4 bit, 8 TB SSD swappable disks
- Each RF channel is configurable (resolution, sampling frequency/bandwidth, AGC settings, Signal Spectrum & GPS L1 PRN analysis)
- Ability to record 3 RF channels at 16-bit I&Q and 200 MHz sampling rate simultaneously
- Flexible quantization and sampling rate
- Quick data dump on local or network storage
- No limit on recording time and playback

Easy to setup and use

- Signal spectrum & GPS L1 PRN analysis software included
- Simple local or remote control
- Quick setup, including for multi-antenna or multi-receiver
- Extensive documentation, examples available & local support
- Field software updates

Options

- Up to 128 TB SSD internal storage (swappable) and sync to external NAS
- Network adapter 10 or 20 GHz
- **Customization on Demand** (Signals, quantization, sampling rate, external sensors like odometer or IMU…)

Powerful, Flexible, Scalable, Easy to use, Affordable

Echo R&P™

Specifications

Echo™ Recorder

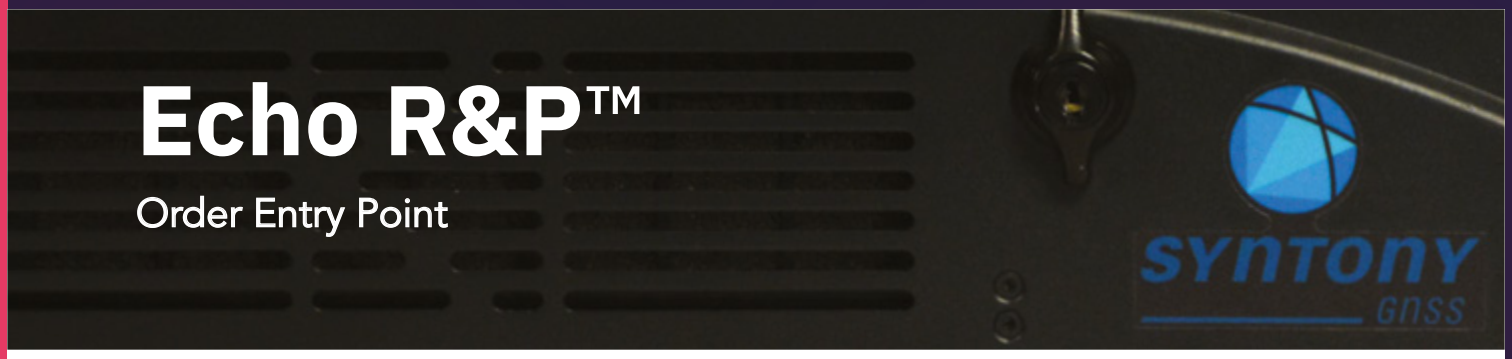
RF Input	
Channels	Up to 3
Frequency Range	1100 MHz to 2550 MHz
Antenna Power Supply	Filtered 5 VDC, 100 mA Max.
Connector	N Female
Synthesizer - Internal 10MHz Reference	
Stability	$5x10^{-9}$ from +10°C to +40°C
Int. 10MHz Reference Output	BNC female
Aging	0.5 ppb/day and 50 ppb/year
Connector	SMA Female
RF Quality	
Maximum voltage gain	80 dB (typ.)
Baseband Bandwidth (I & Q)	80 MHz
Max. Dynamic	60 dB
AGC - Harmonic Spurious	< -60 dB
AGC - RMS Jitter	< 150 fs
AGC - Group Delay Variation	< 15 ns
Digital Output	
Bit Quantization (I & Q)	16bit
Bus Transfer Rate	1.6 GB/s
Digital Quality	
ADC - Sampling Frequency	Up to 200 MHz
ADC - ENOB	11.95 bit
General	
Storage (SATA)	
Standard	8, 16, 32, 64 128 TB removable SSD
Max. Capacity	128 TB removable SSD 192 TB and above thanks to NAS compatibility
Max. Write & Read Speed	1.6 GB/s
Other	
Power Supply	100V to 240V AC 50 Hz to 60 Hz +/- 5%
Power Consumption	88 W
Operating / Storage Temp.	+10 to +40°C / -20 to +55°C
Dimensions	2 x 2U 19" rack, 16kg
Trig & interfaces	10 MHz IN/OUT + Trig

Echo™ Player

RF Output	
Channels	Up to 3
Frequency Range	1100 MHz to 2550 MHz
RF Bandwidth	120 MHz
RF Power (@50 Ohm)	From -30 to -130 dBm
Output VSWR	< 1.3
Synthesizer - Internal 10MHz Reference	
Signal	Sinus
Stability	$5x10^{-9}$ from +10°C to +40°C
Aging	0.5 ppb/day and 50 ppb/year
Allan Variance (1s)	$2x10^{-12}$
RF Quality	
Level Resolution	+/- 0.1 dB
Level Precision	+/- 0.5 dB
Synthesis Step	1.5 Hz
Harmonic Spurious	< -65 dBc min
Non-harmonic Spurious	< -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
General	
Storage (SATA)	
Standard	8, 16, 32, 64 128 TB removable SSD
Max. Capacity	128 TB removable SSD 192 TB and above thanks to NAS compatibility
Max. Write & Read Speed	1.6 GB/s
Other	
Power Supply	100 V to 240 V AC 50 Hz to 60 Hz +/- 5%
Power Consumption	88 W
Operating / Storage Temp.	+10 to +40°C / -20 to +55°C
Dimensions	2 x 2U 19" rack, 16 kg
Trig & interfaces	10 MHz IN/OUT + Trig

Echo R&P™

Order Entry Point



Whether the objective of your GNSS appliance is to protect critical infrastructures and/or become a business driver, Echo™ R&P are speeding up your time to market by saving time, money and testing efforts.

Based on specific features below, Echo™ R&P are customizable, scalable and evolutive to support your current and future GNSS Record & Playback requirements.

Echo™-R

☐ 2 (2U) ☐ 4 (4U)

Echo™-P

☐ 2 (2U) ☐ 4 (4U)

Features

RF Channels

- ☐ ECHO-R-1RF
- ☐ ECHO-R-2RF
- ☐ ECHO-R-3RF
- ☐ ECHO-R-S-Band

Quantization

- ☐ ECHO-R-4 Bits
- ☐ ECHO-R-8 Bits
- ☐ ECHO-R-16 Bits

Sampling Rate

- ☐ ECHO-R-50 MHz
- ☐ ECHO-R-100 MHz
- ☐ ECHO-R-200 MHz

Options

- ☐ ECHO-R-10 GHz
- ☐ ECHO-R-20 GHz
- ☐ ECHO-R-Maintenance-1Y

RF Channels

- ☐ ECHO-P-1RF
- ☐ ECHO-P-2RF
- ☐ ECHO-P-3RF
- ☐ ECHO-P-S-Band

Quantization

- ☐ ECHO-P-4 Bits
- ☐ ECHO-P-8 Bits
- ☐ ECHO-P-16 Bits

Sampling Rate

- ☐ ECHO-P-50 MHz
- ☐ ECHO-P-100 MHz
- ☐ ECHO-P-200 MHz

Options

- ☐ ECHO-P-10 GHz
- ☐ ECHO-P-20 GHz
- ☐ ECHO-P-Maintenance-1Y

The future of navigation is software

Since 2015, Syntony has become a leader in the GNSS industry. Syntony offers unique location solutions allying Software-Defined Radio (SDR) and state-of-the-art RF Analog front-end.

Easy to setup and use, the Syntony solutions are built to evolve with our clients needs, and inherit from 20 years of R&D and collaboration with space agencies and industry leaders.

For more information

Visit our website:
syntony-gnss.com

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SYNTONY GNSS

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	Echo-R	Echo-P
Certifications Safety	EN/IEC 62368-1:2014 ROHS, 2011/65/EU	EN/IEC 61010-1:2010 ROHS, 2011/65/EU
Emissions	EN 62368-1:2014 FCC Part 15 : 2016 – Verification (Section 2.902 47 CFR)	EN 61326-1:2012 FCC Part 15 : 2016 – Verification (Section 2.902 47 CFR)