RP-5300 Series

2-Channel, 50 MHz Compact RF Recorder

The Averna RP-5300 Series captures real-world RF signals, with impairments, for professional GNSS and similar applications – for validation, testing and support of receivers.

Averna Instrumentation Tools for:

R&D, Validation/ Test and Support Engineers/FAEs working for OEMs, ODMs and CMs in the Semiconductor, Automotive, Consumer Electronics and Telecom Infrastructure markets developing Navigation, Radio and Video receivers.

The Averna RP-5300 RF Recorder (available in 1- and 2-channel models) is an advanced tool for both field testing and performance testing. With 50 MHz of recording bandwidth, it can record multiple GNSS signals in multiple bands (L1, L2, L5), such as GPS or GLONASS. Its compact size and integrated display make it ideal for easy field operation and its innovative engineering is designed to drive sophisticated applications.

Recording live (impaired) RF signals of interest in the field, without de-modulation or alteration, reduces the need for traditional field-testing of RF receivers. By reproducing complex field conditions accurately and consistently in the lab, you can cut-back on costly field trips to validate design changes.

The Averna RP-5300 Series can be paired with an Averna RF Player and Signal Generator for a complete Record and Playback solution.

RF Studio™

The RP-5300 comes preloaded with Averna's RF Studio. RF Studio is a workflow tool for making painless RF recordings, managing collected data, and analyzing or playing back collected RF environments. With RF Studio, you can have confidence that the intended signals were captured – all without the need for RF experts on site.

Key Features

- **Frequency range** 330 MHz to 2.65 GHz to cover the full L1, L2 and L5 bands
- **Up to 11 hours of recording time** with external RAID (2 x 50 MHz channels @ 16-bit depth)
- **Field-ready** with an integrated touchscreen display, ruggedized chassis and compact size
- **Simple field setup** and intuitive user interface and test-case profiles
- **Supports multi-recorder/player synchronization** for 4 or more phase-coherent channels
- **Option: DriveView ™** for synchronized recording/viewing of video, audio, and GPS positioning data
- **Available in two models:** RP-5310 (1 channel) and RP-5320 (2 channels)

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Specifications

RF Recorder

Frequency	
Input Frequency	330 MHz to 2.65 GHz[1] (extended to 85 MHz with reduced bandwidth)
Resolution	0.1 Hz
Phase Noise (10 kHz offset)	‹-100 dBc/Hz @ 1 GHz
Internal Reference	10 MHz ±0.1 × 10–6, initial accuracy ±0.5 × 10–9, ageing per day
Temperature Stability	±5 × 10–9, over temperature range
Amplitude	
Noise Floor	-170 dBm/Hz (w/LNA Pre-Amp) 3.5 dB @ 1500 MHz (-20 dBm ref. level)
Maximum Input	+ 10 dBm (with minimum gain)
Adjustable Pre-Amp Gain Range	› 55 dB (with LNA) 0.5 dB steps
Level Accuracy	+/- 1dB (typ.)
Baseband	
Real-time Bandwidth	10 MHz max. ‹ 120 MHz carrier freq. 20 MHz max. ‹ 330 MHz carrier freq. 50 MHz max.[2] › 330 MHz carrier freq.
Output Sample Rate	62.5 MS/s Max. @ 50 MHz Bandwidth
Output Resolution	2x16-bit (IQ samples)
Dynamic Range	80 dB SFDR typ.

Connectivity

RF Connectors (50Ω)	
10 MHz REF Input (50Ω)	1 x SMA Female Freq. 10 MHz; Level 0/+ 10d Bm, Max.: +15 dBm
10 MHz REF Output (50Ω)	1 x SMA Female Freq. 10 MHz; Level +2 dBm, Max.: +10 dBm
RF (Bias-T) Input	1 x SMA Female AC coupled
RF (Bias-T) Output	1 x SMA Female
Pre-Amp Input	1 x SMA Female
Pre-Amp Output	1 x SMA Female
RF (VSA) Input	1 x SMA Female
GPS Antenna	1 x SMA Female DC coupled, antenna bias
10 MHz Reference	
10 MHz REF Input (50Ω)	1 x SMA Female Freq. 10 MHz; Level 0/+10 dBm, Max.: +15 dBm
10 MHz REF Output (50Ω)	2 x SMA Female Freq. 10 MHz; Level +2d Bm, Max.: +10 dBm
Synchronization, Timing and Inter-channel Performance*	
Timing Offset Between Channels	2 ns max; 1 ns typ.
Initial Amp Tracking	1 dB typ.
Amp Tracking Variation[3]	0.5 dB typ.
Cumulative Phase Error Effect on Positioning[4]	‹2 mm / hour
Trigger/Sync Input(s) and Output(s)	
Input (50Ω)	1 x SMA Female Freq.: PULSE, Level: TTL 5 V TOL, Max.: -.5/5.5 V
Output (50Ω)	1 x SMA Female Freq.: PULSE, Level: TTL 5 V TOL, Max.: -.5/5.5 V

[1] With internal Pre-Amplifier @ 50 MHz bandwidth
[2] @ 1 dB edges
[3] Over 5 hours
[4] For L1-L2 precision receiver (using post-processing analysis of pseudo range)

Environmental

Warm-up Time	
30 min (typ.)	
Weight	
20 kg (44 lbs), RP-5310 / 21.5 kg (47 lbs) RP-5320	
Size (H x W x D)	
273 mm (10.75 in) x 311 mm (12.25 in) x 533 mm (21 in)	
597 mm (23.5 in) x 419 mm (16.5 in) x 686 mm (27 in)	
w/lightweight reusable shipping container 6 kg (13.5 lbs)	
Temperature	
Operating	+ 0°C (32°F) to 40°C (113°F)
Storage	-20°C (-4°F) to 70°C (158°F)
Relative Humidity	
10% to 90% (non-condensing)	
Power	
DC Input	11-15 Volts 250 Watts (typ.) – RP-5320 DB 7W2 Terminal Connector SAE j563 12-Volt Size A to DB 7W2, 5.5 m (18 ft) North American power cord included SAE j563 12-Volt Size B to DB 7W2, 5.5 m (18 ft) European power cord included Battery clips to DB 7W2, 5.5 m (18 ft) power cord
AC Supply	90-264 Volts 50/60 Hz 270 Watts (typ.) – RP-5320 IEC 60320-C14 power connector inlet IEC 60320-C13 to NEMA 5-15P, 3 m (9.8 ft) North American power cord IEC 60320-C13 to CEE 7/7, 3 m (9.8 ft) European power cord
Compliance	
FCC 47 part 15 Class A	
CE: European Directive 98/336/EEC Class A (Emission)	
European Directive 2002/95/EC (WEEE)	
Integrated Display	
1024 x 768 pixel, 270 mm (10.5 in) integrated touch-ready display	
Calibration	
1 year	
Storage (Internal)	
4 x 2.5 in hot-swappable drive bays	
Up to 4 x 2.5 in 500 GB (2 TB total) HDD or SSD	
SATA 2.0 hard drives	
External RAID Options	
4 disk RAID (2 TB total)	
12 disk RAID (24 TB total)	
Ethernet	
1 x 10/100/1000 Mbps RJ-45 LAN Port	
Keyboard, Mouse and Service Port	
2 x USB 2.0/1.1 Type A connector ports	
External Display	
Display Port (includes VGA adaptor)	

*Spec. defined typ. at 25 °C +/- 5 °C (77 °F +/- 9 °F). Test condition pre-amp gain at 55 dB with 9 effective bits of quantization. Spec. applies over entire frequency range. Consult the application note on timing and synchronization for GNSS Record & Playback for more details.

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