

Broadband Signal and Environment Generator

Celerity CS25000F Series

Generate accurate broadband communications and radar signals and environments

AEROFLEX
A passion for performance.



The Broadband Signal and Environment Generator (BSG) is used to create precise, repeatable communications and radar signals, as well as realistic environments for testing broadband and frequency agile communications and radar systems.

- Generate communications and radar signals with instantaneous bandwidths up to 500 MHz and hop rates to 500,000 hops per second
- Create continuous, burst and hopped signals (FSK, MSK, PSK, QAM, ASK, OOK, AM, FM, PM, SSB) and radio and SATCOM specific waveforms with powerful VSS software
- Maximize signal and environment realism with up to 88 seconds of full bandwidth signal memory (150 minutes with optional RAID configuration)
- Extended playback times using digital up conversion with tuning
- Control all time, frequency and modulation signal parameters
- Combine real world signal and environment recordings with digitally generated impairments
- Emulate Golden Radios using real radio recordings captured with Celerity CS35000F Series Broadband Signal Analyzers and Recorders
- Add digitally precise signal impairments including thermal noise, phase noise, passband amplitude and phase distortion, CW and co-channel interference, and multi-path distortion

The **Aeroflex Broadband Signal and Environment Generator (BSG)** series provides the widest bandwidth and deepest memory signal sources available. The BSG combines a very deep memory, a very high-speed arbitrary waveform generator and a broadband RF upconverter with powerful signal generation software. The new F-Series BSG provides enhanced performance and capabilities with high speed dual-Xeon processors, gigabit Ethernet, deeper memory, larger removable disk storage, fast disk to memory transfers, and RAID options. The BSG instruments have bandwidths of up to 500 MHz and full bandwidth signal memory configurations up to 88 seconds (to 150 minutes with optional RAID). The bandwidth, memory depth and dynamic range make the BSG a powerful tool for broadband satellite communications, broadband wireless network communications, agile radio communications, jammer test, and radar test. A modular, software defined instrument architecture allows easy imports of user created waveforms. Vector Signal Simulator (VSS) software creates signal files for generic nPSK, nQAM, nFSK, MSK, ASK, OOK, AM, FM, PM, SSB, CW, tone combs, and notched noise signals. Commercial wireless standards are also available. Any of these generic signal types can be gated or bursted in time as well as hopped in frequency with digital precision and easy-to-use controls. Real signals, including signals recorded using Aeroflex's CS35000F Broadband Signal Analyzers or other recorder sources can be imported, combined with digitally generated signals, and then played back on the BSG for ultra-realistic test scenarios. Impairments can be added to the signals including thermal noise, phase noise, passband amplitude and phase distortion, co-channel and adjacent channel interference, and multi-path distortion. VSS software provides the unique ability to mix any combination of signals and impairments to generate complex signal environments. Aeroflex's Vector Signal Player (VSP) software provides simple controls for signal file selection, and output frequency and power control. Aeroflex's upconverters use real (non-I/Q) conversion architectures, generating high dynamic range waveforms without the carrier leakage and signal image problems associated with I/Q modulators found in traditional signal sources.

Select bandwidth, dynamic range, memory depths and options to match your most demanding signal and environment generation applications (example configurations shown).

Model Number	Bandwidth	RF Range (Hz)	SFDR (typical)	Recording Time (max)	Applications
CS25020F	86 MHz	Baseband	65 dB	88 sec (solid state)	High data rate PSK/QAM modulator test, satellite transponder simulation, linkloading, agile radio test,
CS25020F-R	64 MHz	Baseband	65 dB	>150 min (stream from RAID)	
CS25020F-RF	60 MHz	2 MHz to 18 GHz	58 dB	88 sec (solid state)	
CS25020F-RF-R	42 MHz	2 MHz to 18 GHz	58 dB	>150 min (stream from RAID)	
CS25040F	160 MHz	Baseband	50 dB	75 sec (solid state)	radar test, jammer test, military radio test, MILSATCOM test, environment simulation,
CS25040F-R	100 MHz	Baseband	50 dB	>120 min (stream from RAID)	
CS25040F-RF	120 MHz	2 MHz to 18 GHz	45 dB	75 sec (solid state)	
CS25080F	295 MHz	Baseband	50 dB	40 sec (solid state)	UHF/VHF radio test, cellular test, DVB/HDTV test, WLAN test, link simulation, drive test
CS25080F-RF	255 MHz	10 MHz to 18 GHz	45 dB	40 sec (solid state)	
CS25150F	500 MHz	Baseband	50 dB	20 sec (solid state)	playback
CS25150F-RF	400 MHz	10 MHz to 18 GHz	45 dB	20 sec (solid state)	

Vector Signal Simulator (VSS) Software

Advanced signal generation software for creating communication signals and broadband environments including mixed signal environments, realistic impairments and additive recorded signals. Intuitive graphical interface creates signals in single and multiple carrier formats with full control of all RF parameters and underlying data. Playback actual recorded RF signals captured on CS3500F Series Broadband Signal Analyzers.

VSS Signals Include

QAM to 1024, PSK to 256, nFSK, MSK, ASK, OOK
AM, FM, PM, SSB, tone combs, NPR
GSM, IS-136, EDGE, IS-95, WCDMA, CDMA2000
Pulsed, bursted and frequency hopped waveforms
Additive White Gaussian Noise (AWGN)
Mixed signal mode

VSS Software Impairments Include

Banded thermal noise
Phase noise
CW and co-channel interference
Passband phase distortion
Passband amplitude distortion
Multiple-signal channel loading
Multi-path (gain, delay and Doppler)

All Models Include

Dual-high speed Xeon processors with 4 GB system memory, dual-gigabit Ethernet, internal system hard drive, removable 73 GB data drive, DVD-R/W, USB, video, keyboard, and monitor ports, powerful Vector Signal Simulator (VSS) signal and environment creation software, and Vector Signal Player (VSP) control software.

Broadband Signal and Environment Generator Options

Data Memory	4 GB to 28 GB
RAID Storage or Output Streaming	500 GB to 2 TB
Upconverter Options	Tunable or fixed Up to 40 GHz in bands
Memory Sequencing Option	High speed address sequencing
Sample Clock Option	Low phase noise
Output Options	Precision programmable attenuators High speed attenuators Reconstruction filters High output power
Multiple/Mixed Channel Options	1 to 8 coherent or independent I/Q baseband
Disk Storage Options	Fixed and removable drives 146 & 300 GB hard drives RAID up to 2 TB
Multiple Signal Options	RF, baseband, digital, I/Q
Remote Control Option	Software control via 100/1000baseT Ethernet
Data Output Options	Broadband analog High speed digital

CHINA Beijing

Tel: [+86] (10) 6539 1166
Fax: [+86] (10) 6539 1778

CHINA Shanghai

Tel: [+86] (21) 5109 5128
Fax: [+86] (21) 5150 6112

FINLAND

Tel: [+358] (9) 2709 5541
Fax: [+358] (9) 804 2441

FRANCE

Tel: [+33] 1 60 79 96 00
Fax: [+33] 1 60 77 69 22

GERMANY

Tel: [+49] 8131 2926-0
Fax: [+49] 8131 2926-130

HONG KONG

Tel: [+852] 2832 7988
Fax: [+852] 2834 5364

INDIA

Tel: [+91] 80 5115 4501
Fax: [+91] 80 5115 4502

KOREA

Tel: [+82] (2) 3424 2719
Fax: [+82] (2) 3424 8620

SCANDINAVIA

Tel: [+45] 9614 0045
Fax: [+45] 9614 0047

SPAIN

Tel: [+34] (91) 640 11 34
Fax: [+34] (91) 640 06 40

UK Burnham

Tel: [+44] (0) 1628 604455
Fax: [+44] (0) 1628 662017

UK Cambridge

Tel: [+44] (0) 1763 262277
Fax: [+44] (0) 1763 285353

UK Stevenage

Tel: [+44] (0) 1438 742200
Fax: [+44] (0) 1438 727601
Freephone: 0800 282388

USA

Tel: [+1] (316) 522 4981
Fax: [+1] (316) 522 1360
Toll Free: 800 835 2352

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www.aeroflex.com

info-test@eroflex.com



Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.