

CLGD DOCSIS® Cable Load Generator

At a glance

The Calian CLGD emulates an entire DOCSIS 4.0 RF cable plant from a single easy to configure product. Multiple standards compliant DOCSIS OFDM carriers up to 1794 MHz with ITU J.83 A/B/C carriers up to 1218 MHz and analog TV carriers can be generated simultaneously emulating a headend. Multiple DOCSIS burst carriers can be transmitted simultaneously on the upstream up to 204 MHz emulating cable modems. For DOCSIS 4.0 applications, the CLGD can be used to transmit multiple upstream DOCSIS OFDMA carriers up to 684MHz at the same time as downstream carriers for Full Duplex cable plant emulation.

The downstream DOCSIS OFDM and ITU J.83 A/B/C modulated carriers are flexible for a variety of test application with individual configurations. RF performance is not compromised as the product meets all DOCSIS DRFI and ATP performance expectations. All data transmission can be either Ethernet traffic using the dual 10GE interface or an internally generated PN23 data test sequence.

The upstream DOCSIS OFDMA, A-TDMA, and S-CDMA are configurable with custom burst transmission rates. Each carrier can have individual level and frequency.

The ability to transmit factory or custom ARB files at the same time as the modulated carriers enhance the type of cable plant scenarios emulated. Real-world RF impairments can be simulated by configuring RF tilt, micro-reflections, phase noise, AM hum, AWGN noise, and narrowband interferers.

The flexible multichannel signal generation capabilities of the Calian CLGD enable it to simulate network loading in a reproducible manner. It's ideal for testing tuners, cable modems, amplifiers and upstream CMTS receivers.

The complex signal generation process can be conveniently controlled from a PC or web interface. Remote control through SCPI commands enables the generator to be used in automatic test systems.

Key facts

- Frequency range in downstream: 47 MHz to 1218 MHz, extendable to 1794 MHz
- Frequency range in upstream: 5 MHz to 204 MHz
- DOCSIS 4.0 and Full Duplex Support
- Compliant DOCSIS OFDM, SC-QAM (J.83/A/B/C) and analog TV
- Up to 8 x 192 MHz DOCSIS OFDM carriers
- ARB generator bandwidth up to 1747 MHz
- Accommodated in a 19" housing

Benefits and key features

Signal generation for channel loading scenarios in the downstream

- Realtime modulation of DOCSIS 4.0 and legacy DOCSIS (J.83/A/B/C)
- Combined load simulation of DOCSIS with digital and analog TV

Cable modem data traffic simulation in the upstream

- Any combination of OFDMA, A-TDMA and S-CDMA signals
- Trigger function for burst timing control

Signal interference and distortion simulation

- White gaussian (AWGN) and phase noise
- AC hum and RF Tilt
- Narrow bandwidth impulse interference
- Micro-reflections of signals



Specifications in brief

RF parameters

Frequency range

Downstream	47 MHz to 1218 MHz
With Calian CLGD-K3018 option	47 MHz to 1794 MHz
Upstream	5 MHz to 204 MHz

Level	Adjustable up to max. 62 dBmV
Tilt	Adjustable up to ± 15 dB /GHz

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DOCSIS 3.1, f = 500 MHz, B = 192 MHz	Typ. > 53 dB
2 x 192 MHz DOCSIS 3.1 and 24 x J.83/A/B/C and f < 600 MHz	≥ 50 dB
1 x J.83/A/B/C	Typ. > 45 dB

Multichannel signal generation

Downstream	Up to 5 x DOCSIS 3.1 or Up to 2 x DOCSIS 3.1 and 158 x QAM
With Calian CLGD-K3018 option	Up to 8 x DOCSIS 3.1 or Up to 4 x DOCSIS 3.1 and 158 x QAM
Upstream	Up to 2 x DOCSIS 3.1 and 32 x DOCSIS 3.0

Downstream demodulation (CLGD-K200 option)

DOCSIS

Bandwidth	Up to 192 MHz
Constellation	16QAM to 4096QAM, Overrange 8kQAM, 16kQAM
FFT mode	4k, 8k

J.83/A/B/C

Bandwidth	6 MHz, 7 MHz, 8 MHz
Constellation	64QAM, 256QAM

Analog TV	PAL, NTSC
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Upstream modulation (CLGD-K300 option)

DOCSIS 3.1

Modulation mode	OFDMA
Bandwidth	6.4 MHz to 96 MHz

DOCSIS 3.0

Modulation mode	A-TDMA, S-CDMA
Bandwidth	800 kHz, 1.6 MHz, 3.2 MHz, 6.4 MHz

ARB waveform generator

Bandwidth	200 MHz
Number of files played simultaneously	
Up to 10 MHz bandwidth	4
10 MHz to 100 MHz bandwidth	2
100 MHz to 200 MHz bandwidth	1

Interference simulation (CLGD-K1050/K1051 options)

Noise	AWGN, impulsive noise, phase noise
Microreflections	Up to 5 reflections
AC hum (Amplitude modulation)	47 Hz to 200 Hz, 0 % to 6 %
Narrowband interference	AWGN up to 20 MHz bandwidth

Ordering Information

Type	Description
CLGD	DOCSIS Cable Load Generator base unit
CLGD-K200	Downstream Full Channel Load Generator
CLGD-K201	Enhanced Functions for Downstream
CLGD-K300	Upstream Cable Modem Emulator
CLGD-K400	FDX Full Duplex DOCSIS Generator
CLGD-K1050	Signal Interference Simulation
CLGD-K1051	Fullband AWGN Enhancement
CLGD-K3018	Downstream Frequency Range Extension to 1,794 MHz