Advanced Technologies | Datasheet

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# 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 200 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


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# Specifications in brief

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|---|---|---|
| **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 |
| MER | DOCSIS 3.1, f = 500 MHz, B = 192 MHz | Typ. > 53 dB |
| | 2 x 192 MHz DOCSIS 3.1 and<br>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<br>Up to 2 x DOCSIS 3.1 and 158 x QAM |
| | With Calian CLGD-K3018 option | Up to 8 x DOCSIS 3.1 or<br>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 modulation (Calian CLGD-K200 option)** | | |
| DOCSIS | Bandwidth | Up to 192 MHz |
| | Constellation | 16QAM to 4096QAM,<br>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 |
| **Upstream modulation (Calian 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 (Calian 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 |

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