CALIAN
Confidence. Engineered.

Advanced Technologies

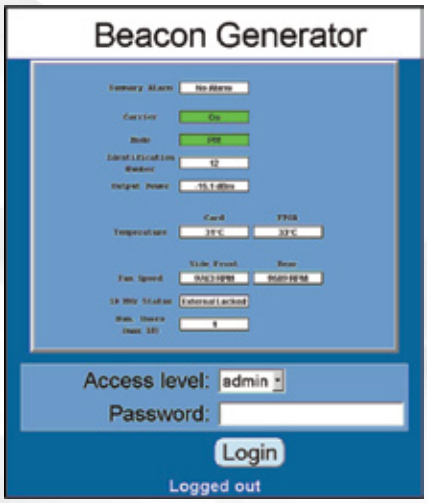
Beacon Generator

Accurate Positioning of Satellite Antennas

Calian, Advanced Technologies' Beacon Generator provides a known ground reference for accurate positioning of satellite antennas. It generates an exceptionally clean modulated signal and it is designed for highly reliable operations. Numerous operational satellite systems have selected the Beacon Generator to help control their satellite antenna pointing.

The Beacon Generator uses a high fidelity BPSK modulated signal to send a specific ID signal to the satellite. Up to 15 different GOLD codes are available to select as the modulator's ID signal. The baseband design is FPGA based, which can cost-effectively support other modulation requirements.

The Beacon Generator operates in conjunction with a third-party Ku/Ka-band block upconverter. The pair in combination generates a flexible high-fidelity RF signal at the required uplink frequency. An external 10MHz reference input is offered to provide enhanced frequency stability for both units and improved phase noise performance in the external block upconverter. Frequency agility in the modulator, combined with custom block upconverter models support other uplink frequency requirements than described in the specifications on the next page.



The modulator is controlled through a local front panel control or via an easy to use, intuitive web browser GUI interface. The GUI interface can be accessed remotely and either interface offers the ability to change the signal ID, configure the network setup, change the RF output power level, or get vital modulator health information.

The Beacon Generator uses a high fidelity BPSK modulated signal to send a specific ID signal to the satellite. Up to 15 different GOLD codes are available to select as the modulator's ID signal. The baseband design is FPGA based which can cost-effectively support other modulation requirements.

A fully documented Ethernet based API is available to integrate this modulator into a higher-level management system or to write custom scripts.

For on-site diagnostics, there are status LED indicators on the front panel.

A contact closure alarm is also available for connection to a local equipment management system.

Technical Specifications

Modulation Format - PM/BPSK

L-Band Output

Frequency	Fixed frequency range 950-1750MHz
Frequency Stability[4]	Per external 10 MHz frequency reference. If disconnected, 4.6 ppm max after 15 yrs.
Connector	50 Ω SMA-Female
Output power range	-20 to 0 dBm (recommended at 0 dBm)

Ku-band Output

Frequency	17.7985 GHz (fixed)
Frequency	Stability4 Per external 10 MHz frequency reference. If disconnected, ±2x10-8 0 to 50ºC, ±5x10-9 /day typical (fixed temp. after 24hr on time)
Connector	50 Ω SMA-Female
Output power range	-15 to +10 dB
Output power step	0.2 dB
Output power stability	± 0.5 dB
Output power accuracy	± 0.5 dB
Return Loss	Minimum 14 dB
Spurious	-75 dBc in any 4 kHz bandwidth

Monitor Output

Output level	-30 dBc
Connector	50 Ω BNC – Female (front panel)

Input Interfaces

Ethernet	10/100 Base T – rear panel
10 MHz Frequency	Connector: 50 Ω BNC-Female

Notes:

1. All specifications at 25°C unless otherwise noted.
2. All specifications subject to change without notice.
3. Phase noise is the combined phase noise of the beacon generator and 3rd party block upconverter (tuned to meet Calian requirements). The Column labeled Phase Noise – Ext is the phase noise when both the upconverter is connected to an external 10 MHz frequency reference. The column labeled Phase Noise – Int is the phase noise when the upconverter is using its own internal 10 MHz frequency reference.
4. An external 10 MHz frequency reference having the phase noise listed in the table above is required to minimize phase noise of the 3rd party block upconverter (used in conjunction with the Calian beacon generator). Connecting this frequency reference to the Calian beacon generator will improve frequency stability but will not affect its phase noise performance.

Reference

10 MHz Frequency	10 Hz, -125 dBc/Hz @ 100 Hz
Reference Phase Noise[4]	-145 dBc/Hz @ 1000 Hz, -160 dBc/Hz
Power	Male IEC 320. 100-120 VAC, 220-240 VAC auto-ranging, 50-60 Hz, Max. consumption 80 VA

Output Interfaces

Alarm	Summary alarm contact closure (normally closed) provided on a DB-9 connector, socket contacts (pins 7 & 8)

Control Interfaces

Web interface	Accessed via Ethernet physical interface
Remote control	Accessed via Ethernet physical interface API uses a socket interface to monitor & control beacon generator parameters.
Local control	Access via front panel display/scroll & select keys

Physical

Size	19” wide, 1U (1.75 inches) high, 21” deep EIA standard 19” rack mount
Weight	7 pounds max.

Environmental

Operating temp.	10ºC to 35ºC
Storage temp.	-30ºC to 55ºC
Humidity - operating	10%-80% relative humidity non-condensing
Electromagnetic Compatibiity	EN 61000-6-1, EN 61000-6-3 Safety EN 60950

PHASE NOISE [3,4]

Frequency Offset (Hz)	Phase Noise - Ext (dBc/Hz)	Phase Noise - Int (dBc/Hz)
10	-45	-42
100	-70	-67
500	-90	-87
1000	-95	-95
2000	-100	-98
4000	-105	-98
10000	-105	-98
100000	-105	-121

Contact Peter today.

Peter Waskowic - Vice President, Satcom Products
T: 306-933-1580
E: peter.waskowic@calian.com
www.calian.com/products/beacon-generator

CALIAN
Confidence. Engineered.