

Pilot Generators with Tracking Reference



The MITEQ pilot generators are designed for advanced satellite communication systems and are available for a wide variety of beacon frequencies. Phase noise, and spurious output have been optimized to provide the user with pilot signals for all video and data applications.

Pilot generators include an internal tracking reference that will adjust to track the external reference with a controlled slew rate. The internal reference also has memory and will maintain its last position to the external with the removal or loss of the external reference. No more frequency jumping with removal or loss of external reference.

A strong remote feature set of monitor and control functions are included for local and remote control. Among these features are control of frequency, attenuation and sixty-four memory locations where various setups can be stored and recalled.

A continuously updated log of time-stamped records of activity is also provided.

Frequency of Operation (MHz)	Model Number
1610 – 1670	PG-98-L-INMST-1K PG-98-L-INMST-100Hz
6410 – 6475	PG-98-C-INMST-1K PG-98-C-INMST-100Hz
7900 – 8400	PG-98-X-1K PG-98-X-100Hz
12720 – 14840	PG-98-Ku-1K PG-98-Ku-100Hz
17300 – 18400	PG-98-DBS-1K PG-98-DBS-200Hz
28000 – 30000	PG-98-Ka-1K PG-98-Ka-200Hz

Notes: 1 kHz frequency step size standard. 100Hz and 200Hz step size optional.

Features

- 1 kHz step size frequency selection
- Superior to IESS-308/309 phase noise
- Supports expandable NSU 1:N switchover series (D-323)
- Ethernet and RS485/RS422 remote control
- Automatic 5/10 MHz internal/external reference selection
- 64 programmable memory locations
- 30 dB level control
- External alarm input via contact closure
- Date and time-stamped event log
- AC power supply with power factor correction
- CE Mark
- Rear panel “U” link to bypass internal reference
- Reference phase lock with tracking memory and slew rate of 0.06 ppm/sec

Options

- Higher frequency stability
- LO level detect
- Remote RS232
- “N” female output connector

Specifications

Output characteristics	
Frequency	Refer to table
Frequency step size	1 kHz, 100Hz, 200Hz (refer to model number table)
Impedance	50 ohms
Return loss	20 dB minimum
Power output at minimum attenuation	+5 dBm minimum
Output mute	60 dB minimum on alarm or command
Spurious output in band	-65 dBc minimum at +5 dBm output
Level adjustment	30 dB
Level adjustment step size	0.2 dB
Frequency accuracy	<1 Hz with external reference
Monitor output	-20 dBc nominal
External reference input characteristics	
Frequency	5 or 10 MHz, 10 MHz only with "U" link
Power	+4 ±3 dBm
Impedance	50 ohms
Internal reference characteristics (see Note 1)	
Frequency stability	$\pm 2 \times 10^{-8}$, 0 to 50°C (higher stability options available, see Option 10), $\pm 5 \times 10^{-9}$ /day typical (fixed temperature after 24 hours on time)

NOTE 1: Reference Phase Lock: External 5 or 10 MHz at +4 ±3 dBm. If external reference is below +1 dBm nominal, the converter will automatically lock to the internal reference. Reference oscillator acts as a tracking oscillator with memory and maximum slew rate of 0.06 ppm/sec. Typical loop suppression of the external reference is as follows: 15 dB at 1 Hz offset; 35 dB at 10 Hz offset and 55 dB at 100 Hz offset.

Phase Noise Specifications

Phase Noise -dBc/Hz (maximum/typical with internal reference)

Model Number	Offset (Hz) Upconverters						
	10	100	1K	10K	100K	100K	
PG-98-L-INMST(-1K, 100Hz)	55/75	78/101	96/107	98/112	99/118	99/118	
PG-98-C-INMST(-1K, 100Hz)	55/74	73/89	90/96	93/102	94/110	94/110	
PG-98-X(-1K, 100Hz)	52/67	66/86	87/94	91/97	93/97	93/97	
PG-98-Ku(-1K, 100Hz)	50/66	69/84	87/92	91/95	93/96	93/96	
PG-98-DBS(-1K, 200Hz)	47/54	60/80	81/87	95/89	87/89	87/89	
PG-98-Ka(-1K, 200Hz)	45/50	65/77	75/85	80/85	80/85	80/85	
Maximum External Reference To Achieve Above Phase Noise with 10 MHz Reference (-dBc/Hz)							
	10	100	1K	10K	100K	300K	1M
Systems with internal reference bypass	120	150	160	160	160	160	160
Systems	95	130	140	140	140	140	140

Options

8. Output level alarm.

10. Higher frequency stability reference.

G. $\pm 5 \times 10^{-9}$ (0 to 50°C), 1×10^{-9} /day typical (fixed temperature after 24 hour on time).

H. $\pm 2 \times 10^{-9}$ (0 to 50°C), 1×10^{-9} /day typical (fixed temperature after 24 hour on time).

17. Remote control.

C. RS232 remote interface.

NRF. Type “N” female output connector. RF return loss: 18 dB, 9–15 GHz, not available above 15 GHz.

Note: Missing option numbers are not applicable for this product.

For literature describing the local control (front panel) and remote control (bus protocols), refer to MITEQ Technical Note 25T063.

General Specifications

Primary Power

Voltage	100–240 VAC (-10%, +6%)
Frequency	47–63 Hz
Power consumption.....	40 W typical, 60 W maximum

Summary Alarm

Contact closure/open for DC voltage alarm
Contact closure/open for DC voltage and/or LO alarm

Physical

Weight	15 pounds (6.8 kg) nominal
Overall dimensions.....	19" [482.6mm] x 1.75" [44.45mm] panel x 22" [558mm] maximum (chassis depth 20" [508mm])
Front panel connector	
Output monitor	SMA female
Rear panel connectors	
Output	SMA compatible (N female optional)
Reference input	BNC female
Remote interface	RS485/RS422: 2 ports user selectable each port (1 port with Option 17C) Ethernet interface: HTTP based web server, SNMP 1.0 configuration, Alarm reporting via SNMP trap, Telnet access, Password protection
Summary alarm	DE-9P
Internal reference bypass "U" link.....	10 MHz input at 0 ±5 dBm, SMA female

Environmental

Operating	
Ambient temperature	0 to 50°C
Relative humidity	Up to 95% at 30°C
Atmosphere pressure	Up to 10,000 feet
Nonoperating	
Ambient temperature	-50 to +70°C
Relative humidity	Up to 95% at 40°C
Atmospheric pressure.....	Up to 40,000 feet
Shock and vibration	Normal handling by commercial carriers