AIM & THURLBY THANDAR INSTRUMENTS

TGR6000



6 GHz RF signal generator - CW with sweep

10 MHz to 6,000 MHz at -110 Bm to +7 dBm

High purity output with low phase noise

Custom level trim of up to 100 points

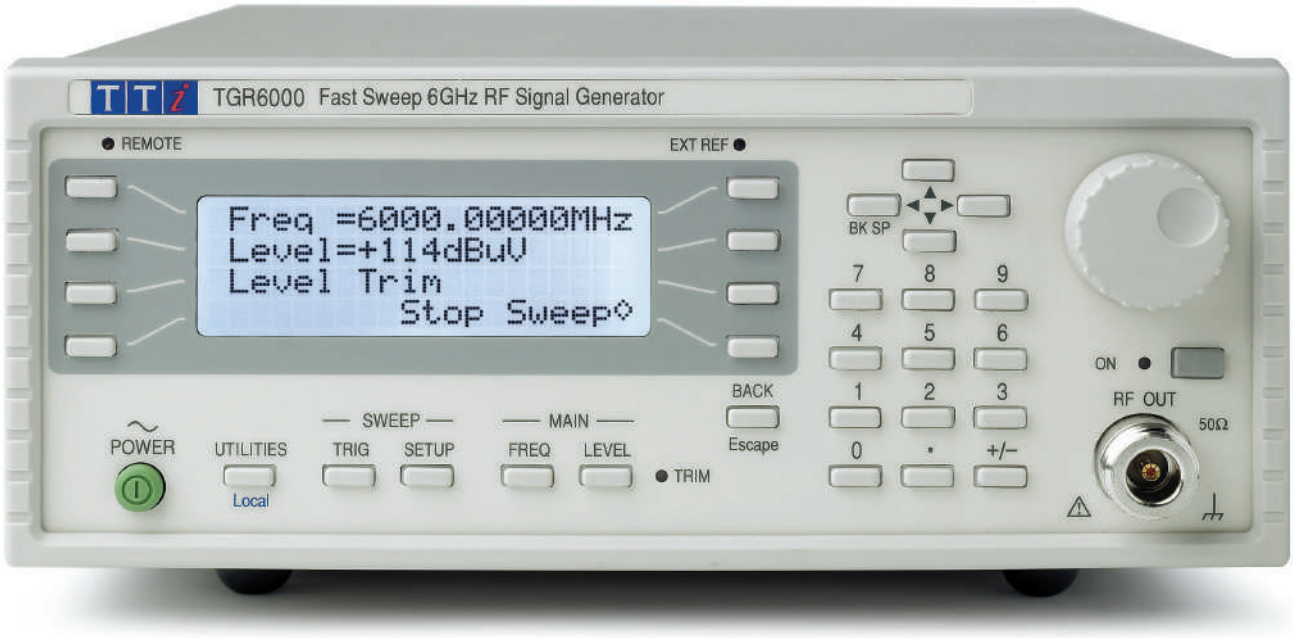
Fast full-range sweep using step or list modes

Remote control via RS232, USB, GPIB and LAN interfaces

tti-test.com

aimtti.com | aimtti.co.uk | aimtti.us

TGR6000 - 6GHz RF signal generator for CW and swept/stepped CW applications



Cost Effective Solution

The TGR6000 is a low-cost RF signal generator with a maximum frequency of 6GHz. It is intended for CW (carrier wave) applications where modulation is not required, and avoids the costs associated with adding modulations.

Low phase noise is matched by low leakage, low residual FM and spurii. The internal timebase has a 1ppm stability, and an external frequency reference can be used for higher precision.

Flexible Sweep Modes

The TGR6000 incorporates an advanced stepped sweep system which allows both frequency and amplitude to be swept.

The sweep can be defined in terms of start and stop frequency/amplitude points with linear or logarithmic interpolation between them. The total number of points can be set from 2 to 1000 and the dwell time between points can be set from 10ms up to 10s.

Sweeps can be triggered manually, from an internal timer or from the remote interfaces. If required, each point within the sweep can be stepped via a trigger event rather than a fixed time.

In List Sweep mode, the sweep is defined by a table of up to 1000 frequency/amplitude points which can be stepped between either by trigger events or by an individual dwell time for each point.

This system provides the flexibility to generate changes in frequency and amplitude to match virtually any required test pattern.

Lists can be generated within the instrument, or on a PC and downloaded via the interfaces. Up to 16 user lists can be stored permanently within the instrument's memory.

User Compensation Table (Trim)

The Trim function enables the output level to be adjusted in order to calibrate an entire test set up.

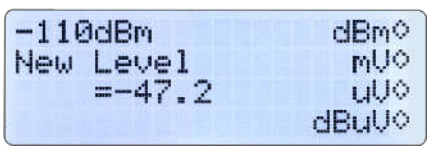
The Trim function consists of a user programmable list of up to 100 amplitude adjustment /frequency pairs. When turned on, it adjusts the output level by an amount linearly interpolated between the frequencies specified in the list.

Ease of Use

The TGR6000 is both simple and intuitive to use.

Frequency and level can be entered directly from the keyboard in whichever units are preferred. Alternatively values can be changed in user defined increments using the spin wheel or up/down keys.

The four line display has soft key functionality for setting up more complex functions such as sweep lists.



- 10MHz to 6000MHz frequency range
- Accuracy better than 1ppm over 15°C to 30°C
- Ageing better than 1 ppm over one year
- External frequency reference input
- Low phase noise and low leakage
- -110dBm to +7dBm amplitude, 0.1dB steps
- Amplitude entry in dBm, µV / mV, or dBµV
- User compensation tables for specific test set-ups
- Fast stepping sweep with dwell times down to 10ms
- Internal or externally triggered sweep, lin or log, up or down
- List sweep of up to 1000 points of amplitude vs frequency
- Storage for 12 generator set-ups and 16 sweep lists
- Compact half-rack 2U casing uses minimum bench space
- Full remote control through RS232, USB, LAN or GPIB
- Significantly lower cost than other 6 GHz generators

Set-up and Sweep List Storage

The generator has internal storage for up to 12 complete instrument set-ups and up to 16 sweep lists.

Set-ups and sweep lists can be given user defined names if required.

Full Remote Control

The TGR6000 incorporates full remote control using USB, RS-232, GPIB and LAN (Ethernet) interfaces.

GPIB IEEE-488 USB UNIVERSAL SERIAL BUS RS-232 RS-423 LAN ETHERNET

Compact for Bench or Rack

The generator is housed in a 2U high half-rack width case the uses the minimum of bench space.

A rack mounting kit is available.



TGR6000 - Technical Specifications

FREQUENCY SPECIFICATION

Frequency Setting

Frequency Range:	10MHz to 6000MHz
Setting Resolution:	10Hz
Accuracy/Stability:	See Reference Frequency section.

Phase Noise

500MHz Carrier:	<-110dBc/Hz (typ) @ 20kHz offset
	<-120dBc/Hz (typ) @ 100kHz offset
3GHz Carrier:	<-95dBc/Hz (typ) @ 20kHz offset
	<-110dBc/Hz (typ) @ 100kHz offset
6GHz Carrier:	<-89dBc/Hz (typ) @ 20kHz offset
	<-104dBc/Hz (typ) @ 100kHz offset

Residual FM

Residual FM:	12 Hz @ 500MHz
	Equivalent peak deviation in a 300Hz to 3.4kHz bandwidth.

Switching Speed

Settling Time:	<8ms to settle within 100Hz or 0.1ppm of final frequency, if greater.

FREQUENCY REFERENCE

Internal Reference

Reference Accuracy:	<± 1ppm, 15°C to 30°C
	<± 2ppm, 5°C to 40°C
Reference Stability:	<1ppm/year

10MHz Reference In/Out

Rear panel BNC that can be disabled when not required for input or output.

Ext. Reference In:	10MHz, 50Ω input impedance, 2 to 5Vpp
	Automatic detection and selection when external reference signal is present and Reference IN is selected from front panel.
	Front panel indicator shows when External Reference is active.
Int. Reference Out:	10MHz, 50Ω output impedance, >2Vpp into 50Ω
	Signal present when Reference OUT is selected from front panel.

OUTPUT LEVEL

Level Setting

Level Range:	–110dBm to +7dBm
Setting Parameters:	dBm, dBµV or µV/mV
Setting Resolution:	0.1dB, 0.01uV to 1mV
Setting Accuracy:	± 2dBm

Signal Purity

Harmonically Related:	<-25dBc @ +7dBm, <-30dBc@levels <=0dBm 30 to 6000MHz
	<-25dBc@levels <=0dBm 10 to 30MHz
Sub-harmonic:	<3000MHz : None. >3000MHz :<–40dBc (typ) @ +7dBm
Non-harmonic Spurii:	<–50dBc >10kHz offset 10 to 3000MHz (Note 1)
	<-44dBc >10kHz offset 3000MHz to 6000MHz (Note 2)
	Note 1 - <-45dBc >10kHz offset 1900–2150MHz
	Note 2 - <-39dBc >10kHz offset 3800–4300MHz.

Output Connection

Output Impedance:	50Ω
Output Connector:	Type N
Reverse Protection:	50V DC
Output Switch:	RF OUT On/Off switch with indication of ON status

FREQUENCY and AMPLITUDE SWEEP

Step Sweep

Step frequency and/or amplitude according to a formula over a specified number of points.

Max Points:	1000
Formula Specifies:	Frequency start/stop. Amplitude start/stop.
	Dwell time at each step – programmable 0.01 to 10.000sec
Sweep Run:	Continuous or single. Sweep up or down
Step Spacing:	Linear or logarithmic
Sweep Triggering:	Manual, Ext. signal, timed (0.1 – 999.9sec) or via remote interface.
Sync Signal:	(Output Stable) available during dwell time.
	Programmable to be high or low

List Sweep

As for Step Sweep except that a user defined table of frequency, amplitude and dwell time values defines the steps. The table can be created within the instrument or downloaded via the remote interfaces.

Max Points:	1000
List Storage:	Up to 16 Sweep Lists can be stored permanently within the instrument

Point Trigger

Each point in a sweep (step or list) can be subject to a trigger event rather than a dwell time.

Point Triggering:	Manual, Ext. signal or via remote interface.

TRIM (User Level Compensation Tables)

A table of frequency/gain pairs allows the user to modify the generator output level with respect to frequency to calibrate an entire test set up or improve the calibration of the generator alone. The table can be created within the instrument or downloaded via the remote interfaces.

Max. Points:	100

OTHER INPUTS/OUTPUTS

TRIG IN

DC coupled External Trigger Input signal used for step Sweep changes in Point Trigger mode.

Input Threshold:	1.65V nominal.
	Trigger polarity can be set to Negative Edge or Postive Edge.
Input Protection:	Maximum/minimum external applied voltage is +6V or –1V.

SYNC Out

Rear panel output SYNC signal goes to its active state when generator output frequency & level have settled within specification after a step change during Sweep. SYNC returns to inactive state at end of specified dwell period.

Active Output Level:	+5V (Active state set to 'Pos') or 0V (Active state set to 'Neg')
Output Impedance:	50Ω Minimum load impedance is also 50Ω.
Output Protection:	Output will withstand accidental short circuit to ground and applied external voltages up to +5V.

DIGITAL INTERFACES

Full digital remote control facilities are available through the RS232, USB, LAN and GPIB interfaces.

RS-232

9-pin D connector. Variable Baud rate can be set between 1200 and 115200 Baud maximum.

USB

USB 2.0 connection (backwards compatible with USB 1.x). Operates as a virtual COM port.

GPIB (IEEE-488)

The interface conforms with IEEE-488.1 and IEEE-488.2.

Ethernet (LAN)

Standard 10/100 base-T hardware connection. ICMP and TCP/IP Protocol for connection to Local Area Network or direct connection to a single PC.

GENERAL SPECIFICATIONS

Input

AC Input:	110-240VAC ±10% 50/60Hz; 100-120VAC ±10% 400Hz; 60VA max.
	Installation Category II.

Temperature & Environmental

Operating Range:	+5°C to +40°C, 20% to 80% RH
Storage Range:	-20°C to + 60°C
Environmental:	Indoor use at altitudes up to 2000m, Pollution Degree 2.

Safety & EMC

Safety:	Complies with EN61010-1
EMC:	Complies with EN61326

Front Panel Display and Setting

Display:	20 character x 4 row backlit alphanumeric LCD
Data Entry:	Keyboard selection of all major parameters. Value entry by character scroll using rotary control or up/down keys, or value stepping in user-selected increment values using rotary control or up/down keys
Stored Settings:	Up to 12 complete set-ups. Up to 16 sweep lists

Physical

Location:	Built-in tilt feet for bench-top use. Rack mountable with optional mount.
Size:	86.5mm (2U) height; 213.5mm (½-rack) width; 350mm long .
Weight:	3.65kg (8lb).

OPTIONS

Rack Mount

19 inch rack mount for one or two instruments.

Thurlby Thandar Instruments Ltd. operates a policy of continuous development and reserves the right to alter specifications without prior notice.

Designed and built in Europe by:

Thurlby Thandar Instruments Ltd.

Glebe Road, Huntingdon, Cambridgeshire. PE29 7DR United Kingdom

Tel: +44 1480 412451 Fax: +44 1480 450409

Email: info@tti-test.com **Web: www.tti-test.com**

Brochure Part No. 82100-1430