

RF/Microwave Signal Generators

MG37020A

Fast Switching Microwave Signal Generator,
100 μ sec Switching Speed, 10 MHz to 20 GHz

Introduction

The MG37020A Fast Switching Microwave Signal Generator is the “ideal microwave signal generator” for applications where fast frequency switching speed is a critical parameter, including data intensive applications, high throughput manufacturing test, and signal simulation. The MG37020A Fast Switching Microwave Signal Generator provides fast switching speed along with high output power, low phase noise, spectral purity, high performance pulse modulation including burst mode, size, upgradeability, reliability and service. Our signal generators are configurable for a broad range of applications from R&D to manufacturing and depot repair. Anritsu provides you a total solution including proven reliability and standard 3 year warranty plus pre- and post-sale support that is the best in the industry.



Specifications

The specifications in the following pages describe the warranted performance of the generator for $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$. Typical specifications describe expected, but not warranted, performance based on sample testing.

Frequency Coverage

Model/Option 4	Frequency Coverage	Output Type
MG37022A	2 to 20 GHz	K(f)
Option 4	10 MHz to 2.2 GHz	K(f)

Option 4: Frequency extension down to 10 MHz. Option 4 uses a digital down-converter (DDC) with successive divide-by-two circuitry. It offers reduced SSB phase noise compared to heterodyne down-converters.

CW Mode

Output Frequency Presets:

Twenty independent CW frequencies (F0 – F9 and M0 – M9).

Accuracy: Same as internal or external 10 MHz time base.

Internal Time Base Stability:

With aging: $< 2 \times 10^{-9}/\text{day}$

With temperature: $< 2 \times 10^{-9}/\text{deg C}$ over 0°C to 50°C

Internal Time Base Calibration:

The internal time base can be calibrated via the System Cal Menu to match an external reference (10 MHz ± 50 Hz).

Resolution: 0.001 Hz

External 10 MHz Reference Input:

Accepts external 10 MHz ± 50 Hz (typical), 0 to +20 dBm time base signal. Automatically detects and switches to the external reference (when applied). Rear panel BNC, 50 Ω impedance. Selectable bandwidth for best phase noise immunity or best phase tracking performance.

10 MHz Reference Output:

1 V p-p into 50 Ω . AC coupled.

Rear panel BNC: 50 Ω impedance.

Electronic Frequency Control (EFC) Input:

–5V to +5V input range. $F_{\text{out}} \times 5 \times 10^{-7}$ Hz/V sensitivity (typical).

<250 Hz modulation bandwidth. Rear Panel BNC: high impedance

Phase-Locked Step Mode

Sweep Width: Independently selected, 0.001 Hz to full range.

Every frequency step in sweep range is phase-locked.

Accuracy: Same as internal or external 10 MHz time base.

Resolution (Minimum Step Size): 0.001 Hz

Linear/Log Sweep: User-selectable linear or log sweep.

In log sweep, step size logarithmically increases with frequency.

Steps: User-selectable number of steps or the step size.

Number of Steps: Variable from 1 to 10,000

Step Size: 0.001 Hz to the full frequency range of the instrument.

(If the step size does not divide into the selected frequency range, the last step is truncated.)

Dwell Time Per Step: Variable from 50 μs to 30 seconds

Fixed Rate Sweep: Allows the user to set the total time of the sweep, including lock time. Variable from 1 ms to 30 seconds.

Alternate Sweep Mode

Sweeps alternately in step sweep between any two sweep ranges. Each sweep range may be associated with a power level.

Manual Sweep Mode

Provides stepped, phase-locked adjustment of frequency between sweep limits. User-selectable number of steps or step size.

List Sweep Mode

Under remote control or via the front panel, up to 4 tables of 3 table types with 10,001 non-sequential frequency/power sets can be stored and then addressed as a phase-locked step sweep. One table type of 10,001 points is stored in volatile memory, all other tables are stored in non-volatile memory.

Markers

Up to 20 independent, settable markers (F0 – F9 and M0 – M9).

Video Markers: +5V or –5V marker output, selectable from system menus. AUX I/O connector, rear panel.

Marker Accuracy: Same as sweep frequency accuracy.

Marker Resolution: 0.001 Hz.

Sweep Triggering

Sweep triggering is provided for Step Frequency Sweep, List Frequency Sweep, and CW Power Sweep.

Auto: Triggers sweep automatically.

External: Triggers a sweep on the low to high transition of an external TTL signal. AUX I/O connector or BNC, rear panel.

Single: Triggers, aborts, and resets a single sweep. Reset sweep may be selected to be at the top or bottom of the sweep.

Manual (List Sweep): GPIB GET or external TTL trigger will step to next index between start/stop indices.

Ultra-Stable Phase Tracking (Option 36)

Option 36 adds the rear panel BNC connectors and internal connections required to provide ultra stable phase tracking between multiple MG37020A synthesizers. Up to four instruments may be inter-connected.

100 MHz Reference Output: Provides the reference signal to drive up to three other MG37020A. All must have Option 36. This signal is only intended for use with other Option 36 instruments.

100 MHz Reference Input: Accepts the 100 MHz reference signal from another MG37020A with Option 36. This input is only intended for use with other Option 36 instruments.

Phase Drift: $< \pm 1^{\circ}$ over 100 seconds (typical), after 24 hours warm-up time.

General

Stored Setups: Stores front panel settings on the hard disk drive. The number of stored settings is limited only by the available space on the hard disk drive. A system menu allows saving and recalling of instrument setups. Whenever the instrument is turned on, control settings come on at the same functions and values existing when the instrument was turned off.

Self-Test: Instrument self-test is performed when Self-Test menu screen is selected. If an error is detected, an error message is shown in a window on the display identifying the probable cause and remedy.

Parameter Entry: Instrument-controlled parameters can be entered in multiple ways: keypad, rotary data knob, the < and > touch pads of the cursor-control key, directly on the touch screen, with an external USB keyboard, or with an external USB mouse. The keypad or keyboard is used to enter new parameter values; the rotary data knob and the cursor-control key are used to edit existing parameter values. The ▲ and ▼ touch pads of the cursor-control key move the cursor left and right one digit under the open parameter. The rotary data knob or the ▲ and ▼ touch pads will increment or decrement the digit position over the cursor. Controlled parameters are frequency, power level, sweep time, dwell time, and number of steps. Keypad entries are terminated by pressing the appropriate menu screen. Edits are terminated by exiting the edit menu.

Preset: Returns all instrument parameters to predefined default states or values. Any pending remote control command is aborted.

Warm Up Time:

From Standby: 30 minutes.

From Cold Start (0 deg C): 120 hours to achieve specified frequency stability with aging. Instruments disconnected from AC line power for more than 72 hours require 30 days to return to specified frequency stability with aging.

Power: 85-264 Vac, 48-440 Hz, 250 VA maximum

Standby: With ac line power connected, unit is placed in standby when front panel power switch is released from the OPERATE position.

Weight: 18 kg maximum

Dimensions: 133 H x 429 W x 450 D mm

Warranty: 3 years from ship date

Remote Operation

All instrument functions, settings, and operating modes (except for power on/standby) are controllable using commands sent from an external computer via the Ethernet LAN, USB or the GPIB (IEEE-488 interface bus).

GPIB Address: Selectable from a system menu

IEEE-488 Interface Function Subset:

Source Handshake: SH1
Acceptor Handshake: AH1
Talker: T6
Listener: L4
Service Request: SR1
Remote/Local: RL1
Parallel Poll: PP1
Device Clear: DC1
Device Trigger: DT1
Controller Capability: C0
Tri-State Driver: E2

GPIB Status Annunciators: When the instrument is operating in Remote, the GPIB status annunciators (listed below) will appear in a window on the front panel LCD.

Remote: Operating on the GPIB (all instrument front panel keys except for the RETURN TO LOCAL and the DISPLAY UPDATES soft-keys will be ignored).

LLO (Local Lockout): Disables the RETURN TO LOCAL soft-key. Instrument can be placed in local mode only via GPIB or by cycling line power.

Environmental (MIL-PRF-28800F, class 3)

Storage Temperature Range: -40° C to +75° C

Operating Temperature Range: 0° C to +50° C

Relative Humidity: 5% to 95% at 40° C

Altitude: 4,600 meters, 43.9 cm Hg

EMI: Meets the emission and immunity requirements of EN61326: 1998

EN55011: 1991/CISPR-11:1990 Group 1 Class A

EN61000-4-2: 1995 – 4 kV CD, 8 kV AD

EN61000-4-3: 1997 – 3 V/m

EN61000-4-4: 1995 – 0.5 kV SL, 1 kV PL

EN61000-4-5: 1995 – 1 kV – 2 kV L-E

EN61000-4-6: 1996

EN61000-4-11: 1994

Vibration:

Random, 5-500 Hz, 0.015-0.0039g²/Hz PSD

Sinusoidal, 5-55 Hz, 0.33 mm displacement

Safety Directive: EN 61010-1: 1993 + A1: 92 + A2: 95

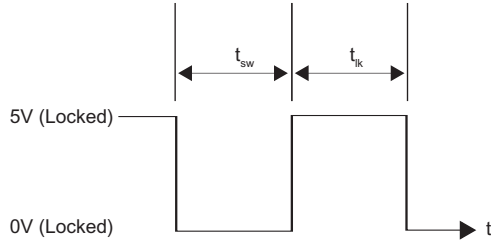
Frequency Switching Time

Definitions

Free Running Mode:

(Step or List sweep)

t_{sw} = Switching Time Unlocked



Lock Status Indicator

Rear Panel AUX I/O connector (pin 11) or Phase Locked BNC connector signal high, to be within 1 KHz of the final frequency.

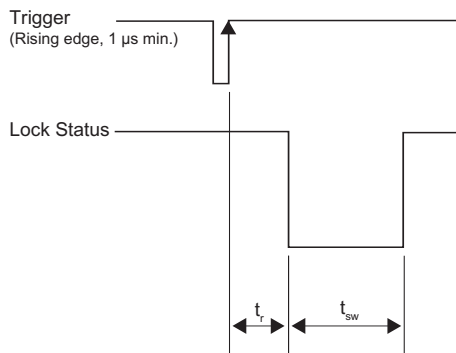
$t_{lk} = \text{Locked Time} = 50 \mu\text{s} + t_{dw}$

$t_{dw} = \text{Dwell Time, after locking. Selectable, } 50 \mu\text{s minimum}$

$t_{lk}(\text{min}) = 100 \mu\text{s}$

Single Frequency Trigger Mode:

(Manual Trigger List Mode)



$t_r = \text{Trigger Response Time } 30 \mu\text{s (typical)}$
(Applies to both remote control and external trigger)

Switching Time (t_{sw})

t_{sw} (μsec)	Condition
<100 μsec (typical)	Step not starting at or crossing a Dwell Frequency
<500 μsec (typical)	Step starting at or crossing a Dwell Frequency

Filter Switching Dwell Frequencies: 3.3, 5.5, 8.4 and 13.25 GHz

Filter Switching Dwell Frequencies, 2.2 GHz (Option 4):

12.5, 15.625, 22.5, 31.25, 43.75, < 62.5, 87.5, 125, 175, 250, 350, 500, 700, 1050 and 1500 MHz

Switching times apply to 100 MHz steps.

Spectral Purity

All specifications apply at the lesser of the maximum specified leveled output power or +10 dBm output power level, unless otherwise indicated.

Spurious Signals

Harmonic and Harmonically-related:

Frequency Range	
10 MHz to 100 MHz (Option 4)	<-40 dBc
>100 MHz to 2.2 GHz (Option 4)	<-50 dBc
2 GHz (2.2 GHz with Option 4) to 20 GHz	<-50 dBc

* -30 dBc typical with high power Option 15

Non-harmonics:

Frequency Range	
10 MHz to 100 MHz (Option 4)	<-40 dBc
2 GHz (2.2 GHz with Option 4) to 20 GHz	<-40 dBc

Power Line and Fan Rotation Spurious Emissions (dBc):

Frequency Range	Offset from Carrier		
	<300 Hz	300 Hz to 1kHz	> 1 kHz
10 MHz to 500 MHz (Option 4)	<-68	<-72	<-72
>500 MHz to 1050 MHz (Option 40)	<-62	<-72	<-72
>1050 MHz to 2.2 GHz (Option 4)	<-56	<-66	<-66
>2.2 GHz to 8.4 GHz	<-50	<-60	<-60
>8.4 GHz to 20 GHz	<-46	<-56	<-60

Residual FM* (CW and Step Sweep modes, 50 Hz to 15 kHz BW):

Frequency Range	Residual FM (Hz rms)
10 MHz to 10 GHz	<80
>10 GHz to 20 GHz	<80

AM Noise Floor: Typically < -145 dBm/Hz at 0 dBm output and offsets > 5 MHz from carrier.

Sub-Harmonics:

2 GHz to 2.5 GHz	<-30 dBc
2.5 GHz to 4 GHz	None
4 GHz to 20 GHz	<-30 dBc

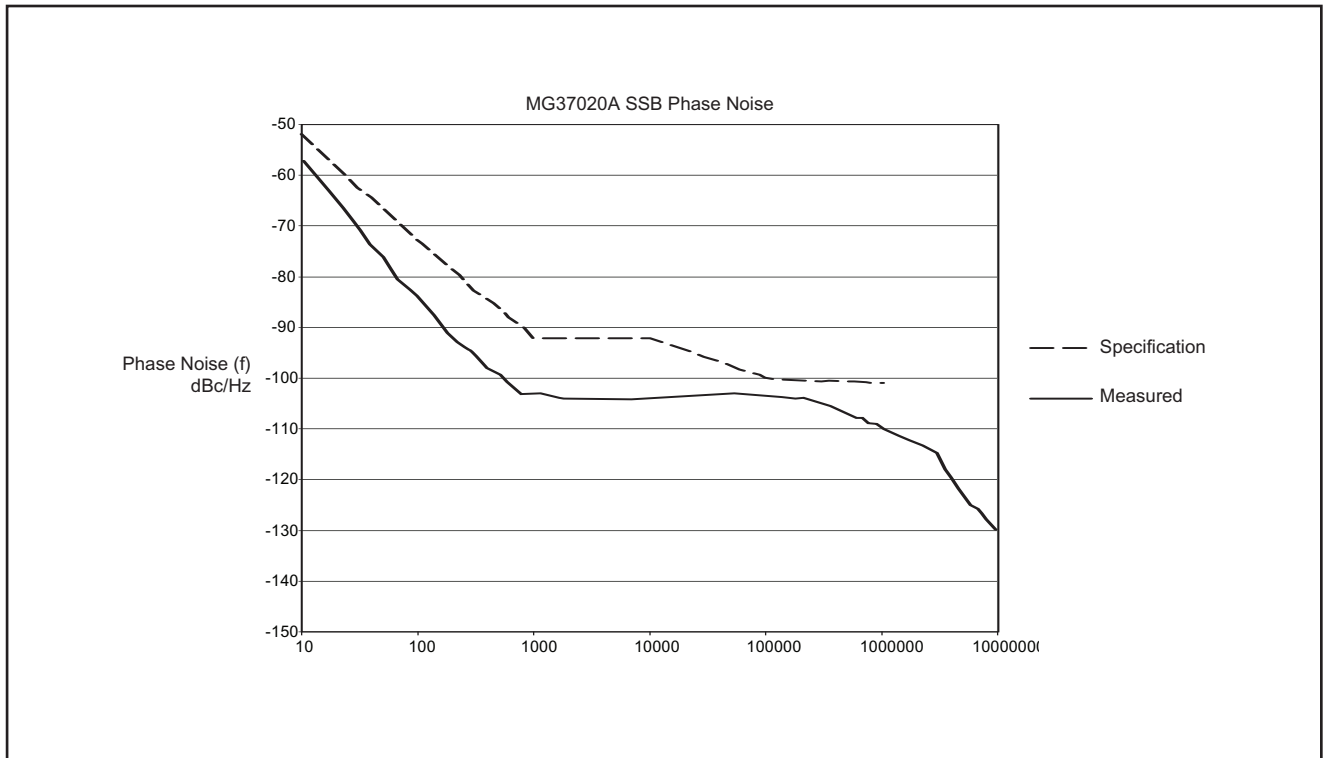
*Not Applicable with FM mode active.

Single-Sideband Phase Noise *

Single-Sideband Phase Noise (dBc/Hz): (typical)

Frequency Range	Offset from carrier					
	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz
10 MHz to 15.625 MHz (Option 4)	-105 (-115)	-126 (-132)	-139 (-143)	-142 (-145)	-142 (-145)	-145 (-148)
>15.625 MHz to 31.25 MHz (Option 4)	-99 (-106)	-121 (-127)	-134 (-142)	-139 (-145)	-139 (-145)	-145 (-148)
>31.25 MHz to 62.5 MHz (Option 4)	-93 (-96)	-116 (-122)	-129 (-140)	-135 (-145)	-137 (-145)	-142 (-150)
>62.5 MHz to 125 MHz (Option 4)	-87 (-92)	-110 (-116)	-127 (-139)	-129 (-140)	-134 (-139)	-138 (-146)
>125 MHz to 250 MHz (Option 4)	-81 (-89)	-104 (-113)	-123 (-133)	-123 (-137)	-128 (-134)	-132 (-144)
>250 MHz to 500 MHz (Option 4)	-75 (-85)	-98 (-105)	-117 (-126)	-117 (-130)	-122 (-128)	-126 (-140)
>500 MHz to 1050 MHz (Option 4)	-69 (-77)	-92 (-100)	-111 (-118)	-111 (-119)	-116 (-118)	-120 (-131)
>1050 MHz to < 2.2 GHz (Option 4)	-63 (-70)	-86 (-95)	-105 (-112)	-105 (-117)	-110 (-114)	-114 (-122)
2 GHz (2.2 GHz with Option 4) to 6 GHz	-54 (-60)	-77 (-88)	-96 (-104)	-96 (-108)	-101 (-107)	-105 (-115)
>6 GHz to 10 GHz	-52 (-55)	-73 (-83)	-92 (-102)	-92 (-105)	-100 (-104)	-101 (-115)
>10 GHz to 20 GHz	-46 (-50)	-67 (-77)	-86 (-95)	-86 (-98)	-94 (-98)	-95 (-114)

* Phase Noise is specified and guaranteed only with internal reference. In external reference mode, the phase noise of the external supplied reference and the external reference bandwidth will dictate the instrument phase noise performance. Phase noise is not degraded when adding the high power Option 15.



Typical MG37020A single sideband phase noise at 10 GHz carrier.

RF Output

Power level specifications apply at 25° C ± 10° C.

Maximum Levelled Output Power:

Model Number	Configuration	Frequency Range	Output Power	Output Power with Option 2 Step Attenuator
MG37022A	Standard	2 GHz to 10 GHz >10 GHz to 20 GHz	+19.0 dBm +17.0 dBm	+18.0 dBm +15.0 dBm
	Option 4	10 MHz to 2.2 GHz >2.2 GHz to 10 GHz >10 GHz to 20 GHz	+19.0 dBm +19.0 dBm +17.0 dBm	+18.0 dBm +18.0 dBm +15.0 dBm

Maximum Levelled Output Power with High Power Option 15:

Model Number	Configuration	Frequency Range	Output Power	Output Power with Option 2 Step Attenuator
MG37022A	Standard	2 GHz to 20 GHz	+23.0 dBm	+21.0 dBm
	Option 4	10 MHz to ≤2.2 GHz >2.2 GHz to 20 GHz	+19.0 dBm +21.0 dBm	+18.0 dBm +19.0 dBm

Minimum Levelled Output Power:

Model Number	Configuration	Frequency Range	Output Power	Output Power (dBm) with Option 2 Step Attenuator
MG37022A	Standard	10 MHz to 20 GHz	-5.0 dBm (-10.0 typical)	-105.0 dBm (-110.0 dBm typical)
	High Power (Option 15)	10 MHz to 20 GHz	-5.0 dBm (-10.0 dBm typical)	-105.0 dBm (-10.0 dBm typical)

Unlevelled Output Power Range (typical)

Without Step Attenuator (Option 2): >40 dB below max settable power

With Step Attenuator (Option 2): >130 dB below max settable power

Power Level Switching Time (to within specified accuracy)

Without Change in Step Attenuator (Option 2): <100 μs typical

With Change in Step Attenuator (Option 2): <20 ms typical

Accuracy and Flatness

Accuracy specifies the total worst case accuracy.

Flatness is included within the accuracy specification.

Accuracy: ± 1.0 dB

Flatness: ± 0.8 dB

Other Output Power Specifications

Output Units: Output units are selectable as either dBm, mV or dB μ V. Selection of mV or dB μ V assumes a 50 Ω load. Data entry and display are all in the selected units.

Output Power Resolution: 0.01 dB, 0.001 mV or 0.01 dB μ V

Source Impedance: 50 Ω nominal

Source VSWR (Internal Leveling): <2.0:1 typical

Power Level Stability with Temperature: 0.04 dB/deg C typical

Output On/Off: Toggles the RF output between an off and on state. During the off state, the RF oscillator is turned off. The off or on state is indicated by two LEDs located below the OUTPUT ON/OFF key on the front panel. Switching the RF on from an off state will require 1 ms for the output to be phase-locked and leveled.

RF On/Off Between Frequency Steps: System menu selection of RF on or RF off during frequency switching in CW, Step sweep and List Sweep modes. RF off state will provide >40 dB of attenuation of output power and will not incur any switching time penalties.

RF On/Off During Retrace: System menu selection of RF on or RF off during retrace. RF off state will provide >40 dB of attenuation of output power and will lengthen switches times to <500 μ s typical.

Internal Leveling: Power is leveled at the output connector in all modes.

Modulation

Pulse Modulation (Option 26):

Option 26 adds pulse modulation, driven externally via a rear panel BNC connector (TTL levels) and an internal modulation waveform generator. Pulse modulation specifications apply at maximum rated power, unless otherwise indicated.

On/Off ratio: >80 dB (>70 dB with high power Option 15)

Minimum Leveled Pulse Width:

<100 ns, 2 GHz (2.2 GHz with Option 4) to 20 GHz

<1 μ s, 10 MHz to <2 GHz (2.2 GHz with Option 4)

Minimum Unleveled Pulse width: <10 ns

Leveled Accuracy Relative to CW (100 Hz to 1 MHz PRF):

± 0.5 dB, ≥ 1 μ s pulse width

± 1.0 dB, <1 μ s pulse width

Pulse delay (typical): 50 ns in External Mode

Pulse Repetition Frequency (PRF) Range:

DC to 10 MHz, unleveled

100 Hz to 5 MHz, leveled

Frequency Range	Rise and Fall Time*	Overshoot	Pulse Width Compression	Video Feedthrough
10 MHz to 31.25 MHz (Option 4)	400 ns typical	33% typical	40 ns typical	± 70 mV typical
>31.25 MHz to 125 MHz (Option 4)	90 ns typical	22% typical	12 ns typical	± 130 mV typical
>125 MHz to 500 MHz (Option 4)	33 ns typical	11% typical	12 ns typical	± 70 mV typical
>500 MHz to <2.2 GHz (Option 4)	15 ns typical	10%	12 ns typical	± 50 mV typical
2 GHz (2.2 GHz with Option 4) to 20 GHz	10 ns (5 ns typical)	10%	8 ns typical	± 10 mV typical

* Rise and Fall Time, 10% to 90%

External Input: Rear-panel BNC.

Drive Level and Input Logic: TTL compatible input, active high or active low selectable from modulation menu.

Internal Pulse Generator (Included with Option 26)

Modes: Single, double, triple, quadruple, burst

Triggers: Free-run, triggered, gated, swept-delay

Inputs/Outputs: Video pulse and sync out, rear-panel BNC connectors

Pulse Parameter	Specification, 100 MHz Clock Rate
Pulse Width	10 ns to 1.6 s
Pulse Period	100 ns to 16 s
Variable Delay, Single Pulse	0 to 1.6 s
Variable Delay, Doublet, Triplet, Quadruplet	100 ns to 1.6 s
Resolution	10 ns
Accuracy	10 ns (5 ns typical)

Inputs and Outputs

Input and Output Connections		
Nomenclature	Type	Location
RF Output	K (female)	Front Panel
RF Output (Option 9)	K (female)	Rear Panel
10 MHz REF IN	BNC	Rear Panel
10 MHz REF OUT	BNC	Rear Panel
PHASE LOCKED	BNC	Rear Panel
EXT ALC IN	BNC	Rear Panel
RF LEVELED	BNC	Rear Panel
PULSE TRIG IN (Option 26)	BNC	Rear Panel
PULSE SYNC OUT (Option 26)	BNC	Rear Panel
PULSE VIDEO OUT (Option 26)	BNC	Rear Panel
AUX I/O	25 Pin D-type (female)	Rear Panel
EXT MONITOR	15 Pin VGA (female)	Rear Panel
SERIAL I/O	9 Pin D-type (male)	Rear Panel
IEEE-488 GPIB	Type 57	Rear Panel
LAN (100BaseT)	RJ45	Rear Panel
USB-2.0 (Host)	USB type A (2 each)	Front Panel
USB-2.0 (Host)	USB type A (2 each)	Rear Panel
USB-2.0 (Device)	USB type B	Rear Panel

Note: Connectors may be available but not active, if option is not ordered.



MG37020A rear panel connectors

EXT ALC IN

EXT ALC IN provides for leveling the RF output signal externally with either a detector or power meter. Signal requirements are shown in the RF Output specifications.

RF OUTPUT

Provides for RF output from a 50 Ω source impedance. K Connector, female. Option 9 moves the RF output connector to the rear panel.

10 MHz REF IN

Accepts an external 10 MHz \pm 100 Hz, 0 to +20 dBm time-base signal.

10 MHz REF OUT

Provides a 1 Vp-p, AC coupled, 10 MHz signal derived from the internal frequency standard. 50 Ω impedance.

100 MHz REF IN (Option 36)

Accepts the 100 MHz signal from an MG37020A with Option 36 for ultra stable phase tracking.

100 MHz REF OUT (Option 36)

Provides the 100 MHz signal for the MG37020A Option 36 ultra stable phase tracking.

AUX I/O (Auxiliary Input/Output)

Provides for most of the rear panel BNC connections through a single, 25-pin, D type connector. Supports master-slave operation with another synthesizer or allows for a single-cable interface with other Anritsu instruments. (see figure below)

SERIAL I/O (Serial Input/Output)

Provides access to RS-232 terminal ports.

IEEE-488 GPIB

Provides input/output connections for the General Purpose Interface Bus (GPIB).

USB-2.0 I/O

Provides input/output connections for the USB interface. Type A connectors are available on both the front and rear panels for USB Host. One type B connector on the rear panel is for USB device mode.

ETHERNET (100BaseT LAN) I/O

Provides input/output connections for the LAN interface.

PULSE TRIG IN

Accepts an external TTL compatible signal to pulse modulate the RF output signal or to trigger or to gate the optional internal pulse generator. Available with Option 26, Pulse Modulation.

PULSE SYNC OUT

Provides a TTL compatible signal, synchronized to the internal pulse modulation output, Option 26.

PULSE VIDEO OUT

Provides a video modulating signal from the internal pulse generator, Option 26.

EXT TRIG IN

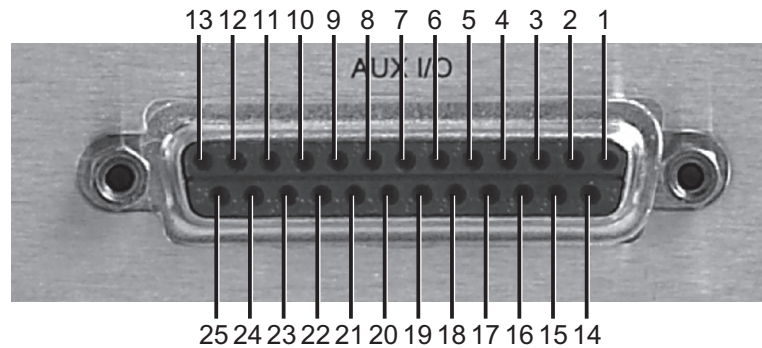
Accepts an external LVTTTL compatible signal (5V tolerant) to trigger a frequency sweep, frequency step, power sweep, power step, list sweep or the next step in a list.

PHASE LOCKED

Provides a TTL compatible signal with a high level indicating the RF Output is phase locked and leveled.

EXT MONITOR

Provides a VGA connector for the use of an external display monitor.

**Aux I/O Pins:**

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Horizontal Output 2. Chassis Ground 3. Sequential Sync Output 4. Low Alternate Enable Output 5. Marker Output 6. Retrace Blanking Output 7. Low Alternate Sweep Output 8. Chassis Ground 9. n/c 10. Sweep Dwell Output 11. Lock Status Output 12. Penlift | <ol style="list-style-type: none"> 13. External Trigger Input 14. V/GHz Output 15. End-of-Sweep Input 16. End-of-Sweep Output 17. n/c 18. Sweep Dwell Input 19. n/c 20. Bandswitch Blanking Output 21. MasterReset 22. Horizontal Sweep Input 23. Horizontal Sweep Input Return 24. Chassis Ground 25. Memory Sequencing Input |
|---|---|

Ordering Information

Model

MG37022A

2 to 20 GHz Fast Switching Signal Generator

Options

MG37022A-001	Rack Mount with Slides - Kit contains a set of track slides, mounting ears and front panel handles for a standard 19 inch equipment rack.	MG37022A-037	Performance Suite – For ease of ordering and package pricing, this option bundles Options 2, 4, 15 and 26.
MG37022A-002	Mechanical Step Attenuator - Adds a 10 dB/step attenuator. RF output power is reduced.	MG37022A-088	1 msec Switching Speed Limit - Limits the frequency switching speed to 1 msec to comply with United States Export Control regulations
MG37022A-004	10 MHz to 2.2 GHz RF Coverage - Uses a digital down converter to significantly reduce SSB phase noise	MG37022A-098	Standard Calibration to ISO17025 and ANSI/NCSL Z540. Provides a calibration certificate, decal and “Calibration void if removed” tamper seals.
MG37022A-009	Rear Panel Output - Moves the RF output connector to the rear panel.	MG37022A-099	Premium Calibration to ISO17025 and ANSI/NCSL Z540. Provides everything included with Option 98 plus test report and uncertainty data.
MG37022A-015	High Power - Adds high-power RF components to the instrument to increase the output power level.		
MG37022A-017	Delete Front Panel - Deletes the front panel for use in remote controlled applications. (Only available with Option 1)		
MG37022A-026	Pulse Modulation - Includes internal waveform generator and external input via a rear panel BNC connector.	34RKNF50	DC to 20 GHz ruggedized K male to Type-N female adapter.
MG37022A-035	Removable Hard Drive - Provides the capability to remove the internal hard drive, and includes one replacement hard drive with instrument software.	63270	Transit case (16 kg, 65 cm x 81 cm, roll-away on two wheels).
MG37022A-036	Ultra Stable Phase Track - Provides the capability for ultra-stable phase tracking between instruments using the internal 100 MHz reference.	806-97	AUX I/O cable, 25 pin to BNC: Sequential Sync, Marker Out, Bandswitch Blanking, Retrace Blanking, Sweep Dwell In, V/GHz and Horizontal Out.

Optional Accessories

Anritsu

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