

IFR/INSTRUMENT FLIGHT RESEARCH

2024

The Marconi / IFR 2024 is a lightweight, portable synthesized signal generator covering a carrier frequency range of 9 kHz to 2.4 GHz. Highly regarded for its spectral purity, low noise floor, and comprehensive modulation capabilities, it is designed for both laboratory and field test environments. Standard features include full GPIB remote control, extensive sweep options, and a robust internal LF modulation source.

SPECIFICATIONS

Frequency

Minimum Frequency	9 kHz Hz
Maximum Frequency	2.4 GHz Hz
Frequency Resolution	1 Hz

Output

Maximum Output Power	+13 dBm dBm
Output Power Range	-140 dBm to +13 dBm
Phase Noise	<-115 dBc/Hz @ 20 kHz offset (1 GHz carrier)

Modulation

Modulation	AM, FM, Phase Modulation (Φ M), Pulse (optional)
Sweep Modes	Linear and logarithmic carrier frequency / RF level sweep
FM Distortion	< 0.5% at 1 kHz rate and 100 kHz deviation
AM Distortion	< 1.5% at 1 kHz rate and 30% depth

General

Reference Oscillator	10 MHz TCXO
Interfaces	GPIB (IEEE-488.2)
Display	LCD with LED backlighting

Physical

Power Supply	100 to 240 V AC ($\pm 10\%$), 50 to 400 Hz
Dimensions (W×H×D)	389 mm × 108 mm × 463 mm mm
Weight	10.5 kg kg

Frequency Specifications

Frequency Range	9 kHz to 2.4 GHz
Internal Reference Frequency	10 MHz
Reference Aging Rate	< ±1 ppm per year
Reference Temperature Stability	< ±1 ppm (0 °C to 50 °C)
External Reference Input Frequency	10 MHz

Output Power and Level

Amplitude Range	-140 dBm to +13 dBm
Amplitude Resolution	0.1 dB
Output Impedance	50 Ω nominal
Output VSWR	< 1.25:1 (for levels < -7 dBm, up to 1.2 GHz)
Maximum Reverse Power Protection	50 W (from 50 Ω source, DC to 2.4 GHz)
Reverse Voltage Protection	50 V DC

Spectral Purity

Harmonics	<-30 dBc (for levels < +6 dBm)
Non-Harmonics (Spurious)	<-70 dBc (at >10 kHz offset, up to 1 GHz)
Sub-Harmonics	None up to 1.2 GHz, <-40 dBc up to 2.4 GHz
SSB Phase Noise at 20 kHz offset	<-115 dBc/Hz (at 1 GHz carrier)
Residual FM	< 4.5 Hz RMS (at 1 GHz, 300 Hz to 3.4 kHz bandwidth)
Residual AM	< 0.05% (50 Hz to 15 kHz bandwidth)

Frequency Modulation (FM)

Maximum FM Deviation	Up to 3.2 MHz (carrier dependent)
FM Resolution	1 Hz or 3 digits

Amplitude Modulation (AM)

Maximum AM Depth	0% to 99.9%
AM Depth Resolution	0.1%
AM Accuracy	±(4% of reading + 1%) at 1 kHz

Phase Modulation (Phi-M)

Maximum Phase Deviation	Up to 320 rads (carrier dependent)
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Internal Modulation Source

Internal LF Generator Frequency Range	0.1 Hz to 500 kHz
Internal LF Generator Resolution	0.1 Hz
Internal LF Waveforms	Sine, triangle, square
LF Output Voltage Range	0.1 mV to 5 V RMS (into high impedance)

Rear Panel and Control Interfaces

GPIO Interface	IEEE-488.2 standard
RF Output Connector	Type N female

Physical and Environmental

Operating Temperature Range	0 °C to 55 °C
Power Supply Frequency Range	45 Hz to 440 Hz
Power Consumption	120 VA maximum

RF Output & Level Performance

RF Level Accuracy	±1.0 dB (for levels > -127 dBm)
RF Level Flatness	±0.5 dB (across full frequency range)
Attenuator Hold Range	up to 20 dB (user-selectable)
Carrier Frequency Settling Time	< 10 ms

Modulation Performance & Options

Pulse Modulation Option	Option 002
Pulse Modulation On/Off Ratio	> 80 dB (with Option 002)
Dual Modulation Source Option	Option 001 (adds second internal LF generator)
Electronic Attenuator Option	Option 003
Avionics Option	Option 006 (adds VOR/ILS capability)

System & Control

Memory Capacity	100 non-volatile store locations, 20 intermediate store locations
GPIO Emulation Modes	Marconi 2018/2019, Marconi 2022

Environmental & Standards

EMC Compliance	Conforms to EN 55011 Class B and EN 50082-1
Safety Compliance	Conforms to EN 61010-1

Inputs & Outputs

External Modulation Input	BNC female (front panel), 100 kOhm input impedance
LF Output Connector	BNC female (front panel)

LF Generator

LF Output Impedance	50 ohms nominal
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Environmental

Storage Temperature Range	-40 °C to +71 °C
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TECHNOLOGY

Synthesized Signal Generation

APPLICATIONS

RF / Microwave Testing & Calibration

Generated by SpecAtlasHub (specatlashub.com). Specifications are compiled from available sources and are subject to change — verify critical values against the manufacturer before purchase.