Product Specification
IFR 4000
Portable Nav/Comm Test Set

VIAVI Solutions

Product Specification

Note: A 15 minute warm-up period is required for all specifications.

RF SIGNAL GENERATOR

Marker Beacon Channel	72.0 to 78.0 MHz in 25 kHz steps
Marker Beacon Pre-set	74.5, 75.0 or 75.5 MHz
Marker Beacon Variable	72.0 to 78.0 MHz in 1 kHz steps
VOR Channel	108.0 to 117.95 MHz in 50 kHz steps
VOR Pre-set	108.0, 108.05 or 117.95 MHz
VOR Variable	107.0 to 118.0 MHz in 1 kHz steps
LOC Channel	108.1 to 111.95 MHz in 50 kHz steps
LOC Pre-set	108.1, 108.15 or 110.15 MHz
LOC Variable	107.0 to 113.0 MHz in 1 kHz steps
G/S Channel	329.15 to 335.0 MHz in 50 kHz steps
G/S Pre-set	334.25, 334.55 or 334.70 MHz
G/S Variable	327.0 to 337.0 MHz in 1 kHz steps
Comm AM Channel	10.0000 to 400.0000 MHz in 25 kHz steps, 118.0000 to 156.0000 in 8.33 KHz steps
Comm AM Preset	118.00, 137.00 or 156.00 MHz (VHF Band) 225.00, 312.00, 400.00 MHz (UHF Band)
Comm AM Variable	10.0000 to 400.0000 MHz in 1 kHz steps
Comm FM Channel	10.0000 to 400.0000 MHz in 12.5 or 25 kHz steps
Comm FM Pre-set	156.00, 165.00 or 174.00 MHz
Comm FM Variable	10.0000 to 400.0000 MHz in 1 kHz steps
Comm SSB Channel	10.0000 to 30.0000 MHz in 100 Hz steps
SELCAL Channel	118.0 to 156.0 MHz in 25 kHz steps
SELCAL Pre-set	118.0, 137.0 or 156.0 MHz
SELCAL Variable	117.0 to 157.0 MHz in 1 kHz steps

Frequency Accuracy
Same as time base

Output Level

Antenna Connector

Single Carrier	
10 MHz to 75 MHz	-17 to -67 dBm in 0.5 dB steps
75 MHz to 400 MHz	+13 to -67 dBm in 0.5 dB steps
Accuracy	±3 dB
Dual Mode – LOC	0 dBm fixed
Accuracy	±2.5 dB
Dual Mode - G/S	0 to -76 dBm in 0.5 dB steps
Accuracy	±3 dB
Tri-Mode – Marker	+13 dBm fixed
Accuracy	±2 dB
Tri-Mode - LOC	-7 dBm fixed
Accuracy	±2 Hz
Tri-Mode - G/S	-7 to -83 dBm in 0.5 dB steps
Accuracy	±3 dB

RF I/O Connector

Single Carrier	
10 MHz to 75 MHz	-40 to -130 dBm in 0.5 dB steps
75 MHz to 400 MHz	-12 to -130 dBm in 0.5 dB steps
Accuracy	
-12 to -39.5 dBm	±2.5 dB
-40 to -94.5 dBm	±2.0 dB
-95 to -120 dBm	±3 dB
Dual Mode - LOC	-22 dBm fixed
Accuracy	±2 dB
Dual Mode - G/S	-22 to -101 dBm in 0.5 dB steps
	±2.5 dB

Spectral Purity

Harmonics	<-20 dBc
Non-harmonics Spurious	<-35 dBc between 10 and 400 MHz

VOR MODE

VOR Tone Frequency Accuracy

30 Hz Reference	±0.02%
30 Hz Variable	±0.02%
1020 Hz	±0.02%
9960 Hz	±0.02%

AM Modulation

CAL

30 and 9960 Hz tones	30% AM, each tone
Accuracy	±1% modulation
1020 Hz tone	30% AM
1020 Hz Morse Code	10% AM
Accuracy	± 2% modulation
Variable	
Range	0% to 55% AM (30, 9960 and 1020 Hz tones)
Distortion	<2.0 % in CAL position

FM Modulation

30 Hz reference at ±480 Hz peak deviation on 9960 Hz sub- carrier

Accuracy ±25 Hz peak deviation

Bearing

To - From selectable

Preset Bearing

0°, 30°, 60°, 90°, 120°, 150°°, 180°, 210°, 240°, 270°, 300°, and 330°

Variable Bearing

3600 digitally derived courses in 0.1° increments

Accuracy ±0.1°

LOC MODE

LOC Tone Frequency Accuracy

90 Hz	±0.02%
150 Hz	±0.02%
1020 Hz	±0.02%

Modulation

CAL

90 and 150 Hz Tones	20% AM each tone
1020 Hz Audio Tone	30% AM
1020 Hz Morse Tone	10% AM
Accuracy	±2% modulation

Variable

Range

0% to 28% AM (90 and 150 Hz Tones)

0 to 42% AM (1020 Hz tone)

Distortion <2.5% in CAL position

LOC DDM

Fixed

Range	±0, 0.093, 0.155 or 0.200 DDM and tone delete
Accuracy	±0.0015 DDM (±1.5 µA) ±3% of setting ≤+10 dBm output level)

Variable

Range	±0.4 in 0.001 DDM steps
Accuracy	±0.0025 DDM (±2.5 µA) ±3% of setting ≤+10 dBm output level)

Variable Sweep

(Available only in dual and tri-modes)

Range	0 to ±30 µA
Sweep Rates	5 to 40 sec
Step Size	5 sec
Accuracy	±0.5 sec/sweep

Phase Shift

Range	0 to 120 degrees in 5 degree increments (150 Hz phase relative to 90 Hz)
Accuracy	±0.5º

G/S MODE

Tone Frequency Accuracy

90 Hz	±0.02%
150 Hz	±0.02%

Modulation

CAL

90 and 150 Hz Tones	40% AM, each tone
Accuracy	±2% modulation

Variable

Range	0% to 50% AM (90 and 150 Hz tones)
Distortion	<2.5% in CAL position

G/S DDM

Fixed

Range	±0, 0.091, 0.175 or 0.400 DDM and tone delete
Accuracy	±0.003 DDM (±2.5 µA) ±3% of setting ≤ +10 dBm output level)

Variable

Range	±0.8 DDM in 0.001 DDM steps
Accuracy	±0.0048 DDM (±4.0 µA) ±3% of setting ≤+10 dBm output level)

Phase Shift

Range	0 to 120 degrees in 5 degree increments (150 Hz phase relative to 90 Hz)
Accuracy	±0.5º

MARKER MODE

Marker Tone Frequency Accuracy

400 Hz	±0.02%
1300 Hz	±0.02%
3000 Hz	±0.02%

Modulation

CAL

Setting	95% AM
Accuracy	±5% modulation

Variable (single carrier only)

Range	0% to 95% AM

Distortion

Single Carrier	<2.5% in CAL position (-67 to +10 dBm)
Tri-Mode	<5% in CAL position

COMM MODE (COMM AM, COMM FM, COMM SSB)

COMM Tone Frequency Accuracy

Pre-set (AM) 1020 Hz	±0.02%
Pre-set (FM) 1000 Hz	±0.02%
Pre-set (SSB) 1000 Hz / Variable (SSB) 25 to 3000 Hz	±6.25 Hz
Variable Steps (SSB)	25 Hz

AM Modulation

CAL

1020 Hz tone	30% AM
Accuracy	±2% modulation

Variable

Range	0% to 95% AM (1% steps)

Distortion <2.5% in CAL position

FM Modulation

CAL

1000 Hz tone	5 KHz deviation
Accuracy	±0.5%

Variable

Range	1 to 15 KHz (1 KHz steps)

Distortion <5% in CAL position

SSB Modulation

USB/LSB offset carrier

SELCAL MODE

Provides amplitude modulation with SELCAL (SELective CALling) tones

SELCAL Tone Freq Accuracy ± 0.02%

Transmit Modes

Single	single transmission
Continuous	7.5 sec interval (typical)

Modulation

CAL

Per SELCAL Tone	40% AM
Accuracy	±2% modulation

Variable

Range	0% to 55% AM

Distortion <2.5% in CAL position

EXTERNAL FREQUENCY COUNTER

Frequency Range

Antenna and RF I/O Connectors

Range	10 to 400 MHz
Resolution	100 Hz
Accuracy	Same as time base, ±1 count

AUX I/O Connectors

Range	1 to 10 MHz
Resolution	1 Hz
Accuracy	Same as time base, ±1 count

Sensitivity

ANT Connector	≥-35 dBm
RF I/O Connector	≥0 dBm
AUX I/O Connector	≥1 Vp-p (from a 50 ohm source)

POWER METER (RF I/O CONNECTOR)

Frequency Range

10.0 to 400.0 MHz

Power Range

0.1 to <1 W	Resolution 0.01 W
1 to <100 W	Resolution 0.1 W (NOTE 1)
100 to 1999 W	Resolution 1 W (NOTE 1)

Accuracy

<100 MHz	±12% of reading, ±1 count, CW only (NOTE 2)
100 to 400 MHz	±8% of reading, ±1 count, CW only (NOTE 2)

Duty Cycle

≤10 W, continuous
>10 W to ≤20 W, 3 min on, 2 min off
>20 W to ≤30 W, 1 min on, 2 min off

AM METER

Audio Range	50 to 3000 Hz
Percent Modulation Range	10% to 99%
Accuracy	±10% of reading
Sensitivity	
Antenna Connector	≥-20 dBm
RF I/O Connector	≥+15 dBm

FM METER

Audio Range	50 to 3000 Hz
Deviation Range	1 to 15 kHz
Accuracy	±(0.4 kHz + 8% of reading)
Minimum Input Level	
Antenna Connector	≥-35 dBm
RF I/O Connector	≥0 dBm

SWR METER (SWR CONNECTOR)

Frequency Range

10.0 MHz to 410.0 MHz

Accuracy	
SWR <3:1	±0.2, ±20% of reading
SWR ≥3:1	±0.3, ±20% of reading

121.5/243 BEACON MONITOR (OPTION)

Swept Audio Tone Range	100 Hz to 3000 Hz
Accuracy	±10% of reading
Sensitivity	
Antenna Connector	≥-30 dBm
RF I/O Connector	≥0 dBm

406 MHZ BEACON MONITOR (OPTION)

Sensitivity	
Antenna Connector	≥-35 dBm
RF I/O Connector	≥0 dBm

INPUTS/OUTPUTS

RF I/O Connector

Type	Input/Output
Impedance	50 Ω typical
Maximum Input Level	30 W, 1 min on, 2 min off
VSWR	
10 to ≤300 MHz	<1.3:1
>300 to 400 MHz	<1.35:1

Antenna Connector

Type	Input/Output
Impedance	50 Ω typical
Maximum Input Level	0.5 W

SWR Connector

Type	Output
Impedance	50 Ω typical
Maximum Reverse Power	+25 dBm
VSWR	
10 to ≤300 MHz	<1.3:1
>300 to 400 MHz	<1.35:1

AUX Connector

Type	Input/Output
Impedance	800 Ω typical
Maximum Input Level	5 Vp-p maximum, 3 VDC maximum

TIMEBASE (TCXO)

Temperature Stability	±1 ppm
Aging	±1 ppm per year
Accuracy	±1 ppm when Auto Cal is performed

BATTERY

Type	Li Ion
Duration	>8 hrs continuous operation

INPUT POWER (TEST SET)

Input Range 11 VDC to 32 VDC

Power Consumption

55 W maximum

16 W nominal at 18 VDC with charged battery

Fuse Requirements

5 A, 32 VDC, type F

INPUT POWER (SUPPLED EXTERNAL AC TO DC CONVERTER)

Input Range

100 to 250 VAC, 1.5 A maximum, 47-63 Hz

Main Supply Voltage Fluctuations

≤10% of the nominal voltage

Transient Over-voltages

According to installation category II

Environmental (Test Set)

Use	*Pollution degree 2*
Altitude	*≤4800 meters*
Operating Temperature (NOTE 3)	*-20°C to 55°C*
Storage Temperature (NOTE 4)	*-30°C to 70°C*
Relative Humidity	
80% from 5°C to <10°C	
95% from 10°C to <31°C	
75% from 31°C to <40°C	
45% from 40°C to 50°C	

Environmental (Supplied External AC to DC Converter)

Use	*Indoors*
Altitude	*≤3,000 meters*
Temperature	*5°C to 40°C*

Physical Characteristics

Dimensions:	
Height	*11.2 in (28.5 cm)*
Width	*9.1 in (23.1 cm)*
Depth	*2.7 in (6.9 cm)*
Weight (Test Set Only)	*<8 lbs. (3.6 kg)*

Supplemental Information

Audio distortion characteristics are measured in a 20 Hz to 15 kHz post detection bandwidth.

All DDM measurements are made on RF output signal.

Test Set Certifications

Altitude, operating	*MIL-PRF-28800F*	*Class 2*
Altitude, not operating	*MIL-PRF-28800F*	*Class 2*
Bench Handling	*MIL-PRF-28800F*	*Class 2*
Blowing Dust	*MIL-STD-810F*	*Method 510.4, Procedure 1*
Drip-proof	*MIL-PRF-28800F*	*Class 2*
Explosive Atmosphere	*MIL-STD-810F*	*Method 511.4, Procedure 1*
Relative Humidity	*MIL-PRF-28800F*	*Class 2*
Shock, Functional	*MIL-PRF-28800F*	*Class 2*
Vibration Limits	*MIL-PRF-28800F*	*Class 2*
Temp, operating NOTE 5	*MIL-PRF-28800F*	*Class 2*
Temp, not operating NOTE 6	*MIL-PRF-28800F*	*Class 2*
Transit Drop	*MIL-PRF-28800F*	*Class 2*
Safety Compliance	*UL-61010B-1 EN 61010-1 CSA 22.2 No 61010-1*	
EMC	*EN 61326*	

External AC-DC Converter Certifications

Safety Compliance	*UL 1950 DS CSA 22.2 No. 234 VDE EN 60 950*
EMI/RFI Compliance	*FCC Docket 20780 Curve "B"*
EMC	*EN 61326*

Transit Case Certifications

Drop Test	*FED-STD-101C*	*Method 5007.1 Paragraph 6.3, Procedure A, Level A*
Falling Dart Impact	*ATA 300*	*Category I*
Vibration, Loose Cargo	*FED-STD-101C*	*Method 5019*
Vibration, Sweep	*ATA 300*	*Category I*
Simulated Rainfall	*MIL-STD-810F*	*Method 506.4 Procedure II of 4.1.2*
	FED-STD-101C	*Method 5009.1 Sec 6.7.1*
Immersion	*MIL-STD-810F*	*Method 512.4*

NOTES

Note 1 - External attenuator required for input power greater than 30 W

Note 2 - Accuracy specification excluding external attenuator

Note 3 - Battery charging temperature range: 5° to 40°C (controlled by internal charger)

Note 4 - Li Ion battery must be removed below -20°C and above 60°C

Note 5 - Temperature range extended to -20°C to 55°C.

Note 6 - Temperature range reduced to -30°C to 71°C.

Versions, Options and Accessories

Order Number	Description
72418	IFR 4000 Nav/Comm Ramp Test Set IFR 4000AR (U.S Military version w/ protective cover)
83402	4000OPT1 ELT (121.5/243 MHz beacon and 406 MHz COSPAS/SARSAT beacon test)
	NSN Information: 6625-01-516-4656 (IFR 4000) 6625-01-559-2384 (IFR 4000AR) 6625-01-553-1956 (IFR 4000 with ELT option installed)

Standard Accessories

9140	Antenna, 75 MHz
9137	Antenna, telescoping
10238	Transit case
6081	Operation Manual (CD)
6087	Getting Started Manual
67366	AC/DC power supply
62302	Power cord, 110 V
64020	Power cord set, 220 V
62398	TNC (male) to TNC (male) coaxial cable
24140	TNC (female) shorting cap
56080	Spare fuse
24141	50 Ω load
63958	Flip cover (IFR 4000AR only)

Optional Accessories

63656	Desk top stand
62400	RS-232 cable
6083	Maintenance Manual (CD)

Extended Standard Warranties with Calibration for 4000

84354	Extended standard warranty 36 months with scheduled calibration
84356	Extended standard warranty 60 months with scheduled calibration

For More Information:

Vicom Australia

1064 Centre Road
Oakleigh South Vic 3167
Australia
1300 360 251
info@vicom.com.au
www.vicom.com.au

Vicom New Zealand

Grd Floor, 60 Grafton Road
Auckland 1010
New Zealand
+64 9 379 4596
info@vicom.co.nz
www.vicom.co.nz

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VIAVI Solutions

Contact Us +1 316 522 4981
AvComm.TechSales@viavisolutions.com

To reach the VIAVI office nearest you, visit viavisolutions.com/contact.

IFR6000-ss-avi-nse-ae
30186488 900 0618

viavisolutions.com