

User Interface

Interfaces Supported

IEEE-488, RS232 and Ethernet (VXI-11)
PC Windows based GUI provided.

Modes of Operation

Transponder Testing 1, 2, 3/A, C, S, 4, 5
Interrogator Testing 1, 2, 3/A, C, S, 4, 5
DME/TACAN Testing G/A, INV G/A, BG/A, BA/A, A/A, INV A/A
ADS-B Transponder Out
GCIB Decode

Signal Generator

| | |
|-------------------------------------|---|
| Frequency Range | 955 to 1223 MHz, 10 KHz resolution |
| Output Amplitude Direct Port | 0.0 dBm to -110.0 dBm (into 50 Ω) in 0.1 dB increments |
| Accuracy @ 25° ± 5° C | |
| 0.0 dBm to -80.0 dbm | ±0.5 dB |
| <-80.0 dBm to -100 dBm | ±[0.5 dB + 0.05 dB per dB below -80 dBm] ¹ |
| <-100.0 dBm | ±[1.5 dB + 0.35 dB per dB below -100 dBm] ² |
| Accuracy over full temp | |
| 0.0 dBm to -80.0 dbm | ±1.0 dB |
| <-80.0 dBm to -100 dBm | ±[1.0 dB + 0.10 dB per dB below -80 dBm] ² |
| <-100.0 dBm | ±[3.0 dB + 0.70 dB per dB below -100 dBm] ² |
| Antenna Port | +30.0 dBm to -60.0 dBm (into 50 Ω) in 0.1 dB increments |
| Accuracy @ 25° ± 5° C | |
| Power ≥-30.0 dBm | ±1.0 dB |
| Power <-30.0 dBm | ±[1.0 dB + 0.033 dB per dB below -30 dBm] ² |
| Accuracy over full temp | |
| Power ≥-30.0 dBm | ±2.0 dB |
| Power <-30.0 dBm | ±[2.0 dB + 0.066 dB per dB below -30 dBm] ² |

NOTES

- 1 - Hence, for a power setting of -85 dBm, the accuracy will be ±[0.5 + 0.05*5], or ±0.75 dB, and for a power setting of -95 dBm, the accuracy will be ±[0.5 + 0.05*15], or ±1.25 dB
- 2 - As per example above

Pulse Formats

| | |
|---|--|
| Transponder/Interrogator | 1, 2, 3/A, C, S |
| Secure Modes | 4, 5 |
| Modes 3/A, C, S comply with RTCA/DO-181C; Modes 1, 2, 4, 5 comply with DOD AIMS 03-1000A. | |
| DME/TACAN | G/A, A/A, INVERSE G/A, INVERSE A/A, BEACON G/A, BEACON A/A |

Pulse Position Deviations

| | |
|---------------------|-------------|
| XPDR | ±1 μs |
| INT Non-Mode 5 | ±1 μs |
| INT Mode5 | ±0.25 μs |
| Accuracy [XPDR/INT] | ±10 ns |
| TACAN* | 12 ± 0.1 μs |
| Accuracy [TACAN] | ±100 ns |

Pulse Width Deviations

| | |
|-----------------|---------------------------------------|
| Transponder** | Nominal ±0.6 μs (fixed in Mode S-SPR) |
| Accuracy | ±10 ns |
| Interrogator** | Nominal ±0.5 μs |
| Accuracy | ±10 ns |
| TACAN | 3.5 μs to 9.0 μs |
| Accuracy | ±0.1 μs |
| Pulse Amplitude | |
| XPDR/INT | +5 to -15 dB |
| TACAN | ±5 to -15 dB |

Interference Pulse Characteristics (1 or 2 pulses)

| | |
|--------------|-------------------------------------|
| Position | -1 μs to +400 relative to reference |
| Offset range | |
| XPDR | -44 μs to 400 μs |
| INT | -1 μs to 400 μs |
| Accuracy | ±10 ns |

Interference Pulse Spacing (multiple pulse interference mode)

| | |
|------------------------|-------------------------------------|
| Range | -1 μs to +400 relative to 1st pulse |
| Max 2nd pulse position | 400 μs - 1st pulse position |
| Accuracy | ±10 ns |

Range Delay

| | |
|-----------|---------------------------------------|
| Range | |
| DME/TACAN | -1 to 400.00 nmi in 0.01 nm steps |
| Accuracy | 0.02 nm or 0.0003% of simulated range |
| INT | 0 to 400.00 nmi |
| Accuracy | ±0.01 nmi |

Diversity

| | |
|-------------------------|-----------------------------|
| Timing (either channel) | 0 to ±1 μs, ±10 ns accuracy |
|-------------------------|-----------------------------|

- * Pulse overlap not allowed
** Minimum pulse width is 200 ns

Echo

| | |
|---------------------|------------------------------|
| DME/TACAN | 30 nmj, fixed |
| Amplitude Variation | +3 to -12 dB, relative to PI |
| Accuracy | ±0.25 dB |

Channel Signal Assignment

| | |
|-------------------|----------------|
| Transponder Test | Top/Bottom |
| Interrogator Test | Sum/Difference |
| TACAN | Top/Bottom |

Interrogation Generator

Independent/Unique Interrogations 1-12

Fixed Mode

| | |
|----------|--|
| SIF Mode | 1-10000 PRF |
| Mode 5 | 1-1200 PRF |
| Mode S | 1-2500 PRF |
| Mode 4 | 1-3500 PRF (internal) 1-2500 PRF (external) |

Double/Supermode

| | |
|---|------------------|
| Spacing between interrogations (slaved delay) | 0-400 µs |
| Pair generation rate | 1-400 PRF |
| Supermode interrogations | 2 interrogations |

Burst Mode

| | |
|-------------------------------------|--------------------|
| Bursts/trigger | 1-1000 or infinite |
| Interrogations/burst | 1-2500 |
| Interrogation rate (within a burst) | 1-400 PRF |
| Spacing between burst sequences | 0.1-20 sec |

Interlaced Mode

| | |
|-----------------|------------|
| Interlace ratio | 1:1 - 1:63 |
| Group rate | 1-400 PRF |

Reply Generator

| | |
|----------------------------|-------------------------|
| Independent/Unique Replies | 1-12 |
| Data and Range | Individually configured |
| Selectable Modes | 1,2,3/A,C,S,4,5 |
| Selectable Efficiency | 1-100% |

Spectral Purity Residual Level

Harmonics

| | |
|----------------------------|------------------------|
| Direct | <50 dBc |
| Antenna | <40 dBc |
| Spurious (> modulation BW) | <60dBc, 350 - 1800 MHz |
| Phase Noise | <80 dBc/Hz @ 100 kHz |

Signal Receiver Measurements

Frequency Range

1020 to 1155 MHz

Input Amplitude

Pulse Power Measurements

25 ±5° C

Direct +30 dBm to +66 dBm: +0.5 dB

Antenna -40 to +30 dBm: +1 dB

Resolution: 0.01 dB

-10° to 55° C

Direct +30 dBm to +66 dBm: +1 dB

Antenna -40 to +30 dBm: +2 dB

Resolution: 0.01 dB

Pulse to Pulse Spacing

XPDR/INT

Non-Mode 5 ±0.3 µs

Mode 5 ±0.0625 µs

Accuracy ±10 ns

TACAN ±0.5 µs

Accuracy ±50 ns

Pulse Width

XPDR/INT

±0.200 µs

Accuracy ±10 ns

TACAN

2.5 to 4.5 µs

Accuracy ±50 ns

Reply Delay

Accuracy

±20 ns

Reply Delay Jitter

Accuracy

±20 ns

Frequency

Accuracy

±50 KHz

% Reply

Range

0-100% for each interrogation type

Resolution

0.0125% (for sample size = 8000)

Sample Size

1 - 8000 interrogations

Specific Application

TACAN/DME

Ident

Variable

Alphanumeric char.

10 sec to 60 sec

1 to 8 [A to Z]

Bearing

Range 0° to 359.9° in 0.1° steps
 Accuracy ±0.05°
 Rate 0° to 39° sec in 0.01° steps

Velocity

Range 0 to 9999 Kts in 1 Kt steps
 Accuracy ±0.001%

Squitter

Range 10 to 8000 Hz
 Accuracy 10 Hz or 2%, whichever is greater
 Distribution Compliant with ARINC 568 @ 2700 Hz

Main Reference Burst

Adjustable Burst (all modes) +1, +2, -1 or -2
 Selectable On/Off
 X Channel 12 pulse pairs
 Y Channel 13 single pulses
 A/A (all channels) 10 single pulses
 Accuracy ±100 ns

Auxiliary Reference Burst

Adjustable Burst (all modes) +1, +2, -1, or -2
 X Channel 6 pulse pairs
 Y Channel 13 single pulses
 Accuracy ±100 ns

TACAN Modulation

Range 0% to 39% in 1 Hz steps (15 Hz and 135 Hz separately adjustable)
 Accuracy ±1%
 Distortion <5% of either tone
 A/A Interrogation Rate 0 to 3999 Hz in 1 Hz steps
 Reply Efficiency 0 to 100% in 1% steps

Crypto Appliqué Compatibility

KIV-77 - AIMS Type B, Mode 4/5
 KIV-78 - AIMS Type A, Mode 4/5
 KIV-6 - Mode 4
 KIT-1(A/C) / KIR-1(A/C) cables (external power cable)

Built-in Crypto Appliqué Function

Mode 4 Internal Crypto Simulator (standard)
 Word A/B, C1 - C16
 Mode 5 Internal Crypto Simulator (standard with options 1 and 3)
 As defined by the U.S. Navy Mode 5 Program Office

Interface Signals

Analog Signal Ports (programmable output) 2
 Programmable Sources Various
 Level ±1 V into 50 Ω

Trigger Out (front panel)
 Programmable Source TX timing ref, RX detection
 Level 3.3 V logic

Trigger In (front panel)
 Functions Interrogation Trigger
 Reply Trigger
 Level 3.3 or 5 V logic

Suppression Out
 Amplitude into 2 KΩ 12 V to 80 V
 Variable Pulse Width 0.25 μs - 300 μs

Suppression In
 Amplitude 10 V to 80 V
 Impedance 2.2 KΩ
 Action Inhibits response to incoming signal

General

Frequency/Time Reference

2.5 ppm composed of 1 ppm/year aging and 1 ppm accuracy over temp

External Reference Input

10 dBm nominal

Temp Range

-10° C to 55° C

Warmup (for specified accuracy)

45 minutes

Size

17.75" wide, 4" high, 21" deep (45 cm x 10 cm x 53 cm)

Weight

24 lbs (10kg)

VSWR

Direct = 1.2:1 over frequency range
 Antenna = 2.5:1 over frequency range

Input Power

100-240 VAC, 50-60 Hz, 3 Amp fuse

Test Set Certifications

UL
 CE
 DoD AIMS MK XIIA Level 1 and Level 2

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