



## INTRODUCTION

The Comtech EFData KST-12025 is a 25W Ku-band satellite earth station and electronics terminal configured in two assemblies:

- The feed assembly consists of a transmit reject filter (TRF) and low noise amplifier (LNA).
- The outdoor enclosure assembly consists of a solid state power amplifier (SSPA), up/down converters, monitor and control (M&C) microprocessor, and power supply.

The KST-12025 meets all requirements for operation on private and regional domestic Ku-band satellite networks.

## APPLICATIONS

When used in conjunction with Comtech EFData modems, the KST-12025 is ideal for single digital carriers, or multiple carrier operation over a 36 MHz bandwidth. Because the KST-12025 has a 70 MHz IFL, it can also be used for other analog and digital applications. Small- to medium-size earth stations are easily constructed and commissioned with a KST-12025.

When used with a high gain antenna, this terminal can also be used as the radio frequency (RF) electronics of a central hub in point-to-multipoint applications, and serve as the terminal for the end points of the network.

The Comtech EFData line of low-cost very small aperture terminal (VSAT) modems may also be used in the construction of such networks.

## MONITOR AND CONTROL (M&C)

An onboard microprocessor monitors and controls all operational parameters and systems status of the KST-12025. This powerful M&C system enables the user to locally or remotely control functions such as output power, and transmit/receive channel frequencies. The system also reports terminal configuration status, as well as fault status of all terminal components.



The KST-12025 can be initially configured by an optional keyboard/LED controller within the enclosure, or by connection of a common ASCII EIA-232 terminal connected to the serial port. A simple command set allows total configuration control and retrieval of status information. If the indoor unit is a more sophisticated station M&C computer, the serial port can be set to EIA-485 for bus operation.

## LNA ASSEMBLY

The LNA assembly consists of a wave guide TRF and an LNA. The TRF provides receive-system protection from transmit energy fed back through the antenna feed system. The LNA standard noise temperature is 120°K, with options down to 80°K, depending upon Gain over Temperature (G/T) requirements.

## OUTDOOR ENCLOSURE

The outdoor unit is a weatherproof enclosure housing the up/down converters, SSPA, monitor/control processor, and power supply. The SSPA is temperature compensated for maximum stability.

Up and down converters use dual conversion with individual synthesizers for independent transmit and receive transponder selection. The microprocessor provides critical online loop monitoring, dynamic control functions, configuration control, fault/status monitoring, and a serial computer/terminal interface.

## INSTALLATION

The KST-12025 is small and light weight, and can be easily mounted to the hat ring of a fiberglass antenna, the mount of an aluminum antenna, or within the hub of a large antenna. Alternately, the enclosure can be mounted on a stand-alone pipe support.

Two common coaxial cables connect the enclosure to the transmit port of the feed, and the TRF/LNA assembly mounted on the receive port feed. The connection to indoor equipment such as modems and station monitor/control equipment is made using two low-cost 70 MHz coaxial cables and a twisted pair for ASCII control of the terminal.

The final connection to the enclosure is prime power at 220 VAC or -48 VDC.



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## TRANSMIT CHARACTERISTICS

Frequency Range	14.0 to 14.5 GHz, in 2.5 MHz steps
Frequency Range (Optional)	14.0 to 14.5 GHz, in 1.0 MHz steps
Transmitter power at 1 dB compression point:	25W
Gain at 1 dB compression point with Customer Attenuator at 13 dB	74 dB gain
Transmitter Linear Gain vs Customer-Controlled Attenuator Setting	0 to 25 dB, factory setting = 10 dB
TX Bandwidth	70 MHz with 1 dB BW of $\pm 18$ MHz
Gain Flatness	$\pm 1$ dB/36 MHz
Gain Variation	$\pm 2$ dB max for flatness, temp, aging
TX Frequency Stability	$\pm 1 \times 10^{-8}$ at 23°C
Daily TX Frequency Stability	$\pm 1 \times 10^{-8}$ at 23°C
Annual TX Frequency Stability	$\pm 1 \times 10^{-7}$ at 23°C
TX Frequency Drift/Temperature	$\pm 1 \times 10^{-8}$ from -40 to 55°C (-40° to 131°F)
TX Synthesizer Lock-up Time	< 1 second
TX Phase Noise (in 2.5 MHz steps)	-60 dBc/Hz at 100 Hz -70 dBc/Hz at 1 kHz -75 dBc/Hz at 10 kHz -80 dBc/Hz at 100 kHz
Optional TX Phase Noise (1.0 MHz steps)	-60 dBc/Hz at 100 Hz -66 dBc/Hz at 1 kHz -75 dBc/Hz at 10 kHz -80 dBc/Hz at 100 kHz

## RECEIVE CHARACTERISTICS

Frequency Range (in 2.5 MHz steps)	10.95 to 12.75 GHz 10.95 to 11.70 GHz 11.70 to 12.20 GHz 12.25 to 12.75 GHz
Frequency Range (optional) (in 1.0 MHz steps)	10.95 to 12.75 GHz 10.95 to 11.70 GHz 11.70 to 12.20 GHz 12.25 to 12.75 GHz
Frequency Sense	No inversion
Receiver gain	Variable at 0.5 dB from 70 to 95 dB with LNA
Frequency Stability	$\pm 1 \times 10^{-8}$ at 23°C (73°F)
Daily RX Freq Stability	$\pm 1 \times 10^{-8}$ at 23°C (73°F)
Annual RX Freq Stability	$\pm 1 \times 10^{-7}$ at 23°C (73°F)
RX Drift/Temp	$\pm 1 \times 10^{-8}$ from -40° to +55°C (-40° to 131°F)
Gain Flatness	$\pm 1.0$ dB/36 MHz
Bandwidth	70 MHz with 1 dB BW of $\pm 18$ MHz
Noise Temperature	120°K (options to 90°K)
Receive Image Rejection	-45 dBc
Linearity	T.O.I. -35 dBc for 2 tones at -86 dBm Pin (with LNA)
Group Delay	< 20 ns/36 MHz
Synth Lock Time	< 1 second
RX Phase Noise (in 2.5 MHz steps)	-60 dBc/Hz at 100 Hz -70 dBc/Hz at 1 kHz -75 dBc/Hz at 10 kHz -80 dBc/Hz at 100 kHz
Optional RX Phase Noise (in 1.0 MHz steps)	-60 dBc/Hz at 100 Hz -66 dBc/Hz at 1 kHz -75 dBc/Hz at 10 kHz -80 dBc/Hz at 100 kHz
Inband Overdrive	No damage to 0 dBm
Third Order Intercept	+24 dBm minimum
1 dB Output Compression	+17 dBm minimum

Common

RF Input Connector	Type N (Female)
TF Output Connector	WR-75G
TX Band	14.0 to 14.5 GHz
RX Band	10.95 to 12.75 GHz 10.95 to 11.70 GHz 11.70 to 12.20 GHz 12.25 to 12.75 GHz
IF Interface	Two 70 MHz ports
IF Out Connector	Type TNC female
IF IN Connector	Type TNC female
IF Out Impedance	50Ω
IF Out RTN Loss	> 19 dB at 70 MHz $\pm 18$ MHz
IF IN Impedance	50Ω
IF IN RTN Loss	> 19 dB at 70 MHz $\pm 18$ MHz
Prime Power Options	230 VAC, 47 to 63 Hz, or 48 VDC (40 to 60V)
25W RF Output	800W AC or DC Input
Size	26.5H x 12.7W x 9.3D inches (67.3H x 32.2W x 23.6D cm)
Weight	49 lbs (22.2kg) max
Environmental:	
Temperature	-40° to +55°C (-40° to 131°F) Operational -50° to +75°C (-58° to 167°F) Survival
Thermal Gradient	40°C (104°F) /hour 10°C (50°F) /15 minutes
Humidity	0 to 100% Relative at -40° to +55°C (-40° to 131°F) 95% at 65°C(149°F)/72 hours
Precipitation	810/Method 506.2
Salt Fog	810/Method 509.2
Sand and Dust	810/Method 510.1
Altitude	0 to 15,000 ft Operational 0 to 50,000 ft storage
Solar Radiation	360 BTU/hrft <sup>2</sup> at 50°C (122°F)
Safety	Capable of UL, CSA, VDE, IEC
Emission	FCC Part 15, J, Class A
ES Discharge	10 kV operational, 15kV survival

## OPTIONS

KP-10 Hand-Held Keypad



Note: For LNA and M&C specifications, refer to the KST-12025 Ku-Band Satellite Terminal Installation and Operation manual.



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