



## INTRODUCTION

The Comtech EFDATA KST-12000 is a 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, up/down converters, monitor and control (M&C) microprocessor, and power supply.

The KST-12000 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-12000 is ideal for single digital carriers, or multiple carrier operation over a 36 or 72 MHz bandwidth. Because the KST-12000 has a 70 or 140 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-12000.

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-12000. 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-12000 can be initially configured by an optional keyboard/LED controller within the enclosure, or by connection of a common ASCII EIA-232/485 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 85°K, depending upon Gain over Temperature (G/T) requirements.

## OUTDOOR ENCLOSURE

The outdoor unit is a weatherproof enclosure housing the up/down converters, solid state power amplifier (SSPA), monitor/control processor, and power supply. Power levels range from +8 dBm (for driving an external SSPA or traveling wave tube [TWT]) to 16W, depending upon EIRP requirements. SSPAs are 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-12000 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.

Connection to indoor 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 either 110/220 VAC or -48 VDC.



[www.satcom-services.com](http://www.satcom-services.com)

Mike Termond

[mike@satcom-services.com](mailto:mike@satcom-services.com)

Phone: 1.805.649.1384

Fax: 1.805.649.1174

## 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 options at 1 dB compression point:	Gain at 1 dB compression point with customer attenuator at 10 dB:
+8 dBm	26 dB gain
2W	63 dB gain
5W	67 dB gain
8W	69 dB gain
16W	72 dB gain
Transmitter Power Option:	Linear Gain with customer attenuator at 10 dB:
+8 dBm	27 dB
2W	64 dB
5W	68 dB
8W	70 dB
16W	73 dB
Transm. linear gain vs. customer controlled attenuator setting	0 to 25 dB, factory setting = 10 dB
TX Bandwidth	70 MHz/ $\pm 18$ MHz; 140 MHz/ $\pm 36$ MHz
Gain Flatness	$\pm 1$ dB/36 MHz; $\pm 15$ dB/72 MHz
Gain Variation	$\pm 2$ dB max for flatness, temp., aging
TX Freq Stability	$\pm 1 \times 10^{-8}$ at 23°C
Daily TX Freq Stability	$\pm 1 \times 10^{-8}$ at 23°C
Annual TX Freq Stability	$\pm 1 \times 10^{-7}$ at 23°C
TX Freq Drift/Temp	$\pm 1 \times 10^{-8}$ from -40 to +55°C
TX Synth. 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 11.7 GHz 11.7 to 12.2 GHz 12.25 to 12.75 GHz
Frequency Range (optional) (in 1.0 MHz steps)	10.95 to 12.75 GHz 10.95 to 11.7 GHz 11.7 to 12.2 GHz 12.25 to 12.75 GHz
Frequency Sense	No inversion
Receiver gain	Variable 70 to 95 dB with LNA
Frequency Stability	$\pm 1 \times 10^{-8}$ at 23°C
Daily RX Freq Stability	$\pm 1 \times 10^{-8}$ at 23°C
Annual RX Freq Stability	$\pm 1 \times 10^{-7}$ at 23°C
Life RX Freq Drift	$\pm 1 \times 10^{-7}$ at 23°C
RX Drift/Temp	$\pm 1 \times 10^{-8}$ from -40 to +55°C
Rx Bandwidth	70 MHz/ $\pm 18$ MHz; 140 MHz/ $\pm 36$ MHz
Gain Flatness	$\pm 1$ dB/36 MHz; $\pm 15$ dB/72 MHz
Noise Figure	120°K (options to 85°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
RX Band	10.95 to 12.75 GHz 10.95 to 11.7 GHz 11.7 to 12.2 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	50 Ohms
IF Out Return Loss	> 19 dB at 70 MHz, $\pm 18$ MHz
IF In Impedance	50 Ohms
IF In Return Loss	> 19 dB at 70 MHz, $\pm 18$ MHz
Prime Power Options	90 to 230 VAC, 47 to 63 Hz, or 48 VDC (40 to 60V)
Power Consumption:	
+8 dBm	100W
2W	150W
5W	200W
8W	250W
16W	450W
Size	23" H x 10.3" W x 9.3" D
Weight	38 lbs. max.
Environmental:	
Temperature	-40° to +55°C operational
Humidity	-50° to +75°C survival
Altitude	0% to 100% RH 0 to 15,000 ft. operational 0 to 50,000 ft. survival

## OPTIONS

KP-10 Hand-Held Keypad



### Notes:

1. For LNA and M&C specifications, refer to the KST-12000 Ku-Band Satellite Terminal Installation and Operation manual.
2. For information on the high-power version of the KST-12000, refer to the HPKST-12000 High-Power Ku-Band Satellite Terminal product data sheet.



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Mike Termond

mike@satcom-services.com

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