



INTRODUCTION

The Comtech EFData CST-5005 is a low- to medium-power, C-band, satellite earth station 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 CST-5005 meets all requirements for operation on private and regional domestic C-band satellite networks.

APPLICATIONS

When used in conjunction with Comtech EFData modems, the CST-5005 terminal is ideal for single- or multiple-carriers over a 36 MHz bandwidth.

Small- to medium-size earth stations are easily constructed and commissioned with a CST-5005.

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 system status of the CST-5005. This powerful M&C system enables the user to locally or remotely control functions such as output power and transmit/receive channel frequencies. The microprocessor also controls a sophisticated digital temperature compensation system, ensuring the highest gain stability over temperature and frequency of any transceiver package available. The system reports terminal configuration status, as well as fault status of all terminal components.

The CST-5005 can be configured and monitored using 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 (IDU) is a 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 waveguide TRF and LNA.

The TRF provides receive system protection from transmit energy feed back through the antenna feed system. The LNA standard noise temperature is 65K, with options down to 35K, depending upon Gain over Temperature (G/T) requirements.

OUTDOOR ENCLOSURE

The outdoor unit (ODU) is a weatherproof enclosure housing the up/down converters, solid-state power amplifier (SSPA), M&C processor, and power supply. Optional power levels include 5 watt of 10 watt. All ODUs are individually temperature compensated for maximum stability.

Up and down converters are dual conversion. The microprocessor provides critical online loop monitoring, dynamic control functions, configuration control, fault/status monitoring, and a serial computer/terminal interface.

INSTALLATION

The CST-5005 terminal 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.

Connections are to IDUs and station M&C equipment is made using two low-cost 70 MHz coaxial cables and a twisted pair for ASCII control of the terminal.

Prime power is either 110/220 VAC or -48 VDC

TRANSMIT CHARACTERISTICS

Output Freq. (no inversion)	5.845 to 6.425 GHz
Input Frequency	70 MHz \pm 18 MHz (optional 140 MHz)
Output Power at 1 dB compression	5W (+37 dBm) or 10W (+40 dBm)
Third Order Intercept	+46 dBm (for 5W) or +49 dBm (for 10W)
Nominal Small Signal Gain	68 dB (for 5W) or +71 dB (for 10W)
Gain Adjust Range (from nominal)	\pm 11 dB min.
Gain Variation:	
Over 36 MHz	\pm 1 dB max.
Over 36 MHz, temp., and aging	\leq 4 dB max.
Group Delay Variation	10 ns/36 MHz
Synthesizer Step Size	125 kHz
Typical Phase Noise Mask	IESS 308/309
Synthesizer Phase Noise	-60 dBc/Hz at 100 Hz -70 dBc/Hz at 1 kHz -80 dBc/Hz at 10 kHz -90 dBc/Hz at 100 kHz
Frequency Stability:	
At Shipment	\pm 1 x 10 ⁻⁸
Daily at 23°C	\pm 1 x 10 ⁻⁸
Annual at 23°C	\pm 1 x 10 ⁻⁷
Over Temperature	\pm 1 x 10 ⁻⁸ (-40 to +55°C)
After 30 min. warm-up	\pm 1 x 10 ⁻⁸
Electrical Adjustment	0.5 x 10 ⁻⁷
Isolation on Fault Shutdown	-60 dBc
Spurious:	
< 250 kHz Carrier Offset	-35 dBc max.
> 250 kHz Carrier Offset	-50 dBc max. (signal related)
Non-signal related	-15 dBm/4 kHz
HPA Harmonics	-50 dBc max.
RF Output VSWR	1.43:1 at 50 Ohms
RF Output Connector	Type N Female
IF Input VSWR	1.5:1 at 50 Ohms
IF Input Connector	Type N Female



RECEIVE CHARACTERISTICS

Input Freq. (no inversion)	3.620 to 4.200 GHz
Output Frequency	70 MHz \pm 18 dB (optional 140 MHz)
Output Power at 1 dB compression	+15 dBm
Gain Adjust Range (with LNA)	74 to 95 dB
Gain Variation (with LNA):	
Over 36 MHz	\pm 1.5 dB max.
Over 36 MHz, temp., and aging	\pm 4 dB max.
Noise Temp. (with LNA)	LNA Specification
Group Delay Variation	10 ns/36 MHz
Synthesizer Step Size	125 kHz
Synthesizer Phase Noise (IESS 308/309)	2.8° RMS from 50 Hz to 500 kHz
Frequency Stability:	
At shipment	\pm 1 x 10 ⁻⁸
Daily at 23°C	\pm 1 x 10 ⁻⁸
Annual at 23°C	\pm 1 x 10 ⁻⁷
Over Temperature	\pm 1 x 10 ⁻⁸ (-40 to +55°C)
After 30 min. warm-up	\pm 1 x 10 ⁻⁸
Electrical Adjustment	0.5 x 10 ⁻⁷
Spurious (In-Band)	-50 dBc max.
Image Rejection (all conversions)	> 50 dB
Linearity	Intermods < -35 dBc for two tones at -89 dBm input at 95 dB gain
RF Input VSWR (with LNA)	1.25:1 at 50 Ohms (with LNA)
RF Input Connector	Type N female
IF Output VSWR	1.5:1 at 50 Ohms
IF Output Connector	Type N female

COMMON

Prime Power	95 to 230 VAC, 47 to 63 Hz, or 48 VDC
Power Consumption:	
5W Output	125W
10W Output	175W
Size	
5W Output	15.1" H x 10.5" W x 8.9" D
10W Output	17.1" H x 10.5" W x 8.9" D
Weight	39 lbs.
Sealing	Weatherproof
Ground Attach	#10 AWG ground lug
Environmental:	
Temperature	-40 to +55°C operational -50 to +80°C survival
Humidity	0 to 100% RH
Altitude	0 to 15,000 ft. operational 0 to 50,000 ft. survival

OPTIONS

- KP-10 Hand-Held Keypad

NOTE:

For LNA and M&C specifications, refer to the *CST-5005 C-Band Satellite Terminal Installation and Operation manual*.