

UT-4505/X C-Band Up Converter



APPLICATION

The Comtech EF Data (CEFD) UT-4505/X Up Converter is the ultimate in high performance and cost effective C-Band frequency conversion. The UT-4505/X can be used for SCPC, DAMA, and TDMA, as well as full transponder HDTV and analog TV. Spectral purity and stability characteristics fully meet or exceed the requirements of all domestic, international, and regional commercial satellite networks.

HIGH GAIN

The UT-4505/X has +17 dBm minimum output level at the 1 dB compression point and 35 dB of gain as a standard. These standard capabilities permits longer cable runs to the high power amplifier or compensates for elaborate combining networks without adding expensive options such as external line amplifiers.

LOW PHASE NOISE

The phase noise performance of the UT-4505/X exceeds the Intelsat phase noise mask for IBS and IDR services by more than 9 dB. This allows phase dependent demodulators to perform better. The close-in phase noise is very low, making the converter ideal for low bit rate digital circuits such as those used in DAMA hub earth stations.

REMOTE CONTROL

The remote control interface is selectable between EIA-232 and EIA-485. All configuration control, status retrieval, and adjustments are available as simple ASCII commands through the serial interface or through the front panel menu. As a cost option, the remote control command structure can be customized in order to accommodate existing network control software.

DETACHABLE I/O MODULE

Each UT-4505/X is equipped with a detachable I/O Module (IOM) that establishes input and output connection types. The module inserts into a rear compartment of the converter, and requires no additional outside space. The IOM includes a Type N connector for the RF path and a BNC connector at 50 or 75Ω for the IF path.

DAISY CHAIN REDUNDANCY SWITCHING

The converter uses CEFD's proprietary "Daisy Chain" integrated switching technology. The Daisy Chain design removes the relays associated with a centralized protection switch tray and distributes them across the individual converters. CEFD was awarded patent 5,666,646 on this distributed protection switch topology.

Daisy Chain technology successfully eliminates a central switching chassis, two power supplies, a microprocessor, and several long, costly cables. Widely accepted in the industry, CEFD's Daisy Chain provides both pricing and marketing advantages.

MINIMUM RACK SPACE

Due to its small rack height (1.75 inches) and the elimination of the space penalty paid for a separate 1+N switch chassis, the UT-4505/X and the Daisy Chain switch architecture provide the most compact and cost effective converter subsystem available. The units are ideal for the construction of transportable systems such as "flyaways," and high capacity earth stations where space utilization and economy are prime considerations.

UT-4505/X C-Band Up Converter

Specifications

| | |
|---------------------|------------------------------------------------|
| Frequency Range | |
| UT-4505 | 5845 to 6425 MHz |
| UT-4505/E | 6725 to 7025 MHz |
| UT-4505/F | 6425 to 6725 MHz |
| UT-4505/G | 5925 to 6725 MHz |
| UT-4505/H | 5850 to 6650 MHz |
| UT-4505/J | 7025 to 7075 MHz |
| UT-4505/K | 5725 to 6425 MHz |
| UT-45405/M | 5725 to 6725 MHz |
| Conversion | Dual, No Inversion |
| Step Size | 125 kHz standard, 1 kHz optional |
| Preset Channels | 32 frequencies and gains |
| Stability Over Time | $\pm 1 \times 10^{-9}$ /Day |
| Stability Over Temp | $\pm 1 \times 10^{-8}$ 32 to 122°F (0 to 50°C) |

IF Input

| | |
|--------------|-----------------------------------------------------------------------------------------------------------------------|
| Noise Figure | 12 dB Maximum at 0 dB Attenuation |
| Level | -35 dBm Typical |
| Range | 52 to 88 or 104 to 176 MHz Optional 50 to 90 MHz or 100 to 180 MHz (Contact factory with specific requirements) |
| Impedance | 50 or 75Ω |
| Return Loss | 23 dB Minimum with IO Module or Switch Module |

RF Output

| | |
|----------------------|-------------------------------|
| Output Level | +17 dBm at 1 dB Compression |
| Intermodulation | -50 dBc @ 0 dBm Output SCL |
| Carrier Mute | -70 dBc |
| Non-Carrier Spurious | -80 dBm |
| Carrier Spurious | -65 dBc @ 0 dBm Output |
| AM to PM | 0.1°/dB at -5 dBm Out |
| Return Loss | 20 dB Minimum with I/O Module |
| Impedance | 50Ω |

Transfer

| | |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gain | 35 dB \pm 2 dB |
| Attenuation Adjust | 0 to 25 in 0.25 dB Steps 0.1 dB Steps Optional |
| Gain Stability | \pm 0.25 dB/Day |
| Ripple | \pm 0.25 dB (\pm 18 MHz) Optional \pm 20 MHz 0.75 dB (\pm 36 MHz) Optional \pm 40 MHz (Contact factory with specific requirements) |
| Slope | 0.05 dB/MHz |
| IF Bandwidth | 36 or 72 MHz, Optional 40 or 80 MHz (Contact factory with specific requirements) |

External Reference

Input, either 5 or 10 MHz Option @ +3 dBm
Optional 10 MHz Rear Panel Reference Output

Group Delay

| | |
|-----------|--------------------------|
| Linear | 0.03 ns/MHz |
| Parabolic | 0.01 ns/MHz ² |
| Ripple | 1.0 ns Peak-to-Peak |

| Phase Noise | Limit (dBc/Hz) | | Typical (dBc/Hz) | |
|-------------|----------------|-----------|------------------|-----------|
| | UT-4505 | UT-4505/X | UT-4505 | UT-4505/X |
| 100 Hz | -80 | -69 | -83 | -72 |
| 1 KHz | -89 | -79 | -92 | -82 |
| 10 KHz | -95 | -89 | -97 | -92 |
| 100 KHz | -105 | -99 | -109 | -102 |
| 1 MHz | -120 | -109 | -124 | -112 |

Remote Control (Rear Panel)

Comm Port RS-485 or RS-232C

Indicators (Front Panel)

| | |
|--------------|------------|
| Power On | Green LED |
| Mute | Yellow LED |
| Remote | Yellow LED |
| Reference | Yellow LED |
| Stored Fault | Red LED |
| Fault | Red LED |

Test Points (Front Panel)

| | |
|----------------------|----------------------|
| RF Sample | SMA, -20 dBc Nominal |
| IF Sample | BNC, -20 dBc Nominal |
| Optional L.O. Sample | |

Power

| | |
|-------------|-------------------------------------------------|
| Voltage | 90 to 250 VAC Auto ranging, optional -48 VDC |
| Frequency | 47 to 63 Hz |
| Dissipation | 60 Watts |

Environmental

| | |
|-------------|----------------------------|
| Temperature | 32 to 122°F (0 to 50°C) |
| Altitude | 10,000 Feet MSL |
| Humidity | 0 to 95% Relative Humidity |

Physical

| | |
|------------------|----------------------------------------------------------|
| Dimensions (1RU) | 19W x 1.75H x 22D Inches (48.30W x 4.45H x 55.90D cm) |
| Weight | 15 Pounds (7.0 kg) |

MTBF

49,740 hrs (calculated)
> 100,000 hrs. (field experience)

Summary Alarm

| | |
|---------------|--------|
| Relay Closure | Form C |
|---------------|--------|

