



APPLICATION

The UT-4514/X Up Converter is the ultimate in high performance and cost effective Ku-Band frequency conversion. The UT-4514/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. The units are ideal for transportable systems (such as "flyaways") and high capacity earth stations accessing many transponders, where space efficiency and economy are prime considerations.

HIGH GAIN

The UT-4514/X has +10 dBm minimum output level at the 1 dB compression point and 35 dB of gain as a standard. This capability permits longer cable runs to the HPA, 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-4514/X Up Converter exceeds the Intelsat phase noise mask for IBS and IDR services by typically more than 8 dB, allowing high capacity earth stations to add more modulators and still meet transmission standards. The close-in phase noise is also very low, making the converter ideal for low bit rate digital circuits such as those used by 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.

DAISY CHAIN REDUNDANCY SWITCHING

The UT-4514/X Up 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.

Transmit Switching and RF/IF Connector Modules

Each UT-4514/X is equipped with a detachable RF/IF connector module, which contains SMA connectors (RF) and BNC connectors at either 50 or 75 Ohms (IF).

For Daisy Chained converters, the RF/IF module is replaced with the Transmit Switching Module, which contains connectors and switching relays for chaining both RF and IF signal paths.

Either module inserts into a rear compartment of the converter, requiring no additional external space.

MINIMUM RACK SPACE

Due to its small rack height (1.75 inches) and the elimination of the space required for a separate 1+N switch chassis, the UT-4514/X with Daisy Chain switch architecture provide the most compact and cost effective converter subsystem available.



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Frequency Range

| | |
|---------------------|------------------------------------|
| UT4514 | 14.00 to 14.50 GHz |
| UT4514/C | 12.75 to 13.25 GHz |
| UT4514/D | 13.75 to 14.50 GHz |
| UT4514/E | 14.70 to 15.00 GHz |
| UT4514/F | 12.75 to 14.50 GHz |
| Conversion | Dual, No Inversion |
| Step Size | 125 kHz standard, 1 kHz optional |
| Preset Channels | 32 Frequencies and Gains |
| Stability Over Time | +/- 1 x 10 ⁻³ /Day |
| Stability Over Temp | +/- 1 x 10 ⁻³ 0 to 50°C |

IF Input

| | |
|--------------|--|
| Noise Figure | 13 dB Maximum at 0 dB Attenuation |
| Level | -35 dBm Typical |
| Range | 52 to 88 or 104 to 176 MHz |
| Impedance | 50 or 75 Ohms |
| Return Loss | 23 dB Min. with IO Module or Switch Module |

RF Output

| | |
|----------------------|---|
| Output Level | +10 dBm at 1 dB Compression |
| Intermodulation | -38 dBc at 0 dBm Output SCL |
| Carrier Mute | -70 dBc |
| Non-carrier Spurious | -80 dBm |
| Carrier Spurious | -65 dBc at 0 dBm Output |
| AM to PM | 0.1*/dB at -5 dBm Out |
| Return Loss | 20 dB Minimum with I/O Module 18 dB Minimum with Switch Module |
| Impedance | 50 Ohms |

Transfer

| | |
|--------------------|---|
| Gain | 35 dB +/- 2 dB |
| Attenuation Adjust | 0 to 25 in 0.25 dB Steps 0.1 dB Steps Optional |
| Gain Stability | +/- 0.25 dB/Day |
| Ripple | +/- 0.25 dB (+/- 18 MHz), 0.75 dB (+/- 36 MHz) |
| Slope | 0.05 dB/MHz |

External Reference

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

Group Delay

| | |
|-----------|--------------------------|
| Linear | 0.03 ns/MHz |
| Parabolic | 0.01 ns/MHz ² |
| Ripple | 1 ns Peak-to-Peak |

Phase Noise

| | Limit (dBc/Hz) | | Typical (dBc/Hz) | |
|---------|----------------|---------|------------------|---------|
| | UT4514x | UT4514F | UT4514x | UT4514F |
| 100 Hz | -72 | -66 | -79 | -69 |
| 1 KHz | -79 | -76 | -82 | -79 |
| 10 KHz | -89 | -86 | -92 | -89 |
| 100 KHz | -98 | -96 | -101 | -99 |
| 1 MHz | -110 | -106 | -114 | -109 |

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

Physical

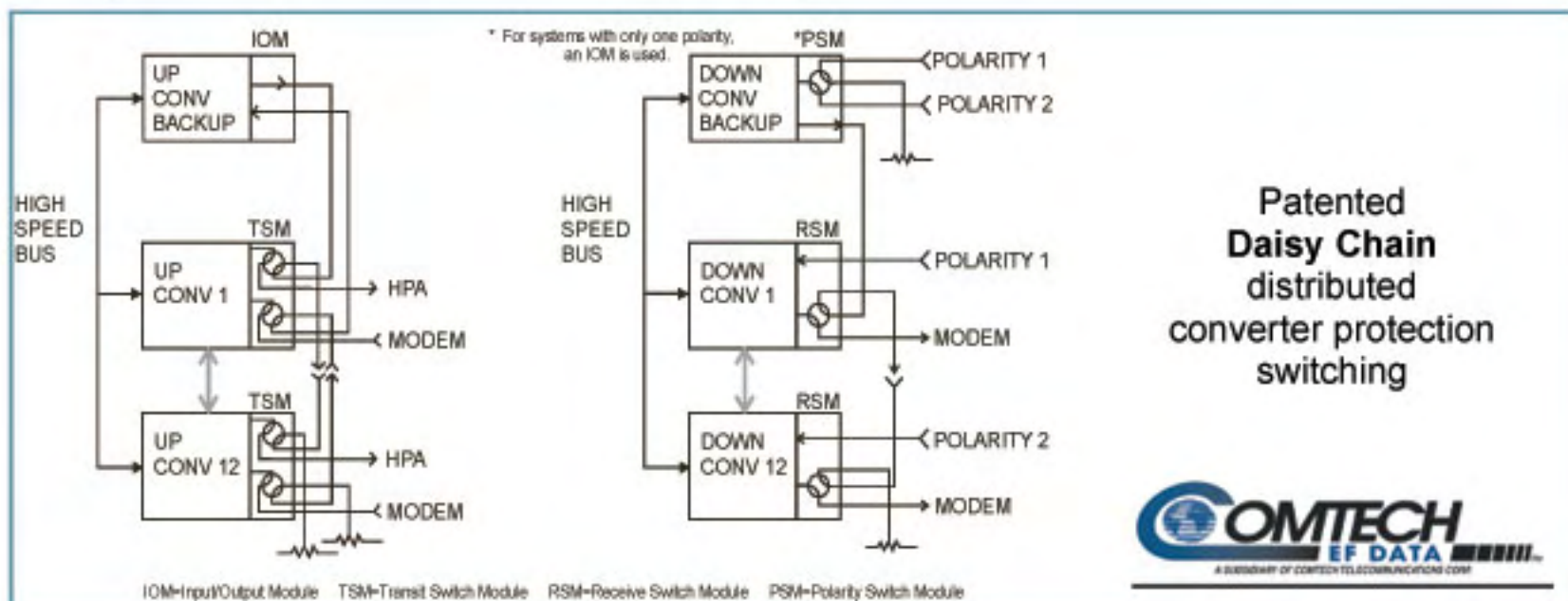
| | |
|--------|-----------------------|
| Width | 19 Inches (48.30 cm) |
| Height | 1.75 Inches (4.45 cm) |
| Depth | 22 Inches (55.90 cm) |
| Weight | 15 Pounds (7.00 kg) |

MTBF

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

Summary Alarm

Relay Closure Form C



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