*Ku-Band*

# 400 W SuperLinear® Outdoor TWTA

## Plays in the Rain

Provides 200 watts of linear power at the flange in a rugged and compact weatherproof package, digital ready, for wideband, single- and multicarrier satellite service in the 13.75 to 14.50 GHz frequency band. Ideal for transportable and fixed earth station applications.

## Cost Effective and Highly Efficient

As part of the SuperLinear TWTA product line, this is the most efficient and compact amplifer in its class. Both the tube and HPA are optimized for efficient operation at linear power output levels.

## Reliable

Designed and built to survive in extremely adverse environmental conditions and features increased cooling margin for longer life.

## Internal Self-Resetting Protection

Protects against high temperatures, open/short/overdrive RF output conditions, INT/EXT reference 10 MHz conditions, prime power fluctuations. RF output overdrive protection prevents damage from higher than rated input power.

## Simple to Operate

User-friendly microprocessor-controlled logic with integrated Ethernet computer interface. Digital metering, pin diode attenuation and optional integrated linearizer for improved intermodulation performance.

## Global Applications

Meets International Safety Standard EN-60215, Electromagnetic Compatibility 2004/108/EC and Harmonic Standard EN-61000-3-2 to satisfy worldwide requirements.

## Worldwide Support

Backed by over 35 years of satellite communications experience, and CPI'sworldwide 24-hour customer support network that includes more than 20 regional factory service centers.

**Model TL04UO**

400 watt Ku-band SuperLinear TWTA for **satellite uplink applications**

### OPTIONS

- Remote Control Panel
- L-Band Block Upconverter (refer to TD-191 or contact CPI for specifications)
- Integral Linearizer
- Extended Frequency (12.75 - 14.50 GHz)
- External Receive Band Reject Filter (Increases loss by by a minimum of 60 dB up to 12.7 GHz)
- Redundant Subsystems
- Integrated 1:1 Switch Control and Drive
- SNMP V3, Serial Interface

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# 400 W Ku-band SupearLinear® Outdoor TWTA

| Specification | Model TL04U0 |
|---|---|
| Frequency | 14.00 to 14.50 GHz or 13.75 to 14.50 GHz (12.75 to 14.50 GHz optional) |
| Output Power (min.)<br>TWT<br>CW Power at Flange<br>Max. CW Flange Power | <br>400 watts (56.0 dBm) peak<br>200 W (53.0 dBm) min.<br>220 W (53.4 dBm) |
| Bandwidth | 500 or 750 MHz (1075 MHz optional) |
| Gain | 67 dB min. at rated power, 70 dB typ. at small signal |
| Gain Stability | ±0.25 dB/24 hours max. (at constant drive and temperature) |
| Small Signal Gain Slope | ±0.04 dB/MHz max. |
| Small Signal Gain Variation | 1.0 dB pk-pk across any 80 MHz band; 3.0 dB pk-pk across the 750 MHz band |
| RF Level Adjust Range | 30 dB typ. |
| Input VSWR | 1.5:1 max. |
| Output VSWR | 2.0:1 max. |
| Load VSWR | 2.0:1 max. continuous operation; any value for operation without damage |
| Phase Noise | -10 dB below IESS-308/309 |
| Spurious | -60 dBc max. at rated output |
| AM/PM Conversion | 2.0˚/dB max. at 2 dB output backoff |
| Harmonic Output | -60 dBc at rated power |
| Noise Density (at max. gain) | <-150 dBW/4 kHz, 10.70 to 12.75 GHz; <-70 dBW/4 kHz, passband to 18 GHz (<-65 dBW/4 kHz with optional linearizer) |
| Spectral Regrowth | -30 dBc max. @ 1.0 S.R. |
| Intermodulation | -25 dBc max. with two equal carriers at total output power of 80 W (at 160 W with optional linearizer);<br>-25 dBc max. with respect to the sum of both carriers at total output power of 100 W (at 200 W with optional linearizer) |
| Group Delay | 0.01 ns/MHz linear max, 0.001 ns/MHz$^2$ parabolic max, 1.0 ns pk-pk ripple max. in any 40 MHz band |
| Prime Power | 100 to 264 VAC single phase, 47-63 Hz |
| Power Consumption | 1000 VA max; 750 VA typ. at 100 W output power |
| Power Factor | 0.95 min. |
| Amplitude and Phase Linearity | Exceeds MIL-STD-188-164B |
| Ambient Temperature | Ambient Temperature -40°C to +60°C operating, plus solar loading; -50°C to +71°C non-operating |
| Relative Humidity | 100% condensing |
| Altitude | 10,000 ft. with standard adiabatic derating of 2°C/1000 ft., operating; 50,000 ft, non-operating |
| Shock | 20 g peak, 11 ms, 1/2 sine |
| Vibration | 2.1 $g_{rms}$, 5 to 500 Hz |
| Acoustic Noise | 65 dBA at 3 feet from amplifier |
| Cooling | Forced air with integral blower |
| M&C Port | Ethernet interface |
| Input Connection | Type N female |
| RF Output Connection | WR-75 waveguide flange, grooved with UNC 2B 6-32 threaded holes |
| RF Output Monitor | Type N Female |
| Dimensions | 10.5 x 8.5 x 17.0 in. max. (267 x 216 x 432 mm) |
| Weight | 32 lbs (14.6 kg) typ. |



For more detailed information, please refer to the corresponding CPI technical description if one has been published, or contact CPI. Specifications may change without notice as a result of additional data or product refinement. Please contact CPI before using this information for system design.

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