L-Band Synthesized Frequency Converter

Single / Dual / Triple / Quad
FCS500

Features

- 70 MHz or 140 MHz IF
- 125 kHz step size
- Cost effective solution
- L-Band 950 – 1750 MHz
- Fully compliant with IESS 308/309 requirements
- High linearity
- Low group delay
- Front panel control (local)
- Full remote control (remote)

Overview

The Advantech HP range of converters uses the latest technology in conversion, local and remote control thus providing the ultimate in performance and user friendly operation at a very competitive price.

The spectral purity, low phase noise and stability exceed the requirements of all major international satellite network operators.

The flexible and comprehensive monitor and control features on the HP converter ensure that it will fit into any network management system architecture. The user-friendly front panel or the RS485 remote interface will provide full set-up and fault monitoring facilities. The RS232 will provide the Monitor and Control functions via a PC and will also allow for software downloading.

The converter is fully synthesized with the PLL oscillators either locked to a highly stable internal 10 MHz reference or if the external reference option is fitted and the proper level of signal is present, the PLL will automatically lock to the external reference.

Application

The HP range of converters is particularly suited for use in VSAT, SCPC Networks, SNG, DVB-RCS and Hub systems. This makes them an ideal choice for large earth stations requiring cost effective solutions for frequency conversion. The lightweight, rugged and compact design also ensures that the HP converter provides the ideal solution for mobile truck or flyaway DSNG systems. With fully welded aluminium chassis and robust modular internal construction the converter can even meet the demands of military installations. The HP range of converters provides an industry leading MTBF of over 120,000 hours.

Models

Up-Converters (non-inverting)
ARUN-70L 70MHz to L-Band up-converter (single)
ARUD-70L 70MHz to L-Band up-converter (dual)
ARUT-70L 70MHz to L-Band up-converter (triple)
ARUQ-70L 70MHz to L-Band up-converter (quad)

Down-Converters (non-inverting)
ARDN-L70 L-Band to 70MHz down-converter (single)
ARDD-L70 L-Band to 70MHz down-converter (dual)
ARDT-L70 L-Band to 70MHz down-converter (triple)
ARDQ-L70 L-Band to 70MHz down-converter (quad)

Down-Converters (inverting)
AREN-L70 L-Band to 70MHz down-converter (single)
ARED-L70 L-Band to 70MHz down-converter (dual)
ARET-L70 L-Band to 70MHz down-converter (triple)
AREQ-L70 L-Band to 70MHz down-converter (quad)

Up/Down-Converters
ARMT-70L 70MHz to L-Band up/Down-converter (Up/Down NINV)
ARMT-70LE 70MHz to L-Band up/Down-converter (Up-converter NINV, Down-converter INV)

Options

- 140 MHz IF Frequency
- Ethernet port and SNMP Interface
- 1:1 Hot Swap Redundancy in single 1RU
- Redundant Ready (for 1:N)

Redundancy

For systems requiring redundancy Advantech can provide 1:1, 1:2 and 1:N (up to 12) solutions. The 1:N redundancy is provided by the 1:N Controller and the Switch Panel. Each Switch Panel can handle up to four (4) converter units. A 1:12 system requires one Controller panel plus three Switch Panels. A complete 1:12 complete system occupies a space of 17U.
# L-Band Synthesized Frequency Converter

## Technical Specifications

### Up-Converter | Down-Converter
---|---
**IF Input** | **RF Input**
Frequency range | Frequency range
70 ± 18 MHz | 950 – 1750 MHz
140 ± 36 MHz (optional) | 140 ± 36 MHz (optional)
Impedance | Impedance
50 Ω standard (optional 75Ω) | 50 Ω
Input Connector | Input Connector
BNC (female) | Type N (female)
Return loss | Return loss
18 dB | 16 dB

### RF Output | IF Output
---|---
Output power (P1dB) | Frequency range
+5 dBm | 70 ± 18 MHz
| 140 ± 36 MHz (optional)
Frequency range | Output level
950 – 1750 MHz | +5 dBm at P1dB
IMD3 (two tone) | Output Connector
-40 dBc max @ -5 dBm output | BNC (female)
Output connector | Connector Impedance
BNC (female) | 50 Ω (optional 75Ω)
Connector Impedance | Return Loss
50 Ω | 18 dB
Return loss | 16 dB

### Transfer Characteristics

#### Conversion Gain
- **Up-Converter**: 20 dB @ max gain setting
- **Down-Converter**: 30 dB min @ max gain setting

#### Gain adjustment
- **Up-Converter**: 20 dB (0.1 dB step size)
- **Down-Converter**: 20 dB (0.1 dB step size)

#### Gain flatness
- **Up-Converter**: 1.5 dB p-p max. 36 MHz
- **Down-Converter**: 1.5 dB p-p max. 36 MHz
- **Up-Converter**: 2.0 dB p-p max. 72 MHz
- **Down-Converter**: 1.5 dB p-p max. 72 MHz

#### Gain stability
- **Up-Converter**: ±0.25 dB max. /24 hours
- **Down-Converter**: ±0.25 dB max. /24 hours
- **Up-Converter**: ±1 dB over temp. range
- **Down-Converter**: ±1 dB over temp. range

#### Spurious
- **Up-Converter**: -55 dBc carrier related @ -5 dBm
- **Down-Converter**: -55 dBc @ -10 dBm output
- **Up-Converter**: < -60 dBm non-carrier related

#### Group delay (over 36 MHz)
- **Up-Converter**: 10 -15 ns p-p
- **Down-Converter**: 10 -15 ns p-p

#### Group delay (with optional group delay equalizer)
- **Up-Converter**: Linear 0.03 ns/MHz
- **Down-Converter**: Linear 0.03 ns/MHz
- **Up-Converter**: Parabolic 0.01 ns/MHz²
- **Down-Converter**: Parabolic 0.01 ns/MHz²
- **Up-Converter**: Ripple 1 ns p-p
- **Down-Converter**: Ripple 1 ns p-p

#### Phase noise
- **Up-Converter**: Meets or Exceeds IESS 308/309
- **Down-Converter**: Phase noise
- **Up-Converter**: Meets or Exceeds IESS 308/309

#### Synthesizer step size
- **Up-Converter**: 125 kHz
- **Down-Converter**: 125 kHz

### Reference

#### Mechanical
- **External Reference**: 10 MHz (optional)
- **Internal reference stability**: ± 2 x 10⁻¹⁰ / day
- **Aging**: ± 5 x 10⁻⁸ / year
- **Dimensions**: Width 19” (482.6 mm)
- **Height**: 1U 1.75” (44.5 mm)
- **Depth**: 22” (558.8 mm)

### Environmental

#### Power Supply
- **Operational**: 0°C to +50°C standard
- **Storage**: -55°C to +85°C
- **Humidity**: Non-condensing
- **Altitude**: 3,000m AMSL
- **Voltage**: 90 – 265 VAC (47 – 63 Hz)
- **Power**: 40W (typical, single converter)
- **Connector**: IEC 603320 10A

### Other options

1) 24V (4A) or 48V (2A) supply to BUC
2) 20V supply to LNB
3) 10 MHz reference for the BUC or LNB
4) Dual, quad, 1:1 redundant in a single shelf (this option is not available with option 1, 2 & 3 above)
5) 10MHz auto-sensing reference

### Monitor and Control
- **Up-Converter**: RS 485, DB9
- **Down-Converter**: RS 232, DB9
- **Group delay equalizer**: Discrete, DB9
- **Ethernet**: RJ45 F (optional)

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Specifications are subject to change without prior notice