# Ku-Band Synthesized Frequency Converter

Single / Dual
FCS300

## Features

- Outperforms IESS 308/309 phase noise by 3dB
- Superior linearity
- 125 kHz step size
- On-site reference aging correction capability
- Intuitive front panel user interface
- RS232 terminal and RS485 packet mode remote interface

## 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 aluminum 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.

## 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.

## Operating Bands

| Up-Converters | | | |
|---|---|---|---|
| **Model Number** | **Config** | **RF Output** | **IF Input** |
| ARUN-70KS | Single | 14.00 – 14.50 GHz | 70 MHz |
| ARUD-70KS | Dual | | |
| ARUN-70KX | Single | 13.75 – 14.50 GHz | 70 MHz |
| ARUD-70KX | Dual | | |

| Down -Converters | | | |
|---|---|---|---|
| **Model Number** | **Config** | **RF Input** | **IF Output** |
| ARDN-K1 70 | Single | 10.95 - 11.70 GHz | 70 MHz |
| ARDD-K1 70 | Dual | | |
| ARDN-K2 70 | Single | 11.70 - 12.20 GHz | 70 MHz |
| ARDD-K2 70 | Dual | | |
| ARDN-K3 70 | Single | 12.25 - 12.75 GHz | 70 MHz |
| ARDD-K3 70 | Dual | | |
| ARDN-K4 70 | Single | 10.70 – 11.70 GHz | 70 MHz |
| ARDD-K4 70 | Dual | | |
| ARDN-K5 70 | Single | 11.70 – 12.75 GHz | 70 MHz |
| ARDD-K5 70 | Dual | | |
| ARDN-KF1 70 | Single Only | 10.95 – 12.75 GHz | 70 MHz |
| ARDN-KF2 70 | | 10.70 – 12.75 GHz | |

| Up/Down-Converters | | | |
|---|---|---|---|
| **Model Number** | **Config** | **RF ports** | **IF ports** |
| ARMT-70XY | Up and Down | See table | 70 MHz |

For X and Y values choose any of the following configs.

**KS** = 14.00 – 14.50 GHz
**Kx** = 13.75 – 14.5 GHz
**K1** = 10.95 – 11.7 GHz
**K2** = 11.70 – 12.20 GHz
**K3** = 12.25 – 12.75 GHz
**K4** = 10.70 – 11.70 GHz
**K5** = 11.70 – 12.75 GHz

## Options

- 140 MHz IF Frequency
- 75 ohms IF Impedance
- Ethernet port
- Single or Dual in 1RU shelf
- Group Delay Equalization
- Autosensing External/Internal Reference
- Input and Output Monitors
- 1kHz step size

# Ku-Band Synthesized Frequency Converter

## Technical Specifications

| Up-Converter | | Down-Converter | |
|---|---|---|---|
| **IF Input** | | **RF Input** | |
| Frequency range | 70 ± 18 MHz or<br>140 ± 36 MHz (optional) | Frequency range | (See table on front page) |
| Impedance | 50 Ω | Impedance | 50 Ω |
| Input Connector | BNC (female) | Input Connector | N-Type (female) |
| Return loss | 18 dB | Return loss | 18 dB |
| **RF Output** | | **IF Output** | |
| Frequency range | (See table on front page) | Frequency range | 70 ± 18 MHz<br>140 ± 36 MHz (optional) |
| Output level | +10 dBm at P1dB | Output level | +5 dBm at P1dB |
| Output connector | N-type (female) | Output Connector | BNC (female) |
| Connector Impedance | 50 Ω | Connector Impedance | 50 Ω |
| Return loss | 18 dB | Return Loss | 18 dB |
| **Transfer Characteristics** | | **Transfer Characteristics** | |
| Maximum Conversion Gain | 20 dB (standard)<br>30 dB (option) | Conversion Gain | 40 dB |
| Gain adjustment | 20 dB (0.1 dB step size) | Gain adjustment | 20 dB (0.1 dB step size) |
| Gain flatness | 1.5 dB p-p max. 36 MHz<br>2.0 dB p-p max. 72 MHz | Gain flatness | 1.5 dB p-p max. 36 MHz<br>2.0 dB p-p max. 72 MHz |
| Gain stability | ±0.25 dB max. /24 hours<br>±1 dB over temp. range | Gain stability | ±0.25 dB max. / 24 hours<br>±1 dB over temp. range |
| Spurious | < -55 dBc related @ 0 dBm output<br>< -55 dBm non-related | Spurious | -55 dBc @ -5 dBm output |
| IMD3 (two tone) | -40 dBc max @ 0 dBm output | IMD3 (two tone) | -40 dBc max @ -5 dBm output |
| | | Image rejection | 60 dBc |
| | | Noise Figure | 20 dB |
| Group delay | 8 ns p-p typical | | |
| Group delay option 36MHz | Linear 0.03 ns/MHz | Parabolic 0.01 ns/MHz$^2$ | Ripple 1 ns p-p |
| Group delay option 72MHz | Linear 0.025 ns/MHz | Parabolic 0.003 ns/MHz$^2$ | Ripple 1 ns p-p |
| Phase noise (dBc/Hz) | 100Hz: -63 | 1kHz: -73 | 10kHz: -83 / 100kHz: -93 |
| Synthesizer step size | 125k kHz | | |
| **Reference** | | **Mechanical** | |
| External Reference | 10 MHz, +/- 5 dBm input level | Dimensions | Width 19" (482.6 mm) |
| Internal reference stability | ± 2 x $10^{-8}$ over 0°C to +50°C | | Height 1U 1.75" (44.5 mm) |
| Aging | ± 2 x $10^{-10}$ / day<br>± 5 x $10^{-8}$ / year | | Depth 22" (558.8 mm) |
| **Environmental** | | **Power Supply** | |
| Operational | 0°C to +50°C standard | Voltage | 90 – 265 VAC (47 – 63 Hz) |
| Storage | -55°C to +85°C | Power | 40W (typical, single converter) |
| Humidity | Non-condensing | Connector | IEC 603320 10A |
| Altitude | 3,000m AMSL | | |
| | | **Monitor and Control** | |
| | | RS 485 | DB9 |
| | | RS 232 | DB9 |
| | | Discrete | DB9 |
| | | Ethernet (optional) | RJ45 F (optional) |

Ref.: PB-FCS300-Ku-19015

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