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

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Technical Specifications

Up-Converter

IF Input	
Frequency range	70 ± 18 MHz or 140 ± 36 MHz (optional)
Impedance	50 Ω
Input Connector	BNC (female)
Return loss	18 dB

RF Output	
Frequency range	(See table on front page)
Output level	+10 dBm at P1dB
Output connector	N-type (female)
Connector Impedance	50 Ω
Return loss	18 dB

Transfer Characteristics							
Maximum Conversion Gain		20 dB (standard) 30 dB (option)					
Gain adjustment		20 dB (0.1 dB step size)					
Gain flatness		1.5 dB p-p max. 36 MHz 2.0 dB p-p max. 72 MHz					
Gain stability		±0.25 dB max. /24 hours ±1 dB over temp. range					
Spurious		< -55 dBc related @ 0 dBm output < -55 dBm non-related					
IMD3 (two tone)		-40 dBc max @ 0 dBm output					
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	
	72MHz	Linear 0.025 ns/MHz		Parabolic 0.003 ns/MHz^2		Ripple 1 ns p-p	
Phase noise (dBc/Hz)		100Hz	1kHz	10kHz	100kHz		
		-63	-73	-83	-93		
Synthesizer step size		125k kHz					

Reference	
External Reference	10 MHz, +/- 5 dBm input level
Internal reference stability	± 2 x 10^{-8} over 0°C to +50°C
Aging	± 2 x 10^{-10} / day ± 5 x 10^{-8} / year

Environmental	
Operational	0°C to +50°C standard
Storage	-55°C to +85°C
Humidity	Non-condensing
Altitude	3,000m AMSL

Down-Converter

RF Input	
Frequency range	(See table on front page)
Impedance	50 Ω
Input Connector	N-Type (female)
Return loss	18 dB

IF Output	
Frequency range	70 ± 18 MHz 140 ± 36 MHz (optional)
Output level	+5 dBm at P1dB
Output Connector	BNC (female)
Connector Impedance	50 Ω
Return Loss	18 dB

Transfer Characteristics	
Conversion Gain	40 dB
Gain adjustment	20 dB (0.1 dB step size)
Gain flatness	1.5 dB p-p max. 36 MHz 2.0 dB p-p max. 72 MHz
Gain stability	±0.25 dB max. / 24 hours ±1 dB over temp. range
Spurious	-55 dBc @ -5 dBm output
IMD3 (two tone)	-40 dBc max @ -5 dBm output
Image rejection	60 dBc
Noise Figure	20 dB

Mechanical	
Dimensions	Width 19" (482.6 mm) Height 1U 1.75" (44.5 mm) Depth 22" (558.8 mm)

Power Supply	
Voltage	90 – 265 VAC (47 – 63 Hz)
Power	40W (typical, single converter)
Connector	IEC 603320 10A

Monitor and Control	
RS 485	DB9
RS 232	DB9
Discrete	DB9
Ethernet (optional)	RJ45 F (optional)

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