

X-Band Synthesized Frequency Converters



Redundant FCS200R

Features

- Two hot swappable converters in 1U
- 70 MHz IF
- 125 kHz step size
- Cost effective solution
- 1:1 Redundancy included
- Meets or exceeds IESS 308/309 requirements
- High linearity
- Front panel control (local)
- Full remote control (remote) RS485 or RS232

Overview

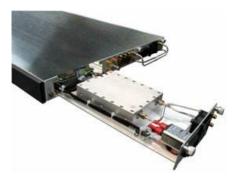
The Advantech Dual - HP range of converters uses the latest technology in conversion, giving two independent conversion chains in 1 RU package, local and remote control thus providing the ultimate in performance and user friendly operation at a very competitive price.

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

The hot swappable 1:1 redundancy feature provides for the ultimate flexibility in a very compact package.

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 uses a PLL oscillator 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 oscillator will automatically lock to the external reference.



Operating Bands

Up-Converters				
Model Number	RF Output	IF Frequency		
ARUD-70CSR	5.850 – 6.425 GHz	70 MHz		
ARUD-70CXR	5.850 – 6.725 GHz	70 MHz		

Down-Converters				
Model Number	RF Input	IF Frequency		
ARDD-CS70R	3.600 – 4.200 GHz	70 MHz		
ARDD-CX70R	3.400 – 4.200 GHz	70 MHz		

Applications

The HP range of converters is particularly suited for use in VSAT, SCPC Networks, SNG, DVB-RCS and Hub systems were compact redundancy is required. 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.

Options

- 140 MHz IF Frequency
- Ethernet port and SNMP Interface
- Low Group Delay (option)
- External/Internal 10 MHz Reference with Auto-sensing



X-Band Synthesized Frequency Converter

December Down-Converter Filipput RF Input RF Input Frequency range 70 ± 18 MHz Frequency range 50 Ω (optional 75Ω) Impedance 50 Ω Impedance 50 Ω Imput Connector Type N (female) Input Connector Type N (female) If Output Toutput Toutpu	Technical Specifications			
Frequency range	Up-Converter		Down-Converter	
Frequency range	-		RF Input	
Impedance	Frequency range	70 ± 18 MHz	Frequency range	7.25 – 7.75 GHz
Return loss		50Ω (optional 75Ω)		50 Ω
Return loss	Input Connector	BNC (female)	Input Connector	Type N (female)
Output power (P1dB) 0 dBm Frequency range 70 ± 18 MHz Frequency range 7.9 - 8.4 GHz Output level ± 5 dBm at P1dB IMD3 (two tone) -40 dBc max @ -10 dBm output Output connector BNC female Output connector Impedance 50 Ω (optional 75Ω) Connector Impedance 50 Ω (optional 75Ω) Return loss 18 dB Transfer Characteristics Conversion Gain 20 dB @ max gain setting Conversion Gain 40 dB min @ max gain setting 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 2.0 dB p-p max. 72 MHz 2.0 dB p-p max. 72 MHz Gain stability ± 0.25 dB max. /24 hours ± 1 dB over temp. range 50 dB max. /24 hours ± 1 dB over temp. range Spurious -55 dBc carrier related @ -10dBm -55 dBc carrier related @ -10dBm -55 dBc carrier related @ -10MBm -50 dBm non-carrier related Group delay (with optional group delay (with optional group delay equalizer) Group delay (with optional group delay equalizer) Innage rejection 60 dBc Noise Figure 20 dB Bo dBc Noise Figure 20 dB Phase noise Meets or Exceeds IESS 308/309 Phase noise Meets or Exceeds IESS 308/309 Synth	Return loss	18 dB	Return loss	
Frequency range 7.9 – 8.4 GHz Output level +5 dBm at P1dB IMD3 (two tone)	RF Output		IF Output	
IMD3 (two tone)	Output power (P1dB)	0 dBm	Frequency range	70 ± 18 MHz
Output connector Type N (female) Connector Impedance 50 Ω (optional 75Ω) Connector Impedance 50 Ω Return Loss 18 dB Return loss 18 dB 18 dB Transfer Characteristics Conversion Gain 40 dB min @ max gain setting Conversion Gain 20 dB (0.1 dB step size) Gain adjustment 20 dB (0.1 dB step size) Gain adjustment 20 dB (0.1 dB step size) Gain flatness 2.0 dB p-p max. 36 MHz 2.0 dB p-p max. 72 MHz 2.0 dB p-p max. 72 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 carrier related @ -10dBm -55 dBc carrier related @ -10dBm 55 dBc carrier related @ -10dBm -50 dBm non-carrier related Spurious -55 dBc @ -5 dBm output Group delay (with optional group delay (with optional group delay equalizer) Group delay (with optional group delay equalizer) Linear 0.03 ns/MHz Parabolic 0.01 ns/MHz² Ripple 1 ns p-p Linear 0.03 ns/MHz Phase noise Meets or Exceeds IESS 308/309 Meets or Exceeds IESS 308/309	Frequency range	7.9 – 8.4 GHz	Output level	+5 dBm at P1dB
Connector Impedance 50 Ω Return Loss 18 dB Return Ioss Return	IMD3 (two tone)	-40 dBc max @ -10 dBm output	Output Connector	BNC female
Return loss 18 dB Transfer Characteristics Transfer Characteristics Conversion Gain 20 dB @ max gain setting Conversion Gain 40 dB min @ max gain setting Gain adjustment 20 dB (0.1 dB step size) Gain adjustment 20 dB (0.1 dB step size) Gain adjustment 20 dB (0.1 dB step size) 1.5 dB p-p max. 36 MHz 2.0 dB p-p max. 72 MHz 2.0 dB p-p max. 72 MHz 2.0 dB p-p max. 72 MHz 40.25 dB max. /24 hours ±1 dB over temp. range ±1 dB over te	Output connector	Type N (female)	Connector Impedance	50Ω (optional 75Ω)
Transfer Characteristics	Connector Impedance	50 Ω	Return Loss	18 dB
Conversion Gain 20 dB @ max gain setting Conversion Gain 40 dB min @ max gain setting 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 2.0 dB p-p max. 72 MHz 1.5 dB p-p max. 72 MHz Gain stability ±0.25 dB max. /24 hours ±1 dB over temp. range ±0.25 dB max. /24 hours ±1 dB over temp. range Spurious -55 dBc carrier related @ -10dBm <-50 dBm non-carrier related	Return loss	18 dB		
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Gain flatness 2.0 dB p-p max. 72 MHz 40.25 dB max. /24 hours ±1 dB over temp. range Spurious	Gain adjustment	20 dB (0.1 dB step size)	Gain adjustment	20 dB (0.1 dB step size)
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Spurious < -50 dBm non-carrier related	Gain stability		Gain stability	
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Group delay (with optional group delay equalizer) Parabolic 0.01 ns/MHz² Ripple 1 ns p-p Image rejection 60 dBc Noise Figure 20 dB Phase noise Meets or Exceeds IESS 308/309 Synthesizer step size 125k kHz Synthesizer step size 125k kHz Reference External Reference 10 MHz (optional) Internal reference stability ± 2 x 10-10 / day Aging ± 5 x 10-8 / year Environmental Operational 0°C to +50°C standard Voltage 90 - 265 VAC (47 - 63 Hz) Storage -55°C to +85°C Power Altitude Group delay (with optional group delay (with optional group delay (with optional group delay (with optional group delay equalizer) Parabolic 0.01 ns/MHz² Ripple 1 ns p-p Image rejection 60 dBc Noise Figure 20 dB Meets or Exceeds IESS 308/309 Synthesizer step size 125 kHz Mechanical Width 19" (482.6 mm) Height 1U 1.75" (44.5 mm) Depth 28" (711.2 mm) Environmental Operational 0°C to +50°C standard Voltage 90 - 265 VAC (47 - 63 Hz) Storage -55°C to +85°C Power 50W (typical) Humidity Non-condensing Connector IEC 603320 10A	Group delay (over 36 MHz)	10 -15 ns p-p	Group delay (over 36 MHz)	10 -15 ns p-p
Image rejection 60 dBc Noise Figure 20 dB Phase noise Meets or Exceeds IESS 308/309 Phase noise Meets or Exceeds IESS 308/309 Synthesizer step size 125k kHz Synthesizer step size 125 kHz Reference Mechanical External Reference 10 MHz (optional) Midth 19" (482.6 mm) Internal reference stability ± 2 x 10 ⁻¹⁰ / day Dimensions Height 1U 1.75" (44.5 mm) Depth 28" (711.2 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 50W (typical) Humidity Non-condensing Connector IEC 603320 10A Altitude 3,000m AMSL		Linear 0.03 ns/MHz Parabolic 0.01 ns/MHz ²		Linear 0.03 ns/MHz Parabolic 0.01 ns/MHz ²
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ReferenceExternal Reference10 MHz (optional)Width 19" (482.6 mm)Internal reference stability± 2 x 10-10 / dayDimensionsHeight 1U 1.75" (44.5 mm)Aging± 5 x 10-8 / yearDepth 28" (711.2 mm)Power SupplyOperational0°C to +50°C standardVoltage90 - 265 VAC (47 - 63 Hz)Storage-55°C to +85°CPower50W (typical)HumidityNon-condensingConnectorIEC 603320 10AAltitude3,000m AMSL	Synthesizer step size	125k kHz	Synthesizer step size	125 kHz
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Aging ± 5 x 10-8 / year Depth 28" (711.2 mm) Environmental Operational 0°C to +50°C standard Voltage 90 - 265 VAC (47 - 63 Hz) Storage -55°C to +85°C Power 50W (typical) Humidity Non-condensing Connector IEC 603320 10A Altitude 3,000m AMSL IEC 603320 10A	External Reference	10 MHz (optional)		Width 19" (482.6 mm)
Aging ± 5 x 10-8 / year Depth 28" (711.2 mm) Environmental Operational 0°C to +50°C standard Voltage 90 - 265 VAC (47 - 63 Hz) Storage -55°C to +85°C Power 50W (typical) Humidity Non-condensing Connector IEC 603320 10A Altitude 3,000m AMSL IEC 603320 10A	Internal reference stability	± 2 x 10 ⁻¹⁰ / day	Dimensions	Height 1U 1.75" (44.5 mm)
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Altitude 3,000m AMSL	Storage		1 OVVC1	
Attitude	Humidity		Connector	IEC 603320 10A
Monitor and Control	Altitude	3,000m AMSL		
			Monitor and Control	
RS 485 DB9				DB9
RS 232 DB9			RS 232	DB9
Discrete DB9				DB9
Ethernet (optional) RJ45 F (optional)			Ethernet (optional)	RJ45 F (optional)

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