

# 70/140 MHz to L-Band or L-Band to 70/140 MHz

## 1:1 Redundant Converter

FCS500R Series



### Features

- 1:1 Redundancy included
- Two hot swappable frequency converters in 1RU
- Automatically switching to the standby converter upon failure of the primary one
- Embedded input & output switches controlled by an embedded M&C unit
- 70 MHz or 140 MHz IF
- 125 kHz step size
- Cost effective solution. High linearity
- 950 – 1750 MHz or 950 – 2150 MHz L-Band
- Meets or exceeds IESS 308/309 requirements
- Internal/External 10 MHz Reference with Autosensing
- Front panel control (local) via buttons, display and LEDs
- Full remote control via RS232, RS485 or optional Ethernet interface port
- Down-converters with inverted or non-inverted output spectrum available

### Overview

The Advantech Wireless HP range of dual 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 is fully synthesized with the PLL oscillator either locked to a highly stable internal 10 MHz reference or if the external 10 MHz reference signal with proper power level is present, the PLL will automatically lock to the external reference.

### Applications

The HP range of converters is particularly suited for use in VSAT, SCPC Networks, SNG, DVB-RCS and Hub systems where 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

- Ethernet port and SNMP Interface
- Low Group Delay
- 10 MHz Reference for LNB via L-Band, on down converters
- Rack mount set of slides

### Operating Bands

Up-Converters (non-inverting)			
Model	Type	IF Input	RF Output
ARUD-70LR	1:1 Red	70 ± 18 MHz	950 – 1750 MHz
ARUD-140LR		140 ± 36 MHz	
ARUD-70LXR	1:1 Red	70 ± 20 MHz	950 – 2150 MHz
ARUD-140LXR		140 ± 40 MHz	

Down-Converters (non-inverting / inverting)			
Model	Type	RF Input	IF Output
ARDD-L70R	1:1 Red	950 – 1750 MHz	70 ± 18 MHz
ARDD-L140R			140 ± 36 MHz
ARDD-LX70R	1:1 Red	950 – 2150 MHz	70 ± 20 MHz
ARDD-LX140R			140 ± 40 MHz

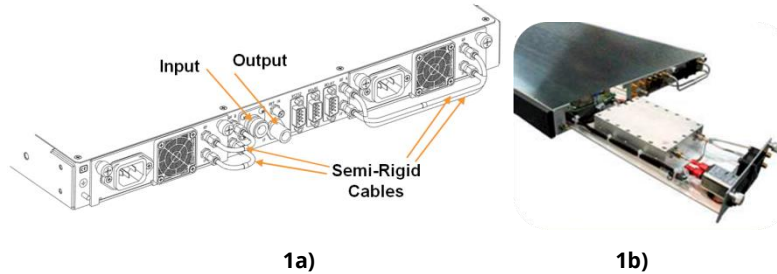


Fig. 1: Rear Side of the 1:1 Redundant Converter With  
a) Two Inserted Drawers b) Pulled-Out and Inserted Drawers

### Redundancy

1:1 redundant converters are available in a single 1RU chassis containing two hot swappable drawers (trays). Designed for easy removal and replacement, each of drawers includes independent frequency converter, power supply and 10 MHz reference source modules. For 1:1 redundancy operation, the chassis has embedded input & output switches controlled by an embedded M&C unit switching automatically to the backup drawer upon failure of any module inside of the primary one.

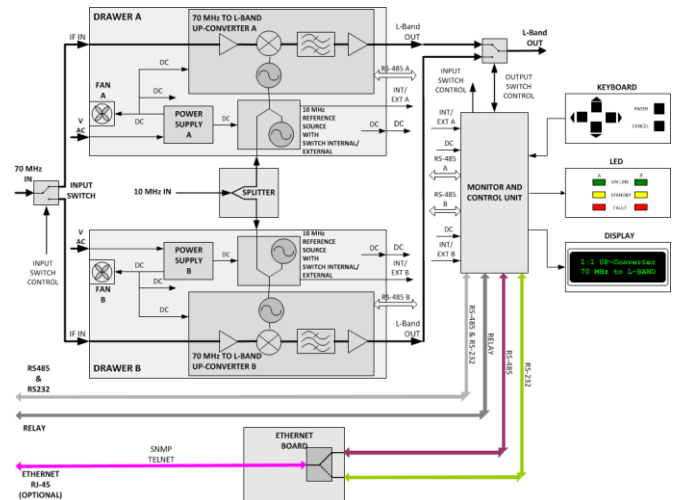


Fig. 2: Block Diagram of 1:1 Redundant 70MHz to L-band Upconverter



## 70/140 MHz to L-Band or L-Band to 70/140 MHz 1:1 Redundant Converter

Technical Specifications			
Up-Converter		Down-Converter	
<b>IF Input</b>		<b>RF Input</b>	
Frequency range	(See table on front page)	Frequency range	(See table on front page)
Impedance	50 Ω standard (optional 75Ω)	Impedance	50 Ω
Input Connector	BNC (f) <i>other options available</i>	Input Connector	Type N (f) <i>other options available</i>
Return loss	18 dB	Return loss	16 dB
<b>RF Output</b>		<b>IF Output</b>	
Frequency range	(See table on front page)	Frequency range	(See table on front page)
Output power (P1dB)	+5 dBm	Output power (P1dB)	+5 dBm
IMD3 (two tone)	-40 dBc max @ -5 dBm output	Output Connector	BNC (f) <i>other options available</i>
Output connector	Type N (f) <i>other options available</i>	Connector Impedance	50 Ω standard (optional 75Ω)
Connector Impedance	50 Ω	Return Loss	18 dB
Return loss	16 dB		
Transfer Characteristics		Transfer Characteristics	
Conversion Gain	20 dB @ max gain setting	Conversion Gain	30 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	1.0 dB p-p max. 40 MHz 1.5 dB p-p max. 80 MHz	Gain flatness	1.0 dB p-p max. 40 MHz 1.5 dB p-p max. 80 MHz
Gain stability	±0.25 dB max. /24 hours ±1 dB over temp. range	Gain stability	±0.25 dB max. / 24 hours ±1 dB over temp. range
Spurious	-55 dBc carrier related @ -10 dBm < -60 dBm non-carrier related	Spurious	-55 dBc @ -10 dBm output
Group delay (over 36 MHz)	10 -15 ns p-p	Group delay (over 36 MHz)	10 -15 ns p-p
Group delay (with optional group delay equalizer)	Linear 0.03 ns/MHz Parabolic 0.01 ns/MHz <sup>2</sup> Ripple 1 ns p-p	Group delay (with optional group delay equalizer)	Linear 0.03 ns/MHz Parabolic 0.01 ns/MHz <sup>2</sup> Ripple 1 ns p-p
		Image rejection	50 dB
		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 Freq.	10 MHz ± 2 Hz, 0 ± 3 dBm	Dimensions	Width 19" (482.6 mm)
External Reference Input	BNC (f) <i>other options available</i>		Height 1U 1.75" (44.5 mm)
Internal reference stability	± 2 x 10 <sup>-10</sup> / day		Depth 24" (609.6 mm)
Aging	± 5 x 10 <sup>-8</sup> / year	Cooling	Forced-Air
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
Humidity	Non-condensing	Connector	IEC 603320 10A
Altitude	3,000m AMSL		
Other options		Monitor and Control	
1) 10 MHz reference for the LNB		RS 485	DB9
2) Rack mount set of slides		RS 232	DB9
		Discrete	DB9
		Ethernet (optional)	RJ45 F (optional)
		Buttons, display & LEDs	via Front Panel

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