



### 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
- 950 – 1750 MHz or 950 – 2150 MHz L-Band
- Meets or exceeds IESS 308/309 requirements
- Internal/External 10 MHz Reference with Autosensing
- High linearity
- 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.

### Application

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

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

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

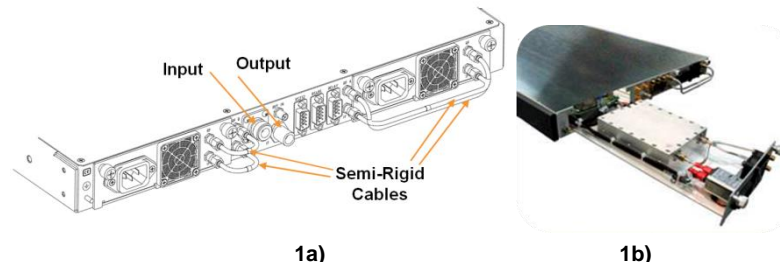


Fig. 1: Rear Side of the 1:1 Redundant Converter With  
a) Two Inserted Drawers b) Pulled-Out and Inserted Drawers

### 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.

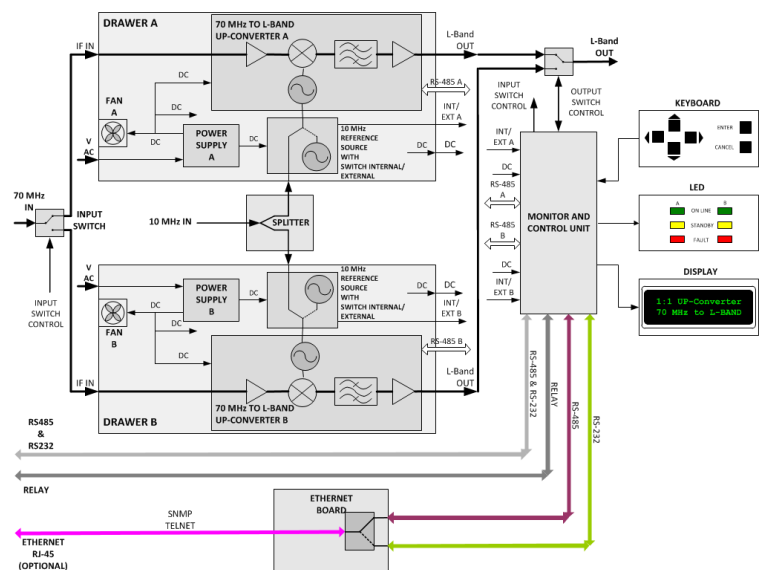


Fig. 2: Block Diagram of 1:1 Redundant 70MHz to L-band Upconverter

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

## Technical Specifications

| Up-Converter                                      |   | Down-Converter                                    |   |
|---|---|---|---|
| IF Input  |   | RF Input  |   |
| 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   |
| RF Output   |   | IF Output   |   |
| 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<br>1.5 dB p-p max. 80 MHz                            | Gain flatness                                     | 1.0 dB p-p max. 40 MHz<br>1.5 dB p-p max. 80 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 carrier related @ -10 dBm<br>< -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<br>Parabolic 0.01 ns/MHz <sup>2</sup><br>Ripple 1 ns p-p | Group delay (with optional group delay equalizer) | Linear 0.03 ns/MHz<br>Parabolic 0.01 ns/MHz <sup>2</sup><br>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   |

**NORTH AMERICA  
USA**  
Tel: +1 770 456 5601  
Fax: +1 770 456 5698  
info.usa@advantechwireless.com

**CANADA**  
Tel: +1 514 420 0045  
Fax: +1 514 420 0073  
info.canada@advantechwireless.com

**SOUTH AMERICA**  
Tel: +1 514 420 0045  
Fax: +1 514 420 0073  
info.latam@advantechwireless.com

**BRAZIL**  
Tel: +55 11 4810 8890  
info.brazil@advantechwireless.com

**EUROPE  
UNITED KINGDOM**  
Tel: +44 1480 357 600  
Fax: +44 1480 357 601  
info.uk@advantechwireless.com

**RUSSIA & CIS**  
Tel: +7 495 971 59 18  
info.russia@advantechwireless.com

**ASIA**  
Tel: +1 514 420 0045 ext. 3116  
Fax: +1 514 420 0073  
info.asia@advantechwireless.com

**INDIA**  
Tel: +1 770 400 9544  
info.india@advantechwireless.com

**INDONESIA**  
Tel: +1 514 420 0045  
Info.indonesia@advantechwireless.com

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