

## IBD(A) series

### Single-Range, Single & Multi-Channel, Rack Mount, Block Down Converters



The 19-inch 1U rack mounted **IBD(A) series** of block frequency down converter units from Peak Communications are designed to take the incoming SHF signal and produce an output at L-Band that is suitable for direct connection to an L-band demodulator or for further conversion typically by a **P7001** synthesised down converter.







The **IBD(A) series** of units are mains powered and are constructed of high-grade components to give the ultimate performance. They utilise externally phase locked dielectric resonator oscillators (XPDROs) and are far superior in stability and phase noise to voltage-controlled oscillators (VCOs), as commonly used in other BDC designs.

High rejection performance filtering techniques are employed to ensure unrivalled spurious response.

These converters use a single-stage topology apart from the **IBD340**, which is dual-stage.

**The unit has a highly stable internal reference source and will automatically detect and lock to an external 10MHz signal, when applied.**

#### Peak Features

-  High stability, low ripple and excellent phase noise, using PDRO technology
-  10MHz external reference fitted as standard with automatic internal reference back-up
-  Full alarm monitoring
-  Fully compatible with **RCU100/ RCU200 & RCUH100/ RCUH200 series** 1+1/ 2+1 redundancy controllers and **RCU1001 series** N+1 redundancy units
-  L-Band monitor & fibre optic L-Band interface options available
-  Available in dual, triple & quad-channel versions



## High grade block down converter products;

| BDC Model  | SHF Input Frequency (GHz)            | L-Band Output Frequency (MHz) |
|--|--------------------------------------|-------------------------------|
| <b>Traditional receive band coverage;</b>  |                                      |                               |
| IBD250   | 2.0-2.5 (S-Band)                     | 950-1450                      |
| IBD370   | 3.7-4.2 (C-Band)                     | 950-1450                      |
| IBD340, IBD342(dual), IBD344 (quad)  | 3.4-4.2 (full C-Band)                | 950-1750                      |
| IBD420, IBD422(dual), IBD424 (quad)  | 3.4-4.2 (full C-Band)                | 1750-950 (inverted spectrum)  |
| IBD450, IBD452(dual), IBD454 (quad)  | 4.5-4.8 (INSAT C-Band)               | 950-1250                      |
| IBD725   | 7.25-7.75 (X-Band)                   | 950-1450                      |
| IBD1070  | 10.7-11.7 (low Ku-Band)              | 950-1950                      |
| IBD1095  | 10.95-11.70 (mid Ku-Band)            | 950-1700                      |
| IBD1120  | 11.2-11.7 (mid Ku-Band)              | 950-1450                      |
| IBD1145  | 11.45-12.20 (mid Ku-Band)            | 950-1700                      |
| IBD1170  | 11.7-12.2 (mid Ku-Band)              | 950-1450                      |
| IBD1171  | 11.70-12.75 (mid Ku-Band)            | 950-2000                      |
| IBD1225  | 12.25-12.75 (mid Ku-Band)            | 950-1450                      |
| <b>Transmit band coverage for ground test &amp; ranging applications (consult factory with any specific filtering requirements);</b> |                                      |                               |
| IBD600   | 5.850-6.425 (C-Band)                 | 950-1525                      |
| IBD665   | 5.85-6.65 (extended C-Band)          | 950-1750                      |
| IBD790   | 7.9-8.4 (X-Band)                     | 950-1450                      |
| IBD1275  | 12.75-13.75 (low Ku-Band)            | 950-1950                      |
| IBD140   | 14.0-14.5 (Ku-Band)                  | 950-1450                      |
| IBD137   | 13.75-14.50 (extended Ku-Band)       | 950-1700                      |
| IBD148   | 13.75-14.80 (super extended Ku-Band) | 950-2000                      |
| IBD184   | 17.30-18.40 (Full DBS-Band)          | 950-1850                      |

For other 'non-standard' frequency requirements or multi-channel units, please contact the factory.

For multiple-range block down converters covering wider bandwidths please see IBD(B) series datasheet.

For Ka-Band block down converters please see IBD(Ka) series datasheet.

For equivalent units with full user interface, remote control and digital attenuation, please see IBDH(A) series datasheet.

For equivalent remote mount units, please see PBD(A) series datasheet.

## Rear panel view (sample)



## IBD(A) series - Typical Specification

### SHF Input

|            |                 |
|------------|-----------------|
| Connector  | 50Ω, SMA (f)    |
| Option 1a; | 50Ω, N-Type (f) |

Note; for multi-channel version, multiple connectors are provided.

|             |                          |
|-------------|--------------------------|
| Return loss | >18dB (>15dB for S-Band) |
|-------------|--------------------------|

### L-Band Output

|                |  |
|----------------|--|
| Frequency      | 950 up to 2000MHz, depending on model      |
| Spectrum sense | Non-inverting, apart from IBD420, 422, 424 |
| Connector      | 50Ω, SMA (f)                               |
| Option 1b;     | 50Ω, N-Type (f)                            |
| Option 3;      | 75Ω, BNC (f)                               |

Note; for multi-channel version, multiple connectors are provided.

|             |        |
|-------------|--------|
| Return loss | >13dB  |
| 1dB GCP     | +8dBm  |
| Option 5b;  | +16dBm |

### Transfer Characteristics

|                 |  |
|-----------------|--|
| Conversion gain | 30dB ±1dB at band centre                           |
| Option 4b;      | 40dB ±1dB at band centre                           |
| Gain stability  | ±0.5dB from 0 to 50°C                              |
| Gain flatness   | ±1dB full band (±1.5dB for bandwidths ≥800MHz)     |
|                 | ±0.5dB across any 40MHz in band dependant on model |
| LO frequency    | dependant on model                                 |

### Manual Attenuation (Option 10)

|                   |   |
|-------------------|---|
| Attenuation range | 30dB nominal                            |
| Control           | Continuously variable from front panel. |

Note; can degrade gain flatness performance.

### Typical RF Performance

|                    |                                       |
|--------------------|---------------------------------------|
| LO phase noise     | -55dBc/Hz at 10Hz                     |
| (typical with good | -75dBc/Hz at 100Hz                    |
| phase noise        | -92dBc/Hz at 1kHz                     |
| ext. 10MHz ref)    | -100dBc/Hz at 10kHz                   |
|                    | -105dBc/Hz at 100kHz                  |
|                    | -125dBc/Hz at 1MHz                    |
| Harmonics          | Better than -50dBc                    |
| Spurious           | <-80dBm (in-band non-carrier related) |

Note; IBD250 specified as <-70dBm.

<-75dBc (in-band carrier related)

Notes: C-Band units specified as <-65dBc at input -40dBm. IBDH340, 342, 344 units specified as <-60dBc at input -40dBm.

LO leakage <-80dBm (always out of band)

Note; IBD250 specified as <-70dBm (in band).

|                     |  |
|---------------------|--|
| 3rd order intercept | >+18dBm                                  |
| Channel isolation   | -65dBc (for multi-channel versions only) |

### SHF & L-Band Monitor (Option 2)

|            |   |
|------------|---|
| Connector  |   |
| Option 2a; | L-Band monitor, 50Ω, SMA (f) on rear panel  |
| Option 2b; | L-Band monitor, 50Ω, SMA (f) on front panel |
| Option 2c; | SHF monitor, 50Ω, SMA (f) on rear panel     |
| Option 2d; | SHF monitor, 50Ω, SMA (f) on front panel    |
| Option 2e; | Rear panel LO monitor (SMA)                 |
| Option 2f; | Front panel LO monitor (SMA)                |

Note; for other connector types please consult the factory.

|       |   |
|-------|---|
| Level | Level -20dBc ±3dB (-13dBm nominal for LO monitor) |
|-------|---|

### L-Band Linear Passive Slope compensation (Option 15)

Compensates for internal circuitry & external primarily cross-site cables.

Note; unit options chosen will determine 'surplus' available for external compensation (for details contact factory).

|           |                                       |
|-----------|---------------------------------------|
| Frequency | 950-2150MHz                           |
| Slope     | 5dB nom., fixed positive compensation |

### External Reference Input (with automatic detection)

|                      |  |
|----------------------|--|
| Frequency            | 10MHz (5MHz factory settable)              |
| Connector            | 50Ω, BNC (f)                               |
| Level                | 0dBm ±5dB                                  |
| Required phase noise | better than 50dBc/Hz of output phase noise |
| Locking delay        | <2 minutes to stabilise from cold          |

### Internal Back-up Reference Stability

|                 |   |
|-----------------|---|
| Allan deviation | $5 \times 10^{-11}$ over 1s                               |
| Ageing          | $<5 \times 10^{-9}$ per day, $<5 \times 10^{-7}$ per year |
| Temp stability  | $<5 \times 10^{-8}$ over 0 to 50°C                        |

### High stability (Option 8)

|                 |  |
|-----------------|--|
| Allan deviation | $3 \times 10^{-12}$ over 1s                                |
| Ageing          | $<2 \times 10^{-10}$ per day, $<2 \times 10^{-8}$ per year |
| Temp stability  | $<3 \times 10^{-9}$ over 0 to 50°C                         |

### Mechanical

|        |                                 |
|--------|---------------------------------|
| Width  | 19" standard rack mountable     |
| Height | 1U (1.75")                      |
| Depth  | ~400mm (15.7"), plus connectors |

Note; for multi-channel versions, a longer ~534mm (21") chassis may be provided, depending upon options selected.

|              |   |
|--------------|---|
| Construction | Aluminium chassis                                     |
| Weight       | 3.5-6kgs (8-13lbs) approx., unit and option dependent |

### Environmental

|                |                               |
|----------------|-------------------------------|
| Operating temp | 0°C to +50°C                  |
| EMC            | EN 55022, part B & EN 50082-1 |
| Safety         | EN 60950                      |

### Power Supply

|           |   |
|-----------|---|
| Voltage   | 90-264VAC   |
| Frequency | 47-63Hz   |
| Power     | 50 Watts max.   |
| Option 7; | Redundant PSU; provides a 1+1 redundant power supply configuration with separate prime power inputs |

### Control System Interface

|        |                                |
|--------|--------------------------------|
| Alarms | LO lock failure<br>PSU failure |
|--------|--------------------------------|

## Options

- 1a) N-Type(f) SHF interface connection
- 1b) N-Type(f) L-Band interface connection
- 2a) -20dBc L-band monitor on rear panel (SMA)
- 2b) -20dBc L-band monitor on front panel (SMA)
- 2c) -20dBc SHF monitor on rear panel (SMA)
- 2d) -20dBc SHF monitor on front panel (SMA)
- 2e) Rear panel LO monitor (SMA)
- 2f) Front panel LO monitor (SMA)
- 3) 75Ω interface at L-band (6dB gain loss)
- 4b) 10dB increase in gain to 40dB
- 5b) 1dB GCP increase to +16dBm (includes extra 10dB gain)
- 6) Fibre optic L-band interface connection
- 7) Redundant power supply
- 8) High stability internal reference option
- 10a) Manual variable attenuator, 0-30dB, at L-band
- 10b) Manual variable attenuator, 0-30dB, at SHF
- 15) 5dB passive, fixed, slope compensation

Notes; the addition of options can modify the typical specification, for details please consult the factory.

