



Model 7420 Model 7320



Features

- Accept RF signals from 400 MHz to 4000 MHz
- Accept RF input levels from -60 dBm to -20 dBm
- Baseband IF output with up to 390 MHz bandwidth
- Internal OCXO or external 10 MHz frequency reference

General Information

These Bandit® models are two- or four-channel, high-performance, stand-alone analog RF wideband downconverters. Packaged in small, shielded cPCI boards with front-panel connectors for easy integration into RF systems, they offer programmable gain, high dynamic range and a low noise figure.

Model 7320 is a 3U cPCI board while Model 7220 is a 6U cPCI board; both provide two channels, while Model 7420 is a double-density 6U cPCI board that provides four channels.

With an input frequency range from 400 to 4000 MHz and a wide IF bandwidth of up to 390 MHz, these models are ideal solutions for amplifying and downconverting antenna signals for communications, radar and signal intelligence systems.

Programmable Input Level

The models accept RF signals on two or four front-panel SSMC connectors. LNAs (Low Noise Amplifiers) are provided, along with two programmable attenuators allowing downconversion of input signals ranging from -60 dBm to -20 dBm in steps of 0.5 dB.

Input Filter Options

An optional five-stage lowpass or bandpass input filter can be included with several available frequency and attenuation characteristics for RF image rejection and harmonic suppression.

Quadrature Mixers

These models feature Analog Devices ADL5380 quadrature mixers. The ADL5380's

are capable of excellent accuracy with amplitude and phase balances of ~0.07 dB and ~0.2°, respectively.

Tuning Accuracy

These models use the Analog Devices ADF4351 low-noise, on-board frequency synthesizer as the LO (Local Oscillator). Locked to an external input reference for accuracy with a fractional-N phase-locked loop, its frequency is programmable across the 400 to the 4000 MHz band with a tuning resolution of better than 100 kHz.

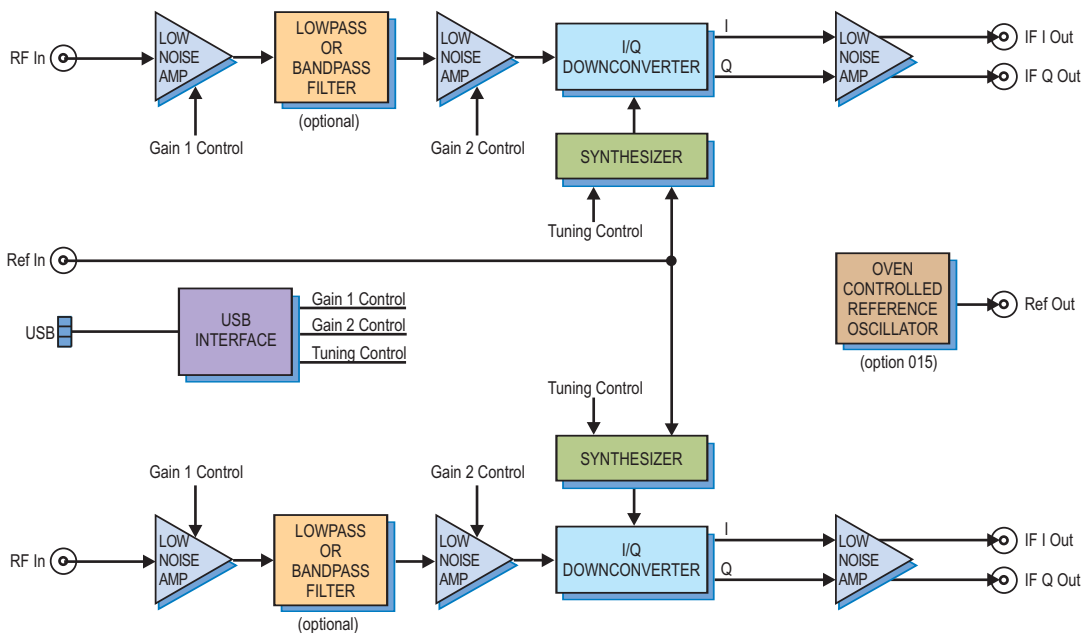
On-board Reference Clock

In addition to accepting a 10 MHz reference signal on the front panel, these models include on-board 10 MHz crystal oscillators which can be used as the reference to lock the internal LO frequency synthesizers.

This reference is an OCXO (Oven Controlled Crystal Oscillator), which provides an exceptionally precise frequency standard with excellent phase noise characteristics.

Wideband Output

Outputs are provided as baseband I and Q signals at bandwidths up to 390 MHz. Alternatively, either I or Q output can be used at some intermediate offset frequency convenient to the application. User-provided in-line output IF filters allow customizing the output bandwidth and offset frequency to the specific application requirements. This output is suitable for A/D conversion using Pentek high-performance signal acquisition products, such as those in the Cobalt and Onyx families. ➤



► Specifications

RF Input

Connector Type: SSMC
Input Impedance: 50 ohms
Input Level Range: -60 dBm to -20 dBm
Flatness: ±2 dB from 400 MHz to 1 GHz,
 ±3 dB from 1 GHz to 3 GHz, ±5 dB from
 3 GHz to 4 GHz

RF Attenuator: Programmable from 0 to
 63 dB in 0.5 dB steps

LO Synthesizer Tuning

Frequency range: 400-4000 MHz,
Resolution: < 10 kHz
Tuning Speed: < 500 µsec
Phase-Locked Loop Bandwidth: 100 kHz

Phase Noise

1 kHz: -90 dBc/Hz
100 kHz: -110 dBc/Hz
1 MHz: -130 dBc/Hz

Noise Figure (referred to input)

60 dB gain: 2.6 dB

Inband Output IP3

20 dB gain: +10 dBm
60 dB gain: +42 dBm

Reference Input/Output

Connector Type: SSMC
Input/Output Impedance: 50 ohms

Reference Input Signal

Frequency: 10 MHz
Level: 0 dBm, sine wave

Reference Output Signal

Frequency: 10 MHz
Level: 0 dBm, sine wave

OCXO Reference

Center Frequency: 10 MHz
**Frequency Stability vs. Change in
 Temperature:** ±50.0 ppb
Frequency Calibration: ±1.0 ppm

Aging

Daily: ±10 ppb/day
First Year: ±300 ppb

**Total Frequency Tolerance
 (20 years):** ±4.60 ppm

Phase Noise

1 Hz Offset: -67 dBc/Hz
10 Hz Offset: -100 dBc/Hz
100 Hz Offset: -130 dBc/Hz
1 KHz Offset: -148 dBc/Hz
10 KHz Offset: -154 dBc/Hz
100 KHz Offset: -155 dBc/Hz

IF Output

Connector Type: SSMC
Output Impedance: 50 ohms
Center Frequency: User definable
Output Level: 0 dBm, nominal

Programming

Functions: RF Atten, IF Atten, Int/Ext
 Reference Select, LO Synthesizer Frequency
Interface: USB
Connector Type: MicroUSB

Power

Voltage: +12 VDC
Current: 1.5 A

PCI Interface

PCI Bus: 32-bit, 66 MHz (supports
 33 MHz), power only

Environmental

Operating Temp: 0° to 50° C
Storage Temp: -20° to 90° C
Relative Humidity: 0 to 95%, non-cond.

Size: Standard 3U or 6U cPCI board

Ordering Information

Model	Description
7220	Bandit Two-Channel Analog RF Wideband Downconverter - 6U cPCI
7320	Bandit Two-Channel Analog RF Wideband Downconverter - 3U cPCI
7420	Bandit Four-Channel Analog RF Wideband Downconverter - 6U cPCI

Option	Description
-015	Oven Controlled Reference Oscillator
-145	1.45 GHz lowpass input filter
-280	2.80 GHz lowpass input filter