

Dual Frequency GPS Hardware Front End



The Dual Frequency GPS Front End consists of a dual-frequency downconverter and an optional data acquisition system. The downconverter box downconverts L_1 and L_2 band signals to suitable IF frequencies, whose signals can then be digitized and stored in either a PC using the data acquisition card or the digital storage unit. The IF signal can also be used as a direct input to the real-time software correlators or other receivers.

These downconverters are developed using discrete components and provide excellent performance in terms of noise, gain, phase flatness, and overall reliability. Both AGC and fixed gain (digitally controlled) versions are available.

SAMPLE APPLICATIONS

- CRS Real-Time Software Receiver Front End
- Snapshot Processing
- Receiver Development
- Signal Simulator Evaluation
- Multipath Monitoring

Dual Frequency Front End

OPERATING SPECIFICATIONS

TWO CHANNEL DOWNCONVERTER, FIXED GAIN (DC-2-001-01)

Input Frequencies:	1575.42 MHz (L ₁) 1227.60 MHz (L ₂)
Input/Output Impedance:	500 Ohms, all ports except 10 MHz IN and 10 MHz OUT ports
I.F. Bandwidth (3 dB):	18 MHz
Gain:	70 dB, typical (attenuator set to 0 dB)
Attenuation Ranger:	30 dB with 2 dB steps, user-selected at each channel
Gain Flatness:	± 1 dB
Noise Figure:	4.5 dB, typical
Output 1 dB Compression:	± 10 dBm, typical
Final I.F. Output:	13.991429 MHz (L ₁) 16.600000 MHz (L ₂)
Antenna Power:	12 VDC @ 50 mA, maximum current
Reference Frequency:	10.000000 MHz
Reference Stability:	± 0.020 ppm
Reference Warm Up:	10 minutes, minimum
Reference Phase Noise: (Typical)	-35 dBc/Hz @ 1 Hz -115 dBc/Hz @ 10 Hz -155 dBc/Hz @ 1 KHz
External Reference:	10 MHz ± 1 KHz, TTL compatible
Power Requirements:	+ 12 VDC +/-5%, 520 mA after warm-up + 12 VDC +/-5%, 750 mA during warm-up - 12 VDC +/-5%, 80 mA
Operating Temperature:	0° to 50° C
Housing Dimensions:	4.00" X 6.00" X 0.9"
R.F. Connections:	SMA
Power Connections:	Solder terminals

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OPERATING SPECIFICATIONS

TWO CHANNEL DOWNCONVERTER WITH AGC (DC-2-007-04)

Input Frequencies:	1575.42 MHz (L ₁) 1227.60 MHz (L ₂)
Input/Output Impedance:	500 Ohms, all ports except 10 MHz IN and 10 MHz OUT ports
I.F. Bandwidth (3 dB):	18 MHz
Gain:	90 dB, typical (attenuator set to 0 dB)
Output AGC Point:	0 dBm ± 1 dBm
AGC Range:	40 dB
Gain Flatness:	± 1 dB
Noise Figure:	4.5 dB, typical
Output 1 dB Compression:	± 10 dBm, typical
Final I.F. Output:	13.991429 MHz (L ₁) 16.600000 MHz (L ₂)
Antenna Power:	12 VDC @ 50 mA, maximum current
Reference Frequency:	10.000000 MHz
Reference Stability:	± 0.020 ppm
Reference Warm Up:	10 minutes, minimum
Reference Phase Noise: (Typical)	-85 dBc/Hz @ 1 Hz -115 dBc/Hz @ 10 Hz -155 dBc/Hz @ 1 KHz
External Reference:	10 MHz ± 1 KHz, TTL compatible
Power Requirements:	+12 VDC +/-5%, 520 mA after warm-up +12 VDC +/-5%, 750 mA during warm-up -12 VDC +/-5%, 80 mA
Operating Temperature:	0° to 50° C
Storage Temperatures:	-40° to +60° C
Relative Humidity:	95% maximum, non-condensing
Altitude:	0 - 5 km, maximum
Housing Dimensions:	4.00" X 6.00" X 0.9"
R.F. Connections:	SMA
Power Connections:	Solder terminals

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DATA ACQUISITION

DL-2-007-04

Number of Bits	4 or 14
Number of Channels	1, 2, 3, or 4
ADC Sampling Clock	105, 80, etc. MHz
Decimation	1 to 16
Input Connector	SMA
External Trigger Signal	3.3 V TTL
Interface	PCI Bus
Storage	300 MB in RAM

ALSO AVAILABLE:

- Hard Disk Recording System: *For data storage up to 1 to 3 hours*
- FPGA Accelerated Correlator: *For pre-processing and real-time operation*
- Modular Software GPS Receiver: *Interfaces directly with the Front End for an entirely software-based operation or through FPGA correlator for real-time operation*
- Single Frequency RF Front End: *For C/A code operation*
- Multiple Antenna RF Front End: *For beamforming, multipath monitoring, and mitigations as well as other STAP processing*
- Satellite Beacon Receivers: *150 MHz/400 MHz RF Front Ends. Programmable Los allow easy adaptation to any frequency plan. Specialized adaptation with various Front End, A/D conversion, interface card, storage, and other relevant subassemblies.*