



Model 125 RF-DDC with AnyRate Tuners Application

RF to Digital Down Converters with AnyRate Tuners

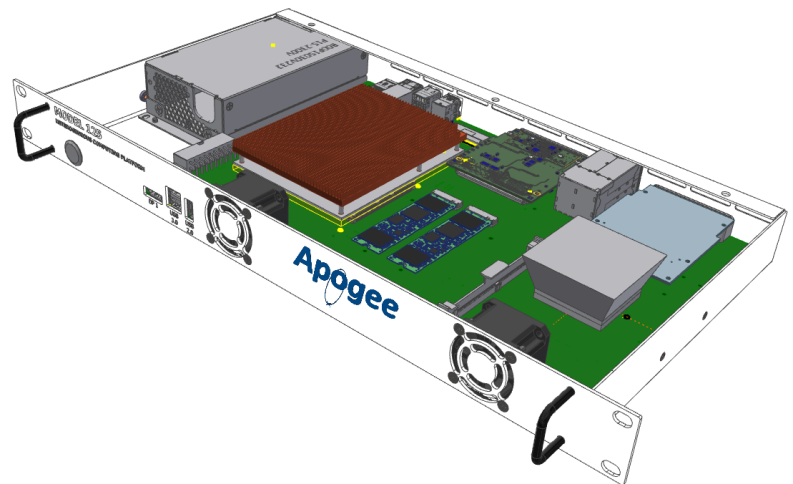
With AnyRate tuner technology the narrowband and wideband tuner decimations are no longer set with integer values (limited to integer numbers with fixed step sizes). AnyRate tuner decimations are set with a floating point number that can adjust the tuners sample rate to sub hertz resolution. AnyRate tuners can precisely match the tuner to the signal bandwidth which maximizes the efficiency of downstream processing.

AnyRate Narrowband Tuners— 64 Tuners, decimation range from 131072 down to 128 (9.7 KHz to 10 MHz BW)

AnyRate Wideband Tuners— 12 Tuners, decimation range from 128 down to 8 (10 MHz to 160 MHz BW)

- **The full input is digitized, 950 MHz to 2150 MHz (1200 MHz Bandwidth)**
- **Place tuners anywhere across the L-Band input 950 MHz to 2150 MHz**
- **All tuners have fully independent Center Frequency and Bandwidth**
- **Tuner bandwidths between 9.7 KHz and 160 MHz**
- **Apogee AnyRate Tuner Technology**
- **Each tuner has an adjustable output filter with a range between 5% and 80%**
- **VITA-49A or SDDS Packet Output**
- **Tuners timestamped to 1 nsec accuracy**
- **Wideband Digital Snapshot of the RF Input**

Apogee Model 125



Key Features—RF-DDC with AnyRate Tuners

L-Band Input.....	950-2150 MHz Frequency Range
Input Power Range.....	-87 dBm to 0 dBm (Typ)
ADC Converter.....	12-bit, 1600 MSPS, 1200 MHz BW
Clock References.....	10 MHz and 1PPS required, Apogee Timing Module (FMC-T01) Required in timing FMC slot
Other ADC.....	Histogram, % in Clip Metrics Monitoring, Spectral Inversion
Narrowband Tuners.....	64 tuners per L-Band Input, decimations of 128 to 131,072—AnyRate decimations
Wideband Tuners.....	12 tuners per L-Band input, decimations of 8 to 128—AnyRate decimations
Tuners.....	All independent CF, BW, adjustable output filters, and tune anywhere across the L-Band
Output.....	Separate Digital IF multicast for each tuner output via the units four 10 GbE ports
Output Format.....	VITA-49A or SDDS
Form Factor/Environmental.....	19" 1U rack mount, 0-35C Operation Range, less than 400 Watts power



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Key Specifications– RF-DDC AnyRate Application

L-Band Input.....	SMA Connector, 50 Ohm, Analog L-Band, 950-2150 MHz Frequency Range
Input VSWR.....	≤ 1.3:1 (950-2150 MHz)
Input Power Range.....	-87 dBm to 0 dBm (Typ)
Input Max Power.....	+10 dB without damage
Amplitude Flatness.....	Typical Uncorrected amplitude ripple over any 80 MHz segment less than ± 0.5 dB Typical Uncorrected amplitude ripple over any 40 MHz segment less than ± 0.3 dB
Out of Band Rejection.....	Typical of 50 dB rejection between 0-900 MHz. Typical of 50 dB rejection between 2200 -3200 MHz.
Gain.....	Up to 28 dB, 14 dB selectable, 14dB fixed
Attenuation.....	Adjustable 0.5 to 31.5 dB in increments of 1 dB steps
System Spurious Performance.....	Typical SFDR of -55 dBc, IMD3 of -57 dBFS Typical
Noise Figure.....	Typical Noise Figure 5.5 dB for input paths routed via the internal LNA Typical Noise Figure 14.6 dB for selected inputs that bypass the internal gain stages.
Phase Noise (Typical).....	-78 dBc at 100 Hz. -82 dBc/Hz at 1 kHz. -89 dBc/Hz at 10kHz. -103 dBc/Hz at 100 kHz. -115 dBc/Hz at 1 MHz.
Time Stamping.....	Input 1PPS, 10 MHz Ref, NTP time, time stamp each tuner output to 1nsec accuracy
RF Input Digital Snapshot.....	User selectable in number of samples and delta time between captures
Spectrum Inversion.....	User configurable to invert or not invert in the input spectrum pre-processing
Output Packet Formatting.....	SDDS, or VITA 49 with the Spectrum Survey Profile version 1.1 (VITA 49A) Output via the units four 10 GbE SFP+ ports
External Reference.....	10 MHz, AC Coupled, 50 Ohm, 4 to 13 dBm, female SMA port 1 PPS, AC Coupled, 50 Ohm, 7 to 13 dBm, female SMA port
Digital Tuners.....	64 Narrowband tuners per RF input, decimation range of 128 to 131,072 12 Wideband Tuners per RF input, decimation range of 8 to 128 Can be tuned anywhere between 950–2150 MHz, Independent BW and CF per Tuner Sub Hertz Tuning resolution per Tuner Adjustable Output Filter per Tuner, 5% to 80% in steps of 1.125% Independent Multicast stream for each tuner, selectable data output, Real or Complex Tuner allocation resource management provided by Apogee software
Performance Monitoring.....	Histogram provided for ADC loading, Percent Time in Clip Metrics, ADC overload indicator
User Interface.....	HTTPS Post command software for user control via a 100/1000 RJ45 Command control port
Form Factor / Environmental.....	19" rack mount, 1U form factor, 0-35C operating, humidity 30 to 70% non condensing