Apogee
Applied Research, Inc.

Model 454
Quad RF with AnyRate Tuners Application

- **Four Independent L-Band RF Inputs**
- **950—2150 MHz per Input**
- **1200 MHz BW per Input**
- **192 Tuners per Input**
- **Place tuners anywhere across the Input Band**
- **Independent BW and CF per tuner**
- **AnyRate Tuner Technology**
- **SDDS / VITA-49A Output**
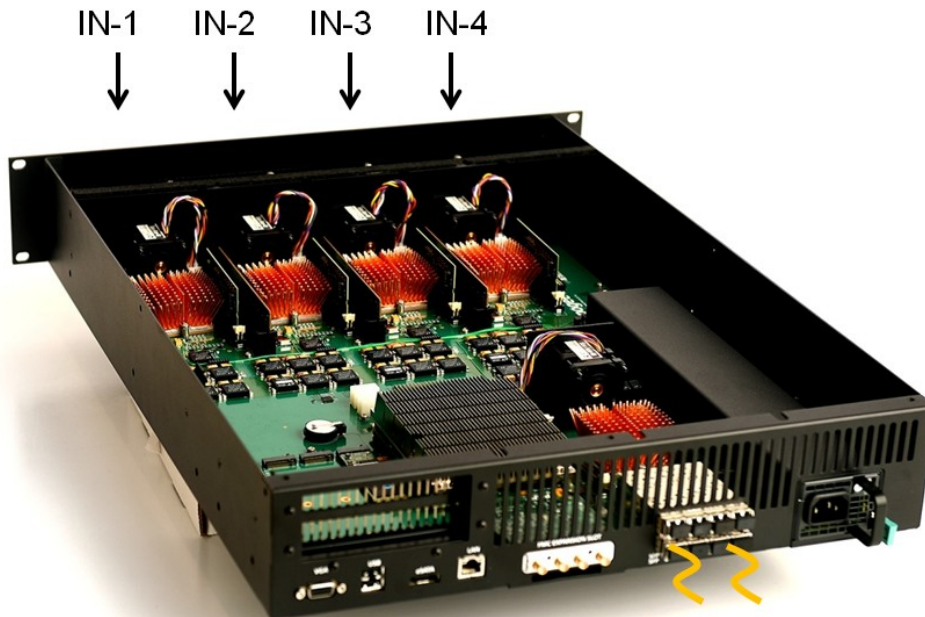
QuadRF with AnyRate Tuners Application

The Quad L-Band Digitizer Application utilizes the Model 454 and Apogee L-Band Digitizer Modules to digitize four L-Band inputs (950 MHz to 2150 MHz, 1200 MHz BW per input).

With AnyRate tuner technology the narrowband 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 tuners provides fractional decimations between 128 to 131072

Each tuner is Time Tagged to 1nsec accuracy and 250 psec Time Tag resolution.

L-Band Inputs 950-2150 MHz, 1200 MHz BW per Input

IN-1   IN-2   IN-3   IN-4

Apogee Model 454
QuadRF with
AnyRate Tuners

Network Output
SDDS or VITA-49A
192 Tuners per RF Input
Any Tuner decimation between
128 and 131072

Model 454
Quad RF with AnyRate Tuners Application

Specifications– QuadRF with AnyRate Tuners Application

L-Band Inputs.. Four RF Inputs—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... Uncorrected amplitude ripple over any 80 MHz segment less than ± 0.5 dB

Uncorrected amplitude ripple over any 40 MHz segment less than ± 0.3 dB

Out of Band Rejection.. Minimum of 50 dB rejection between 0-900 MHz.

Minimum 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 of 10 dB for input paths routed via the internal LNA

Typical Noise Figure of 27 dB for selected inputs that bypass the internal gain stages.

Phase Noise... -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 1 nsec accuracy

Spectrum Inversion... User configurable to invert or not invert in the input spectrum pre-processing

Output Packet Formatting................................... SDDS or VITA 49A with the Spectrum Survey Profile version 1.1 (VITA 49A)

Output via the units eight 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

AnyRate Digital Tuners per L-Band Input......... 192 Narrowband tuners per RF input, decimation range of 128 to 131072

Any fractional decimation setting between 128 and 131072

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..................................... 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

SATA Port... One external SATA port provided to storage outside the chassis

Form Factor / Environmental.............................. 19" rack mount, 2U form factor, 0-35C operating, humidity 30 to 70% non condensing

Power... 90—264 VAC, 47—63 Hz, Power Factor Corrected