



Receiver Signal Processor



The Enterprise Electronics Corporation (EEC) IQ2-RSP (Receiver Signal Processor) is the latest and most innovative integrated receiver / signal processor configuration on the market. The IQ2 RSP employs cutting edge hardware and software technology to achieve the highest weather radar data resolution and system control accuracy. EEC Engineers developed the best RSP available in the industry today.

Key Benefits Include:

- Digital Automatic Frequency Control (DAFC), IFD supported – No AFC required on Magnetron systems
- All digital IF and signal processing functions hosted on open Linux PC hardware
- 16-bit digital sampling
- Up to 8000 Range Bins - Highest resolution in the industry
- High Speed Serial Angle Tag Bits (Parallel Tag Bits are Optional) – No complex wiring
- Fiber optic interfaces provide real-time I&Q data recording (10 GB/Sec)
- Open API allows for customer developed signal processing algorithms

The IFD supports Digital Automatic Frequency Control (DAFC). The frequency of the IF is no longer controlled by adjusting the STALO frequency, the input frequency of the 4-data channels is now adjusted to match the IF frequency while supporting traditional AFC control.

IQ2-Intermediate Frequency Digitizer

Digitizer is encased in a machined aluminum housing - mechanically robust & stable

Provides high inter-channel isolation and external EMI isolation

Four signal channel A/D converters with 16-bit sampling up to 100MHz

Maximum number of range bins= 8000

Minimum Range Resolution= 15 meters

16 bit TX channel A/D - waveform flexibility

Dynamic range \geq 110 dB (\pm 1.0dB)

BandWidth = 0.5MHz (at IQ2-IF input)

IF bandwidth = 0.1MHz \div 10 MHz

RoHS compliant

IIR clutter filter

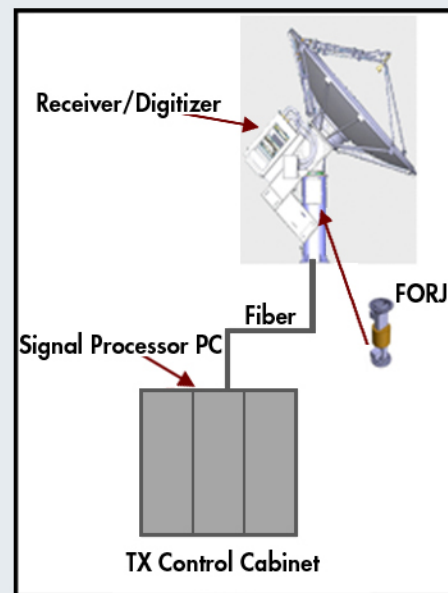
DFT clutter filtering

DFT processing

Pulse Repetition Frequency = 10 Hz-24 KHz

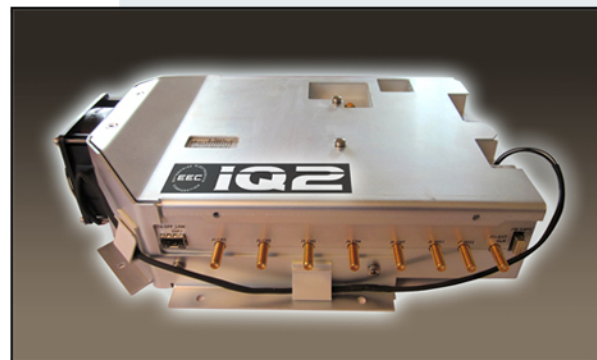
Number of Pulse widths - 4 with independent configurable matched filters (up to 1280 taps)

Dual PRF Stagger Modes - None, 2/3, 3/4, and 4/5



The IQ2-RSP (Receiver Signal Processor) consists of:

- IQ2-IFD (Intermediate Frequency Digitizer)
- IQ2-DSP (Digital Signal Processor)





IQ2-Digital Signal Processor - Minimum Computer Specifications

Processor: Intel Xeon quad-core 5520 or superior
 Memory: 8GB DD3
 Disk: 160GB minimum
 Two Gigabit Ethernet ports
 Operating System: Linux

Output Data

Simultaneous Horizontal/Vertical Transmit

Corrected reflectivity H/V	Zh, Zv [dBZ]
Uncorrected reflectivity H/V	UZh, UZv [dBZ]
Radial Velocity H/V	Vh, Vv [m/s]
Spectral width H/V	Wh, Wv [m/s]
Cross correlation coefficient	RHOHV
Differential phase	PHIDP [°]
Differential reflectivity	ZDR [dB]
Clutter power H/V	CCORh CCORv [dB]
Signal quality index H/V	SQLh, SQLv
Signal Noise Ratio	SNRh.SNRb [dB]
Inphase/Quadrature signalH/V	Ih, Iv, Qh, Qv
Power spectrum H/V	

Horizontal Transmit

Corrected reflectivity	Zh [dBZ]
Uncorrected reflectivity	UZh [dBZ]
Radial velocity	Vh [m/s]
Spectral width	Wh [m/s]
Depolarization Ratio	LDR [dB]
Signal Noise Ratio	SNRh [dB]
Signal quality index H	SQLh
Clutter power H	CCORh

Vertical Transmit

Corrected reflectivity	Zv [dBZ]
Uncorrected reflectivity	UZv [dBZ]
Radial velocity	Vv [m/s]
Spectral width	Wv [m/s]
Depolarization Ratio	LDR [dB]
Signal Noise Ratio	SNRv [dB]
Signal quality index V	SQLv
Clutter power V	CCORv

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SIDPOL™ Radar is patented technology, covered by U.S. Patent No. 6,859,163 B2, U.S. Patent No. 7,049,997, U.S. Patent No. 7,439,899, 13041 (OAPI Region), 13040 (OAPI Region), 13694 (OAPI Region), 009250 (Eurasia) and 009249 (Eurasia).