



Sensors I

RadaScan: A local reference, high resolution radar, dynamic positioning sensor

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Introduction

RadaScan: a high resolution radar local DP reference system



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- Antenna Properties
- Target Properties
- DSP Hardware
- Signal Processing
- Performance
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RadaScan: a high resolution radar local DP reference sensor



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RadaScan: a high resolution radar local DP reference sensor

Microwave FMCW radar (patented)

All weather operation

High accuracy

Continuously rotating (180 rpm)

Multi-target tracking

3Hz data refresh rate

High elevation coverage

Close working arrangements

Coded retro-reflective transponders (patented)

Clutter Rejection / No false reflections



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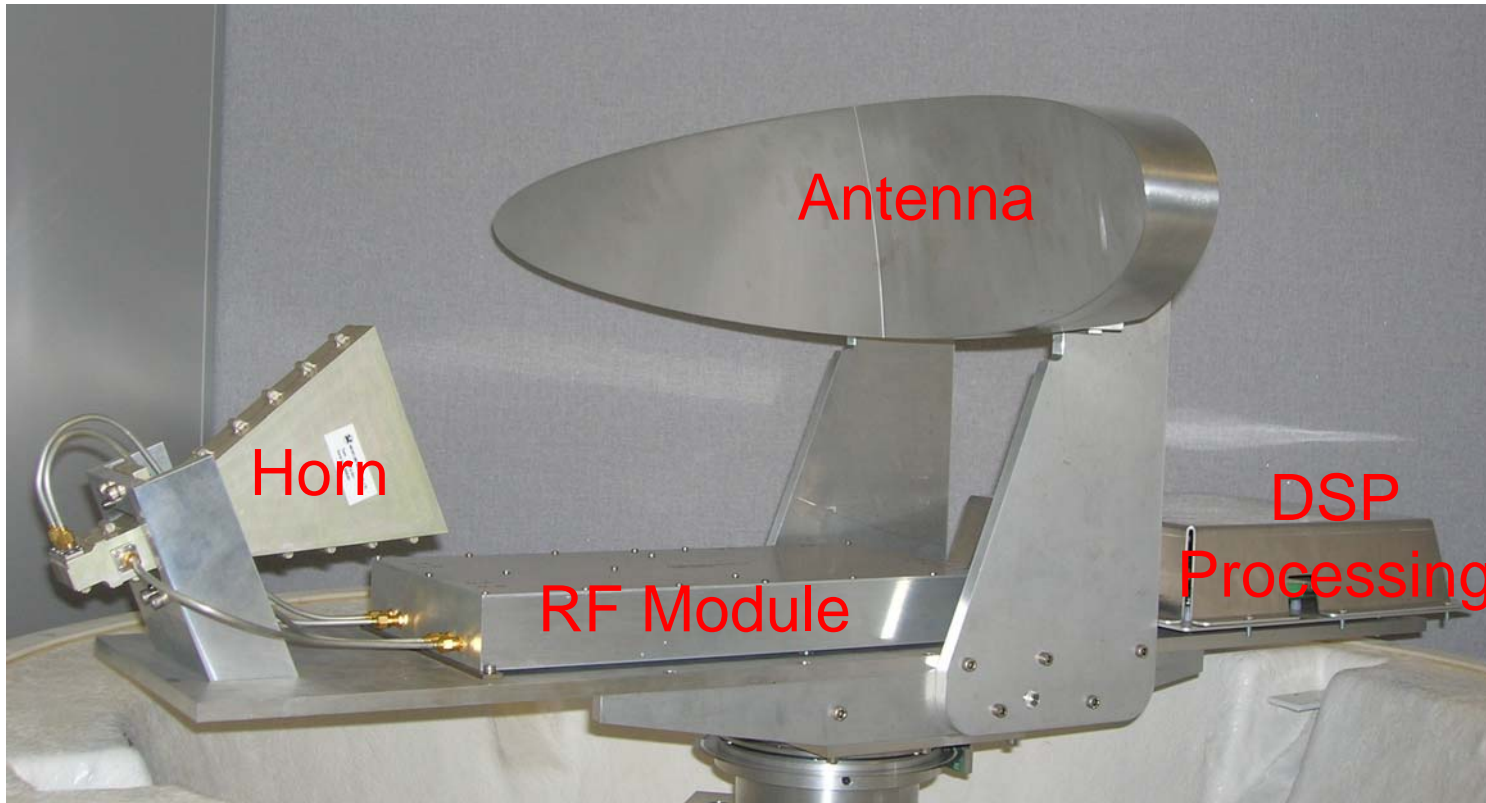
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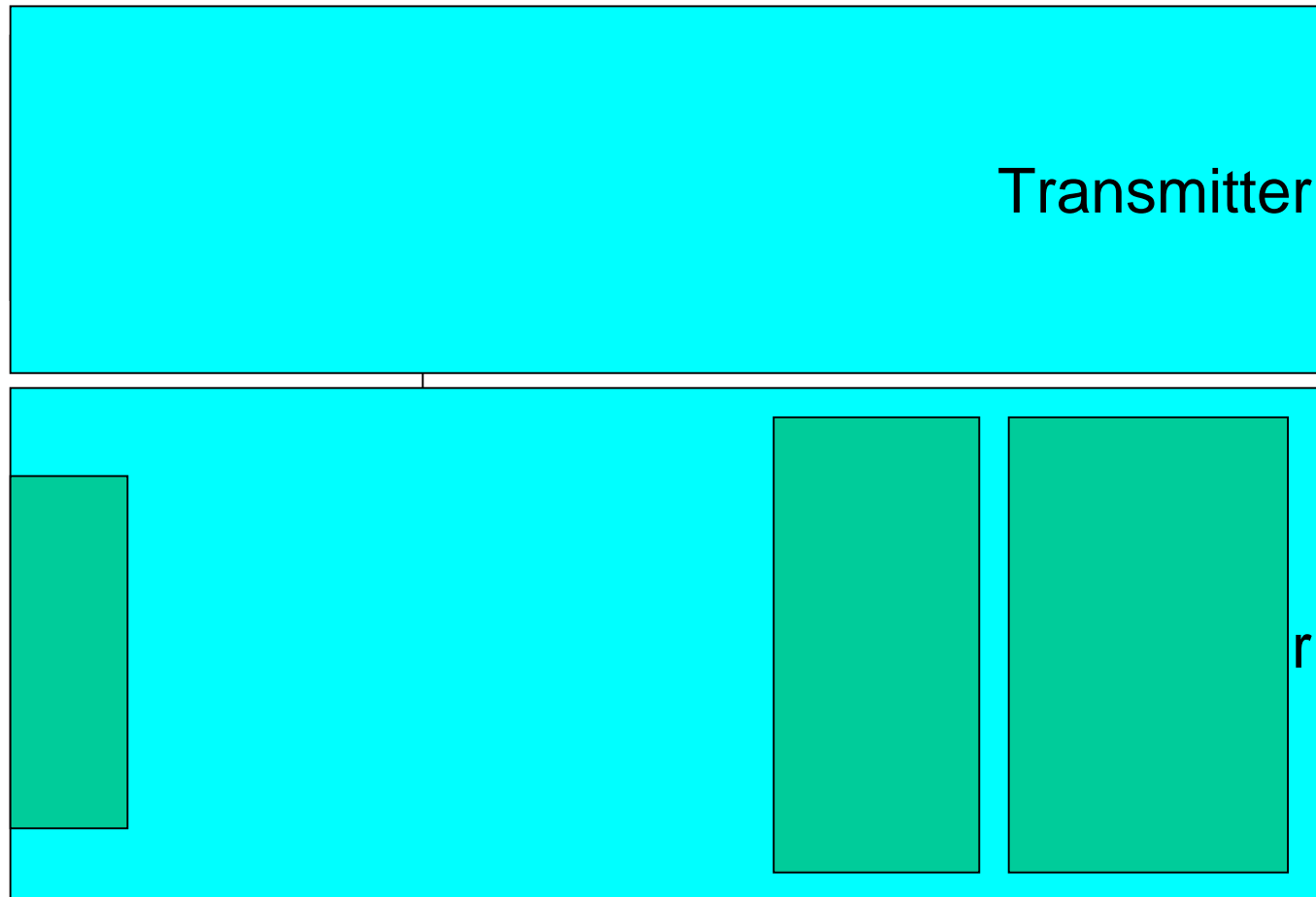
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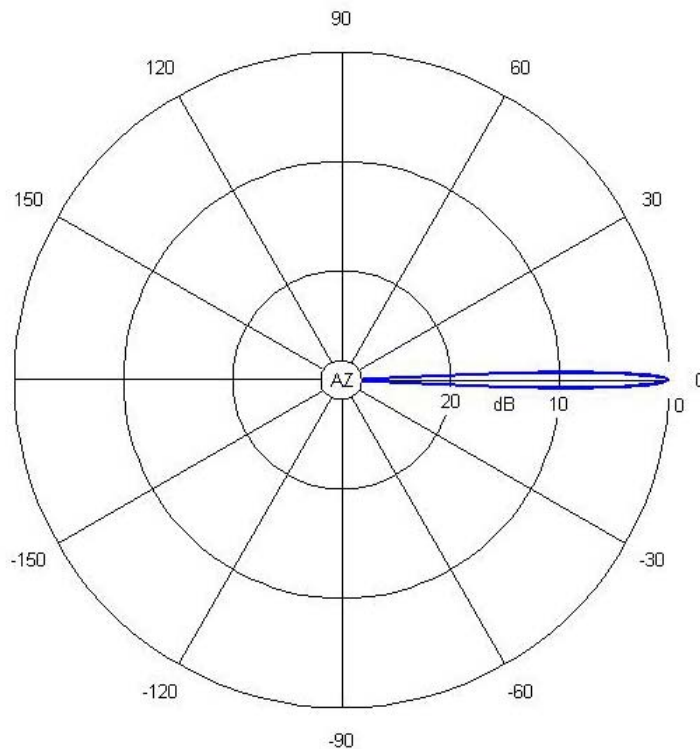
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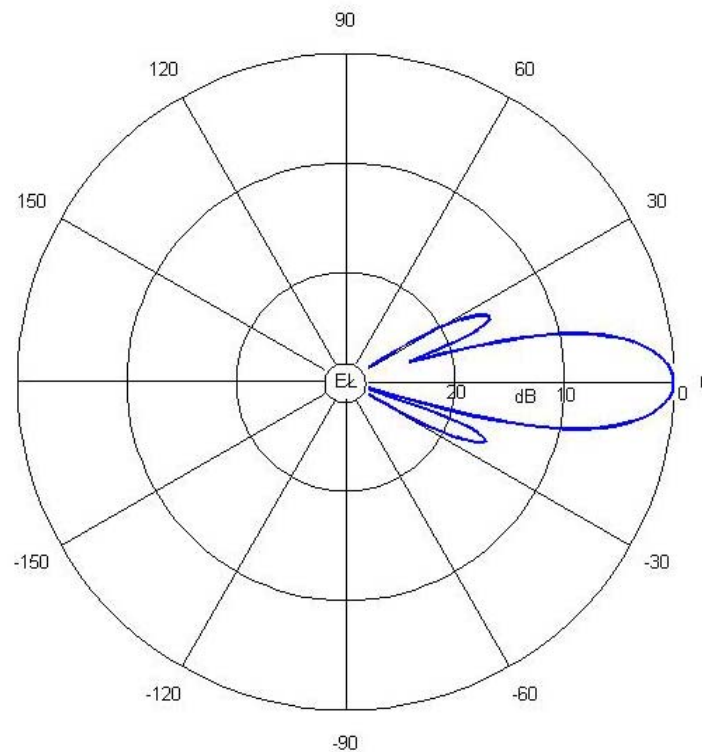
Antenna Properties

RadaScan: a high resolution radar local DP reference sensor

Tight azimuth beam pattern (H-plane)



Wide elevation beam pattern (E-plane)



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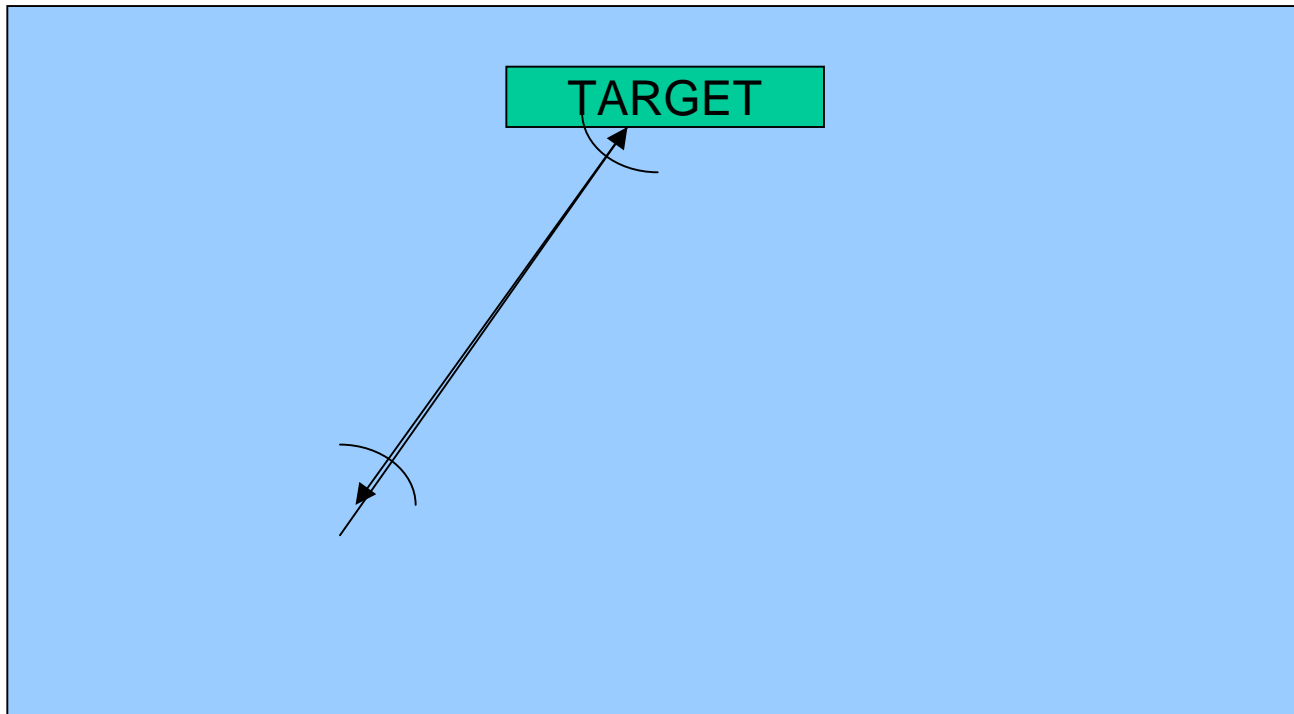
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Target Properties

RadaScan: a high resolution radar local DP reference sensor

True retro-reflector (no transmit energy)

No external power source required



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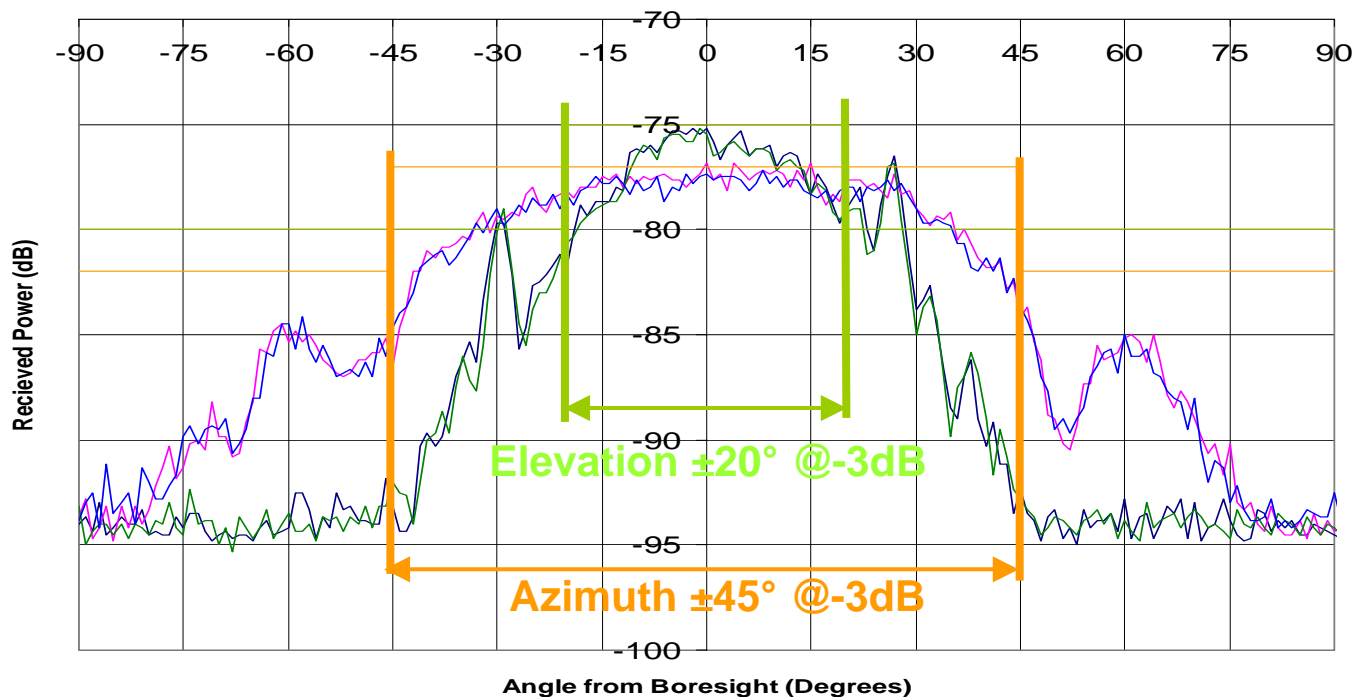
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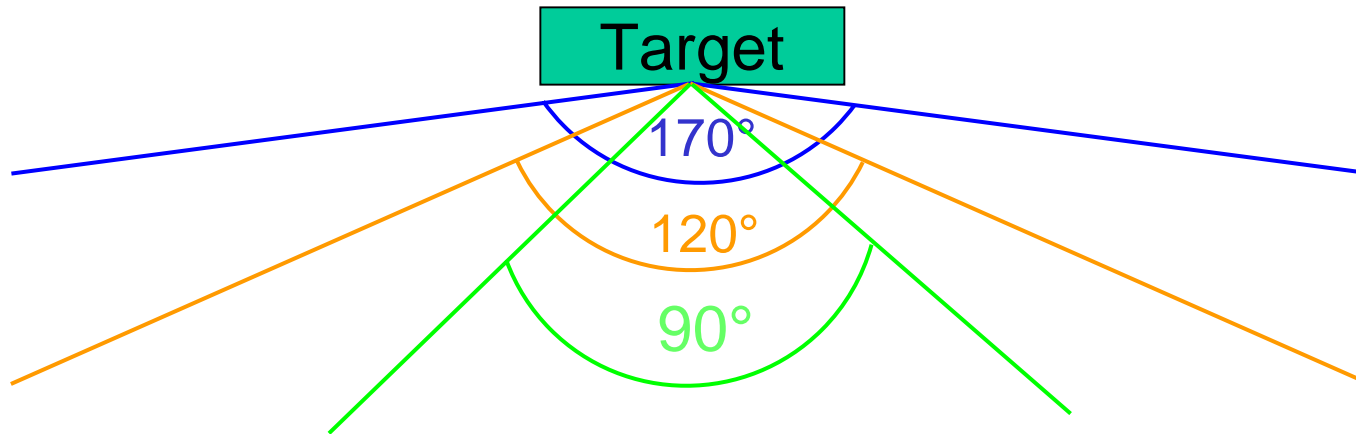
Broad azimuth response for wide incidence angle



Target Properties

RadaScan: a high resolution radar local DP reference sensor

Broad azimuth response for wide incidence angle



Range	50m	100m	500m
Angle	170°	120°	90°

Clutter rejection by modulated ID and polarization

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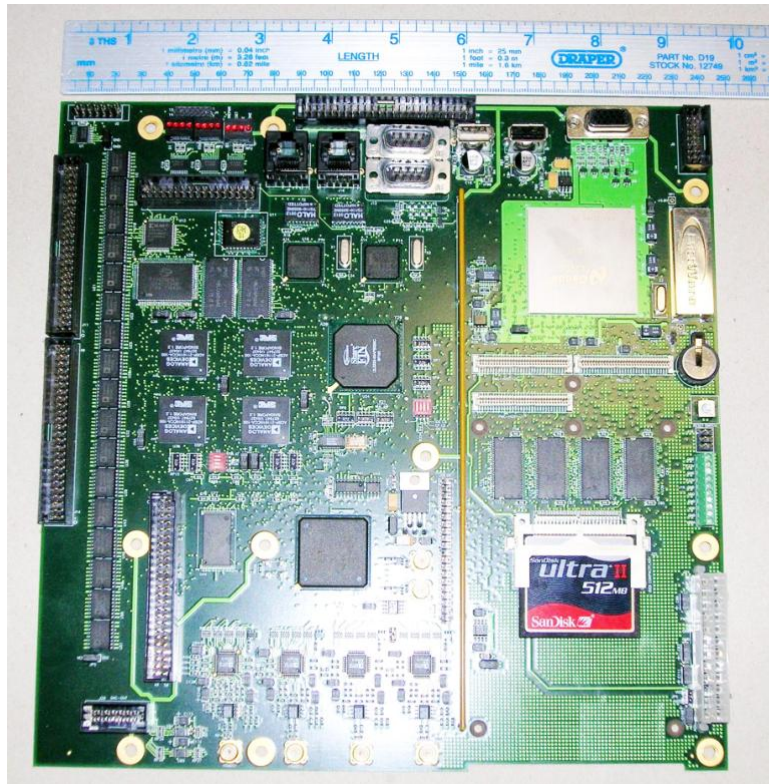
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DSP Hardware

RadaScan: a high resolution radar local DP reference sensor

One single highly integrated board provides:



- 4 ADC channels
- 1500K Gate FPGA
- 1.2 GFLOPS DSP processor cluster
- Embedded PC
- All external IO to DP system

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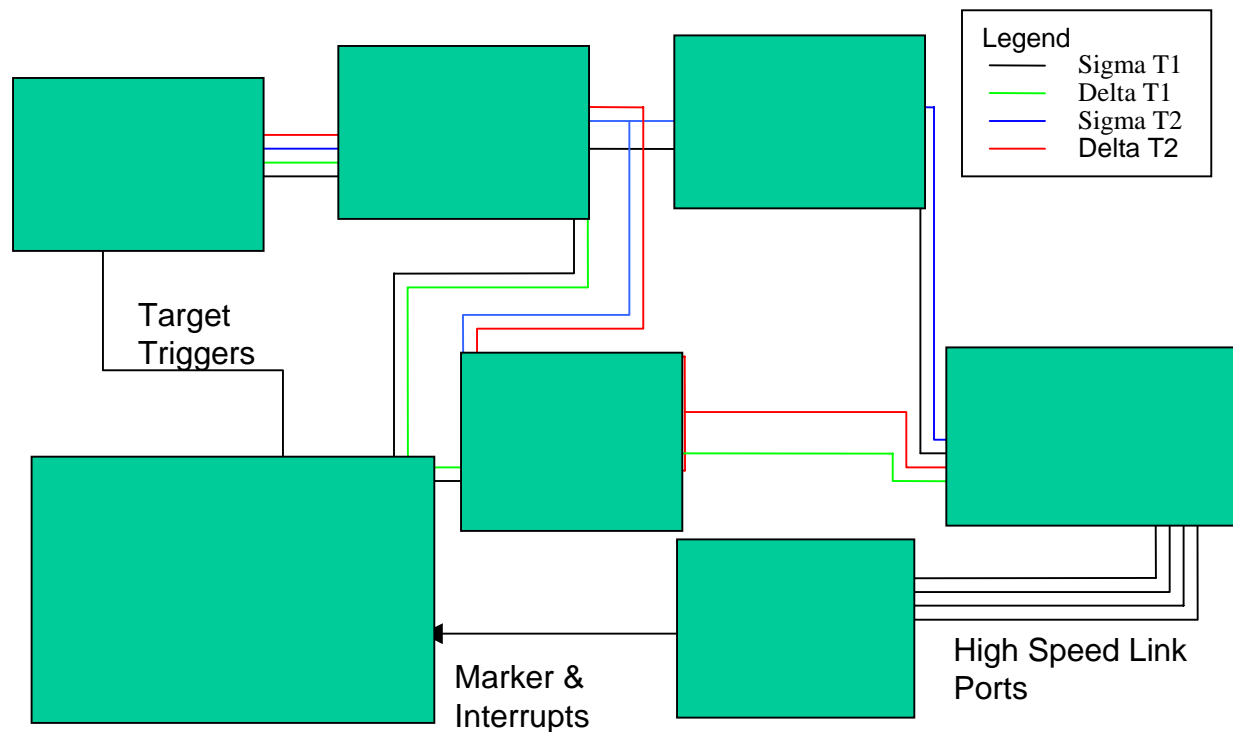
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Signal Processing

RadaScan: a high resolution radar local DP reference sensor

FPGA Front End Digital Signal Processing:

Basic Digital Signal Processing (processing capability)



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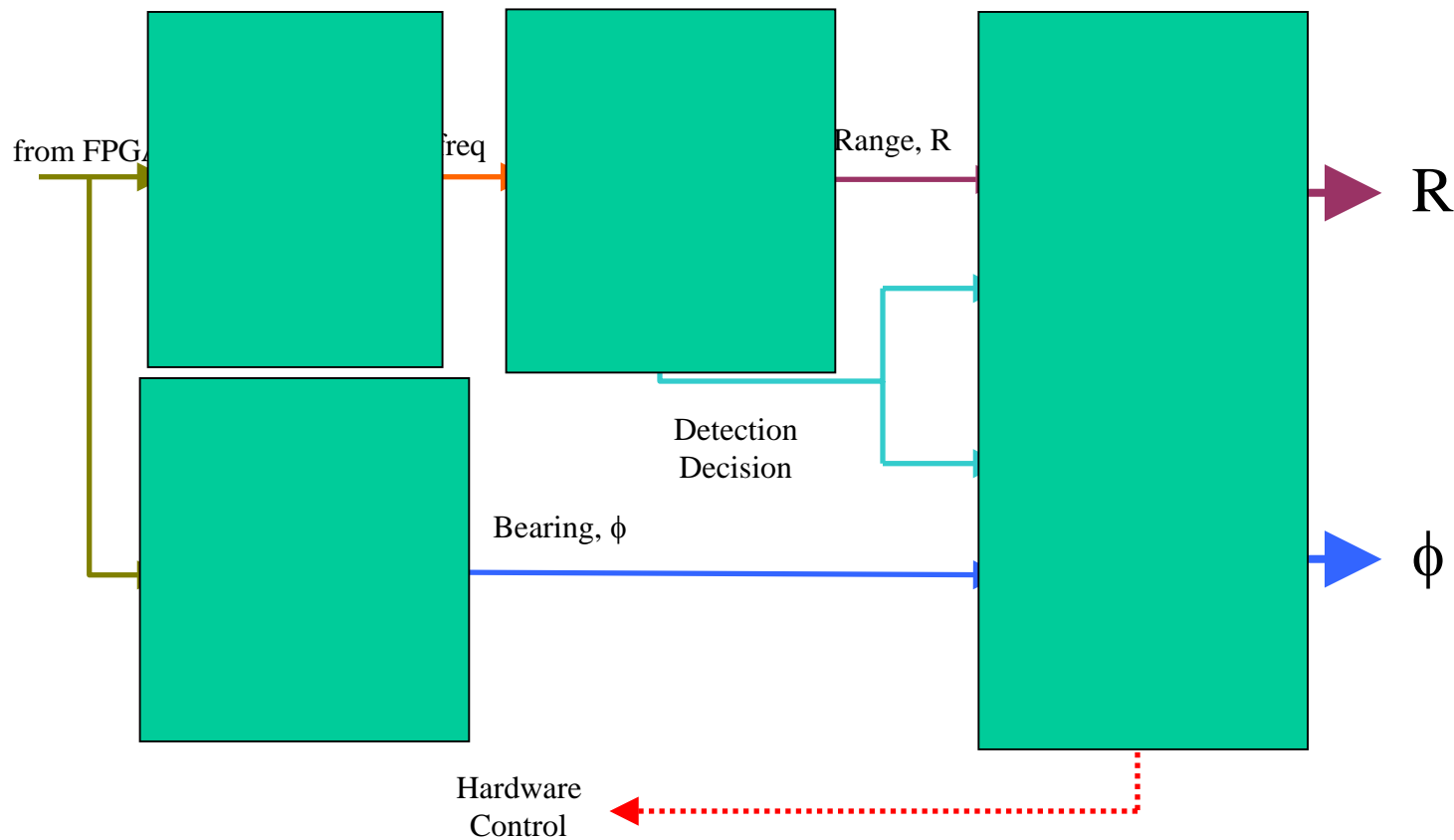
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Signal Processing

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Down Stream Digital Signal Processing:



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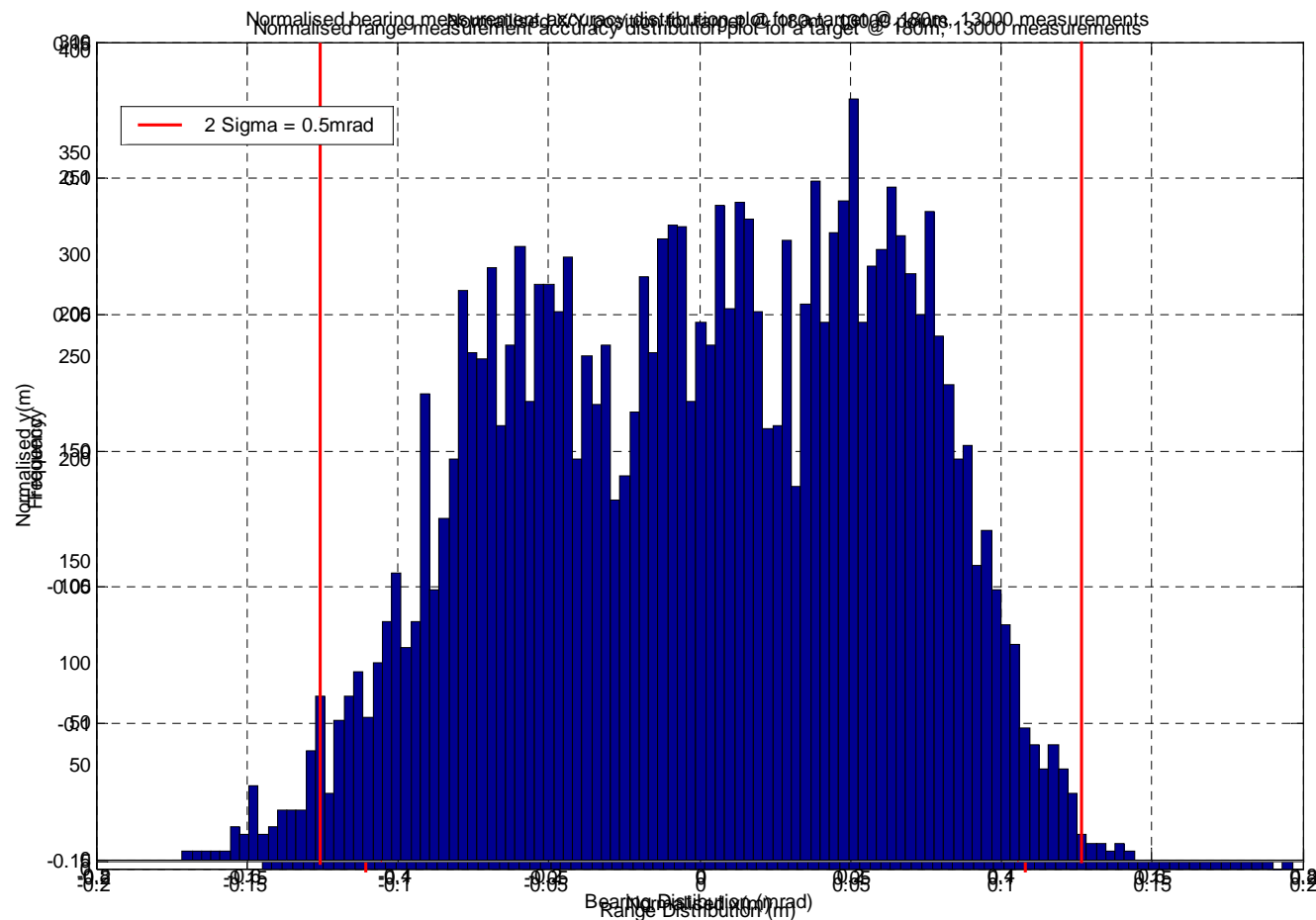
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Measurement Accuracy: Bearing



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RadaScan: a high resolution radar local DP reference sensor

Range Accuracy:	Typically 0.1% of range.
Operating Range:	20 to 750m
Angular repeatability:	STD 0.03° @ 200m STD 0.06° @ 500m
Elevation Beam Shape:	± 12 degrees @ -10dB
Close-Up Elevation:	+35 degrees @ 25m.

**High-accuracy all-weather radar position
and heading dynamic positioning sensor**



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