

Real Time Processor Multi Beam Phased Array

RTP-2100-MBPA



The Weibel RTP-2100-MBPA is the next generation of Real Time Processors designed to improve the radar systems overall tracking capability, support the new phased array capabilities and the future Graphical User Interface. The new RTP-2100-MBPA also moves the processing platform from a hardware based DSP solution to a modern GPU based platform to increase processing capacity, more advanced algorithms and handling component obsolescence.

CAPABILITIES

Weibel's new RTP-2100-MBPA is based on Weibel configured workstations utilizing high performance GPU's. The change from a Weibel produced DSP solution to a more commonly available GPU solution offers enhanced capabilities, more advanced algorithms and increased flexibility.

PROCESSING POWER

The GPU based processing increases the processing power of the RTP by a factor a 100+, which allows more advanced and simultaneous tracking algorithms and also supports 4 to 64 times higher data rates.

UPGRADED TRACKING ALGORITHM

The new tracking algorithm supports multiple simultaneous tracking algorithms, which can utilize different algorithm setting to ensure optimized tracking for the individual target.

DIGITAL SYNTHETIC BEAM FORMING

With the increased processing power comes a new processing method where incoming Doppler data can be digitally phase shifted which effectively increases the Receiving Antennas beam width by a factor of 2 without sacrificing gain. The increase in the radar field of view reduces the risk for tracking in side lobes.

REAL-TIME/POST PROCESSING COMPARISON

The GPU based processing is also included in the newest Radar User Interface and used during post-processing. This allows operators to post-process their data using the exact same algorithm and filtering as the Real-Time data processing used. The operator can then modify and optimize this processing to increase mission success rate for the next mission.

Model	RTP-2100-MBPA	RTP-2100
Data processing speed	> 4.4 TFlops	> 9 GFlops
Observation time selection	No operational limit	Based on 2n FFT size
Maximum observation time @ 1us sample rate	> 2 s	< 1 s
Max number of detections	> 40	< 40
Real-time motion compensation	CW and FM	CW
Zero padding	4	1
SNR increase using zero padding (general)	3 dB	0 dB
Range capability increase using zero padding (general)	15%	0%
Receiver field of view @ full gain	2x Antenna BW	1x Antenna BW

UPGRADE PATHS

The RTP-2100-MBPA is fully compatible with any Weibel Radar with Phased Array capability and can replace the RTP-2100 running the system.

Systems that support digitization of the Doppler data within the antenna will require some amount of rework and new embedded firmware to allow full functionality with the RTP-2100-MBPA.

Older systems where the radar outputs analog Doppler data and digitizes in the RTP-2100 will require a translator box instead of the RTP-2100 before the new RTP-2100-MBPA can be included into the system build-up.

OBSOLESCENCE

As the RTP-2100 is slowly approaching a time were component obsolescence becomes an issue the new RTP-2100-MBPA is far more future prof as its design is based on commercially available workstations and graphical processing units.

BACK-WARDS COMPATIBILITY

The RTP-2100-MBPA is a new product that introduces a high number of new features and functionalities that was not available on the old RTP/WinTrack. Some features on the old RTP/WinTrack have not been implemented on the new platform as the functionality has been replaced by new functionality or was deemed outdated. In case a customer has a requirement to reintroduce a specific feature from the old RTP/WinTrack onto the new platform, then Weibel is always willing to consider this and if possible include it in the software roadmap.

FUTURE PROOF

The use of GPU based processing also allows for easy scaling of processing power modern single processing units support up to 8 GPU's working in parallel. This ensures that the advancements Weibel is putting into the Radar design, phased array capability, increasing radar size, number of channels or sampling rates, can be supported by the RTP-2100-MBPA now and in the foreseeable future.

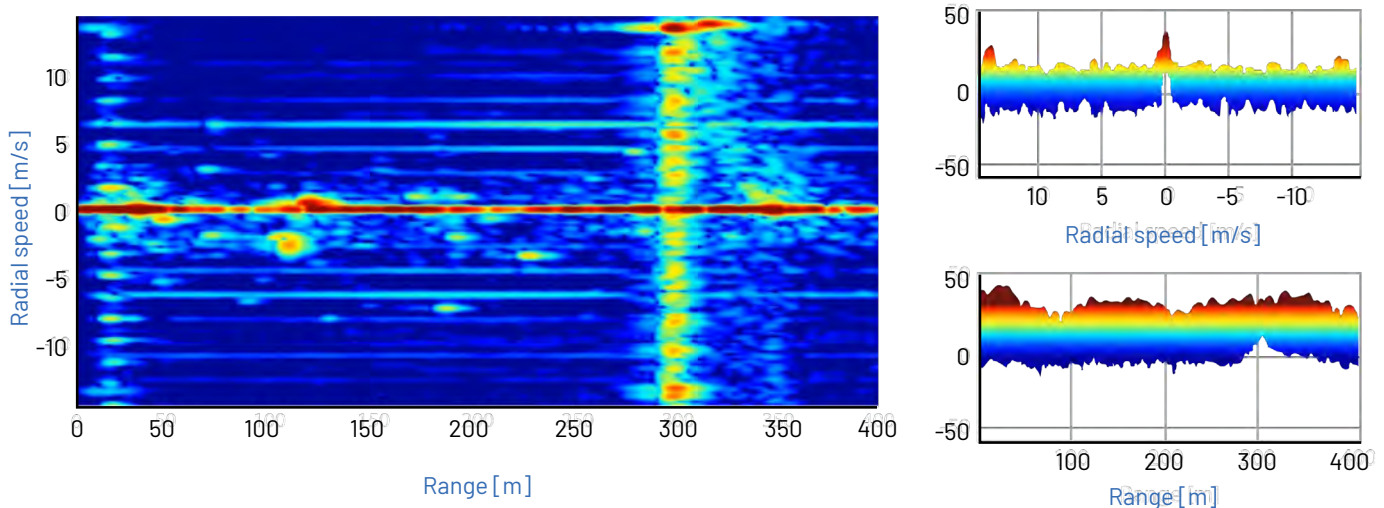
WEIBEL RADAR SUITE

The RTP-2100MBPA is also required to support the future Weibel Radar Software Suite; which will be replacing WinTrack in the foreseeable future. The applications offered by the suite are designed to simplify, modernize and optimize all aspects of work with the Weibel Radars. From deployment to missions all the way through data post-processing and still supporting the more and more advanced functionalities of the radar systems.

SPECIFICATIONS

Model	RTP-2100-MBPA
Hardware platform	Weibel configured workstation
CPU type	Intel 10-Core 3.2 GHz (or similar)
HD space	1000 GB of NVMe (or similar)
RAM	32 GB (or similar)
GPU type	Pascal 5000 or Ampere 5000 (or similar)
Data processing speed	> 4.4 TFlops
Memory bandwidth	> 288 GB/s
Operating system	Windows (or Linux depending on configuration)
Mounting	19" Rack mountable
Size	4U (or smaller)
Weight	< 20 kg
Power consumption	< 1000 W
Temperature range	0 °C to +40 °C (operating), -45 °C to +65 °C (storage)
Humidity	0 to 95% non-condensing at +40 °C

DETECTION CAPABILITIES



BEHIND THE STORY

The RTP-2100 was developed in 2005 to support the NASA space missions. The original DSP solution was then matured and proven over the next 15 years with great success and results from mission aspects of defense test ranges and space organizations

In 2019, the development of new Phased Array Radars required the RTP-2100 to go beyond the capabilities that this platform could supply and the new RTP-2100-MBPA was created. Based on the well proven algorithms of the RTP-2100 and on the large amount of knowledge gained through more than 40 years within the field of Doppler Radars; the RTP-2100-MBPA is the benchmark of modern Real-Time Doppler Radar Processing.

ABOUT WEIBEL SCIENTIFIC

Danish Weibel Scientific is the global leader in the market for advanced Doppler radar systems. For more than 40 years, we have sold cutting-edge radars around the world for use in space, aerospace, defense, and missile defense systems. We have delivered more than 5,000 radars to more than 40 countries.

As a key approach to ensuring high-quality logistics support, Weibel designs and builds all critical units in-house. In-house design and manufacturing mean that with the exception of standard components, Weibel is independent of sub-suppliers for the manufacturing of both prime equipment and spares. In this way, we are able to offer fast and guaranteed through-life support.

Read more at weibelradars.com

