

A technical implementation of VDES ship and shore side units

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Senro

Industry

Design Goals

Solution

Hardware Detail

Conclusion

- ▣ Senro is a UK-based technology development company.
- ▣ Senro, along with its partners, IMIS Global and Stone Three Venture Technology, developed:
 - Class B AIS (Certified with BHS).
 - AIS Locator.
 - VDES solutions for base station and mobile.



- ❑ Electronic industry driven by cellphone market.
- ❑ People came to expect more features at lower price.
- ❑ Standards are evolving faster.
- ❑ Existing standards are constantly being updated.
- ❑ Access to data is becoming ambiguous.
- ❑ Time to market is becoming critical.
- ❑ ITU-R M.2092 is a reality.

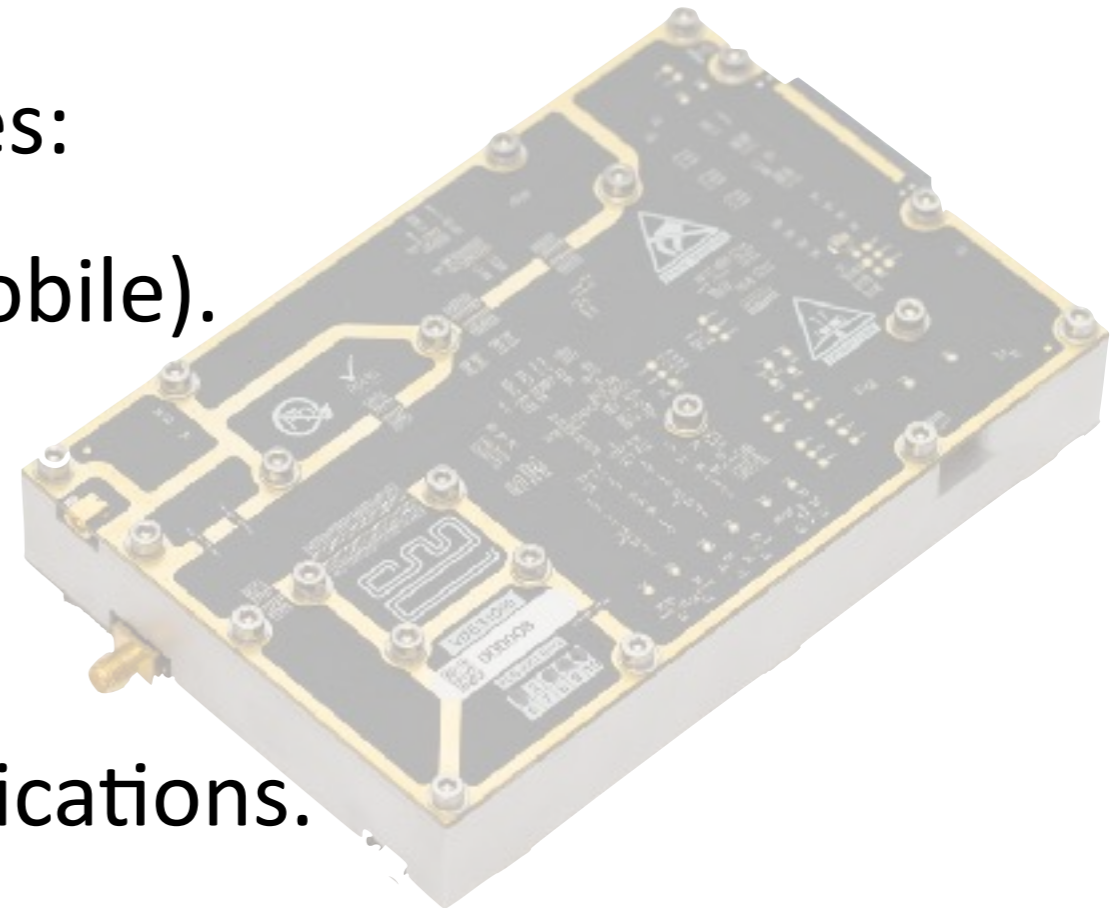
Design Goals



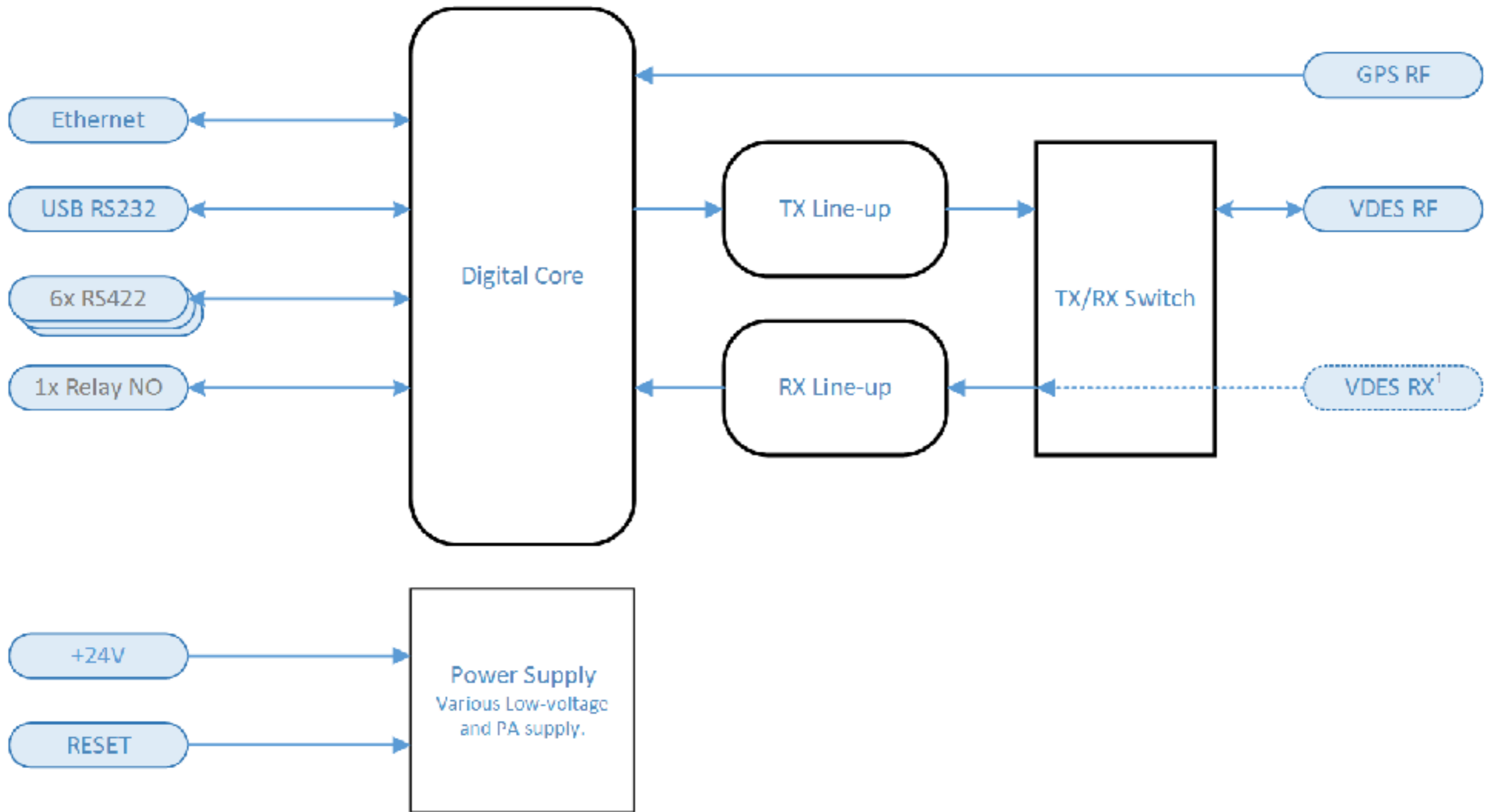
- ❑ Fully compliant to ITU-R M.2092-0 and IEC 61993-2.
- ❑ Field upgradable to adapt to ever changing specifications.
- ❑ Small form-factor.
- ❑ Customizable.
- ❑ Expandable.
- ❑ Easy to integrate.

Solution

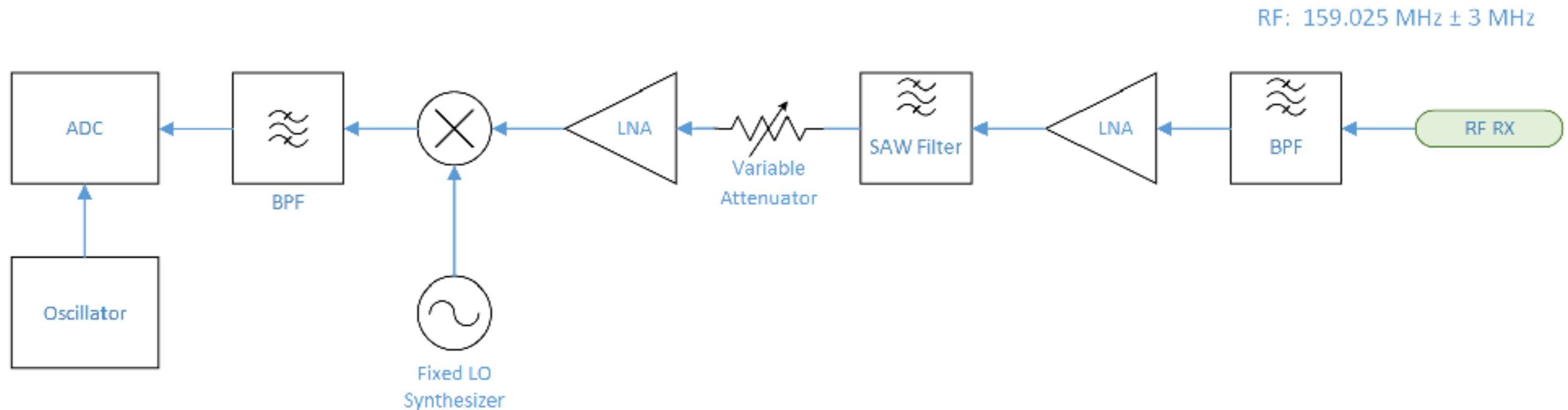
- ❑ Fully qualified VDES hardware that meets ITU-R M.2092-0.
- ❑ Hardware and software that includes:
 - AIS (base station and Class A mobile).
 - ASM (base station and mobile).
 - VDE (base station and mobile).
- ❑ Spare capacity for value added applications.
- ❑ 12 Wrms TX power.
- ❑ 7 concurrent receivers (307 kbit/sec throughput).
- ❑ All the interfaces to implement fully compliant IEC 61993-2.
- ❑ Completed development, performing internal qualification.



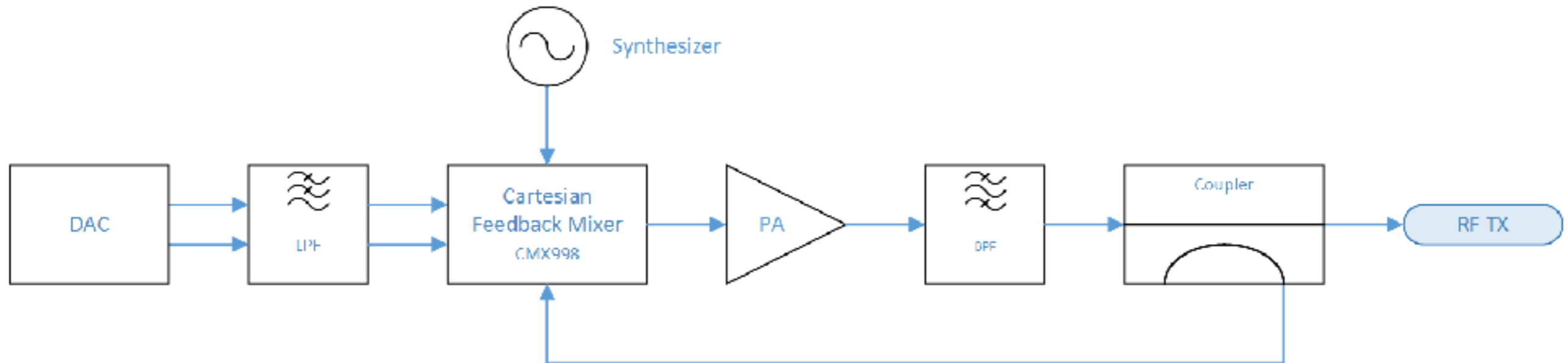
Hardware Detail: Block diagram



Hardware Detail: Receiver



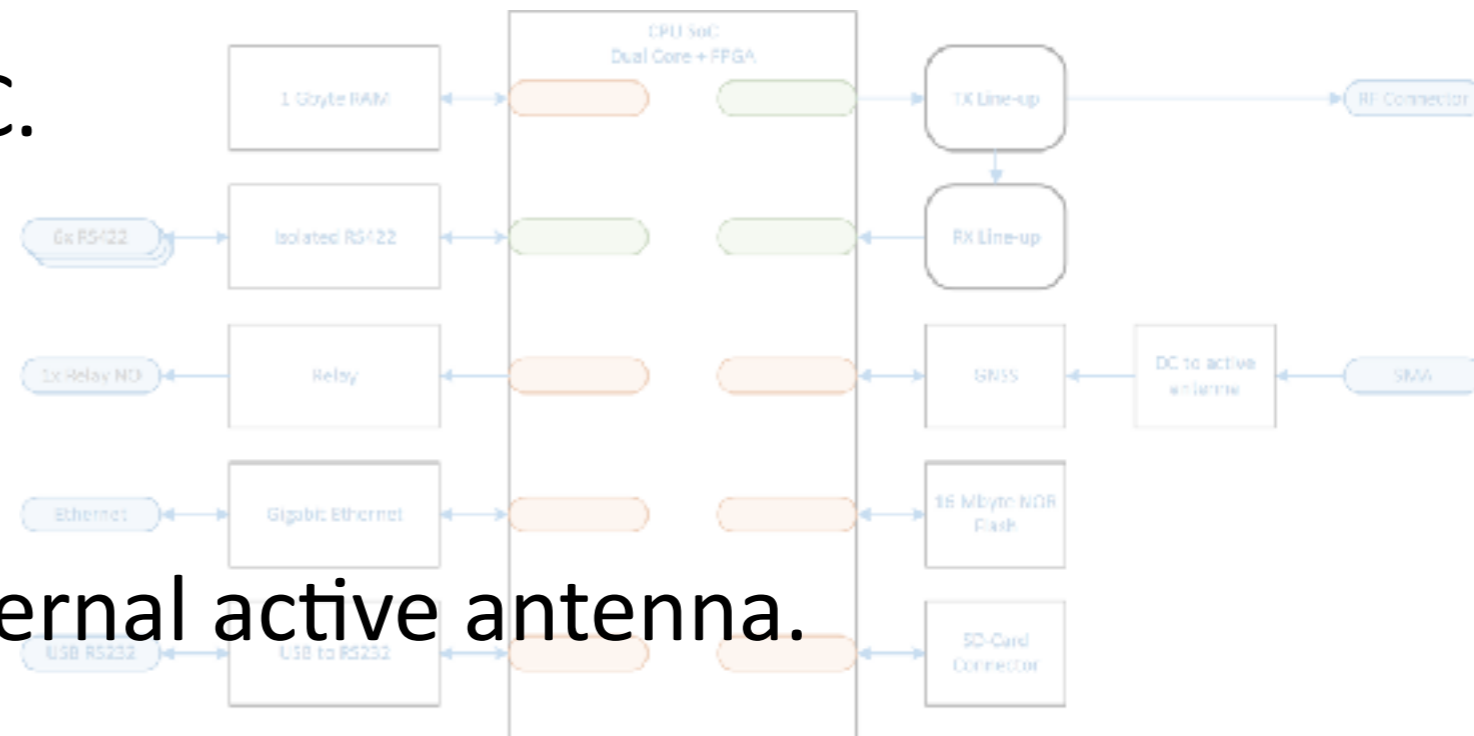
- ❑ Wide-band solution. Entire maritime band is digitized.
- ❑ Uses latest high-performance RF components.
- ❑ Simple line-up – most of the work is being done digitally.
- ❑ High-speed ADC, maximizing digital gain.
- ❑ Better than -107 dBm sensitivity.
- ❑ Can dynamically adjust for high power blocking interferers.



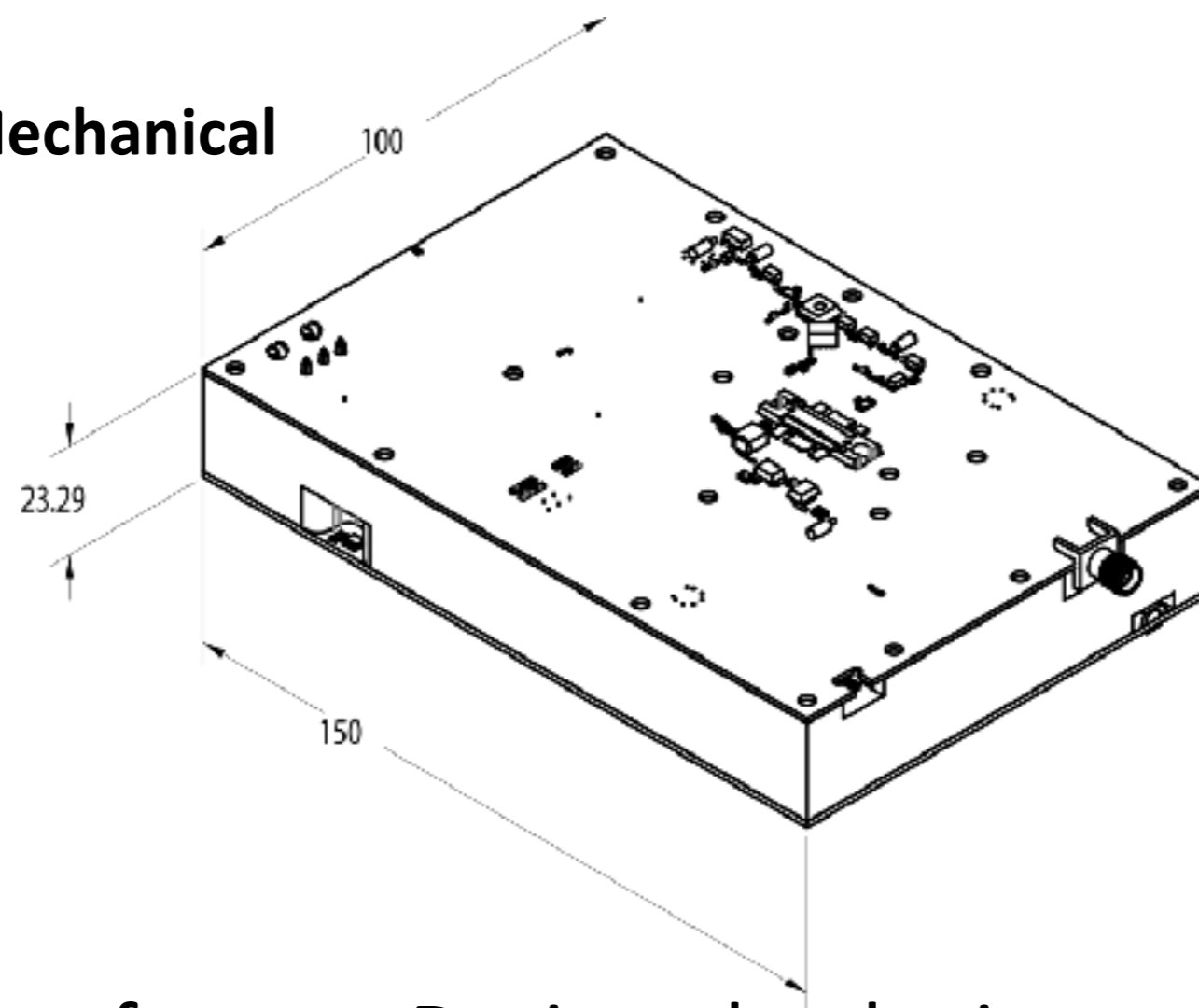
- ❑ Uses Cartesian feedback loop to linearize the PA.
- ❑ Low cost, high efficiency, bespoke design.
- ❑ 12.5 Wrms output power.

Hardware Detail: Digital system

- ❑ Software Defined Radio (SDR)
- ❑ Fully compliant IEC 61162-1 Presentation Interface for integration within a ship or shore environment
- ❑ Uses latest generation SoC.
- ❑ 6x RS422 interfaces.
- ❑ 1x Gigabit Ethernet.
- ❑ GNSS with support for external active antenna.
- ❑ Spare capacity for running 3rd party software.
- ❑ 2 GBit/s bandwidth to RX line-up.
- ❑ Close coupling between software cores and FPGA.
- ❑ Can process 7 simultaneous receive channels.



Hardware Detail: Mechanical



- ❑ Very small form factor – Designed to be integrated in to existing products.
- ❑ Fully shielded.
- ❑ Heatsink allows high duty cycle TX at maximum operating temperature.
- ❑ Robust, high reliability connectors.

Conclusion

- ❑ A VDES platform compliant to ITU-R M.2092-0 is available.
- ❑ The VDES platform has mobile and base station functionality.
- ❑ Platform is designed to be upgrade in the field to remain current with the specifications and customer requirements.
- ❑ Fully integrated, including linear 12.5Wrms PA, isolated PSU and RS422.
- ❑ 7x receive channels.



Thank You

