

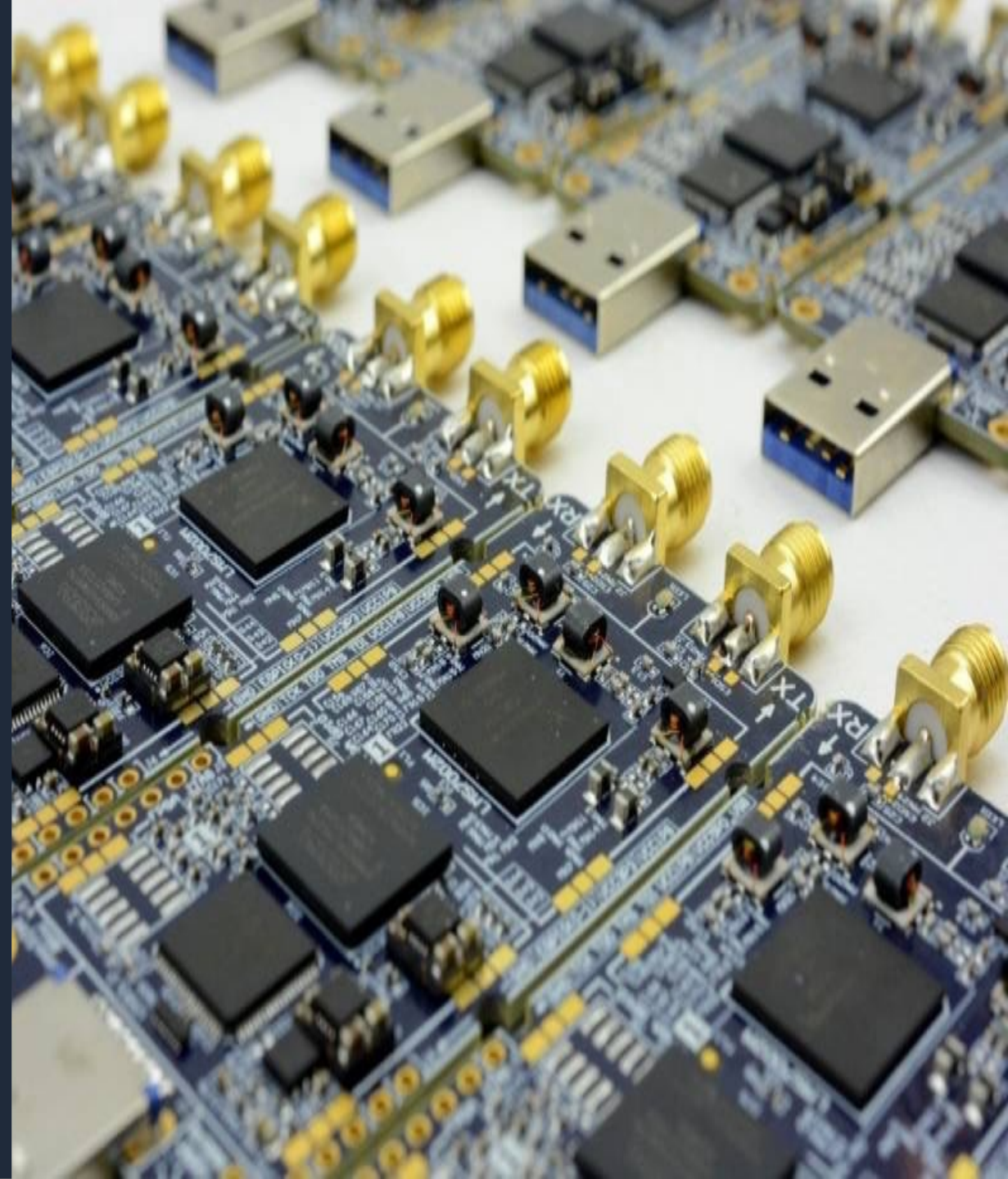


LimeSDR Micro

An all-software-programmable SDR and its open 5G stack

Technical Overview | June 2026

Presenter: Ricardas Jonaitis



| Contents

- Lime Micro: delivery proven deep-Tech
- Lime Micro RF Silicon: building blocks for distributed networks
- LimeSDR Portfolio: research instrument to deployable platform
- LimeNET: network systems already in the market
- LimeSDR Micro: overview and specifications
- LimeSDR Micro: block diagram and architecture
- LimeSDR Micro: firmware
- LimeSuiteNG: driver stack and plug-ins
- MyriadRF OAI fork with LimeSuiteNG
- OAI setup and configuration
- Roadmap

Lime Micro: Delivery proven deep-Tech

Established credibility, Tier 1 customer collaborations, and a multi-jurisdiction engineering footprint



20,000+

LimeSDR units deployed worldwide



28

Engineering team focused on
Telco market, spread over 3 sites



10+

Years building open SDR
infrastructure

Building commodity Wireless Networks based on Software Defined Radio - for over a decade

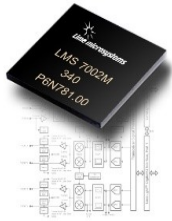
- Reducing total cost of ownership for any Radio Access Network, fixed and Mobile.
- Breaking single vendor dependencies through the separation of HW and SW provisioning.
- Driving Open Source ecosystem development and innovation
- Accelerating operational readiness & commercialization by App enabling wireless networks

Lime Micro RF Silicon: Building Blocks for Distributed Networks

Wideband RX, multi-channel MIMO, sync & programmable IQ, from sub-1 GHz to mmWave roadmap

Sub-10 GHz

February 2009



LMS6002D FPRF

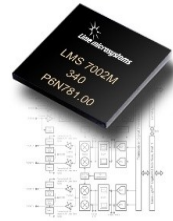
Frequency 10 MHz - 3.4 GHz

RF BW 60 MHz SISO

EOL November 2024

Migrating to new foundry

January 2016



LMS7002M FPRF

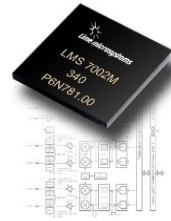
Frequency 1 MHz - 3.8 GHz

RF BW 60 MHz MIMO

IN PRODUCTION

Shipping in volume

August 2025



LMS8001A/B RF CMOS

Frequency up to 10.5 GHz

IN PRODUCTION

Shipping in volume

Satellite & Defence



LMS9004

LMS7002M+LMS8001A

RF BW 500 MHz

ROADMAP

Ready for prototyping

Roadmap - ready for prototyping



LMS9 family · BiCMOS up/down converter

LMS9A001 23 - 45 GHz

LMS9B001 45 - 76 GHz

LMS9C001 71 - 95 GHz

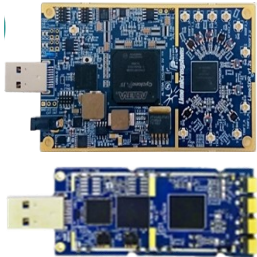
ROADMAP

Satellite & defence applications

Highest flexibility in frequency & bandwidth · Lowest power dissipation · Open source software & drivers · Large, supportive user base

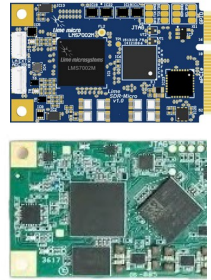
LimeSDR Portfolio: Research Instrument to Deployable Platform

One software stack across the family - research developed on LimeSDR migrates cleanly to LimeNET and HiPer-RAN



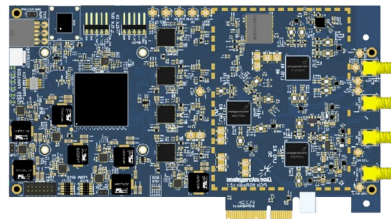
LimeSDR USB/Mini

USB module



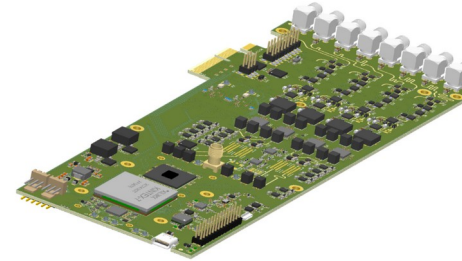
LimeSDR XTRX

M.2 / mPCIe



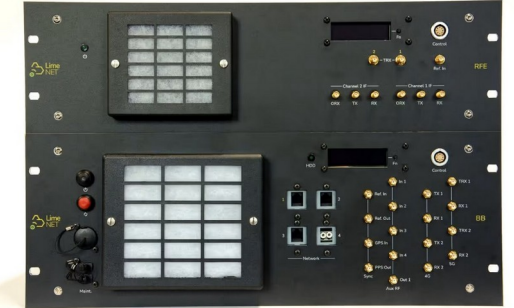
LimeSDR X3

PCIe full-height



HiperSDR

400 MHz / channel



HiPer-RAN

Carrier-grade



20,000+ units deployed worldwide

FPGA / GPU dependency required

Open-source hardware ecosystem

LimeNET: Network Systems Already in the Market

Three productised platforms across edge, developer and operator scale — LimeNET Micro is the candidate for RX-only research



LimeNET Micro 2.0

Co-developed with Vodafone

SPECIFICATIONS

Form factor Compact, integrated

Radio Raspberry Pi CM5 + LimeSDR XTRX

Sync GPS + OCXO on-board

USE CASES

Edge cellular, private networks



LimeNET Mini 2.0

Network-in-a-box

Developer & residential networks

SPECIFICATIONS

Form factor Mini-PC, shielded enclosure

Radio LimeSDR X3

Stack Ubuntu Core + LimeNET apps

USE CASES

Residential 4G/5G, IoT, small cell, app development



LimeNET 2.0 *Multi-radio business platform*

Enterprise & operator-grade

SPECIFICATIONS

Form factor Rack-ready chassis

Radio Multi-LimeSDR (HiperSDR) concurrent

Stack Multi-standard 4G / 5G / IoT

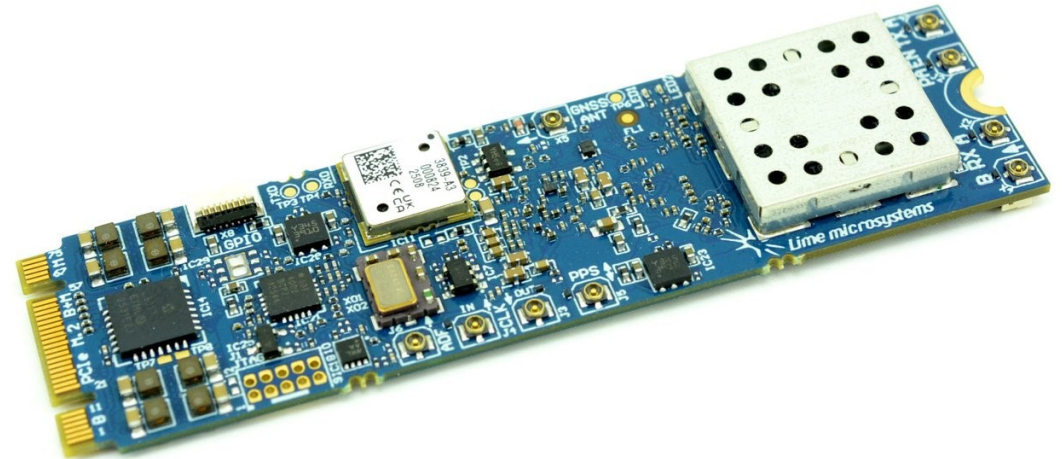
USE CASES

Campus networks, enterprise 5G, complex multi-band deployments

LimeSDR Micro: Overview and Specifications

FPGA-free, vector-accelerated SDR in an M.2 module

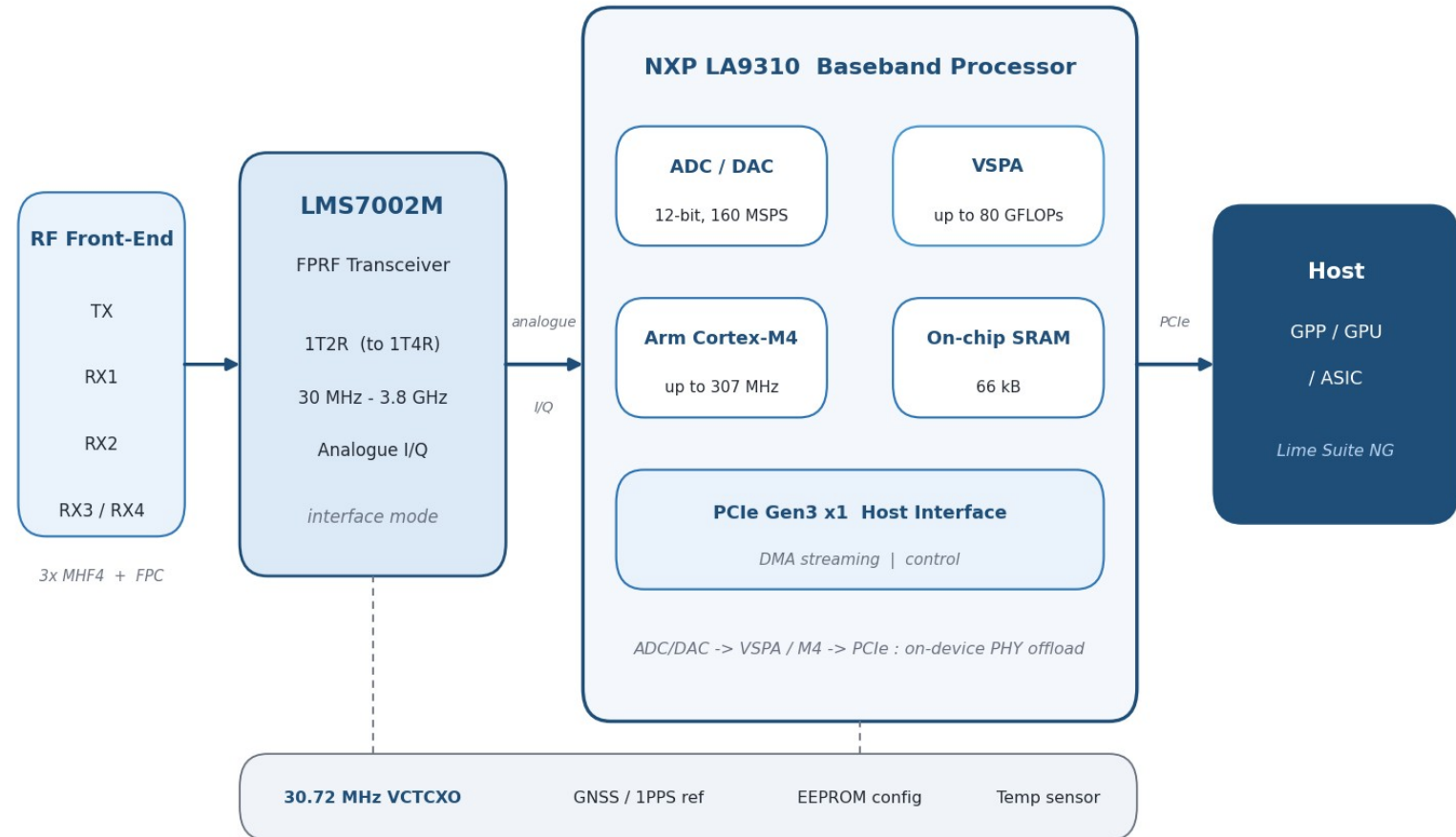
- **Baseband: NXP LA9310**
 - VSPA up to 80 GFLOPs;
 - Arm Cortex-M4 up to 307 MHz
- **RF transceiver: LMS7002M**
 - 30 MHz - 3.8 GHz; 1T2R, expandable to 1T4R
 - Over 100 MHz BW; up to 160 MSPS, 12-bit
- **Form factor and host**
 - M.2 2280 (22 x 80 mm); PCIe Gen3 x1
 - Under 20 g; for servers, SBCs and embedded
- **Open and flexible**
 - GNSS option
 - classic SDR or on-device PHY offload



LimeSDR Micro: Block Diagram and Architecture

Architecture notes: LimeSDR Micro signal and data path

- LMS7002M runs in analogue I/Q mode
- LA9310 performs all data processing
- ADC/DAC integrated in the LA9310: no FPGA and no FPGA toolchain
- VSPA and Cortex-M4 can offload physical-layer work from the host CPU
- A single PCIe Gen3 x1 lane carries the IQ stream and control
- Same LMS7002M transceiver as the wider LimeSDR family



LimeSDR Micro Firmware

VSPA and M4 firmware

VSPA - DSP firmware

- ✓ Open source on GitHub, cmake based project
- ✓ Open kernels: FFT, iFFT, FIR, mixer, CRC
- ✓ Modulation / demodulation of 1024-QAM
- ✓ Free build toolchain provided by NXP

Arm Cortex-M4 - control firmware

- ✓ Open source on GitHub, cmake based project
- ✓ Boots and configures the LA9310 and radio
- ✓ Manages communications, clocking and GPIO controls

LimeSuiteNG: driver stack and plug-ins

Components, features and plug-ins

Components and features

- ✓ liblimesuiteng: C++ device API
- ✓ Command line utilities:
 - Device enumeration
 - SDR configuration
 - Basic Tx/Rx using files
 - Firmware updating
- ✓ Graphical user interface:
 - Full access to specific control registers
 - Live Rx FFT monitoring

Plug-ins

- ✓ GNU Radio
- ✓ SoapySDR
- ✓ OpenAirInterface5G
- ✓ Amarisoft
- ✓ srsRAN
- ✓ Compatible with all LimeSDR devices

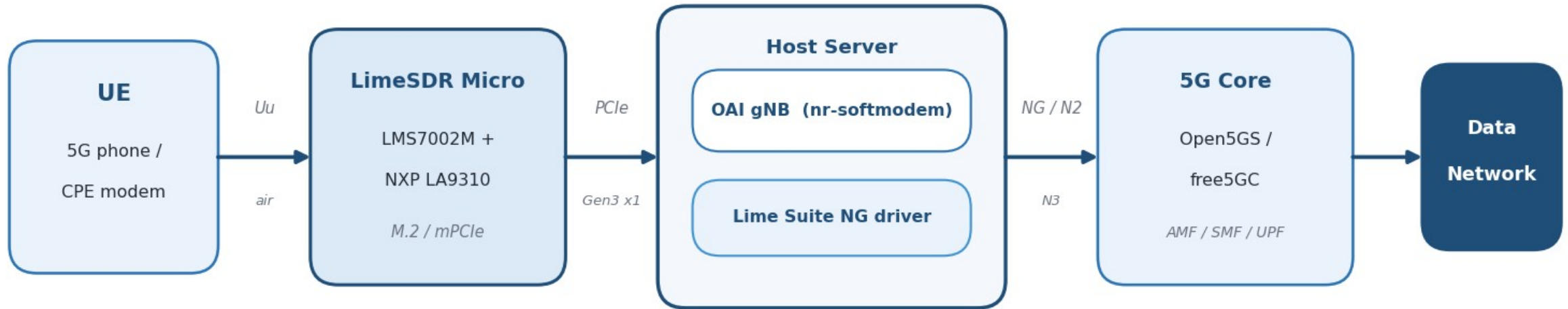
| MyriadRF OAI Fork with LimeSuiteNG

OAI integration with LimeSuiteNG

- **github.com/myriadrf/openairinterface5g**
 - limesuiteng-integration branch, tracking upstream OAI
 - Native support for LimeSDR devices
- **Status and scope**
 - Validated on x86
 - Path to on-device PHY offload using the LA9310 VSPA

OAI Setup and Configuration

Example



• Configuration

- OAI nr-softmodem from the limesuiteng-integration fork, linked against liblimesuiteng
- Radio: band n78 TDD, 20 MHz channel; LMS7002M driven through LimeSuiteNG
- Reference: 30.72 MHz VCTCXO, core network via Open5GS / free5GC

• Current results

- COTS UE attaches to network. Limited sustained stack up-time due to on-going firmware development work

Roadmap

Current state and to-do list

- **Now**

- Crowd Supply fulfillment from end of September 2026
- Harden LimeSuiteNG PCIe driver and streaming

- **Next**

- VSPA reference PHY: offload FFT and filtering on-device
- OAI 5G NR functional split across host and LA9310

- **Later**

- LimeFEA HF Micro and LimeSDR Micro Pro variants
- Distributed uplink topologies; broader band support

Thank You

Lime Microsystems Ltd | www.limemicro.com