5G Open RAN Starter Kit

Product Brief

Product Summary

The RANsemi 5G Open RAN Starter Kit is a compact O-RAN 7.2 5G End-to-End System. It enables customers to rapidly evaluate and deploy 3GPP 5G NR and O-RAN Alliance compliant systems based on components from industry leading vendors including: RANsemi SRS, Texas Instruments, AttoCore, LinkWave, Telit and iCana.

The system provides fully integrated and tested components in an O-RAN split 7.2 topology that includes: a 5G SA Core, Centralised Unit (CU), Distributed Unit (DU) with RANsemi RNS802 5G High PHY connected via an Open Fronthaul eCPRI link to the RANsemi RNS805 Radio Demonstrator Board with an RF interface allowing connection to commercial handsets or UE test equipment.

The Starter Kit includes several options as summarised on page 2. The starter kit includes bring up presentation training.

Key Applications

The RANsemi 5G Open RAN Starter Kit is designed for:

- Lab based evaluation of ORAN components
- Lab based test environments
- Neutral host and private network demonstrations

Note, customer is responsible for the OTA arrangement, either via shielded box/chamber (not supplied) or via an OTA licence for lab or public space.

Interfaces

- 5GC routable to internet
- NG-C / NG-U between 5GC and CU
- F1-C / F1-U between CU and DU
- PCIe bifurcated interface to RANsemi RNS805 In-Line Accelerator
- RANsemi FAPI compliant L1 API
- 10/25Gbps eCPRI Open Fronthaul
- 4T4R antenna SMA ports

Key Components and Suppliers

- **Core Network**: Open 5GS core (options AttoCore and VoNR)
- **Centralised Unit**: SRS Enterprise CU binary
- **Distributed Unit**:
  - SRS Enterprise L2 binary
  - RANsemi RNS802 In-Line Accelerator
  - RANsemi RNS802 NR High PHY binary
- **Radio Unit**: RANsemi Cat-A O-RU
  - RNS805 NR RU binary eval software
  - RNS805 RU Demonstrator Board
  - S-Plane with GPS 1pps via ORANIC and PTP IEEE1588 to O-RU
  - 4 dipole antennas
- **5G UE**: Commercial S24 Samsung
  - 4 additional test SIMs provided
  - iPhone16 option
  - Sierra Wireless AirLink® XR60 option

Key Specifications

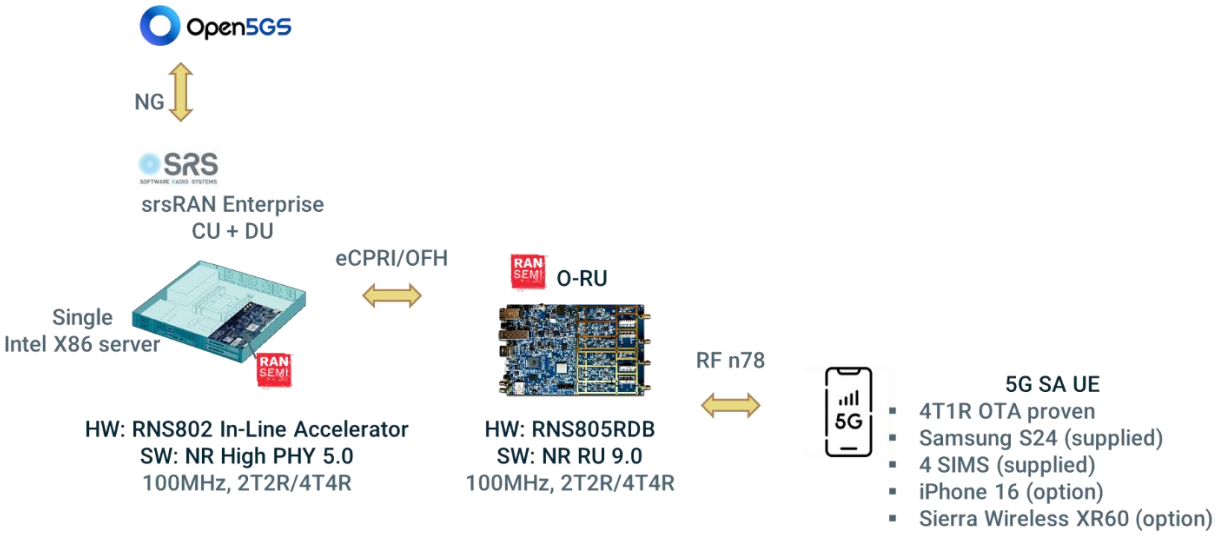
- Core, CU and DU sharing X86 server
- 5G NR 3GPP Rel 15 Release support
- O-RAN Alliance support:
  - O-RAN.WG4.CUS.0-R003-v14.00
  - O-RAN.WG4.MP.0-R003-v14.00
  - O-RAN.WG4.CONF.0-v06.00
  - O-RAN WG4.IOT.0-v10.00

Supported configurations

The standard supported configuration is as follows, contact RANsemi for other support:

- 5G NR SA, single cell/carrier
- TDD, 30kHz SCS
- 256QAM UL/DL
- MCS up to MCS27
- RF
  - n78 (3.3 to 3.8GHz)
  - 10-100MHz bandwidth (10MHz steps)
  - 4T4R
  - 24dBm TX power per antenna port
- Verified bandwidths
- MIMO
  - 4 layer DL MIMO
  - 1 layer UL MIMO (limit in DU SW)

5G Open RAN Starter Kit configuration



Proven Performance

Use Case /UE type	Core Network	B/W /Duplex	Data Stream	Throughput TCP/UDP	Modulation	MCS
End to End OTA COTS UE*	O5GS	100MHz TDD	DL UL	805 Mbps 104Mbps	QAM256 QAM256	27 27
End to End Cabled to XR60 UE	AttoCore	100MHz TDD	DL UL	1.35Gbps 104Mbps	QAM256 QAM256	27 27

Order Information and Configuration Options

Product (Order Code)	L1 configuration	CN configuration	CU/DU configuration	UE configuration
Standard Starter Kit (RNS-Starter-Kit)	Single Cell, 5G TDD, SCS 30kHz N78 100MHz bandwidth Up to 256QAM 4T4R RF ports	Open 5GS CN running on shared server with CU/DU Single operator Data Packet CN 800Mbps max	4 DL/1 UL MIMO Link adaptation and power control	Commercial S24 Samsung 2 DL/1 UL 4 additional SIMs OTA end to end*
+ Attocore upgrade (RNS-AC-CN)	As standard	Single operator Packet Core (1.34Gbps max)	Separate CN server	As standard
+ iPhone16 (RNS-iP16)	As standard	As standard	As standard	+ iPhone 16
+ Sierra Wireless AirLink® XR60 (RNS-XR60)	4T4R RF ports	Recommended with AttoCore option	As standard	+ XR60 modem + Fixed and variable attenuators for cabled RF
+VoNR (RNS-VoNR)	As standard	Experimental VoNR CN (Kamailio + pyHSS)	As standard	Adding VoNR capability to S24

For further details about the RANsemi 5G Open RAN Starter Kit, please contact your local RANsemi representative or email us at info@ransemi.com