

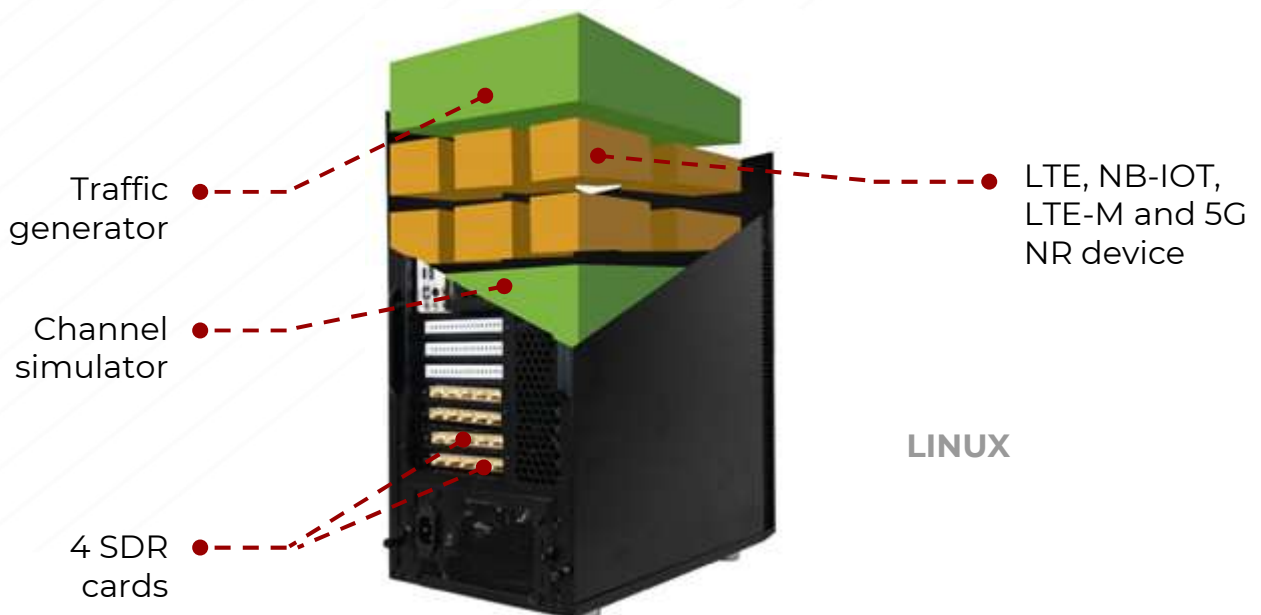
AMARI UE Simbox is an ideal solution to support functional and performance testing of LTE eNodeB, 5G NR gNodeB in NSA or SA mode as well as LTE and 5G core networks.

One single AMARI UE Simbox can simulate hundreds UEs sharing the same spectrum with different types of traffic within multiple cells. Each UE can be configured independently as LTE, 5G NR, NB-IoT or LTE-M device.

The offer is completed by an integrated IP simulation package for reproducible test results.



## Complete Software Based NR/LTE Network Test Solution





### Logging and Measurements

Selective logging and display of all layers of 3GPP LTE and NR stack as well as useful graphs and analytic tools



### Automatic Test Setup and Scripting

Extensive WebSocket API allowing to send remote commands to each simulated UE to ease test automation



### Easy Configuration

Easy configuration thanks to JSON files with example configurations already included in each software release



### End to End Data Testing

Running on top of standard Linux in user space mode allowing easy integration with IP services



### Data Traffic Generator

Embedded traffic generator provides a controlled environment for reproducible results as well as a variety of traffic types such as TCP, UDP and HTTP.



### Channel Simulation

On the downlink side, depending on the simulated UE path loss, the channel simulator modifies the PER of PDSCH and PDCCH and updates measured RSRP/CQI and modifies the uplink signal level accordingly.



### Test Features

Test features allowing to override the nominal protocol behavior in order to simulate error cases



### High Performance

Highly optimized software supporting multiple UEs and cells



### Frequency Agnostic

Support of all FDD and TDD sub-6GHz bands even non standard ones to test custom frequencies



### 3GPP Features

Early access to 3GPP features for rapid validation of features under development

## PC Specifications

Dimensions H x W x D	<b>45,5 cm x 40 cm x 20,5 cm</b>
Weight	<b>13 kg</b>
Number of PCIe SDR Cards	<b>4</b>
Power supply voltage	<b>230 V AC input</b>
CPU	<b>Intel Core i9</b>
Operating System	<b>Linux Fedora</b>

## PCIe SDR Specifications

Dimensions H x W x D	<b>2 cm x 11.5 cm x 12.8 cm</b>
Weight	<b>0.1 kg</b>
Power supply voltage	<b>12 V DC input</b>
RF Coverage	<b>500 MHz to 6.0 GHz</b>
RF bandwidth	<b>200 KHz to 56 MHz</b>
Wireless range	<b>10 meters</b>
Operation mode	<b>FDD and TDD</b>
MIMO	<b>DL 2x2</b>

## UE Simulator 4G technical specifications

3GPP Specification	<b>LTE Release 8 support with features up to Release 15</b>
Frequency bands	<b>All FDD and TDD sub-6GHz bands with support of custom frequencies</b>
Bandwidth	<b>1.4, 3, 5, 10, 15 and 20 MHz, 200 KHz for NB-IoT</b>
Carrier aggregation	<b>up to 4 carriers in DL and 2 carriers in UL</b>
MIMO	<b>DL MIMO support up to 4x4</b>
Modulation schemes	<b>up to 256Q AM in DL and UL</b>
AS encryption and integrity protection	<b>AES, SNOW3G, ZUC</b>
Handover	<b>Intra-freq, inter-freq and inter-band Handovers</b>
Group communication	<b>eMBMS as per Rel10</b>
IoT	<b>LTE category 0 and 1, LTE-M cat M1, NB-IoT cat NB1 and NB2 UE categories</b>
UE categories	<b>Cat0, Cat1, cat 3, cat 4, cat 15 with 4CCs in DL and cat 13 with 2 CCs in UL</b>
Number of active users	<b>1000+ UEs (see table page 4 for details)</b>
Number of active cells	<b>4 cells MIMO 2x2 or 2 cell MIMO 4x4</b>
IP traffic	<b>Simulation of TCP, UDP, RTP, HTTP and VoIP with configurable packet size as well as support of external applications such as iperf</b>

## UE Simulator 5G technical specifications

3GPP Specification	Release 15
Frequency bands	All FDD and TDD sub-6GHz bands with support of custom frequencies
Bandwidth	up to 50MHz
MIMO	up to MIMO 4x4 in DL
Modulation schemes	up to 256Q AM in DL and UL
Subcarrier spacing	All SSB/data subcarrier spacing combination
Supported modes	NSA and SA
NSA NR Split bearer	3, 3a and 3x
Use case	eMBB
Number of active users	1 UE
Number of active cells	1 cell
IP traffic	Simulation of TCP, UDP, RTP, HTTP and VoIP with configurable packet size as well as support of external applications such as iperf

## AMARI UE Simbox Series product list

Product	RAT	Number max of UEs				
		LTE 20 MHz 2x2	LTE 20 MHz 4CC 2x2	LTE 20 MHz 2CC 4x4	5G NSA 40MHz 2x2 + LTE 20MHz 2x2	5G SA 40MHz 2x2 or 20MHz 4x4
AMARI LTE UE Simbox 001	LTE, NB-IOT	1	1	1	0	0
AMARI LTE UE Simbox 064	LTE, NB-IOT	64	64	64	0	0
AMARI LTE UE Simbox 128	LTE, NB-IOT	128	128	128	0	0
AMARI LTE UE Simbox 256	LTE, NB-IOT	256	256	256	0	0
AMARI LTE UE Simbox U	LTE, NB-IOT	1000	256	256	0	0
AMARI UE Simbox 001	LTE, NB-IOT, NR	1	1	1	1	1
AMARI UE Simbox 064	LTE, NB-IOT, NR	64	64	64	64	64