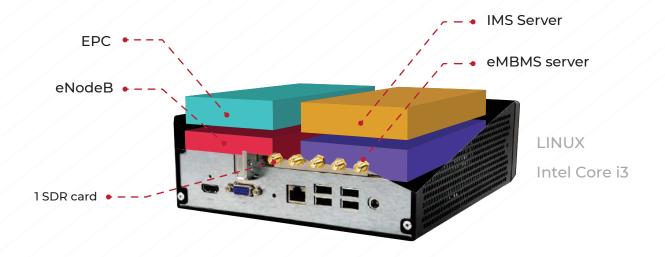# **AMARI** LTE Callbox [mini]

Packaged in a plug and play compact PC, Amari LTE Callbox Mini is an ideal solution for LTE testing of all IoT devices as well as LTE user equipments. It acts as a 3GPP compliant eNodeB and EPC allowing functional and performance testing of LTE, LTE-M and NB-IoT devices.

The offer is completed by an integrated IMS server as well as an eMBMS gateway for VoLTE and eMBMs testing.

The Callbox is powered by a deployment quality software suite offering the same level of baseband functionality as an indoor/outdoor LTE and NB-IoT nework.

All LTE in one compact box

EPC

eNodeB

IMS Server

eMBMS server

LINUX

Intel Core i3

1 SDR card

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

Automatic Test Setup and Scripting
Extensive WebSocket API allowing to send remote commands to eNodeB and EPC to ease test automation.

Easy Configuration
Easy configuration thanks to JSON files with example configurations already included in each software release for eNodeB and EPC.

End to End Data Testing
Running on top of standard Linux in user space mode allowing easy integration with IP services.

Channel Simulation
Simulation of different DL channel types as per 3GPP models specified in 36101 specification.

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

High Performance
▸ Highly optimized software supporting hundreds of UEs.
▸ High data rates supporting downlink and uplink rates of 150 Mbps and 50 Mbps.

Frequency Agnostic
Support of all FDD and TDD frequency 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 × W × D	**7.8 cm × 20 cm × 25 cm**
Weight	**2 kg**
Number of PCIe SDR Cards	**1**
Power	**Input: 100 - 240V AC Output: 19.5V/9.23A 180W Adapter**
CPU	**Intel Core i3**
Operating System	**Linux Fedora**

PCIe SDR Specifications

Dimensions H × W × D	**2 cm × 11.5 cm × 12.8 cm**
Weight	**0.1 kg**
Power supply voltage	**Input: 12 V DC**
RF Coverage	**70 MHz to 6.0 GHz**
RF bandwidth	**200 KHz to 56 MHz**
Wireless range	**10 meters**
Operation mode	**FDD and TDD**
MIMO	**DL 2x2**

eNodeB Technical Specifications

3GPP release	**LTE release 15**
Frequency bands	**All FDD and TDD bands with support of custom frequencies**
Bandwidth	**1.4, 3, 5, 10, 15 and 20 MHz in LTE 200 KHz for NB-IoT supporting all operation modes (in-band, guard band and standalone).**
Supported number of cells	**1**
Supported number of UEs	**Up to 500 UEs**
LTE UE category	**0/1/2/3/4**
Transmission modes	**1 (single antenna) and 2 to 10 (MIMO 2x2)**
Modulation schemes	**Up to 256QAM in DL and 64QAM in UL**
AS encryption and integrity protection	**AES, SNOW3G, ZUC**
Handover	**Intra eNodeB, S1 and X2 handover support**
IoT	**LTE category 0 and 1 LTE-M cat M1 NB-IoT cat NB1 and NB2 single-tone and multi-tone**
NB-IoT subcarrier spacing	**15 kHz and 3.75 kHz**
Network interfaces	**S1AP and GTP-U to EPC X2AP between eNodeBs M1 and M2 for eMBMS**

EPC Technical Specifications

Network elements	**Mobility Management Entity (MME), Serving Gateway (SGW), Packet Data Network Gateway (PGW), and Home Subscriber Server (HSS) all integrated within the same software component**
3GPP release	**Release 14**
NAS encryption and integrity protection	**AES, SNOW3G, ZUC**
USIM authentication	**XOR, Milenage, TUAK**
IP version	**IPv4 and IPv6**
QoS	**Support of all LTE QCIs as well TFT and dedicated bearers**
Handover	**S1 based support**
Network interfaces	**S1AP and GTP-U to eNodeB** **RX for external IMS server** **S6a for optional external HSS**
RAT	**LTE, NB-IoT**
CIoT features	**control plane CIoT optimization, Non IP data delivery, Attach without PDN connectivity**
Power saving features	**PSM and extended DRX**

IMS Server Technical Specifications

Network Elements	**Proxy-CSCF (P-CSCF), Interrogating-CSCF (I-CSCF), Serving-CSCF (S-CSCF), and Home Subscriber Server (HSS) all integrated within the same software component**
ISIM authentication	**XOR, Milenage, TUAK**
Security features	**MD5, AKAv1 and AKAv2 for authentication and IPSec at transport level**
Network interfaces	**Rx interface for support of precondition and dedicated bearer** **Cx interface for external authentication** **S1 based support**
IP versions	**IPv4 and IPv6**
Services	**Voice call, Video call, Voice echo test, Call hold, SMS over SIP and SMS over SG**

eMBMS Technical Specifications

Network Elements	**LTE eMBMS Gateway (eMBMS-GW) and Multi-cell Coordination Entity (MCU)**
Network interfaces	**M1 interface to eNodeB for user plane** **M2AP interface to eNodeB for control plane**

Do you have any question? E-mail us at **sales@amarisoft.com** or visit **www.amarisoft.com**