GNSS Performance Testing for eCall Modules
## Automated tests with R&S®CMWrun and R&S®SMBV-K361

Test challenges
❙ As from April 1st 2018, newly registered cars and vans in the European Union must be equipped with the automatic emergency call system eCall
❙ Each eCall module has to undergo a certification process before being used in a car; this process comprises a series of conformance and performance tests
❙ The performance of the built-in GNSS receivers has to be tested against the EU regulation EU2017/76, Annex VI
❙ Tests cannot be performed in a real-world environment since this is difficult to implement, time-consuming, costly and almost impossible to reproduce

Basic architecture of an automatic emergency call system.

Test solution
❙ Perform tests in the lab under controlled and repeatable conditions using the GNSS simulator in the R&S®SMBV100A
❙ Install the R&S®SMBV-K361 and turn the R&S®SMBV100A into a fully automated eCall performance tester
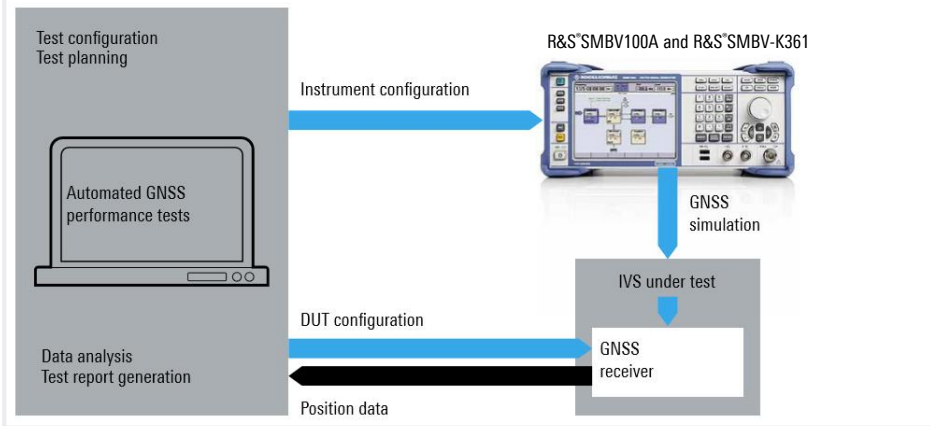❙ Schedule, configure and analyze your tests using the R&S®CMWrun sequencer software
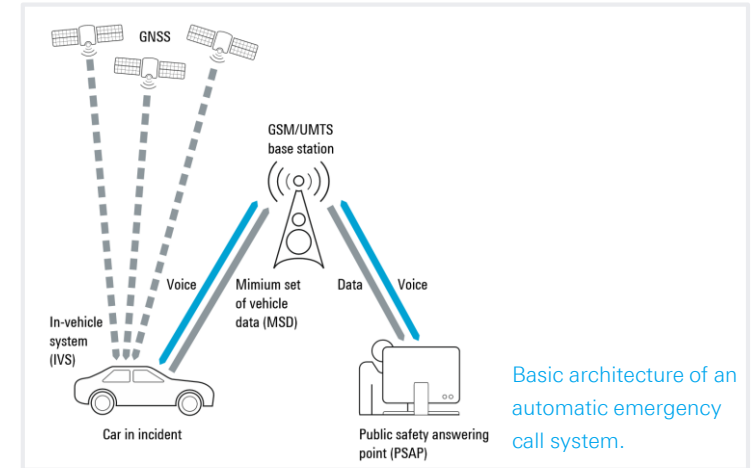
❙ Required GNSS performance tests include:
  ▪ Tracking sensitivity
  ▪ Acquisition sensitivity
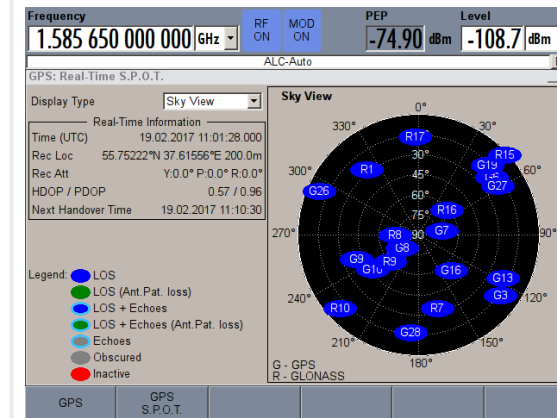 ▪ Time to first fix (TTFF)
  ▪ Location accuracy

Your benefits	Features
Tests are 100 % reproducible	The GNSS simulator in the **R&S®SMBV100A** makes sure that scenarios are fully reproducible, which makes the solution ideal for validation measurements prior to official certification tests.
Tests are fully automated	The **R&S®SMBV-K361** in combination with the R&S®CMWrun sequencer software automatically configures the signal generator; no manual instrument configuration is required.
Efficiently plan, execute and evaluate validation and certification tests	The test solution features **R&S®CMWrun** for automatic test configuration, scheduling, DUT configuration, data analysis and test report generation.

ROHDE & SCHWARZ

Test setup for automated GNSS performance tests

Test configuration
Test planning

Instrument configuration → R&S®SMBV100A and R&S®SMBV-K361

GNSS simulation → IVS under test → GNSS receiver

Automated GNSS performance tests

DUT configuration →

Data analysis
Test report generation

Position data ←

GNSS simulator in the R&S®SMBV100A

Frequency	PEP	Level
1.585 650 000 000 GHz	-74.90 dBm	-108.7 dBm

GPS: Real-Time S.P.O.T.

Display Type: Sky View

Real-Time Information
Time (UTC) 19.02.2017 11:01:28.000
Rec Loc 55.75222°N 37.61556°E 200.0m
Rec Att Y:0.0° P:0.0° R:0.0°
HDOP / PDOP 0.57 / 0.96
Next Handover Time 19.02.2017 11:10:30

Legend:
- LOS
- LOS (Ant.Pat. loss)
- LOS + Echoes
- LOS + Echoes (Ant.Pat. loss)
- Echoes
- Obscured
- Inactive

G - GPS
R - GLONASS

Combined GPS/Galileo/SBAS simulation performed by the R&S®SMBV100A.

Instrument configuration

Minimum HW configuration		
R&S®SMBV100A	Vector signal generator	
R&S®SMBV-B103	Frequency up to 3.2 GHz	
R&S®SMBV-B10	Baseband generator	
R&S®SMBV-B92	Hard disk	
Minimum SW configuration		**Test cases according to EU2017/79, Annex VI**
R&S®SMBV-K44	GPS	Required for TC 2.1, 2.2, 2.3, 2.5, 2.6, 2.7
R&S®SMBV-K66	Galileo	
R&S®SMBV-K92	GNSS enhanced	
R&S®SMBV-K91	Extension to 12 satellites	
R&S®SMBV-K96	Extension to 24 satellites	
R&S®SMBV-K110	SBAS	
To add for full test coverage [1]		**Test cases according to EU2017/79, Annex VI**
R&S®SMBV-K102	Antenna pattern	Required for TC 2.4 (location accuracy with obstructed signals)
Test automation		
R&S®SMBV-K361	eCall test suite	+ R&S®CMWrun to be installed on a control PC

[1] in case the eCall module needs to be tested against the UNECE2016/07 regulation, the SMBV-K94 option must be added to the instrument configuration

Other GNSS test solutions offered by Rohde & Schwarz

WV

- GNSS waveforms with R&S®WinIQSIM2, 1 channel
- GNSS production tester, R&S®SMBV-P101, 4 channels
- GNSS simulator, R&S®SMBV100A, 24 channels
- GNSS simulator, R&S®SMW200A, 72 channels

▷ For more information,
see www.rohde-schwarz.com/catalog/smbv100a