SPECTRACOM eCall Compliance Tool
eCall – GSG SIMULATOR configuration PROVIDED BY SPECTRACOM for eCall GNSS DEVICE TESTING

European Standard regulation for eCall (ANNEX VI – GNSS testing)

Spectracom solution provides GSG simulators with configuration for eCall devices, a testing tool and dedicated scenarios (option “OPT-ECL”).

Recommended Configurations

- GSG 5-ES Model + 16 Channels + OPT-ECL (minimum configuration)
- GSG 62-ES Model + OPT-ECL (32 Channels ready for future purposes)
- Other useful option: GLONASS (OPT-GLO) for ERA-GLONASS application

Simulated signals

| Galileo (E1 frequency band OS); |
| GPS (L1 frequency band C/A code); |
| Combined Galileo/GPS/SBAS. |

Number of simulated satellites:

| at least 6 Galileo satellites; |
| at least 6 GPS satellites; |
| at least 2 SBAS satellites; |

Extract from 2.2.1.3 - Table 2 - Main parameters of simulation script for static scenario
European Standard regulation for eCall

European Standard regulation : Main articles

• 2.2.1. NMEA-0183 messages output test (static).
• 2.2.2. Assessment of positioning accuracy in autonomous static mode (static).

Especially:

• 2.2.2. 2 – STATIC COMBINED GALILEO / GPS / SBAS (EGNOS) SIGNALS
• 2.2.2.15 – STATIC GALILEO SIGNAL ONLY TEST
• 2.2.2.16 - STATIC GPS SIGNAL ONLY TEST

• 2.2.3. Assessment of positioning accuracy in autonomous dynamic mode (dynamic).
• 2.2.4. Movement in shadow areas, areas of intermittent reception of navigation signals and urban canyons (dynamic).
• 2.2.5. Cold Start time to first fix test (Static).

Especially:

• 2.2.5.3 – Time to First Fix -130dBm
• 2.2.5.8 - Time to First Fix -140dBm

• 2.2.6. Test of re-acquisition time of tracking signals after block out of 60 seconds (static).
• 2.2.7. Test of GNSS receiver sensitivity in cold start mode, tracking mode, and re-acquisition scenario (static).
eCall solution & list of test

OPT-ECL

GSG unit with OPT-ECL option comes with pre-installed eCall scenarios for GNSS testing (only ANNEX VI of EU 2017/079 regulation). No need to configure anything!

Available list of test that can be conducted:

- 2.2.1. NMEA-0183 messages output test (static).
- 2.2.2. Assessment of positioning accuracy in autonomous static mode (static).
- 2.2.3. Assessment of positioning accuracy in autonomous dynamic mode (dynamic).
- 2.2.4. Movement in shadow areas, areas of intermittent reception of navigation signals and urban canyons (dynamic).
- 2.2.5. Cold Start time to first fix test (static)
- 2.2.6. Test of re-acquisition time of tracking signals after block out of 60 seconds (static)
- 2.2.7. Test of GNSS receiver sensitivity in cold start mode, tracking mode, and re-acquisition scenario (static).

User can manually (locally or remotely) launch individually each scenario to generate RF signals on the GSG output (RF-OUT connector).

User can use GSG StudioView™ software (see next slides) to performs all the tests automatically.
Example: Typical request for urban canyon configuration

With OPT-ECL option, the GSG simulator contains "eCallDynamic224" scenario file that includes event files and antenna pattern (Figure 3 – chapter 2.2.4) to simulate the urban canyon conditions without any other specific action required by the user.

- 0 dB
- B: -40 dB
- C: -40 dB
- A: -100 dB or signal is switched off
Testing condition

Diagram of Test Stand principle (eCall requirement)

- **GSG UNIT**: GNSS simulator
- **RF signal**: Simulated GNSS constellation
- **Ecall Device**: Including GNSS receiver
- **Power supply**: Adapted to Ecall Device
- **Station**: To manage simulation sequences and record results
- **Network Management Link**: Provides communication between simulator and GNSS receiver/test software (IP network or USB)
- **Serial Link RS232**: (NMEA GGA or GPRMC data) provided by the Ecall Device
- **Ecall device** must be able to be setup for receiving Galileo, GPS, and SBAS
- **Ecall device** must be able to be output NMEA - 0183 messages

* Test Bench provided by SPECTRACOM

** Devices and Accessories not provided by SPECTRACOM

(1) For RF connector input: Prefer N-TNC-SMA-SMB- connectors

Need appropriate RF connection (1)
eCall compliance testing tool

GSG StudioView™ software is normally used to build trajectories and scenarios that will be uploaded and executed on the GSG unit.

GSG StudioView™ software also provides eCall Compliance Testing Tool, based on the EU 2017/079 regulation, featuring:

- Automatic execution of one or several tests (according to the regulation clauses).
- Automatic pass/fail reporting after each executed test.
- Possibility to export reports.

GSG unit needs to have OPT-ECL installed.
eCall compliance testing tool

OPT-ECL

- Automatic execution of one or several tests (according to the regulation clauses).
- You can select tests to be executed individually.
- You can select the whole sequence of all the tests that will be executed automatically by the tool.
- “Override defaults” checkbox allows to change some parameters (for example reduce a one hour test to only 5 minutes for debug purposes or preliminary test).
- Additional option allows to get more verbose logs (like all position errors).

“Parameters” page of the eCall Compliance Test Tool.
**eCall compliance testing tool**

Connect your receiver or GNSS device

1. Enter the link (Ethernet / USB) to your GSG simulator
2. Select the COM port of your GNSS device to get NMEA 0183 messages from
3. Optionally create receiver profile (see next page)
eCall compliance testing tool

Create a profile for your receiver:

1. Specify receiver profile name
2. Specify “cold start” command to automatically be send by the tool each time it is needed.
3. ASCII and binary commands supported
4. Try “cold start” command with your receiver before using the tool.
eCall compliance testing tool

- Observe executed sequence during the test
- Log the measurements (position errors in this example)
- Reports can be exported.

Example: see your TTFF (Time To First Fix) information during the test sequence
eCall compliance testing tool

- Automatic passed/failed indication after each executed test
- Reports can be exported. (example for article 2.2.2. - Assessment of positioning accuracy in autonomous static mode - passed).

“Status” page of the eCall Compliance Test Tool – provided in the final report.
SOLUTION : OPT-ECL – eCall
SCENARIOS & Compliance
TESTING tool

OPT-ECL

- eCall EU 2017/079 Annex VI compliant
- Set of scenarios for eCall built in GSG unit.
- Automatic Passed/Failed indication after each test Reports can be exported.
- Prepare your device for Certification