



French C-ITS Deployment Coordination committee

UpperTester extension for ITS-S configurations

2.4.2.1_M_Annexe2_UT_Extension_Configuration

Activity 2: Studies

Sub Activity 2.4 > Specifications

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Quality rules

Reference to the version administration

Version number to be composed of 3 digits > vR.XY

- **R** corresponds to the release number: it is upgraded each time SC Studies validates the diffusion of a new release,
- **X** is the major version number: it is upgraded each time SC Studies validates the deliverable,
- **Y** is the minor version number: it is upgraded each time a contributor changes anything.

Once the deliverable is approved, its version number is upgraded from vR.XY to vR.(X+1)0

Once the deliverable is release, its version number is upgraded from vR.XY to v(R+1).00

As illustration:

- 0.03 > Work in progress version
- 0.10 > Del. Approved by SC Studies but not released
- 2.00 > Del. approved & released (in release 2)
- 2.05 > Del. Updated - in progress version

Requirements identification & traceability

In this document, the following verbal forms are used to indicate requirements: **Shall / Shall not**

Recommendations shall be indicated by the verbal forms: **Should / Should not**

Permissions shall be indicated by the verbal forms: **May / May not**

Possibility and capability shall be indicated by the verbal forms: **Can / Cannot**

Inevitability used to describe behaviour of systems beyond of the scope of this del. shall be indicated by: **Will / Will not**

Facts shall be indicated by the verbal forms: **Is / Is not**

In the table here below:

2.4.X.XX > is the number given to the deliverable (e.g. 2.4.4.8)

YYYY > for digit are given to identifying which component/entity the requirement is addressing (e.g. LTCA for long term certificate authority)

ZZZ > is the numeration of the requirement

W > is the number of the version of the requirement

Acronyms & abbreviations

C-ITS	Cooperative ITS
ETSI	European Telecommunications Standards Institute
ITS	Intelligent Transport System
IUT	Implementation Under Test
TS	Test System
UT	UpperTester
N/A	<i>Not Applicable</i>
TBC	<i>To Be Checked, with MS or associated partner</i>

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1. References

Document reference	Name
[DR1]	ETSI TR 103 099 V1.4.1 (2017-03)
[DR2]	2.4.2.1_M_Annexe1

2. Background

In order to make on-lab C-ITS protocols testing, ETSI developed some tests and an architecture to emulate the C-ITS equipment environment. We have two parts: the implementation under test (IUT, i.e. the equipment to test) and the Tester. Since generation of C-ITS messages and environment acquisition is ad-hoc to each equipment, ETSI specified a middleware implemented by the C-ITS equipment providers to emulate the environment. This middleware is called UpperTester (UT). This UT is connected to the Tester using Ethernet, and is used to communicate with the Tester using primitives specified by ETSI which can be found in [DR1].

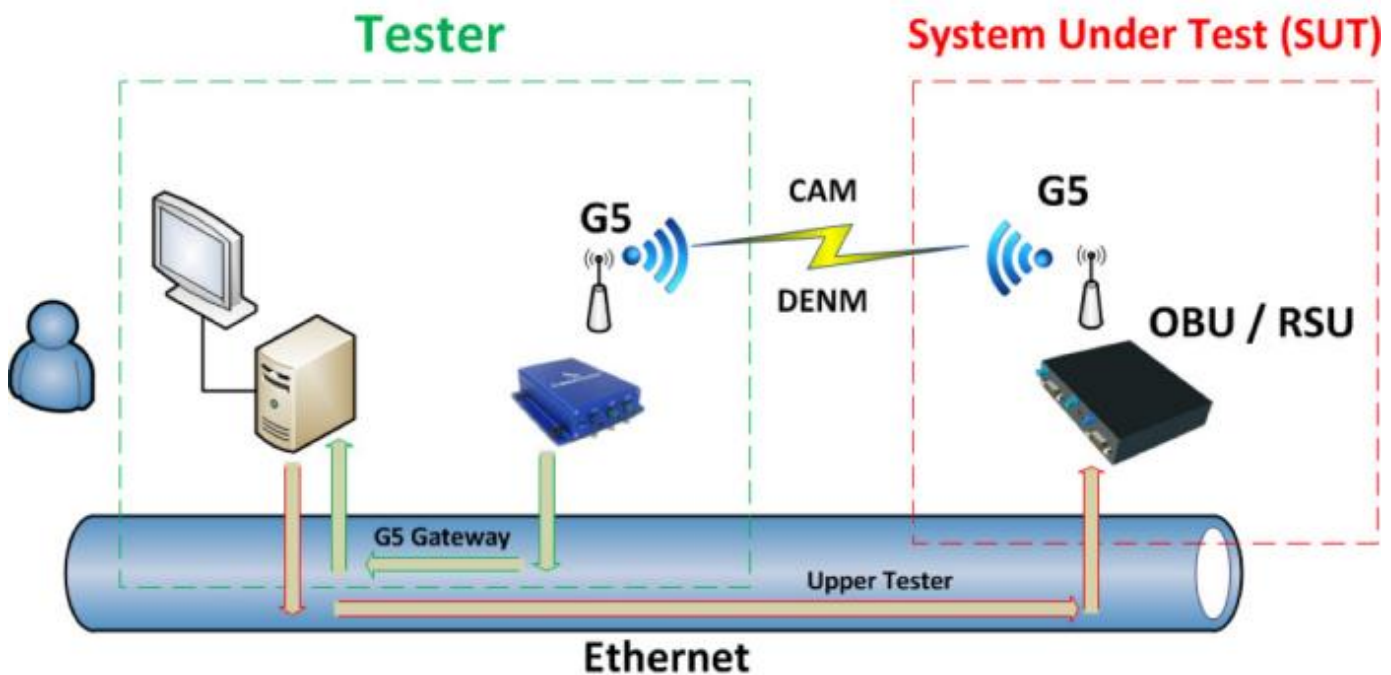


Figure 1: On-lab testing architecture

[DR2] is a deliverable that extends UT in order to emulate traffic light controller. In this document, we add primitives only for static configurations purposes, like roadworks or entry roadway areas. In the future, some primitives **may** be added for other configurations.

Since ETSI **may** add some primitives to their UT, if new values of MessageType collide with some of these extensions, the ETSI MessageType and associated primitives **must be** used and so, this document will be updated in order to be compliant with the ETSI standard.

3. Roadworks area configuration

These primitives are used in order to configure roadworks are like in B4 or B5 use cases.

3.1 UtRoadworksAreaConfiguration

Request (UtRoadworksAreaConfiguration TS → UT):

0								1								2								3							
0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
MessageType=0xB8								EventPositionLength								EventPosition															
...																															
SpeedLimit								NbLanes								Lanes															

Name	Length	Value
MessageType	1 byte	0xB8
EventPositionLength	1 byte	EventPosition UPER encoded length
EventPosition	EventPositionLength bytes	ReferencePosition UPER encoded. This field corresponds to the eventPosition.
SpeedLimit	1 byte	From 1 to 255 km/h. If SpeedLimit is set to 0, this field must be ignored by IUT.
NbLanes	1 byte	From 0 to 13. This field is used to know how many bits of the Lanes field are used. If NbLanes is set to 0, the Lanes field must be ignored by IUT.
Lanes	2 bytes	Each bit corresponds to the status of a lane counting from the inner lane. A closed lane correspond to a bit at 1. An open lane correspond to a bit at 0. For example, '1000000000000000'b with NbLanes equals 3 corresponds to the closure of the first lane and the two others are opened.

Response (UtConfigurationResult UT → TS):

0	1
0 1 2 3 4 5 6 7	0 1 2 3 4 5 6 7
MessageType=0xB7	Result

Name	Length	Value
MessageType	1 byte	0xB7
Result	1 byte	0x00: Failure 0x01: Success

4. Entry roadway area configuration

These primitives are used for entry roadway area configuration like in G5 or G6 use cases.

4.1 UtEntryRoadwayAreaConfiguration

Request (UtEntryRoadwayAreaConfiguration TS → UT):

0								1								2								3							
0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
MessageType=0xB9								EventPositionLength								EventPosition															
																...															
EventHistoryLength																EventHistory															
																...															
EntryRoadTraceLength																EntryRoadTraces															
																...															
MainRoadTraceLength																MainRoadTraces															
																...															
Shape								DistanceA								DistanceB															
...								Angle																							

Name	Length	Value
MessageType	1 byte	0xB9
EventPositionLength	1 byte	EventPosition UPER encoded length.
EventPosition	EventPositionLength bytes	ReferencePosition UPER encoded. This field corresponds to the eventPosition.
EventHistoryLength	2 bytes	EventHistory UPER encoded length.
EventHistory	EventHistoryLength bytes	EventHistory UPER encoded. This field corresponds to the eventHistory.
EntryRoadTraceLength	2 bytes	EntryRoadTraces UPER encoded length.
EntryRoadTraces	EntryRoadTracesLength bytes	Traces UPER encoded. This field corresponds to the traces of the entry road.
MainRoadTracesLength	2 bytes	MainRoadTraces UPER encoded length.
MainRoadTraces	MainRoadTracesLength bytes	Traces UPER encoded. This field corresponds to the traces of the main road.
Shape	1 byte	<ul style="list-style-type: none"> • 0 : circle • 1 : ellipse • 2 : rectangle This field is used to set the destination area shape.
DistanceA	2 bytes	From 0 to 65 535 m. This field is used to set the distance A of the destination area.
DistanceB	2 bytes	From 0 to 65 535 m. This field is used to set the distance B of the destination area.
Angle	2 bytes	From 0 to 360 ° from North. This field is used to set the angle of the destination area.

Response (UtConfigurationResult UT → TS):

0 1
0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7

MessageType=0xB7	Result
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Name	Length	Value
MessageType	1 byte	0xB7
Result	1 byte	0x00: Failure 0x01: Success