

# ETSI TS 103 158 V1.1.1 (2014-11)



TECHNICAL SPECIFICATION

**Digital Enhanced Cordless Telecommunications (DECT);  
New Generation DECT; Light Data Services;  
Software Update Over The Air (SUOTA);  
Profile Test Specification (PTS) and Test Case Library (TCL)**

PREVIEW  
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# Content

Intellectual Property Rights .....	5
Foreword.....	5
Modal verbs terminology.....	5
1 Scope .....	6
2 References .....	6
2.1 Normative references .....	6
2.2 Informative references.....	6
3 Definitions, symbols and abbreviations .....	7
3.1 Definitions.....	7
3.2 Symbols.....	7
3.3 Abbreviations .....	8
4 Test method.....	8
4.1 Test platform .....	9
4.1.1 PP test platform.....	9
4.1.1.1 PP test platform main requirements .....	9
4.1.1.2 Test content for HTTP-based applications, Simple profile .....	9
4.1.1.2.1 Test url and index page: index.html .....	9
4.1.1.2.2 Left page: pages/left.html .....	9
4.1.1.2.3 Center page: pages/center.html.....	9
4.1.1.2.4 Right page: pages/right.html.....	9
4.1.1.3 Test content for HTTP-based applications, Baseline profile.....	10
4.1.1.3.1 Test url and index page: index.html .....	10
4.1.1.3.2 Left page: pages/left.html.....	10
4.1.1.3.3 Center page: pages/center.html.....	10
4.1.1.3.4 Right page: pages/right.html.....	10
4.1.2 FP test platform.....	10
4.1.2.1 FP test platform main requirements .....	10
4.1.2.2 Test content for software upgrade (TS_1 + MS).....	11
4.2 Hypothesis.....	12
4.3 Test groups .....	12
4.3.1 Network features.....	12
4.3.2 Application features.....	12
5 Test Cases (TCs) .....	12
5.1 TC definition conventions .....	13
5.1.1 Test equipment implementation requirements .....	13
5.1.2 Definitions of used MACROs (PT and FT sides).....	14
5.1.2.1 Basic service MACROs (request from PP to FP).....	14
5.1.2.1.1 Suota C-plane .....	14
5.1.2.1.2 Binary content download.....	14
5.1.2.1 Handset version indication MACRO (request from PP to FP).....	15
5.1.2.2 Handset version available MACRO (from FP to PP).....	15
5.1.2.3 HTTP related MACROS .....	15
5.1.2.3.1 Submacros .....	15
5.1.2.3.2 range request MACRO (from PP to FP).....	16
5.1.2.3.3 HTTP range response MACRO (from FP to PP) .....	16
5.1.2.3.4 HTTP error MACRO (from FP to PP) .....	16
5.2 TC naming conventions.....	16
5.3 Portable Part TC purposes.....	17
5.3.1 List of New Generation DECT Part 4 PT tests cases.....	17
5.4 Fixed Part TC purposes .....	19
5.4.1 List of New Generation DECT Part 4 FT tests cases.....	19
6 Portable Part Test specification.....	22

6.1	DPRS PT Procedures.....	22
6.2	NGLDS-N.1 General Light Data Service Procedures .....	28
6.3	NGLDS-N.2 Software upgrade over the air, C-plane.....	31
6.4	NGLDS-A.1 Binary content download .....	38
6.5	NGLDS-A.2 Software upgrade over the air .....	39
6.6	NGLDS-A.3 HTTP based applications .....	46
7	Fixed Part Test specification .....	47
7.1	DPRS FT Procedures.....	48
7.2	NGLDS-N.1 General Light Data Service Procedures .....	55
7.3	NGLDS-N.2 Software upgrade over the air, C-plane.....	57
7.4	NGLDS-A.1 Binary content download .....	60
7.5	NGLDS-A.2 Software upgrade over the air .....	61
7.6	NGLDS-A.3 HTTP based applications .....	71
<b>Annex A (normative):       Declarations on features and procedures supported .....</b>		<b>73</b>
A.1	Declarations for portable part.....	73
A.1.1	Optional PT features.....	73
A.1.2	Extra information for PT testing.....	73
A.1.3	Optional or conditional PT procedures.....	74
A.2	Declarations for fixed part.....	75
A.2.1	Optional FT features.....	75
A.2.2	Extra information for FT testing.....	75
A.2.3	Optional or conditional FT procedures.....	75
<b>Annex B (informative):     List of NG-DECT Part 4 procedures .....</b>		<b>76</b>
<b>Annex C (normative):     Configuration for testing .....</b>		<b>78</b>
C.1	Portable part configuration to be declared by supplier.....	78
C.2	Fixed part internal configuration to be declared by supplier.....	78
C.3	Test environment configuration to be declared by test house or supplier .....	78
<b>Annex D (normative):     Amendments to other DECT specifications .....</b>		<b>79</b>
<b>Annex E (informative):    Bibliography.....</b>		<b>80</b>
History .....		81

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## Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Digital Enhanced Cordless Telecommunications (DECT).

The present document is the Test Specification for testing compliance with ETSI TS 102 527-4 [5]. "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 4: Light Data Services; Software Update Over The Air (SUOTA), content downloading and HTTP based applications".

The information in the present document is believed to be correct at the time of publication. However, DECT standardization is a rapidly changing area and it is possible that some of the information contained in the present document may become outdated or incomplete within relatively short time-scales.

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## Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**may not**", "**need**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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# 1 Scope

The present document contains the Profile Test Specification (PTS) and the Test Case Library (TCL) for "New Generation DECT; Part 4" Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 4: Light Data Services; Software Update Over The Air (SUOTA), content downloading and HTTP based applications"

The present document covers both the Portable (PT) and the Fixed (FT) Radio terminations.

The Test Case Library (TCL) covers also some test cases for "DECT Digital Packet Radio Service" [i.4]. This is done because such test cases are mandatory or especially relevant for New Generation DECT Part 4 (see ETSI TS 102 527-4 [5]).

The objective of the present document is to provide a basis for approval tests of NG-DECT Part 4 [5] equipment giving a high probability of air interface inter-operability between different manufacturer's DECT equipment.

# 2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

## 2.1 Normative references

The following referenced documents are necessary for the application of the present document.

- [1] ETSI EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".
- [2] ETSI EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".
- [3] ETSI TS 102 527-1: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 1: Wideband speech".
- [4] ETSI TS 102 527-3: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 3: Extended wideband speech services".
- [5] ETSI TS 102 527-4: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 4: Light Data Services; Software Update Over The Air (SUOTA), content downloading and HTTP based applications".
- [6] ETSI TS 102 527-5: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Part 5: Additional feature set nr. 1 for extended wideband speech services".

## 2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] World Wide Web Consortium Recommendation XHTML™ 1.1: "Module-based XHTML - Second Edition" - 23 November 2010.

NOTE: <http://www.w3.org/TR/2010/REC-xhtml11-20101123/>.

- [i.2] ISO/IEC 9646-7:1995: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".
- [i.3] ETSI TS 102 841: "Digital Enhanced Cordless Telecommunications (DECT); New Generation DECT; Extended wideband speech services; Profile Test Specification (PTS) and Test Case Library (TCL)".
- [i.4] ETSI EN 301 649: "Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Service (DPRS)".

## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI TS 102 527-5 [6], ETSI TS 102 527-3 [4], ETSI TS 102 527-1 [3], ETSI EN 300 444 [2] and the following apply:

**GAP (PP, FP, device or equipment):** PP, FP or any of them compliant with ETSI EN 300 444 [2].

**golden device:** ideal example of a device used as reference device for compliance testing and against which later devices are tested and judged

**NG-DECT Part 1 Golden Device:** Golden Device, such as the one administered by the DECT Forum, used for compliance testing of NG-DECT Part 1 [3] equipment

**NG-DECT Part 1 (PP, FP, device or equipment), also shortened as Part 1 (PP, FP, device or equipment):** PP, FP or any of them compliant with ETSI TS 102 527-1 [3]

**NG-DECT Part 3 (PP, FP, device or equipment), also shortened as Part 3 (PP, FP, device or equipment):** PP, FP or any of them compliant with ETSI TS 102 527-3 [4]

**NG-DECT Part 4 (PP, FP, device or equipment), also shortened as Part 4 (PP, FP, device or equipment):** PP, FP or any of them compliant with ETSI TS 102 527-4 [5]

**NG-DECT Part 5 (PP, FP, device or equipment), also shortened as Part 5 (PP, FP, device or equipment):** PP, FP or any of them compliant with ETSI TS 102 527-5 [6]

**provision mandatory, process mandatory:** indicated feature service or procedure are implemented as described in the present document, and may be subject to testing

**provision optional, process mandatory:** indicated feature, service or procedure may be implemented, and if implemented, the feature, service or procedure are implemented as described in the present document, and may be subject to testing

NOTE: The notation used is based on the notation proposed in ISO/IEC 9646-7 [i.2].

### 3.2 Symbols

For the purposes of the present document, the following symbols apply:

C	conditional to support (process mandatory)
E	Test Parameter used in parameterized tests for an HTTP Error
I	out-of-scope (provision optional, process optional) not subject for testing
M	mandatory to support (provision mandatory, process mandatory)
MSO	Test Parameter used in parameterized tests for indicating the MS origin (manufacturer or 3 <sup>rd</sup> party)
N/A	not applicable (in the given context the present document makes it impossible to use this capability)
O	optional to support (provision optional, process mandatory)
SUF	Test Parameter used in parameterized tests for the (variable) suffix of the software version
URLP	Test Parameter used in parameterized tests for an URL Parameter

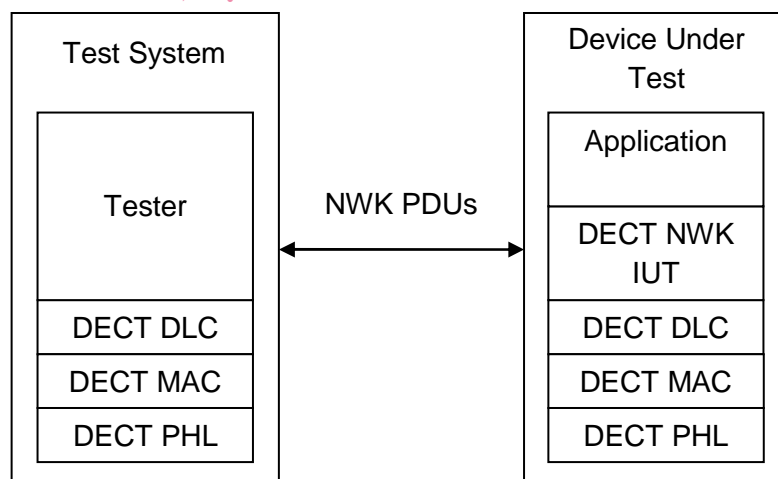
### 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

BCD	Binary Content Download
CC	Call Control
CI	Common Interface
DECT	Digital Enhanced Cordless Telecommunications
DLC	Data Link Control
DS	Download Server
FP	Fixed Part
FT	Fixed radio Termination
GAP	Generic Access Profile
HTTP	HyperText Transfer Protocol
IE	Information Element
IUT	Implementation Under Test
IWU	InterWorking Unit
IXIT	Implementation eXtra Information for Testing
LDS	Light Data Services
MAC	Medium Access Control
MS	Management Server
NG	New Generation
NG-DECT	New Generation DECT
NWK	NetWork
PHL	PHysical Layer
PP	Portable Part
PT	Portable radio Termination
PTS	Profile Test Specification
RF	Radio Frequency
TCL	Test Case Library
TS	Test System

## 4 Test method

This clause describes the test method used to test the NG DECT Part 4 devices.



**Figure 1: New Generation DECT remote test method**

A tester (see figure 1) is located in a remote DECT test system. It controls and observes the behaviour of the Implementation Under Test (IUT). The Test System behaves as a FP (or a PP) when testing a PP (respectively a FP). Figure 1 illustrates the layered architecture of the test method.

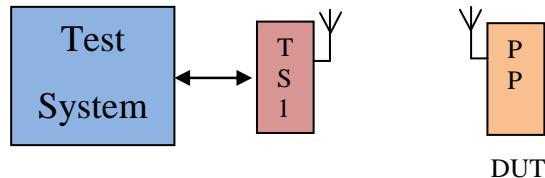


## 4.1 Test platform

### 4.1.1 PP test platform

#### 4.1.1.1 PP test platform main requirements

The PP test platform is outlined in figure 2.



**Figure 2: PP Test Platform**

The first RF front-end of Test system "TS\_1" plays the role of a LDS FP to which the PP under test is registered.

The DUT supplier shall also supply new software revision file/files for installation on the Test System.

#### 4.1.1.2 Test content for HTTP-based applications, Simple profile

NOTE : This test content was designed for TC\_PT\_NGLDS.A3\_BV\_109 and is reused for test TC\_FT\_NGLDS.A.2\_BV\_105 on FT side.

##### 4.1.1.2.1 Test url and index page: index.html

Test url1 = http:// \${SERVER\_HOSTNAME}/http-based-application-1/

The SERVER\_HOSTNAME variable value shall be provided by the 3<sup>rd</sup> party providing the server.

Home\_page=Test url1 + 'index.html' shall target the following resource.

```
<html>
<head><title>My service</title></head>
<body>
  <p style="text-align:left;"><a href="pages/left.html">Left</a></p><br />
  <p style="text-align:center;"><a href="pages/center.html">Center</a></p><br />
  <p style="text-align:right;"><a href="pages/right.html">Right</a></p>
</body>
</html>
```

##### 4.1.1.2.2 Left page: pages/left.html

```
<html>
  <head><title>Left page</title></head>
  <body><p>Link for this page was on the left</p></body>
</html>
```

##### 4.1.1.2.3 Center page: pages/center.html

```
<html>
  <head><title>Center page</title></head>
  <body><p>Link for this page was centered</p></body>
</html>
```

##### 4.1.1.2.4 Right page: pages/right.html

```
<html>
  <head><title>Right page</title></head>
  <body><p>Link for this page was on the right</p></body>
</html>
```

### 4.1.1.3 Test content for HTTP-based applications, Baseline profile

#### 4.1.1.3.1 Test url and index page: index.html

Test url2 = http:// \${SERVER\_HOSTNAME}/http-based-application-2/

The SERVER\_HOSTNAME variable value shall be provided by the 3<sup>rd</sup> party providing the server.

Home\_page=Test url2 + 'index.html' shall target the following resource.

```
<html>
<head><title>My service</title></head>
<body>
<ul>
<li style="text-align:left;">
<a href="pages/left.html">Left</a></p><br/>
<li style="text-align:center;">
<a href="pages/center.html">Center</a></p><br/>
<li style="text-align:right;">
<a href="pages/right.html">Right</a></p>
</ul>
</body>
</html>
```

#### 4.1.1.3.2 Left page: pages/left.html

```
<html>
<head><title>Left page</title></head>
<body><p>Link for this page was on the left</p></body>
</html>
```

#### 4.1.1.3.3 Center page: pages/center.html

```
<html>
<head><title>Center page</title></head>
<body><p>Link for this page was centered</p></body>
</html>
```

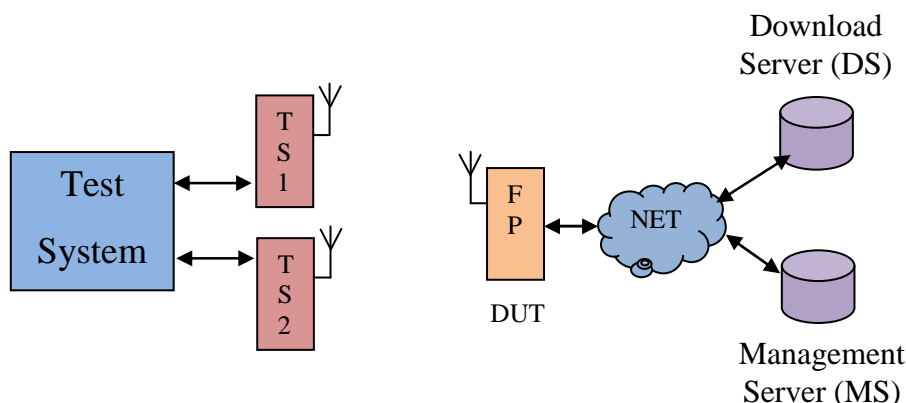
#### 4.1.1.3.4 Right page: pages/right.html

```
<html>
<head><title>Right page</title></head>
<body><p>Link for this page was on the right</p></body>
</html>
```

## 4.1.2 FP test platform

### 4.1.2.1 FP test platform main requirements

The fixed part under test shall be connected to a network when running the tests suite. It shall be ready to support the SUOTA feature. An example of FP test platform is depicted in figure 3.



**Figure 3: Example of FP Test platform**

The Test System shall include 2 separate PP entities (TS\_1 and TS\_2).

**Management server.** The FP IUT may be presented for conformance testing with an IP addressable Management Server. In that case, every test involving a MS shall be performed twice. More specifically:

- The test shall at least be performed once with the 3<sup>rd</sup> party MS, that shall implement Basic SUOTA.
- If the FP manufacturer provides another MS, the test shall additionally be performed a second time with this MS. This MS implementation may be either basic or enhanced.

Both MSs shall be populated with the data provided in clause 4.1.2.2.

**Download server.** The FP manufacturer shall not provide any Downloading Server. Only the 3<sup>rd</sup> party DS shall be used.

Two mock firmware files (image.bin and checksum.bin) shall be provided by the 3<sup>rd</sup> party together with the Downloading Server, to be used for the upgrade of TS\_1 and TS\_2 (see clause 4.1.2.2).

**Set of XHTML pages and server for HTTP based application tests.** The third party shall provide a server for hosting the set of test pages (the download server could be reused for this purpose) and shall reuse the set of XHTML test pages described in clause 4.1.1.2 for PT test platform (see parameterized test TC\_FT\_NGLDS.A3\_BV\_104(URLP) and corresponding test instance TC\_FT\_NGLDS.A3\_BV\_105 for more details).

#### 4.1.2.2 Test content for software upgrade (TS\_1 + MS)

Table 1 describes the data to be used for populating TS\_1 (PT), the Management Server (MS) or both when testing the FT (multiple file upgrade with two files is used).

The values listed below for populating the MS (or for populating both the MS and TS\_1) shall apply whether the MS used for a given test is provided by a third party (3<sup>rd</sup> party Basic SUOTA MS), or by the FP manufacturer (either basic or enhanced SUOTA enabled).

As an exception and for convenience, the value of URL1 depends on the MS used (see below and FT\_IXIT\_2 and 3 in table A.4 of clause A.2.2).

The tester supplier shall supply the mock files image.bin and checksum.md5 as described in table 1 below.

**Table 1: Test content for software upgrade**

Description	Name	Value	Comment
<b>Variables populating both TS_1 and MS at test start</b>			
MS entry point	URL1	FT_IXIT_2 for 3 <sup>rd</sup> party Basic SUOTA MS FT_IXIT_3 for Manufacturer MS	note 1
IUT hardware version	HWV	"YOU 'RTALKINGTOME?"	17 IA5 characters (assumed to be stable over the whole test):

Description	Name	Value	Comment
<b>Variables populating both TS_1 and MS at test start</b>			
IUT EMC value at test start	EMC	'01ab'H	2 octets
IUT SW version installed at test start	SWV0	"SWV-BEFORE-TEST" + number_str (note 3)	20 IA5 characters
<b>Variables populating MS only at test start</b>			
IUT SW version installed at test end	SWV1	"SWV-AFTER-TEST"	19 IA5 characters
Nb of files to be downloaded	Nf	2	
Url of 1 <sup>st</sup> file	URL2 <sub>1</sub>	http://\${DS_HOSTNAME}/download/image.bin (note 2)	'image.bin' file size shall be 100010 octets
Url of 2 <sup>nd</sup> file	URL2 <sub>2</sub>	http://\${DS_HOSTNAME}/download/checksum.md5 (note 2)	'checksum.bin' file size shall be 100010 octets
<b>Variables populating TS_1 only at test start</b>			
Number of file chunks used	M	101	Used for both files
HTTP range sizes	C <sub>1</sub> , ..., C <sub>M-1</sub>	1000	Used for both files
Last HTTP range size	C <sub>M</sub>	10	Used for both files
NOTE 1: If the test uses the 3 <sup>rd</sup> party Basic SUOTA MS, then URL1=FT_IXIT_2; else if the test uses the MS provided by the manufacturer, URL1=FT_IXIT_3 (see Table A.1 of clause A.2.2).			
NOTE 2: DS_HOSTNAME is declared through FT_IXIT_4 (see table A.4 of clause A.2.2).			
NOTE 3: TS_1 shall use a different SWV0 value for each test, formed with "SWV-BEFORE-TEST" prefix immediately followed by a string representing a number between 1 and 1 000 in decimal. This avoids the case of a FP not requesting the MS in step 2 (see SUOTA upgrade description) because it already has the needed information in cache.			

## 4.2 Hypothesis

### Protocol layers tested

Network and application features are only tested. DLC, MAC and PHY procedures used by new DECT generation standard are supposed to be tested when testing network features.

### Speech services tested

The device under test is required to support only mandatory speech services. Optional codecs are out of the scope of the present document.

### Length of a NWK layer message

The test equipment shall not send NWK layer messages longer than 63 bytes (see ETSI EN 300 444 [2], clause 6.9.3). In the other direction, the test equipment shall be capable of receiving and processing NWK layer messages of at least 63 octets long. A received NWK layer message longer than 63 bytes shall be discarded.

## 4.3 Test groups

### 4.3.1 Network features

Network features are described in clauses 5.2, 6.4 and 6.10 of ETSI TS 102 527-5 [6].

### 4.3.2 Application features

Application features are described in clauses 5.7, 6.9 and 6.13 of ETSI TS 102 527-5 [6].

## 5 Test Cases (TCs)

Each test case is allocated directly under a defined TC.

## 5.1 TC definition conventions

The TCs are defined following particular rules as shown in table 2.

**Table 2: TC definition rules**

TC Id according to the TC naming conventions	Test case objective
<b>Main test purpose:</b>	Optional detailed description of test case objective for complex test cases
<b>Reference:</b>	The reference should contain the references of the subject to be validated by the actual TC (specification reference, clause, paragraph, flow chart number, etc.).
<b>Initial condition:</b>	The condition defines in which initial state the IUT has to be to apply the actual TC.
<b>Time sequence:</b>	The time sequence is the description of the test case, including messages exchanged between IUT and tester and user actions. In other words, it defines the sequence of stimuli experienced by the IUT and its expected response(s).
<b>Pass criteria:</b>	Definition of the verifications that the tester shall perform on the responses expected from the IUT in order to ascertain conformance of the latter with the base specification.
<b>Comments: (optional)</b>	Additional information or comments on test case content.
<b>Display_n</b>	Optional list of tester display messages description

The device under test and the test equipment shall meet the features and procedures specified in "New Generation DECT; Part 4: Light Data Services; Software Updates Over The Air (SUOTA), content downloading and HTTP based applications" (see ETSI TS 102 527-4 [5]).

### TC Id

The TC Id is a unique identifier; it shall be specified according to the TC naming conventions defined in the clause 5.2.

### Reference

When a flowchart number is given in reference, this flowchart is only a recommendation to implement the test case. As a result, the TS shall be flexible enough to deal with several IUT implementations (dynamic behaviour).

### Initial condition

It is stipulated when a test necessitates another registered PP (NG PP or legacy GAP PP).

By default (i.e. when no other PP is specified), the TS\_1 and the IUT are involved together in the CC instance whose CC control state is stipulated in the initial condition.

A test case reference is given when this TC has to be run to reach the initial condition (for example: "Run TC\_FT\_NG1.N.16\_BV\_1802"). That means that this test case shall be run before the current one.

### Pass criteria

- Criterion for checking "end-to-end U-plane connection": this is an operation to detect the state of the U-plane connection. The acoustical path will be checked in both directions. When testing a PP, Test system could perform an audio loopback and introduce a delay (e.g. 1 s) to create an echo. When testing a FP, Test system could use a tone generation. In both cases, Test system could also use a handset receiver plugged in the equipment.
- Some parameters used in TCs can be allocated by the IUT (e.g. call id, terminal identity number, session id, line id, etc.) or be network dependant (line type information for each line). As a consequence a generic notation is used in the TC description (respectively "call id A", "IA5 coding of terminal identity number in decimal of PP1", session id n, line 0, lt0, etc.).

### 5.1.1 Test equipment implementation requirements

This clause specifies the general requirements to be implemented by the test equipment. The requirements listed below can be valid either for several features on one side, or for one feature on both sides, PP and FP side. Specific requirements for a single feature are given in the related clause describing the sub tests suite for this feature.