

# ETSI TS 105 388 V1.1.1 (2008-04)

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*Technical Specification*

**Transmission and Multiplexing (TM);  
Access transmission systems on metallic access cables;  
Asymmetric Digital Subscriber Line (ADSL2plus) -  
European specific requirements  
[ITU-T Recommendation G.992.5 modified]**

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F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00. Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
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# Contents

Intellectual Property Rights .....	4
Foreword.....	4
1 Scope .....	5
2 References .....	5
2.1 Normative references .....	5
2.2 Informative references.....	6
3 Abbreviations .....	6
3.1 Abbreviations .....	6
4 Test methods .....	6
5 Other specific requirements.....	6
5.1 European specific tests .....	6
5.1.1 Repetitive Electrical Impulse Noise (REIN) test .....	6
5.2 Reach requirements .....	6
5.2.1 Reach requirements for FDD ADSL2plus from cabinet in "FD" noise .....	6
5.3 Framing related requirements.....	7
5.3.1 Requirements for INP .....	7
5.3.2 Requirements for interleaving memory .....	7
5.3.3 Requirements for S&D framing parameters .....	7
5.3.3.1 Requirement for use in conjunction with 16 002 bytes interleaving memory.....	7
5.3.3.2 Requirement for use in conjunction with 24 000 bytes interleaving memory.....	7
History .....	9

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## Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Access, Terminals, Transmission and Multiplexing(ATTM).

The present document, in conjunction with ITU-T Recommendation G.992.5 [1] and amendments 1 [2], 2 [3] and 3 [4], provides the European specifications for ADSL2plus, to the exclusion in annex C of G.992.5.

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# 1 Scope

The present document specifies European requirements for ADSL2plus.

The present document endorses ITU-T Recommendation G.992.5 [1] and amendments 1 [2], 2 [3] and 3 [4], the contents of which apply together with the addition of the modifications being covered herein, to the exclusion of annex C of G.992.5. In particular the aspects covered by the present document are related to:

- 1) Define INP values as mandatory.
- 2) Define specific European tests.
- 3) Define mandatory S&D values.
- 4) Define mandatory support of extended interleaving memory.

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# 2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
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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 indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] ITU-T Recommendation G.992.5 (01/05): "Asymmetric digital subscriber line (ADSL) transceivers - extended bandwidth ADSL2 (ADSL2plus)".
- [2] ITU-T Recommendation G.992.5 (07/05): Amendment 1, "Asymmetric digital subscriber line (ADSL) transceivers - extended bandwidth ADSL2 (ADSL2plus)".
- [3] ITU-T Recommendation G.992.5 (06/06) Amendment 2: "Asymmetric digital subscriber line (ADSL) transceivers - extended bandwidth ADSL2 (ADSL2plus)".
- [4] ITU-T Recommendation G.992.5 (07/02) Amendment 3: "Asymmetric digital subscriber line (ADSL) transceivers - extended bandwidth ADSL2 (ADSL2plus)".

- [5] DSL Forum TR-100 (2007): "ADSL2/ADSL2plus Performance test plan".
- [6] ETSI TS 101 388 (V1.4.1): "Access Terminals Transmission and Multiplexing (ATTM); Access transmission systems on metallic access cables; Asymmetric Digital Subscriber Line (ADSL) - European specific requirements [ITU-T Recommendation G.992.1 modified]".
- [7] ITU-T Recommendation G.992.3 (09/05) Amendment 1: "Asymmetric digital subscriber line (ADSL) transceivers".

## 2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Not applicable.

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## 3 Abbreviations

### 3.1 Abbreviations

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

DSL	Digital Subscriber Line
INP	Impulse Noise Protection
REIN	Repetitive Electrical Impulse Noise

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## 4 Test methods

All test methods shall be as defined in TS 101 388 [6], and DSL Forum Technical report TR 100 [5], as required by test definitions in clause 5.

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## 5 Other specific requirements

### 5.1 European specific tests

This clause contains European specific tests. Other performance requirements are for further study.

#### 5.1.1 Repetitive Electrical Impulse Noise (REIN) test

The test method shall be identical to the section 7.2.2 of DSL Forum TR-100 [5].

Additional European requirements are for further study.

### 5.2 Reach requirements

This clause contains European specific reach requirements.

#### 5.2.1 Reach requirements for FDD ADSL2plus from cabinet in "FD" noise

Shall meet the requirements of A.3.1 (rate adaptive) and A.3.2 (fixed rate) in DSL Forum TR-100 [5]. Additional European requirements are for further study.

## 5.3 Framing related requirements

This clause contains European specific requirements related to framing parameter and framing parameter control.

### 5.3.1 Requirements for INP

The mandatory values for Impulse Noise Protection (INP) for upstream and downstream transmission in European ADSL2plus transmission systems are 0, 1/2, 1, 2, 4, 8, and 16.

The choice of values for INP\_min and Delay\_max can dramatically affect the resulting net data rate of the transmission system. This is illustrated in Tables K.3a/G.992.5 and K.3b/G.992.5 of ITU-T Recommendation G.992.5 [1] for upstream and downstream transmission.

### 5.3.2 Requirements for interleaving memory

From January 1<sup>st</sup>, 2009, the extended interleaving memory of 24 000 bytes, that can be negotiated as defined in ITU-T Recommendation G.992.5 amendment 3 [4], shall be mandatory.

### 5.3.3 Requirements for S&D framing parameters

#### 5.3.3.1 Requirement for use in conjunction with 16 002 bytes interleaving memory

The mandatory framing configurations are extended as follows:

The mandatory downstream framing control parameter support for the mandatory latency path 0 is extended as follows (extension of table 7-9/G.992.3 amendment 1 [7]). The values in the table shall be supported in the transmitter and receiver.

**Table 1: Mandatory downstream control parameter support for latency path #0 in conjunction with 16 002 bytes interleaving memory**

Parameter	Capability
$D_0$	1, 2, 4, 8, 16, 32, 64, 96, 128, 160, 192, 224, 256, 288, 320. Support of the mandatory $D_0$ values above 64 shall be indicated during initialization, through individual indication with 1 bit per value. Support of additional optional $D_0$ values is indicated during initialization. All indicated values of $D_0$ shall be supported.
$S_0$	$1/11 \leq S_0 < 64$ . Support of these mandatory $S_0$ values shall be indicated during initialization, through $S_{0\ min}$ , with $S_{0\ min} \leq 1/11$ . Support of additional optional $S_0$ values is indicated during initialization, through $S_{0\ min}$ , with $1/16 \leq S_{0\ min} < 1/11$ . All values of $S_0$ , with $S_{0\ min} \leq S_0 \leq 1/11$ , shall be supported.

#### 5.3.3.2 Requirement for use in conjunction with 24 000 bytes interleaving memory

From January 1<sup>st</sup>, 2009, in conjunction with the 24 000 bytes interleaving memory defined in clause 5.3.2, the mandatory downstream framing control parameter support for the mandatory latency path 0 will be extended as follows (extension of table 7-9/G.992.3 amendment 1 [7]). The values in the table shall be supported in the transmitter and receiver.

**Table 2: Mandatory downstream control parameter support for latency path #0  
in conjunction with 24 000 bytes interleaving memory**

Parameter	Capability
$D_0$	1,2,4,8,16,32,64,96,128,160,192,224,256,288,320, 352, 384 Support of the mandatory $D_0$ values above 64 shall be indicated during initialization, through individual indication with 1 bit per value. Support of additional optional $D_0$ values is indicated during initialization. All indicated values of $D_0$ shall be supported.
$S_0$	$1/11 \leq S_0 < 64$ . Support of these mandatory $S_0$ values shall be indicated during initialization, through $S_{0\ min}$ , with $S_{0\ min} \leq 1/11$ . Support of additional optional $S_0$ values is indicated during initialization, through $S_{0\ min}$ , with $1/16 \leq S_{0\ min} < 1/11$ . All values of $S_0$ , with $S_{0\ min} \leq S_0 \leq 1/11$ , shall be supported.

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