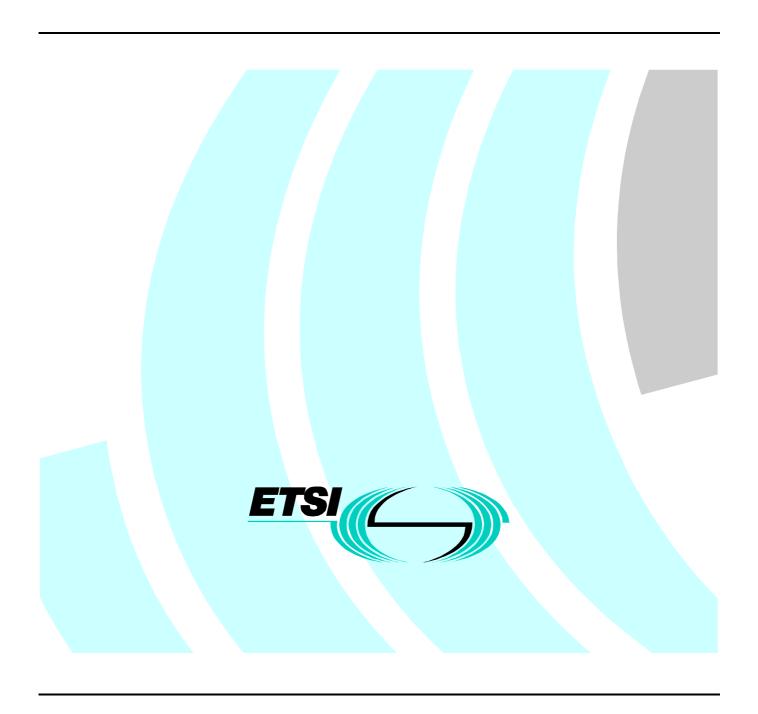# ETSI EN 300 462-6-2 V1.1.1 (2000-03)

European Standard (Telecommunications series)

Transmission and Multiplexing (TM);
Generic requirements for synchronization networks;
Part 6-2: Timing characteristics of primary reference clocks;
Implementation Conformance Statement (ICS)
proforma specification

ETSI

ETSI

Important notice

This ETSI deliverable may be made available in more than one electronic version or in print. In any case of existing or
perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF).
In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network
drive within ETSI Secretariat.

Copyright Notification

ETSI

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://www.etsi.org/ipr).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Transmission and Multiplexing (TM).

The present document has been produced to provide requirements for synchronization networks that are compatible with the performance requirements of digital networks.

The present document is part 6, sub-part 2 of a multi-part EN covering Transmission and Multiplexing (TM); Generic requirements for synchronization networks, as identified below:

Part 1-1:   "Definitions and terminology for synchronization networks";

Part 2-1:   "Synchronization network architecture";

Part 3-1:   "The control of jitter and wander within synchronization networks";

Part 4-1:   "Timing characteristics of slave clocks suitable for synchronization supply to Synchronous Digital Hierarchy (SDH) and Plesiochronous Digital Hierarchy (PDH) equipment";

Part 4-2:   "Timing characteristics of slave clocks suitable for synchronization supply to Synchronous Digital Hierarchy (SDH) and Plesiochronous Digital Hierarchy (PDH) equipment; Implementation Conformance Statement (ICS) proforma specification";

Part 5-1:   "Timing characteristics of slave clocks suitable for operation in Synchronous Digital Hierarchy (SDH) equipment";

Part 6-1:   "Timing characteristics of primary reference clocks";

Part 6-2:   "Timing characteristics of primary reference clocks; Implementation Conformance Statement (ICS) proforma specification";

Part 7-1:   "Timing characteristics of slave clocks suitable for synchronization supply to equipment in local node applications".

National transposition dates	
Date of adoption of this EN:	25 February 2000
Date of latest announcement of this EN (doa):	31 May 2000
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 November 2000
Date of withdrawal of any conflicting National Standard (dow):	30 November 2000

Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a telecommunication specification. Such a statement is called an Implementation Conformance Statement (ICS).

The ICS proforma is not another complete description of the related specification, but rather a compact form of its static conformance requirements, to be used by the test laboratory to identify which test shall be performed on a given implementation. Not every feature of a profile specification is contained in the related ICS proforma. For particular cases requiring specific information the ICS can refer to the appropriate clause of the related specification by means of references, notes and or comments.

1 Scope

The present document provides the Implementation Conformance Statement (ICS) proforma specification for the synchronization network generic requirements defined in EN 300 462-6-1 [6] in compliance with the relevant requirements, and in accordance with the relevant guidance given in ISO/IEC 9646-7 [9] and ETS 300 406 [7].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

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

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1]   ETSI EN 300 462-1-1: "Transmission and Multiplexing (TM); Generic requirements for synchronization networks; Part 1-1: Definitions and terminology for synchronization networks".

[2]   ETSI EN 300 462-2-1: "Transmission and Multiplexing (TM); Generic requirements for synchronization networks; Part 2-1: Synchronization network architecture".

[3]   ETSI EN 300 462-3-1: "Transmission and Multiplexing (TM); Generic requirements for synchronization networks; Part 3-1: The control of jitter and wander within synchronization networks".

[4]   ETSI EN 300 462-4-1: "Transmission and Multiplexing (TM); Generic requirements for synchronization networks; Part 4-1: Timing characteristics of slave clocks suitable for synchronization supply to Synchronous Digital Hierarchy (SDH) and Plesiochronous Digital Hierarchy (PDH) equipment".

[5]   ETSI EN 300 462-5-1: "Transmission and Multiplexing (TM); Generic requirements for synchronization networks; Part 5-1: Timing characteristics of slave clocks suitable for operation in Synchronous Digital Hierarchy (SDH) equipment".

[6]   ETSI EN 300 462-6-1: "Transmission and Multiplexing (TM); Generic requirements for synchronization networks; Part 6-1: Timing characteristics of primary reference clocks".

[7]   ETSI ETS 300 406 (Ed.1): "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

[8]   ISO/IEC 9646-1 (1994): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 1: General concepts".

[9]   ISO/IEC 9646-7 (1995): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 7: Implementation Conformance Statements ".

[10]   ETSI ETS 300 019: "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Terms defined in:

- EN 300 462-1-1 [1]; EN 300 462-2-1 [2]; EN 300 462-3-1 [3]; EN 300 462-4-1 [4]; EN 300 462-5-1 [5] and in EN 300 462-6-1 [6];

- ISO/IEC 9646-1 [8] and in ISO/IEC 9646-7 [9].

In particular, the following terms defined in ISO/IEC 9646-1 [8] apply:

Implementation Conformance Statement (ICS): statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented. The ICS can take several forms: protocol ICS, profile ICS, profile specific ICS, information object ICS, etc.

ICS proforma: document, in the form of a questionnaire, which when completed for an implementation or system becomes an ICS.

3.2 Abbreviations

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

ICS	Implementation Conformance Statement
IUT	Implementation Under Test
MTIE	Maximum Time Interval Error
PDH	Plesiochronous Digital Hierarchy
PRC	Primary Reference Clock
SCS	System Conformance Statement
SDH	Synchronous Digital Hierarchy
SUT	System Under Test
TDEV	Time DEViation
UI	Unit Interval
UIpp	Unit Interval peak to peak
UTC	Universal Time Coordinated

A full list of abbreviations used in timing and synchronization is listed in EN 300 462-1-1 [1].

4 Conformance to this ICS proforma specification

If it claims to conform to the present document, the actual ICS proforma to be filled in by a supplier shall be technically equivalent to the text of the ICS proforma given in annex A, and shall preserve the numbering/naming and ordering of the proforma items.

An ICS which conforms to the present document shall be a conforming ICS proforma completed in accordance with the guidance for completion given in clause A.1.

Annex A (normative):
ICS proforma guidance

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the ICS proforma in this annex so that it can be used for its intended purposes and may further publish the completed ICS.

A.1   Guidance for completing the ICS proforma

A.1.1   Purposes and structure

The purpose of this ICS proforma is to provide a mechanism whereby a supplier of an implementation of the requirements defined in EN 300 462-6-1 may provide information about the implementation in a standardized manner.

The ICS proforma is subdivided into subclauses for the following categories of information:

- guidance for completing the ICS proforma;

- identification of the implementation;

- identification of the EN;

- global statement of conformance.

A.1.2   Abbreviations and conventions

The ICS proforma contained in annexes of the present document is comprised of information in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7.

Item column

The item column contains a number which identifies the item in the table.

Item description column

The item description column describes in free text each respective item (e.g. parameters, timers, etc.). It implicitly means "is <item description> supported by the implementation?".

Status column

The following notations, defined in ISO/IEC 9646-7, are used for the status column:

- m: mandatory - the capability is required to be supported;

- o: optional - the capability may be supported or not;

- n/a: not applicable - in the given context, it is impossible to use the capability;

- x: prohibited (excluded) - there is a requirement not to use this capability in the given context;

- o.i: qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer which identifies an unique group of related optional items and the logic of their selection which is defined immediately following the table;

- ci: conditional - the requirement on the capability ("m", "o", "x" or "n/a") depends on the support of other optional or conditional items. "i" is an integer identifying an unique conditional status expression which is defined immediately following the table.

Reference column

The reference column makes reference to EN 300 462-6-1, except where explicitly stated otherwise.

Support column

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO/IEC 9646-7, are used for the support column:

- Y or y: supported by the implementation;

- N or n: not supported by the implementation;

- N/A, n/a or -:   no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).

If this ICS proforma is completed in order to describe a multiple-profile support in a system, it is necessary to be able to answer that a capability is supported for one profile and not supported for another. In that case, the supplier shall enter the unique reference to a conditional expression, preceded by "?" (e.g. ?3). This expression shall be given in the space for comments provided at the bottom of the table. It uses predicates defined in the SCS, each of which refers to a single profile and which takes the value TRUE if and only if that profile is to be used.

    EXAMPLE: ?3:   IF prof1 THEN Y ELSE N.

It is also possible to provide a comment to an answer in the space provided at the bottom of the table.

Values allowed column

The values allowed column contains the type, the list, the range, or the length of values allowed. The following notations are used:

- range of values: <min value>.. <max value>:

  - example: 5.. 20.

- list of values: <value1>, <value2>,........, <valueN>:

  - example: 2, 4, 6, 8, 9;

  - example: '1101'B, '1011'B, '1111'B;

  - example: '0A'H, '34'H, '2F'H.

- list of named values: <name1>(<val1>), <name2>(<val2>),...., <nameN>(<valN>:

  - example: reject(1), accept(2).

- length: size (<min size>.. <max size>):

  - example: size (1.. 8).

Values supported column

The values supported column shall be filled in by the supplier of the implementation. In this column, the values or the ranges of values supported by the implementation shall be indicated.

References to items

For each possible item answer (answer in the support column) within the ICS proforma a unique reference exists, used, for example, in the conditional expressions. It is defined as the table identifier, followed by a "slash" character "/", followed by the item number in the table. If there is more than one support column in a table, the columns are discriminated by letters (a, b, etc.), respectively.

    EXAMPLE 1:   A.5/4 is the reference to the answer of item 4 in table 5 of annex A.

    EXAMPLE 2:   A.6/3b is the reference to the second answer (i.e. in the second support column) of item 3 in table 6 of annex A.

Prerequisite line

A prerequisite line takes the form: Prerequisite: <predicate>.

A prerequisite line after a clause or table title indicates that the whole clause or the whole table is not required to be completed if the predicate is FALSE.

A.1.3   Instructions for completing the ICS proforma

The supplier of the implementation shall complete the ICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support column boxes provided, using the notation described in subclause A.1.2.

If necessary, the supplier may provide additional comments in space at the bottom of the tables, or separately on sheets of paper.

More detailed instructions are given at the beginning of the different subclauses of the ICS proforma.

Annex B (normative):
ICS proforma for EN 300 462-6-1, Timing characteristics of primary reference clocks

B.1   Identification of the implementation

In the present document, an Implementation Under Test (IUT) refers to a Primary Reference Clock (PRC), specifically one suitable for synchronization supply to digital networks. A typical PRC provides the reference signal for the timing or synchronization of other clocks within a network of section of a network. The PRC is a clock with a long-term accuracy better than 1 part in 10^{11} as compared to Universal Time Coordinated (UTC).

Identification of the IUT and the SUT in which it resides should be filled in so as to provide as much detail as possible regarding version numbers and configuration options.

The product supplier information and client information should both be filled in if they are different.

A person who can answer queries regarding information supplied in the ICS should be named as the contact person.

B.1.1   Date of the statement

....

B.1.2   Implementation Under Test (IUT) identification

IUT name:

....

....

IUT version:

....

B.1.3   System Under Test (SUT) identification (if appropriate)

SUT name:

....

....

Hardware configuration:

....

....

....

Operating system:

....

B.1.4   Product supplier

Name:

....

Address:

....

....

....

Telephone number:

....

Facsimile number:

....

E-mail address:

....

Additional information:

....

....

....

B.2   Identification of the EN

This ICS proforma applies to the following standard:

-    EN 300 462-6-1: "Transmission and Multiplexing (TM); Generic requirements for synchronization networks; Part 6-1: Timing characteristics of primary reference clocks".

B.3   Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No)   ....

NOTE 1: Answering "No" to this question indicates non-conformance to the EN specification. Non-supported mandatory capabilities are to be identified in the ICS, with an explanation of why the implementation is non-conforming, on pages attached to the ICS proforma.

NOTE 2: Answering "Yes" to this question indicates only that all the capabilities with the explicit status "m" are supported. It is not necessary to fill in the support column of the associated item.

B.4 PRC description

Table B.1: PRC description

Item	PRC function	Reference	Status	Support
1	The PRC supports one or more output external synchronization interfaces of one or more of the following types: 2 048 kHz or 2 048 kbit/s.	8	m	
2	The PRC supports other output interfaces such as sine wave 8 kHz to 5 MHz (under study).	8	n/a	

B.4.1 PRC interface description

Table B.2: PRC output interface description

Item	PRC output interface	Reference	Status	Support
1	The PRC supports an output external synchronization interface type of 2 048 kHz.	8	o.201	
2	The PRC supports an output external synchronization interface type of 2 048 kbit/s.	8	o.201	
3	The PRC supports other output interfaces such as sine wave 8 kHz to 5 MHz (under study).	8	n/a	

o.201: It is mandatory to support at least one of these items

B.5 PRC frequency accuracy

Table B.3: PRC frequency accuracy

Item	PRC frequency	Reference	Status	Support
1	The maximum allowable fractional frequency offset for observation times greater than one week is 1 part in 10^{11}, over all applicable environmental conditions as defined in ETS 300 019.	1	m	

B.6 PRC output noise generation

Table B.4: PRC output noise generation

Item	PRC output noise generation	Reference	Status	Support
1	The intrinsic jitter at PRC outputs of 2 048 kHz and 2 048 kbit/s measured over 60 seconds shall not exceed 0,05 UIpp when measured through a single pole band-pass filter with corner frequencies at 20 Hz and 100 kHz.	5 5.2	m	
2	The wander generated at PRC outputs shall not exceed the MTIE limits defined in EN 300 462-6-1 Figure 1 and its associated table.	5 5.1	m	
3	The wander generated at PRC outputs shall not exceed the TDEV limits defined in EN 300 462-6-1 Figure 2 and its associated table.	5 5.1	m	

B.7   PRC phase discontinuity

Table B.5: PRC phase discontinuity

Item	PRC phase discontinuity	Reference	Status	Support
1	Any phase discontinuity at PRC outputs of 2 048 kHz and 2 048 kbit/s due to internal operations within the clock should not cause a phase discontinuity in excess of 1/8 UI.	6	m	

B.8   PRC performance degradation limits

Table B.6: PRC performance degradation limits

Item	PRC performance degradation limits	Reference	Status	Support
1	In the event of switching to an undegraded oscillator because a clock frequency departs significantly from its nominal value, this switching should occur before the MTIE limits defined in EN 300 462-6-1 Figure 1 and its associated table are exceeded.	7 5 5.1	m	
2	In the event of switching to an undegraded oscillator because a clock frequency departs significantly from its nominal value, this switching should occur before the TDEV limits defined in EN 300 462-6-1 Figure 2 and its associated table are exceeded.	7 5 5.1	m	

History

Document history				
V1.1.1	May 1999	Public Enquiry	PE 9943:	1999-05-26 to 1999-10-22
V1.1.1	December 1999	Vote	V 200008:	1999-12-27 to 2000-02-25
V1.1.1	March 2000	Publication		