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**Vmesniki V pri digitalnih krajevnih telefonskih centralah (LE) - Vmesnik V5.2 za podoro dostopovnemu omrežju (AN) - 1. del: Specifikacija vmesnika V5.2**

V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN); Part 1: V5.2 interface specification

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## **V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN); Part 1: V5.2 interface specification**

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## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Signalling Protocols and Switching (SPS).

The present document is part 1 of a multi-part EN covering the V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN), as described below:

**Part 1: "V5.2 interface specification";**

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network layer (AN side)";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network layer (AN side)";

Part 5: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network layer (LE side)";

Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network layer";

Part 7: "Test Suite Structure and Test Purposes (TSS&TP) specification for the data link layer";

Part 8: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the data link layer";

Part 9: "Test specification for the physical layer".

### National transposition dates

|  |                   |
|--|-------------------|
| Date of adoption of this EN:   | 10 December 1999  |
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# Introduction

## General

The work on a new V interface concept was initiated by a request from the ETSI Technical Assembly (TA) to Technical Committee (TC) Network Aspects (NA), in particular Technical Sub-Committee (STC) NA4 to consider, in co-operation with other STCs involved, possible new structures and interfaces for the connection of new access arrangements to local exchanges. After two meetings (in January and May 1991) the work was terminated with some guidelines for further consideration.

The work was taken over by a special experts group, set up by TC SPS, working under STC SPS3, with experts from several STCs, e.g. SPS5, Transmission and Multiplexing (TM) 3 and NA4. This was to avoid a split of the difficult task to several STCs requiring intensive co-operation and possibly may have caused significant delay of the standardization work. The work on Access Networks (AN) was later transferred to a new working group SPS9.

TC SPS identified in the terms of reference two interface concepts, one based on a static multiplexer principle, now called the V5.1 interface, and the other based on a dynamic, concentrator type, principle, now called the V5.2 interface.

## Major differences between the V5.1 interface and the V5.2 interface

The V5.1 specification (EN 300 324-1 [8]) is a stand-alone standard whereas this V5.2 specification (EN 300 347-1 [11]) references parts of EN 300 324-1 [8].

V5.1 uses only one 2 048 kbit/s link whereas V5.2 may use up to sixteen (16) 2 048 kbit/s links on one interface.

V5.1 does not support concentration whereas V5.2 is inherently designed to support it using a dedicated protocol known as the Bearer Channel Connection (BCC) protocol.

V5.1 does not support ISDN primary rate access user ports whereas V5.2 does.

V5.1 has no concept of communication channel protection whereas this function is available for V5.2 when the V5.2 interface uses more than one 2 048 kbit/s link. A specific protocol, known as the protection protocol, is provided for this function.

The control protocol for V5.2 is slightly modified to that used for V5.1. A link control protocol is specified for V5.2 as multiple links have to be managed.

Major differences between the first edition (EN 300 347-1 [11] (1994)) and this the second edition (EN 300 347-1 [11]):

- 1) Includes the amendments A1.
- 2) State that Link-ID verification is not needed for V5.2 interface on single link.
- 3) In case of AN internal faults on unavailable links may be blocked by the AN.
- 4) Eliminate potential misalignment conditions at blocking of user ports (co-ordinated unblocking).
- 5) Extension of the Accelerated alignment of the port procedure.
- 6) Clarification of mandatory and optional information elements (error handling).
- 7) System startup:
  - to use the same principles for both V5.1 and V5.2;
  - improved robustness during startup.
- 8) Extended definition of data link failure.
- 9) More timers have been defined for the supervision of ongoing processes during startup.

The modifications have affected following parts of the standard:

|                      |   |
|----------------------|---|
| Clause 4             | Generalizing the electrical and physical requirements.  |
| Subclause 5.1.2      | Enhancements of the link blocking in case of AN internal failures.  |
| Subclause 8.7.4      | Add reference to V5.1 about the need of flow control mechanism on layer 2.  |
| Subclause 15.4       | Accelerated port alignment is an additional function that reduces the messages over the V5 interface during startup procedures. |
| Subclause 16.2.4.3.4 | Enhancements of the co-ordinated unblocking procedures.   |

General for some of the message types with optional information elements has been changed to conditional.

Annex C has got the most modifications. It is written to be inline with V5.1 (EN 300 324-1 [8]). When an item is the same it is only referenced to V5.1. Procedures that have been modified mostly are related to startup, restart of the interface and also link blocking/unblocking.

#### Associated standards

The following set of standards and reports is expected to relate to the V5 interface concept:

|                     |  |
|---------------------|--|
| EN 300 324-1 [8]:   | V interfaces at the digital Local Exchange (LE); V5.1 interface for the support of Access Network (AN); Part 1: V5.1 interface specification;                |
| EN 300 347-1 [11]:  | V interfaces at the digital Local Exchange (LE); V5.2 interface for the support of Access Network (AN); Part 1: V5.2 interface specification;                |
| ETS 300 376 series: | Q3 interface at the Access Network (AN) for configuration management of V5 interfaces and associated user ports;   |
| ETS 300 377 series: | Q3 interface at the Local Exchange (LE) for configuration management of V5 interfaces and associated customer profiles;                                      |
| ETS 300 378-1 [14]: | Q3 interface at the Access Network (AN) for fault and performance management of V5 interfaces and associated user ports; Part 1: Q3 interface specification; |
| ETS 300 379-1 [15]: | Q3 interface at the Local Exchange (LE) for fault and performance management of V5 interfaces and associated customer profiles;                              |
| ETR 150 [16]:       | V5 interface; PSTN protocol mapping examples.  |

# 1 Scope

This first part of EN 300 347 specifies the electrical, physical, procedural and protocol requirements for the V5.2 interface between an Access Network (AN) and the Local Exchange (LE) for the support of the following access types:

- analogue telephone access;
- ISDN basic access with a line transmission system conforming to ETS 300 297 [4] for the case with an NT1 separate from the AN;
- ISDN basic access with a user network interface according to ETS 300 012 [3] at the user side of the AN, (i.e. the interface at the T reference point);
- ISDN primary rate access with a line transmission system conforming to ETS 300 233 [10] for the case with a NT1 separate from the AN;
- ISDN primary rate access with a user network interface according to ETS 300 011 [9] at the user side of the AN, (i.e. the interface at the T reference point);
- other analogue or digital accesses for semi-permanent connections without associated out-band signalling information,

with flexible information channel (bearer channel) allocation on a call by call basis which provides concentration capability within the AN and over the V5.2 interface. The present document does not specify the implementation of the requirements within the AN and does not constrain any implementation alternative as long as the functionality at the V5.2 interface as specified in the present document is met.

A link control capability is provided in order to manage the possible multi-link arrangements within a V5.2 interface. See clause 16.

A protection capability is provided in order to allow the interface to continue functioning in the event of 2 048 kbit/s link failures.

The present document should be used in conjunction with EN 300 324-1 [8]. The two documents share a common format and clauses within EN 300 324-1 [8] are referenced in the present document.

Annex F provides an overview of the service scenarios and architecture taken as the conceptual basis for the specification of the V5.2 interface.

Annex J provides additional notes and information flow diagrams to the PSTN protocol specification. The use of the protocol information elements for the definition of the national PSTN protocols is defined in annex D. Annex K provides the definition of the Layer 3 PSTN protocol error detection.

The Specification Description Language (SDL) diagrams for the additional V5.2 protocols and the management function for V5.2 are given in annex L.

Permanent lines from an ISDN user port or from other types of customer access, which bypass the LE, are outside the scope of the present document. Requirements for the support of permanent lines in ISDN basic and primary rate accesses, using one or a number of B-channels of a user port, are specified in annex A.

Semi-permanent leased lines are supported. They are routed through the V5.2 interface by application of a provisioning procedure. The assumptions and requirements for this procedure are defined in annex B.

Annex M provides an overview of frame formats used in the V5.2 interface and also the message types allocated to the V5.2 interface.

Annex N describes the protocol architecture for the ISDN and PSTN user port status control information transfer.

Annex C specifies the basic assumptions of the management function in the LE and the AN to support correct operation and control of the configuration.