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Prizemni snopovni radio (TETRA) - Govor in podatki V+D - 13. del: Model SDL radijskega vmesnika (AI)

Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 13: SDL model of the Air Interface (AI)

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Radio Equipment and Systems (RES) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS is a multi-part standard and will consist of the following parts:

Part 1: "General network design";

Part 2: "Air Interface (AI)";

Part 3: "Inter-working", (DE/RES-06001-3);

Part 4: "Gateways", (DE/RES-06001-4);

Part 5: "Terminal equipment interface", (DE/RES-06001-5);

Part 6: "Line connected stations", (DE/RES-06001-6);

Part 7: "Security";

Part 8: "Management services", (DE/RES-06001-8);

Part 10: "Supplementary services stage 1";

Part 11: "Supplementary services stage 2";

Part 12: "Supplementary services stage 3";

Part 13: "SDL model of the Air Interface (AI)";

Part 14: "PICS Proforma".

Transposition dates	
Date of adoption:	2 May 1997
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1 Scope

This European Telecommunication Standard (ETS) defines the Specification and Description Language (SDL) model of the TETRA Voice plus Data (V+D) Air Interface (AI).

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 392-2: "Radio Equipment and Systems (RES); Trans-European Trunked RAdio (TETRA); Voice plus Data (V+D); Part 2: Air Interface".

[2] ITU-T Recommendation Z.100 (1993): "Specification and Description Language (SDL)".

[3] ISO/IEC 8878: "Use of X.25 to provide the OSI connection mode network service".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

acknowledged data transfer: A service provided by the layer below which gives an acknowledgement back over the air interface from the lower layer peer entity. This service is used by the layer 3 entities to acquire a secure transmission including re-transmissions.

Advanced Link (AL): An AL is bi-directional connection between one Mobile Station (MS) and a Base Station (BS) with provision of acknowledged and unacknowledged services including windowing, segmentation, extended error protection and choice among several throughputs. The data transfer via the AL requires a set-up phase.

announced cell re-selection: Cell re-selection where MS Mobile Link Entity (MLE) informs the Switching and Management Infrastructure (SwMI) both in the serving cell and in the new cell that cell change is performed. There can be three types of announced cell re-selection:

- type 1: The MS-MLE knows the new cell and the traffic channel allocations on the cell before deciding to leave its serving cell;

- type 2: The MS-MLE knows the new cell before changing to it, but does not know the channel allocation on the new cell in advance;

- type 3: The MS-MLE need not to know the new cell before changing to it. The serving cell is only informed by the MS-MLE that it wants to change cell.

TETRA V+D may support all three types of announced cell re-selection.

attached: An MS is said to be attached to a cell when the MS is camped and registered on the cell. The MS may be in idle mode (i.e. not actively processing a transaction) or in traffic mode (i.e. actively processing a transaction in reception and/or in transmission). It is the Mobility Management (MM) which decides when an MS is said to be attached.

Basic Link (BL): A bi-directional connectionless path between one or several MSs and a BS, with a provision of both unacknowledged and acknowledged services on a single message basis.

call transaction: All of the functions associated with a complete unidirectional transmission of information during a call. A call can be made up of one or more call transactions. In a semi-duplex call these call transactions are sequential.

camped: An MS is said to be camped on a cell when the MS is synchronized on the cell BS and has decoded the Broadcast Network CHannel (BNCH) of the cell. The synchronization procedure is performed by the Medium Access Control (MAC) entity and the interpretation of the Network information from the BNCH is performed by a procedure in the MLE. It is the MLE which decides when an MS is said to be camped on a cell.

cell re-selection: The act of changing the serving cell from an old cell to a new cell. The cell re-selection is performed by procedures located in MLE and in the MAC. When the re-selection is made and possible registration is performed, the MS is said to be attached to the cell.

cell-id: Characterized as the channel number of the main carrier on the cell.

confirmed service: A service provided by the layer below which ensures that a message is responded to by the peer entity before new messages are allowed. The service may be used for synchronization of peer entities or for provision of sequential behaviour.

current serving BS: The BS on one of whose channels the MS is currently operating.

direct set-up signalling: A signalling procedure where immediate communication can take place between the calling and the called users without the alerting process and without an explicit response from the called user that he has answered.

initial cell selection: The act of choosing a first serving cell to register in. The initial cell selection is performed by procedures located in MLE and in the MAC. When the cell selection is made and possible registration is performed, the MS is said to be attached to the cell.

migration: The act of changing to a new location area in a network (either with different Mobile Network Code (MNC) and/or Mobile Country Code (MCC)) where the user does not have subscription, an Individual TETRA Subscriber Identity (ITSI) for that network.

monitoring: The act of measuring the power of neighbour cells and calculate the path loss parameter C2 based upon information on neighbour cells broadcasted by the serving cell.

on/off hook signalling: A signalling procedure which includes an alerting process to the called user. The calling user waits for an explicit response from the called user that he has answered before the call can be set-up.

received segment sequence number: The number of the currently received segment.

roaming: The act of changing location area within a network of same MNC/MCC, and for which the user has a valid registration (ITSI).

scanning: The act of measuring the power of neighbour cells and calculate the path loss parameter C1 based upon the information on the neighbour cells broadcasted by the neighbour cells themselves.

segment: A Logical Link Control (LLC) segment is the AL unit of transmission and re-transmission. A segment is the numbered piece of a TL-SDU fitting into one MAC layer Protocol Data Unit (PDU) (MAC block). A segment is a synonym to a PDU.

Service Data Unit (SDU) number: A number on the LLC entity to keep TL-SDUs in order.

serving cell: The cell that is currently providing services to the MS.

subscriber class: A subscriber class has no other defined usage than offering a population subdivision. The operator defines the values and meaning of each class.

surveillance: The process of monitoring the quality of the radio link to the serving cell.

timebase: A device which determines the timing state of signals transmitted by a BS or MS.

timeslot number: The timing of timeslots within a Time Division Multiple Access (TDMA) frame.

TLC-SAP: The management Service Access Point (SAP) is a way of modelling layer-to-layer communication for management and control purpose.

un-acknowledged data transfer: A service which does not give any acknowledgement back to the service user.

unannounced cell re-selection: Cell re-selection where the MS-MLE does not inform the serving cell that it intend to change to a new cell. Only the new cell is informed about the MS-MLE.

unconfirmed service: A service which does not ensure response from peer entities before allowing new messages. This implies that messages to be transported may arrive in different order at the peer entity.

undeclared cell re-selection: Cell re-selection where the MS-MLE does not inform the serving cell nor the new cell that cell change is performed.

validation model: A model for the protocol specified with a formal description technique in this case, SDL.

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

AI	Air Interface
AL	Advanced Link
BL	Basic Link
BNCH	Broadcast Network CHannel
BS	Base Station
CC	Call Control
CMCE	Circuit Mode Control Entity
CONP	Connection Oriented Network Protocol
FCS	Frame Check Sequence
ITSI	Individual TETRA Subscriber Identity
LLC	Logical Link Control
LS	Line Station
MAC	Medium Access Control
MCC	Mobile Country Code
MLE	Mobile Link Entity
MM	Mobility Management
MNC	Mobile Network Code
MS	Mobile Station
PC	Protocol Control
PDU	Protocol Data Unit
PS	PostScript
QoS	Quality of Service
SAP	Service Access Point
SCLNP	Specific ConnectionLess Network Protocol
SDL	Specification and Description Language
SDU	Service Data Unit
SP	Service Primitive
SS	Supplementary Service
SwMI	Switching and Management Infrastructure
TDMA	Time Division Multiple Access
TETRA	Terrestrial Trunked RAdio
TL-SDU	SDU from the service user (i.e. MLE)
TLA	A layer 2 service access point (TLA-SAP)
TLB	A layer 2 service access point (TLB-SAP)
TLC	A layer 2 service access point (TLC-SAP)
TM-SDU	SDU from the layer above MAC (i.e. LLC)
V+D	Voice plus Data