

SLOVENSKI STANDARD

SIST EN 300 392-10-4 V1.3.1:2003

01-december-2003

Prizemni snopovni radio (TETRA) – Govor in podatki (V+D) – 10. del: Dopolnilne storitve stopnje 1 – 4. poglavje: Predaja klica (CF)

Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 4: Call Forwarding (CF)

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Ta slovenski standard je istoveten z: EN 300 392-10-4 Version 1.3.1

SIST EN 300 392-10-4 V1.3.1:2003
<https://standards.iteh.ai/catalog/standards/sist/b2819676-a96b-4d80-8cde-7dc2dbddb00c/sist-en-300-392-10-4-v1-3-1-2003>

ICS:

33.070.10

Prizemni snopovni radio
(TETRA)

Terrestrial Trunked Radio
(TETRA)

SIST EN 300 392-10-4 V1.3.1:2003

en

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ETSI EN 300 392-10-4 V1.3.1 (2003-09)

European Standard (Telecommunications series)

**Terrestrial Trunked Radio (TETRA);
Voice plus Data (V+D);
Part 10: Supplementary services stage 1;
Sub-part 4: Call Forwarding (CF)**

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ReferenceREN/TETRA-03093

Keywords

CF, data, radio, speech, stage 1, supplementary
service, TETRA**ETSI**650 Route des Lucioles
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
Sous-Préfecture de Grasse (06) N° 7803/88

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Project Terrestrial Trunked Radio (TETRA).

The present document is part 10, sub-part 4 of a multi-part deliverable covering Voice plus Data (V+D), as identified below:

EN 300 392-1: "General network design";

EN 300 392-2: "Air Interface (AI)";

EN 300 392-3: "Interworking at the Inter-System Interface (ISI)";

ETS 300 392-4: "Gateways basic operation";

EN 300 392-5: "Peripheral Equipment Interface (PEI)";

EN 300 392-7: "Security";

EN 300 392-9: "General requirements for supplementary services";

EN 300 392-10: "Supplementary services stage 1";

ETS 300 392-10-1: "Call identification";

ETS 300 392-10-2: "Call report";

ETS 300 392-10-3: "Talking Party Identification (TPI)";

EN 300 392-10-4: "Call Forwarding (CF)";

ETS 300 392-10-5: "List Search Call (LSC)";

ETS 300 392-10-6: "Call Authorized by Dispatcher (CAD)";

ETS 300 392-10-7: "Short number addressing";

ETS 300 392-10-8: "Area selection";

ETS 300 392-10-9: "Access priority";

EN 300 392-10-10: "Priority Call (PC)";

ETS 300 392-10-11: "Call Waiting (CW)";

ETS 300 392-10-12: "Call Hold (CH)";

ETS 300 392-10-13: "Call completion to busy subscriber";

EN 300 392-10-14: "Late Entry (LE)";

- ETS 300 392-10-15: "Transfer of control";
- ETS 300 392-10-16: "Pre-emptive priority call";
- EN 300 392-10-17: "Include Call (IC)";
- EN 300 392-10-18: "Barring of Outgoing Calls (BOC)";
- EN 300 392-10-19: "Barring of Incoming Calls (BIC)";
- ETS 300 392-10-20: "Discreet Listening (DL)";
- EN 300 392-10-21: "Ambience Listening (AL)";
- EN 300 392-10-22: "Dynamic Group Number Assignment (DGNA)";
- ETS 300 392-10-23: "Call completion on no reply";
- ETS 300 392-10-24: "Call Retention (CRT)";
- EN 300 392-11: "Supplementary services stage 2";
- EN 300 392-12: "Supplementary services stage 3";
- ETS 300 392-13: "SDL model of the Air Interface (AI)";
- ETS 300 392-14: "Protocol Implementation Conformance Statement (PICS) proforma specification";
- TS 100 392-15: "TETRA frequency bands, duplex spacings and channel numbering";
- TS 100 392-16: "Network Performance Metrics";
- TS 100 392-17: "TETRA V+D and DMO Release 1.1 specifications";

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National transposition dates
<https://standards.iteh.ai/catalog/standards/sist-en-300-392-10-4-v1-3-1-2003>

Date of adoption of this EN:	29 August 2003
Date of latest announcement of this EN (doa):	30 November 2003
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 2004
Date of withdrawal of any conflicting National Standard (dow):	31 May 2004

Introduction

Supplementary services specifications are produced in three stages, according to the method described in ITU-T Recommendation I.210 [2]. The present document contains the stage 1 specifications of SS-CFU, SS-CFB, SS-CFNRY and SS-CFNRC. The stage 1 descriptions specify the supplementary services as seen by users of networks.

The first edition of the present document was presented as a delta document to the first edition of ECMA-173 [1]. The second edition was redrafted based on the latest published text of ECMA-173 [1] as a self contained document so as to be more readable. Additions compared to ECMA-173 [1] were made to take into account particular TETRA specifics such as group calls and to include user requirements and situations not addressed in ECMA-173 [1].

NOTE 1: Contrary to ECMA-173 [1], the present document does not specify SS-CD (Call Deflection) which is not presently supported by TETRA.

NOTE 2: Contrary to ECMA-173 [1], distinction is needed in the TETRA environment between "no reply" and "not reachable" because of the radio nature of the TETRA links. The distinction between the two services is that in the case of SS-CFNRY, the calling user obtains an ALERT signal while in the case of SS-CFNRC, the calling user does not obtain any signal.

The present document is updated to take into account improvements to the protocol in stage 3.

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1 Scope

The present document specifies the supplementary services Call Forwarding Unconditional (CFU), Call Forwarding Busy (CFB), Call Forwarding on No Reply (CFNRy) and Call Forwarding on Not Reachable (CFNRc) which are applicable to various basic services supported by TETRA SwMIs. Basic services are specified in EN 300 392-2 [4].

SS-CFU, SS-CFB, SS-CFNRy and SS-CFNRc are supplementary services which apply during call establishment providing a forwarding of an incoming call to an other destination than the original destination defined by the calling user under different conditions (busy, no reply or not reachable) or under no condition (unconditional).

The present document is applicable to circuit mode TETRA V+D tele-services and bearer services. The present document is also applicable to TETRA Short Data Service (SDS), but limited to the supplementary service Call Forwarding Unconditional (CFU).

Man machine interfaces and charging principles are outside the scope of the present document.

The present document specifies also the SS-CF invocation counter, which is applicable to various basic services supported by TETRA networks.

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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

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

- [1] ECMA-173: "Private Integrated Services Network (PISN) - Specification, Functional Model and Information Flows - Call Diversion Supplementary Services (CFSD)".
- [2] ITU-T Recommendation I.210: "Principles of telecommunication services supported by an ISDN and the means to describe them".
- [3] ITU-T Recommendation Z.100: "Specification and description language (SDL)".
- [4] ETSI EN 300 392-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: Air Interface (AI)".
- [5] ITU-T Recommendation Q.9: "Vocabulary of switching and signalling terms".
- [6] ETSI EN 300 392-12-4: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 12: Supplementary services stage 3; Sub-part 4: Call Forwarding (CF)".
- [7] ETSI EN 300 392-3-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 2: Additional Network Feature Individual Call (ANF-ISIIC)".
- [8] ETSI EN 300 392-7: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 7: Security".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

Additional Network Feature (ANF): capability, over and above that of a basic service, provided by a SwMI, but not directly to a SwMI user

authorized user: user who is responsible for the definition, activation and deactivation of the service

NOTE: The authorized user may also interrogate the service.

busy: TETRA destination is considered to be busy if either a "network determined user busy" or a "user determined user busy" condition exists

call, basic call: instance of the use of a basic service

connected number: number of the user that answers (user C)

forwarded-to number: number to which a call is forwarded

forwarded-to user: user to which a call is forwarded

forwarding: redirection of a call, on behalf of a called user and prior to connect, to a number different from the number of that called user

forwarding cause: contains the reason for the forwarding: CFU, CFB, CFNRy, CFNRc

forwarding number: number of the served user

forwarding user: user for which the call forwarding is invoked; it may be the called user first and then any of the successive forwarded-to users (see also last forwarding user)

forward switching: network routing algorithm which performs the forwarding by joining together the first connection from user A's node to user B's node and a second, new connection from user B's node to user C's node

last forwarding user: served user from the point of view of the forwarded-to user for a particular stage of call forwarding

NOTE: In the case of a call subject to a single stage of call forwarding, user B is the last forwarding user from the point of view of user C. In the case of a call subject to multiple stages of call forwarding, user B1 is the last forwarding user from the point of view of user B2, user B2 is the last forwarding user from the point of view of user B3, etc. The served user for the final stage of call forwarding is the last forwarding user from the point of view of user C.

Mobile Station (MS): physical grouping that contains all of the mobile equipment that is used to obtain TETRA services. By definition, a mobile station contains at least one Mobile Radio Stack (MRS)

original called number: number of user B (in case of multiple call forwarding user B1)

original called user: first served user of a call which is subject to one or more stages of call forwarding, i.e. user B or B1

partial re-routing: network routing algorithm which performs the call forwarding by replacing a particular part of the connection from user A's node to user B's node by another connection from user A's node to user C's node

SDS message: status or any type of SDS message

NOTE: This definition is used in the present document to combine all TETRA STATUS and SDS messages as defined in clause 13.3 of EN 300 392-2 [4].

signalling connection: connection used to exchange information between peer supplementary service protocol control entities independently of a basic call

SS-CF invocation counter: counter for the number of forwarding involved in a call or signalling connection during the establishment phase

supplementary service: any service provided by a network in addition to its basic service or services (defined in ITU-T Recommendation Q.9)

NOTE: A supplementary service modifies or supplements a basic telecommunication service. Consequently, it cannot be offered to a customer as a stand alone service. It must be offered together with or in association with a basic telecommunication service (extract from ITU-T Recommendation I.210 [2])

Switching and Management Infrastructure (SwMI): all of the TETRA equipment for a Voice plus Data (V+D) network except for subscriber terminals

NOTE: The SwMI enables subscriber terminals to communicate with each other via the SwMI.

SwMI number: number belonging to a SwMI numbering plan

re-routeing: network routeing algorithm which performs the call forwarding by replacing the connection from user A's node to user B's node by another connection from user A's node to user C's node

served user: user of a particular SwMI number who is requesting that calls to his number be forwarded

NOTE: This user may also be referred to as the forwarding user or the called user.

tele-service: type of telecommunications service that provides the complete capability, including terminal equipment functions, for communication between users according to agreed protocols

served user: user for whom the supplementary service is invoked

user: entity using the services of a telecommunications network via an externally accessible service access point

NOTE 1: Unless otherwise noted, the word user is to be understood as individual or group.

NOTE 2: A user may be a person or an application process.

user application: application process which acts as a user (see definition of user)

user A: calling user of a call which is subject to call forwarding

user B: served (forwarding) user of a call which is subject to call forwarding.

NOTE: User B is also known as the (original) called user.

user B1, user B2, user B3, etc.: these are the served (forwarding) users of a call which are subject to multiple stages of forwarding

NOTE 1: B1 is the first served user, B2 is the second served user, B3 is the third served user, etc.

NOTE 2: B2 is also the forwarded-to user with respect to the first stage of call forwarding, B3 is also the forwarded-to user with respect to the second stage of call forwarding, etc.

user C: forwarded-to user with respect to the final stage of call forwarding

3.2 Symbols

For the purposes of the present document, the symbols defined in ITU-T Recommendation Z.100 [3] apply.

3.3 Abbreviations

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

ANF	Additional Network Feature
GTSI	Group TETRA Subscriber Identity
ISDN	Integrated Services Digital Network
ISI	Inter System Interface