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Integrated Services Digital Network (ISDN); Closed User Group (CUG) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification

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*European Standard (Telecommunications series)*

## **Integrated Services Digital Network (ISDN); Closed User Group (CUG) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol 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 standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Closed User Group (CUG) supplementary service, as described below:

**Part 1: "Protocol specification";**

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

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

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

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

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

In accordance with CCITT Recommendation I.130, the following three level structure is used to describe the supplementary telecommunication services as provided by European public telecommunications operators under the pan-European Integrated Services Digital Network (ISDN):

- Stage 1: is an overall service description, from the user's stand-point;
- Stage 2: identifies the functional capabilities and information flows needed to support the service described in stage 1; and
- Stage 3: defines the signalling system protocols and switching functions needed to implement the service described in stage 1.

The present document details the stage 3 aspects (signalling system protocols and switching functions) needed to support the CUG supplementary service. The stage 1 and stage 2 aspects are detailed in ETS 300 136 and ETS 300 137, respectively.

The present version updates the references to the basic call specifications.

**National transposition dates**

Date of adoption of this EN:	19 June 1998
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# 1 Scope

This first part of EN 300 138 specifies the stage three of the Closed User Group (CUG) supplementary service for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators at the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [5]) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunication service (see CCITT Recommendation I.130 [3]).

In addition, the present document specifies the protocol requirements at the T reference point where the service is provided to the user via a private ISDN.

The present document does not specify the additional protocol requirements where the service is provided to the user via a telecommunications network that is not an ISDN.

The CUG supplementary service enables users to form groups, to and from which access is restricted. A specific user may be a member of one or more CUGs. Members of a specific CUG can communicate among themselves but not, in general, with users outside the group.

The CUG supplementary service is applicable to all telecommunication services.

Further parts of this EN specify the method of testing required to identify conformance to the present document.

The present document is applicable to equipment, supporting the CUG supplementary service, to be attached at either side of a T reference point or coincident S and T reference points when used as an access to the public ISDN.

# 2 Normative references

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case 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] CCITT Recommendation E.164: "Numbering plan for the ISDN era".
- [2] ITU-T Recommendation I.112: "Vocabulary of terms for ISDNs".
- [3] CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".
- [4] ITU-T Recommendation I.210: "Principles of telecommunication services supported by an ISDN and the means used to describe them".
- [5] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".
- [6] CCITT Recommendation X.208 (1988): "Open Systems Interconnection (OSI); Model and Notation: Service definition: Specification of Abstract Syntax Notation One (ASN.1)".
- [7] CCITT Recommendation X.209 (1988): "Open Systems Interconnection (OSI); Model and Notation: Service definition: Specification of basic encoding rules for Abstract Syntax Notation One (ASN.1)".
- [8] CCITT Recommendation X.219 (1988): "Remote Operations: Notation and Service Definition".

- [9] CCITT Recommendation Z.100 (1988): "Functional Specification and Description Language (SDL)".
- [10] ETS 300 136 (1992): "Integrated Services Digital Network (ISDN); Closed User Group (CUG) supplementary service; Service description".
- [11] EN 300 195-1: "Integrated Services Digital Network (ISDN); Supplementary service interactions; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".
- [12] EN 300 196-1: "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".
- [13] EN 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".
- [14] EN 300 403-2: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 2: Specification and Description Language (SDL) diagrams".
- [15] EN 300 485: "Integrated Services Digital Network (ISDN); Definition and usage of cause and location in Digital Subscriber Signalling System No. one (DSS1) and Signalling System No.7 ISDN User Part (ISUP) [ITU-T Recommendation Q.850 (1993), modified]".

### 3 Definitions

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

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**basic telecommunication service:** A bearer service or teleservice. The terms "bearer service" and "teleservice" are defined in ITU-T Recommendation I.112 [2], definitions 202 and 203.

**CUG call:** See ETS 300 136 [10], clause 3.

**CUG index:** The CUG index is a parameter used by the calling user to select a particular CUG when originating a call. The index is also used by the network to indicate to the called user the CUG from which an incoming call has originated. This index has only local significance, i.e. the index used by the calling user is, in general, different from the index used by the called user to identify the same CUG.

**CUG interlock code:** This is a means of identifying CUG membership within the network. At the calling side, if a CUG match exists, the CUG index identifying a CUG maps to the CUG interlock code for that CUG. If a CUG match exists at the called side the CUG interlock code identifying a CUG maps to the CUG index representing that CUG. CUG interlock code is not an access concept, but is used for clarity during the descriptions of signalling procedures and flows.

**default number:** An agreed ISDN number between the user at the calling side and the network provider.

**incoming access:** See ETS 300 136 [10], clause 3.

**incoming calls barred within a CUG:** See ETS 300 136 [10], clause 3.

**Integrated Services Digital Network (ISDN):** See ITU-T Recommendation I.112 [2], definition 308.

**ISDN number:** A number conforming to the numbering plan and structure specified in CCITT Recommendation E.164 [1].

**network:** The DSS1 protocol entity at the network side of the user-network interface.

**outgoing access:** See ETS 300 136 [10], clause 3.

**outgoing calls barred within a CUG:** See ETS 300 136 [10], clause 3.

**preferential CUG:** A CUG user subscribing to preferential CUG nominates a CUG index which the network uses as a default to identify the required CUG in the absence of any CUG information in the outgoing call request. A preferential CUG applies to an ISDN number (or to an ISDN number/service - see subclause 6.1) and not to a specific CUG.

**service; telecommunication service:** See ITU-T Recommendation I.112 [2], definition 201.

**supplementary service:** See ITU-T Recommendation I.210 [4], subclause 2.4.

**user:** The DSS1 protocol entity at the user side of the user-network interface.

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## 4 Abbreviations

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

CES	Connection Endpoint Suffix
CUG	Closed User Group
DSS1	Digital Subscriber Signalling System No. one
IA	Incoming Access
ICB	Incoming Calls Barred within a CUG
ISDN	Integrated Services Digital Network
ISUP	Integrated Services User Part
OA	Outgoing Access
OCB	Outgoing Calls Barred within a CUG
SDL	Specification and Description Language

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## 5 Description

Essentially normal call establishment procedures shall apply but, additionally, to provide the CUG supplementary service, the network shall analyse the call request from the calling user in conjunction with the CUG attributes associated with both the calling and called users (as identified by their ISDN numbers). As a result of this analysis the call can either fail for CUG supplementary service reasons or be allowed to proceed.

The network provider may define the maximum number of CUGs of which a user can be a member.

Since the fundamental purpose of the CUG supplementary service is to prevent certain connections the network shall strictly control interactions with some other supplementary services to protect CUG integrity.

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## 6 Operational requirements

### 6.1 Provision and withdrawal

The provision of the CUG supplementary service to a new member and also the assignment of the various CUG supplementary service options to a new or existing member, shall require a prior arrangement between the member and the network provider.

The CUG supplementary service shall be provided on a subscription basis. As a network provider option, the CUG supplementary service may be offered with subscription options.

The options can be divided into two groups:

- a) the options shown in table 1 shall apply per ISDN number. The option values may be assigned individually for each basic service, or set of basic services, available at the ISDN number with the CUG supplementary service;
- b) the option shown in table 2 shall apply per CUG provided at the ISDN number with the CUG supplementary service.

**Table 1: Options available per ISDN number**

Option (note)	Values
1) Preferential CUG	Nominated CUG index, or none designated.
2) Outgoing access	Allowed, or not allowed.
3) Incoming access	Allowed, or not allowed.
NOTE: If, for a user with the CUG supplementary service, a basic service, or set of basic services, is not included in at least one CUG, then: <ul style="list-style-type: none"> <li>- preferential CUG shall have the "none designated" option value;</li> <li>- outgoing access shall have the "allowed" option value if normal outgoing calls using that basic service, or set of basic services, are required;</li> <li>- incoming access shall have the "allowed" option value if incoming calls using that basic service, or set of basic services, are required.</li> </ul>	

**Table 2: Options available per CUG**

Option	Values
1) Barring within the CUG	None, incoming calls, or outgoing calls.

The options assigned to a CUG member shall be stored in the network.

Withdrawal of the CUG supplementary service shall be as a result of network provider action either at the request of a particular member, or for administrative reasons.

## 6.2 Requirements on the originating network side

For correct interactions with certain other supplementary services, the originating network side shall store, for the duration of the call, details of whether a normal or a CUG call was requested in the information sent to the destination network side. The CUG interlock code (if any) of the call request to the destination network side shall also be retained. However, if the network knows that such interactions are not possible (e.g. the user has only the CUG supplementary service) then the information may be discarded.

## 6.3 Requirements on the destination network side

For correct interactions with certain other supplementary services, the destination network side shall store, for the duration of the call, details of whether a normal or a CUG call request was passed to the called user. The CUG interlock code (if any) of the call request shall also be retained. However, if the network knows that such interactions are not possible (e.g. the user has only the CUG supplementary service) then the information may be discarded.

# 7 Coding requirements

## 7.1 ASN.1 description of coding requirements

Table 3 provides an Abstract Syntax Notation one (ASN.1) description of the coding of the Facility information element components necessary to support this service in accordance with CCITT Recommendations X.208 [6] and X.209 [7] and uses the OPERATION and ERROR macro as defined in figure 4/X.219 of CCITT Recommendation X.219 [8].