



# SLOVENSKI STANDARD SIST EN 301 065-1:2001

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8 ][ ]HJbc`ca fYy`Y`n`]bhY[ f]fUb]a ]`g]hcf]h] Ua ]`f]G8 BŁ!`8 cdc`b]`bUg]hcf]h]Yj .  
Xc\_cb Ub`Y`\_]WUb`UŁ\_c`b]`cXn]j Uf7 7 BFŁ!`Dfch\_c`X][ ]HJbY`bUfc b]y`Y  
g][ bU]nUW`Y`yH`r`%fB GG%Ł!`%`XY.`GdYWZ\_ UW`Udfch\_c`U

Integrated Services Digital Network (ISDN); Completion of Calls on No Reply (CCNR) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification

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# EN 301 065-1 V1.2.2 (1998-10)

*European Standard (Telecommunications series)*

**Integrated Services Digital Network (ISDN);  
Completion of Calls on No Reply (CCNR)  
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) Completion of Calls on No Reply (CCNR) 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 ISDN:

- Stage 1: is an overall service description, from the user's standpoint;
- 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 CCNR supplementary service. The stage 1 aspects are detailed in EN 301 134.

NOTE: Currently no stage 2 document exists.

<b>National transposition dates</b>	
Date of adoption of this EN:	9 October 1998
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# 1 Scope

This first part of EN 301 065 specifies the stage three of the Completion of Calls on No Reply (CCNR) 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 [6]) 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 an intermediate 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 CCNR supplementary service enables user A, encountering a destination B, which does not answer the call, to have the call completed without having to make a new call attempt when the destination B becomes not busy after having initiated an activity .

The CCNR supplementary service is applicable to all circuit-switched telecommunication services with the following exceptions:

- a) call 2 of the videotelephony teleservice;
- b) call 2 of the audiographic conference teleservice;
- c) call 2 and subsequent calls of videoconference teleservice;
- d) all other circuit-switched telecommunication services requiring the use of more than one B-channel.

Further parts of EN 301 065 specify the method of testing required to identify conformance to the present document.

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

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# 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] ITU-T Recommendation E.164 (1997): "The international public telecommunication numbering plan".
- [2] ITU-T Recommendation I.112 (1993): "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 (1993): "Principles of telecommunication services supported by an ISDN and the means to describe them".
- [5] ITU-T Recommendation I.221 (1993): "Common specific characteristics of services".
- [6] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces; Reference configurations".
- [7] CCITT Recommendation Q.9 (1988): "Vocabulary of switching and signalling terms".
- [8] CCITT Recommendation X.208 (1988): "Specification of Abstract Syntax Notation One (ASN.1)".
- [9] CCITT Recommendation X.219 (1988): "Remote Operations: Model, notation and service definition".
- [10] CCITT Recommendation Z.100 (1993): "Specification and Description Language (SDL)".
- [11] 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]".
- [12] ETS 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".
- [13] EN 300 195-1: "Integrated Services Digital Network (ISDN); Supplementary service interactions; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".
- [14] 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".
- [15] EN 300 359-1: "Integrated Services Digital Network (ISDN); Completion of Calls to Busy Subscriber (CCBS) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

### 3 Definitions

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

**activity:** the activity condition applies, if at least one CCNR request is in queue B and any user at destination B either:

- initiates an outgoing call with a SETUP message; or,
- answers an incoming call with a CONNECT message; or
- clears an established call; or,
- clears an outgoing call.

**busy:** See ITU-T Recommendation I.221 [5], subclause 2.1.5.

**call:** See CCITT Recommendation Q.9 [7], definition 2201.

**call information retention:** A procedure of network A to store the call information of a specific call so that it can be used for that call.

**call state:** A state as defined in EN 300 403-1 [11], subclause 2.1 for either the user or the network as appropriate. A call state may exist for each call reference value (and for each additional responding CEI in the incoming call states).

**CCNR busy:** Any one of the following conditions will cause a CCNR busy condition:

- maximum number of calls reached at user A (see ITU-T Recommendation I.221 [5], subclause 2.1.3, item 2);
- no B-channels available at user A;
- CCNR or CCBS recall pending on user A.

**CCNR call:** A call which is established under the control of the CCNR supplementary service.

**CCNR recall:** The procedure where user A is requested to complete the communication when user B ceases to be busy after having initiated an activity.

**CCBS request retention:** If an attempt to establish a CCNR call fails because the destination is busy, then the network provider option "CCBS request retention" defines whether the CCNR supplementary service shall continue or not, i.e. if the "CCBS request retention" is supported, the original CCNR request shall retain its position in the queue B, and monitoring of user B shall continue. Otherwise, on receiving an indication that user alerting has been initiated at the called address the CCNR request will be deactivated.

**destination B:** The entity addressed in the original call.

**existing service:** The basic telecommunication service associated with speech, 3,1 kHz audio and 64 kbit/s unrestricted bearer capabilities.

**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 ITU-T Recommendation E.164 [1].

**invoke component:** See EN 300 196-1 [14], subclause 8.2.2.1. Where reference is made to an "xxxx" invoke component, an invoke component is meant with its operation value set to the value of the operation "xxxx".

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

**network A:** The network, at the coincident S and T reference point, to which user A is attached.

**network B:** The network, at the coincident S and T reference point, which is identified as destination B.

**private network:** The DSS1 protocol entity at the user side of the user-network interface at the T reference point.

**public network:** The DSS1 protocol entity at the network side of the user-network interface at the T reference point.

**queue A:** A buffer at network A for the control of CCNR requests associated with user A, provided on a per-ISDN number basis.

**queue B:** A buffer at network B for the control of CCNR requests associated with destination B. Resource is provided in the buffer for each ISDN number, but the buffer is processed on a per-access basis. The buffer is used to support the monitoring of user B to become not busy after having initiated an activity.

**reject component:** See EN 300 196-1 [14], subclause 8.2.2.4.

**return error component:** See EN 300 196-1 [14], subclause 8.2.2.3. Where reference is made to an "xxxx" return error component, a return error component is meant which is related to an "xxxx" invoke component.

**return result component:** See EN 300 196-1 [14], subclause 8.2.2.2. Where reference is made to an "xxxx" return result component, a return result component is meant which is related to an "xxxx" invoke component.

**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.

**user A:** The user, at the coincident S and T reference point, who originated the call and to whom the CCNR supplementary service is provided.

**user B:** The user, at the coincident S and T reference point, which is identified as destination B.

## 4 Abbreviations

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

ASN.1	Abstract Syntax Notation One
CCBS	Completion of Calls to Busy Subscriber
CCNR	Completion of Calls on No Reply
DCR	Dummy Call Reference
DSS1	Digital Subscriber Signalling System No. one
ISDN	Integrated Services Digital Network

## 5 Description

The CCNR supplementary service enables user A, encountering a destination B, which does not answer the call, to have the call completed without having to make a new call attempt when the destination B becomes not busy after having initiated an activity. User A can request the CCNR supplementary service when the call is in the alerting phase and after call clearing during the alerting phase before the retention timer is expired.

When user A requests the CCNR supplementary service, the network B will monitor destination B for becoming not busy after having initiated an activity.

When the destination B becomes not busy, (i.e. access resources e.g. one B-channel are not busy) after having initiated an activity, then the network will wait a short time in order to allow the resources to be reused for originating a call. If the resources are not reused within this time by destination B, then the network B will automatically recall user A.

When user A accepts the CCNR recall, then network A will automatically generate a CCNR call to destination B.

**NOTE:** The procedures for the CCNR supplementary service are similar to the procedures specified in the CCBS standard. Therefore, where possible, the terms (e.g. CCBS reference parameter) as defined for the CCBS supplementary service are used and in some cases a reference to the subclauses in EN 300 359-1 [15] is made.

## 6 Operational requirements

### 6.1 Provision and withdrawal

CCNR may be provided to subscribers by the network provider on a subscription basis or may be generally available. Withdrawal may happen on subscriber's request or for administrative reasons.

As a network option, the CCNR supplementary service can be offered with a subscription option which shall apply to the whole access of user A.

Table 1 summarizes the subscription options for the CCNR supplementary service.

**Table 1: Subscription option**

Subscription option	Value	Meaning
Recall mode	Global recall	CCNR recall offered to all compatible terminals.
	Specific recall	CCNR recall offered to the terminal which has activated the CCNR supplementary service.

If the subscription option is not offered, one of the two values shall be chosen by the network provider.

Table 2 summarizes the network options which apply to the CCNR supplementary service.

**Table 2: Network options**

Network option	Value	Meaning
Check for identical calls (note)	Yes	The network checks if CCNR is requested for a call identical to a call for which CCNR is already activated.
	No	The network does not check if CCNR is requested for a call identical to a call for which CCNR is already activated.
CCBS request retention (note)	Yes	User A's CCNR request is continued if user B is busy.
	No	User A's CCNR request does not continue if user B is busy.
NOTE: Regarding this network option, refer to EN 300 195-1 [13], for further details on the CCNR and CCBS supplementary service interactions and the correlation between this option and the equivalent option in the CCBS specification.		

## 6.2 Requirements on the network A side

The network A side shall register whether the CCNR supplementary service specific functions have to be performed in network A or in an attached private ISDN.

## 6.3 Requirements on the network B side

The network B side shall register whether the CCNR supplementary service specific functions have to be performed in the network B or in an attached private ISDN.

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## 7 Coding requirements

Tables 3 and 4 show the definition of the operations and errors required for the CCNR supplementary service using Abstract Syntax Notation one (ASN.1) as defined in CCITT Recommendation X.208 [8] and using the OPERATION and ERROR macro as defined in CCITT Recommendation X.219 [9], figure 4/X.219.

The formal definition of the component types to encode these operations is provided in EN 300 196-1 [14], annex D, clause D.1.

The inclusion of components in Facility information elements is defined in EN 300 196-1 [14], subclause 11.2.2.1.

All components (invoke, return result, return error and reject) shall be included within a Facility information element. This Facility information element may be included in any appropriate message as specified in EN 300 196-1 [14], subclause 8.3.1.1, unless a more restrictive specification is given in clause 9.

For all ASN.1 components (i.e. operations, parameters and error values) with the exception of:

- the CCNRRequest invoke component;
- the CCNRInterrogate invoke component; and
- the CCNR-T-Request invoke component,

the same terms and values (object identifiers) as defined in EN 300 359-1 [15] are used.

**Table 3: Operation and error definitions for the CCNR supplementary service at the coincident S and T reference point**

```

CCNR-Operations-and-Errors {ccitt identified-organization etsi(0) 1065 operations-and-errors(1)}
DEFINITIONS EXPLICIT TAGS ::=
BEGIN
EXPORTS
    CCNRRequest, CCNRInterrogate
;
IMPORTS
    OPERATION, ERROR
    FROM Remote-Operation-Notation
        {joint-iso-ccitt remote-operations(4) notation(0)}

    notSubscribed, supplementaryServiceInteractionNotAllowed
    FROM General-Errors
        {ccitt identified-organization etsi(0) 196 general-errors(2)}

    PartyNumber, PartySubaddress
    FROM Addressing-Data-Elements
        {ccitt identified-organization etsi(0) 196 addressing-data-elements(6)}

    CallInfoRetain, CCBSDeactivate, CCBSERase, CCBSRemoteUserFree, CCBSCall,
    CCBSStatusRequest, CCBSBFree, CCBSStopAlerting, InvalidCCBSReference,
    EraseCallLinkageID, InvalidCallLinkageID, LongTermDenial, ShortTermDenial,
    CCBSIsAlreadyActivated, AlreadyAccepted, OutgoingCCBSQueueFull,
    NotReadyForCall, CallDetails, CallInformation, CallLinkageID, CCBSReference,
    RecallMode
    FROM CCBS-Operations-and-Errors
        {ccitt identified-organization etsi(0) 359 operations-and-errors(1)}
;

CCNRRequest ::= OPERATION
    ARGUMENT callLinkageID CallLinkageID
    RESULT SEQUENCE {
        recallMode RecallMode,
        CCBSReference CCBSReference
    }
    ERRORS {notSubscribed, InvalidCallLinkageID, ShortTermDenial,
        LongTermDenial, CCBSIsAlreadyActivated,
        supplementaryServiceInteractionNotAllowed,
        OutgoingCCBSQueueFull}

CCNRInterrogate ::= OPERATION
    ARGUMENT SEQUENCE {
        cCBSReference CCBSReference OPTIONAL,
        partyNumberOfA PartyNumber OPTIONAL}
    RESULT SEQUENCE {
        recallMode RecallMode,
        callDetails CallDetails OPTIONAL}
    ERRORS {InvalidCCBSReference, notSubscribed}

cCNROID OBJECT IDENTIFIER ::= {ccitt identified-organization etsi(0) 1065
    operations-and-errors(1)}

cCNRRequest CCNRRequest ::= globalValue {cCNROID 1}
cCNRInterrogate CCNRInterrogate ::= globalValue {cCNROID 2}

-- The object identifiers below are defined in EN 300 359-1 and should be imported from there

cCBSOID OBJECT IDENTIFIER ::= {ccitt identified-organization etsi(0) 359
    operations-and-errors(1)}

callInfoRetain CallInfoRetain ::= globalValue {cCBSOID 1}
cCBSDeactivate CCBSDeactivate ::= globalValue {cCBSOID 3}
cCBSERase CCBSERase ::= globalValue {cCBSOID 5}
cCBSRemoteUserFree CCBSRemoteUserFree ::= globalValue {cCBSOID 6}
cCBSCall CCBSCall ::= globalValue {cCBSOID 7}
cCBSStatusRequest CCBSStatusRequest ::= globalValue {cCBSOID 8}
cCBSBFree CCBSBFree ::= globalValue {cCBSOID 9}
eraseCallLinkageID EraseCallLinkageID ::= globalValue {cCBSOID 10}
cCBSStopAlerting CCBSStopAlerting ::= globalValue {cCBSOID 11}
invalidCallLinkageID InvalidCallLinkageID ::= globalValue {cCBSOID 20}
invalidCCBSReference InvalidCCBSReference ::= globalValue {cCBSOID 21}
longTermDenial LongTermDenial ::= globalValue {cCBSOID 22}
shortTermDenial ShortTermDenial ::= globalValue {cCBSOID 23}
cCBSIsAlreadyActivated CCBSIsAlreadyActivated ::= globalValue {cCBSOID 24}
alreadyAccepted AlreadyAccepted ::= globalValue {cCBSOID 25}
outgoingCCBSQueueFull OutgoingCCBSQueueFull ::= globalValue {cCBSOID 26}
notReadyForCall NotReadyForCall ::= globalValue {cCBSOID 28}

END -- of CCNR-Operations-and-Errors

```

**Table 4: Operation and error definitions for the CCNR supplementary service for interworking with private ISDNs**

```

CCNR-private-networks-Operations-and-Errors {ccitt identified-organization etsi(0) 1065
private-networks-operations-and-errors(2)}

DEFINITIONS EXPLICIT TAGS ::=

BEGIN

EXPORTS
    CCNR-T-Request;

IMPORTS
    OPERATION, ERROR
    FROM Remote-Operation-Notation
        {joint-iso-ccitt remote-operations(4) notation (0)}

    notSubscribed
    FROM General-Errors
        {ccitt identified-organization etsi(0) 196 general-errors(2)}

    Address
    FROM Addressing-Data-Elements
        {ccitt identified-organization etsi(0) 196 addressing-data-elements(6)}

    Q931InformationElement
    FROM Embedded-Q931-Types
        {ccitt identified-organization etsi(0) 196 embedded-q931-types(7)}

    CCBS-T-Call, CCBS-T-Suspend, CCBS-T-Resume, CCBS-T-RemoteUserFree,
    CCBS-T-Available, LongTermDenial, ShortTermDenial
    FROM CCBS-private-networks-Operations-and-Errors
        {ccitt identified-organization etsi(0) 359
        private-networks-operations-and-errors(2)};

CCNR-T-Request
    ::= OPERATION
    ARGUMENT SEQUENCE {
        destinationAddress      Address,
        q931InfoElement         Q931InformationElement,
        containsHLC, LLC and BC information
        retentionSupported      [1] IMPLICIT BOOLEAN
                                DEFAULT FALSE,
        presentationAllowedIndicator [2] IMPLICIT BOOLEAN
                                OPTIONAL,
        originatingAddress     Address OPTIONAL
        -- The use of this parameter is specified in
        -- EN 300 195-1 for interaction of CCNR with CLIP
        retentionSupported      BOOLEAN -- Default False
    }
    RESULT
    ERRORS {ShortTermDenial, notSubscribed, LongTermDenial}

cCNR-T-OID OBJECT IDENTIFIER ::= {ccitt identified-organization etsi(0) 1065
private-networks-operations-and-errors(2)}

cCNR-T-Request
    CCNR-T-Request ::= globalValue {cCNR-T-OID 1}

-- The object identifiers below are defined in EN 300 359-1 and should be imported from there

cCBS-T-OID OBJECT IDENTIFIER ::= {ccitt identified-organization etsi(0) 359
private-networks-operations-and-errors(2)}

cCBS-T-Call
cCBS-T-Suspend
cCBS-T-Resume
cCBS-T-RemoteUserFree
cCBS-T-Available
    CCBS-T-Call
    CCBS-T-Suspend
    CCBS-T-Resume
    CCBS-T-RemoteUserFree
    CCBS-T-Available
    ::= globalValue {cCBS-T-OID 2}
    ::= globalValue {cCBS-T-OID 3}
    ::= globalValue {cCBS-T-OID 4}
    ::= globalValue {cCBS-T-OID 5}
    ::= globalValue {cCBS-T-OID 6}

longTermDenial
shortTermDenial
    LongTermDenial
    ShortTermDenial
    ::= globalValue {cCBS-T-OID 20}
    ::= globalValue {cCBS-T-OID 21}

END -- of CCNR-private-networks-operations-and-errors

```