



# SLOVENSKI STANDARD SIST ETS 300 549 E1:2003

01-december-2003

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Digital cellular telecommunications system (Phase 2) (GSM); Unstructured  
Supplementary Service Data (USSD); Stage 2 (GSM 03.90)

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Ta slovenski standard je istoveten z: **ETS 300 549 Edition 1**  
<https://standards.iteh.ai/catalog/standards/sist/eda01d94-c4a9-41bf-a491-e7db3a235069/sist-ets-300-549-e1-2003>

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**ICS:**

33.070.50	Globalni sistem za mobilno telekomunikacijo (GSM)	Global System for Mobile Communication (GSM)
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**SIST ETS 300 549 E1:2003**

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**E**UROPEAN  
**T**ELECOMMUNICATION  
**S**TANDARD

**ETS 300 549**

March 1995

Source: ETSI TC-SMG

Reference: DE/SMG-030390P

ICS: 33.060.30

**Key words:** European digital cellular telecommunications system, Global System for Mobile communications (GSM)

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**European digital cellular telecommunications system (Phase 2);**  
**Unstructured Supplementary Service Data (USSD) - Stage 2**

**(GSM 03.90)**  
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## Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI) and is now submitted for the Voting phase of the ETSI standards approval procedure.

This ETS describes the unstructured supplementary service operation within the European digital cellular telecommunications system (Phase 2).

This ETS corresponds to GSM Technical Specification (GSM-TS) GSM 03.90, version 4.0.3.

Reference is made within this ETS to GSM-TSs.

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the European digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TSs). These TSs may have subsequently become I-ETTs (Phase 1), or ETSS (Phase 2), whilst others may become ETSI Technical Reports (ETRs). GSM-TSs are, for editorial reasons, still referred to in current GSM ETSS.

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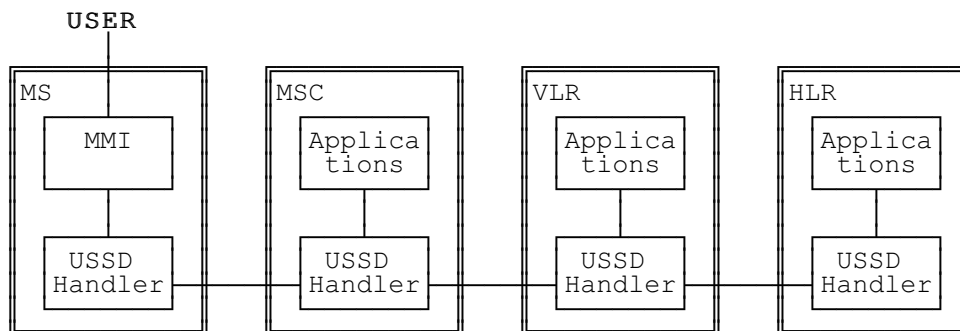
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## 1 Scope

This specification gives the stage 2 description of Unstructured Supplementary Service Data (USSD).

The unstructured supplementary service data (USSD) mechanism allows the MS user and a PLMN operator defined application to communicate in a way which is transparent to the MS and to intermediate network entities. The mechanism allows development of PLMN specific supplementary services. The following diagram shows how handling of USSD is carried out, independently of the applications.



**Figure 1.1: Handling of USSD**

This specification defines the requirements for handling USSD at the MS and network entities. It does not include specification of particular applications, nor does it specify how a particular application is selected. Where more than one application exists at a network entity, routing of messages to the correct application is carried out by the applications. The MMI for USSD is specified in TS GSM 02.30.

USSD may be initiated by the mobile station user, or by the network in the following ways:

- Network initiated USSD (section 1),
- Mobile initiated USSD (section 2).

## 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] GSM 01.04 (ETR 100): "European digital cellular telecommunication system (Phase 2); Definitions, abbreviations and acronyms".
- [2] GSM 02.04 (ETS 300 503): "European digital cellular telecommunication system (Phase 2); General on supplementary services".
- [3] GSM 02.30 (ETS 300 511): "European digital cellular telecommunication system (Phase 2); Man-Machine Interface (MMI) of the Mobile Station (MS)".

### 3 Definitions and abbreviations

In addition to those below, abbreviations used in this specification are listed in GSM 01.04.

AI	Application Initiated
MI	Mobile Initiated
USSD	Unstructured Supplementary Service Data

### 4 Cross phase compatibility

The phase 1 series of GSM specifications defined the signalling protocol which may be used, but they did not specify the operation of USSD as a service.

The main body of this specification assumes that the mobile station and all network entities comply with this phase of USSD. In order to minimize any possible problems between a phase 1 implementation of USSD and this phase, sections 5.6 and 6.6 define the additional requirements for when one or more entity complies with the phase 1 USSD specification for network initiated and mobile initiated USSD respectively.

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## 5 Network initiated unstructured supplementary service

### 5.1 Handling of network initiated USSD

The network (MSC, VLR or HLR) can at any time send a USSD operation towards an MS. This operation may be either a request (asking the MS to provide information) or a notification (requiring no information in the response from the MS). No prior provision of USSD is required, although provision of services which make use of USSD may be required. All USSD requests, notifications and responses (except responses to notifications) contain the USSD string, an alphabet indicator and language indicator, as defined in TS GSM 02.04.

### 5.2 Functions and information flows

The following text describes the handling of network initiated USSD. Diagrammatic representations are as follows:

figure 5.1 SDL for USSD invocation (HLR, VLR, MSC);

figure 5.2 SDL for forwarding of USSD operations (VLR, MSC);

figure 5.3 SDL for MS;

figure 5.4 Call flow for successful single USSD request;

figure 5.5 Call flow for successful single USSD notification;

figure 5.6 Call flow for successful multiple USSD requests;

figure 5.7 Call flow for failed USSD request.

#### 5.2.1 Invoking unstructured SS operation from the HLR

When an application in the HLR is to send a USSD request or notification to an MS, it shall set up a transaction to the VLR where the subscriber is currently registered and send the operation to the VLR. It shall then await a response. The HLR is responsible for controlling the transaction, and shall therefore normally release the transaction when it receives a response from the VLR. The HLR may also release the transaction before receiving a response if necessary (eg if an application timer expires).

If an application in the HLR needs to send further operations to the same MS as part of the same application, it may continue to use the same transaction until all operations are completed (see figure 5.6). If a different transaction is to be used for a subsequent operation, the HLR shall release the first transaction before starting the next.

If the VLR releases the transaction at any time (eg due to user clearing), the HLR shall inform the application and terminate the USSD operation.

See section 5.2.4 for forwarding of an HLR invoked operation by the VLR and MSC.

### 5.2.2 Invoking unstructured SS operation from the VLR

When an application in the VLR is to send a USSD request or notification to an MS, it shall set up a transaction to the MSC where the subscriber is currently registered and send the operation to the MSC. It shall then await a response. The VLR is responsible for controlling the transaction, and shall therefore normally release the transaction when it receives a response from the MSC. The VLR may also release the transaction before receiving a response if necessary (eg if an application timer expires).

If an application in the VLR needs to send further operations to the same MS as part of the same application, it may continue to use the same transaction until all operations are completed. If a different transaction is to be used for a subsequent operation, the VLR shall release the first transaction before starting the next.

See section 5.2.4 for forwarding of a VLR invoked operation by the MSC.

If the MSC releases the transaction at any time (eg due to the user clearing), the VLR shall inform the application and terminate the USSD operation.

### 5.2.3 Invoking unstructured SS operation from the MSC

When an application in the MSC is to send a USSD request or notification to an MS, it shall set up a transaction to the MS where the subscriber is currently registered and send the operation to the MS. It shall then await a response. The MSC is responsible for controlling the transaction, and shall therefore normally release the transaction when it receives a response from the MS. The MSC may also release the transaction before receiving a response if necessary (eg if an application timer expires).

If an application in the MSC needs to send further operations to the same MS as part of the same application, it may continue to use the same transaction until all operations are completed. If a different transaction is to be used for a subsequent operation, the VLR shall release the first transaction before starting the next.

If the MS releases the transaction at any time (eg due to the user clearing), the MSC shall inform the application and terminate the USSD operation.

NOTE: MSC invoked USSD is only likely to be used for call related operations, where the application is controlling a call to or from the MS.

### 5.2.4 Forwarding USSD operations

The VLR may any time receive a USSD operation fm the HLR. If the subscriber can be contacted, the VLR shall set up a transaction to the MSC and forward the operation unchanged. Any further information exchange between the HLR and MSC shall be transparent to the VLR. When one transaction is released, the VLR shall release the other. If an error is received from the MSC, the VLR shall release the transaction to the HLR.

The MSC may at any time receive an USSD operation from the VLR. If the subscriber can be contacted, the MSC shall set up a transaction to the MS and forward the operation unchanged. Any further information exchange between the VLR and MS shall be transparent to the MSC. When one transaction is released, the MSC shall release the other. If an error is received from the MS, the MSC shall release the transaction to the VLR.