DSS1 ETSI Protocol Modules for TTCN-3 Toolset with TITAN, Function Specification

Contents

[1 Introduction 2](#_Toc337793880)

[1.1 Revision history 2](#_Toc337793881)

[1.2 How to Read this Document 2](#_Toc337793882)

[1.3 Scope 2](#_Toc337793883)

[1.4 References 2](#_Toc337793884)

[1.5 Abbreviations 3](#_Toc337793885)

[1.6 Terminology 3](#_Toc337793886)

[2 General 3](#_Toc337793887)

[3 Functional specification 3](#_Toc337793888)

[3.1 Protocol version implemented 3](#_Toc337793889)

[3.2 Modifications/deviations related to the protocol specification 3](#_Toc337793890)

[3.2.1 Implemented Messages 3](#_Toc337793891)

[3.2.2 Functional protocol 4](#_Toc337793892)

[3.2.3 Protocol Modifications/Deviations 4](#_Toc337793893)

[3.3 Encoding/Decoding and Other Related Functions 4](#_Toc337793894)

[3.4 Limitations 5](#_Toc337793895)

# Introduction

## Revision history

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Rev | Characteristics | Prepared |
| 2005-04-19 | PA1 | First draft version | ETHLAFA |
| 2005-04-20 | PA2 | Updated after inspection | ETHLAFA |
| 2006-01-10 | PA3 | Functional protocol added | ETHLAFA |
| 2012-06-28 | PC1 | New operations for facility + backtrack decoder | ETHGBH |

## How to Read this Document

This is the Function Specification for the set of DSS1 ETSI protocol modules. DSS1 ETSI protocol modules are developed for the TTCN-3 Toolset with TITAN. This document should be read together with Product Revision Information [4].

## Scope

The purpose of this document is to specify the content of the DSS1 ETSI protocol modules.

## References

1. ITU-T Q.931 (03/93)  
   DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 1 (DSS 1) –   
   ISDN USER-NETWORK INTERFACE LAYER 3 SPECIFICATION FOR BASIC CALL CONTROL
2. 13/155 17‑CRT 288 01 Uen Rev. C  
   DSS1 LAYER 3 PROTOCOL SPECIFICATION, INFORMATION ELEMENTS FOR BOTH BASIC CALL AND SUPPLEMENTARY SERVICE CONTROL, ISDN‑E
3. ETSI ES 201 873-1 v.4.4.1 (2012)  
   The Testing and Test Control Notation version 3. Part 1: Core Language
4. 109 21-CNL 113 435-3  
   DSS1 ETSI Protocol Modules for TTCN-3 Toolset with TITAN, Product Revision Information
5. 1/1553-CRL 113 200 Uen  
   User Documentation for the TITAN TTCN-3 Test Executor
6. ETSI EN 300 196-1 V1.3.2 (2001-06)  
   ISDN: Generic functional protocol for the support of supplementary services
7. 30/155 17-APR 101 20 Uen Rev F  
   DSS1 LAYER 7 PROTOCOL SPECIFICATION, FACILITY CONTROL OF SUPPLEMENTARY SERVICES (DSS1 L7 PROTOCOL), ISDN-E

## Abbreviations

DSS1 Digital Subscriber Signaling System No. 1

ISDN Integrated Services Digital Network

TTCN-3 Testing and Test Control Notation version 3

## Terminology

No specific terminology is used.

# General

Protocol modules implement the message structures of the related protocol in a formalized way, using the standard specification language TTCN-3. This allows defining of test data (templates) in the TTCN-3 language [3] and correctly encoding/decoding messages when executing test suites using the TITAN TTCN-3 test environment.

Protocol modules are using TITAN’s RAW encoding attributes [5] and hence are usable with the TITAN test toolset only.

# Functional specification

## Protocol version implemented

This set of protocol modules implements protocol messages and constants of the DSS1 ETSI protocol, version 03/93 (see [1]) with the modifications specified in 3.2.

In addition, the functional protocol specified in [6] and in [7] is implemented.

## Modifications/deviations related to the protocol specification

### Implemented Messages

The following messages are implemented from [1]:

* ALERTING
* CALL PROCEEDING
* CONGESTION CONTROL
* CONNECT
* CONNECT ACKNOWLEDGE
* DISCONNECT
* FACILITY
* HOLD
* HOLD ACKNOWLEDGE
* HOLD REJECT
* INFORMATION
* NOTIFY
* PROGRESS
* REGISTER
* RELEASE
* RELEASE COMPLETE
* RESTART
* RESTART ACKNOWLEDGE
* RESUME
* RESUME ACKNOWLEDGE
* RESUME REJECT
* RETRIEVE
* RETRIEVE ACKNOWLEDGE
* RETRIEVE REJECT
* SEGMENT
* SETUP
* SETUP ACKNOWLEDGE
* STATUS
* STATUS ENQUIRY
* SUSPEND
* SUSPEND ACKNOWLEDGE
* SUSPEND REJECT
* USER INFORMATION

### Functional protocol

The implementation is based on files contained in annex E of [6] and in [7]

### Protocol Modifications/Deviations

Protocol modules contain the following additions to [1] (see [2]):

* NATIONAL REGISTER
* NATIONAL REGISTER ACKNOWLEDGE

## Encoding/Decoding and Other Related Functions

This product also contains encoding/decoding functions that assure correct encoding of messages when sent from TITAN and correct decoding of messages when received by TITAN. Implemented encoding/decoding functions. Via the backtrack decoder it is possible to avoid dynamic testcase error in case of trying to decode invalid message. In this case decoder function return a non-zero value:

Name Type of formal parameters Type of return value  
enc\_PDU\_DSS1 PDU\_DSS1 octetstring  
dec\_PDU\_DSS1 octetstring PDU\_DSS1

enc\_PDU\_DSS1\_fast PDU\_DSS1, octetstring

dec\_PDU\_DSS1\_backtrack octetstring, PDU\_DSS1 integer

Name Type of formal parameters Type of return value  
enc\_Facility\_IE Facility\_IE octetstring  
dec\_Facility\_IE octetstring Facility\_IE

enc\_Facility\_IE\_fast Facility\_IE, octetstring

dec\_Facility\_IE\_backtrack octetstring, Facility\_IE integer

## Limitations

Debug log generation is not supported when this revision of this product is used with TITAN version R7A (1.7pl0), because the encoder/decoder functions, automatically generated by TITAN version R7A (1.7pl0) doesn't contain logging functions. Newer versions of TITAN supports the debug logging within the automatically generated encoder/decoder functions that can be activated by allowing the DEBUG\_ENCDEC (see TITAN TTCN-3 Test Executor Technical Reference, clause 7.2.3.2) in TITAN runtime configuration files.