



SLOVENSKI STANDARD
SIST ETS 300 417-3-1 E1:2003

01-december-2003

DfYbcg]b`a i `hjd`Y_g]fUb`Y`fHAŁĚ; YbYf] bY`nU hYj Y`nUdfYbcgbc`Z b_W]cbUbcgh
cdfYa YĚ' !%`XY. : i b_W]Y`d`Ugh]fY[YbYfUrcfg_Y[U]b`a i `hjd`Y_gbY[UcXgY_U`nU
g]b\ fcb]dfYbcgb]a cXi `!B`fGHA!BŁ

Transmission and Multiplexing (TM); Generic requirements of transport functionality of equipment; Part 3-1: Synchronous Transport Module-N (STM-N) regenerator and multiplex section layer functions

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST ETS 300 417-3-1 E1:2003](https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-5436d97c3f61/sist-ets-300-417-3-1-e1-2003)

[https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-](https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-5436d97c3f61/sist-ets-300-417-3-1-e1-2003)

[5436d97c3f61/sist-ets-300-417-3-1-e1-2003](https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-5436d97c3f61/sist-ets-300-417-3-1-e1-2003)

Ta slovenski standard je istoveten z: ETS 300 417-3-1 Edition 1

ICS:

33.040.20 Prenosni sistem Transmission systems

SIST ETS 300 417-3-1 E1:2003 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST ETS 300 417-3-1 E1:2003](https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-5436d97c3f61/sist-ets-300-417-3-1-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-5436d97c3f61/sist-ets-300-417-3-1-e1-2003>



EUROPEAN
TELECOMMUNICATION
STANDARD

ETS 300 417-3-1

June 1997

Source: ETSI TC-TM

Reference: DE/TM-01015-3-1

ICS: 33.020

Key words: Transmission, SDH, interface

**Transmission and Multiplexing (TM);
Generic requirements of transport
functionality of equipment;
Part 3-1: Synchronous Transport Module-N (STM-N)
regenerator and multiplex section layer functions**

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE

Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 4 92 94 42 00 - Fax: +33 4 93 65 47 16

Copyright Notification: No part may be reproduced except as authorized by written permission. The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 1997. All rights reserved.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ETS 300 417-3-1 E1:2003](https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-5436d97c3f61/sist-ets-300-417-3-1-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-5436d97c3f61/sist-ets-300-417-3-1-e1-2003>

Contents

Foreword	7
1 Scope	9
2 Normative references	9
3 Definitions, abbreviations and symbols	10
3.1 Definitions	10
3.2 Abbreviations	10
3.3 Symbols and Diagrammatic Conventions	12
3.4 Introduction	12
4 STM-1 Regenerator Section Layer Functions	13
4.1 STM-1 Regenerator Section Connection functions	14
4.2 STM-1 Regenerator Section Trail Termination functions	15
4.2.1 STM-1 Regenerator Section Trail Termination Source RS1_TT_So	15
4.2.2 STM-1 Regenerator Section Trail Termination Sink RS1_TT_Sk	17
4.3 STM-1 Regenerator Section Adaptation functions	19
4.3.1 STM-1 Regenerator Section to Multiplex Section Adaptation Source RS1/MS1_A_So	19
4.3.2 STM-1 Regenerator Section to Multiplex Section Adaptation Sink RS1/MS1_A_Sk	20
4.3.3 STM-1 Regenerator Section to DCC Adaptation Source RS1/DCC_A_So	21
4.3.4 STM-1 Regenerator Section to DCC Adaptation Sink RS1/DCC_A_Sk	22
4.3.5 STM-1 Regenerator Section to P0s Adaptation Source RS1/P0s_A_So/N	23
4.3.6 STM-1 Regenerator Section to P0s Adaptation Sink RS1/P0s_A_Sk/N	24
4.3.7 STM-1 Regenerator Section to V0x Adaptation Source RS1/V0x_A_So	25
4.3.8 STM-1 Regenerator Section to V0x Adaptation Sink RS1/V0x_A_Sk	26
5 STM-1 Multiplex Section Layer Functions	27
5.1 STM-1 Multiplex Section Connection functions	29
5.2 STM-1 Multiplex Section Trail Termination functions	30
5.2.1 STM-1 Multiplex Section Trail Termination Source MS1_TT_So	30
5.2.2 STM-1 Multiplex Section Trail Termination Sink MS1_TT_Sk	31
5.3 STM-1 Multiplex Section Adaptation functions	34
5.3.1 STM-1 Multiplex Section to S4 Layer Adaptation Source MS1/S4_A_So	34
5.3.2 STM-1 Multiplex Section to S4 Layer Adaptation Sink MS1/S4_A_Sk	37
5.3.3 STM-1 Multiplex Section to DCC Adaptation Source MS1/DCC_A_So	39
5.3.4 STM-1 Multiplex Section to DCC Adaptation Sink MS1/DCC_A_Sk	40
5.3.5 STM-1 Multiplex Section to P0s Adaptation Source MS1/P0s_A_So	41
5.3.6 STM-1 Multiplex Section to P0s Adaptation Sink MS1/P0s_A_Sk	42
5.3.7 STM-1 Multiplex Section to Synchronization Distribution Adaptation Source MS1/SD_A_So	42
5.3.8 STM-1 Multiplex Section to Synchronization Distribution Adaptation Sink MS1/SD_A_Sk	43
5.3.9 STM-1 Multiplex Section Layer Clock Adaptation Source MS1-LC_A_So	43
5.4 STM-1 Multiplex Section Layer Monitoring Functions	43
5.5 STM-1 Multiplex Section Linear Trail Protection Functions	44
5.5.1 STM-1 Multiplex Section Linear Trail Protection Connection Functions	44
5.5.1.1 STM-1 Multiplex Section 1+1 Linear Trail Protection Connection MS1P1+1_C	44
5.5.1.2 STM-1 Multiplex Section 1:n Linear Trail Protection Connection MS1P1:n_C	46
5.5.2 STM-1 Multiplex Section Linear Trail Protection Trail Termination Functions	48
5.5.2.1 Multiplex Section Protection Trail Termination Source MS1P_TT_So	48

	5.5.2.2	Multiplex Section Protection Trail Termination Sink MS1P_TT_Sk.....	49
5.5.3	STM-1 Multiplex Section Linear Trail Protection Adaptation Functions.....		50
	5.5.3.1	STM-1 Multiplex Section to STM-1 Multiplex Section Protection Layer Adaptation Source MS1/MS1P_A_So	50
	5.5.3.2	STM-1 Multiplex Section to STM-1 Multiplex Section Protection Layer Adaptation Sink MS1/MS1P_A_Sk.....	51
6	STM-4 Regenerator Section Layer Functions		52
6.1	STM-4 Regenerator Section Connection functions.....		53
6.2	STM-4 Regenerator Section Trail Termination functions.....		54
	6.2.1	STM-4 Regenerator Section Trail Termination Source RS4_TT_So	54
	6.2.2	STM-4 Regenerator Section Trail Termination Sink RS4_TT_Sk.....	56
6.3	STM-4 Regenerator Section Adaptation functions.....		58
	6.3.1	STM-4 Regenerator Section to Multiplex Section Adaptation Source RS4/MS4_A_So.....	58
	6.3.2	STM-4 Regenerator Section to Multiplex Section Adaptation Sink RS4/MS4_A_Sk.....	59
	6.3.3	STM-4 Regenerator Section to DCC Adaptation Source RS4/DCC_A_So..	60
	6.3.4	STM-4 Regenerator Section to DCC Adaptation Sink RS4/DCC_A_Sk	61
	6.3.5	STM-4 Regenerator Section to P0s Adaptation Source RS4/P0s_A_So/N..	62
	6.3.6	STM-4 Regenerator Section to P0s Adaptation Sink RS4/P0s_A_Sk/N.....	63
	6.3.7	STM-4 Regenerator Section to V0x Adaptation Source RS4/V0x_A_So	64
	6.3.8	STM-4 Regenerator Section to V0x Adaptation Sink RS4/V0x_A_Sk.....	65
7	STM-4 Multiplex Section Layer Functions		66
7.1	STM-4 Multiplex Section Connection functions.....		68
7.2	STM-4 Multiplex Section Trail Termination functions.....		69
	7.2.1	STM-4 Multiplex Section Trail Termination Source MS4_TT_So	69
	7.2.2	STM-4 Multiplex Section Trail Termination Sink MS4_TT_Sk	71
7.3	STM-4 Multiplex Section Adaptation functions.....		74
	7.3.1	STM-4 Multiplex Section to S4 Layer Adaptation Source MS4/S4_A_So/N.	74
	7.3.2	STM-4 Multiplex Section to S4 Layer Adaptation Sink MS4/S4_A_Sk/N	77
	7.3.3	STM-4 Multiplex Section to S4-4c Layer Adaptation Source MS4/S4-4c_A_So	79
	7.3.4	STM-4 Multiplex Section to S4-4c Layer Adaptation Sink MS4/S4-4c_A_Sk	82
	7.3.5	STM-4 Multiplex Section to DCC Adaptation Source MS4/DCC_A_So	84
	7.3.6	STM-4 Multiplex Section to DCC Adaptation Sink MS4/DCC_A_Sk.....	85
	7.3.7	STM-4 Multiplex Section to P0s Adaptation Source MS4/P0s_A_So.....	86
	7.3.8	STM-4 Multiplex Section to P0s Adaptation Sink MS4/P0s_A_Sk	87
	7.3.9	STM-4 Multiplex Section to Synchronization Distribution Adaptation Source MS4/SD_A_So	87
	7.3.10	STM-4 Multiplex Section to Synchronization Distribution Adaptation Sink MS4/SD_A_Sk.....	88
	7.3.11	STM-4 Multiplex Section Layer Clock Adaptation Source MS4-LC_A_So ...	88
7.4	STM-4 Multiplex Section Layer Monitoring Functions		88
7.5	STM-4 Multiplex Section Linear Trail Protection Functions		89
	7.5.1	STM-4 Multiplex Section Linear Trail Protection Connection Functions.....	89
	7.5.1.1	STM-4 Multiplex Section 1+1 Linear Trail Protection Connection MS4P1+1_C	89
	7.5.1.2	STM-4 Multiplex Section 1:n Linear Trail Protection Connection MS4P1:n_C.....	91
	7.5.2	STM-4 Multiplex Section Linear Trail Protection Trail Termination Functions	93
	7.5.2.1	Multiplex Section Protection Trail Termination Source MS4P_TT_So	93
	7.5.2.2	Multiplex Section Protection Trail Termination Sink MS4P_TT_Sk.....	94
	7.5.3	STM-4 Multiplex Section Linear Trail Protection Adaptation Functions.....	95
	7.5.3.1	STM-4 Multiplex Section to STM-4 Multiplex Section Protection Layer Adaptation Source MS4/MS4P_A_So	95

	7.5.3.2	STM-4 Multiplex Section to STM-4 Multiplex Section Protection Layer Adaptation Sink MS4/MS4P_A_Sk.....	96
8		STM-16 Regenerator Section Layer Functions	97
	8.1	STM-16 Regenerator Section Connection functions	98
	8.2	STM-16 Regenerator Section Trail Termination functions	99
	8.2.1	STM-16 Regenerator Section Trail Termination Source RS16_TT_So	99
	8.2.2	STM-16 Regenerator Section Trail Termination Sink RS16_TT_Sk.....	101
	8.3	STM-16 Regenerator Section Adaptation functions	103
	8.3.1	STM-16 Regenerator Section to Multiplex Section Adaptation Source RS16/MS16_A_So	103
	8.3.2	STM-16 Regenerator Section to Multiplex Section Adaptation Sink RS16/MS16_A_Sk	104
	8.3.3	STM-16 Regenerator Section to DCC Adaptation Source RS16/DCC_A_So	105
	8.3.4	STM-16 Regenerator Section to DCC Adaptation Sink RS16/DCC_A_Sk ..	106
	8.3.5	STM-16 Regenerator Section to P0s Adaptation Source RS16/P0s_A_So/N.....	107
	8.3.6	STM-16 Regenerator Section to P0s Adaptation Sink RS16/P0s_A_Sk/N.	108
	8.3.7	STM-16 Regenerator Section to V0x Adaptation Source RS16/V0x_A_So	109
	8.3.8	STM-16 Regenerator Section to V0x Adaptation Sink RS16/V0x_A_Sk....	110
9		STM-16 Multiplex Section Layer Functions.....	111
	9.1	STM-16 Multiplex Section Connection functions	116
	9.2	STM-16 Multiplex Section Trail Termination functions	116
	9.2.1	STM-16 Multiplex Section Trail Termination Source MS16_TT_So.....	116
	9.2.2	STM-16 Multiplex Section Trail Termination Sink MS16_TT_Sk	118
	9.3	STM-16 Multiplex Section Adaptation functions.....	121
	9.3.1	STM-16 Multiplex Section to S4 Layer Adaptation Source MS16/S4_A_So/N	121
	9.3.2	STM-16 Multiplex Section to S4 Layer Adaptation Sink MS16/S4_A_Sk/N	124
	9.3.3	STM-16 Multiplex Section to S4-4c Layer Adaptation Source MS16/S4-4c_A_So/N	126
	9.3.4	STM-16 Multiplex Section to S4-4c Layer Adaptation Sink MS16/S4-4c_A_Sk/N	129
	9.3.5	STM-16 Multiplex Section to DCC Adaptation Source MS16/DCC_A_So ..	131
	9.3.6	STM-16 Multiplex Section to DCC Adaptation Sink MS16/DCC_A_Sk.....	132
	9.3.7	STM-16 Multiplex Section to P0s Adaptation Source MS16/P0s_A_So	133
	9.3.8	STM-16 Multiplex Section to P0s Adaptation Sink MS16/P0s_A_Sk.....	134
	9.3.9	STM-16 Multiplex Section to Synchronization Distribution Adaptation Source MS16/SD_A_So	134
	9.3.10	STM-16 Multiplex Section to Synchronization Distribution Adaptation Sink MS16/SD_A_Sk	135
	9.3.11	STM-16 Multiplex Section Layer Clock Adaptation Source MS16- LC_A_So	135
	9.4	STM-16 Multiplex Section Layer Monitoring Functions.....	135
	9.5	STM-16 Multiplex Section Linear Trail Protection Functions	136
	9.5.1	STM-16 Multiplex Section Linear Trail Protection Connection Functions ...	136
	9.5.1.1	STM-16 Multiplex Section 1+1 Linear Trail Protection Connection MS16P1+1_C	136
	9.5.1.2	STM-16 Multiplex Section 1:n Linear Trail Protection Connection MS16P1:n_C	138
	9.5.2	STM-16 Multiplex Section Linear Trail Protection Trail Termination Functions.....	140
	9.5.2.1	Multiplex Section Protection Trail Termination Source MS16P_TT_So	140
	9.5.2.2	Multiplex Section Protection Trail Termination Sink MS16P_TT_Sk	141
	9.5.3	STM-16 Multiplex Section Linear Trail Protection Adaptation Functions	142
	9.5.3.1	STM-16 Multiplex Section to STM-16 Multiplex Section Protection Layer Adaptation Source MS16/MS16P_A_So	142
	9.5.3.2	STM-16 Multiplex Section to STM-16 Multiplex Section Protection Layer Adaptation Sink MS16/MS16P_A_Sk.....	143

9.6	STM-16 Multiplex Section 2 Fibre Shared Protection Ring Functions	144
9.6.1	STM-16 Multiplex Section 2 Fibre Shared Protection Ring Connection MS16P2fsh_C.....	144
9.6.2	STM-16 Multiplex Section 2 Fibre Shared Protection Ring Trail Termination Functions	148
9.6.2.1	STM-16 Multiplex Section 2 Fibre Shared Protection Ring Trail Termination Source MS16P2fsh_TT_So.....	148
9.6.2.2	STM-16 Multiplex Section 2 Fibre Shared Protection Ring Trail Termination Sink MS16P2fsh_TT_Sk.....	149
9.6.3	STM-16 Multiplex Section 2 Fibre Shared Protection Ring Adaptation Functions	150
9.6.3.1	STM-16 Multiplex Section to STM-16 Multiplex Section 2 Fibre Shared Protection Ring Adaptation Source MS16/MS16P2fsh_A_So	150
9.6.3.2	STM-16 Multiplex Section to STM-16 Multiplex Section 2 Fibre Shared Protection Ring Adaptation Sink MS16/MS16P2fsh_A_Sk	151
9.7	STM-16 Multiplex Section 4 Fibre Shared Protection Ring Functions	152
9.7.1	STM-16 Multiplex Section 4 Fibre Shared Protection Ring Connection MS16P4fsh_C.....	152
9.7.2	STM-16 Multiplex Section 4 Fibre Shared Protection Ring Trail Termination Functions	152
9.7.2.1	STM-16 Multiplex Section 4 Fibre Shared Protection Ring Trail Termination Source MS16P4fsh_TT_So.....	152
9.7.2.2	STM-16 Multiplex Section 4 Fibre Shared Protection Ring Trail Termination Sink MS16P4fsh_TT_Sk.....	152
9.7.3	STM-16 Multiplex Section 4 Fibre Shared Protection Ring Adaptation Functions	152
9.7.3.1	STM-16 Multiplex Section to STM-16 Multiplex Section 4 Fibre Shared Protection Ring Adaptation Source MS16/MS16P4fsh_A_So.....	152
9.7.3.2	STM-16 Multiplex Section to STM-16 Multiplex Section 4 Fibre Shared Protection Ring Adaptation Sink MS16/MS16P4fsh_A_Sk.....	152
10	STM-64 Regenerator Section layer functions.....	152
11	STM-64 Multiplex Section layer functions.....	152
Annex A (normative):	Generic specification of linear protection switching operation	153
A.1	Protection process overview	154
A.2	External switch commands definition	156
A.3	Conditions of working and protection trail/connections	157
A.4	States within protection process.....	157
A.5	Numbering of working, protection, normal, extra traffic, null signals.....	158
A.6	Priority of request types (conditions, external commands, states).....	159
A.7	APS signal definition	160
A.7.1	APS signal fields.....	160
A.7.2	STM-N MS-APS.....	162
A.7.3	STM-N VC-APS	162
A.8	Switch performance: switching and holdoff times	162
A.9	Subprocesses	163
Annex B (informative):	STM-16 regenerator functional model (example).....	171
Annex C (informative):	AU-4-Xc numbering scheme & pointer allocation.....	172
Annex D (informative):	MS protection examples	176
Annex E (informative):	Bibliography	178
History	179

Foreword

This European Telecommunication Standard (ETS) has been produced by the Transmission and Multiplexing (TM) Technical Committee of the European Telecommunications Standards Institute (ETSI) in order to provide inter-vendor and inter-operator compatibility of SDH equipments.

This ETS has been produced in order to provide inter-vendor and inter-operator compatibility for transport functionality of equipment.

This ETS consists of 8 parts as follows:

- Part 1: "Generic processes and performance" (ETS 300 417-1-1);
- Part 2: "SDH and PDH physical section layer functions" (ETS 300 417-2-1);
- Part 3: "STM-N regenerator and multiplex section layer functions" (ETS 300 417-3-1);**
- Part 4: "SDH path layer functions" (ETS 300 417-4-1);
- Part 5: "PDH path layer functions" (ETS 300 417-5-1);
- Part 6: "Synchronization distribution layer functions" (ETS 300 417-6-1);
- Part 7: "Auxiliary layer functions" (ETS 300 417-7-1);
- Part 8: "Compound and major compound functions" (ETS 300 417-8-1).

Transposition dates	
Date of adoption:	4 April 1997
Date of latest announcement of this ETS (doa):	30 September 1997
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 March 1998
Date of withdrawal of any conflicting National Standard (dow):	31 March 1998

Blank page

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST ETS 300 417-3-1 E1:2003](https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-5436d97c3f61/sist-ets-300-417-3-1-e1-2003)

<https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-5436d97c3f61/sist-ets-300-417-3-1-e1-2003>

1 Scope

This European Telecommunication Standard (ETS) specifies a library of basic building blocks and a set of rules by which they are combined in order to describe transport functionality of equipment. The library comprises the functional building blocks needed to completely specify the generic functional structure of the European Transmission Hierarchies. Equipment which is compliant with this ETS needs to be describable as an interconnection of a subset of these functional blocks contained within this ETS. The interconnections of these blocks need to obey the combination rules given. The generic functionality is described in ETS 300 417-1-1 [1].

2 Normative references

This ETS incorporates by dated or 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 amendments or revisions. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 417-1-1: "Transmission and Multiplexing (TM); Generic functional requirements for Synchronous Digital Hierarchy (SDH) equipment; Part 1-1: Generic processes and performance".
- [2] ETS 300 147: "Transmission and Multiplexing (TM); Synchronous Digital Hierarchy (SDH) Multiplexing structure".
- [3] ETS 300 166 (1993): "Transmission and Multiplexing (TM); Physical and electrical characteristics of hierarchical digital interfaces for equipment using the 2 048 kbit/s - based plesiochronous or synchronous digital hierarchies".
- [4] ITU-T Recommendation G 783 (1994): "Characteristics of synchronous digital hierarchy (SDH) equipment functional blocks".
- [5] ETS 300 746: "Transmission and Multiplexing (TM); Synchronous Digital Hierarchy (SDH); Automatic Protection Switching (APS) protocols and operation".
- [6] ETS 300 417-4-1: "Transmission and Multiplexing (TM); Generic requirements of transport functionality of equipment; Part 4-1: SDH path layer functions".
- [7] prETS 300 417-6-1: "Transmission and Multiplexing (TM); Generic requirements of transport functionality of equipment; Part 6-1: Synchronization distribution layer functions".

3 Definitions, abbreviations and symbols

3.1 Definitions

The functional definitions are described in ETS 300 417-1-1 [1].

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

A	Adaptation function
AcTI	Accepted Trace Identifier
ADM	Add-Drop Multiplexer
AI	Adapted Information
AIS	Alarm Indication Signal
AP	Access Point
APId	Access Point Identifier
APS	Automatic Protection Switch
AU	Administrative Unit
AUG	Administrative Unit Group
AU-n	Administrative Unit, level n
BER	Bit Error Ratio
BIP	Bit Interleaved Parity
BIP-N	Bit Interleaved Parity, width N
C	Connection function
CI	Characteristic Information
CK	Clock
CM	Connection Matrix
CP	Connection Point
CS	Clock Source
D	Data
DCC	Data Communications Channel
DEC	DECrement
DEG	DEGraded
DEGTHR	DEGraded THReshold
EBC	Errored Block Count
ECC	Embedded Communications Channel
ECC(x)	Embedded Communications Channel, layer x
EDC	Error Detection Code
EDCV	Error Detection Code Violation
EMF	Equipment Management Function
EQ	EQuipment
ES	Electrical Section
ES	Errored Second
ExTI	Expected Trace Identifier
F_B	Far-end Block
FAS	Frame Alignment Signal
FOP	Failure Of Protocol
FS	Frame Start signal
HO	Higher Order
HOVC	Higher Order Virtual Container
HP	Higher order Path
ID	IDentifier
IF	In Frame state
INC	INCrement
INV	INValid
LC	Link Connection
LO	Lower Order
LOA	Loss Of Alignment; generic for LOF, LOM, LOP
LOF	Loss Of Frame
LOP	Loss Of Pointer
LOS	Loss Of Signal
LOVC	Lower Order Virtual Container

MC	Matrix Connection
MCF	Message Communications Function
MDT	Mean Down Time
mei	maintenance event information
MI	Management Information
MO	Managed Object
MON	MONitored
MP	Management Point
MS	Multiplex Section
MS1	STM-1 Multiplex Section
MS16	STM-16 Multiplex Section
MS4	STM-4 Multiplex Section
MSB	Most Significant Bit
MSOH	Multiplex Section OverHead
MSP	Multiplex Section Protection
MSPG	Multiplex Section Protection Group
NC	Not Connected
N_B	Near-end Block
NC	Network Connection
NDF	New Data Flag
NE	Network Element
NMON	Not MONitored
NNI	Network Node Interface
NU	National Use (bits, bytes)
NUx	National Use, bit rate order x
OAM	Operation, Administration and Maintenance
OFS	Out of Frame Second
OOF	Out Of Frame state
OS	Optical Section
OSI(x)	Open Systems Interconnection, layer x
OW	Order Wire
P	Protection
P_A	Protection Adaptation
P_C	Protection Connection
P_TT	Protection Trail Termination
PDH	Plesiochronous Digital Hierarchy
PJE	Pointer Justification Event
PM	Performance Monitoring
Pn	Plesiochronous signal, level n
POH	Path OverHead
PRC	Primary Reference Clock
PS	Protection Switching
PSC	Protection Switch Count
PTR	PoinTeR
QOS	Quality Of Service
RDI	Remote Defect Indication
REI	Remote Error Indication
RI	Remote Information
RP	Remote Point
RS	Regenerator Section
RS1	STM-1 Regenerator Section
RS16	STM-16 Regenerator Section
RS4	STM-4 Regenerator Section
RSOH	Regenerator Section OverHead
RxTI	Received Trace Identifier
S4	VC-4 path layer
SASE	Stand-Alone Synchronization Equipment
SD	Synchronization Distribution layer, Signal Degrade
SDH	Synchronous Digital Hierarchy
SEC	SDH Equipment Clock
SF	Signal Fail
Sk	Sink
SNC	Sub-Network Connection

iTech STANDARD PREVIEW

(standards.iteh.ai)

SIST ETS 300 417-3-1 E1:2003

<https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-343897c31010/sist-ets-300-417-3-1-e1-2003>

SIST ETS 300 417-3-1 E1:2003

SNC/I	Inherently monitored Sub-Network Connection protection
SNC/N	Non-intrusively monitored Sub-Network Connection protection
SNC/S	Sublayer monitored Sub-Network Connection protection
So	Source
SOH	Section OverHead
SPRING	Shared Protection RING
SR	Selected Reference
SSD	Server Signal Degrade
SSF	Server Signal Fail
SSM	Synchronization Status Message
SSU	Synchronization Supply Unit
STM	Synchronous Transport Module
STM-N	Synchronous Transport Module, level N
TCP	Termination Connection Point
TI	Timing Information
TIM	Trace Identifier Mismatch
TM	Transmission_Medium
TMN	Telecommunications Management Network
TP	Timing Point
TPmode	Termination Point mode
TS	Time Slot
TSD	Trail Signal Degrade
TSF	Trail Signal Fail
TT	Trail Termination function
TTI	Trail Trace Identifier
TTs	Trail Termination supervisory function
TxTI	Transmitted Trace Identifier
UNEQ	UNEQuipped
UNI	User Network Interface
USR	USeR channels
V0	64 kbit/s contra
VC	Virtual Container
VC-n	Virtual Container, level-n
W	Working

iteh STANDARD PREVIEW
 (standards.iteh.ai)
 SIST ETS 300 417-3-1 E1:2003
<https://standards.iteh.ai/catalog/standards/sist/96d826cc-4708-4234-aa1a-5436d97c3f61/sist-ets-300-417-3-1-e1-2003>

3.3 Symbols and Diagrammatic Conventions

The symbols and diagrammatic conventions are described in ETS 300 417-1-1 [1].

3.4 Introduction

The atomic functions defining the regenerator and multiplex section layers are described below (clause 4 onwards).

4 STM-1 Regenerator Section Layer Functions

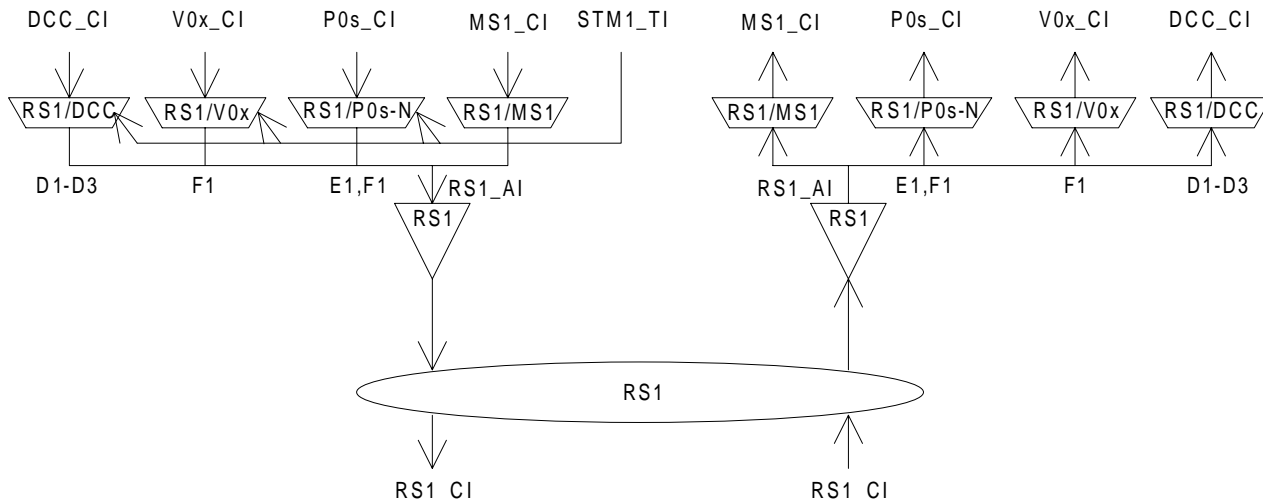


Figure 1: STM-1 Regenerator Section atomic functions

RS1 Layer CP

The CI at this point is an octet structured, 125 μs framed data stream with co-directional timing. It is the entire STM-1 signal as defined in ETS 300 147 [2]. Figure 2 depicts only bytes handled in the RS1 layer.

- NOTE 1: The unmarked bytes [2, 6], [3, 6], [3, 8], [3, 9] in rows 2,3 (figure 2) are reserved for future international standardization. Currently, they are undefined.
- NOTE 2: The unmarked bytes [2, 2], [2, 3], [2, 5], [3, 2], [3, 3], [3, 5] in rows 2,3 (figure 2) are reserved for media specific usage (e.g. radio sections). In optical and electrical section applications they are undefined.
- NOTE 3: The bytes for National Use (NU) in rows 1,2 (figure 2) are reserved for operator specific usage. Their processing is not within the province of this ETS. If NU bytes [1, 8] and [1, 9] are unused, care should be taken in selecting the binary content of the bytes which are excluded from the scrambling process of the STM-N signal to ensure that long sequences of "1"s or "0"s do not occur.

	1	2	3	4	5	6	7	8	9	10	270
1	A1	A1	A1	A2	A2	A2	J0	NU	NU			
2	B1			E1			F1	NU	NU			
3	D1			D2			D3					
4												
5												
6												
7												
8												
9												

Figure 2: RS1_CI_D signal

RS1 Layer AP

The AI at this point is octet structured and 125 μs framed with co-directional timing and represents the combination of adapted information from the MS1 layer (2 403 bytes per frame), the management communication DCC layer (3 bytes per frame if supported), the OW layer (1 byte per frame if supported) and the user channel F1 (1 byte per frame if supported). The location of these four components in the frame is defined in ETS 300 147 [2] and depicted in figure 3.