



COVERING NOTE

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Recommendation ITU-T G.810

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

ITU-T Recommendation G.810 (08/1996)

Definitions and terminology for synchronization networks

In Table II.2 of Appendix II of English version only, in the column of the slope of $MDEV(\tau)$ corresponding to WFM noise process, replace $\tau^{-1/22}$ by $\tau^{-1/2}$.



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.810

(08/96)

SERIES G: TRANSMISSION SYSTEMS AND MEDIA

Digital transmission systems – Digital networks – Design
objectives for digital networks

Definitions and terminology for synchronization networks

ITU-T Recommendation G.810

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION G.810**DEFINITIONS AND TERMINOLOGY FOR SYNCHRONIZATION NETWORKS****Summary**

This Recommendation provides definitions and abbreviations used in timing and synchronization Recommendations.

Source

ITU-T Recommendation G.810 was revised by ITU-T Study Group 13 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 27th of August 1996.

Keywords

Clock Performance, Jitter Performance, SDH, Synchronization network, Wander Performance.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Recommendation G.810**DEFINITIONS AND TERMINOLOGY FOR SYNCHRONIZATION NETWORKS***(Melbourne, 1980; revised in 1996)***1 Scope**

This Recommendation provides definitions and abbreviations used in timing and synchronization Recommendations. It also provides background information on the need to limit phase variation and the impairments on digital systems.

2 References

The following Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. All Recommendations are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- [1] ITU-T Recommendation G.707 (1996), *Network node interface for the Synchronous Digital Hierarchy (SDH)*.
- [2] CCITT Recommendation G.811 (1988), *Timing requirements at the outputs of primary reference clocks suitable for plesiochronous operation of international digital links*.
- [3] CCITT Recommendation G.812 (1988), *Timing requirements at the outputs of slave clocks suitable for plesiochronous operation of international digital links*.
- [4] ITU-T Recommendation G.813 (1996), *Timing characteristics for SDH equipment slave clocks (SEC)*.
- [5] CCITT Recommendation G.822 (1988), *Controlled slip rate objectives on an international digital connection*.
- [6] ITU-T Recommendation G.823 (1993), *The control of jitter and wander within digital networks which are based on the 2048 kbit/s hierarchy*.
- [7] ITU-T Recommendation G.824 (1993), *The control of jitter and wander within digital networks which are based on the 1544 kbit/s hierarchy*.
- [8] ITU-T Recommendation G.825 (1993), *The control of jitter and wander within digital networks which are based on the Synchronous Digital Hierarchy (SDH)*.

3 Abbreviations

For the purposes of timing and synchronization Recommendations, the following abbreviations apply:

ADEV	Allan Deviation
AIS	Alarm Indication Signal
AP	Access Point
CUT	Clock Under Test
FFM	Flicker Frequency Modulation
FPM	Flicker Phase Modulation

MC	Master Clock
MDEV	Modified Allan Deviation
MRTIE	Maximum Relative Time Interval Error
MST	Multiplex Section Terminal
MTIE	Maximum Time Interval Error
NE	Network Element
PDH	Plesiochronous Digital Hierarchy
PRC	Primary Reference Clock
PSTN	Public Switched Telephone Network
RWFM	Random Walk Frequency Modulation
SASE	Stand Alone Synchronization Equipment
SC	Slave Clock
SDH	Synchronous Digital Hierarchy
SE	Synchronization Element
SEC	SDH Equipment Clock
SETS	SDH Equipment Timing Source
STM	Synchronous Transport Module
SSU	Synchronization Supply Unit
TDEV	Time Deviation
TIE	Time Interval Error
TIErms	root mean square Time Interval Error
TVAR	Time Variance
UI	Unit Interval
UIp-p	Unit Interval peak-to-peak
UTC	Coordinated Universal Time
WFM	White Frequency Modulation
WPM	White Phase Modulation

4 Definitions

For the purposes of timing and synchronization Recommendations, the following definitions apply.

4.1 General definitions

4.1.1 alignment jitter: The short-term variations between the optimum sampling instants of a digital signal and sampling clock derived from it.

4.1.2 bilateral: A synchronization link where the corrective action to maintain locking is active at both ends of the link.

4.1.3 frequency departure: An underlying offset in the long-term frequency of a timing signal from its ideal frequency.

4.1.4 network synchronization: A generic concept that depicts the way of distributing a common time and/or frequency to all elements in a network.