



ATIS-0900105.09.2013(S.023)

**Synchronous Optical Network (SONET) –
Network Element Timing and
Synchronization**

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ATIS-0900105.09.2013(S202) Synchronous Optical Network (SONET) – Network Element Timing and Synchronization

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American National Standard for Telecommunications

Synchronous Optical Network (SONET) – Network Element Timing and Synchronization

Alliance for Telecommunications Industry Solutions

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American National Standards Institute, Inc.

Abstract

This standard describes and specifies the minimum synchronization-related performance parameters for SONET network interfaces. These specifications apply to all electrical and optical SONET network interfaces as defined in ATIS-0900105.2008 (R2013), whereas ATIS-0900101.2006 applies only to network interfaces for carrying synchronization between carriers.

Foreword

The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between providers, customers, and manufacturers. The Copper/Optical Access, Synchronization, and Transport (COAST) Committee – formerly the Optical Transport and Synchronization Committee (OPTXS) – engages industry expertise to develop and recommend standards and technical reports for home, access and transport network and synchronization technologies over copper and optical mediums. COAST is committed to proactive engagement with national, regional and international standards development organizations and forums that share its scope of work. The technical requirements, measurement techniques, metrics, and operational practices documented in COAST's work products encompass copper and optical network interfaces and transceiver functionality required for access to, and transport through, telecommunications networks.

ANSI guidelines specify two categories of requirements: mandatory and recommendation. The mandatory requirements are designated by the word *shall* and recommendations by the word *should*. Where both a mandatory requirement and a recommendation are specified for the same criterion, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages.

Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, COAST, 1200 G Street NW, Suite 500, Washington, DC 20005.

At the time of consensus on this document, COAST, which was responsible for its development, had the following leadership:

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1 Scope & Purpose

1.1 Scope

This standard describes and specifies the minimum synchronization-related performance parameters for SONET network interfaces. These specifications apply to all electrical and optical SONET network interfaces as defined in ATIS-0900105, whereas ATIS-0900101 applies only to network interfaces for carrying synchronization between carriers.

1.2 Purpose

Synchronization-related specifications for SONET network interfaces are necessary to achieve satisfactory performance at network interconnections. It is important to specify the synchronization performance limits at the network interfaces in terms of frequency offsets, frequency changes, and wander. Inadequate control of the synchronization performance of network interfaces can lead to excessive pointer adjustments, which can in turn lead to error bursts on payload signals due to jitter and/or slips caused by excessive wander. Wander of SONET signals must also be limited since it can be transferred onto the asynchronous payloads through the mapping mechanism.

Note that SONET NEs are not required to have an internal clock that meets the stratum level requirements as described in ATIS-0900101. This document defines the minimum performance specification for SONET signals at interfaces that are timed by SONET NEs with clocks that have free-run and holdover accuracies that are of lower quality than the stratum 3 level. Herein, these clocks are referred to as SONET minimum clocks (SMCs). Some SONET NEs may be required, by either network operators or application, to support a minimum of stratum 3 level performance.

2 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ATIS-0900101.2006, *Synchronization Interface Standard*.¹

ATIS-0900102.1993 (R2010), *Digital Hierarchy – Electrical Interfaces*.²

¹ This document is available from the Alliance for Telecommunications Industry Solutions (ATIS), 1200 G Street N.W., Suite 500, Washington, DC 20005 < <https://www.atis.org/docstore/product.aspx?id=25280> >.