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Network to Customer Installation Interfaces – Analog Voicegrade Switched Access Lines Using Loop-Start and Ground-Start Signaling

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Is an American National Standard developed by the **Network Access Interfaces (NAI)** Subcommittee under the **ATIS Copper/ Optical Access, Synchronization and Transport Committee (COAST).**

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American National Standard for Telecommunications

NETWORK TO CUSTOMER INSTALLATION INTERFACES – ANALOG VOICEGRADE SWITCHED ACCESS LINES USING LOOP-START AND GROUND-START SIGNALING

Secretariat

Alliance for Telecommunications Industry Solutions

Approved July 26, 2006

American National Standards Institute, Inc.

Abstract

This standard provides requirements for loop-start and ground-start signaling for the analog voicegrade interface between carrier switched access lines and customer installations. These requirements are intended to assist carriers, manufacturers, and users of products to be used in the switched network to understand the characteristics of the existing networks. This standard is a revision and compilation of T1.401-2000 and its supplements T1.401a-2000 and T1.401b-20002, which it replaces in its entirety.

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 carriers, customers, and manufacturers. The Network Interface, Power, and Protection Committee (NIPP) -- formerly T1E1 develops and recommends standards and technical reports. The standards and technical reports are related to power systems, electrical and physical protection for the exchange and interexchange carrier networks, and interfaces associated with user access to 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.

This standard is one of a series of network-to-customer installation interface standards originally developed by Technical Subcommittee T1E1 of Accredited Standards Committee T1, Telecommunications. This standard is intended to be a living document, subject to revision and updating as warranted by advances in network and equipment technology.

This standard provides the requirements associated with analog voicegrade switched access lines that use loop-start or ground-start signaling. This standard will be useful to those engaged in the provisioning or operation of telecommunications equipment or services that share a boundary at the Network Interface (NI). Compliance with this standard should provide interface compatibility in most installations, but this standard does not guarantee compatibility or acceptable performance under all operating conditions. In some cases, location-oriented options are needed to ensure compatibility at the NI. This need for options is imposed by significant differences between various network elements.

This standard has six annexes. Annexes A, B, C, D, E, and F are informative. The informative annexes and footnotes are not considered a part of this standard.

This is the fourth issue of this standard and it supersedes American National Standard T1.401-2000 in its entirety. Some of the revisions were editorial in nature, that is, they are intended to provide information or to improve clarity. The following technical revisions were made:

- A description of test signals used for measuring line characteristics was added to Annex A.
- Amendments T1.401a-2001 and T1.401b-2002 were merged into this document.

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

At the time of initiation or issuance of the letter ballot for this document, NIPP, which was responsible for it's development, had the following roster:

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TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

American National Standard for Telecommunications –

Network to Customer Installation Interfaces – Analog Voicegrade Switched Access Lines Using Loop-Start and Ground-Start Signaling

1 SCOPE, PURPOSE, & APPLICATION

1.1 Scope

This standard provides the signaling requirements associated with analog voicegrade switched access lines that use loop-start and ground-start signaling. In this standard, the public switched network is referred to as the Network and the customer premises cabling and equipment is referred to as the Customer Installation (CI).

The interface between the Network and the CI is referred to as the Network Interface (NI). The NI is the same as the demarcation point defined in TIA-968-A, *Technical Requirements for Connection of Terminal Equipment to the Telephone Network* (formerly known as FCC Part 68).

The network applies two basic types of loop-start and ground-start signals at the NI:

- Normal telecommunications system voltages and currents.
- Voltages and currents due to maintenance activities.

The normal signals are specified in this standard. Maintenance signals are described in Annex A. Abnormal voltages and currents that are the result of the environment (e.g., induced voltages and currents, or lightning) are not covered in this standard.

This standard covers only those characteristics of loop-start and ground-start switched access line interfaces that are used by the network and the CI to establish calls using the public switched network. Other signals produced by supplementary features that are either associated with or independent of the basic signaling interfaces covered by this standard may appear at the NI. Examples of supplementary features directly associated with loop-start or ground-start signaling are line-side answer supervision, distinctive alerting, calling number delivery, calling name delivery, and visual message waiting indication. Meter reading is an example of a supplementary feature that is independent of the basic interfaces described in this standard. The characteristics of some supplementary features are contained in the following American National Standards:

- T1.401.01-2000 (R2005), *Network to Customer Installation Interfaces – Analog Switched Access Lines Using Loop-Start or Ground-Start Signaling with the Line-Side Answer Supervision Feature*.[1]

[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/default.aspx >