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Standard for signal and test definition

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STANDARD FOR SIGNAL AND TEST DEFINITION

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IEEE Std	FDIS	Report on voting
1641(2004)	93/251/FDIS	93/262/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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IEEE Standard for
Signal and Test Definition

Sponsor

**IEEE Standards Coordinating Committee 20 on
Test and Diagnosis for Electronic Systems**

Approved 2 February 2005

American National Standards Institute

Approved 23 September 2004

IEEE-SA Standards Board

Abstract: This standard provides the means to define and describe signals used in testing. It also provides a set of common basic signals, mathematically underpinned so that signals can be combined to form complex signals usable across all test platforms.
Keywords: ATE, ATLAS, automatic test equipment, signal definitions, test definitions, test requirements, test signals, unit under test, UUT

IEEE Introduction

This standard is the culmination of a radical review of the Abbreviated Test Language for All Systems (ATLAS) and the requirement to create truly portable test requirements. During the review process, it was determined that it would be impractical to revise the existing ATLAS standard to include the required improvements. The decision was made to formulate a new standard to resolve these issues.

The key feature of the signal and test definition (STD) in this standard is the ability to unambiguously define test signals. It includes a rigorous mathematical and definitive foundation for all of its signal components. Any signal defined using this standard will be the same whatever equipment is used to create it. The standard supports the implementation of new technologies by providing users with the ability to describe their own signals by combining existing signals. Thus, any desired signal may be described, and there is no limit on the extensibility of signals supported by this standard.

Signals defined using STD can be used in a programming environment of the user's choice provided that that environment fulfills the minimum requirements stated in this standard. This universality enables the user to take full advantage of modern program structures and development environments, including graphical programming environments.

This standard was developed by the Test Description Subcommittee, whose intention is to prepare a companion guide to explain how to implement signal definitions and test requirements in conformance with STD.

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STANDARD FOR SIGNAL AND TEST DEFINITION

1. Overview

This standard, also known as the signal and test definition (STD) standard, is the culmination of a radical review of the Abbreviated Test Language for All Systems (ATLAS) test programming language and the requirement to create truly portable test requirements. STD will allow test information to pass more freely between the design, test, and maintenance phases of a project, enabling the same information to be used directly across project phases. This more efficient use of information will lead to reduced life-cycle costs.

STD provides the capability to describe and control signals, while permitting a choice of operating environment, including the choice of carrier language. STD permits signal operations to be embedded in any object-oriented environment and thus to be used by the architecture standards of various automatic test systems (ATSs).

Portability is extended beyond that of test specifications by virtue of a layered architecture.

STD defines a collection of objects and their interfaces. These objects describe signal components relevant to test requirements. The STD standard defines how to interconnect these objects using interfaces, through which the objects exchange information, so that a test model may be defined that describes actual test requirements.

Finally, the link to published ATLAS standards (such as IEEE Std 716™-1995 [B9][1]) is preserved in that the user can describe signal operations using very similar test-signal-related keywords. These keywords now have formal definitions. Furthermore, the parameters of the signals themselves also have a rigorous formal behavioral description.

1.1 Scope

This standard provides the means to define and describe signals used in testing. It also provides a set of common basic signals, mathematically underpinned so that signals can be combined to form complex signals usable across all test platforms. The provision of language elements supports test signal descriptions for interoperability.

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[1] The numbers in brackets correspond to the numbers of the bibliography in Annex L.

This standard is divided into seven clauses:

- Clause 1 provides an introduction to this standard.
- Clause 2 provides definitions of terms and lists abbreviations.
- Clause 3 describes the structure of the STD standard.
- Clause 4 specifies the signal modeling language (SML).
- Clause 5 specifies the STD basic signal components (BSCs).
- Clause 6 defines the test signal frameworks (TSFs).
- Clause 7 describes the test procedure language (TPL) layer.

This standard also contains the following annexes:

a) Annex A provides the Signals Modeling Language that is used to construct the BSCs and the TSFs.
b) Annex B provides BSC descriptions.
c) Annex C provides dynamic signal model description, states, and state transitions.
d) Annex D provides the interface definition language (IDL) description for the BSCs.
e) Annex E provides a TSF. This framework provides a formal description of signals similar to the signals defined in IEEE Std 716-1995. It also serves to illustrate how complex test signal models can be built up from BSCs.
f) Annex F provides the IDL description for the TSF provided in Annex E.
g) Annex G defines the requirements for a carrier language.
h) Annex H provides the formal TPL description.
i) Annex I provides the extensible markup language (XML) description mapping signal models into XML descriptions.
j) Annex J provides XML description mapping the TSF provided in Annex E into XML descriptions.
k) Annex K provides a description of how ATLAS nouns and noun modifiers are supported by STD.
l) Annex L provides a bibliography of related documents.