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# INTERNATIONAL STANDARD

# IEEE Std 1671.2™

## Standard for automatic test markup language (ATML) instrument description

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# STANDARD FOR AUTOMATIC TEST MARKUP LANGUAGE (ATML) INSTRUMENT DESCRIPTION

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**IEEE Std 1671.2™-2012**
(Revision of
IEEE Std 1671.2-2008)

# IEEE Standard for Automatic Test Markup Language (ATML) Instrument Description

Sponsor

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

Approved 5 December 2012

**IEEE-SA Standards Board**

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**Abstract:** An exchange format is specified in this standard, using extensible markup language (XML), for identifying instrumentation that may be integrated in an automatic test system (ATS) that is to be used to test and diagnose a unit under test (UUT).

**Keywords:** ATML instance document, ATS, automatic test equipment (ATE), Automatic Test Markup Language (ATML), automatic test system, IEEE 1671.2, instrument, instrumentation, synthetic instrument, XML schema

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## IEEE Introduction

This introduction is not part of IEEE Std 1671.2-2012, IEEE Standard for Automatic Test Markup Language (ATML) Instrument Description.

This child, or "dot," standard, also known as an ATML component standard, provides for the definition of the *InstrumentDescription* and *InstrumentInstance* XML schemas, and contains references to examples. These XML schemas and examples accompany this standard and provide for the identification and definition of an instrument.

XML schemas define the basic information required within any test application and provide a vehicle for formally defining the test environment by defining a class hierarchy corresponding to these basic information entities and providing several methods within each to enable basic operations to be performed on these entities. ATML component standards within the ATML framework define the particular requirements within the test environment.

The Synthetic Instrument Working Group (SIWG) was formed, at Department of Defense request, to define synthetic instrumentation and its attributes and develop a framework that balances user and supplier objectives, facilitates rapid technology advancements and adaptation throughout the test life cycle, and complements/supports other relevant test and measurement industry activities.

The goals or desired effects of the SIWG activities were to:

a) Reduce the total cost of ownership of the automatic test system (ATS).

b) Reduce time to develop and field new or upgraded ATSs.

c) Provide greater flexibility to the war fighter through U.S. and coalition partner's interoperable ATSs.

d) Reduce the ATS's logistics footprint.

e) Reduce the ATS's physical footprint.

f) Improve the quality of test.

The SIWG addressed the reductions from the test and measurement perspective. The SIWG efforts resulted in both the definition of synthetic instruments and the specifications of their respective attributes.

Synthetic instruments were originally part of the IEEE Std 1671.2™-2008[1] standard, as both an example of *InstrumentDescription* instances as well as to provide a definition of the necessary parameters/attributes to document a synthetic instrument as defined by the SIWG. These synthetic instrument definitions have now been incorporated into their own IEEE project (P1871.2), and therefore their associated Annexes have been removed from later revisions of IEEE Std 1671.2. The *InstrumentDescription* template instance example for synthetic instruments are still provided as downloads of this standard to ensure continuity and support for existing users.

Template instance documents are used by vendors developing/providing synthetic instruments as the basis for documenting the synthetic instrument. The template instance document provides examples for each instrument vendor to follow. These templates will not validate against the schemas documented within this standard until actual values for the specifications are incorporated into the SI-based *InstrumentDescription* instance document.

[1] IEEE publications are available from the Institute of Electrical and Electronics Engineers, 445 Hoes Lane, Piscataway, NJ 08855, USA (http://standards.ieee.org/).

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# Standard for Automatic Test Markup Language (ATML) Instrument Description

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## 1. Overview

### 1.1 General

Automatic test markup language (ATML) is a collection of IEEE standards and associated extensible markup language (XML) schemas that allows automatic test system (ATS) and test information to be exchanged in a common format adhering to the XML standard.[1]

The ATML framework and the ATML family of standards have been developed and are maintained under the guidance of the Test Information Integration (TII) Subcommittee of IEEE Standards Coordinating Committee 20 (SCC20) to serve as a comprehensive environment for integrating design data, test strategies, test requirements, test procedures, test results management, and test system implementations, while allowing test program (TP), test asset interoperability, and unit under test (UUT) data to be interchanged between heterogeneous systems.

This standard (as well as the XML schemas and XML instance document examples[2] that accompany this standard) is intended to be used in identifying and documenting instrumentation which may be utilized

[1]This information is given for the convenience of users of this standard and does not constitute an endorsement by the IEEE of this consortium standard. Equivalent standards or products may be used if they can be shown to lead to the same results.
[2]The schemas and examples that accompany this standard are available at http://standards.ieee.org/downloads/1671/1671.2-2012/.

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during the testing of a particular unit under test. This information includes the mechanical, electrical, and software interfaces of the instrument.

## 1.2 Application of this document's annexes

This document includes four annexes.

Annex A, Annex B, Annex C, and Annex D are informative, and thus are provided strictly as information, for users, implementers, and maintainers of this document.

## 1.3 Scope

This standard defines an exchange format, utilizing extensible markup language (XML), for both the static description of instrument models, and the specific description of instrument instance information.

## 1.4 Application

This standard provides for the specification and identification of instrumentation that will be used for the purposes of testing a UUT. The specification and identification consist of, but are not limited to: physical characteristics, power requirements, operational requirements, calibration requirements, factory defaults, configuration options, capabilities, and interfaces (both hardware [HW] and software [SW]). This collection of information represents an entire "data package" for either a class or type of instrument (as represented by the InstrumentDescription.xsd schema defined in Clause 4 or a specific instrument (as represented by the InstrumentInstance.xsd schema defined in Clause 5).

Identifying an instrument provides for the unambiguous specification of a particular instrument, which may be utilized in a bench-test scenario, a piece of manual test equipment, or within automatic test equipment (ATE). This unambiguous specification shall be readable by both humans and machines. Humans may use the specification to identify and assemble the instrument into their test application. Machines may use the specification to verify that the testing need can be accomplished by the instrument in place.

Synthetic instruments link a series of HW and SW components with standardized interfaces to generate signals or make measurements using algorithmic numeric processing techniques. The goal is to decrease the total cost of ownership of ATS, to lessen the time to develop and field new or upgraded ATS, to reduce the test system logistics footprint, and finally, to improve the quality of test.

The information contained in XML documents conforming to this standard will be useful to the following:

a) Test program set (TPS) developers

b) TPS maintainers

c) ATE system developers

d) ATE system maintainers

e) Developers of ATML-based tools and systems

f) Instrument manufactures

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