SLOVENSKI STANDARD

SIST-TP CLC/R217-015:2004

september 2004

Informacijski standard o komponentah Pinnacles 1.2 – PCIS predavanje

Pinnacles Component Information Standard 1.2 - PCIS Tutorial

ICS 35.240.50

Referenčna številka
SIST-TP CLC/R217-015:2004(en)

CENELEC

R217-015

REPORT

February 1999

English version

Pinnacles Component Information Standard 1.2

PCIS Tutorial

This CENELEC Report has been prepared by the Technical Committee CENELEC TC 217, Electronic Design Automation (EDA). It was approved by the Technical Committee on 1996-12-09 and endorsed by the CENELEC Technical Board on 1998-08-01.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. R217-015:1999 E

Foreword

This CENELEC Report has been produced by The Pinnacles Group (predominantly) and by CENELEC Technical Committee TC 217, Electronic Design Automation (EDA). The text of the draft, which was submitted to the CENELEC members for comments, was approved during the CLC/TC 217 meeting on 1996-12-09 and endorsed by the CENELEC Technical Board as R217-015 on 1998-08-01.

The Pinnacles Component Information Standard 1.2 (PCIS 1.2) was developed by members of the Pinnacles Group who collaborated towards internationally agreed standards in the area of electronic data book technology.

The original development of the PCIS standard was accomplished under the coordination of the Pinnacles Group, with members from five electronic component manufacturers who joined together to create a technical information exchange standard for use by the electronics industry. These original member companies have all been active members of the Silicon Integration Initiative, Inc. (Si2) electronic databook working group, and it was in conjunction with Si2 (then the CAD Framework Initiative, Inc.) activities that the original concept of the PCIS was developed. The orginal work of Hitachi America Limited, Intel, National Semiconductor, Philips Semiconductors, and Texas Instruments was extended when Hewlett-Packard, IBM Microelectronics, and Motorola joined the effort. Representatives of Hewlett-Packard, Hitachi America Limited, IBM Microelectronics, Intel, Motorola, Philips Semiconductors, and Texas Instruments currently serve as members of the Si2 Electronic Component Information Exchange (ECIX) Project Technical Advisory Board.

Additional information regarding tools, customers and related specifications may be found at http://www.si2.org/ecix/.

Represented by

Philips Semiconductors

NL 5600 MD Eindhoven, The Netherlands

Mr. Alfred Elkerbout

Phone: +31 40 272 2588
Fax: +31 40 272 4825

E-Mail: Alfred.Elkerbout@ehv.sc.philips.com

Contents

General Introduction

Scope and object

The purpose of this European Prestandard is to model electric component data and to define an interchange format for that data (Electronic Data Book -EDB- standard) which is independent of the component supplier or the customers CAD environment.

The Pinnacles Component Information Standard (PCIS) is being developed to serve as a basis for the interchange of technical information about electronic components and to enable electronic component manufacturers to create and distribute a new form of compiled information, Electronic Data Books (EDBs), by electronic component manufacturers. An established, documented interchange standard is a necessary precursor for both of these tasks.

The PCIS principles and methodology may be applied to any kind of electric component, such as semiconductor devices, passive components, display components etc.

An interchange standard will enable companies to provide reusable technical data to customers and vendors. Currently, customers and vendors must rekey this data into their systems. Such rekeying is often an extremely inefficient, inaccurate, time-consuming, and costly process. The interchange standard will define ways to identify information elements so that customers and vendors can receive, process, and extract only the information they need.

In addition, manufacturers themselves will be able to identify, organize, and offer more useful information to customers through the implementation of Electronic Data Books. An EDB is a comprehensive set of information about one or more electronic components, including active and passive components, materials, and connectors. As the PCIS defines an EDB, it could include both the textual and graphic information currently published in databooks and datasheets and other computer-sensible data types such as CAD files, behavioral and functional models, and audio and video recordings. In short, an EDB could include all the data that a company wishes to provide to facilitate the design-in and support of an electronic component.

EDBs will increase the quality of product information by improving its accuracy, accessibility, and timeliness, as well as by enabling CAD integration. Such improvements will help customers realize benefits in product identification and selection, reduce design-in and qualification cycle-times, and improve product life-cycle management, among other benefits.

Structure of the Pinnacles Component Information Standard (PCIS)

This version of the PCIS describes only the SGML component of the developing interchange standard. This Tutorial and the accompanying parts are the first in a series of documents that will be necessary to support the standard. Other documentation, such as a physical packaging standard and graphics standards, will be developed and described in future efforts.

The Pinnacles Component Information Standard 1.2 is organized into four main parts:

- The PCIS Tutorial (document CENELEC R217-015: 1996 E) that describes the SGML architecture, intended use and application of the PCIS standard, and the rationale for the SGML design decisions
- The PCIS Tag Library (document CENELEC ENV 50247-1: 1996 E), that provides definitions of the information elements within electronic component documents;
- The SGML Declaration and SGML Document Type Definitions (document CENELEC ENV 50247-2: 1996 E) that describe the class of electronic components documents; and
- Tagged sample datasheets and datasheet fragments (document CENELEC R217-016: 1996 E).

Users of the Pinnacles Component Information Standard

PCIS will be used by many different types of users, with different benefits accruing to each type.

- Original Information Producers (OIPs) are companies who produce electronic components and materials and who supply information about those components to their customers.
- Value-Added Providers (VAPs) are companies who are in the business of adding value to a manufacturer's information (for example, models, simulations, etc.) and charging customers a fee for the value they add.
- Tool Suppliers supply hardware/software tools, such as CAD/CAE systems, publishing systems, database management systems, etc., to the industry.
- Equipment Producers (EPs) are companies or end users who design electronic products which include the components supplied by OIPs.

Each of these various types of users has a big stake in producing his work as efficiently as possible.

PCIS is designed to provide the most efficient transfer and re-use of component information possible, in both human- and computer-sensible form.

Relation to existing standards

PCIS has been build on existing standards activities where appropriate. PCIS 1.2 was placed in the public domain as an open standard.

The PCIS is an application of the meta-language of Standard Generalized Markup Language (ISO 8879:1986, also known as SGML). It is highly subject/content oriented, with a great deal of structure that can be used to describe the characteristics of electric components.

Clause 2.1 of the PCIS SGML Tutorial (document CENELEC R217-015: 1996 E) describes the reasoning behind this decision and the benefits and drawbacks of SGML usage. SGML is a technical standard, and it is not expected that all readers of this document will necessarily understand the minutiae of its use and syntax. More detailed information about SGML is given at the informative annexes.

Currently there are no analogous standards activities for the electrical component industry that match the PCIS in scope, or applicability to the many phases of the business process and product life-cycle.

It is in no way the intention of the Pinnacles Group to duplicate existing standards, but rather to interoperate with related standards or standards activities such as:

- IEC SC3D; generating the IEC 1360 series of standards "Standards data element types with associated classification scheme for electric components";
- JEDEC;
- ISO 10303 (STEP);
- ESPRIT Project 22124-CIREP "Component Information Representation European Project";

The Pinnacles Group

The development of the Pinnacles Component Information Standard has been accomplished under the coordination of the Pinnacles Group, a non-affiliated standards working group with members from five electronic component manufacturers who joined together to create a technical information exchange standard for use by the electronic components industry. The member companies have all been active participants in the CAD Framework Initiative (CFI) Electronic Databook Working Group (EDB WG), and it was in conjunction with CFI activities that the original concept of the PCIS developed.

In discussion, it became clear to representatives of the various companies that creating such a standard would be difficult and time-consuming in a volunteer setting without expert assistance. As a result, a proposal was made to establish a privately-funded initiative that could address the CFI objectives as well as business issues outside the scope of the CFI. In April of 1993, after a year of preliminary work, Intel, National Semiconductor, Philips Semiconductors, and Texas Instruments signed an agreement to join forces under the working name "Pinnacles Group" to produce a technical information interchange standard to be called the Pinnacles Component Information Standard (PCIS). In July of 1993 Hitachi America Limited joined the Pinnacles Group as a full partner, more recently (1995) Hewlett Packard and IBM Microelectronics joined.

Soon after its inception in 1993, the European contribution to the development of PCIS became a part of CENELEC TC 217 WG 4, itself a part of the ESPRIT Project ESIP, ultimately resulting in the current documents as referenced in clause 1.2.

Informative references

The Pinnacles Electronic Data Book Project; The Pinnacles Group, http://www.cfi.org/pinnacles/

The SGML Handbook; Charles Goldfarb New York, Oxford University Press, 1990

Developing SGML DTDs: Eve Maler & Jeanne Andaloussi, Prentice Hall, 1996

The SGML Primer, SoftQuad, Inc. Toronto, SoftQuad, Inc. 1991

SGML seminars, tutorials, and publication sales Graphic Communications Association

The SGML Implementation Guide. Travis, Brian & Waldt, Dale, Springer-Verlag, 1995

IEC 1360-1 Standard data element types with associated classification scheme for electric components - part 1: Definitions - Principles and methods

IEC/48/FDIS Standard data element types with associated classification scheme for electric components - IEC reference collection of standard data element types, component classes and terms - (to become IEC 1360-4)

Contents

blank page

1 Introduction

This document, the PCIS SGML Tutorial, is intended to explain the principles behind the PCIS SGML application and to highlight the more unusual and most important aspects of that application. Parts of this tutorial will be of interest to anyone interested in the PCIS, while others are quite technical, and will be of interest only to the creators and managers of SGML applications.

This tutorial begins with a description of the background of the project and the Pinnacles application standard. This is followed by a discussion of the general architectural principles on which the standard is based, and a description of the SGML architecture. The next sections concern important information constructs within PCIS: Document and Element Identification; Product Identification; and Parametric Data. Each of these sections describes the approach to a particularly important type of component information. The tutorial then discusses some further Document Content Considerations, and handling of External Files. Appendices to this tutorial include:

- PCIS Glossary (which should help readers new to either SGML or electric component information);
- Element Naming Conventions (which were used in constructing the SGML tags);
- The Initial Pinnacles Guidelines (which were written at the beginning of the project to guide development); and
- An explanation of the PCIS Formal Public Identifiers (which are used to identify every document and every part of the SGML application such as the DTDs and DTD modules).

2 Background

2.1 The Decision to Use SGML for Document Interchange

From the initial investigations, the Pinnacles Group has been looking for a document modeling and interchange format that:

- Was platform and vendor non-specific;
- Allowed the inclusion and referencing of other applicable standards;
- Was supported by commercially available tools and services;
- Would ensure longevity of the electronic component data; and
- Could support the current publishing processes (such as paper and CD-ROM).

Standard Generalized Markup Language (SGML) met these specifications. SGML, which is defined in international standard ISO 8879, is a widely accepted and supported standard for the encoding of structured information. SGML provides a vendor and platform independent way of identifying information structures.

SGML has been adopted by many organizations and industries whose needs for information exchange are similar to that of the electronic component industry, e.g., the airline, telecommunication, and automotive industries, the Department of Defense, and many major and minor publishers. These organizations have also chosen SGML because SGML can provide:

- A method of describing the structure of information and the relationships between data elements; and
- Content-driven document architectures which are focused on the purpose of the information rather than the physical (printed or displayed) appearance of information.

SGML works through the use of "tags" which are inserted in text to identify the beginning and end of each element (or type of information) in the text.

2.2 PCIS: An SGML Application Standard

Calling for the use of SGML is not enough to provide the electronic components industry with a viable interchange standard. Consistent encoding of the information set forth in databooks, whether existing or future, requires the creation of an SGML Application Standard.

2.2.1 SGML Application Standards

An application standard is a specific subset of the standard. For example, a general standard might say:

- Standard spoons may be 6, 7, 8, or 10 inches long;
- Standard spoons shall be made of a non-toxic wood, or of a food-safe non-reactive metal such as stainless-steel or sterling silver; and
- The length of the standard spoon may be indicated either on the back of the handle of the spoon or on a removable sticky label attached to the inside bowl of the spoon.

An application specification for our spoons might say:

- We will make all spoons out of pewter;
- Our teaspoons will be 6 inches long;
- Our serving-spoons will be 10 inches long; and

- Raised lettering on the back of the handle of the spoon will indicate the date of manufacture, the length of the spoon, and the bowl capacity in fluid ounces.

The application standard establishes strict guidelines within the context of a general specification and selects among the options made available in the general standard.

An SGML application standard specifies how a group, organization, or industry will implement SGML. An SGML application standard conforms to ISO 8879, the international standard for SGML, but is far more specific. An SGML application standard typically includes:

- Selection of SGML features;
- A standard tag set;
- Standard documentation and definitions;
- A standard approach to structure; and
- Standard table coding.

2.2.2 Selection of SGML Features and Capacities

ISO 8879, the International Standard for SGML, defines a basic set of capabilities that all SGML applications must have. In addition it defines several optional features. The optional features include several ways to reduce the number of tags in documents and to process complex documents. In general, the more features used, the more computer resources required to support an application.

In SGML each application must specify the maximum length of several SGML components, including tags, attribute values, and the entities which hold standard text. These "capacities" can be used to estimate how much computer memory will be needed to process documents. The larger the number assigned to the capacities, the more computing power needed to process documents. Small capacities may be selected if it is more important that documents be processable on small computers, while larger capacities allow more user-friendly tags, larger boiler-plate text blocks, and larger, more complex documents.

An application standard should specify what SGML features and capacities must be supported by all systems, sub-systems, hardware, and software that support the standard. For example, while many SGML applications have a maximum tag length of eight characters, the US Department of Defense's application standard specifies thirty-two characters. This allows them to use tags with long, mnemonic names (such as SHORTTITLE, which identifies a smaller version of the document title to be used in running heads and indexes). Similarly, PCIS 1.2 specifies a maximum tag length of thirty-two characters.

2.2.3 Standard Tag Set

The international standard for SGML provides the means to name tags and specify their relationships to each other. However, the SGML standard does not provide any tag names nor does it recommend any. There is nothing in the SGML standard that prohibits users from making up different tags for each document. For example, the title of a research paper could be tagged <TITLE>, the title of a bibliography could be <TI>, and the title of a Memorandum <TTL>. An SGML application specifies a set of tags to be used by a group of people and provides definitions of those tags so they can be used consistently.

2.2.4 Standard Documentation and Definitions

An SGML application, like any other computer application, must be documented in order to be useful. It is essential that users be taught to use a new system, and that they have appropriate reference materials at hand to maximize their use of the system. One part of that SGML application documen-