

NATL INST. OF STAND & TECH R.I.C.  
A11104 416009

NIST  
PUBLICATIONS

**NISTIR 5511**

**The IGES/PDES ORGANIZATION  
STEP On-Line Information Service (SOLIS)**

**Gaylen R. Rinaudot**

U.S. DEPARTMENT OF COMMERCE  
Technology Administration  
National Institute of Standards  
and Technology  
Gaithersburg, MD 20899

QC  
100  
.U56  
NO.5511  
1994

**NIST**



**The IGES/PDES ORGANIZATION  
STEP On-Line Information Service (SOLIS)**



**Gaylen R. Rinaudot**

U.S. DEPARTMENT OF COMMERCE  
Technology Administration  
National Institute of Standards  
and Technology  
Gaithersburg, MD 20899

October 1994



U.S. DEPARTMENT OF COMMERCE  
Ronald H. Brown, Secretary  
TECHNOLOGY ADMINISTRATION  
Mary L. Good, Under Secretary for Technology  
NATIONAL INSTITUTE OF STANDARDS  
AND TECHNOLOGY  
Arati Prabhakar, Director



## TABLE OF CONTENTS

1	INTRODUCTION .....	2
2	ACCESSING ON LINE DOCUMENTS .....	3
2.1	Directory Structure .....	3
3	ORGANIZATION OF SOLIS .....	3
3.1	ISO 10303 STEP part titles .....	4
3.2	Current directories and descriptions of information available on SOLIS .....	4
4	INSTRUCTIONS FOR SUBMITTING PART VERSIONS .....	6
5	IF YOU ENCOUNTER PROBLEMS WITH SOLIS .....	7
6	FUTURE DIRECTORY PLANS .....	7
7	ACKNOWLEDGMENTS .....	8
8	REFERENCES .....	8
	Appendix A - Instructions for Accessing Public STEP Information and Software .....	9
	Appendix B - STEP Part Titles .....	11
	Appendix C - List of File Extensions .....	13
	Appendix D - Instructions, ftp UPLOAD .....	14

## LIST OF TABLES

Table 1: High-level directory organization of SOLIS .....	5
---	---

## STEP ON-LINE INFORMATION SERVICE (SOLIS)

October 1994

### **Abstract**

This document contains an overview and describes the objectives of the STEP (STandard for the Exchange of Product model data) On-Line Information Service (SOLIS). This report is also intended to provide a general explanation of this service and its capabilities. This service is provided and maintained by the National Institute of Standards and Technology (NIST), Manufacturing Engineering Laboratory (MEL), IGES/PDES (Initial Graphics Exchange Specification/Product Data Exchange using STEP) Office in the Factory Automation Systems Division. SOLIS enhances the ability to gain consensus on STEP by expanding the availability of the draft standards, supporting documents, and software used by the community of experts who are contributing to this standard.

Keywords: SOLIS, STEP, ISO 10303, TC184/SC4, STEP repository, Standards development



## 1 INTRODUCTION

A large and geographically distributed effort is underway in the United States and in the international community to develop standards for product data representation and exchange. The international effort is organized under the International Organization for Standardization (ISO) Technical Committee on Industrial Automation Systems and Integration (TC184), Subcommittee 4 - Industrial Data and Global Manufacturing Programming Languages and is called STandard for the Exchange of Product model data (STEP).

Essential to the productivity of this effort are good communications among its technical experts. The STEP On-Line Information Service (SOLIS)<sup>1</sup> provides technical experts in the STEP development community with electronic access to the latest parts of ISO 10303<sup>2</sup>, and related documents, such as issue logs, schedules, and software. All items available through the SOLIS are in the public domain.

The SC4 Project Management Advisory Group (PMAG) requested that the following formats be available on SOLIS for all STEP parts to facilitate use: 1) master copy of part or document in either LaTeX or WordPerfect format,<sup>3</sup> 2) a 7bit ASCII-text file derived from the STEP document, and 3) a printable file in PostScript also derived from the master copy of the STEP part.

Project leaders, editors, and conveners are responsible for submitting material to the SOLIS Administrator who then verifies the integrity of the file and places the file in SOLIS. The master version files may be submitted in LaTeX or WordPerfect by these authorized individuals via mail, email, or ftp.

This report describes the objectives of the SOLIS service and highlights the organization and access methods of SOLIS.

---

<sup>1</sup>The development of SOLIS was funded by the U.S. Government's Department of Defense Continuous Acquisition and Life-Cycle Support (CALC) program and is not subject to copyright. Maintenance for SOLIS is funded by NIST.

<sup>2</sup>ISO 10303 is an International Standard for the computer-interpretable representation and exchange of product data.

<sup>3</sup>Certain commercial products are identified in this paper in order to adequately specify the SOLIS procedures. Such identification does not imply recommendation or endorsement by the IGES/PDES Organization of the National Institute of Standards and Technology, nor does it imply that the products identified are necessarily the best available for the purpose.



## 2 ACCESSING ON LINE DOCUMENTS

Electronic documents may be requested using one of the four types of access methods supported: 1) electronic mail (email) with access provided by an archive server utility, 2) anonymous file transfer protocol (ftp), 3) the kermit modem transfer protocol, and 4) through the Internet gopher server. [1]

Detailed instructions for accessing information on SOLIS are included in Appendix A.

SOLIS supports the ability to download the most current version of a part. In order to download the most current version of a part, request: "partxxx/current" from whichever access method.

### 2.1 Directory Structure

ISO 10303 is organized into parts. Information in SOLIS is organized by directories and subdirectories. The organization parallels the various STEP projects and the lifecycle stages of each standards document. Each STEP part proceeds through several stages of development and balloting. For every STEP part, there is a corresponding SOLIS directory.

Under each part document directory, subdirectories identify the document status and version such as:

- wd1 first working draft,
- wd2 second working draft,
- cd1 first committee draft,
- cd2 second committee draft,
- dis draft international standard, and
- is international standard.

The process and terminology are further described in the most recent version of *TC184/SC4 Policy and Procedures Manual*. Copies can be requested from the IPO/ISO Office, National Institute of Standards and Technology, Building 220, Room A127, Gaithersburg, MD 20899.

STEP parts often have complex document structures and are typically managed in multiple files to facilitate primary document root file. Each STEP part subdirectory contains a readme.txt file that has a list of the files that are in that directory and any file-specific printing instructions necessary.

## 3 ORGANIZATION OF SOLIS

SOLIS has been organized to handle a large number of documents in a simple directory structure. Subdirectories have been created under directories to organize the versions of each part document and the multiple files for each version.

### 3.1 ISO 10303 STEP part titles

A directory is created for a part when the part work item is approved by PMAG. The development of the part is managed under the Working Group (WG) that submitted the work item. When the WG releases versions of the part such as a working draft or a committee draft, a subdirectory is created to correspond to that release. Ballot comments and ballot responses are also stored within the corresponding document version subdirectory.

A listing of current STEP part titles is included in Appendix B.

Directories are built as the document matures from first working draft (wd1), second working draft (wd2), first committee draft (cd1), etc. All of these documents are in the public domain.

Draft International Standard (DIS) and International Standard (IS) documents are copyrighted by ISO. Copies of DIS and IS documents are distributed to SC4 members only for use in ballot review or continued standards development. The SC4 Chairman controls the list of those authorized access to the copyrighted materials. Authorized individuals are responsible that copyrighted material is not further distributed.

All other users requesting copies of DIS and IS documents are referred to their national standards body (for purchase of a copy). DIS and IS documents may also be purchased from ISO Geneva. These rules apply to both the electronic form and the paper copy of any part of ISO 10303. If you have further questions, please contact: SC4 Chairman Bradford Smith, telephone +1 301 975-3558 or smithb@cme.nist.gov.

### 3.2 Current directories and descriptions of information available on SOLIS

Current directories and descriptions of information available on SOLIS are listed in Table 1. These include directories for each of the Parts of ISO 10303, working documents within a working group, and other directories that are of interest to developers and users of ISO 10303. Table 1 corresponds to the top level directory structure.

directory name	description
partnnn where n is an approved part number	the files that are associated with a specific part of ISO 10303
aic	application interpreted construct library; information relevant to the development of all aics
express	provides details about all the EXPRESS-based software tools and services that are known to the EXPRESS Committee

<b>directory name</b>	<b>description</b>
howto	useful instructions for using SOLIS or processing documents on SOLIS
jwg9docs	IEC/TC3/TC184/SC4 JWG "Electrical Applications of ISO 10303"
latex	style files and instructions for using LaTeX
listings	listings of all files in each directory
menu	files needed for Internet gopher service
nptdocs	reports from NIST's National PDES Testbed
npttool	software developed by NIST's National PDES Testbed
pmag	PMAG numbered documents
sc4_ctr	STEP files that were used for ProSTEP Demo '93 during the ISO conference in Berlin, October 1993
sc4docs	status reports and SC4 project schedules
status	overview and status of TC184/SC4 scheduling process
utils	software utilities
wg2docs	minutes and working documents within WG2
wg3docs	minutes and working documents within WG3
wg4docs	minutes and working documents within WG4
wg5docs	minutes and working documents within WG5
wg6docs	minutes and working documents within WG6
wg7docs	minutes and working documents within WG7

Table 1: High-level directory organization of SOLIS



## 4 INSTRUCTIONS FOR SUBMITTING PART VERSIONS

Editors, conveners, and project leaders shall include the following when submitting a STEP part to the SOLIS Administrator:

- 1) a readme.txt file. This file should include:
  - the WG\*N#;
  - part title\*;
  - date\* and version number\*;
  - convener name\*, address\*, phone\*, and email\*;
  - project leader name\*, address\*, phone\*, and email\*;
  - part editor name\*, address\*, phone\*, and email\*;
  - list of files and a brief description of each file;
  - number of files in the submission and what identification format the part is provided;
  - an overview; and
  - any specific printing instructions.

The above "\*" information is included on the ISO cover sheet. A readme.txt file template is located in /pub/step/howto/readme.txt for your convenience.

- 2) any style files if the master copy is in LaTeX format,
- 3) any WordPerfect instructions if the master copy is in WordPerfect format, and
- 4) a cover sheet which includes a committee number, status, and document superseded.

A PostScript version and an ASCII version of the file will be produced by the SOLIS Administrator (LaTeX files are ASCII).

All files submitted for SOLIS should use the 8(character).3(character extension) file name limitation. All files submitted to SOLIS should be named in lower case characters. This eight character file name and three character extension ensures compatibility with personal computer users. If it is necessary to exceed this limitation, personal computer users must manually change file names to names that meet this limitation. File extensions are listed in Appendix C.

Complete part submissions, as indicated above, shall be given to the SOLIS Administrator by:

- floppy or magnetic electronic disks,
- email to solis-admin@cme.nist.gov, or
- uploaded using ftp.

Instructions for using ftp to upload files to the SOLIS Administrator are included in Appendix D.

When files are received by the SOLIS Administrator, they are verified for quality and completeness by printing them before they are placed on line. If problems occur, the SOLIS Administrator will contact the appropriate party. A maximum of one week turnaround is expected to place files on line.

## **5 IF YOU ENCOUNTER PROBLEMS WITH SOLIS**

If you experience any problems or have questions or suggestions about the service, please electronic mail to the SOLIS Administrator at [solis-admin@cme.nist.gov](mailto:solis-admin@cme.nist.gov) to report any difficulty. These problems will be addressed and a reply returned on every inquiry.

If a file you need is not on line, please send a note to the appropriate project leader and a copy of your note to the SOLIS Administrator.

## **6 FUTURE DIRECTORY PLANS**

There are plans to expand available information on SOLIS to include areas such as: IGES test files, IGES testing related information, IPO project status, STEP-based software tools, STEP development methods, STEP actions, and STEP ballot comments and resolutions from PMAG.

## **7 ACKNOWLEDGMENTS**

Many thanks to Mary Mitchell for her contributions in improving the clarity of this document and to Bradford Smith for his continued support on this work.

## **8 REFERENCES**

[1] Ressler, Sandy, *The National PDES Testbed Mail Server User's Guide*, NISTIR 4508, National Institute of Standards and Technology, Gaithersburg, MD, January 1991.

Requests for this document should be directed to the National PDES Testbed Project Office, by any of the following methods: 1) send an electronic message to [randall@cme.nist.gov](mailto:randall@cme.nist.gov); 2) telephone at 1 (301) 975-3983; or 3) write to NPT Project, Factory Automation Systems Division, Building 220, Room A127, National Institute of Standards and Technology, Gaithersburg, MD 20899, U.S.A.

## Appendix A - Instructions for Accessing Public STEP Information and Software

There are four methods of accessing the public, on-line copies of the STEP parts, SC4 and working group documentation and schedules, and the NIST PDES (Product Data Exchange using STEP) Toolkit software and documentation:

### **anonymous ftp:**

```
ftp ftp.cme.nist.gov (or, ftp 129.6.32.54)
name: anonymous
password: <your-user-ID> (for example, rinaudot@cme.nist.gov)
cd pub/step (this is where the files to be downloaded are located)
```

### **kermit server:**

1. Use a communications package that supports the kermit protocol
2. Dial into the NIST modem pool at 1 301 948-9720
3. When prompted "Enter Username>" type in your last name
4. Connect to the SOLIS by typing in: connect solis.cme
5. At the "Login:" prompt, type in: kermit
6. Answer the prompts to register yourself as a user

You will be logged in to the kermit server and will be able to access all the files available on SOLIS.

### **electronic mail:**

Send electronic mail to nptserver@cme.nist.gov (request goes in the body of the message; subject is ignored). Use any of the following request commands:

1. type: "help" to get the help file (instructions for use of the archive server)
2. type: "index all" to get a list of directories, subdirectories, and file names
3. type: "index <dname>" to receive all the files in the <dname> directory
4. type: "send step/<dname>" to receive all the files in a directory
5. type: "send step/<dname>/current" to receive all files of the most the current version of that part
6. type: "send step/<dname>/<subdname>/<filename>" to receive a particular file
7. type: "send step/howto/mailhelp.txt" for an explanation of the archive server

## **internet gopher:**

The gopher server is running on `elib.cme.nist.gov` on port 70. There are two ways to access the SOLIS gopher server:

1. World Wide Web (WWW) browser (such as Mosaic), use one of the following URLs:

`gopher://elib.cme.nist.gov` or  
`http://elib.cme.nist.gov:70/`

You are now in SOLIS, using the gopher menu. Just click on either the "step" directory or the "howto" directory and proceed! When you have found a file you would like to receive, there are two ways to download that file.

Note: These instructions are specific to Mosaic for X Windows. The procedures for Mosaic for Microsoft Windows and Mosaic for Macintosh will differ slightly.

- a. When you are viewing the file you want, open the "File" pull down menu and select the "Mail To" option and fill in your email address. The file will then be emailed to you.

- b. You must first be at the gopher menu that lists the file that you want. Next, you pull down the "Options" menu and click on "Load to Local Disk". Select the file you want (ASCII, WordPerfect, or PostScript) from the Gopher menu. The "Save Binary File to Local Disk" window will appear. Then, select the directory where you want to save the file and fill in the "Name for binary file on local disk:".

2. Gopher client, connect to the following host:

`elib.cme.nist.gov`

For example, if your executable file is "gopher", type:

`gopher elib.cme.nist.gov`

You are now in SOLIS, using the gopher menu. Just select either the "step" directory or the "howto" directory and proceed! When you have found a file you would like to receive, there are two ways to download that file.

- a. Email the file. For this method, you must be viewing the file that you want to receive. Type "m" and a "Mail current document to:" window will appear. Enter your email address, press the "Enter" key, and the file will be emailed to you.

- b. Save the file to your local machine. For this method, you must either be viewing the file or have the file selected in the gopher menu. Type "s" and a "Save in file:" window will appear. You can enter the name you want for the file or use the default provided by the gopher client, and then press the "Enter" key.



## Appendix B - STEP Part Titles

Note: Part titles to be in the form:

Industrial automation systems and integration - Product data representation and exchange

Part	Title
1	Overview and fundamental principles
11	Description methods: The EXPRESS language reference manual
12	Description methods: EXPRESS-I language for abstract test cases
21	Implementation methods: Clear text encoding of the exchange structure
22	Implementation methods: STEP Data access interface
31	Conformance testing methodology and framework: General concepts
32	Conformance testing methodology and framework: Test laboratory requirements
41	Integrated generic resources: Fundamentals of product description and support
42	Integrated generic resources: Geometric and topological representation
43	Integrated generic resources: Representation structures
44	Integrated generic resources: Product structure configuration
45	Integrated generic resources: Materials
46	Integrated generic resources: Visual presentation
47	Integrated generic resources: Shape tolerances
48	Integrated generic resources: Form features
49	Integrated generic resources: Process structure, property and representation
101	Integrated application resources: Draughting
103	Integrated application resources: E/E connectivity
104	Integrated application resources: Finite element analysis
105	Integrated application resources: Kinematics
201	Application protocol: Explicit draughting
202	Application protocol: Associative draughting
203	Application protocol: Configuration controlled 3D design for mechanical parts and assemblies

- 204 Application protocol: Mechanical design using boundary representation
- 205 Application protocol: Mechanical design using surface representation
- 206 Application protocol: Mechanical design using wireframe representation
- 207 Application protocol: Sheet metal die planning and design
- 208 Application protocol: Life cycle product change process
- 209 Application protocol: Design through analysis of composite and metallic structures
- 210 Application protocol: Electronic printed circuit assembly, design and manufacture
- 211 Application protocol: Electronics test diagnostics and remanufacture
- 212 Application protocol: Electrotechnical plants
- 213 Application protocol: Numerical control process plans for machined parts
- 214 Application protocol: Core data for automotive design processes
- 215 Application protocol: Ship arrangement
- 216 Application protocol: Ship moulded forms
- 217 Application protocol: Ship piping
- 218 Application protocol: Ship structures
- 219 Application protocol: Dimensional inspection processing planning for coordinate measuring machines
- 220 Application protocol: Printed circuit assembly manufacturing planning
- 221 Application protocol: Functional data and schematic representation for process plans
- 222 Application protocol: Exchange of design engineering to manufacturing for composite structures
- 223 Application protocol: Exchange of design and manufacturing DPD for composites
- 224 Application protocol: Mechanical product definition for process planning
- 225 Application protocol: Structural building elements using explicit shape representation
- 226 Application protocol: Shipbuilding mechanical systems
- 227 Application protocol: Plant spatial configuration

## Appendix C - List of File Extensions

.clx	ChartX file, a PC drawing application
.com	An executable file system command (may be user-created)
.dir	ASCII text file that lists the files in a directory
.dvi	Device-Independent file (created by TeX)
.exe	A file which will unpack itself when executed on DOS, or any other executable software file
.exp	EXPRESS extraction file
.mac	A file created with any Macintosh application
.pak	A file which was compressed using the pak program
.ps	PostScript
.sgm	SGML file; The Standard Generalized Markup Language
.sty	LaTeX style file, ASCII format
.tex	LaTeX file, ASCII format
.trz	Compressed tar file (or .tar.Z)
.txt	ASCII text file
.w51	WordPerfect Version 5.1
.w60	WordPerfect Version 6.0

## Appendix D - Instructions, ftp UPLOAD

SC4 Editors, Project Leaders, and Conveners may use the following instructions to ftp part documents or other STEP information to the SOLIS Administrator:

- 1) ftp ftp.cme.nist.gov (or ftp 129.6.32.54)
- 2) name: stepup
- 3) password: Telephone the SOLIS Administrator at NIST on USA +1 (301) 975-3386 to receive the password
- 4) put filename
- 5) quit
- 6) electronic mail a notification message to the SOLIS Administrator when you have completed this process.

If you have any questions, you may email the SOLIS Administrator at [solis-admin@cme.nist.gov](mailto:solis-admin@cme.nist.gov) for further clarification.





